

Appendix A

Steering Committee Materials



KICKOFF MEETING AGENDA

1:00 PM **Welcome & Introductions**

1:05 PM **Overview Hazard Mitigation Planning (HMP)**

- History in Cambridge
- The Gold Standard: Examples from City of Boston HMP
- FEMA and MEMA requirements
- Value of hazard mitigation planning

1:15 PM **Scope & Schedule**

Scope of Work Overview

- Task 1: Project Initiation
- Task 2: Initiation of Engagement
- Task 3: Hazard Profiles
- Task 4: Facility Inventory
- Task 5: Vulnerability Assessment
- Task 6: Mitigation Goals and Capabilities
- Task 7: Mitigation Actions: Past, Present, and Future
- Task 8: Plan Maintenance and Implementation
- Task 9: Public Review
- Task 10: MEMA and FEMA Review, City Adoption
- Ongoing Public Outreach
- Ongoing Project Administration

Critical Path Items

- Asset/Facility Inventory
- Capabilities Assessment
- Request repetitive loss data

Key Changes

- How is this different from last update?
- How are we consolidating relevant planning updates & documents in this HMP?

Schedule

- Screen share of draft schedule



CITY OF CAMBRIDGE

2023 Hazard Mitigation Plan Update

Kickoff Meeting

February 27, 2023

1:00 to 2:30 PM

2:00 PM

Engagement

- Groups
 - Steering Committee
 - Hazard Mitigation Planning Team
 - Street Team
 - Public
- Roles, responsibilities, and commitments
- Meeting dates & times (Slido poll)

2:10 PM

Questions, Discussion, and Action Items

2:30 PM

Conclude



Hazard Mitigation Plan Update 2023

Kickoff Meeting
February 27, 2023



**CITY OF
CAMBRIDGE**



AGENDA



Welcome & Introductions

1:00 PM



Overview of Hazard Mitigation Planning

1:05 PM



Scope & Schedule

1:15 PM



Engagement

2:00 PM



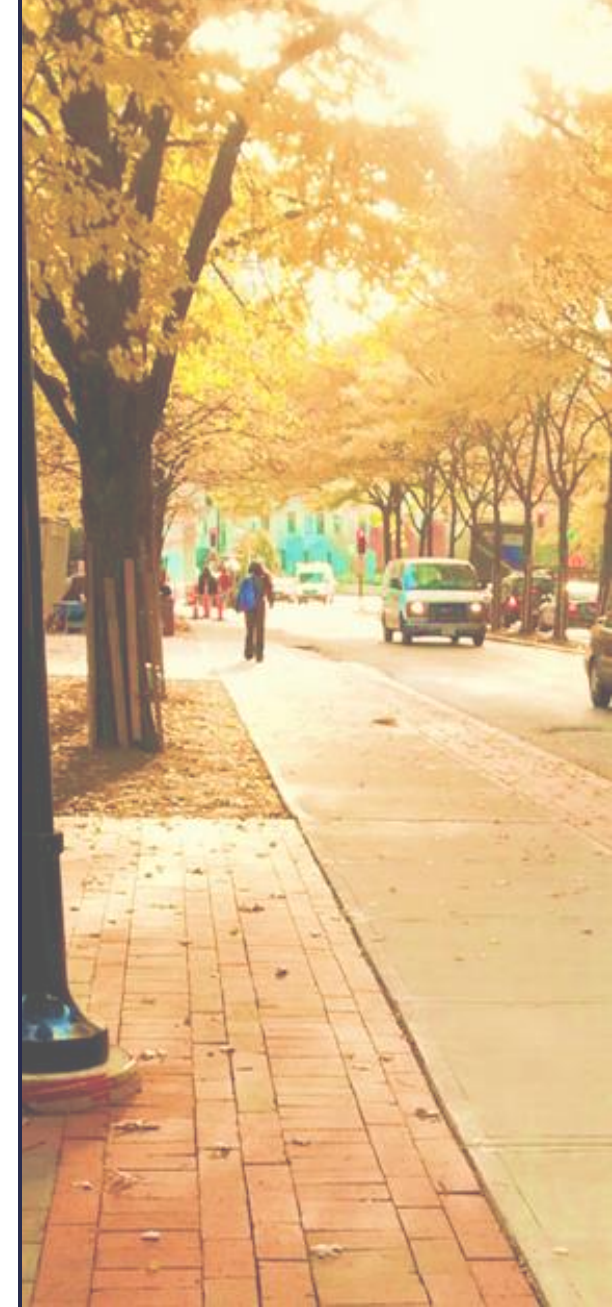
Questions, Discussion, Action Items

2:10 PM



Conclude

2:30 PM



AGENDA



Welcome & Introductions

1:00 PM



Overview of Hazard Mitigation Planning

1:05 PM



Scope & Schedule

1:15 PM



Engagement

2:00 PM



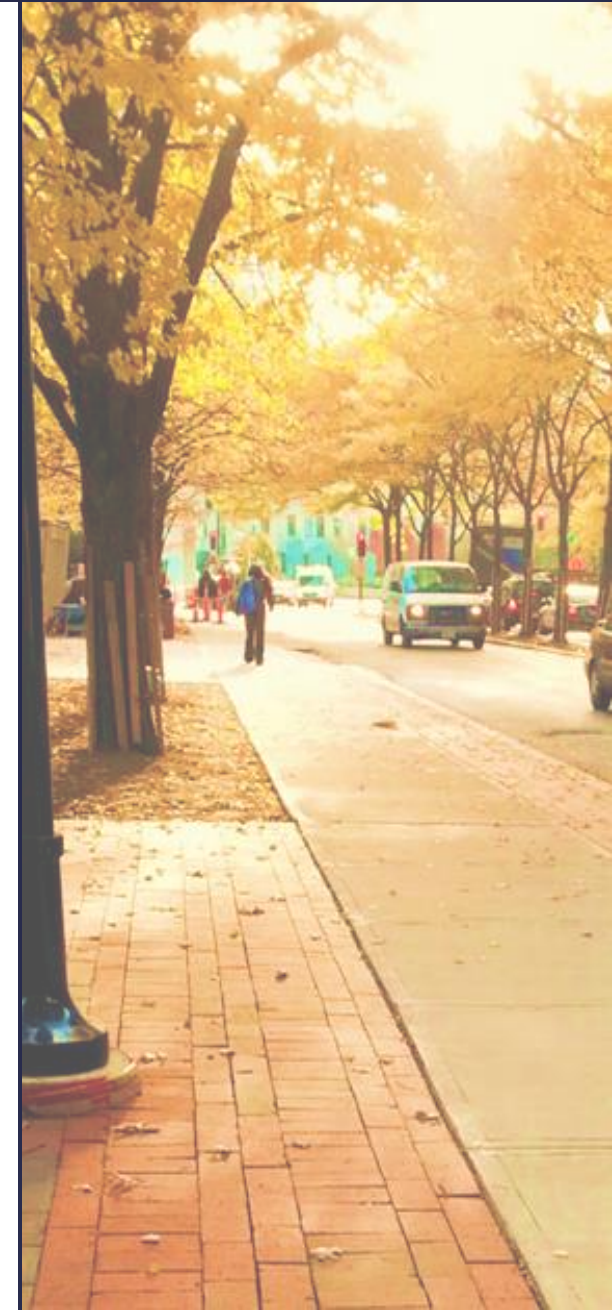
Questions, Discussion, Action Items

2:10 PM

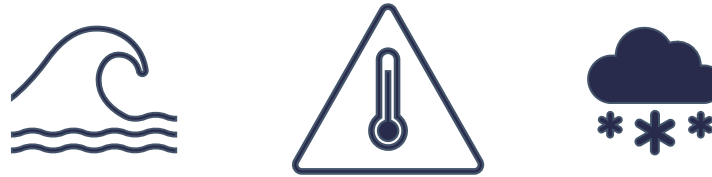


Conclude

2:30 PM



WHAT IS HAZARD MITIGATION?



The effort to reduce impacts from natural hazards such as flooding, extreme temperatures, and winter weather...



...through planning, policy, education, infrastructure projects, and more.

FEMA & MEMA REQUIREMENTS



“The Disaster Mitigation Act of 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act (44 CFR Part 201), creating the framework for state, local, tribal and territorial governments to engage in hazard mitigation planning to receive certain types of non-emergency disaster assistance.”

**FEMA updated *Local Mitigation Planning Policies and Guidance*
(released April 2022, effective April 2023)**

2022 Updates Include:

- ✓ Expanded list of participants required in planning process.
- ✓ Requires consideration of climate change.
- ✓ Recognizes the important role of adopting and enforcing building, land use, and development code
- ✓ Facilitates stronger alignment with other FEMA mitigation programs.

HISTORY IN CAMBRIDGE: 2015 PLAN UPDATE

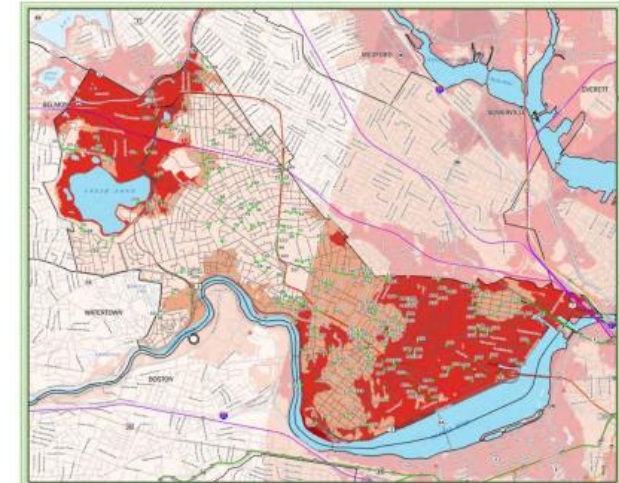


CITY OF CAMBRIDGE HAZARD MITIGATION PLAN 2015 UPDATE

Prepared by MAPC

Adopted: 3/21/2016
Approved: 5/24/2016
Expired: 5/24/2021

CITY OF CAMBRIDGE HAZARD MITIGATION PLAN 2015 UPDATE



Final Plan
Approved by FEMA
May 24, 2016

HISTORY IN CAMBRIDGE: MITIGATION ACTIONS



Cambridge HMP 2015 Mitigation Actions

Mitigation Action	Measure Type	Implementation Responsibility	Priority	Time Frame	Potential Funding Sources
Flood Hazard Mitigation Measures					
A) Complete hydraulic modeling for the city	Prevention	DPW	High	2014–2018	City of Cambridge
B) Complete sewer separation and stormwater management program for Kirkland Street, Myrtle Street, Magnolia Street and Cambridge Street (CAM #011, areas 18 and 19)	Structural Projects	DPW	High	2014-2016	City of Cambridge
C) Complete sewer separation and stormwater management program for areas east of Fresh Pond Pkwy (area #6) and between Concord Avenue rotaries and New Street (area #5)	Structural Projects	DPW	High	2014-2016	City of Cambridge
D) Complete sewer separation at Porter Square (CAM 002 CSO area)	Structural Projects	DPW	High	2014–2018	City of Cambridge
E) Improve collection and conveyance system at area east of 2nd Street and north of Charles Street (area #27)	Structural Projects	DPW	High	2014–2018	City of Cambridge
F) Implement additional stormwater management measures: School, Pine, Cherry and Windsor Streets (area #26)	Structural Projects	DPW	High	2014–2018	City of Cambridge
G) Complete Cambridgeport stormwater management program: Newton, Green, Franklin and Sidney Streets (CAM 017, area #28)	Structural Projects	DPW	High	2014–2018	City of Cambridge

Mitigation Action	Measure Type	Implementation Responsibility	Priority	Time Frame	Potential Funding Sources
H) Complete sewer separation and stormwater management program for Irving, Bryant, Crescent, Carver and Sacramento Streets (CAM011, areas #16 and 17)	Structural Projects	DPW	High	2014–2017	City of Cambridge
I) Complete sewer separation and stormwater management program for Ellery Street and Broadway (CAM011, area #24)	Structural Projects	DPW	High	2014–2017	City of Cambridge
J) Establish funding program for residential structural improvements and flood proofing	Prevention/Property Protection	CDD, DPW	Medium	2016-2018	City of Cambridge, FEMA
K) Floodplain Management	Prevention	Conservation Commission	Low	2014-2018	City of Cambridge
L) Floodplain Mapping	Prevention	CDD, Conservation Commission	Low	2014-2018	City of Cambridge
Winter Storm Hazard Mitigation Measures					
M) Expand program to clear snow and maintain public ROWs (e.g., travel ways for non-vehicular mobility and access for vulnerable populations)	Prevention	DPW	Medium	2014-2018	City of Cambridge, DCR, MassDOT
Geologic Hazard Mitigation Measures					
N) Determine vulnerability of roadways and utilities to earthquakes in the high liquefaction areas	Prevention	EMD, DPW, Inspectional Services	Medium	2016-2018	City of Cambridge

Mitigation Action	Measure Type	Implementation Responsibility	Priority	Time Frame	Potential Funding Sources
Extreme Temperature Mitigation Measures					
O) Provide facility for additional vulnerable populations during extreme temperature event	Prevention/Public Education & Awareness	DHSP, EMD	Medium	2014-2016	City of Cambridge
Wind Mitigation Measures					
P) Increase public education on the benefits and proper care of trees on private property	Public Education & Awareness	Inspectional Services, EMD	Low	2015-2017	City of Cambridge, MEMA
Climate Change Mitigation Measures					
Q) Complete Climate Change Vulnerability Assessment	Prevention	CDD	High	2014	City of Cambridge
R) Complete Climate Change Adaptation Plan	Prevention	CDD	High	2014-2015	City of Cambridge, EOEEA
S) Encourage installation of solar photovoltaic systems, cogeneration, and other energy supplies	Prevention	CDD	Low	2014-2017	City of Cambridge
T) Encourage energy efficiency in buildings through zoning requirements and community outreach	Prevention	CDD	Low	2014-2017	City of Cambridge
Other Hazard Mitigation Measures					
U) Evacuation Protocol Review	Emergency Services Protection	EMD	High	2015-2016	City of Cambridge
V) Develop program for enhanced staffing for disaster recovery	Prevention/Emergency Services Protection	Inspectional Services, CPHD	Medium	2014-2016	City of Cambridge

KEY CHANGES



Federal

FEMA updated Local Mitigation Planning Policies and Guidance (released April 2022, effective April 2023)

State

State adopted Massachusetts Integrated State Hazard Mitigation and Climate Adaptation Plan (September 2018)

Local

- CCVA Reports (Parts 1 & 2)
- CCPR/Neighborhood Plans for Alewife and The Port
- Resilient Cambridge
- Cambridge Flood Viewer
- Cambridge Heat Viewer
- Cambridge Urban Forest Master Plan
- Envision Cambridge
- Sustainability Dashboard and Net Zero Action Plan
- Climate Resilience Zoning Petition



RECENT EXAMPLE: BOSTON



Publicly Accessible:
Easily understandable for people without a technical or planning background

Benefits of Natural Hazard Mitigation Planning

- 1) Increase public awareness of natural hazards that may affect the community
- 2) Allow state and local governments to work together and combine hazard risk reduction with other community goals and plans
- 3) Ensure resources and attention are focused on the community's greatest vulnerabilities

What is...?

Climate change
According to the 2018 Massachusetts Integrated State Hazard Mitigation and Climate Adaptation Plan (SHMCAP), climate change is "a change in the state of the climate that can be identified by statistical changes of its properties that persist for an extended period, whether due to natural variability or as a result of human activity." Changes in climate impact the NHMP development process, making it necessary to consider climate change predictions even for a five-year plan.

Climate adaptation
An action that seeks to reduce vulnerability and risk to an anticipated climate change impact. This may include flood barriers, living shorelines, elevated buildings, and increased tree canopy.

Wondering what's in the plan?
See page 14!

BOSTON				MASSACHUSETTS			
AGE 👤							
15.8%	11.5%	19.6%	17%	Under Age 18	Over Age 65	Under Age 18	Over Age 65
EDUCATION 🎓							
49.7%	45.0%			Bachelor's degree or higher			
DISABILITIES ♿							
11.9%	11.5%			With a disability			
ENGLISH SPEAKING SKILLS 🗣️							
17.4%	9.2%			Limited English-speaking skills			
INCOME 💰							
\$71,115	18.9%	\$85,843	9.4%	Median household income	Poverty rate	Median household income	Poverty rate
HOUSING 🏠							
294,418	32.1%	40%	16%	2.9 M	62.2%	40%	15%
Housing units	Owner-occupancy rate	Burdened by housing costs* (renter)	Burdened by housing costs* (mortgage)	Housing units	Owner-occupancy rate	Burdened by housing costs* (renter)	Burdened by housing costs* (mortgage)
TECHNOLOGY 📱							
91.0%	85.4%	93.5%	88.9%	With a computer	With a broadband internet subscription	With a computer	With a broadband internet subscription

By completing an NHMP, municipalities also become eligible for specific federal funding which allows the use of potential funding sources to reflect a community's priorities (FEMA, 2020). Hazard mitigation funding is available through the Federal Emergency Management Agency (FEMA). To be eligible for FEMA grants, local governments are required to prepare an NHMP meeting the requirements established in the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended by the Disaster Mitigation Act of 2000. Please refer to Chapter 7 for more information on FEMA grants and other potential funding sources.

Many of the hazards that Boston commonly experiences are projected to worsen due to climate change. Climate change refers to changes in regional weather patterns that are linked to warming of the Earth's atmosphere as a result of both human activity and natural fluctuations. The Earth's atmosphere has naturally occurring greenhouse gases (GHGs), like carbon dioxide (CO₂), that capture heat and contribute to the regulation of the Earth's climate. When fossil fuels (including oil, coal and gas) are burned, GHGs are released into the atmosphere and the Earth's temperature tends to increase. The global temperature increase affects the jet stream and the Earth's climate patterns.

A diagram of the greenhouse gas effect

City of Boston Natural Hazard Mitigation Plan | Page 17

B

ONE: INTRODUCTION

The City of Boston through the Office of Emergency Management (OEM) prepared a Natural Hazard Mitigation Plan (NHMP) to create an action roadmap to reduce the impacts of natural hazards and climate change within the community and the region. This project is funded by a Federal Emergency Management Agency (FEMA) grant.

What are...?

Natural hazards are severe weather events and can include flooding, extreme wind events, winter weather, earthquakes, fires, extreme temperatures, and drought.

Hazard Mitigation is the effort to reduce impacts from natural hazards through planning, policy, education, infrastructure projects, and more.

A Natural Hazard Mitigation Plan (NHMP) is a strategy to reduce risks and vulnerabilities associated with natural hazards and climate change, to protect homes, businesses, and the critical infrastructure that keeps our City running.

Resilience is the ability to withstand and swiftly recover from an extreme event. Ideally, resilient systems "bounce forward" to create healthier, greener, and more equitable systems and spaces.

1.1 What is a Natural Hazard Mitigation Plan?

Natural hazards, such as earthquakes, hurricanes, and flooding, can result in loss of life, disruptions to everyday life, and property damage. Hazard mitigation is the effort to reduce these impacts through community planning, policy changes, education programs, infrastructure projects, and other activities (FEMA, 2021a). Natural hazard mitigation planning uses a stepped process with the participation of a wide range of stakeholders to:

1. define local hazards
2. assess vulnerabilities and risks
3. review current mitigation measures
4. develop priority action items

The resulting plan and implementation of action items saves lives and money. A dollar spent on federal hazard mitigation grants saves an average of six dollars (NIBS, 2019).

EVERY \$1 SPENT ON MITIGATION

SAVES \$6 ON DISASTER RECOVERY

Page 16 | Chapter 1

RECENT EXAMPLE: BOSTON



Opportunity to streamline goals:
Consider goals designed to be easily
communicated and consistent with other
local planning initiatives.

Cambridge HMP 2015 Goals

- Ensure that evacuation can happen in an organized and efficient manner.
 - Minimize secondary impacts from hazards, such as the release of pollutants.
- 2. Goal: Protect existing properties and structures.
 - Provide resources for residents and businesses to make their buildings and properties more disaster resistant.
 - Educate the public on measures they can take to protect their property.
 - Maintain existing mitigation structures.
 - Ensure that future development / redevelopment does not make existing properties more vulnerable to hazards.
 - Ensure that critical facilities are protected from hazards.
 - Complete separation of combined sewers
- 3. Goal: Ensure that essential services can function during and after a hazard event.
 - Ensure that critical infrastructure is protected from natural hazards.
 - Ensure that people (key service providers and employees) can get into the city to provide services.
 - Build resiliency into the system for faster recovery, e.g., electricity distribution system.
- 4. Goal: Avoid chaos and confusion with good communication.
 - Have an effective communication plan.
 - Perform outreach to non-English speakers and other vulnerable populations before, during and after hazard events.
 - Coordinate efforts with the private sector and institutions and with neighboring communities.
- 5. Goal: Work regionally to mitigate impacts from natural hazards and to respond and recover from hazard events.
 - Continue to participate in regional efforts.
 - Cooperate with other agencies, communities, and private entities.
 - Understand priorities and capabilities of other entities to allow for resource-sharing, mutual aid, and entering into memoranda of understanding (MOU).
- 6. Goal: Determine priorities for directing resources for hazard mitigation and response.
 - Prioritize mitigation projects.
- Continue to program mitigation projects in the 5 and 10 year CIP.
 - Pursue various funding sources.
 - Encourage private property-owners to implement measures to protect their own property.
- 7. Protect natural resources
 - Identify mitigation strategies that preserve or restore the function of natural systems.
 - Protect indigenous wetland areas, undeveloped floodplains and other natural features that provide mitigation of natural hazards.
 - Introduce green infrastructure elements, where possible, to reduce impervious surfaces and introduce natural systems.
- 8. Create capacity to monitor existing changes
 - Identify and understand how climate change may alter where and how the City is vulnerable to natural hazards.
 - Review and update current mitigation activities to anticipate future changes in vulnerabilities.
 - Review and update current emergency preparedness and response activities to anticipate future changes in vulnerabilities.



Hazard Mitigation and Climate Adaptation Goals

Fundamentally, the NHMP intends to equitably support Boston's neighborhoods by protecting public health and safety, increasing awareness of steps to mitigate damages from natural hazards, and promoting preparedness for climate change. The Executive Steering Committee, representing the City of Boston, endorsed, the following set of hazard mitigation and climate adaptation goals. Each goal was assigned a set of objectives, which can be found in Chapter 2. These goals informed the selection and prioritization of future adaptation and mitigation actions.



1 Equitably protect the health and safety of the public through awareness, preparedness, and connections.



2 Increase resilience by protecting and enhancing natural resources.



3 Implement hazard mitigation and climate adaptation projects that meet strategic priorities.



4 Invest in protecting properties and structures.



5 Ensure that essential services and infrastructure will function during and after a hazard event and prepare essential services for projected climate change impacts.

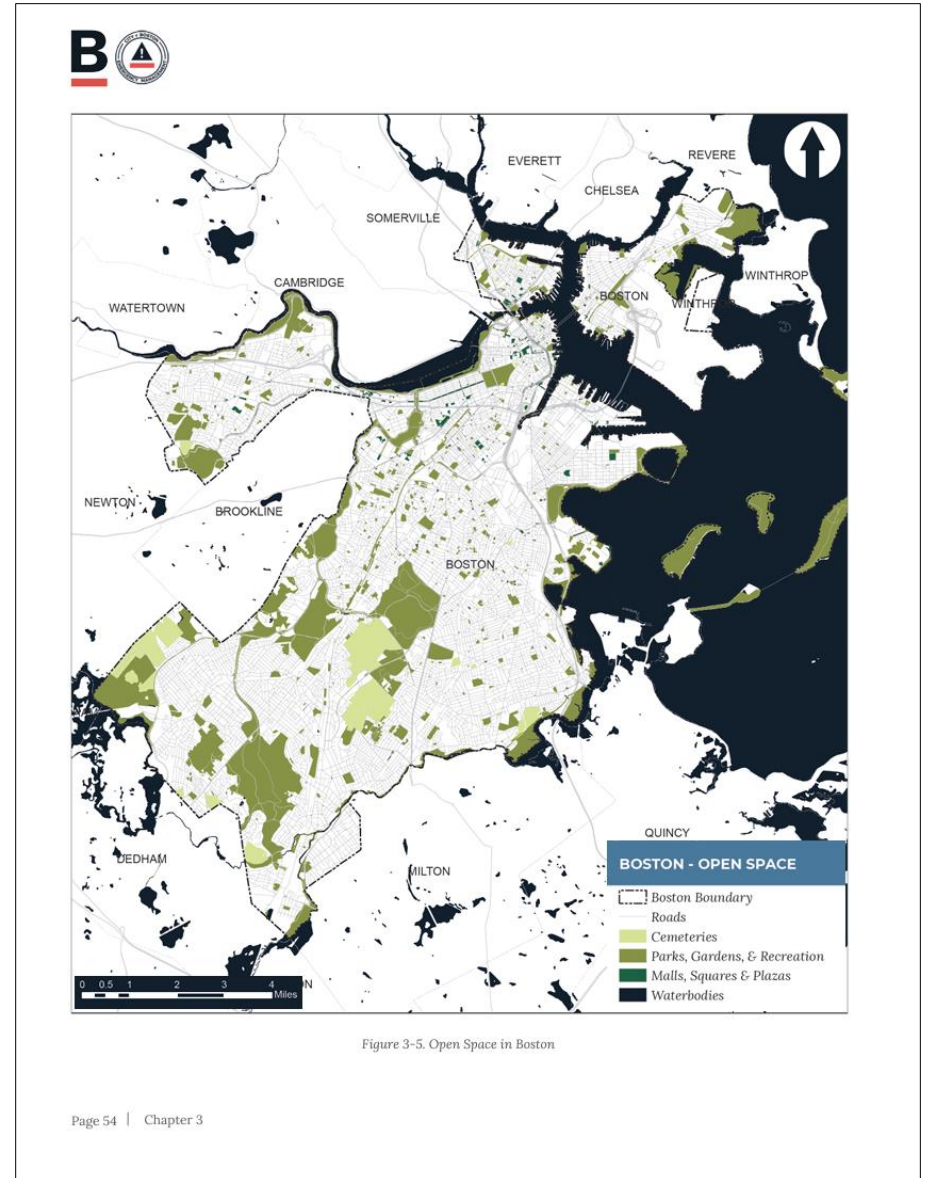
RECENT EXAMPLE: BOSTON



Prioritized to be Implemented:
Practical, integrated, and proactive mitigation actions.

Action Prioritization - A prioritization designation of high, medium, or low priority was assigned to each mitigation measure. This designation was based on a cumulative rating from the ten categories listed below:

- **Life Safety** - Will this action protect lives and prevent injury?
- **Property Protection** - Will this action eliminate or reduce damage to structures and infrastructure?
- **Technical** - Is the mitigation action technically feasible?
- **Political** - Does the public support the mitigation action?
- **Legal** - Does the City have the authority to implement the action?
- **Environmental** - Will the action protect and preserve Boston's natural resources?
- **Social** - Will the action have a positive impact on the community and vulnerable populations?
- **Administrative** - Does the City have the capabilities to implement and maintain the action?
- **Local Champion** - Is there a strong advocate for the project with the City?
- **Other Community Objectives** - Does the action advance other objectives in Boston, such as capital improvement, economic development, environmental quality, or open space preservation?



VALUE OF HAZARD MITIGATION PLANNING



Eligibility for grant funding



Preparedness planning



Building public consensus for implementation



Creating equitable outcomes

EVERY \$1

SPENT ON MITIGATION



SAVES \$6

ON DISASTER RECOVERY



AGENDA



Welcome & Introductions

1:00 PM



Overview of Hazard Mitigation Planning

1:05 PM



Scope & Schedule

1:15 PM



Engagement

2:00 PM



Questions, Discussion, Action Items

2:10 PM



Conclude

2:30 PM



HMP OVERVIEW



Project Tasks align with the Final Document Chapters:

Task 1: Project Initiation

Task 2: Initiation of Engagement

Task 3: Hazard Profiles

Task 4: Facility/Asset Inventory

Task 5: Vulnerability Assessment

Task 6: Mitigation Goals and Capabilities

Task 7: Mitigation Actions: Past, Present, and Future

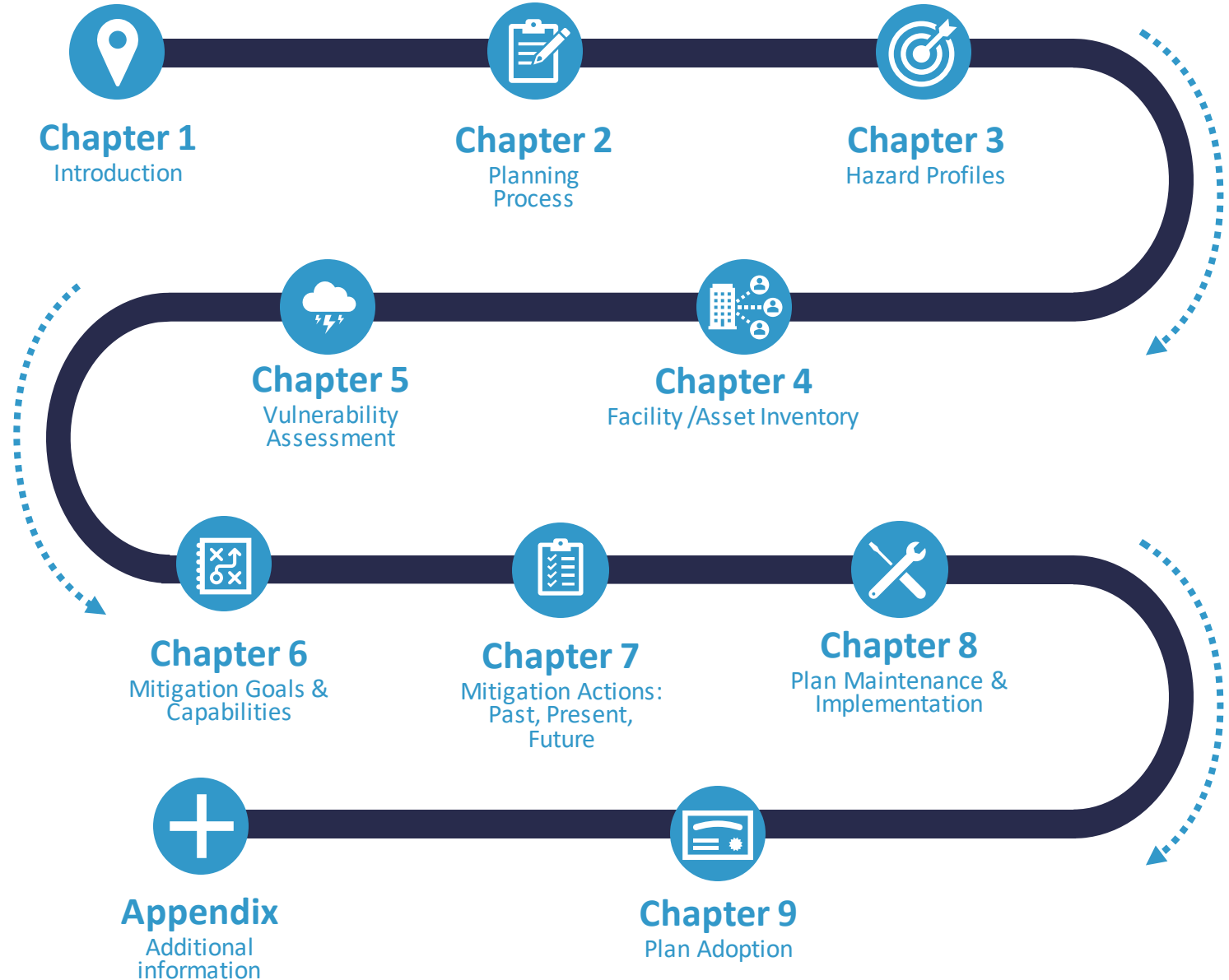
Task 8: Plan Maintenance and Implementation

Task 9: Public Review

Task 10:]

Ongoing Public Outreach

Ongoing Project Administration



TASK 1

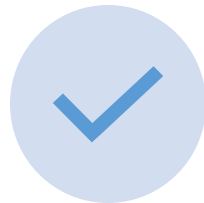


Project Initiation

“A successful planning effort includes active participation and buy-in from community leaders, stakeholders, and the public.”



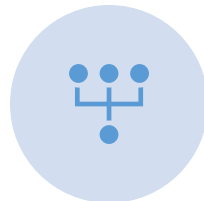
Defining engagement groups (Steering Committee, SHTP, Stakeholders)



Confirming logistics



Project initiation meeting to facilitate understanding & vet questions/concerns



Data gathering, review, consolidation, and integration



Ongoing coordination

TASK 2



Initiation of Engagement

Create a shared understanding of risk due to natural hazards

Provide opportunities to be actively participating in the development of the hazard mitigation plan

Engage community lifelines, which are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function



Community Lifelines:

- Safety and Security
- Food, Water, Shelter
- Health and Medical
- Energy
- Communications
- Transportation
- Hazardous Material

City Staff



Stakeholders



Outreach



Public



FEMA's new engagement requirements

Local + Regional Agencies

- Public Works
- Emergency Management
- Local Floodplain Administration
- GIS Departments

Agencies that have the authority to regulate development

- Zoning
- Planning
- Community and economic development departments
- Building officials
- Planning commissions
- Other elected officials

Neighboring Communities

- Adjacent local governments, including special districts, such as those that are affected by similar hazard events or may share a mitigation action or project that crosses boundaries
- Neighboring communities may be partners in hazard mitigation and response activities, or may be where critical assets, such as dams, are located.

Representatives of businesses, academia, and other private organizations

- Private utilities or major employers that sustain community lifelines

Stakeholders



Representatives of nonprofit organizations, including community-based organizations, that work directly with and/or provide support to underserved communities and socially vulnerable populations, among others

- Housing, healthcare or social service agencies

TASK 2



Outreach



Engagement Materials

- Website Information
- Social Media Posts
- E-blasts
- Project Video
- Public Survey(s)
- FAQ Section
- Interactive Map
- ESRI Storymap
- Flyers
- Fact sheets

Consistent Visual and Tonal Branding

Public



Groups to Focus On

- People with lower incomes
- People of color
- Infants + Youth
- Older adults
- People experiencing homelessness
- Non-English speakers + Immigrants
- People with physical or developmental disabilities
- People who are currently or formerly incarcerated + their families
- People with a physical or mental illness
- People with undocumented status

Considerations will be made for each group and each engagement activity.

Translation and interpretation services to be provided by City of Cambridge

PRELIMINARY CONTENT FOR DISCUSSION

TASK 3



Hazard Profiles

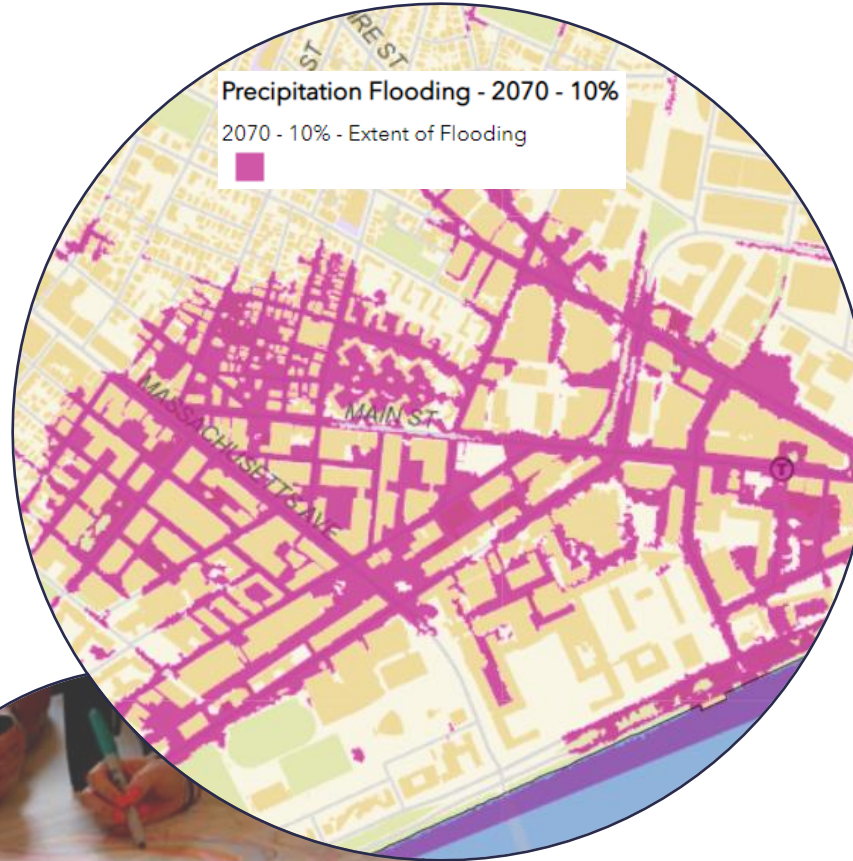
Identifies the hazards that can affect the City of Cambridge and associated Risk:

Location: Where each hazard might affect the planning area

Extent: Potential intensities

Previous Occurrence: How often events have happened in the past?

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



TASK 4



Facility / Asset Inventory

Assets are determined by the community and include, but are not limited to:



People (including underserved communities and socially vulnerable populations).



Structures (including facilities, lifelines and critical infrastructure).



Systems (including networks and capabilities).



Natural, historic, and cultural resources.



Activities that have value to the community

Example Critical Facilities

- Energy
- Transportation
- Water, wastewater, stormwater
- Telecommunication
- Emergency Response
- Hospitals and health care
- Municipal Buildings
- Community Resources
- Etc.

Repetitive Loss Structures

Land Use Changes & Future Potential Development

TASK 5



Risk & Vulnerability Assessment

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



Use information from Hazard Profiles (Task 3) and Facility/Asset Inventory (Task 4)

Define what parts of the community are most likely to be affected (vulnerability) and the potential consequences (impacts).

TASK 6



Mitigation Goals and Capabilities

Intent: Revisit and refine goals & assess current capabilities to support plan implementation. Critical steps in developing specific hazard mitigation actions and projects.



Goals

Long-term policy statements and global visions that support the mitigation strategy.



Capabilities Assessment

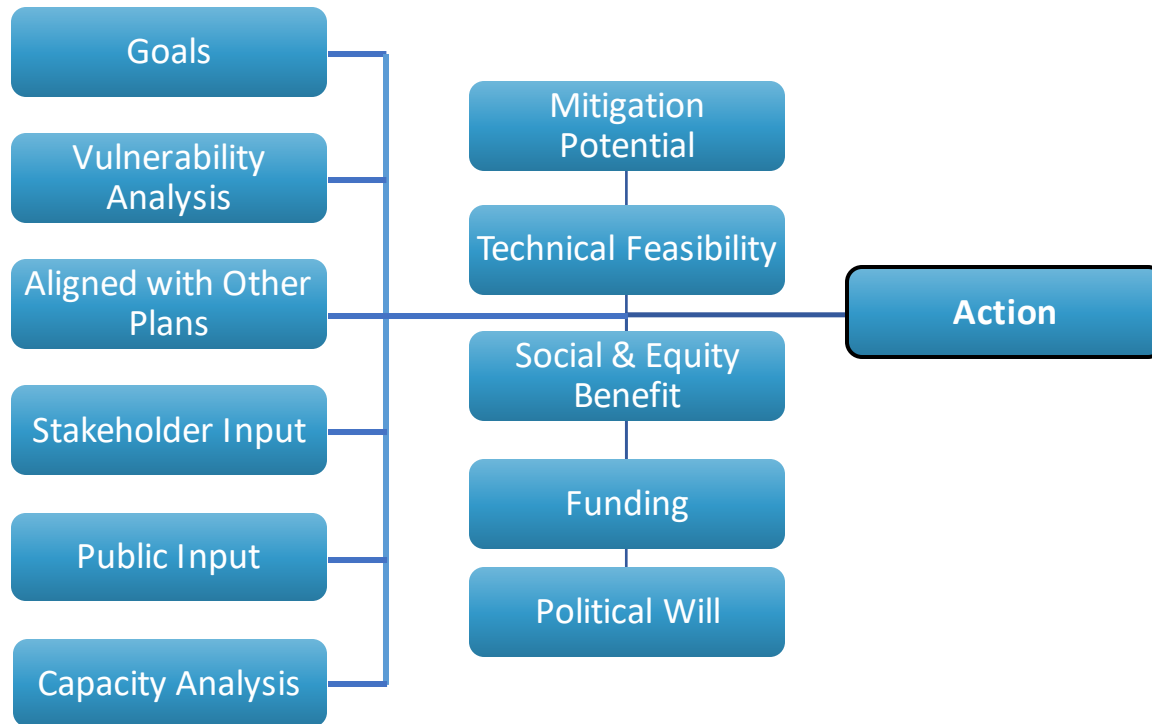
Identify and assess existing authorities, policies, programs, and resources and capabilities to use or modify local tools to reduce losses and vulnerability from profiled hazards.

TASK 7



Mitigation Actions: Past, Present, and Future

Intent: The mitigation strategy serves as the long-term blueprint for reducing the potential losses identified in the risk assessment.



Mitigation actions fall into the following categories:

- Life Safety
- Property Protection
- Technical
- Political
- Legal
- Environmental
- Social
- Administrative

TASK 8



Plan Maintenance and Implementation

- **Intent:**
 - **Living document** that guides actions over time. Having a process for maintaining the plan reflects the recognition that things change.
 - **Track progress** on implementing the mitigation strategy.
 - **Revisit** at regular intervals to keep it relevant.
- **Schedule** with procedures for ensuring the plan's implementation, updating, and revision.
- Identify a **Champion** to organize future meetings and to track progress.
- Identify potential **future** planning and budgeting efforts that will **require coordination**.
- Incorporate into **next MVP Planning Phase**.



TASK 9



Public Review



Public Review

- Website Information
- Social Media Posts
- E-blasts
- Public Comment Period
- Public Survey(s)
- FAQ Section
- Public Meeting
- Flyers
- Fact sheets

Translation and Interpretation Services to be provided by City of Cambridge



TASK 10



MEMA and FEMA Review, City Adoption

“Adoption by the local governing body demonstrates Cambridge’s commitment to the hazard mitigation goals and actions outlined in the plan.

Adoption authorizes responsible agencies to perform.

Without adoption, Cambridge has not completed the mitigation planning process and will not be eligible for certain FEMA assistance, such as HMA or HHPD grant program funding for mitigation actions.”



CRITICAL PATH ITEMS



	Facility/ Asset Inventory	Capabilities Assessment	Repetitive Loss Data
Requirement	Community must determine assets (people; structures; systems; natural, historic, and cultural resources; and/or activities that have value to the community).	Document local mitigation capabilities (existing authorities, policies, programs, and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities).	Address repetitively flooded NFIP-insured structures by including the estimated numbers and types (residential, commercial, institutional, etc.) of repetitive/severe repetitive loss properties.
Starting Point	CCVA Critical Assets & Community Resources (November 2015)	2015 HMP & Institutional Knowledge	2015 HMP: There were 2 repetitive loss structures, an increase from the one structure identified in the 2008 plan.
Tools	Institutional Knowledge & Assessor's Database	FEMA worksheet	Email template for request

SCHEDULE OVERVIEW



	TASK	February	March	April	May	June	July	August
1	Project Initiation	█						
2	Engagement		█	█	█	█	█	
3	Hazard Profiles	█	█					
4	Facility/Asset Inventory		█	█				
5	Vulnerability Assessment			█	█			
6	Mitigation Goals & Cap.		█	█	█			
7	Develop Actions				█	█	█	
8	Plan Implementation					█	█	
9	Public Review						█	
10	Adoption						█	█
	Admin. & Outreach	█	█	█	█	█	█	█



PRELIMINARY CONTENT FOR DISCUSSION

AGENDA



Welcome & Introductions

1:00 PM



Overview of Hazard Mitigation Planning

1:05 PM



Scope & Schedule

1:15 PM



Engagement

2:00 PM



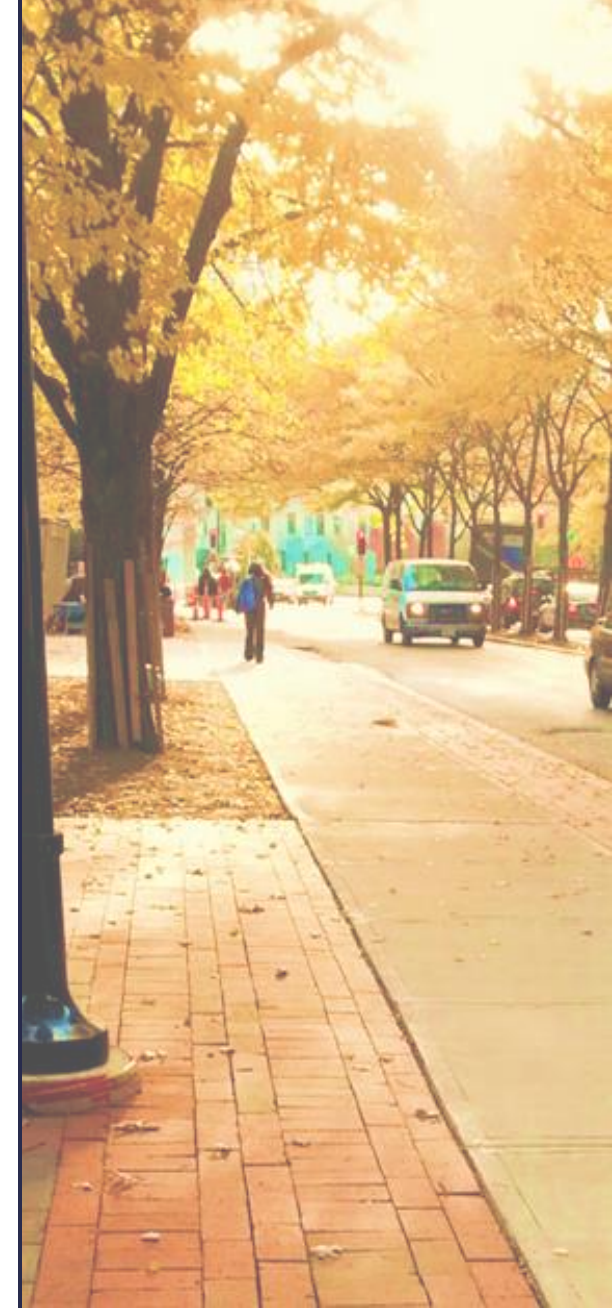
Questions, Discussion, Action Items

2:10 PM



Conclude

2:30 PM



GROUPS



City Staff



Steering Committee

Group of key City staff responsible for making final planning decisions. Steering Committee Meetings will guide the planning process, endorse draft Goals, and members will participate in Hazard Mitigation Planning Workshops.

*6 Monthly Meetings
& 3 Workshops*

Stakeholders



Hazard Mitigation Planning Team (HMPT)

Group of stakeholders bringing a wide range of local expertise and perspectives. The group will include advocates, residents, business-owners, state and local agency representatives, and people from various other organizations.

3 Workshops

Outreach



Street Team

Subset of the HMPT who can help with in-person and virtual outreach and engagement events. This could include activity at local community organizations, schools, events, door-to-door outreach, and others engagement.

Ongoing

Public



Public Engagement

Public Meetings will be an opportunity to educate about the HMP, share progress, and gather feedback and ideas. Results from these meetings and other feedback will be integrated into the final report. The group will include advocates, residents, business-owners, state and local agency representatives, and people from various other organizations.

3 Meetings

ROLES, RESPONSIBILITIES, COMMITMENTS



City Staff



Steering Committee

Group of key City staff responsible for making final planning decisions. Steering Committee Meetings will guide the planning process, endorse draft Goals, and members will participate in Hazard Mitigation Planning Workshops.

Proposed Participants:

- DPW
- CDD
- Public Health
- Emergency Mgmt. Manger (Fire Chief)

*6 Monthly Meetings
(1 hour each)
& 3 Workshops
(1.5 hours each)*

Stakeholders



Hazard Mitigation Planning Team (HMPT)

Group of stakeholders bringing a wide range of local expertise and perspectives. This includes a broader range of City staff and can include targeted individuals from organizations that have influence and/or serve a large group.

Proposed Participants:

- Traffic, Parking, and Transportation
- Inspectional Services
- Historic Commission
- Finance Department
- Housing Authority
- School Department
- Immigration Affairs
- Human Services
- City Manager's Office
- Police?

*3 Workshops
(1.5 hours each)*

slido



What days and times would you be able to attend a monthly Steering Committee Meeting?

ⓘ Start presenting to display the poll results on this slide.

AGENDA



Welcome & Introductions

1:00 PM



Overview of Hazard Mitigation Planning

1:05 PM



Scope & Schedule

1:15 PM



Engagement

2:00 PM



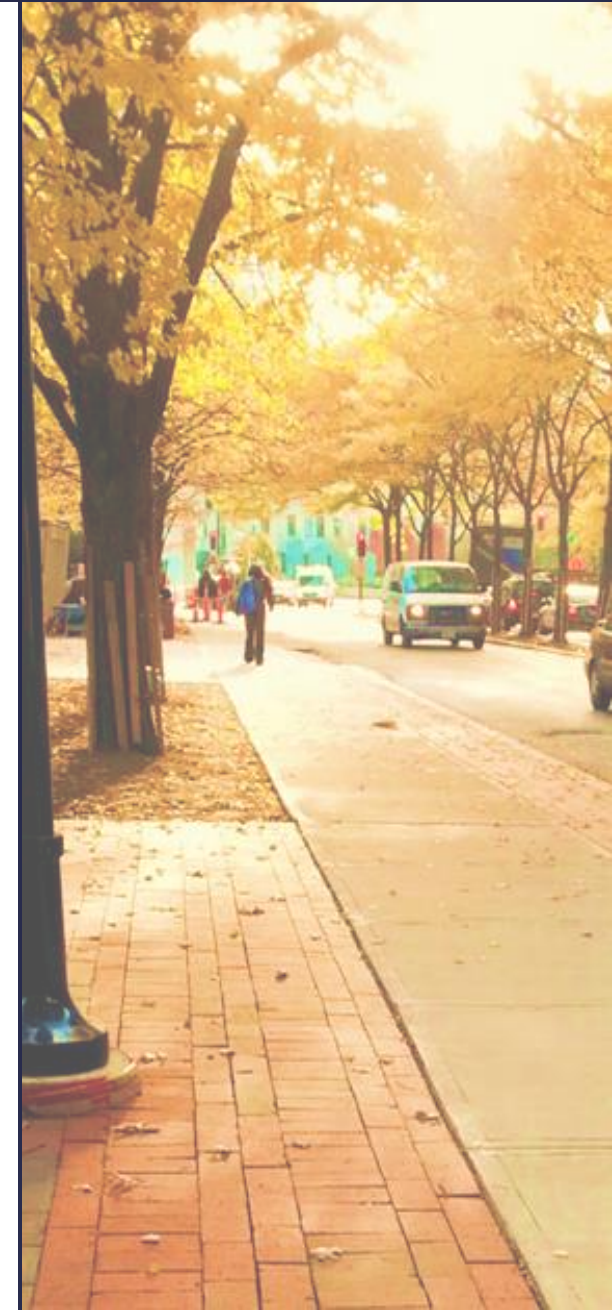
Questions, Discussion, Action Items

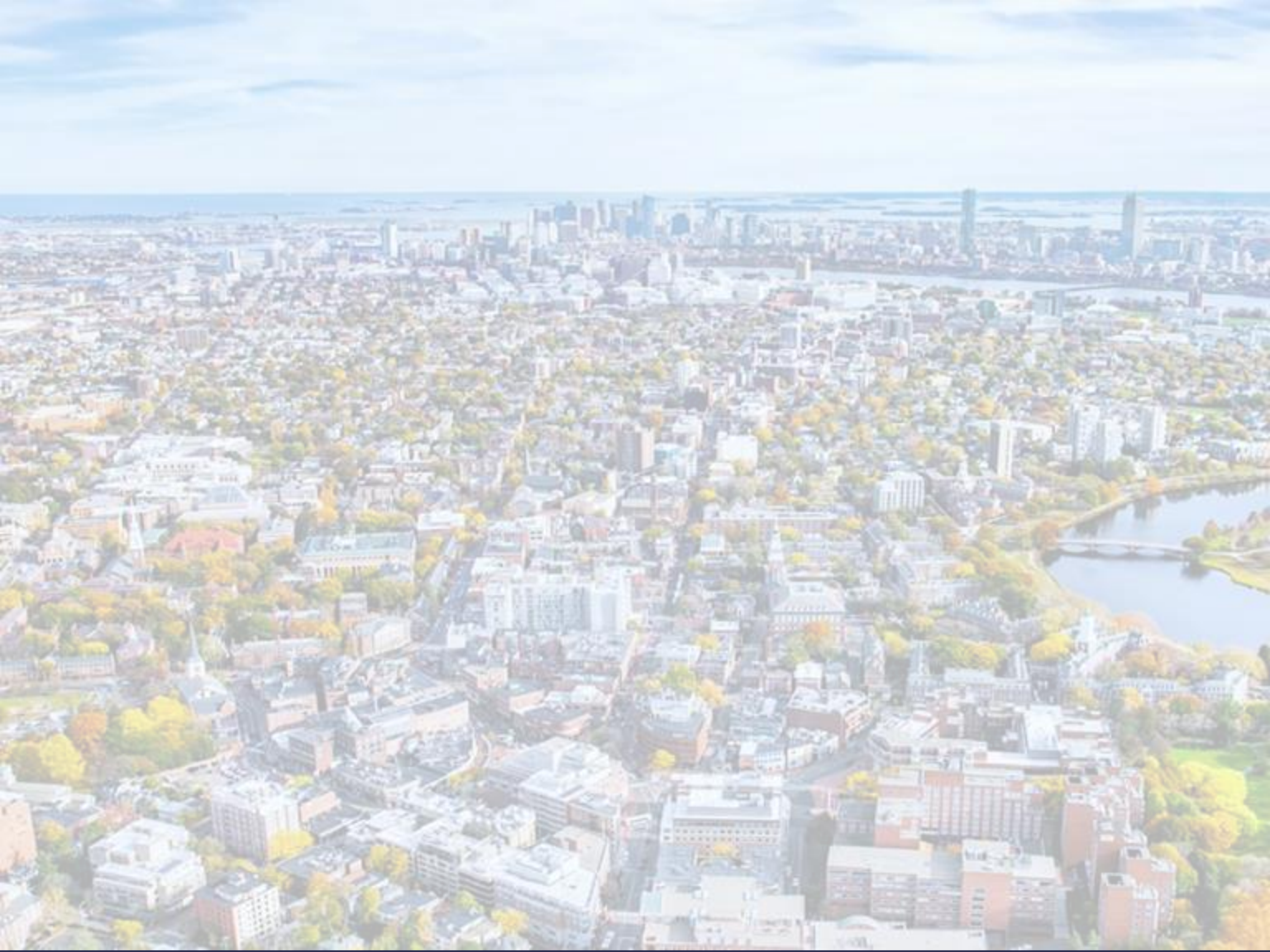
2:10 PM



Conclude

2:30 PM





Hazard Mitigation Plan Update 2023

Thank you!



HAZARD MITIGATION PLAN 2023 UPDATE KICKOFF MEETING NOTES

February 27, 2023

Attendees

City of Cambridge

- Leila Mekias, CDD
- Susanne Rasmussen, CDD
- Seth Federspiel, CDD
- Catherine Woodbury, DPW
- Deputy Chief Colin Walsh, Fire Dept.
- Sandra Clark, CDD
- John Nardone, DPW
- Brian McLane, DPW
- Marlees Owayda, CDD
- Nick Stoutt, DPW

- Jim Wilcox, DPW
- Crystal Rosa, Human Rights Commission
- Nancy Rihan-Porter, CPHD
- Sam Lipson, CPHD

Weston & Sampson

- Robin Seidel, Project Manager
- Indrani Ghosh, Climate Resilience Technical Lead
- Jennie Moonan, HMP Technical Lead

Discussion items

Hazard Mitigation Planning Team (HMPT)

- Organizations and groups for consideration on the HMPT: Disabilities Commission, Cambridge Housing Authority.
- Additional recommendations for HMPT to be collected through survey to kick-off meeting attendees

Engagement

- City's Community Engagement Team to support and provide input on community contacts for stakeholder list.
- Develop engagement plan to consider migrant and climate vulnerable population groups
- Develop guidelines with City's Community Engagement team to avoid bias in determining stakeholder groups, and the creation of HMPT and Steering Committee (STC).
- Engage public for meaningful input on the plan and provide clear expectations on how community input will be used to inform the plan and how we are integrating language access in the Plan.
- Public Health has a Community Core that could help with Street Team duties.

- Identify how Resilience Hub in the non-profits and CBOs can be utilized in the plan.
- Include Rachel from the Disability Commission to be part of the STC

Technical Input

- Public health – jurisdictional resiliency and hazard analysis and data can be provided by Public Health Dept.
- Note on considering solutions – re-evaluating the City’s policies related to basement apartment may be a potential mitigation action identified as part of the Updated Plan

Schedule and Scope

- Schedule for engagement and meetings will need to be carefully planned and coordinated with the City to meeting project schedule.
- Already scheduled public events should be considered for incorporation in engagement program to prevent planning fatigue.
- Poll used to identify Steering Committee Monthly meeting time. 1 to 2 PM on Mondays was selected in poll and based on discussion.

Action Items

1. WSE draft and send survey and email to Leila re documents/reports/plans, steering committee, stakeholders, etc.
2. WSE to send dates/times to Leila for
 - a. Outreach and engagement meeting with the City’s Community Engagement Team to finalize the Engagement Plan. This meeting will be used to formalize the list of committee members in STC, HMPT, Street Teams, larger community members, etc.
 - b. Ongoing PM meetings
3. WSE to coordinate information request on update critical facilities inventory from DPW (Nick S)
4. WSE to give Leila access to SharePoint
5. WSE to organize for capabilities assessment & follow up with Leila
6. WSE to organize asset update & follow up with Leila
7. Leila to send out survey post kickoff
8. Leila to coordinate with City staff to form the City’s Community Engagement Team and get dates lined up for meeting between Weston & Sampson and City’s Engagement Team. This meeting should ideally occur before the March Steering Committee meeting.
9. Leila to schedule month STC meetings fourth Monday of every month

Next Steering Committee Meeting Agenda (tentative)

- Overview of Work in Progress
- Presentation of Hazard Profiles and review deadline
- Update on Stakeholder Engagement Plan
- Update on Capabilities Assessment
- Next Steps

STEERING COMMITTEE MEETING #1: MARCH

AGENDA

- 1:00 PM** **Overview of Work in Progress**
- Project timeline
 - Tasks underway
- 1:05 PM** **Chapter 3: Hazard Profiles**
- Overview of FEMA requirements
 - Process to develop chapter and data sources
 - Review process & deadline
- 1:20 PM** **Update on Stakeholder Outreach and Engagement Plan & Next Steps**
- 1:30 PM** **Capabilities Assessment**
- Overview
 - Input needs and schedule
- 1:50 PM** **Next Steps**
- Asset Inventory
 - Initiate Capabilities Assessment
 - Review Chapter 3
 - Reminder to take survey <https://forms.office.com/r/4v395ZZJ5Y>
 - Next Meeting April 24, 2023 1 to 2 PM
- 2:00 PM** **Conclude**



Hazard Mitigation Plan Update 2023

Steering Committee
Meeting #1
March 27, 2023



**CITY OF
CAMBRIDGE**



AGENDA



Work in Progress

1:00 PM



Chapter 3: Hazard Profiles

1:05 PM



Outreach and Engagement Plan

1:20 PM



Capabilities Assessment

1:30 PM



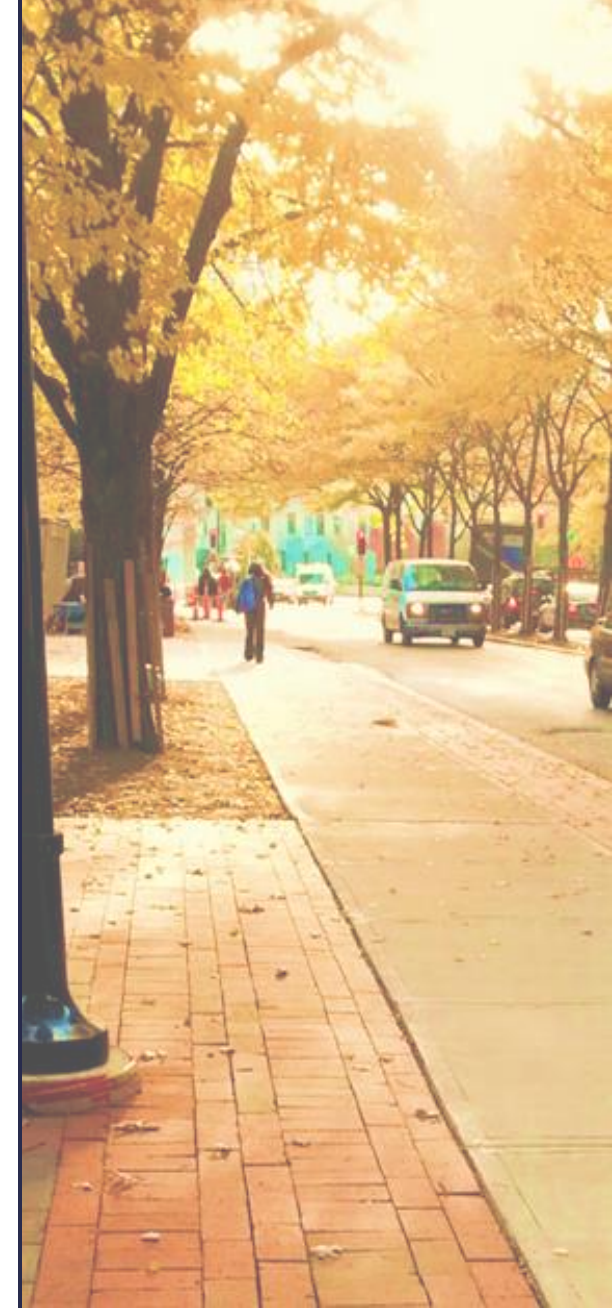
Next Steps

1:50 PM



Conclude

2:00 PM



AGENDA



Work in Progress

1:00 PM



Chapter 3: Hazard Profiles

1:05 PM



Outreach and Engagement Plan

1:20 PM



Capabilities Assessment

1:30 PM



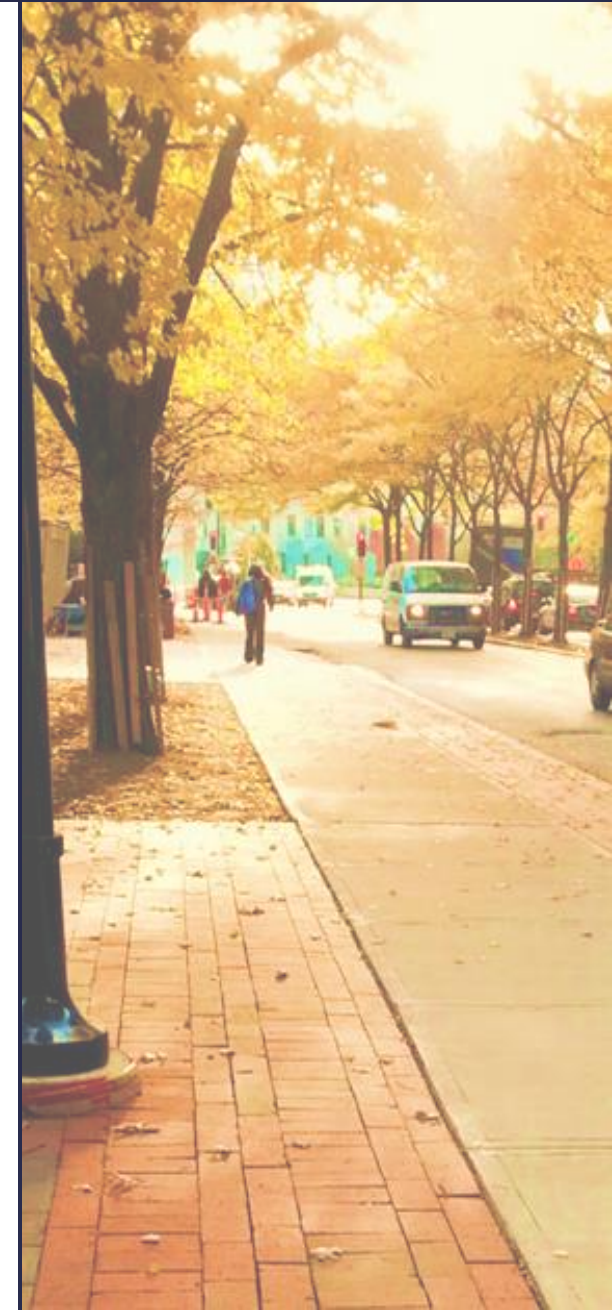
Next Steps

1:50 PM



Conclude

2:00 PM

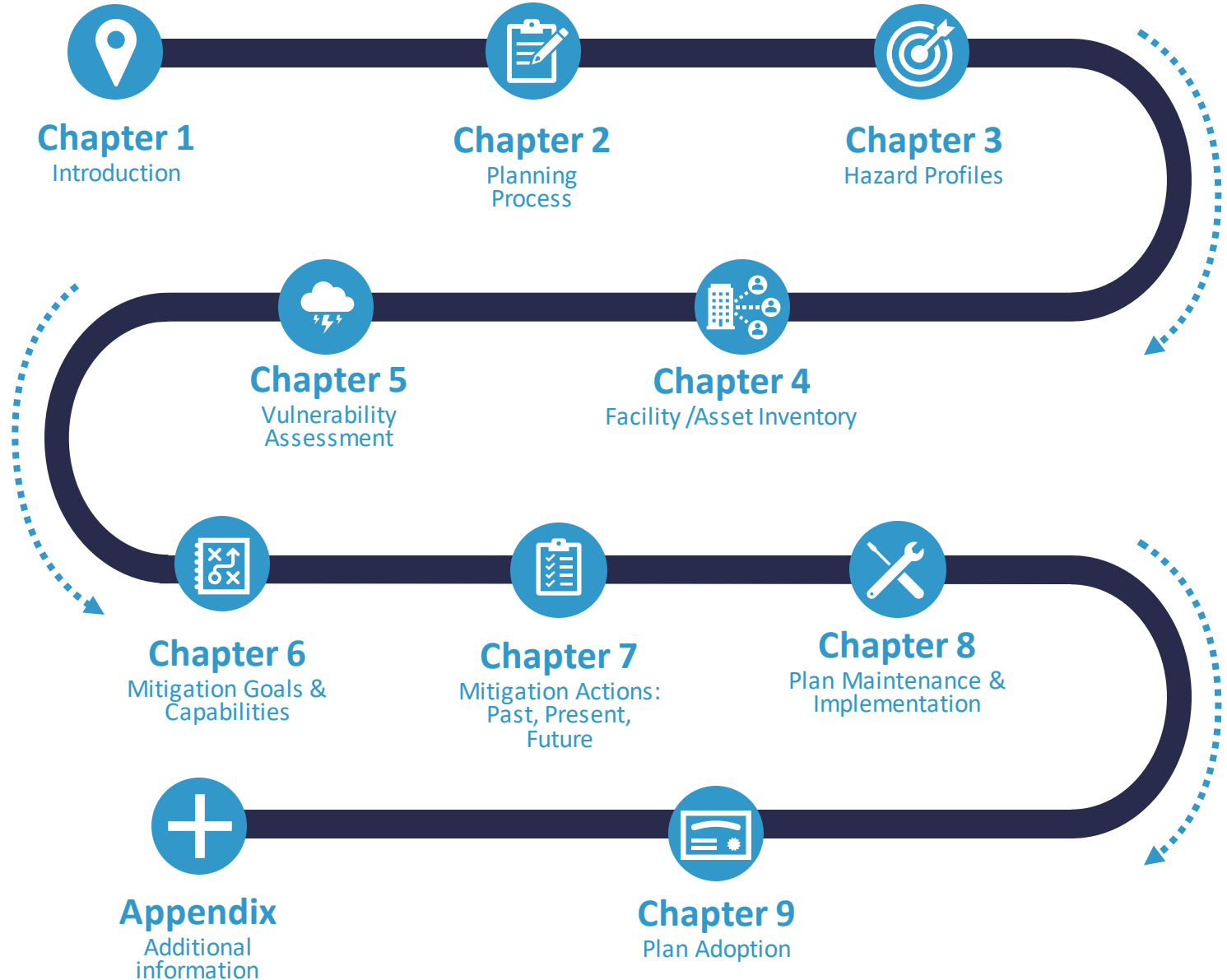


WORK IN PROGRESS



Project Tasks align with the Final Document Chapters:

- Task 1:** Project Initiation
- Task 2:** Initiation of Engagement
- Task 3:** Hazard Profiles
- Task 4:** Facility/Asset Inventory
- Task 5:** Vulnerability Assessment
- Task 6:** Mitigation Goals and Capabilities
- Task 7:** Mitigation Actions: Past, Present, and Future
- Task 8:** Plan Maintenance and Implementation
- Task 9:** Public Review
- Task 10:** MEMA and FEMA Review, City Adoption
- Ongoing** Public Outreach
- Ongoing** Project Administration

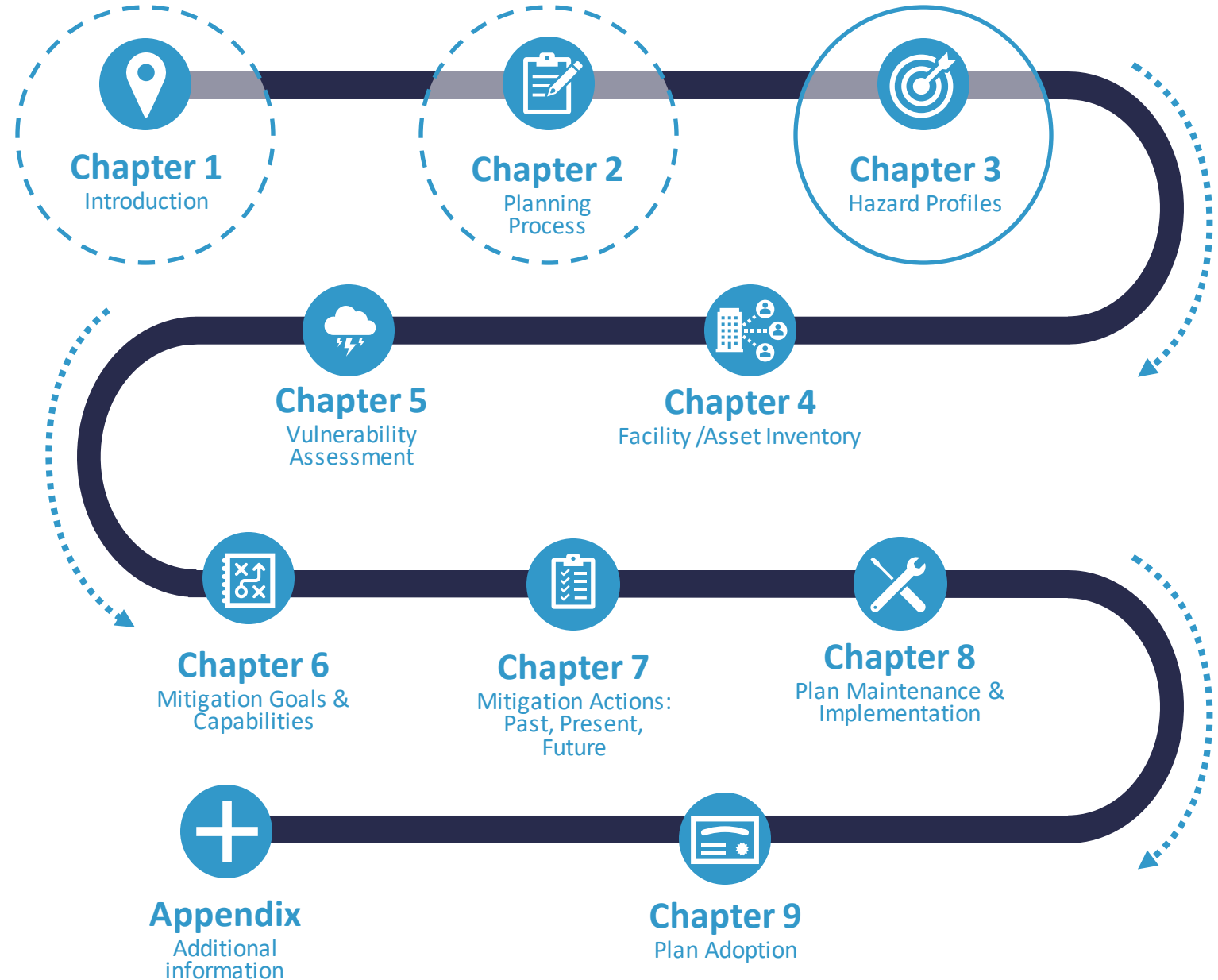


WORK IN PROGRESS



Project Tasks align with the Final Document Chapters:

- Task 1:** Project Initiation
- Task 2:** Initiation of Engagement
- Task 3:** Hazard Profiles
- Task 4:** Facility/Asset Inventory
- Task 5:** Vulnerability Assessment
- Task 6:** Mitigation Goals and Capabilities
- Task 7:** Mitigation Actions: Past, Present, and Future
- Task 8:** Plan Maintenance and Implementation
- Task 9:** Public Review
- Task 10:** MEMA and FEMA Review, City Adoption
- Ongoing** Public Outreach
- Ongoing** Project Administration



WORK IN PROGRESS



	TASK	February	March	April	May	June	July	August	Sept.
1	Project Initiation	█	█						
2	Engagement		█	█	█	█	█	█	█
3	Hazard Profiles		█	█					
4	Facility/Asset Inventory		█	█	█				
5	Vulnerability Assessment			█	█	█			
6	Mitigation Goals & Cap.			█	█	█	█	█	
7	Develop Actions			█	█	█	█	█	
8	Plan Implementation							█	
9	Public Review							█	█
10	Adoption								█
	Admin. & Outreach	█	█	█	█	█	█	█	█



AGENDA



Work in Progress

1:00 PM



Chapter 3: Hazard Profiles

1:05 PM



Outreach and Engagement Plan

1:20 PM



Capabilities Assessment

1:30 PM



Next Steps

1:50 PM



Conclude

2:00 PM



Hazard Profiles

Identifies the hazards that can affect the City of Cambridge and associated Risk:

Location: Where each hazard might affect the planning area

Extent: Potential intensities

Previous Occurrence: How often events have happened in the past?

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

Note: This exercise uses existing best available data.



Hazard Profiles

How to decide on what natural hazards affect Cambridge?

Starting Point: City of Cambridge Hazard Mitigation Plan 2015 Update

- Flooding
- Dam Failures
- Thunder Storms
- Winter Storms
- Hurricanes
- Nor'easters
- Tornadoes
- Brushfire
- Earthquakes
- Landslides
- Extreme Temperatures
- Drought

Updates from: Massachusetts 2018 State Hazard Mitigation and Climate Adaptation Plan (SHMCAP)

- *Separate* flooding (inland and coastal)
- *Integrate* dam failure into flooding discussion
- *Add* Tsunami
- *Add* Invasive species
- *Add* Tropical storms



Hazard Profiles



HURRICANES/
TROPICAL
STORMS



INLAND
FLOODING



EXTREME
TEMPERATURES



SEVERE WINTER
WEATHER /
NOR'EASTERS



COASTAL
FLOODING



TSUNAMI



DROUGHT



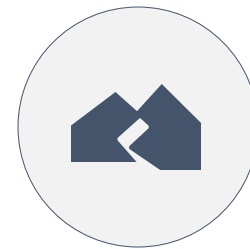
WILDFIRE



EARTHQUAKES



TORNADOES



LANDSLIDES



INVASIVE
SPECIES

Data Sources for Hazard Profiles

State-Wide Data

- Massachusetts 2018 State Hazard Mitigation and Climate Adaptation Plan (SHMCAP)
- MA Climate Change Assessment
- Greater Boston Research Advisory Group Report (GBRAG)
- MA Climate Resilience Design Standards Tool

National Data

- FEMA
- NOAA
- USGS

Local Data

- City of Cambridge Hazard Mitigation Plan 2015 Update (prepared by MAPC)
- Climate Change Vulnerability Assessment (CCVA) Reports (Parts 1 & 2)
- Climate Change Preparedness and Resilience (CCPR)/Neighborhood Plans for Alewife and The Port
- Resilient Cambridge
- Cambridge Flood Viewer
- Cambridge Heat Viewer
- Cambridge Urban Forest Master Plan



AGENDA



Work in Progress

1:00 PM



Chapter 3: Hazard Profiles

1:05 PM



Outreach and Engagement Plan

1:20 PM



Capabilities Assessment

1:30 PM



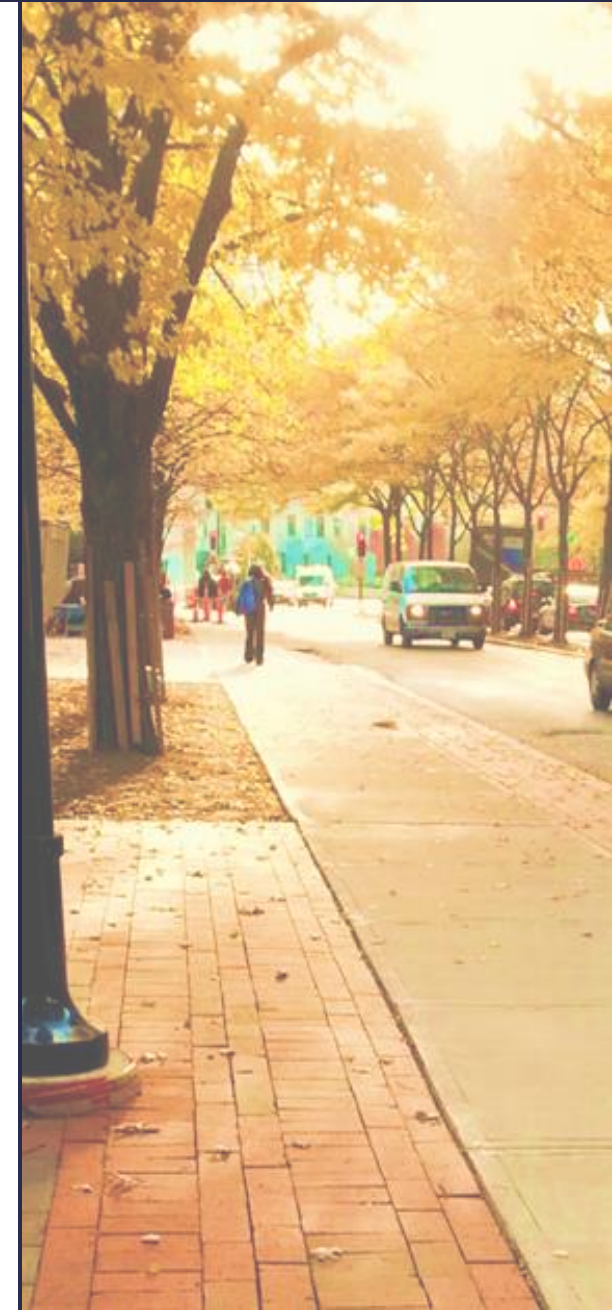
Next Steps

1:50 PM



Conclude

2:00 PM



OUTREACH AND ENGAGEMENT



Key Takeaways: City Community Engagement Team

Meeting on Wednesday March 22, 2023

- **Prioritize simplification of language and messaging**
- **Developing a plan to advertise opportunities for feedback that inform the HMP**
- **Creation of Street Team to equitably engage**

City Staff



Stakeholders



Outreach



Public



OUTREACH AND ENGAGEMENT PLAN



- Public Meeting #1 (May)
- HMPT Workshop #1 (May)
- HMPT Workshop #2 (June)
- HMPT Workshop #3 (July)
- Public Meeting #2/#3 (September)
- Survey (Ongoing)
- Stream Team Outreach (Ongoing)

Cambridge HMP Engagement Plan DRAFT FOR DISCUSSION		Details					
Tasks	HMP Chapters Supported	Goals	Targeted Audience	Education or Input?	Outreach Method	How will Feedback be Incorporated into HMP?	Task-Specific Strategies for Mitigating Bias
Kickoff Meeting	1. Introduction	Get started and project overview	City Employees	Education	Meeting	Project workshop	Engagement Plan
Survey for City Employees	1. Introduction 2. Planning Process 3. Hazard Profiles 4. Facility/Asset Inventory 5. Vulnerability Assessment	Get information on engagement events, typical City processes/ best practices, and lessons learned	City Employees	Input	Survey	Results to be incorporated into Engagement Plan	Ask employees about lessons learned, specific groups to be aware of, and resources on the issues.
Project Promotion	All Chapters and public meetings	Provide project overview and relevant information	Public, targeted entities (discuss)	Education	Websites, Social Media, Flyers	N/A General awareness	Utilize virtual + in-person methods. Stream Team to strategically engage vulnerable groups
STC Meeting #1 (March)	3. Hazard Profiles 4. Facility/Asset Inventory	Review of existing plans and information and coordination with other planning processes, review workshop and HMPT outreach	STC	Input	Invite only	Review and comments will be included in Chapter 3. Coordination with existing plans and processes, plan for HMPT outreach	STC must include people who are well-served in issue
Public Survey	3. Hazard Profiles 4. Facility/Asset Inventory 5. Vulnerability Assessment 6. Mitigation Goals & Capabilities	Gathering information on specific climate-related experiences	Public, targeted entities (discuss)	Input	Survey	Results of survey will be incorporated into Chapter 3, 4, 5, and 6 as supporting narrative and graphics	Digital + printed version of the survey. Stream Team to assist with printed, content must be inclusive of all experiences
STC Meeting #2 (April)	4. Facility/Asset Inventory 5. Vulnerability Assessment	Confirmation of Facility Inventory + Review Vulnerability Assessment	City Employees	Input	Invite only	Review and comments will be included in Chapter 4.	STC must include people who are well-served in issues for all groups
Public Meeting #1	4. Facility/Asset Inventory 5. Vulnerability Assessment	Project Overview, promote public survey, + gather feedback	Public	Education + Input	See Project Promotion	Questions and comments will be reflected in relevant HMP chapters.	Translation, in-person attendance at community organizations/ location if that is helpful for those who do not have internet access
HMPT Workshop #1	3. Hazard Profiles 4. Facility/Asset Inventory 5. Vulnerability Assessment	Overview of plan, discussion of natural hazards, asset inventory, identify vulnerabilities, review all groups who may be impacted (focusing on those with limited resources)	HMPT	Education + Input	Invite only	Information for chapters 3, 4, and 5, further information on vulnerable groups or those not accounted for	Translation as needed, ensure all groups are discussed. Create workshop environment where people feel comfortable bringing up concerns.
STC Meeting #3 (May)	5. Vulnerability Assessment 6. Mitigation Goals & Capabilities	Review Capability Assessment + Initial Mitigation Goals	City Employees	Input	Invite only	Review and comments will be included in Chapter 5.	STC must include people who are well-served in issues for all groups

AGENDA



Work in Progress

1:00 PM



Chapter 3: Hazard Profiles

1:05 PM



Outreach and Engagement Plan

1:20 PM



Capabilities Assessment

1:30 PM



Next Steps

1:50 PM



Conclude

2:00 PM



CAPABILITIES ASSESSMENT



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

Planning and Regulatory

Plans

Building Code, Permitting,
and Inspections

Land Use Planning and
Ordinances

Administrative and Technical

Administration

Staff

Technical

Financial

Funding Resource

Education and Outreach

Program/Organization

Who Has Capabilities?

Agencies, stakeholders, organizations, groups, and individuals can all have capabilities.

Examples:

Sectors, Agencies and Stakeholders

- Emergency management.
- Economic development.
- Land use and development.
- Housing.
- Health and social services.
- Infrastructure (including transportation).
- Natural and cultural resources.
- Community lifelines (safety/security, food/water/shelter health/medical, energy, communications, transportation, hazardous material storage/transport/management)

Examples:

Organizations, Entities, and Groups

- All levels of government
- Faith-based organizations
- Nonprofit organizations
- Private/corporate entities
- Advocacy groups
- Community associations
- Academia
- Professional groups
- Neighbors

Existing Capabilities & Capacity for Future Improvement

Does the plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs?
(Requirement 44 CFR § 201.6(c)(3))

EXISTING

Does the plan describe how the existing capabilities of each participant are available to support the mitigation strategy? Does this include a discussion of the existing building codes and land use and development ordinances or regulations?

FUTURE

Does the plan describe each participant's ability to expand and improve the identified capabilities to achieve mitigation?

Next Steps: Leila will be coordinating a survey and discussions over the coming months

AGENDA



Work in Progress

1:00 PM



Chapter 3: Hazard Profiles

1:05 PM



Outreach and Engagement Plan

1:20 PM



Capabilities Assessment

1:30 PM



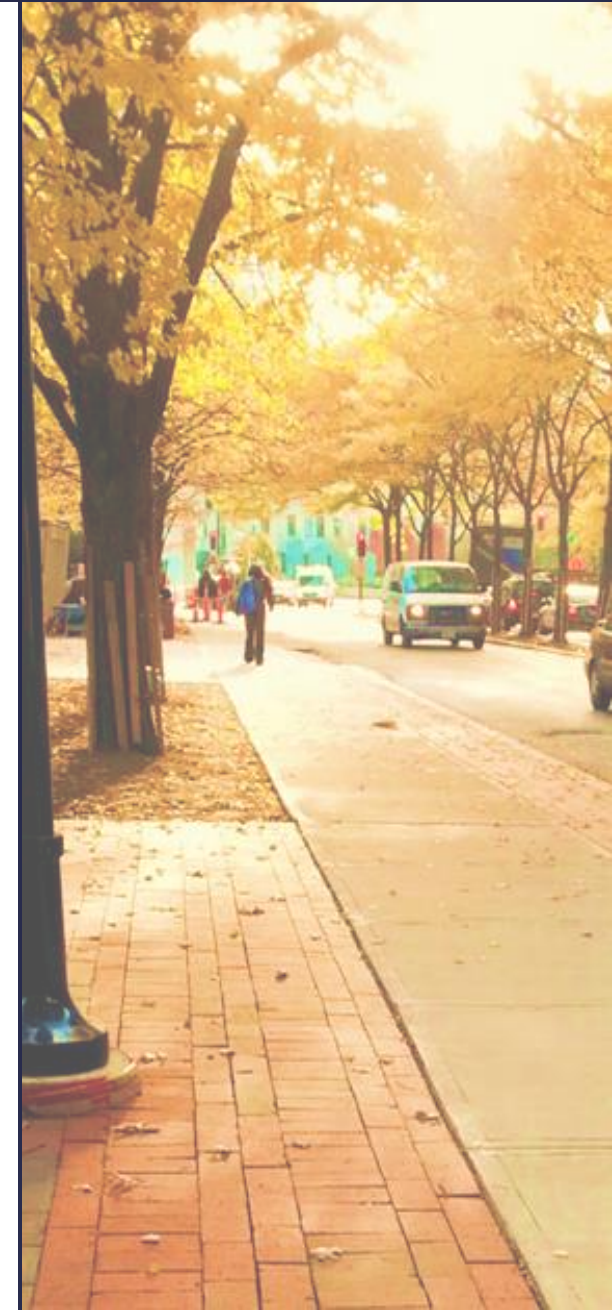
Next Steps

1:50 PM



Conclude

2:00 PM



NEXT STEPS



Asset Inventory



Capabilities Assessment

- + Review Chapter 3 Hazard Profiles
- + Take Survey by End of Today
- + Next Meeting April 24 at 1PM

Assets are determined by the community and include, but are not limited to:



People (including underserved communities and socially vulnerable populations).



Structures (including facilities, lifelines and critical infrastructure).



Systems (including networks and capabilities).



Natural, historic, and cultural resources.



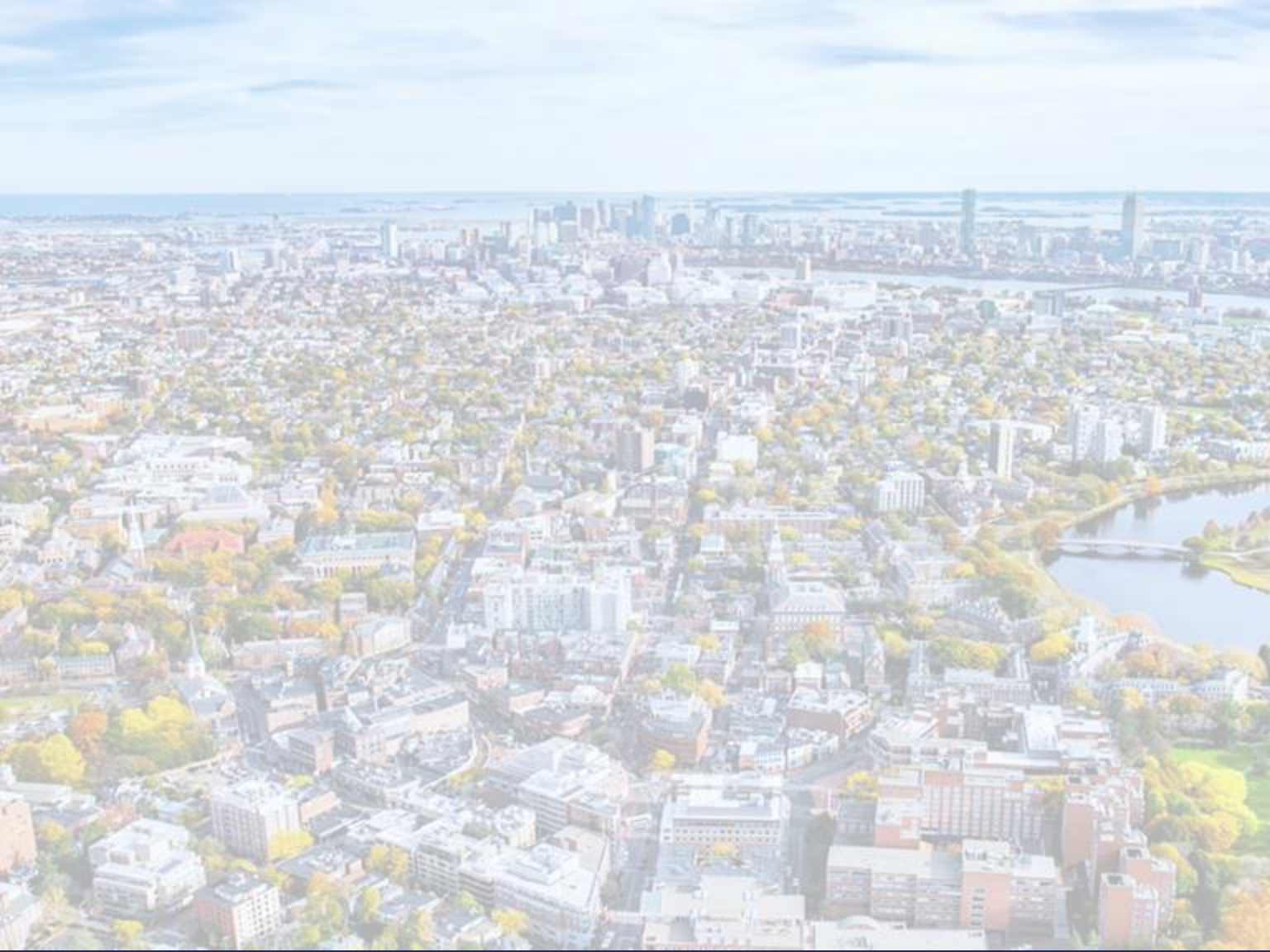
Activities that have value to the community

Example Critical Facilities

- Energy
- Transportation
- Water, wastewater, stormwater
- Telecommunication
- Emergency Response
- Hospitals and health care
- Municipal Buildings
- Community Resources
- Etc.

Repetitive Loss Structures

Land Use Changes & Future Potential Development



Hazard Mitigation Plan Update 2023 Questions?



HAZARD MITIGATION PLAN 2023 UPDATE STEERING COMMITTEE MEETING #1 (MARCH) NOTES

March 27, 2023

Attendees

City of Cambridge

- Leila Mekias, CDD
- Susanne Rasmussen, CDD
- Seth Federspiel, CDD
- Catherine Woodbury, DPW
- Deputy Chief Colin Walsh, Fire Dept.
- Brian McLane, DPW
- Marlees Owayda, CDD
- Nick Stoutt, DPW
- Jim Wilcox, DPW
- Crystal Rosa, Human Rights Commission
- Nancy Rihan-Porter, CPHD

Weston & Sampson

- Robin Seidel, Project Manager
- Jennie Moonan, HMP Technical Lead

Invitees *Not Present*

- Sandra Clark, CDD
- John Nardone, DPW
- Sam Lipson, CPHD

Discussion items

Hazard Profiles

- Should Wildfire be included as a natural hazard in the plan?
 - There are concerns about brush fires around the reservoir
 - A fire could start in another area and become a risk to Cambridge
 - Limited data available for wildfires
 - Impacts include negative air quality, ash. An example of this occurred in the recent years when there was a fire in Canada.
- What about pandemic as a natural hazard?
 - Let's include introductory narrative in the chapter about the connection between pandemics and climate change but not have it be an individual hazard
 - Presently, Pub. Health has planning documents related to pandemic/flu protocols, but not coordinated with larger planning efforts in the City.

Engagement

- Focus on plain language.
- Crystal recently attended roundtable on disabilities and access – will share information. Share best practices checklist.
- Give public three weeks of notice – date on invite should be three weeks if there will be the request to accommodate for ASL. For interpretation it can be shorter (two weeks).

Goals (not on agenda – see attached for Cambridge’s 2015 HMP Goals)

- Recommend removing “Identify at-risk populations and keep up to date list of locations” under Goal #1 (Protect the health and safety of the public.)
- On Goal #4 (Avoid chaos and confusion with good communication), recommend adding “improve internal communications.” City’s experience from COVID pandemic found that communication occurred with Department heads but in cases this information did not trickle down, such that a direct service person giving information to the public was not aware of decisions/most updated information. This applies to natural hazards as well.

Action Items

1. WSE to follow up with Leila regarding capabilities assessment
2. WSE to provide draft of Chapter 3; Leila to circulate for STC members to comment (two week comment period)
3. Leila to provide “plan language guide” to STC and WSE

Next Steering Committee Meeting Agenda (tentative)

- Overview of Work in Progress
- Endorsement of Mitigation Goals
- Presentation of Asset Inventory and review deadline
- Review of 2015 Mitigation Actions
- Next Steps

STEERING COMMITTEE MEETING #2: APRIL AGENDA

- 1:00 PM** **Overview of Work in Progress**
- Project Timeline
 - Tasks Underway
- 1:05 PM** **Mitigation Goals**
- Review of FEMA Requirements
 - Proposed Update Goals
 - Discussion
 - Follow up survey
- 1:20 PM** **Mitigation Actions: Past**
- Review of FEMA Requirements
 - Review of Past Actions List – who can provide update if not today?
- 1:45 PM** **Outreach & HMPT Meetings**
- Public Meeting #1: Week of May 22nd 6:00 PM to 8:00 PM?
 - HMPT Workshop Scheduling
 - Distribution of public survey
- 1:55 PM** **Next Steps**
- Review Chapter 3
 - Take follow up survey on mitigation goals
 - Support input on update on Past Mitigation Actions
 - Initiate Capabilities Assessment
 - Next Meeting 5/22/2023 1 to 2 PM
- 2:00 PM** **Conclude**



Hazard Mitigation Plan Update 2023

Steering Committee
Meeting #2
April 24, 2023



**CITY OF
CAMBRIDGE**



AGENDA



Work in Progress

1:00 PM



Mitigation Goals

1:05 PM



Mitigation Actions: Past

1:20 PM



Outreach & HMPT Meetings

1:45 PM



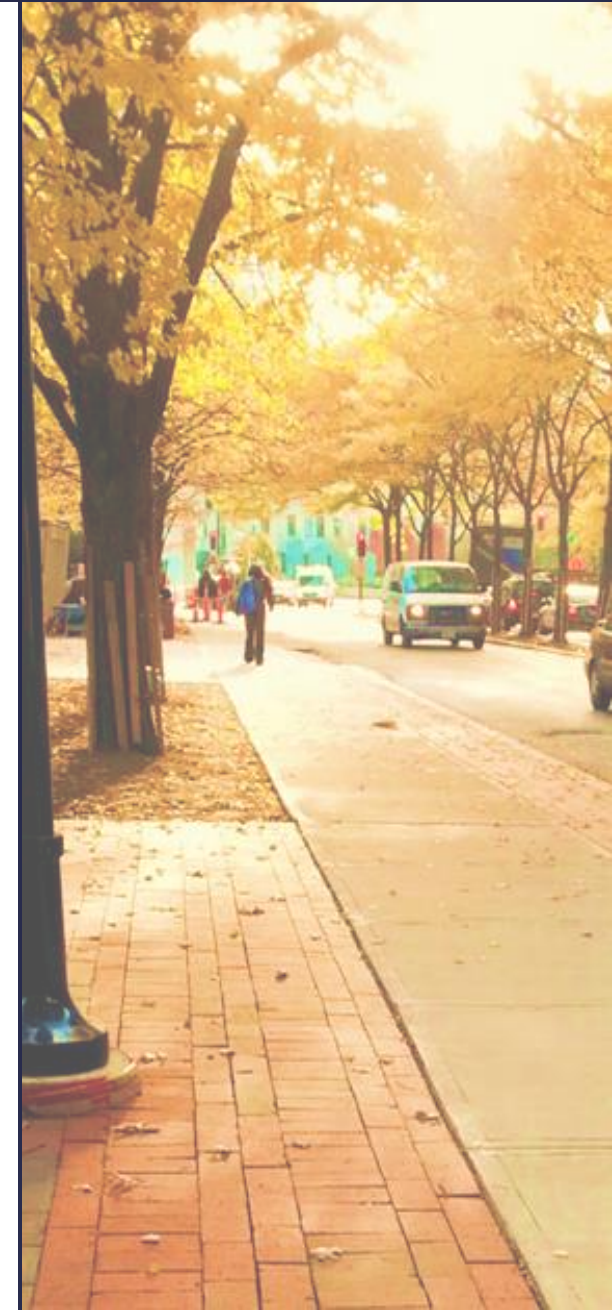
Next Steps

1:55 PM



Conclude

2:00 PM



AGENDA



Work in Progress

1:00 PM



Mitigation Goals

1:05 PM



Mitigation Actions: Past

1:20 PM



Outreach & HMPT Meetings

1:45 PM



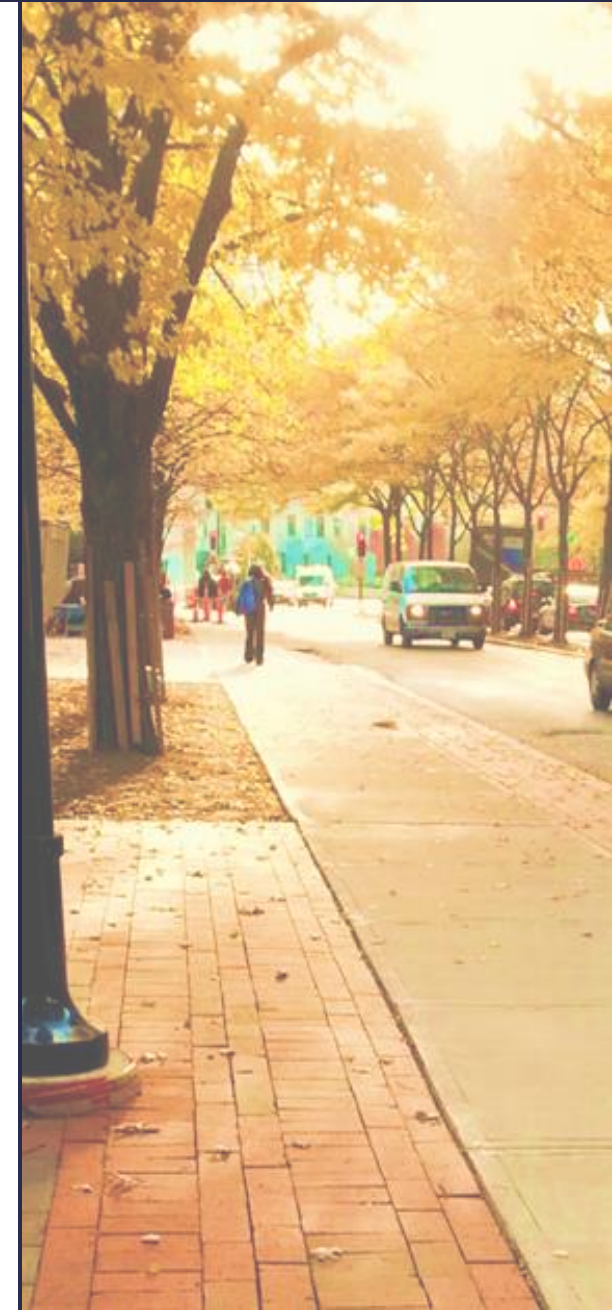
Next Steps

1:55 PM



Conclude

2:00 PM



WORK IN PROGRESS



Project Timeline

	TASK	February	March	April	May	June	July	August	Sept.
1	Project Initiation	█	█						
2	Engagement		█	█	█	█	█	█	█
3	Hazard Profiles		█	█	█				
4	Facility/Asset Inventory			█	█				
5	Vulnerability Assessment				█	█	█		
6	Mitigation Goals & Cap.			█	█	█	█	█	
7	Develop Actions				█	█	█	█	
8	Plan Implementation							█	
9	Public Review								█
10	Adoption								█
	Admin. & Outreach	█	█	█	█	█	█	█	█

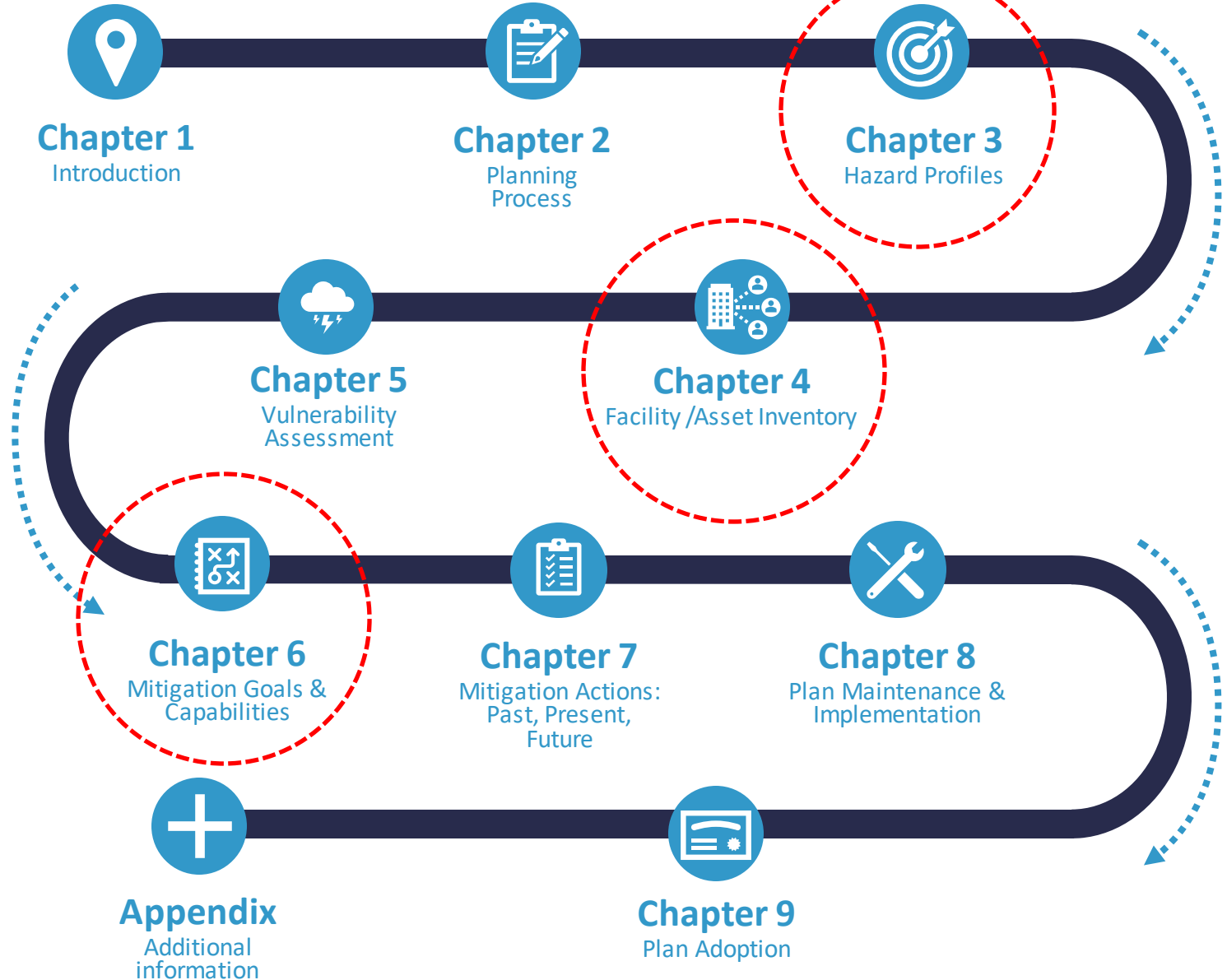


WORK IN PROGRESS



Project Tasks align with the Final Document Chapters:

- Task 1:** Project Initiation
- Task 2:** Initiation of Engagement
- Task 3:** Hazard Profiles
- Task 4:** Facility/Asset Inventory
- Task 5:** Vulnerability Assessment
- Task 6:** Mitigation Goals and Capabilities
- Task 7:** Mitigation Actions: Past, Present, and Future
- Task 8:** Plan Maintenance and Implementation
- Task 9:** Public Review
- Task 10:** MEMA and FEMA Review, City Adoption
- Ongoing** Public Outreach
- Ongoing** Project Administration



AGENDA



Work in Progress

1:00 PM



Mitigation Goals

1:05 PM



Mitigation Actions: Past

1:20 PM



Outreach & HMPT Meetings

1:45 PM



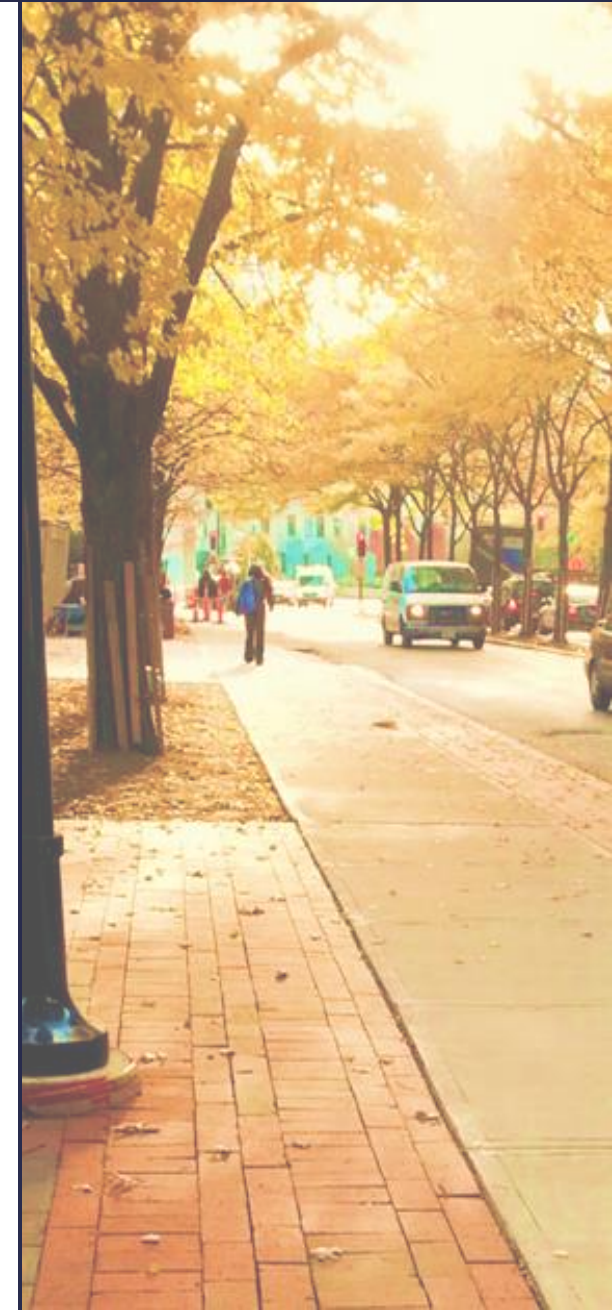
Next Steps

1:55 PM



Conclude

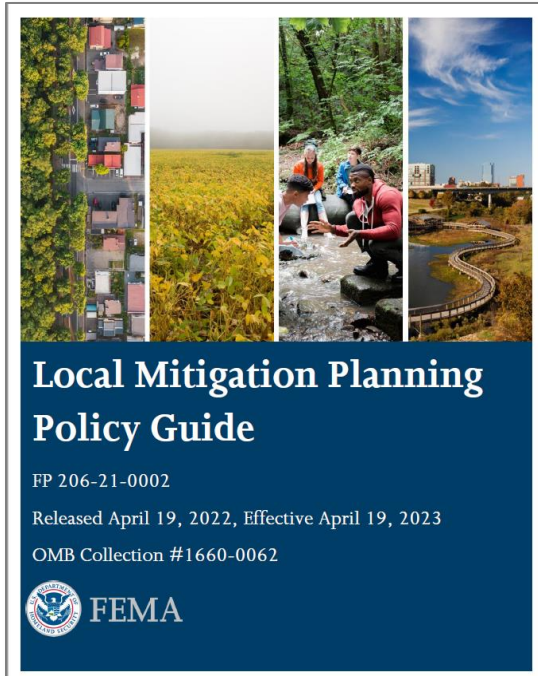
2:00 PM



MITIGATION GOALS



FEMA Requirements



C3-a. The plan must include goals to reduce the risk of the identified hazards. The goals must be consistent with the hazards identified in the plan. Goals may be presented as general statements applying to more than one hazard, or they may be itemized to each of the identified hazards.

Goals are broad, long-term policy and vision statements that explain what is to be achieved by implementing the mitigation strategy.

MITIGATION GOALS



2015 Goals

1. Protect the health and safety of the public
2. Protect existing properties and structures
3. Ensure that essential services can function during and after a hazard event
4. Avoid chaos and confusion with good communication
5. Work regionally to mitigate impacts from natural hazards and to respond and recover from hazard events
6. Work regionally to mitigate impacts from natural hazards and to respond and recover from hazard events
7. Protect natural resources
8. Create capacity to monitor existing changes

Recommended 2023 Goals

1

Equitably *Protect*
Health and Safety of
the Community

2

Promote Public Awareness
and Resilience through
Communication

3

Coordinate and Collaborate in Hazard Mitigation
Planning and Climate Adaptation

4

Invest in and Plan for
Priority Hazard Mitigation
Implementation

5

Improve Capacity to
Monitor Existing
Changes

1

Equitably *Protect*
Health and Safety of
the Community

- a. Identify and reduce the health and safety impacts from hazards on vulnerable populations. *<-- from NYC HMP Goals*
- b. Provide resources for residents and businesses to make their buildings and properties more disaster resistant.**
- c. Ensure critical infrastructure, facilities, and services are protected from natural hazards** and incorporate resiliency, to facilitate efficient recovery, evacuation, public health, and safety.
- d. Ensure that future development / redevelopment does not make existing properties more vulnerable to hazards.**
- e. Identify mitigation strategies that preserve or restore the function of natural systems and minimize secondary impacts from hazards.**

Bold = 2015 objectives

2

Promote Public Awareness and Resilience through *Communication*

- a. Improve **outreach to non-English speakers and other vulnerable populations before, during and after hazard events.**
- b. **Encourage people to be prepared before, during and after hazard events.**
- c. Increase awareness and provide information for hazard mitigation and climate resilience to businesses and residents through outreach and education, including promoting community-based mitigation strategies

Bold = 2015 objectives

3

Coordinate and Collaborate in Hazard Mitigation Planning and Climate Adaptation

- a. Develop internal strategies to **review and update current emergency preparedness, outreach, and response activities to anticipate future changes in vulnerabilities.**
- b. **Encourage private property-owners, institutions, and local businesses to implement measures to protect their own property.**
- c. **Work regionally** with state, regional and federal agencies, and surrounding communities **to mitigate impacts from natural hazards and to respond and recover from hazard events.**

Bold = 2015 objectives

4

Invest in and Plan for
Priority Hazard Mitigation
Implementation

- a. **Continue to program mitigation projects in the Cambridge Capital Improvement Plans.**
- b. Identify and seek funding for priority measures to mitigate or eliminate significant hazards and impacts.

Bold = 2015 objectives

5

Improve Capacity to
Monitor Existing
Changes

- a. **Identify and understand how climate change may alter where and how the City is vulnerable to natural hazards.**
- b. Ensure City departments, committees, and boards have adequate data, guidance, staff, training, and equipment to respond to natural hazard events, maintain preparedness, and anticipate future changes in vulnerabilities.

Bold = 2015 objectives

Please provide input
in the Mitigation
Goals Survey

Recommended 2023 Goals

1

Equitably *Protect*
Health and Safety of
the Community

2

Promote Public Awareness
and Resilience through
Communication

3

Coordinate and Collaborate in Hazard Mitigation
Planning and Climate Adaptation

4

Invest in and Plan for
Priority Hazard Mitigation
Implementation

5

Improve Capacity to
Monitor Existing
Changes

AGENDA



Work in Progress

1:00 PM



Mitigation Goals

1:05 PM



Mitigation Actions: Past

1:20 PM



Outreach & HMPT Meetings

1:45 PM



Next Steps

1:55 PM



Conclude

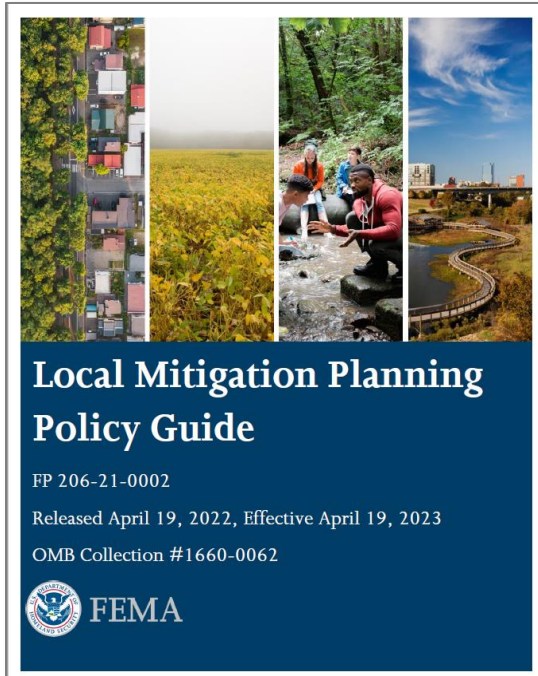
2:00 PM



MITIGATION ACTIONS



FEMA Requirements



E2-b. The plan must describe the status of all hazard mitigation actions in the previous plan by identifying whether they have been completed or not, for each jurisdiction. For actions that are not complete, the plan must state whether the action is no longer relevant or will be included in the updated action plan.

MITIGATION ACTIONS



2015 Plan Goals

Cambridge HMP 2015 Mitigation Actions

Mitigation Action	Measure Type	Implementation Responsibility	Priority	Time Frame	Potential Funding Sources
Flood Hazard Mitigation Measures					
A) Complete hydraulic modeling for the city	Prevention	DPW	High	2014–2018	City of Cambridge
B) Complete sewer separation and stormwater management program for Kirkland Street, Myrtle Street, Magnolia Street and Cambridge Street (CAM #011, areas 18 and 19)	Structural Projects	DPW	High	2014–2016	City of Cambridge
C) Complete sewer separation and stormwater management program for areas east of Fresh Pond Pkwy (area #6) and between Concord Avenue rotaries and New Street (area #5)	Structural Projects	DPW	High	2014–2016	City of Cambridge
D) Complete sewer separation at Porter Square (CAM 002 CSO area)	Structural Projects	DPW	High	2014–2018	City of Cambridge
E) Improve collection and conveyance system at area east of 2nd Street and north of Charles Street (area #27)	Structural Projects	DPW	High	2014–2018	City of Cambridge
F) Implement additional stormwater management measures: School, Pine, Cherry and Windsor Streets (area #26)	Structural Projects	DPW	High	2014–2018	City of Cambridge
G) Complete Cambridgeport stormwater management program: Newton, Green, Franklin and Sidney Streets (CAM 017, area #28)	Structural Projects	DPW	High	2014–2018	City of Cambridge

Mitigation Action	Measure Type	Implementation Responsibility	Priority	Time Frame	Potential Funding Sources
H) Complete sewer separation and stormwater management program for Irving, Bryant, Crescent, Carver and Sacramento Streets (CAM011, areas #16 and 17)	Structural Projects	DPW	High	2014–2017	City of Cambridge
I) Complete sewer separation and stormwater management program for Ellery Street and Broadway (CAM011, area #24)	Structural Projects	DPW	High	2014–2017	City of Cambridge
J) Establish funding program for residential structural improvements and flood proofing	Prevention/Property Protection	CDD, DPW	Medium	2016–2018	City of Cambridge, FEMA
K) Floodplain Management	Prevention	Conservation Commission	Low	2014–2018	City of Cambridge
L) Floodplain Mapping	Prevention	CDD, Conservation Commission	Low	2014–2018	City of Cambridge
Winter Storm Hazard Mitigation Measures					
M) Expand program to clear snow and maintain public ROWs (e.g., travel ways for non-vehicular mobility and access for vulnerable populations)	Prevention	DPW	Medium	2014–2018	City of Cambridge, DCR, MassDOT
Geologic Hazard Mitigation Measures					
N) Determine vulnerability of roadways and utilities to earthquakes in the high liquefaction areas	Prevention	EMD, DPW, Inspectional Services	Medium	2016–2018	City of Cambridge

Mitigation Action	Measure Type	Implementation Responsibility	Priority	Time Frame	Potential Funding Sources
Extreme Temperature Mitigation Measures					
O) Provide facility for additional vulnerable populations during extreme temperature event	Prevention/Public Education & Awareness	DHSP, EMD	Medium	2014–2016	City of Cambridge
Wind Mitigation Measures					
P) Increase public education on the benefits and proper care of trees on private property	Public Education & Awareness	Inspectional Services, EMD	Low	2015–2017	City of Cambridge, MEMA
Climate Change Mitigation Measures					
Q) Complete Climate Change Vulnerability Assessment	Prevention	CDD	High	2014	City of Cambridge
R) Complete Climate Change Adaptation Plan	Prevention	CDD	High	2014–2015	City of Cambridge, EOEEA
S) Encourage installation of solar photovoltaic systems, cogeneration, and other energy supplies	Prevention	CDD	Low	2014–2017	City of Cambridge
T) Encourage energy efficiency in buildings through zoning requirements and community outreach	Prevention	CDD	Low	2014–2017	City of Cambridge
Other Hazard Mitigation Measures					
U) Evacuation Protocol Review	Emergency Services Protection	EMD	High	2015–2016	City of Cambridge
V) Develop program for enhanced staffing for disaster recovery	Prevention/Emergency Services Protection	Inspectional Services, CPHD	Medium	2014–2016	City of Cambridge

Who can provide updates?

24 Past Mitigation Actions:

12
Flood Hazard
Mitigation
Measures

4
Climate Change
Mitigation
Measures

4
Other Hazard
Mitigation
Measures

1
Geologic
Hazard
Mitigation
Measure

1
Extreme
Temperature
Mitigation
Measure

1
Wind
Mitigation
Measure

1
Winter Storm
Hazard
Mitigation
Measure



AGENDA



Work in Progress

1:00 PM



Mitigation Goals

1:05 PM



Mitigation Actions: Past

1:20 PM



Outreach & HMPT Meetings

1:45 PM



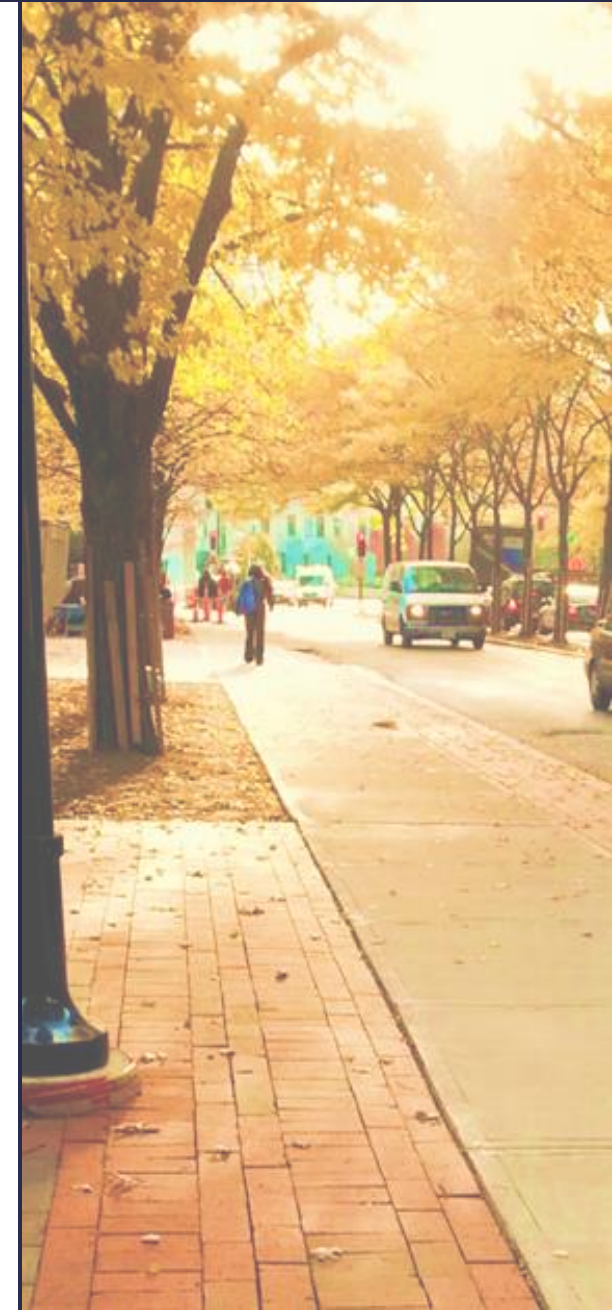
Next Steps

1:55 PM



Conclude

2:00 PM



PUBLIC MEETING #1



Public



Stakeholders



Outreach



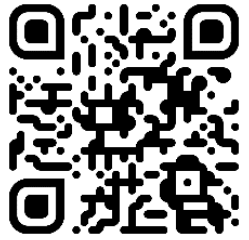
Date
Time
Format

Week of May 22
6PM – 8PM
Hybrid

STC not required to attend

**Any concerns with
this plan?**

HMPT WORKSHOP



HMPT
Workshop
Logistics Survey



Public



Stakeholders



Outreach



JUNE

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

JULY

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

AUGUST

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

PUBLIC SURVEY



Public



Stakeholders



Outreach



Promotional
Material

The City of Cambridge is updating its Hazard Mitigation Plan for a more resilient, safe, and prepared community.

Share your experiences of living in Cambridge to help the City understand how it can improve. Please take this short, 5-minute survey to share your insights.

tinyurl.com/CambridgeHMPsurvey

Survey
Preview

City of Cambridge Hazard Mitigation Plan Public Survey

The City is updating its Hazard Mitigation Plan for a more resilient, safe, prepared community. Share your experiences to help the City improve.

[Start now](#)

AGENDA



Work in Progress

1:00 PM



Mitigation Goals

1:05 PM



Mitigation Actions: Past

1:20 PM



Outreach & HMPT Meetings

1:45 PM



Next Steps

1:55 PM



Conclude

2:00 PM



NEXT STEPS



**Take Follow Up Survey
Mitigation Goals**

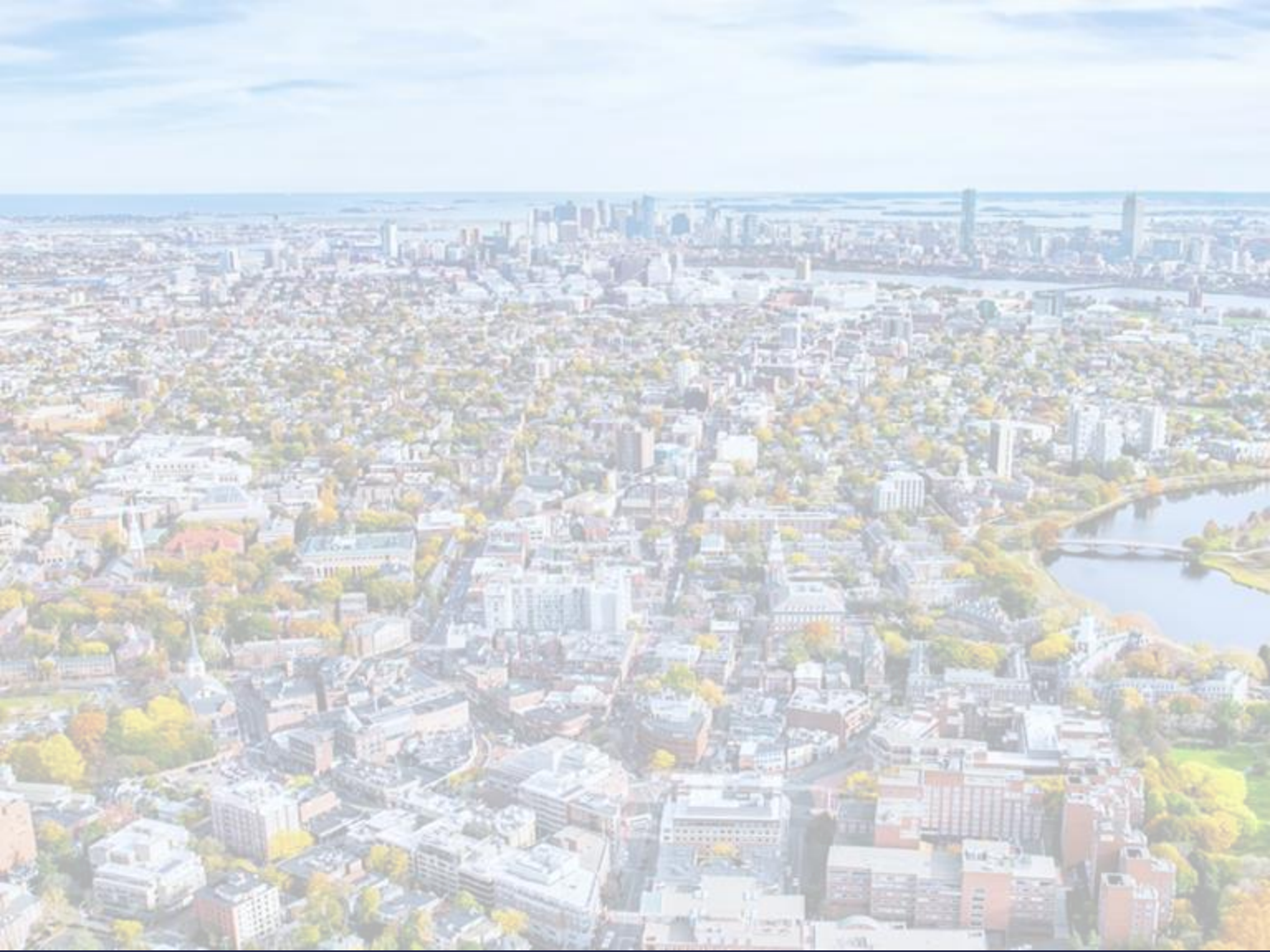


**Support Input on Past
Mitigation Actions**

+ Review Chapter 3 Hazard Profiles

+ Initiate Capabilities Assessment

+ Next Meeting May 22 at 1PM



Hazard Mitigation Plan Update 2023 Questions?



HAZARD MITIGATION PLAN 2023 UPDATE STEERING COMMITTEE MEETING #2 (APRIL)

NOTES

April 24, 2023

Attendees

City of Cambridge

- Leila Mekias, CDD
- Susanne Rasmussen, CDD
- Anthony Tuccinardi, CISD
- Catherine Woodbury, DPW
- Deputy Chief Colin Walsh, Fire Dept.
- Jeremiah Hart
- Marlees Owayda, CDD
- Brian McLane
- Jacob Lazzara, CISD
- Jim Wilcox, DPW
- Julie Torelli-Greenwood, CWD
- Crystal Rosa, Human Rights Commission
- Mark Gallagher, CWD
- Sam Lipson, CPHD
- Vedad Konjic, CPS Facilities

Weston & Sampson

- Robin Seidel, Project Manager
- Emily Judson, Resiliency Planner

Discussion items

Overview of Work in Progress

- Work on chapters 3, 4, and 6 has started.
 - Chapter 3: Hazard Profiles is under internal review and will be sent to the STC soon for comments and review.
 - Chapter 4: Facility/Asset Inventory has also been started. W&S to send RFI for critical asset inventory layers from Kleinfelder from Resilient Cambridge and CCVA. C
 - Chapter 5: Mitigation Goals & Capabilities started with the materials and information presented today at the meeting.
- Capabilities assessment needs to start as soon as possible.

Mitigation Goals Update

- Consolidate the 2015 eight (8) goals into five (5) goals

- Add emphasis of equity
- Shorter and communicable to public
- Plain language easy to understand
- Hit on five important terms for HMPs:
 - Protect
 - Communicate
 - Coordinate/collaborate
 - Invest/Plan
 - Monitor
- Used prior objectives where reasonable, added objectives from other resources, and consolidated many objectives
- **Follow up: Mitigation Goals Survey and provide feedback on new revised goals**



2015 HMP Mitigation Actions:

- Discussion of FEMA Requirements
 - Discussion of the definition of [Critical Facilities](#). W&S will look into if FEMA's definition is flexible and can be expanded upon.
 - Suggestion to request input from residents on critical assets at public meeting.
 - Discussion of the distinction between actions related to extreme hazard categories and distinct Climate Change Mitigation Actions.
 - Outcome: climate change mitigation actions were broader and related to mitigation of emissions or citywide adaptation planning
 - The group discussed the status of the 2015 HMP actions for a table to be included in the final report and added comments for how to expand, clarify, or remove in next plan.
 - The spreadsheet will be shared around to fill out the last remaining action status

Outreach & HMPT Meetings

- Public Meeting #1: Week of May 22nd 6:00 PM to 8:00 PM
 - Public overview of the project and opportunity for input, questions, concerns.
 - This meeting will be hybrid
 - **Follow up:** *Who books this date on the City calendar and how will it be advertised?*
- HMPT Workshop Scheduling
 - **Follow up:** [HMPT Survey](#)

- **Follow up Questions** (can answer in the survey):
 - *Are there dates/times that don't work?*
 - *Are there formats that work better for people (hybrid/online/in person)?*
 - *Are we missing any questions on the HMPT Survey for invitees?*
 - *Are you available to help facilitate in person?*
- Distribution of Public Survey
 - **Follow up ask:** *What are best practices for print distribution and promotion, especially for ongoing survey participation?*

Action Items

1. STC to Review Chapter 3
2. Send Mitigation Goals Survey to STC
3. Send [HMPT Survey](#) to STC
4. Send Follow Up Questions to STC
5. Leila to Initiate Capabilities Assessment

Next Steering Committee Meeting Agenda (tentative)

- Overview of Work in Progress
- Capabilities Assessment
- Asset Inventory
- Public Meeting Debrief
- HMPT Workshop Preparation
- Next Steps

STEERING COMMITTEE MEETING #3: MAY

AGENDA

- 1:00 PM** **Overview of Work in Progress**
- Project Timeline
 - Tasks Underway
- 1:05 PM** **Hazard Mitigation Goals**
- Final approval
- 1:15 PM** **Capabilities Assessment**
- Review of Survey Questions
 - Discussion
- 1:30 PM** **Asset Inventory**
- Review of FEMA Requirements
 - Review inventory to date
 - Process for updates
- 1:50 PM** **Outreach & HMPT Meetings**
- Public Meeting #1 booked June 13, 2023, 6:00 PM
 - HMPT workshops - scheduling in progress
- 1:55 PM** **Next Steps**
- Distribute Capabilities Assessment
 - Provide input on Asset Inventory
 - Next Meeting 6/26/2023 1 to 2 PM
- 2:00 PM** **Conclude**



Hazard Mitigation Plan Update 2023

Steering Committee
Meeting #3
May 22, 2023



**CITY OF
CAMBRIDGE**



AGENDA



	Work in Progress	1:00 PM
	Mitigation Goals	1:05 PM
	Capabilities Assessment	1:15 PM
	Asset Inventory	1:30 PM
	Outreach & HMPT Meetings	1:50 PM
	Next Steps	1:55 PM
	Conclude	2:00 PM



AGENDA



Work in Progress

1:00 PM



Mitigation Goals

1:05 PM



Capabilities Assessment

1:15 PM



Asset Inventory

1:30 PM



Outreach & HMPT Meetings

1:50 PM



Next Steps

1:55 PM



Conclude

2:00 PM



WORK IN PROGRESS



Project Timeline

	TASK	February	March	April	May	June	July	August	Sept.
1	Project Initiation	█	█						
2	Engagement		█	█	█	█	█	█	█
3	Hazard Profiles		█	█	█	█			
4	Facility/Asset Inventory				█	█			
5	Vulnerability Assessment					█	█	█	
6	Mitigation Goals & Cap.			█	█	█	█	█	
7	Develop Actions			█	█	█	█	█	
8	Plan Implementation						█	█	
9	Public Review							█	█
10	Adoption								█
Admin. & Outreach		█	█	█	█	█	█	█	█

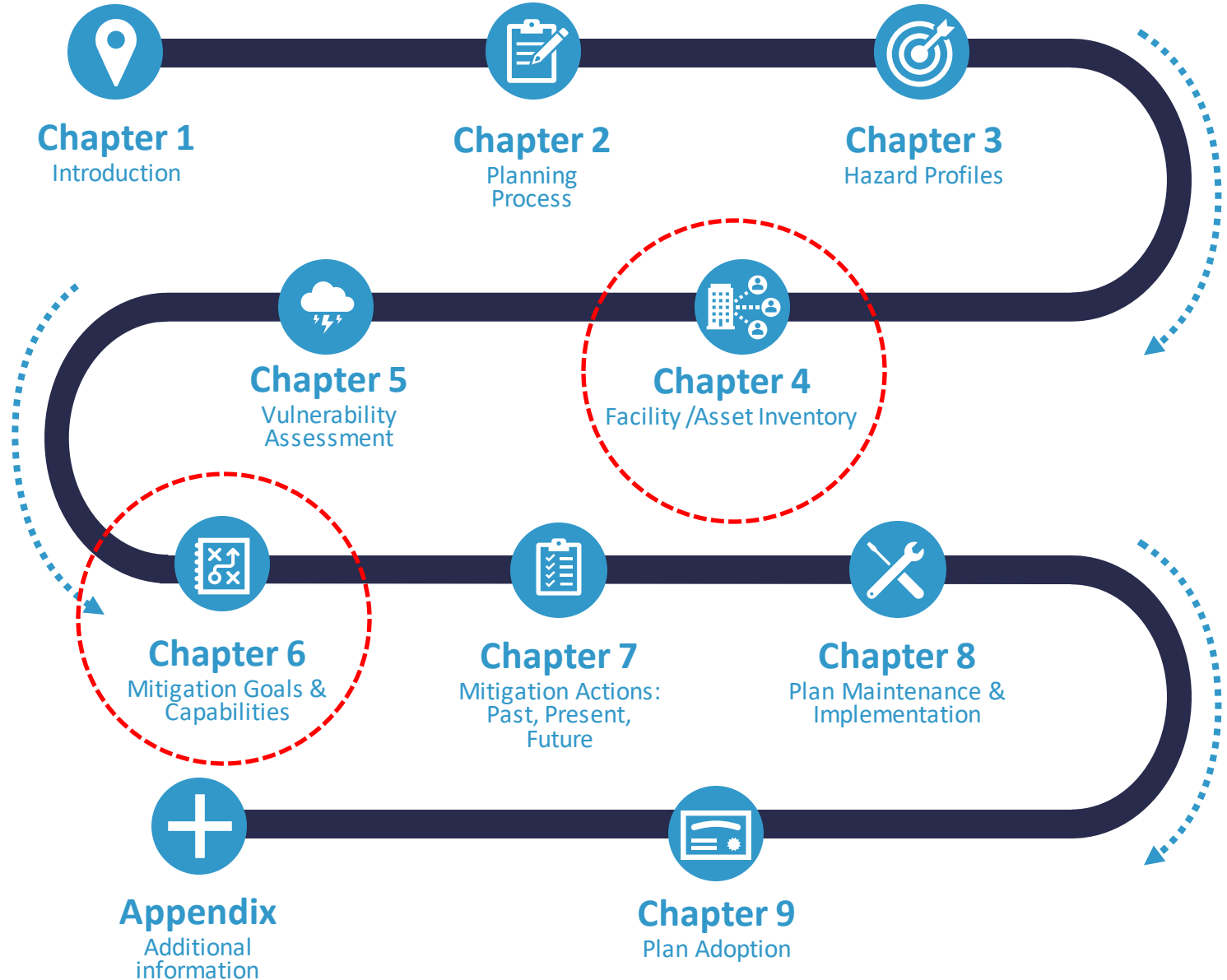


WORK IN PROGRESS



Project Tasks align with the Final Document Chapters:

- Task 1:** Project Initiation
- Task 2:** Initiation of Engagement
- Task 3:** Hazard Profiles
- Task 4:** Facility/Asset Inventory
- Task 5:** Vulnerability Assessment
- Task 6:** Mitigation Goals and Capabilities
- Task 7:** Mitigation Actions: Past, Present, and Future
- Task 8:** Plan Maintenance and Implementation
- Task 9:** Public Review
- Task 10:** MEMA and FEMA Review, City Adoption
- Ongoing** Public Outreach
- Ongoing** Project Administration



AGENDA



Work in Progress

1:00 PM



Mitigation Goals

1:05 PM



Capabilities Assessment

1:15 PM



Asset Inventory

1:30 PM



Outreach & HMPT Meetings

1:50 PM



Next Steps

1:55 PM



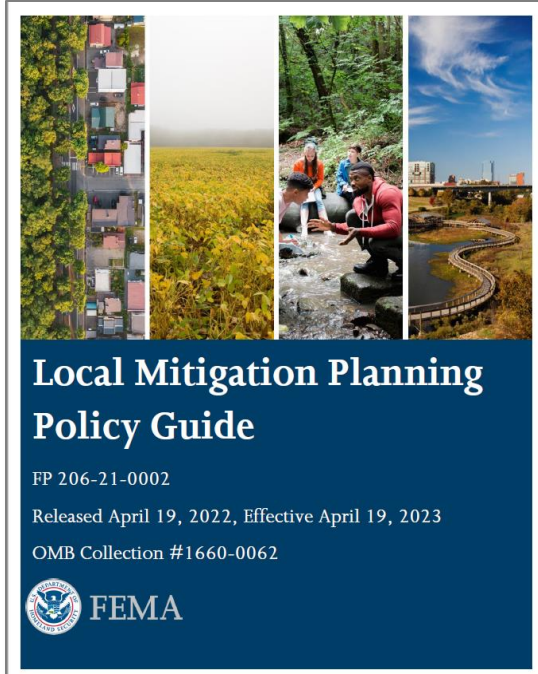
Conclude

2:00 PM



MITIGATION GOALS

FEMA Requirements



C3-a. The plan must include goals to reduce the risk of the identified hazards. The goals must be consistent with the hazards identified in the plan. Goals may be presented as general statements applying to more than one hazard, or they may be itemized to each of the identified hazards.

Goals are broad, long-term policy and vision statements that explain what is to be achieved by implementing the mitigation strategy.

MITIGATION GOALS



Recommended 2023 Goals

1

Equitably *Protect*
Health and Safety of
the Community

2

Promote Public Awareness
and Resilience through
Communication

3

Coordinate and Collaborate in Hazard Mitigation
Planning and Climate Adaptation

4


Invest in and Plan for
Priority Hazard Mitigation
Implementation

5

Improve Capacity to
Monitor Existing
Changes

**Vote with Slido to
endorse goals**

Discussion welcome

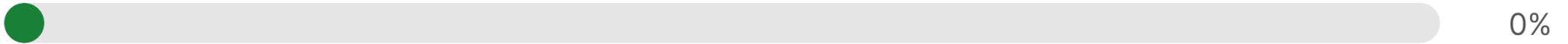
 Do you endorse Mitigation Goal #1? Equitably Protect Health and Safety of the Community

Multiple Choice Poll  8 votes  8 participants

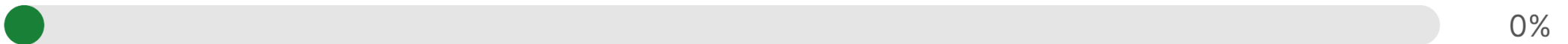
Yes - 8 votes



No - 0 votes



Propose an edit - 0 votes





Do you endorse Mitigation Goal #2? Promote Public Awareness and Resilience through Communication

Multiple Choice Poll 8 votes 8 participants

Yes - 8 votes



No - 0 votes



Propose an edit - 0 votes





Do you endorse Mitigation Goal #3? Coordinate and Collaborate in Hazard Mitigation Planning and Climate Adaptation

Multiple Choice Poll 9 votes 9 participants

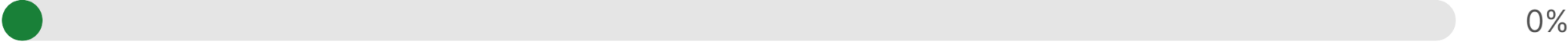
Yes - 8 votes



No - 1 vote



Propose an edit - 0 votes





Do you endorse Mitigation Goal #4? Invest in and Plan for Priority Hazard Mitigation Implementation

Multiple Choice Poll 8 votes 8 participants

Yes - 7 votes



No - 0 votes



Propose an edit - 1 vote





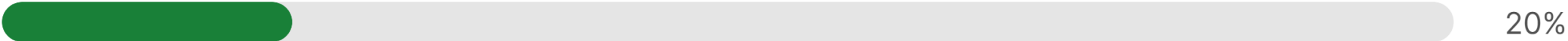
Do you endorse Mitigation Goal #5? Improve Capacity to Monitor Existing Changes

Multiple Choice Poll 5 votes 5 participants

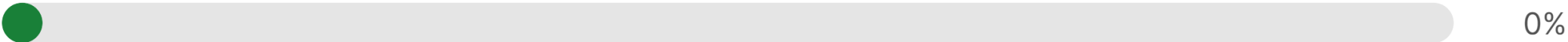
Yes - 4 votes



No - 1 vote



Propose an edit - 0 votes



MITIGATION GOALS



1

Equitably *Protect*
Health and Safety of
the Community

2

Promote Public
Preparedness and Resilience
through *Communication*

3

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

4

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

5

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

**2023 HMP goals
endorsed by Steering
Committee**

AGENDA



Work in Progress

1:00 PM



Mitigation Goals

1:05 PM



Capabilities Assessment

1:15 PM



Asset Inventory

1:30 PM



Outreach & HMPT Meetings

1:50 PM



Next Steps

1:55 PM



Conclude

2:00 PM



FEMA Requirement

**Does the plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs?
(Requirement 44 CFR § 201.6(c)(3))**

EXISTING

Does the plan describe how the existing capabilities of each participant are available to support the mitigation strategy? Does this include a discussion of the existing building codes and land use and development ordinances or regulations?

FUTURE

Does the plan describe each participant's ability to expand and improve the identified capabilities to achieve mitigation?

CAPABILITIES ASSESSMENT



Survey

Agencies, stakeholders, organizations, groups, and individuals can all have capabilities.

Survey Screenshot

Provide your input on Local Natural Hazard Mitigation Capabilities

The City of Cambridge is updating its Hazard Mitigation Plan (HMP) with help from Weston & Sampson. This plan is meant to guide Cambridge towards being more resilient to, safe from, and prepared for natural hazards. This survey seeks to identify each participant's existing authorities, policies, programs, and resources that reduce natural hazard impacts and/or could be used to undertake hazard mitigation activities.

The Capabilities Assessment is a required input by FEMA for updating the HMP. The HMP update process is just getting started and is expected to wrap up in Fall 2023.

Your participation in this process is greatly appreciated.

Below are some definitions that may assist in completing this survey:

Natural Hazards are a source of harm or difficulty created by a meteorological, environmental or geological event. Natural hazards, such as flooding and earthquakes, impact the built environment, including dams and levees.








[Screenshare of Capabilities Assessment](#)

Survey Being Distributed to the following

- Assessing
- Budget
- Fire
- Police
- City Clerk's Office
- City Manager's Office
- Commission on Persons with Disabilities
- Commission on Immigrant Rights and Citizenship
- Community Development (CDD)
- Community Safety
- Electrical
- Emergency Communications
- Equity and Inclusion
- Finance
- Historical Commission
- Human Rights Commission
- Human Service Programs
- Information Technology
- Inspectional Services
- LGBTQ+ Commission
- Peace Commission
- Public Health
- Public Schools
- Public Works
- Traffic, Parking, and Transportation (TPT)
- Veterans' Services
- Water Department
- Women's Commission

AGENDA



	Work in Progress	1:00 PM
	Mitigation Goals	1:05 PM
	Capabilities Assessment	1:15 PM
	Asset Inventory	1:30 PM
	Outreach & HMPT Meetings	1:50 PM
	Next Steps	1:55 PM
	Conclude	2:00 PM



FEMA Requirements

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

Assets are determined by the community and include, but are not limited to:



People (including underserved communities and socially vulnerable populations).



Structures (including facilities, lifelines and critical infrastructure).



Systems (including networks and capabilities).



Natural, historic, and cultural resources.



Activities that have value to the community

ASSET INVENTORY



Previous Asset inventory obtained from:

- Climate Change Vulnerability Assessment (CCVA) Report - Part 1 (November 2015)
- Climate Change Vulnerability Assessment (CCVA) Report - Part 2 (February 2017)

Previous Asset Inventory:



Upcoming Asset Inventory:

**Re-organize and update:
add, delete, modify**

**Review who in the City can
support this effort for each
sub-category**

AGENDA



Work in Progress

1:00 PM



Mitigation Goals

1:05 PM



Capabilities Assessment

1:15 PM



Asset Inventory

1:30 PM



Outreach & HMPT Meetings

1:50 PM



Next Steps

1:55 PM



Conclude

2:00 PM



PUBLIC MEETING #1



Public



Stakeholders



Outreach



Date June 13
Time 6PM – 7PM
Format Virtual

STC not required to attend

A recording with subtitles in all languages will be posted on the website afterwards

Are you concerned about rising heat, unusually warm winters, and other extreme events?

The City of Cambridge is working hard to prepare for a more resilient and safe community by updating its Hazard Mitigation Plan, which will study risks and introduce strategies to address natural hazards now and in the future.

Join us for a public meeting to learn more about the Plan and make your voice heard!

Register using the QR code and link at right. After registering, you will receive a Zoom link to attend virtually via email.








To request an interpreter for this event, please call 617-349-4396 by June 2, 2023

TUESDAY
JUNE 13
6PM

tinyurl.com/CambridgeHMPsvp2

AGENDA



	Work in Progress	1:00 PM
	Mitigation Goals	1:05 PM
	Capabilities Assessment	1:15 PM
	Asset Inventory	1:30 PM
	Outreach & HMPT Meetings	1:50 PM
	Next Steps	1:55 PM
	Conclude	2:00 PM



NEXT STEPS



**Take Capabilities
Assessment Survey**

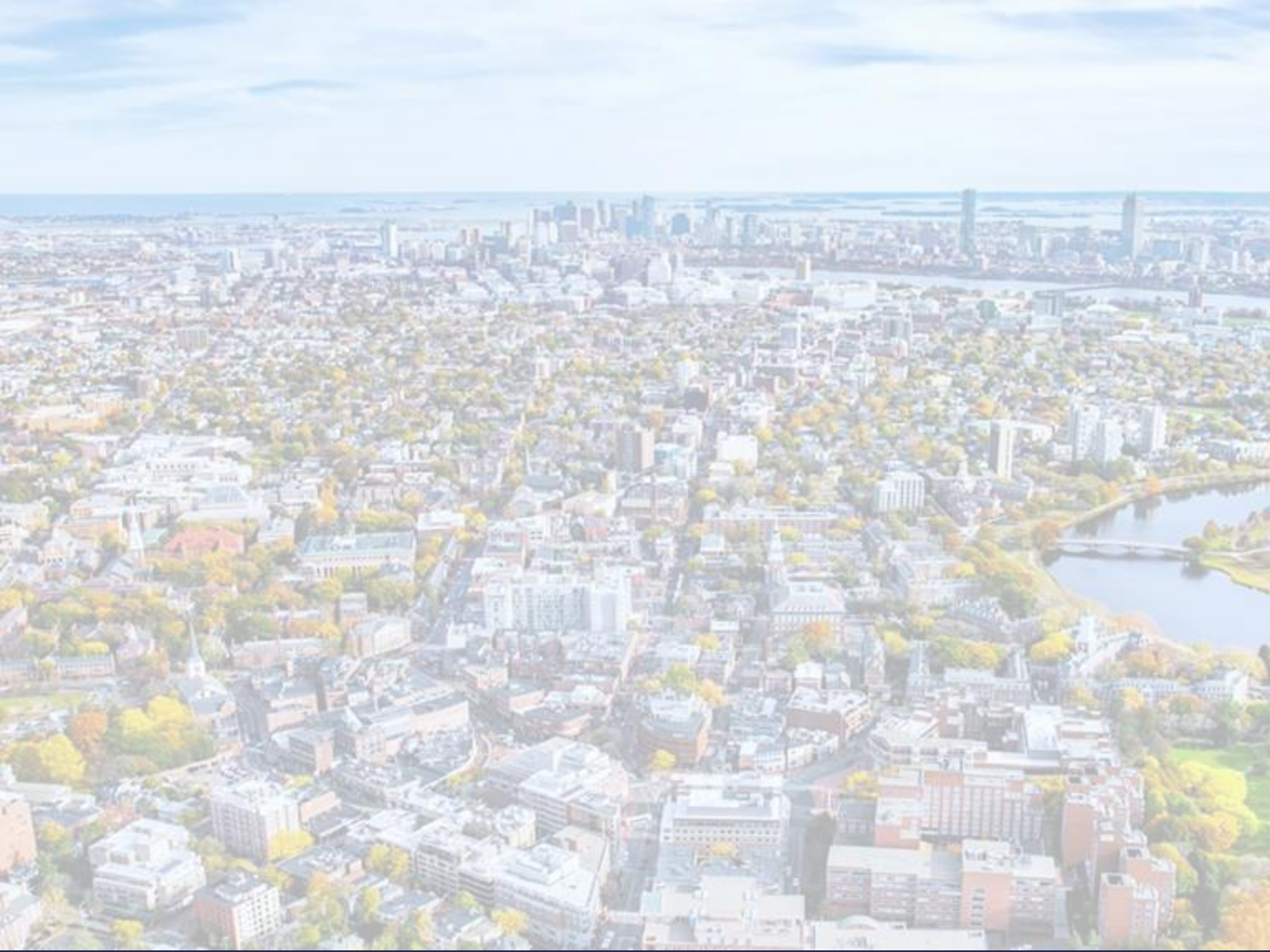


**Support Input on
Asset Inventory**

+ Public Meeting on June 13th

+ HMPT Workshop Dates TBD

+ Next Meeting June 26 at 1PM



Hazard Mitigation Plan Update 2023 Questions?



**CITY OF
CAMBRIDGE**



HAZARD MITIGATION PLAN 2023 UPDATE STEERING COMMITTEE MEETING #3 (MAY)

NOTES

May 22, 2023

Attendees

City of Cambridge

- Leila Mekias, CDD
- Susanne Rasmussen, CDD
- Catherine Woodbury, DPW
- Deputy Chief Colin Walsh, Fire Dept.
- Jeremiah Hart, Fire Dept.
- Brian McLane, DPW
- Jacob Lazzara, CISD
- Jim Wilcox, DPW
- Julie Torelli-Greenwood, CWD
- Crystal Rosa, Human Rights Commission
- Sam Lipson, CPHD
- Vedad Konjic, CPS Facilities
- Nancy Porter, CPHD

Weston & Sampson

- Robin Seidel, Project Manager
- Jennie Moonan, HMP Technical Lead
- Emily Judson, Resiliency Planner

Discussion items

Overview of Work in Progress

- Hazard Profiles (Chapter 3) wrapping up
- Facility / Asset Inventory just initiated (Chapter 4)
- Vulnerability Assessment (Chapter 5) next month
- Mitigation Goals to be completed today, Capabilities Assessment ongoing
- Mitigation Actions – initiate discussion at next month's meeting

Mitigation Goal Endorsement

- Voting via slido and discussion:
 - **Goal #1:**
 - Proposed Goal: Equitably Protect Health and Safety of the Community

- Full endorsement (8 votes)
- **Goal #2:**
 - Proposed Goal: Promote Public Awareness and Resilience through Communication
 - Edit: change “awareness” to “*preparedness*”
 - Final Goal: Promote Public Preparedness and Resilience through Communication
 - Full endorsement after edit (8 votes)
- **Goal #3:**
 - Proposed Goal: Coordinate and Collaborate in Hazard Mitigation Planning and Climate Adaptation
 - Edit: coordinate and collaborate *among city departments and with community partners*
 - Final Goal: Coordinate and Collaborate among City Departments and with Community Partners on Hazard Mitigation Planning and Climate Adaptation
 - Full endorsement after edit (9 votes)
- **Goal #4:**
 - Proposed Goal: Invest in and Plan for Priority Hazard Mitigation Implementation
 - Edit: *Sustainably* invest
 - Edit: Plan for and sustainably invest in (switch order from original)
 - Final Goal: Plan for and Sustainability Invest in Priority Hazard Mitigation Implementation
 - Full endorsement after edit (8 votes)
- **Goal #5:**
 - Proposed Goal: Improve Capacity to Monitor Existing Changes
 - Edit: remove “existing”
 - Edit: monitor and *respond to* emerging changes
 - Edit: Improve capacity to monitor natural hazards and respond to changes
 - Final Goal: Improve Capacity to Monitor Natural Hazards and Respond to Changes
 - Full endorsement after edit (5 votes)

Capabilities Assessment:

- Explanation and presentation of Capabilities Assessment Survey
- Comment on the Plan Questions: clarify in survey that we want Department-specific plans and that the HMP will bring those plans together

- Discussion regarding mutual aid: there is a lot of mutual aid. Provide clarification on what need and create more space (or another question) for answer.
- Note: a new department was just created to manage building renovation (to be added to the list)
- Make departments multiple choice in survey
- Leila to send the survey to the group for comment
- Leila, WSE, and the STC to review the list of City departments listed and confirm who should receive survey

Asset Inventory:

- Discussion about activities:
 - Activities include community-building events (i.e., Porchfest), they create social resiliency, community cohesion, and practice in emergency logistical planning.
 - Put bikeshare and bike paths under Systems
 - Change activities to actual actions (i.e., swimming)
 - Best way to input on activities is to
 - Look at City Calendar as starting point
 - TPT has special events calendar, can get filtered list from Brooke McKenna
 - Get input on privately organized community events during HMPTs
- Leila to send spreadsheet to STC for comment

Outreach & HMPT Meetings

- Public Meeting #1: June 13, 2023 - 6:00 PM to 7:00 PM
 - Public overview of the project and opportunity for input on how natural hazards affect the community, questions, concerns.
 - This meeting will be virtual
 - Leila to coordinate outreach
- WSE to send workplan documenting schedule for duration of project
 - Note: September 11, 18, 25 are City Council meetings for vote
 - HMP will probably be on the meeting on the 18th
 - Last HMP public meetings are planned for September right after the holiday
- HMPT list need input from STC on contact information and organizations/categories that are missing. **Leila sent to STC on 5/22/2023.**

Action Items

1. Leila/WSE to send the Capabilities Assessment survey to STC for comment and/or completion
2. Leila/WSE to send Asset Inventory spreadsheet to STC for comment
3. STC to provide input on HMPT list Leila to STC for input
4. STC to send comments on the above action items
5. Weston & Sampson to send City Council meeting information including vote language

Next Steering Committee Meeting Agenda (tentative)

- Overview of Work in Progress
- Asset Inventory – last questions and outstanding items
- Preliminary Mitigation Actions
- Public Meeting Debrief
- HMPT Workshop Preparation

STEERING COMMITTEE MEETING #4: JUNE

AGENDA

- 1:00 PM** **Overview of Work in Progress**
- Project Timeline
 - Tasks Underway
 - Questions on ongoing input & reviews requested?
- 1:10 PM** **Outreach & HMPT Meetings**
- Public Meeting #1 June 13, 2023, 6:00 PM completed
 - HMPT Workshop #1: June 29, 2023 10:00 AM to 11:30 AM
 - HMPT Workshops 2 & 3
- 1:15 PM** **Mitigation Actions**
- 1:40 PM** **Plan Evaluation and Maintenance (if time allows)**
- 1:55 PM** **Next Steps**
- Next Meeting 7/24/2023 1 to 2 PM
 - Provide input on requested items
- 2:00 PM** **Conclude**



Hazard Mitigation Plan Update 2023

Steering Committee
Meeting #4
June 26, 2023



**CITY OF
CAMBRIDGE**



AGENDA



Work in Progress

1:00 PM



Outreach & HMPT Meetings

1:05 PM



Mitigation Actions

1:15 PM



Plan Maintenance (if time allows)

1:30 PM



Next Steps

1:55 PM



Conclude

2:00 PM



AGENDA



Work in Progress

1:00 PM



Outreach & HMPT Meetings

1:05 PM



Mitigation Actions

1:15 PM



Plan Maintenance (if time allows)

1:30 PM



Next Steps

1:55 PM



Conclude

2:00 PM

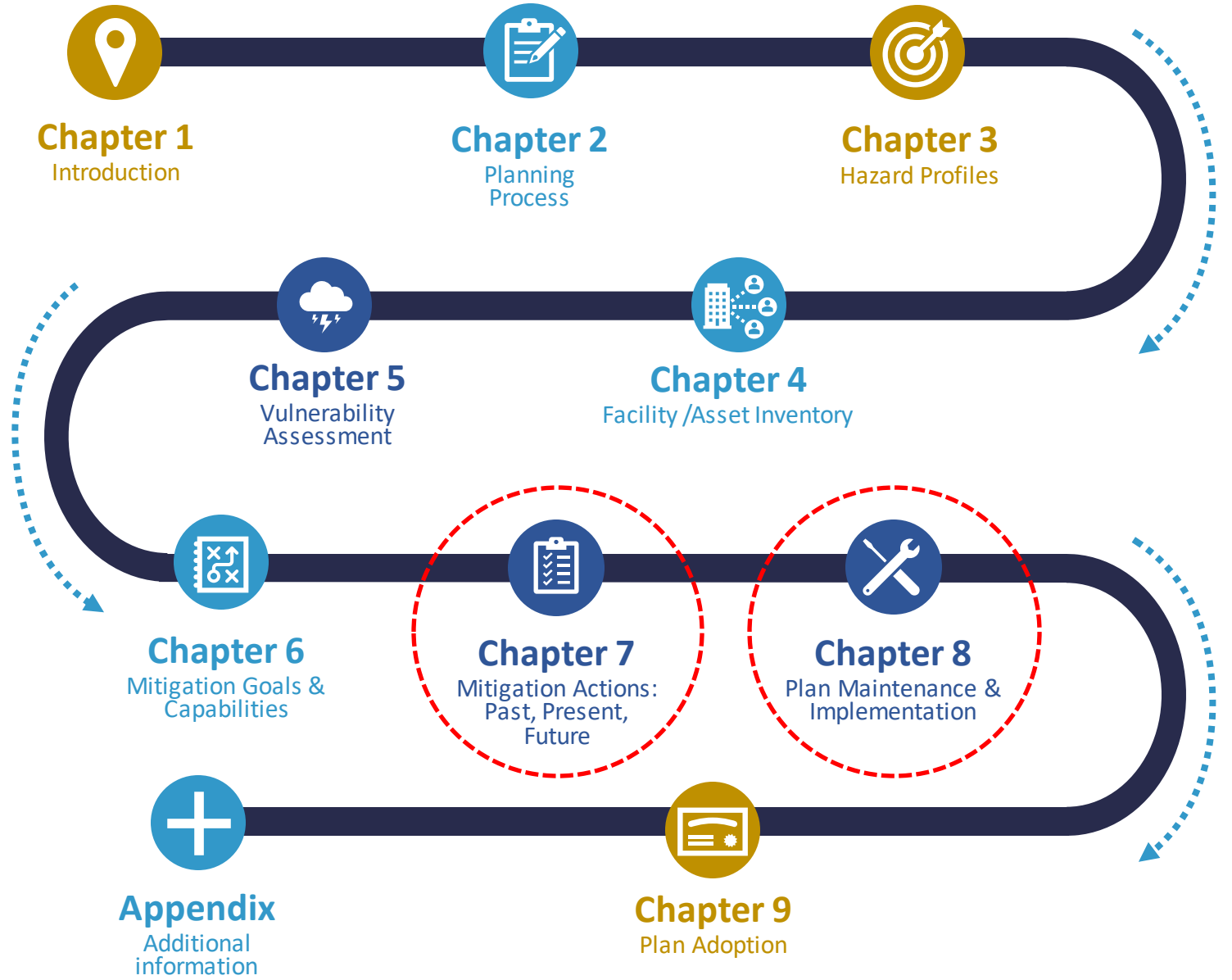


WORK IN PROGRESS



Project Tasks align with the Final Document Chapters:

- Task 1: Project Initiation
- Task 2: Initiation of Engagement
- Task 3: Hazard Profiles
- Task 4: Facility/Asset Inventory
- Task 5: Vulnerability Assessment
- Task 6: Mitigation Goals and Capabilities
- Task 7: Mitigation Actions: Past, Present, and Future
- Task 8: Plan Maintenance and Implementation
- Task 9: Public Review
- Task 10: MEMA and FEMA Review, City Adoption
- Ongoing Public Outreach
- Ongoing Project Administration



Draft Submitted to City In-progress Not Started

AGENDA



Work in Progress

1:00 PM



Outreach & HMPT Meetings

1:05 PM



Mitigation Actions

1:15 PM



Plan Maintenance (if time allows)

1:30 PM



Next Steps

1:55 PM

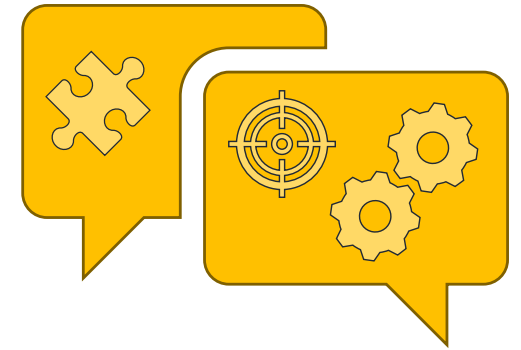


Conclude

2:00 PM



OUTREACH + HMPT MEETINGS



Public Meeting #1

June 13, 2023
Completed



HMPT Workshop #1

June 29, 2023
10 AM – 11:30 AM

Asset Inventory

HMPT Workshop #2

July 11, 2023
6 PM – 7:30 PM

Mitigation Actions

HMPT Workshop #3

July 25, 2023
4 PM – 5:30 PM

Final Feedback

AGENDA



Work in Progress

1:00 PM



Outreach & HMPT Meetings

1:05 PM



Mitigation Actions

1:15 PM



Plan Maintenance (if time allows)

1:30 PM



Next Steps

1:55 PM



Conclude

2:00 PM



MITIGATION ACTION CATEGORIES



PREVENTATIVE

1. **Preventive** activities keep flood problems from getting worse. The use and development of flood-prone areas is limited through planning, land acquisition, or regulation. They are usually administered by building, zoning, planning, and/or code enforcement offices.
 - Floodplain mapping and data
 - Open space preservation
 - Floodplain regulations
 - Erosion setbacks
 - Planning and zoning
 - Stormwater management
 - Drainage system maintenance
 - Building codes

PROPERTY PROTECTION

2. **Property protection** activities are usually undertaken by property owners on a building-by-building or parcel basis.
 - Relocation
 - Acquisition
 - Building elevation
 - Retrofitting
 - Sewer backup protection
 - Insurance

MITIGATION ACTION CATEGORIES



NATURAL RESOURCE PROTECTION

3. **Natural resource protection** activities preserve or restore natural areas or the natural functions of floodplain and watershed areas. They are implemented by a variety of agencies, primarily parks, recreation, or conservation agencies or organizations.
- Wetlands protection
 - Erosion and sediment control
 - Natural area preservation
 - Natural area restoration
 - Water quality improvement
 - Coastal barrier protection
 - Environmental corridors
 - Natural functions protection

EMERGENCY SERVICES

4. **Emergency services** measures are taken during an emergency to minimize its impact. These measures are usually the responsibility of city or county emergency management staff and the owners or operators of major or critical facilities.
- Hazard threat recognition
 - Hazard warning
 - Hazard response operations
 - Critical facilities protection
 - Health and safety maintenance
 - Post-disaster mitigation actions

MITIGATION ACTION CATEGORIES



STRUCTURAL PROJECTS

5. **Structural projects** keep flood waters away from an area with a levee, reservoir, or other flood control measure. They are usually designed by engineers and managed or maintained by public works staff.
- Reservoirs
 - Levees/floodwalls
 - Diversions
 - Channel modifications
 - Storm drain improvements

PUBLIC INFORMATION

6. **Public information** activities advise property owners, potential property owners, and visitors about the hazards, ways to protect people and property from the hazards, and the natural and beneficial functions of local floodplains. They are usually implemented by a public information office.
- Map information
 - Outreach projects
 - Real estate disclosure
 - Library
 - Technical assistance
 - Environmental education

AGENDA



Work in Progress

1:00 PM



Outreach & HMPT Meetings

1:05 PM



Mitigation Actions

1:15 PM



Plan Maintenance (if time allows)

1:30 PM



Next Steps

1:55 PM



Conclude

2:00 PM



Who in the City is responsible for *leading* monitoring and maintenance of the HMP?

Responsibilities include:

- Tracking the progress of the plan
- Sharing this progress with the public
- Making monitoring information publicly available
- Notifying the public when new information has been posted or updated
- Providing the public with opportunities to give input on this information

Who in the City will *participate* in monitoring and maintenance of the HMP?

Responsibilities include:

- Supporting tracking the progress of the plan
- Supporting sharing this progress with the public
- Making monitoring information publicly available
- Notifying the public when new information has been posted or updated
- Providing the public with opportunities to give input on this information

PLAN MAINTENANCE

Roles and Responsibilities



With what *frequency* will this group meet and append the Plan?

Examples:

- Monthly
- Quarterly
- Yearly

Efficiency:

- Combine with another regularly scheduled meeting?

How will the City *continue* to seek public participation *after* the plan has been approved and *during* the plan's implementation?

The plan may contain a narrative description or an itemized list of steps, demonstrating the prescribed method that will be followed to obtain future public participation.

Special consideration should be given to identifying and using unique and meaningful ways to keep the public engaged in the process.

Examples include, but are not limited to: periodic presentations on the plan's progress to elected officials, schools or other community groups; annual questionnaires or surveys; public meetings; postings on social media; and interactive websites.



If time allows: How will each participant *integrate information* from the mitigation strategy into their identified *planning mechanisms*?

Integrate means to include hazard mitigation principles, vulnerability information and mitigation actions into other existing community planning to leverage activities that have co-benefits, reduce risk and increase resilience. Planning mechanisms refers to the governance structures used to manage local land use development and community decision-making, such as budgets, comprehensive plans, capital improvement plans, economic development strategies, climate action plans or other long-range plans.

AGENDA



Work in Progress

1:00 PM



Outreach & HMPT Meetings

1:05 PM



Mitigation Actions

1:15 PM



Plan Maintenance (if time allows)

1:30 PM



Next Steps

1:55 PM

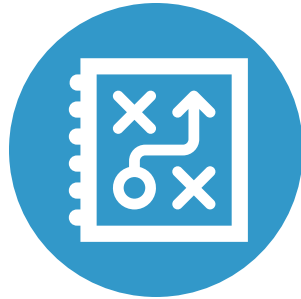


Conclude

2:00 PM



NEXT STEPS

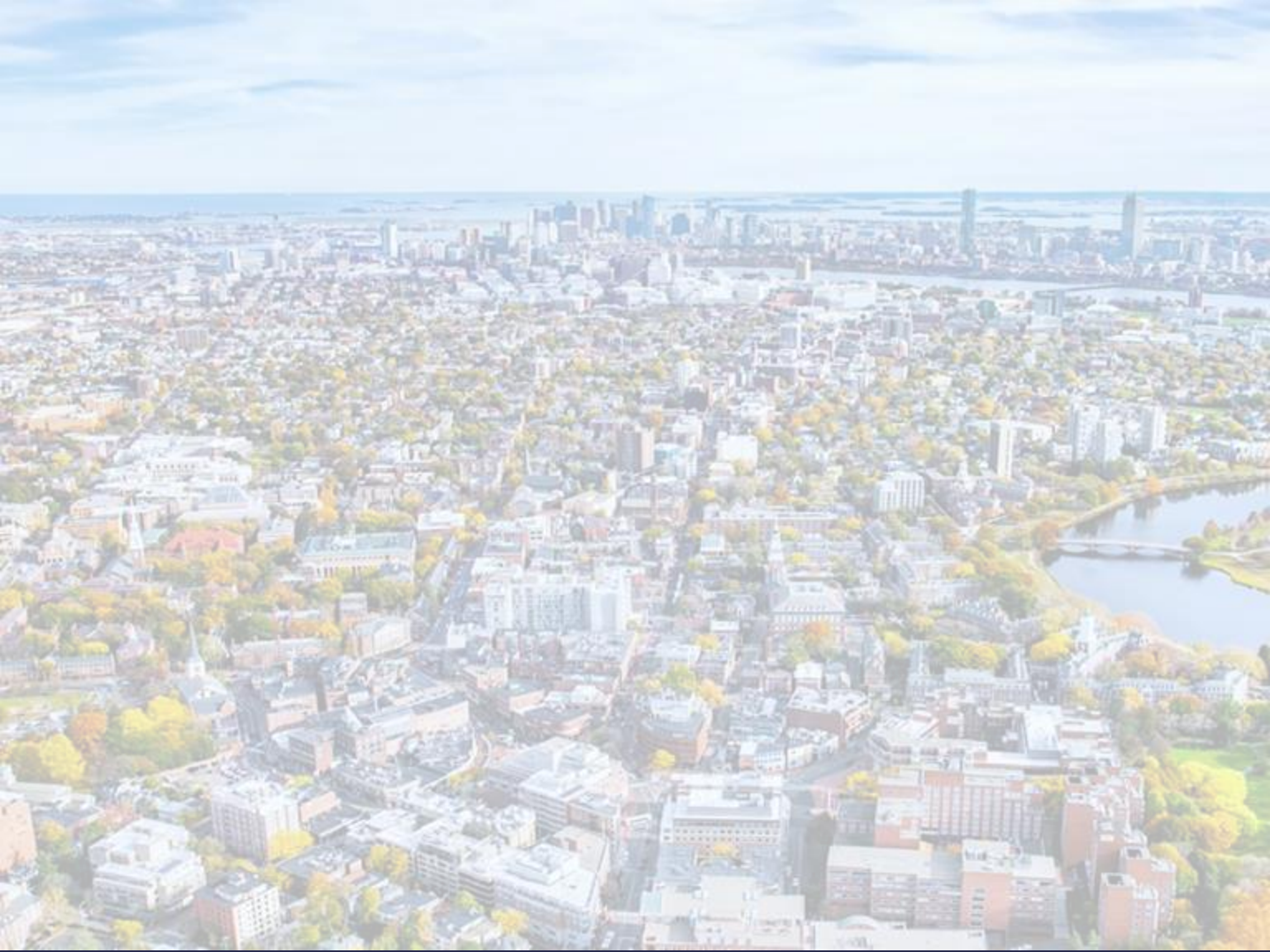


Capabilities Assessment



Start Reviewing
Chapters

- + Provide input on requested items
- + HMPT Workshop Thursday at 10 AM
- + Next Meeting July 24 at 1PM



Hazard Mitigation Plan Update 2023 Questions?



HAZARD MITIGATION PLAN 2023 UPDATE STEERING COMMITTEE MEETING #4 (JUNE)

NOTES

June 26, 2023

Attendees

City of Cambridge

- Leila Mekias, CDD
- Susanne Rasmussen, CDD
- Catherine Woodbury, DPW
- Jeremiah Hart, Fire Dept.
- Jim Wilcox, DPW
- Nancy Porter, CPHD
- Mark Gallagher
- Rachel Tenanhaus

Weston & Sampson

- Robin Seidel, Project Manager
- Jennie Moonan, HMP Technical Lead
- Emily Judson, Resiliency Planner

Presentation

- Work in progress
 - Robin reviewed status of each chapter (see slide)
- Outreach & HMPT Meetings
 - HMPT Workshop #1: June 29, 2023 – 10 AM – 11:30 AM
 - HMPT Workshop #2: July 11, 2023 – 6 PM – 7:30 PM
 - HMPT Workshop #3: July 11, 2023 – 4 PM – 5:30 PM
- Mitigation Actions
 - Jennie reviewed “what are mitigation actions” (see slides)
- Plan Maintenance
 - Discussion notes below

Discussion items

Mitigation Actions

See Spreadsheet *2023.06.26 Draft STC Generated Mitigation Actions* (attached)

What is the HMP Action Commitment?

- The City is committing to working on it within the next 5 years, but there are also opportunities to amend that commitment and there is no penalty if the action is not completed

Will this help projects get funding?

- The HMP will make these actions eligible for FEMA funding
- May help support case to obtain other sources of funding, too

Should we include actions that are joint ventures with other communities?

- We should prioritize projects that the City has full control of

Plan Maintenance: Roles & Responsibilities

Who in the City is responsible for leading monitoring and maintenance of the HMP?

- New Hazard Mitigation (?) Manager who is currently be hired at City Manager's office (hiring in progress)

Who in the City will participate in monitoring and maintenance of the HMP?

- Same Departments as STC

With what frequency will this group meet and append the Plan?

Thoughts:

- Combine it with other regularly scheduled program meetings
- It could be part of STC for Resilient Cambridge Plan meetings
- Quarterly

Final Decision:

- Yearly

How will the City continue to seek public participation after the plan has been approved and during the plan's implementation?

- What is the process to modify the plan? That's when we'd want to have a public process

- Committee will make updates at any time, updates don't need to be certified by City Council, and that group could decide if/how/when to have a public process around that modification
- Could be that we will update the StoryMap throughout the process and notify people? Yes
- Incorporate feedback opportunities that are more fun and concrete and/or integrate into an existing set City process

If time allows: How will each participant integrate information from the mitigation strategy into their identified planning mechanisms?

- Ran out of time – return to this next meeting

Action Items

- Follow up with Susanne about Capabilities Assessment (WSE)
- HMPT Workshops - attend
- City to Review Chapters provided

Next Steering Committee Meeting Agenda (tentative)

- Overview of Work in Progress
- Working session on asset inventory
- Review initial mitigation list
- Discuss final HMPT workshop
- Chapter Reviews

STEERING COMMITTEE MEETING #5: JULY

AGENDA

- 1:00 PM** **Overview of Work in Progress**
- Tasks Underway
 - Remaining timeline & meetings
- 1:10 PM** **Prioritization Criteria & Process for Prioritizing Mitigation Actions**
- Criteria
 - Process
 - HMPT Meeting #3
- 1:35 PM** **Asset Inventory Discussion**
- Critical Assets
 - Community Lifelines
 - Overview Maps
- 1:50 PM** **Draft Report Template**
- 1:55 PM** **Next Steps**
- Last STC Meeting August 8, 2023: 1 to 2 PM (could some stay until 2:30 PM?)
 - Review draft chapters provided
 - Review mitigation actions following HMPT Meeting #3
- 2:00 PM** **Conclude**



Hazard Mitigation Plan Update 2023

Steering Committee
Meeting #5
July 24, 2023



**CITY OF
CAMBRIDGE**



AGENDA



Overview of Work in Progress

1:00 PM



Mitigation Actions: Prioritization Process

1:10 PM



Asset Inventory Discussion

1:35 PM



Draft Report Template

1:50 PM



Next Steps

1:55 PM



Conclude

2:00 PM



AGENDA



Overview of Work in Progress

1:00 PM



Mitigation Actions: Prioritization Process

1:10 PM



Asset Inventory Discussion

1:35 PM



Draft Report Template

1:50 PM



Next Steps

1:55 PM



Conclude

2:00 PM



WORK IN PROGRESS



Project Tasks align with the Final Document Chapters:

Task 1: Project Initiation

Task 2: Initiation of Engagement

Task 3: Hazard Profiles

Task 4: Facility/Asset Inventory

Task 5: Vulnerability Assessment

Task 6: Mitigation Goals and Capabilities

Task 7: Mitigation Actions: Past, Present, and Future

Task 8: Plan Maintenance and Implementation

Task 9: Public Review

Task 10: MEMA and FEMA Review, City Adoption

Ongoing Public Outreach

Ongoing Project Administration



CHAPTER PROGRESS



	Chapter	Status	Draft to City	Deadline for City Review	Responsible Reviewer	Final Draft Deliverable to City
1	Introduction & Goals	In Review by City	June 26	July 7	Susanne R.	August 11 9
2	Planning Process	Internal Review	July 28	August 7	Susanne R.	August 11 9
3	Hazard Profiles	In Review by City	June 23	July 21	Susanne R. , Catherine W., Sam L, Nancy R., Fire Dept.	August 11 9
4	Facility/Asset Inventory	In Progress	July 28	July 21	STC July Meeting	August 11 9
5	Vulnerability Assessment	In Progress	July 28	August 7	?	August 11 9
6	Mitigation Capabilities	In Progress	July 28	August 7	?	August 11 9
7	Mitigation Actions	In Progress	July 31	August 7	?	August 11 9
8	Plan Implementation	Internal Review	July 24	August 7	Susanne R.	August 11 9
9	Plan Adoption	In Review by City	June 9	June 30	Susanne R.	September 25

ENGAGEMENT PROGRESS



Steering Committee (STC) Meetings	Status	Meeting Date	Notes
STC #1 (March)	Complete	March 27, 2023	Hazard Profiles, Stakeholder Outreach & Engagement Plan, Capabilities Assessment, confirm STC meetings.
STC #2 (April)	Complete	April 24, 2023	Proposed Mitigation Goals & Objectives, Past (2015) Mitigation Actions, Outreach & HMPT meetings.
STC #3 (May)	Complete	May 22, 2023	Endorse Mitigation Goals, Launch Capabilities Assessment Survey, Asset Inventory Presentation & Discussion, Outreach & HMPT Meetings.
STC #4 (June)	Complete	June 26, 2023 July 12, 2023	Review questions/concerns re: Asset inventory, Review questions on Chapter 1, initiate discussion on Hazard Mitigation Actions, review past and projected development.
STC #5 (July)	Today!	July 24, 2023	Review results of capabilities assessment, review vulnerability assessment, initiate discussion on plan maintenance and implementation
STC #6 (August)		August 8, 2023	Review questions on draft plan.

ENGAGEMENT PROGRESS



Other Meetings, Workshops, and Surveys	Status	Final Meeting/ Deliverable Date
HMPT Workshop #1	Complete	June 29, 2023
HMPT Workshop #2	Complete	July 11, 2023
HMPT Workshop #3		July 25, 2023
Public Meeting #1	Complete	June 13, 2023
Public Meeting #2		Week of September 13, 2023 (Day Virtual)
Public Meeting #3		Week of September 13, 2023 (Evening In-Person)
Public Survey	Complete	Posted in English (June 15, 2023); Posted in other languages (July 12, 2023); Final Deliverable (August 4, 2023)
ESRI StoryMap	Starting July 26	September 5, 2023
Presentation to City Council for Adoption		September 18, 2023
Street Team		Upcoming

AGENDA



Overview of Work in Progress

1:00 PM



Mitigation Actions: Prioritization Process

1:10 PM



Asset Inventory Discussion

1:35 PM



Draft Report Template

1:50 PM



Next Steps

1:55 PM



Conclude

2:00 PM



MITIGATION ACTION:

PRIORITIZATION PROCESS OVERVIEW



1. Consider the **Prioritization Criteria** for each **Mitigation Action**



2. **Rate** each Action under each **Criteria**



3. **Add up** all the ratings for each Action



4. Finalize Prioritization **Categories: Low, Medium, High**

PRIORITIZATION CRITERIA



STAPLEE (by FEMA)

SOCIAL	TECHNICAL	ADMINISTRATIVE	POLITICAL	LEGAL	ECONOMIC	ENVIRONMENTAL
--------	-----------	----------------	-----------	-------	----------	---------------

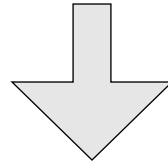
STAPLEE Criteria	S (Social)		T (Technical)			A (Administrative)			P (Political)			L (Legal)			E (Economic)				E (Environmental)				
Considerations → for Alternative Actions ↓	Community Acceptance	Effect on Segment of Population	Technical Feasibility	Long-term Solution	Secondary Impacts	Staffing	Funding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

PRIORITIZATION CRITERIA



STAPLEE (by FEMA)

SOCIAL	TECHNICAL	ADMINISTRATIVE	POLITICAL	LEGAL	ECONOMIC	ENVIRONMENTAL
--------	-----------	----------------	-----------	-------	----------	---------------



Criteria for Cambridge

LIFE SAFETY	SOCIAL	TECHNICAL	ADMINISTRATIVE	POLITICAL	LOCAL CHAMPION	LEGAL	PROPERTY PROTECTION	ENVIRONMENTAL
-------------	--------	-----------	----------------	-----------	----------------	-------	---------------------	---------------

OTHER COMMUNITY OBJECTIVES

PRIORITIZATION CRITERIA



LIFE SAFETY

Will this actions **protect lives and prevent injury**?

SOCIAL

Will the action have a **positive impact** on the community and **vulnerable populations**?

TECHNICAL

Is the mitigation action **technically feasible**?

ADMINISTRATIVE

Does the City have the **capabilities to implement and maintain** the action?

POLITICAL

Does **the public support** the mitigation action?

LOCAL CHAMPION

Is there a **strong advocate** for the project within the City?

LEGAL

Does the City have the **authority** to implement the action?

PROPERTY PROTECTION

Will this action **eliminate or reduce damage** to structures and infrastructure?

ENVIRONMENTAL

Will the action **protect and preserve** the City's natural resources?

OTHER COMMUNITY OBJECTIVES

Does the action advance other community objectives such as economic development, environmental quality, or open space preservation?

PRIORITIZATION CRITERIA



	ACTION 1	ACTION 2	ACTION 3
LIFE SAFETY	●	●	●
SOCIAL	●	●	●
TECHNICAL	●	●	●
ADMINISTRATIVE	●	●	●
POLITICAL	●	●	●
LOCAL CHAMPION	●	●	●
LEGAL	●	●	●
PROPERTY PROTECTION	●	●	●
ENVIRONMENTAL	●	●	●
OTHER COMMUNITY OBJECTIVES	●	●	●
Final Prioritization Level	●	●	●

Draft Presented for Discussion
 – Edits recommended by
 Steering Committee

RANKING KEY

- Unlikely / 1 point
- Maybe / 2 points
- Likely / 3 points

All rankings tallied and result
 in **Prioritization Categories:**
HIGH, MEDIUM, LOW

AGENDA



Overview of Work in Progress

1:00 PM



Mitigation Actions: Prioritization Process

1:10 PM



Asset Inventory Discussion

1:35 PM



Draft Report Template

1:50 PM



Next Steps

1:55 PM



Conclude

2:00 PM



ASSET INVENTORY



Three Tiers of Critical Assets:

1. Critical Facilities tracked by Eversource to maintain power
2. Community Lifelines
3. Assets deemed important by the community

PEOPLE

Assets that serve populations that are more vulnerable to disaster (e.g., elderly, children, visiting populations) and/or serve densely populated areas.

STRUCTURES

Built facilities that provide community lifeline services. A community lifeline enables the continuation of critical government and business functions and is essential to human health and safety or economic security.

SYSTEMS

A collection of components that perform a critical service for the community. Systems are linear type assets. Systems may include horizontal assets associated with linear type assets.

Natural, Historical, & Cultural Resources (NHCR)

Areas that provide protective function to reduce magnitude of hazard impact and increase resiliency. Assets that possess historical, cultural, archaeological or paleontological significance

Activities that have Value to the Community

Data Sources

City's GIS
CCVA(2015)
Resilient Cambridge

Cambridge Special
Events Calendar
from TPT

TOTAL “CRITICAL” ASSET INVENTORY



People		Structures		Systems		Natural, Historical, & Cultural Resources	
Asset Type	Number of Assets	Asset Type	Number of Assets	Asset Type	Number of Assets	Asset Type	Number of Assets
Arts and Culture	7	Emergency Operations Center	1	Antenna Tower-Publically Sourced	3	Community Assets	51
Child and Youth Services	6	Emergency Shelters	17	Backup Electric Generator	50	Community Gardens	14
Community Resources	7	Fire Stations	8	Cell Towers	3	Historic Markers	0
Daycare Facilities	76	Food-Related Service	22	Data Hub, Colocation Center	2	Landmarks and Easements	113
Elderly Facilities	18	Gas Station	12	Emergency Communications Center	1	MHC Areas	57
Health Centers	13	Grocery Stores	89	Energy Steam Line	1	MHC Points	1372
Health-Related Service	20	Hazardous Materials Storage	38	Energy System Power Plant	6	National Reg of Historic Places	226
Hospitals	3	MBTA Bridges	1	Gas Distribution System	16	NRHP	193
Housing	13	MBTA Underpass	1	Major Roads	47	Open Space	221
Housing-Related Service	2	Municipal Buildings	21	Natural Gas Station	2	Places of Worship	80
Inclusionary	57	Municipal Parking Lots	10	NSTAR Electric Substation	20	Public Art	206
Nonprofit, Scattered Site HO	254	Other Bridges	1	Sewer & Stormwater Pump Stations	70	Reservoir	5
Playgrounds	60	Pharmacy	15	Steam Generating Facilities	1	Water Bodies	2
Private Housing	23	Police Stations	5	Stormwater Pump Station	8		
Private Schools	34	Post Offices	7	Subway Station	10		
Public Housing	46	Professional Ambulance Service	1	Telephone Office, Switch	1		
Public Schools	18	Public Libraries	7	Trackless Trolley	1		
Shelter	6	Snow Emergency Lots	5	Train	3		
Waterplay	30	Tunnels	1	Transmission Line	1		
Youth Centers	4	University Police	2	Utility Facilities	5		
Public Pools	3			Water System	5		

1800+ Assets
 - Maps by category
 showing where assets are
 distributed

TOTAL “CRITICAL” ASSET INVENTORY



People		Structures		Systems		Natural, Historical, & Cultural Resources	
Asset Type	Number of Assets	Asset Type	Number of Assets	Asset Type	Number of Assets	Asset Type	Number of Assets
				Antenna Tower-Publically Sourced	3	Community Assets	51
				Backup Electric Generator	50	Community Gardens	14
				Cell Towers	3	Historic Markers	0
				Data Hub, Colocation Center	2	Landmarks and Easements	113
				Emergency Communications Center	1	MHC Areas	57
				Energy Steam Line	1	MHC Points	1372
				Energy System Power Plant	6	National Reg of Historic Places	226
				Gas Distribution System	16	NRHP	193
				Major Roads	47	Open Space	221
				Natural Gas Station	2	Places of Worship	80
				NSTAR Electric Substation	20	Public Art	206
				Sewer & Stormwater Pump Stations	70	Reservoir	5
				Steam Generating Facilities	1	Water Bodies	2
				Stormwater Pump Station	8		
				Subway Station	10		
				Telephone Office, Switch	1		
				Trackless Trolley	1		
				Train	3		
				Transmission Line	1		
				Utility Facilities	5		
				Water System	5		
Arts & Cultural							
Child Care							
Commercial							
Daycare							
Elder Care							
Health							
Health							
Hospital							
Housing							
Housing-Related Service	2	Municipal Buildings	21				
Inclusionary	57	Municipal Parking Lots	10				
Nonprofit, Scattered Site HO	254	Other Bridges	1				
Playgrounds	60	Pharmacy	15				
Private Housing	23	Police Stations	5				
Private Schools	34	Post Offices	7				
Public Housing	46	Professional Ambulance Service	1				
Public Schools	18	Public Libraries	7				
Shelter	6	Snow Emergency Lots	5				
Waterplay	30	Tunnels	1				
Youth Centers	4	University Police	2				
Public Pools	3						

Question:

- Do you have community data on % of residents who don't own a car?

1800+ Assets
 - Maps by category showing where assets are distributed

COMMUNITY LIFELINES



A lifeline enables the continuous operation of critical government and business functions and is essential to human health and safety or economic security. Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function.



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



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



Food, Water, Shelter - Food, Water, Shelter, Agriculture



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



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



Hazardous Material - Facilities, HAZMAT, Pollutants, Contaminants



Energy - Power Grid, Fuel

COMMUNITY LIFELINE IDENTIFICATION



People		Structures		Systems		Natural, Historical, & Cultural Resources	
Asset Type	Number of Assets	Asset Type	Number of Assets	Asset Type	Number of Assets	Asset Type	Number of Assets
Arts and Culture	7	Emergency Operations Center	1	Antenna Tower-Publically Sourced	3	Community Assets	51
Child and Youth Services	6	Emergency Shelters	17	Backup Electric Generator	50	Community Gardens	14
Community Resources	7	Fire Stations	8	Cell Towers	3	Historic Markers	0
Daycare Facilities	76	Food-Related Service	22	Data Hub, Colocation Center	2	Landmarks and Easements	113
Elderly Facilities	18	Gas Station	12	Emergency Communications Center	1	MHC Areas	57
Health Centers	13	Grocery Stores	89	Energy Steam Line	1	MHC Points	1372
Health-Related Service	20	Hazardous Materials Storage	38	Energy System Power Plant	6	National Reg of Historic Places	226
Hospitals	3	MBTA Bridges	1	Gas Distribution System	16	NRHP	193
Housing	13	MBTA Underpass	1	Major Roads	47	Open Space	221
Housing-Related Service	2	Municipal Buildings	21	Natural Gas Station	2	Places of Worship	80
Inclusionary	57	Municipal Parking Lots	10	NSTAR Electric Substation	20	Public Art	206
Nonprofit, Scattered Site HO	254	Other Bridges	1	Sewer & Stormwater Pump Stations	70	Reservoir	5
Playgrounds	60	Pharmacy	15	Steam Generating Facilities	1	Water Bodies	2
Private Housing	23	Police Stations	5	Stormwater Pump Station	8		
Private Schools	34	Post Offices	7	Subway Station	10		
Public Housing	46	Professional Ambulance Service	1	Telephone Office, Switch	1		
Public Schools	18	Public Libraries	7	Trackless Trolley	1		
Shelter	6	Snow Emergency Lots	5	Train	3		
Waterplay	30	Tunnels	1	Transmission Line	1		
Youth Centers	4	University Police	2	Utility Facilities	5		
Public Pools	3			Water System	5		

808 Assets
- Maps by lifeline category

COMMUNITY LIFELINE IDENTIFICATION

Question:

- Should we add a category called "Community Support" which would include daycares, religious institutions etc?

People		Structures		Utilities		Other	
Asset Type	Number of Assets	Asset Type	Number of Assets	Asset Type	Number of Assets	Asset Type	Number of Assets
Arts and Culture	7	Emergency Operations Center	1	Antenna Tower-Publically Sourced	3	Community Assets	51
Child and Youth Services	6	Emergency Shelters	17	Backup Electric Generator	50	Community Gardens	14
Community Resources	7	Fire Stations	8	Cell Towers	3	Historic Markers	0
Daycare Facilities	76	Food-Related Service	22	Data Hub, Colocation Center	2	Landmarks and Easements	113
Elderly Facilities	18	Gas Station	12	Emergency Communications Center	1	MHC Areas	57
Health Centers	13	Grocery Stores	89	Energy Steam Line	1	MHC Points	1372
Health-Related Service	20	Hazardous Materials Storage	38	Energy System Power Plant	6	National Reg of Historic Places	226
Hospitals	3	MBTA Bridges	1	Gas Distribution System	16	NRHP	193
Housing	13	MBTA Underpass	1	Major Roads	47	Open Space	221
Housing-Related Service	2	Municipal Buildings	21	Natural Gas Station	2	Places of Worship	80
Inclusionary	57	Municipal Parking Lots	10	NSTAR Electric Substation	20	Public Art	206
Nonprofit, Scattered Site HO	254	Other Bridges	1	Sewer & Stormwater Pump Stations	70	Reservoir	5
Playgrounds	60	Pharmacy	15	Steam Generating Facilities	1	Water Bodies	2
Private Housing	23	Police Stations	5	Stormwater Pump Station	8		
Private Schools	34	Post Offices	7	Subway Station	10		
Public Housing	46	Professional Ambulance Service	1	Telephone Office, Switch	1		
Public Schools	18	Public Libraries	7	Trackless Trolley	1		
Shelter	6	Snow Emergency Lots	5	Train	3		
Waterplay	30	Tunnels	1	Transmission Line	1		
Youth Centers	4	University Police	2	Utility Facilities	5		
Public Pools	3			Water System	5		

- Safety and security
- Food water Shelter
- Health and Medical
- Energy
- Communications
- Transportation
- Hazardous material

AGENDA



Overview of Work in Progress

1:00 PM



Mitigation Actions: Prioritization Process

1:10 PM



Asset Inventory Discussion

1:35 PM



Draft Report Template

1:50 PM



Next Steps

1:55 PM



Conclude

2:00 PM



1. Introduction

1.1. What is a Hazard Mitigation Plan?

Hazard mitigation planning is an iterative process that seeks to reduce the impact of natural hazards on people and property. Cambridge has assessed a variety of natural hazards that pose a risk to the health and welfare of residents, identified specific vulnerabilities associated with those hazards and climate change, and identified location capabilities and specific mitigation actions to protect homes, businesses, and the critical infrastructure that keeps the City running. This process is tailored to address the issues affecting Cambridge residents now and into the future and is crucial to building community resilience.

What are Natural Hazards?

Natural hazards are a source of harm or difficulty created by a meteorological, environmental or geological event (such as extreme wind events, tornadoes, winter weather as well as earthquakes flooding, and fires).

Vulnerability

is a description of which community "assets" (e.g., people, structures, systems, natural resources, cultural resources, historic resources, etc.) are at risk from the effects of a natural hazard.

Hazard Mitigation

is the effort to reduce impacts from natural hazards through community planning, policy changes, educational programs, infrastructure projects, and other activities.

Climate change refers to long-term fluctuations in regional temperatures and weather patterns. These fluctuations can be natural, due to events such as solar activity or volcanic eruptions. These fluctuations are also driven by human activities, primarily the burning of fossil fuels like coal, oil, and gas, which have been prominent since the 1800s. Increasing global temperatures have resulted in a multitude of impacts, including but not limited to rising sea levels, shrinking of the polar ice caps, receding glaciers, changes in seasonality, and shifting animal and plant populations (Climate Change Vulnerability Assessment (CCVA), 2015). Climate change has increased the frequency and intensity of many natural hazards creating a greater need for proactive planning. Chapter 3 includes additional information on natural hazard severity and risk.



Resilience is the ability to withstand and swiftly recover from an extreme event. Ideally, resilient systems "bounce forward" to create healthier, greener, and more equitable systems and spaces.

1.2. Benefits of Natural Hazard Mitigation Planning

Completing natural hazard mitigation planning provides benefits to Cambridge:



1. Increasing public awareness of natural hazards that may affect the community reduces overall risk. By providing education and outreach, individuals are able to understand how natural hazards may affect their lives and what the region, the City, and they as individuals can do and are doing to minimize impacts of those hazards.



2. Proactive planning creates efficiency beyond City limits. Developing a HMP allows state and local governments to work together and combine hazard risk reduction with other community goals and plans.



3. The community's greatest vulnerabilities can be prioritized to receive resources. Developing a plan of hazard mitigation measures considers a prioritization process that reflects the cost and benefit of safety, property protection, technical, political, legal, environmental, economic, social, administrative, and other community objectives, quantitatively and/or qualitatively.



4. The implementation of an HMP saves taxpayer money. According to FEMA, one dollar spent on federal hazard mitigation grants saves an average of six dollars on disaster response (NIBS, 2019).



5. Maintaining a FEMA compliant HMP also makes the municipality eligible for federal grant funding (FEMA, 2020). Hazard mitigation funding is available through the Federal Emergency Management Agency (FEMA). To be eligible for FEMA Grants, local governments must prepare an HMP that meets the requirements established in the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended by the Disaster Mitigation Act of 2000. The HMP also ensures that federally funded projects reflect a community's priorities and offer solutions to specific threats. Please refer to Chapter 7 for more information on FEMA grants and other potential funding sources.

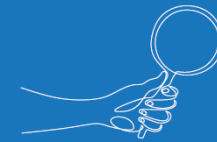
1.3. Review and Analysis

Weston & Sampson, in coordination with City staff, collected and reviewed federal, statewide, and local reports and documents. These documents were reviewed for relevance to hazards and inclusion of actions that could relate to this plan. The City of Cambridge has been at the forefront of climate resilience planning for many years. This HMP reflects prior work completed in Cambridge, as noted below in the figure. Citations provided throughout the body of this report (summarized in the resultant bibliography) indicating the extent and details of the existing plans, studies, reports, and technical information used to complete this update.



3. Coordinate and Collaborate among City Departments and with Community Partners on Hazard Mitigation Planning and Climate Adaptation

- Develop internal strategies to review and update current emergency preparedness, outreach, and response activities to anticipate future changes in vulnerabilities.
- Encourage private property-owners, institutions, and local businesses to implement measures to protect their own property.
- Work regionally with state, regional and federal agencies as well as surrounding communities to mitigate impacts from natural hazards and to respond and recover from hazard events.



4. Plan for and Sustainably Invest in Priority Hazard Mitigation Implementation

- Continue to program mitigation projects in the Cambridge capital improvement planning.
- Identify and seek funding for priority measures to mitigate or eliminate significant hazards and impacts.



5. Improve Capacity to Monitor Natural Hazards and Respond to Changes

- Continue to identify and understand how climate change may alter where and how the City is vulnerable to natural hazards.
- Ensure City departments, committees, and boards have adequate data, guidance, staff, training, and equipment to respond to natural hazard events, maintain preparedness, and anticipate future changes in vulnerabilities.

AGENDA



Overview of Work in Progress

1:00 PM



Mitigation Actions: Prioritization Process

1:10 PM



Asset Inventory Discussion

1:35 PM



Draft Report Template

1:50 PM



Next Steps

1:55 PM



Conclude

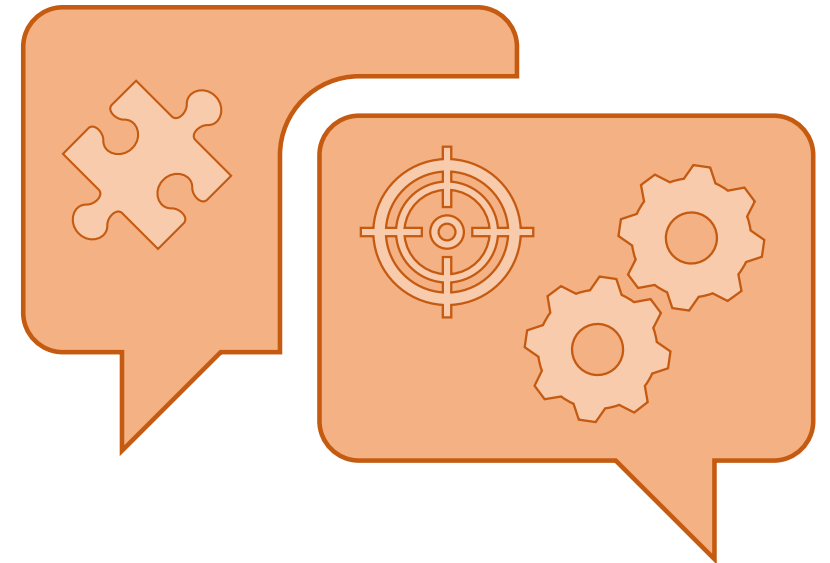
2:00 PM



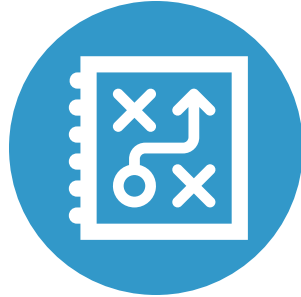
NEXT STEPS



Virtual: Sept. 13 at 12PM-1PM
In-Person: Sept. 13 at 6PM-7PM



NEXT STEPS



**Review Mitigation Actions post-
HMPT Workshop & Preliminary
Ranking**



**Continue Reviewing
Chapters**

- + Provide input on requested items**
- + HMPT Workshop Tuesday 4 – 5:30 PM**
- + Next Meeting August 8, 2023 at 1PM**



Hazard Mitigation Plan Update 2023 Questions?



HAZARD MITIGATION PLAN 2023 UPDATE STEERING COMMITTEE MEETING #5 (JULY)

NOTES

July 24, 2023

Attendees

City of Cambridge

- Leila Mekias, CDD
- Susanne Rasmussen, CDD
- Catherine Woodbury, DPW
- Jeremiah Hart, Fire Dept.
- Nancy Porter, CPHD
- Mark Gallagher
- Rachel Tenanhaus
- Marlees Owayda
- Colin S. Walsh
- Julie Greenwood-Torelli

Weston & Sampson

- Robin Seidel, Project Manager
- Jennie Moonan, HMP Technical Lead
- Emily Judson, Resiliency Planner
- Jocelyn Tsai, Resiliency Planner

Presentation

- Work in progress
 - Robin reviewed status of each chapter (see slide)
- Prioritization Criteria & Process for Prioritizing Mitigation Actions
 - Jennie reviewed how to assess actions and introduces the process of prioritizing (see slides)
- Asset Inventory Discussion
 - Robin reviewed current asset inventory and community lifelines (see slides)
- Draft Report Template
 - Robin presented an example of how the final report will look and feel (see slides)

- Outreach & HMPT Meetings
 - HMPT Workshop #3: July 25, 2023 – 4 PM – 5:30 PM
 - Public Meeting #1: September 13, 2023 – 12 PM – 1 PM (Virtual)
 - Public Meeting #2: September 13, 2023 – 6 PM – 7 PM (In-Person)

Discussion items

Chapter Review + Schedule

Chapter Review

- *Chapters 1+2:* to be reviewed by Susanne and Leila
- *Chapter 3:* Nancy is reviewing it, she will be done hopefully by this afternoon
- *Chapter 4:* We will send draft to STC by end of this week, then reviewer will be decided at end of this meeting
- *Chapter 5-7:* STC to review
- *There is also review period after August 9*

Public Meeting

- Add more visual cues, i.e. flooding maps for people who are less familiar with the material
- In-person: printed maps on tables?
- Need to make the in-person one hybrid

Public Survey

- We'll incorporate comments from public survey into the submission for August 9, not initial City review

September 18 City Council meeting

- STC should be there

Leila is recruiting for Street Team now so they may help promote public meeting

Prioritization Criteria & Process for Prioritizing Mitigation Actions

Local Champion Criteria

- The committee determined that we should remove Local Champion because if an action is important, we will assign it a local champion.

Life Safety Criteria

- Concern over how we are assessing life safety, vulnerable populations, and whose lives are considered most valuable in an emergency.

Political Criteria

- The committee determined that we should change is to Public Support or similar title, instead of Political.

Legal Criteria

- Discussion about why this is on the list if the City cannot carry out actions that it does not have legal authority to do. We are keeping this one to support regional or other partnership actions that the City could support but not complete alone.

Equity Criteria

- The committee discussed adding an Equity Criteria section to replace Local Champion, which would help weight actions that help vulnerable communities.

Overall Takeaways

- Reframe / restructure prioritization criteria to be more directly connected with Goals.

Asset Inventory

Do you have community data on % of residents who don't own a car?

- Susanne will send the data – looks like about 63.2% of residents with cars

Should we add a category called "Community Support" which would include daycares, religious institutions etc.?

- Ran out of time to discuss

Action Items

- HMPT Workshops - attend
- Review Mitigation Actions Post-HMPT Workshop & Preliminary Ranking
- City to Review Chapters provided
- Public Meetings (September 13) – attend
- Susanne to send car ownership data
- WSE to directly connect prioritization criteria to goals

Next Steering Committee Meeting Agenda (tentative)

- Overview of Work in Progress
- Discuss Public Meetings
- Chapter Reviews

STEERING COMMITTEE MEETING #6: AUGUST

AGENDA

- 1:00 PM** **Overview of Work in Progress**
- Tasks Underway
 - Draft chapters
 - Remaining timeline & meetings
- 1:05 PM** **Questions for the Committee**
- 1:20 PM** **Review Mitigation Actions & Updated Prioritization**
- 1:55 PM** **Next Steps**
- Review of Complete Draft of HMP
 - Targeted chapters (Ch. 4 Asset Inventory, Ch. 5 Vulnerability Assessment, Ch 6. Capabilities Assessment, Ch. 7 Mitigation Actions)
 - Comments due by Friday August 25th
 - Offer HTMP Opportunity to review concurrently?
- 2:00 PM** **Conclude**



Hazard Mitigation Plan Update 2023

Steering Committee
Meeting #6
August 8, 2023



**CITY OF
CAMBRIDGE**



AGENDA



Overview of Work in Progress

1:00 PM



Questions for the Committee

1:05 PM



Review Mitigation Actions
& Updated Prioritization

1:20 PM



Next Steps

1:55 PM



Conclude

2:00 PM



AGENDA



Overview of Work in Progress

1:00 PM



Questions for the Committee

1:05 PM



Review Mitigation Actions
& Updated Prioritization

1:20 PM



Next Steps

1:55 PM



Conclude

2:00 PM



WORK IN PROGRESS



Project Tasks align with the Final Document Chapters:

Task 1: Project Initiation

Task 2: Initiation of Engagement

Task 3: Hazard Profiles

Task 4: Facility/Asset Inventory

Task 5: Vulnerability Assessment

Task 6: Mitigation Goals and Capabilities

Task 7: Mitigation Actions: Past, Present, and Future

Task 8: Plan Maintenance and Implementation

Task 9: Public Review

Task 10: MEMA and FEMA Review, City Adoption

Ongoing Public Outreach

Ongoing Project Administration



CHAPTER PROGRESS

	Chapter	Status	Draft to City	Deadline for City Review	Final Draft Deliverable to City
1	Introduction & Goals	Complete	June 26	July 7	August 11 9
2	Planning Process	In Review by City	July 28	August 7	August 11 9
3	Hazard Profiles	Complete	June 23	July 21	August 11 9
4	Facility/Asset Inventory	Internal Review	July 28	July 21	August 11 9
5	Vulnerability Assessment	In Progress	July 28	August 7	August 11 9
6	Mitigation Capabilities	Internal Review	July 28	August 7	August 11 9
7	Mitigation Actions	In Review by City	July 31	August 7	August 11 9
8	Plan Implementation	In Review by City	July 24	August 7	August 11 9
9	Plan Adoption	Complete	June 9	June 30	September 25

ENGAGEMENT PROGRESS



Steering Committee (STC) Meetings	Status	Meeting Date	Notes
STC #1 (March)	Complete	March 27, 2023	Hazard Profiles, Stakeholder Outreach & Engagement Plan, Capabilities Assessment, confirm STC meetings.
STC #2 (April)	Complete	April 24, 2023	Proposed Mitigation Goals & Objectives, Past (2015) Mitigation Actions, Outreach & HMPT meetings.
STC #3 (May)	Complete	May 22, 2023	Endorse Mitigation Goals, Launch Capabilities Assessment Survey, Asset Inventory Presentation & Discussion, Outreach & HMPT Meetings.
STC #4 (June)	Complete	June 26, 2023 July 12, 2023	Review questions/concerns re: Asset inventory, Review questions on Chapter 1, initiate discussion on Hazard Mitigation Actions, review past and projected development.
STC #5 (July)	Complete	July 24, 2023	Review results of capabilities assessment, review vulnerability assessment, initiate discussion on plan maintenance and implementation
STC #6 (August)	Today!	August 8, 2023	Review questions on draft plan.

ENGAGEMENT PROGRESS



Other Meetings, Workshops, and Surveys	Status	Final Meeting/ Deliverable Date
HMPT Workshop #1	Complete	June 29, 2023
HMPT Workshop #2	Complete	July 11, 2023
HMPT Workshop #3	Complete	July 25, 2023
Public Meeting #1	Complete	June 13, 2023
Public Meeting #2		September 13, 2023 (Day Virtual)
Public Meeting #3		September 13, 2023 (Evening In-Person)
Public Survey	Complete	Posted in English (June 15, 2023); Posted in other languages (July 12, 2023); Final Deliverable (August 4, 2023)
ESRI StoryMap	In progress	September 5, 2023
Presentation to City Council for Adoption		September 18, 2023

AGENDA



Overview of Work in Progress

1:00 PM



Questions for the Committee

1:05 PM



Review Mitigation Actions
& Updated Prioritization

1:20 PM



Next Steps

1:55 PM



Conclude

2:00 PM



AGENDA



Overview of Work in Progress

1:00 PM



Questions for the Committee

1:05 PM



Review Mitigation Actions
& Updated Prioritization

1:20 PM



Next Steps

1:55 PM



Conclude

2:00 PM



MITIGATION ACTION



[New Actions List.xlsx \(sharepoint.com\)](#)

#	Action	Cost	Geographic Coverage	Funding Source	Timeframe to Start	Associated Goal(s)	Hazards	Consistency with Other Plans	Enhances Inclusion and Equity / Co-Benefits	Priority	Source (Internal)
		Greater than \$2 mil = high \$500k- \$2 mil = medium Less than \$500k = low	regional city-wide neighborhood specific site specific	Capital Budget Municipal Bond Grant Staff Time	In Progress Less than 1 year 1-2 years 2-5 years	1. Equitably Protect health and safety 2. Communication 3. Coordinate and Collaborate 4. Sustainably invest 5. Monitor and Respond			Positive Impact on Students Positive Impact on Diverse Groups Enhances Community Education Positive Impact on Renters Equitable Implementation		
1	Update and improve the City's HeatViewer with best available information	Low	City-Wide		Less than 1 year	#2 Communication	Extreme Heat		Enhances Community Education, Equitable Implementation	Medium	Weston & Sampson
2	Update and Improve Floodplain Mapping (Cambridge Flood Viewer)	Low	City-Wide		Less than 1 year	#2 Communication	Precipitation Flooding, Coastal Flooding	Resilient Cambridge Handbook - Strategy A7: Enhance Emergency Response Plans	Enhances Community Education, Equitable Implementation	Medium	2015 HMP
3	Undertake interventions as a regional collaboration at Charles River and Amelia Earhart Dam to reduce overtopping/flanking	High	Regional		Less than 1 year	#3 Coordinate & Collaborate, #4 Sustainably Invest	Coastal Flooding	Resilient Cambridge Handbook - Strategy A7: Enhance Emergency Response Plans	Positive Impact on Diverse Groups	High	STC
4	Perform a study to identify how to best protect Fresh Pond reservoir from saltwater intrusion	Low	Site Specific		2-5 years	#1 Protect, #3 Coordinate & Collaborate, #4 Sustainably Invest	Coastal Flooding	Resilient Cambridge Handbook -Strategy C1: Protect Fresh Pond Reservoir		High	STC
5	Design and construct stormwater holding tanks for Baldwin and Cambridgeport neighborhoods	High	Neighborhood specific		In Progress	#1 Protect, #4 Sustainably Invest	Precipitation Flooding	DPW 10-year Sewer Plan - Goal 4: Manage stormwater quality and quantity. Resilient Cambridge Handbook - Strategy C5: Upgrade Stormwater Storage.		High	STC
6	Initiate a City led program to install valves to mitigate basement backups of stormwater/sewage due to wet weather events	Low	City-Wide		Less than 1 year	#1 Protect	Precipitation Flooding	DPW 10-year Sewer Plan - Goal 5: Reduce flooding and protect neighborhoods		Medium	STC
7	Improve collection and conveyance system at area east of 2nd Street and north of Charles Street (area #27)	High	Neighborhood specific		Less than 1 year	#1 Protect, #4 Sustainably Invest	Precipitation Flooding	DPW 10-year Sewer Plan - Goal 4: Manage stormwater quality and quantity		High	2015 HMP
8	Complete in-progress stormwater management program: Newton, Green, Franklin and Sidney Streets (CAM 017, area #28), School, Pine, Cherry and Windsor Streets (area #26)	High	Neighborhood specific		Less than 1 year	#1 Protect, #4 Sustainably Invest	Precipitation Flooding	DPW 10-year Sewer Plan - Goal 4: Manage stormwater quality and quantity		High	2015 HMP
9	Design and construct updates to metering stations for Combined Sewers	Medium	City-Wide		Less than 1 year	#5 Monitor & Respond	Precipitation Flooding	DPW 10-year Sewer Plan - Goal 4: Manage stormwater quality and quantity. Resilient Cambridge Handbook - Strategy C5: Upgrade Stormwater Storage		Medium	HMPT Room 3

PRIORITIZATION CRITERIA



CRITERIA 1

Does the action contribute to regional resilience?

CRITERIA 2

Is the action part of other plans?

CRITERIA 3

Does the action positively impact residents of LMI or EJ Census Block Groups?

CRITERIA 4

Is the action a nature-based solution?

CRITERIA 5

Would the action mitigate economic loss/damage?

CRITERIA 6

Will the action reduce life/safety risk?

CRITERIA 7

Does the action address future climate change projections?

CRITERIA 8

Does the action leverage innovation /technology?

SCORING:

YES = 1 POINT

NO = 0 POINT

PRIORITIZATION CRITERIA



	ACTION 1	ACTION 2	ACTION 3	
CRITERIA 1	1	0	1	<p>SCORING:</p> <p>YES = 1 POINT</p> <p>NO = 0 POINT</p> <p>RANKING KEY</p> <ul style="list-style-type: none"> ● Low : 1-2 point ● Medium : 3-4 points ● High : > 4 points
CRITERIA 2	0	0	1	
CRITERIA 3	0	0	0	
CRITERIA 4	1	1	1	
CRITERIA 5	1	0	1	
CRITERIA 6	0	0	0	
CRITERIA 7	1	1	1	
CRITERIA 8	0	0	1	
Final Prioritization Level	4	2	6	<p>All rankings tallied and result in Prioritization Categories: HIGH, MEDIUM, LOW</p>

AGENDA



Overview of Work in Progress

1:00 PM



Questions for the Committee

1:05 PM



Review Mitigation Actions
& Updated Prioritization

1:20 PM



Next Steps

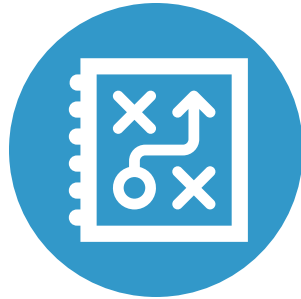
1:55 PM



Conclude

2:00 PM





**Review Complete Draft
of HMP**



**Comments due by
Friday, August 25th**



Targeted chapters for review:

- **Ch 4: Asset Inventory**
- **Ch 5: Vulnerability Assessment**
- **Ch 6: Capabilities Assessment**
- **Ch 7: Mitigation Actions**



**Offer HMPT opportunity to
review concurrently?**

AGENDA



Overview of Work in Progress

1:00 PM



Questions for the Committee

1:05 PM



Review Mitigation Actions
& Updated Prioritization

1:20 PM



Next Steps

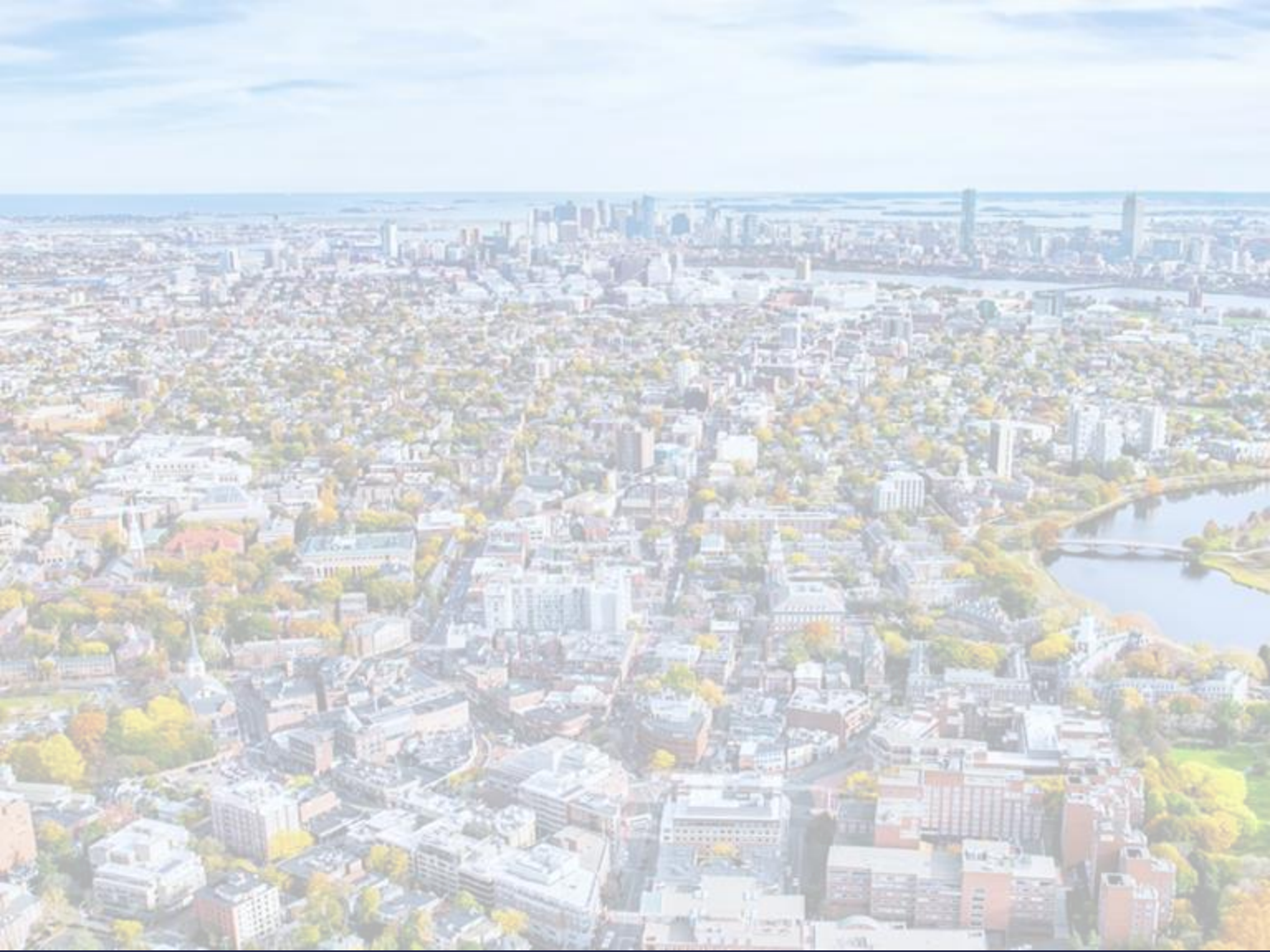
1:55 PM



Conclude

2:00 PM





Hazard Mitigation Plan Update 2023 Questions?



**CITY OF
CAMBRIDGE**



STEERING COMMITTEE MEETING #6

1:00 PM Overview of Work in Progress

- Tasks Underway
- Draft chapters
- Remaining timeline & meetings

1:05 PM Questions for the Committee

Questions for the Committee:

1. Inspect and maintain targeted infrastructure pre-storm events (e.g., remove sediment and obstructions to allow stormwater to flow unimpeded) should we remove this? Doesn't the city already do this?

City has ongoing operation and maintenance plan, they don't need more funding for that.

Remove this action.

2. Chapter 3: The following indicated events represent significant historic flood events in Cambridge, with widespread flooding.
 - a. MWH/Stantec had drafted a memo to the City for the July 10, 2010 flooding.
 - b. We can ask Leila for this memo from Jim W

Jim can provide memo. Stantec has storms that they use for modeling that are significant, basically dates and rainfall.

WSE to send Jim the HMP section so he can see what he can provide.

City of Cambridge
2023 Hazard Mitigation Plan Update
 Steering Committee Meeting
 August 8, 2023
 1:00 to 2:00 PM

3. Chapter 3: In 2018, the fire dept. reported 103 acres of wildfire. This number is a significant outlier compared to the others in the table provided. Please confirm.

Year	# of Incidents	# of Acres Burned (Fire Module)	# of Wildland Acres Burned	Total Acres Burned
2017	26	1	0	1
2018	18	0	103	103
2019	8	0	1	1
2020	31	0	4	4
2021	9	1	0	1
2022	17	1	0	1
Total	83	1	108	109

Colin Walsh: yes, this is correct, there was a large incident that year.

4. Chapter 4: Need the rest of the community events list from Leila for first ½ of year

Rachel might have it or will check. WSE needs Dec-May.

5. Chapter 4: When the climate change vulnerability assessment was completed in 2015, new data was developed for that project. It identifies a lot of what is already now included in your GIS database. However, for that project, more sensitive information such as gas distribution was included. I'm assuming this information, along with the Eversource list may not be something we want to create maps for that would then be publicly available. But we also need to decide if this should be included in the analysis. Not including it is okay. We just need a decision.

Susanne has internal crosswalk so WSE can make source clear about where information is coming from.

Do not share the maps with the public, represent them in the narrative only.

6. Chapter 8: Catherine asked in comments if someone was reviewing the chapter with the City Manager office to ensure the tasks are consistent with the new position's responsibilities and staffing? Will this be done once the final full draft plan is completed this week?

Susanne: We are working to organize an update meeting on Friday, so the team will let Owen know that we want him to check this chapter for the responsibilities of the new hire position.

7. Are there any regulations supporting Zoning Article 20.70 Flood Plain Overlay District?

*Reach out to Jennifer LeTeranea
jletourneau@cambridgema.gov*

8. Floodplain management
- a. Is the Planning Board formally the community floodplain administrators? Is there a specific person that is designated and is that person a Certified Floodplain Manager?
 - b. Who can we talk to ask more questions about the flood plain ordinance?
 - c. Is the Flood Plain Overlay District the only active flood ordinance for Cambridge? Is there a more general Flood Protection/Prevention Ordinance?
 - i. Minimum requirements for new and redevelopment in flood plain – enclosures can only be for parking, lowest flood has to be at 1 foot over base flood elevation
 - d. Do you have a scoresheet for the most recent CRS Community Assistance Visit?
 - e. When was your last CRS Community Assistance Visit?
 - f. What are your substantial damage/improvement procedures? Is the threshold 50%? Do you track this cumulatively?

*Reach out to Jennifer LeTeranea
jletourneau@cambridgema.gov*

1:20 PM Review Mitigation Actions & Updated Prioritization

Four Dollar Sign Buckets:

\$ = Under 100k

\$\$ = 100k - 500k

\$\$\$ = 500k - 2mil

\$\$\$\$ = Over 2mil

Prioritization:

Leila asked if this process is okay with everyone? Yes, move forward.

1:55 PM Next Steps

- Review of Complete Draft of HMP

City of Cambridge
2023 Hazard Mitigation Plan Update
Steering Committee Meeting
August 8, 2023
1:00 to 2:00 PM

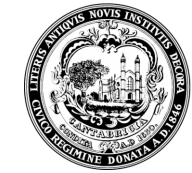
- Targeted chapters (Ch. 4 Asset Inventory, Ch. 5 Vulnerability Assessment, Ch 6. Capabilities Assessment, Ch. 7 Mitigation Actions)
- Comments due by Friday August 25th
- Offer HTMP Opportunity to review concurrently?

2:00 PM **Conclude**



Natural Hazard Mitigation Plan Update 2023

City Official's Meeting
August 11, 2023



**CITY OF
CAMBRIDGE**



2015 HMP PLAN UPDATE



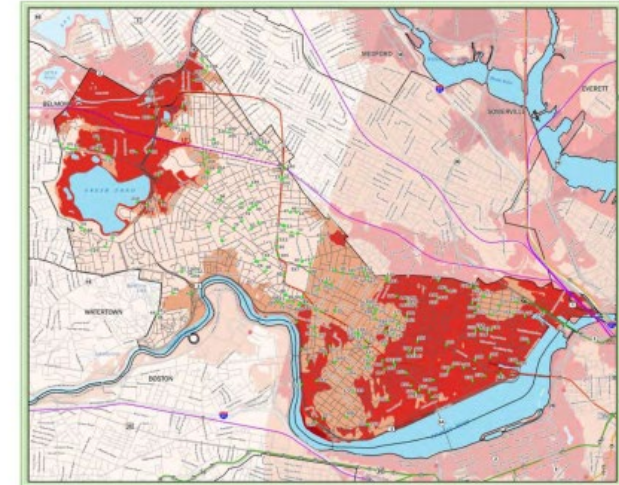
CITY OF CAMBRIDGE HAZARD MITIGATION PLAN 2015 UPDATE

Prepared by MAPC

Adopted: 3/21/2016
Approved: 5/24/2016
Expired: 5/24/2021

24 Mitigation Actions for 2016-2021

CITY OF CAMBRIDGE HAZARD MITIGATION PLAN 2015 UPDATE



Final Plan
Approved by FEMA
May 24, 2016

FEMA & MEMA REQUIREMENTS

“The Disaster Mitigation Act of 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act (44 CFR Part 201), creating the framework for state, local, tribal and territorial governments to engage in hazard mitigation planning to receive certain types of non-emergency disaster assistance.”

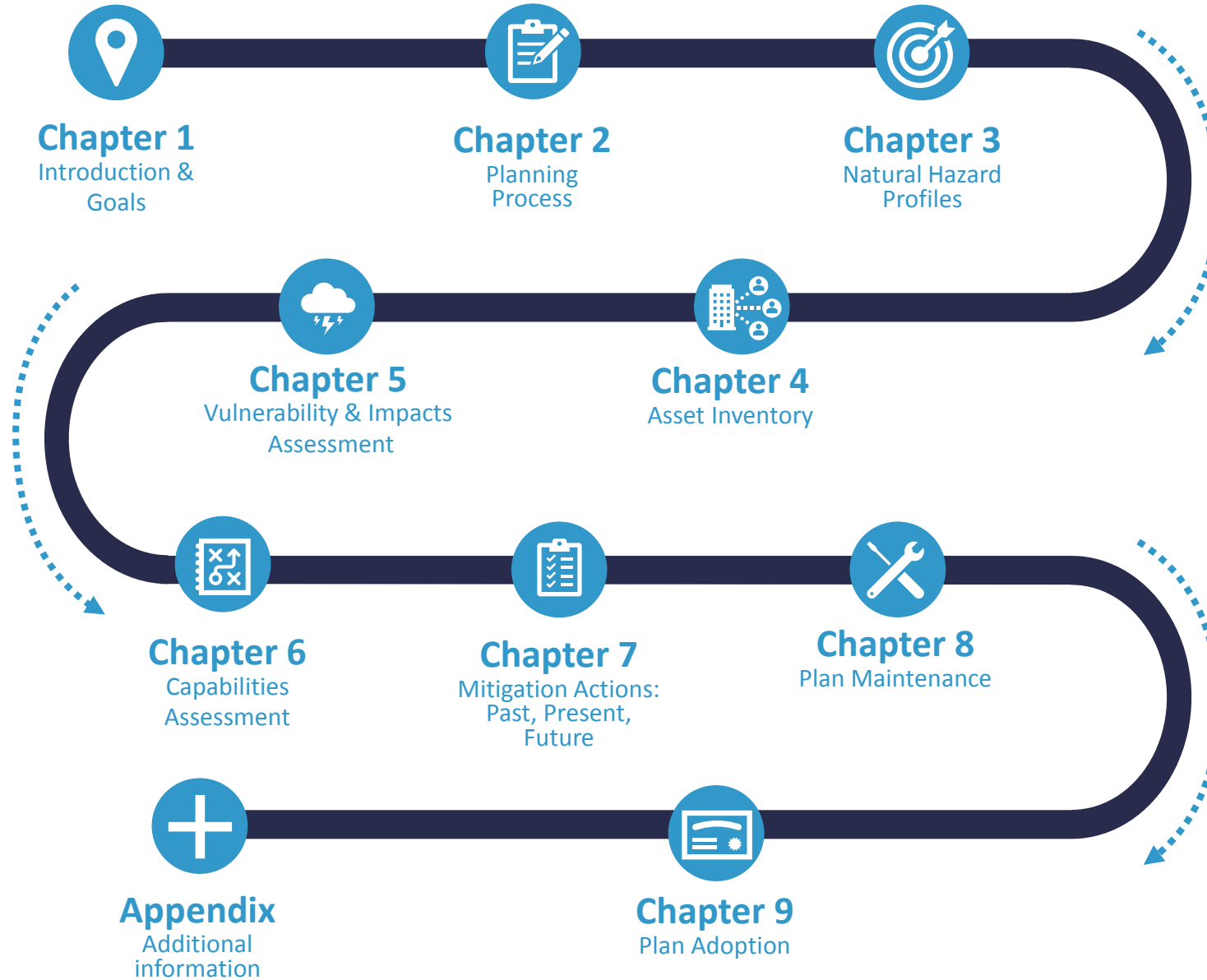
FEMA updated *Local Mitigation Planning Policies and Guidance*
(released April 2022, effective April 2023)

FEMA updated *Location Mitigation Planning Handbook* (May 2023)

2022 Updates Include:

- ✓ Expanded list of participants required in planning process.
- ✓ Requires consideration of climate change.
- ✓ Recognizes the important role of adopting and enforcing building, land use, and development code.
- ✓ Facilitates stronger alignment with other FEMA mitigation programs.

NHMP SCOPE OF WORK



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

Group of **19** key City staff responsible for making final planning decisions. Steering Committee Meetings will guide the planning process, endorse draft Goals, and members will participate in Hazard Mitigation Planning Workshops.

*6 Monthly Meetings
& 3 Workshops*

Stakeholders



Hazard Mitigation Planning Team (HMPT)

Group of **90** stakeholders bringing a wide range of local expertise and perspectives. The group will include advocates, residents, business-owners, state and local agency representatives, and people from various other organizations.

3 Workshops

Public



Public Engagement

Public Meetings will be an opportunity to educate about the HMP, share progress, and gather feedback and ideas. Results from these meetings and other feedback will be integrated into the final report. The group will include advocates, residents, business-owners, state and local agency representatives, and people from various other organizations.

*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

CH 3: NATURAL HAZARD PROFILES

Chapter 3 Identifies the hazards that can affect the city and associated risk:

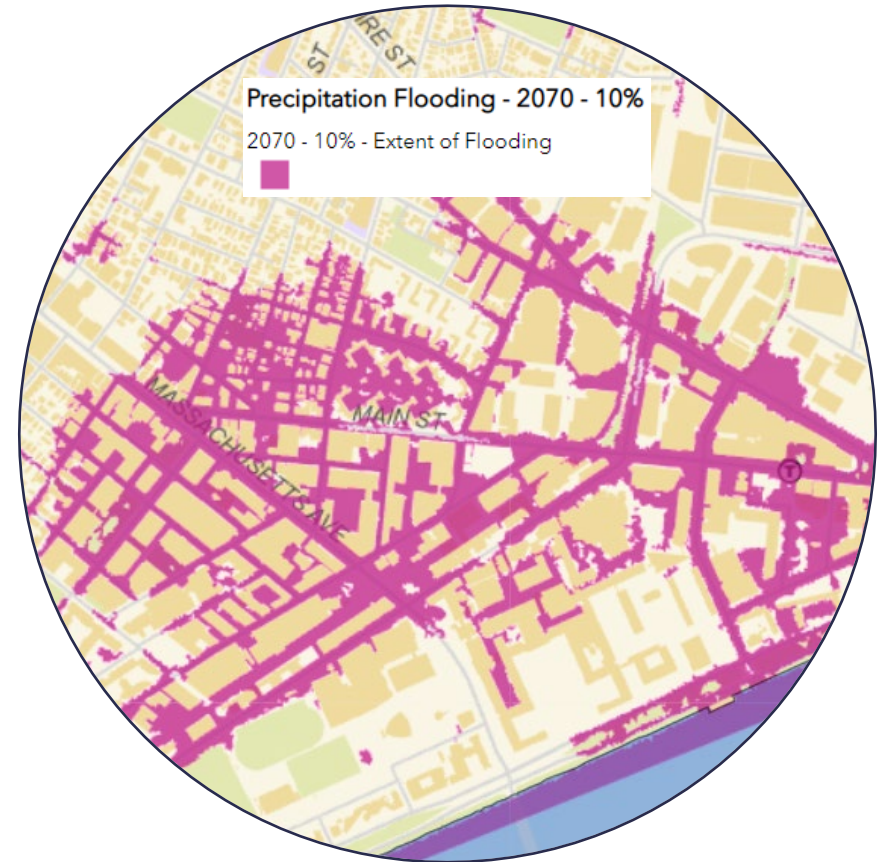
Location: Where each hazard might affect the planning area

Extent: Potential intensities

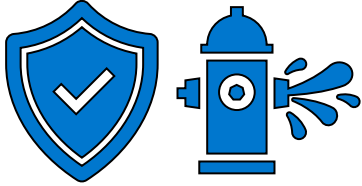
Previous Occurrence: How often events have happened in the past?

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

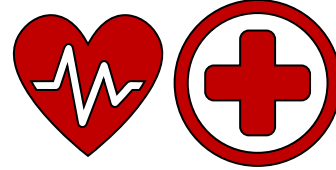
WSE drafted chapter 3 using the best public available data for Cambridge, and the Steering Committee provided thorough review



CH 4: ASSET INVENTORY



Safety & Security



Health & Medical



Transportation



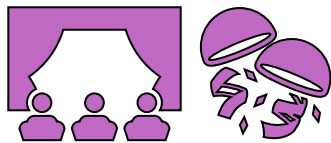
Food, Water, Shelter



Parks & Greenspace



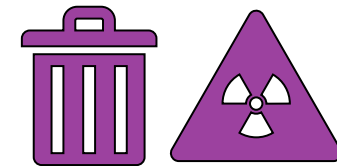
Communications



**Cultural, Historic,
& Events**



Energy



**Hazardous Material
Management**

CH 4: ASSET INVENTORY

Economy & Activities

People

Assets that serve populations that are more vulnerable

- Child and Youth Services
- Hospitals
- Housing
- Schools
- Shelter

Structures

Built facilities that provide community lifeline services

- Emergency Shelters
- Grocery Stores
- Fire Stations
- Food-related Services
- Gas Stations
- Tunnels

Systems

Collection of components that perform a critical service for the community

- Power Grid
- Cell Towers
- Energy System Power Plant
- Major Roads
- Train
- Water System

Resources

Natural, cultural, and historic resources

- Open Space
- Places of Worship
- Public Art
- Water Bodies
- Historic Markers
- Landmarks and Easements

Economy

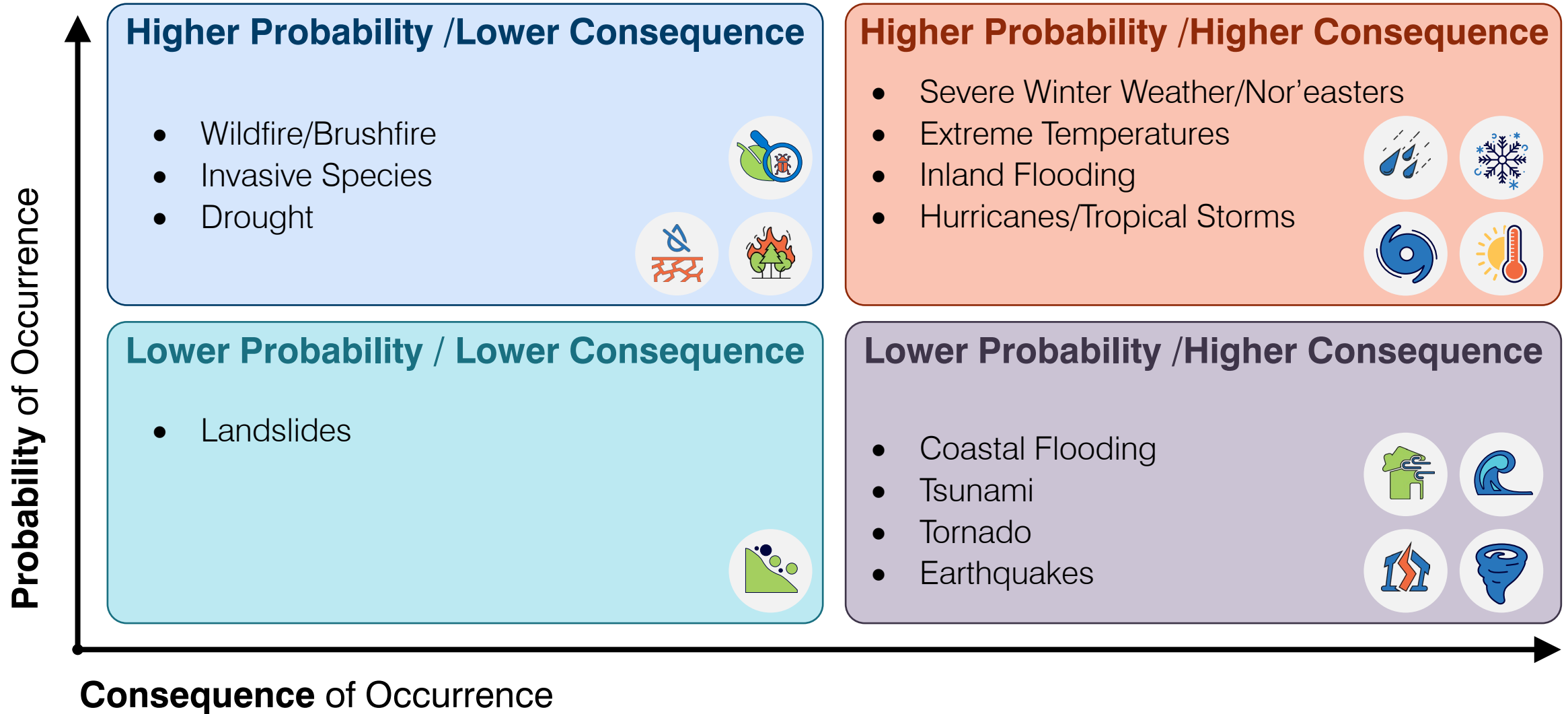
- Top Employers
- Targeted areas

Activities that increase community morale and well-being

- Farmer's Markets
- Street Fairs and Festivals
- Public Health Fair
- Community Bike Rides

CH 5: VULNERABILITY & IMPACTS ASSESSMENT

Risks and Vulnerabilities



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 NHMP and increase resilience.

There are 4 types of mitigation capabilities:



Planning and Regulatory Capabilities



Administrative and Technical Capabilities



Financial Capabilities



Education and Outreach Capabilities

CH 6: CAPABILITIES ASSESSMENT

The following opportunities were identified through discussions with the STC, input from the NHMPT, and the public:



Improved coordination between Departments



Centralized hazard mitigation efforts including leadership role & develop overarching plan



Coordinate with adjacent communities for hazard preparation and response



Develop an operations plan for DPW and Police on how to respond to flooding

CH 7: MITIGATION ACTIONS

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

Before an event

- Local code and regulations
- Maintenance
- Proactive Structural Projects

During an event

- Warnings
- Protection of critical facilities
- Emergency response

Following an event

- Clean up
- Restoration
- Enhancement

COMMUNICATIONS

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

Action	Natural Hazard Mitigated	Cost	Geographic Coverage
Lead Department	Consistency with Other Plans	Greater than \$2 mil = \$\$\$\$ Over \$500k up to \$2M = \$\$\$ Over \$100k up to \$500k = \$\$ Up to \$100k = \$	regional city-wide neighborhood specific site specific
Funding Source	Timeframe to Start	Enhances Inclusion and Equity / Co-Benefits	Associated Goals
Capital Budget Operating Budget Municipal Bond Grant Staff Time	In Progress Less than 1 year 1-2 years 2-5 years	Positive Impact on Students Positive Impact on Diverse Groups Enhances Community Education Positive Impact on Renters Equitable Implementation	<ol style="list-style-type: none"> Equitably Protect health and safety Communication Coordinate and Collaborate Sustainably invest Monitor and Respond

CH 7: MITIGATION ACTIONS

[Copy of New Actions List.xlsx \(sharepoint.com\)](#)

#	Action	Lead Dept	Cost	Geographic Coverage	Funding Source	Timeframe to Start	Associated Goal(s)	Hazards	Consistency with Other Plans	Enhances Inclusion and Equity / Co-Benefits	Priority
			Greater than \$2 mil = \$\$\$\$ Over \$500k up to \$2M = \$\$\$ Over \$100k up to \$500k = \$\$ Up to \$100k = \$	regional city-wide neighborhood specific site specific	Capital Budget Operating Budget Municipal Bond Grant Staff Time	In Progress Less than 1 year 1-2 years 2-5 years	1. Equitably Protect health and safety 2. Communication 3. Coordinate and Collaborate 4. Sustainably invest 5. Monitor and Respond			Positive Impact on Students Positive Impact on Diverse Groups Enhances Community Education Positive Impact on Renters Equitable Implementation	
1	Update and improve the City's HeatViewer with best available information	Department of Public Works, Community Development Department	Low	City-Wide	Operating Budget	Less than 1 year	#2 Communication	Extreme Heat		Enhances Community Education, Equitable Implementation	Medium
2	Update and Improve Floodplain Mapping (Cambridge Flood Viewer)	Department of Public Works	Low	City-Wide	Operating Budget	Less than 1 year	#2 Communication	Precipitation Flooding, Coastal Flooding	Resilient Cambridge Handbook - Strategy A7: Enhance Emergency Response Plans	Enhances Community Education, Equitable Implementation	Medium
3	Undertake interventions as a regional collaboration at Charles River and Amelia Earhart Dam to reduce overtopping/flanking	Department of Public Works, City of Arlington	High	Regional	Grant	Less than 1 year	#3 Coordinate & Collaborate, #4 Sustainably Invest	Coastal Flooding	Resilient Cambridge Handbook - Strategy A7: Enhance Emergency Response Plans	Positive Impact on Diverse Groups	High
4	Perform a study to identify how to best protect Fresh Pond reservoir from saltwater intrusion	Department of Public Works	Low	Site Specific	Capital Budget	2-5 years	#1 Protect, #3 Coordinate & Collaborate, #4 Sustainably Invest	Coastal Flooding	Resilient Cambridge Handbook -Strategy C1: Protect Fresh Pond Reservoir		High
5	Design and construct stormwater holding tanks for Baldwin and Cambridgeport neighborhoods	Department of Public Works	High	Neighborhood specific	Municipal Bond	In Progress	#1 Protect, #4 Sustainably Invest	Precipitation Flooding	DPW 10-year Sewer Plan - Goal 4: Manage stormwater quality and quantity. Resilient Cambridge Handbook - Strategy C5: Upgrade Stormwater Storage.		High
6	Initiate a City led program to install valves to mitigate basement backups of stormwater/sewage due to wet weather events	Department of Public Works	Low	City-Wide	Operating Budget	Less than 1 year	#1 Protect	Precipitation Flooding	DPW 10-year Sewer Plan - Goal 5: Reduce flooding and protect neighborhoods		Medium
7	Improve collection and conveyance system at area east of 2nd Street and north of Charles Street (area #27)	Department of Public Works	High	Neighborhood specific	Municipal Bond	Less than 1 year	#1 Protect, #4 Sustainably Invest	Precipitation Flooding	DPW 10-year Sewer Plan - Goal 4: Manage stormwater quality and quantity		High
8	Complete in-progress stormwater management program: Newton, Green, Franklin and Sidney Streets (CAM 017, area #28), School, Pine, Cherry and Windsor Streets (area #26)	Department of Public Works	High	Neighborhood specific	Municipal Bond	Less than 1 year	#1 Protect, #4 Sustainably Invest	Precipitation Flooding	DPW 10-year Sewer Plan - Goal 4: Manage stormwater quality and quantity		High
9	Design and construct updates to metering stations for Combined Sewers	Department of Public Works	Medium	City-Wide	Capital Budget	Less than 1 year	#5 Monitor & Respond	Precipitation Flooding	DPW 10-year Sewer Plan - Goal 4: Manage stormwater quality and quantity. Resilient Cambridge Handbook - Strategy C5: Upgrade Stormwater Storage		Medium

CH 7: MITIGATION ACTIONS

Grant Funding Criteria

CRITERIA 1	Does the action contribute to regional resilience?
CRITERIA 2	Is the action part of other plans?
CRITERIA 3	Does the action positively impact residents of LMI or EJ Census Block Groups?
CRITERIA 4	Is the action a nature-based solution?
CRITERIA 5	Would the action mitigate economic loss/damage?
CRITERIA 6	Will the action reduce life/safety risk?
CRITERIA 7	Does the action address future climate change projections?
CRITERIA 8	Does the action leverage innovation /technology?

SCORING:
YES = 1 POINT
NO = 0 POINT

CH 8: PLAN MAINTENANCE



MONITORING THE PLAN

The Hazard Mitigation Manager will monitor the status of mitigation actions on an ongoing basis with annual meetings to update the status of mitigation actions.



EVALUATING THE PLAN

The Steering Committee will meet annually to evaluate the effectiveness of the plan. The STC may also be called to meet after a major event or storm to evaluate the effectiveness of the plan.



UPDATING THE PLAN

The Hazard Mitigation Manager will initiate the process to complete a comprehensive update to the HMP at least every five years to maintain FEMA funding eligibility, or complete plan updates after a major disaster event.



INTEGRATING THE PLAN

Cambridge can integrate ideas, information, and strategy into Building and Zoning Regulations, Community Plans, Emergency Management Plans, and develop strong partnerships between planners and emergency managers.



PUBLIC PARTICIPATION THROUGHOUT PLAN MAINTENANCE

The city is committed to developing equitable and impactful public participation. Public engagement activities will align with the annual evaluation, monitoring, and plan update meetings as well as with large storms or events.

CH 8: PLAN MAINTENANCE

- Track the progress of the NHMP Mitigation Actions - Who?
- Reconvene the Steering Committee annually to monitor, evaluate, update, and integrate the plan. How often?
- Share NHMP progress with the public, at least once a year. Who, how, how often?
- Make all monitoring information publicly available. Where?
- Notify the public when new information has been posted or updated. How and how?
- Provide the public opportunities to give input on this information. How?

CH 9: PLAN ADOPTION



City of Cambridge

IN CITY COUNCIL
_____ 2023

CITY OF CAMBRIDGE, MASSACHUSETTS
RESOLUTION NO. _____

A RESOLUTION OF THE CITY OF CAMBRIDGE ADOPTING THE 2023 HAZARD MITIGATION PLAN UPDATE

MAYOR SIDDIQUI

WHEREAS the City Council recognizes the threat that natural hazards pose to people and property within the City of Cambridge; and

WHEREAS the City of Cambridge has prepared a multi-hazard mitigation plan, hereby known as the City of Cambridge 2023 Hazard Mitigation Plan Update, in accordance with federal laws, including the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended; the National Flood Insurance Act of 1968, as amended; and the National Dam Safety Program Act, as amended; and

WHEREAS the City of Cambridge 2023 Hazard Mitigation Plan Update identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the City of Cambridge from the impacts of future hazards and disasters; and

WHEREAS duly-noticed public meetings on the 2023 Hazard Mitigation Plan Update were held by the City on June 13, 2023 and two on September 13, 2023; and

WHEREAS the City Council authorizes Departments to executive their responsibilities demonstrated in the 2023 Hazard Mitigation Plan Update; and

WHEREAS adoption by the City Council demonstrates its commitment to hazard mitigation and achieving the goals outlined in the City of Cambridge 2023 Hazard Mitigation Plan Update; now therefore be it

Resolved: That in accordance with M.G.L. 40 §4 or the charter and ordinances of the City of Cambridge, the City Council adopts the City of Cambridge 2023 Hazard Mitigation Plan Update. While content related to the City of Cambridge may require revisions to meet the plan approval requirements, changes occurring after adoption will not require the City of Cambridge to re-adopt any further iterations of the plan. Subsequent plan updates following the approval period for this plan will require separate adoption resolutions.

Option 1: Approve Plan, allowing for potential updates due to MEMA/FEMA Review. Resolution language leaves room for any required NHMP revisions that occur after adoption is approved

Option 2: Submit plan to MEMA and FEMA, wait for responses, and then City Council can formally adopt and respond to FEMA.

Due to City's desired schedule, we recommend Option 1



Natural Hazard Mitigation Plan Update 2023 Thank you!



**CITY OF
CAMBRIDGE**





Appendix B

Hazard Mitigation Planning Team Materials



YOU'RE INVITED!



You're invited to be on the City of Cambridge's Hazard Mitigation Planning Team!

The City has identified you as someone with a unique and valuable perspective on impacts of natural hazards, vulnerabilities, and risks facing the community in Cambridge. **Therefore, the City is inviting you to be a part of the Hazard Mitigation Planning Team (HMPT).** The HMPT is a team of local experts and community representatives who will be instrumental in developing an effective, meaningful, and ambitious plan for the resiliency and safety of the Cambridge community.

The City of Cambridge is updating its Hazard Mitigation Plan, which will study risks from natural hazards (such as flooding, winter storms, periods of extreme temperatures, etc.) and introduce approaches to address these hazards now and in the future. Your contributions in the workshops will be reviewed and incorporated into the plan, and you will also have the opportunity to give feedback on the final draft of the plan. Your participation will inform strategies for the resilience, security, and wellbeing of Cambridge.

If you are interested in participating in the HMPT, please fill out this **brief survey to indicate dates and times** that work best for you for these workshops:

<https://forms.office.com/r/MS6kdNBQCm>



Survey Here!



Will you help?

Expected Commitment:

- HMPT members should attend three (3) 1.5-hour Summer Workshops over the next four months. Dates and times of workshops will be chosen to best accommodate everyone on the Team, so please share your needs and scheduling preferences in the brief survey below.
- (optional) Join the Street Team (details will be shared at the first Workshop)

Your experiences and ideas are invaluable to the City and we look forward to your participation. **Thank you in advance for your contributions to the resilience and wellbeing of Cambridge!**



Cambridge HMPT Workshop Attendance List

Contact	Organization	Workshop #1 - June 29, 2023	Workshop #2 - July 11, 2023	Workshop #3 - July 25, 2023
		Attended	Attended	Attended
David Morgan	Town of Arlington Department of Planning and Community Development		X	
Brooke Amendola	City of Boston Office of Emergency Management (OEM)	X		
Mikayla Criger	City of Boston OEM	X		X
Nikhil Nadkarni	City of Cambridge Community Development Department (CDD)		X	
Rachel Tanenhaus	City of Cambridge Commission for Persons with Disabilities	X	X	X
Nahid Chowdhury	CDD	X	X	X
Susanne Rasmussen	CDD	X		X
Michele Scott	City of Cambridge Community Safety Dept.	X		X
Catherine Woodbury	City of Cambridge Department of Public Works (DPW)	X	X	X
Tina Alu	Cambridge Economic Opportunity Committee, Inc.			X
Peter Vellucci	City of Cambridge Police Department	X		X
Julie Greenwood-Torelli	City of Cambridge Water Department			X
Ali Sorrels	Cambridge Women's Center	X		X
Sherry Bernard	Christian Life Center (Elnora Yard Food Pantry)	X		X
Cliff Cook	CDD	X		
Jeff Amero	City of Cambridge Information Technology Department (ITD)	X		
Jennifer Letourneau	City of Cambridge Conservation Commission	X	X	X
Leila Mekias	CDD	X	X	X
Lindsay Diaz	City of Cambridge Department of Human Service Programs (DHSP)		X	X
Melissa Castillo	DHSP	X		X
Phoebe West	City of Cambridge Office of the Housing Liaison + Multiservice Center	X		
Vernon Walker	Communities Responding to Extreme Weather (CREW)	X		
Susan Pacheco	City of Cambridge Council on Aging, Senior Center	X	X	
Nancy Porter	Cambridge Public Health Department (CPHD)			X
Sam Lipson	CPHD	X		
Julie Wood	Charles River Watershed Association	X		X
Celeste DePalma	MA Department of Conservation and Recreation (DCR)	X		X
Mike Galvin	DCR	X		
Mike J Nelson	DCR	X		
Robert Lowell	DCR	X		
Sarah J White	DCR	X		
William Gode	DCR	X		
Jason W Wright	Eversource		X	X
Pasang Lhamo	Friend of Jerry's Pond			X
Eric Grunebaum	Friends of Jerry's Pond, Friends of Alewife Reservation			X
Steven Nutter	Green Cambridge			X
Bill VanSchalkwyk	Harvard University	X		
Joanne Kossuth	Lesley University	X	X	
Barry Keppard	Metropolitan Area Planning Council	X		
Hannah Lyons-Galante	Massachusetts Bay Transportation Authority	X		
Suzanne Blake	Massachusetts Institute of Technology	X		X
Hillary Monahan	Massachusetts Water Resources Authority	X		
Emily Sullivan	City of Somerville	X	X	
Sarah Gyorog	Transition House	X		
Laurel Schwab	Town of Watertown	X	X	
Crystal Rosa	Cambridge Human Rights Commission	X	X	
Jim Wilcox	DPW	X	X	
Darrin Korte	Cambridge Community Center	X		
Mhamed Jounaidi	CDD		X	
Mike Johnston	Cambridge Housing Authority		X	
Rebecca Bowie	Cambridgeport Neighborhood Association	X		
Sean Sweeney	ITD	X		

Abebe Kelemework	CDD	X		
Ruth Ryals	Buena Vista Social Club	X		
Total Attendees		42	17	23

AGENDA HMPT WORKSHOP 1

10:00 AM **Welcome & Introductions**

- Introductions/Slido
- HMP Team Overview
- Ground Rules

10:05 AM **Presentation**

- Overview of Hazard Mitigation Plan
- Project Goals and Asset Inventory

10:20 AM **Asset Inventory Activity**

- Google Sheets Activity: participants will give input on hazards and vulnerabilities for specific assets
- 30+ minutes on the first category on the sheet
- Remaining time on other asset category/ies

11:15 AM **Reconvene + Closing Thoughts**

- Closing reflections from small group – quick highlights
- Final Slido question: Actions and Strategies

11:25 AM **Next Steps**

- Share additional ideas through the HMPT Inventory Survey by Jul. 6
- Next HMPT Workshop dates
 - Tue., Jul. 11: 6pm-7:30pm
 - Tue., Jul. 25: 4pm-5:30pm
- Public Survey

11:30 AM **Conclude**



Hazard Mitigation Plan Update 2023

HMPT Workshop 1
June 29, 2023



**CITY OF
CAMBRIDGE**



WELCOME



*Introduce yourself
in the **chat***



*HMPT **Facilitators** will
help lead the workshop*



***City Officials** leading
this project are here today*



Leila Mekias

Climate Resilience
Project Planner



Robin Seidel

Project Manager,
Weston & Sampson



Janet Moonan

Project Technical Lead,
Weston & Sampson



Susanne Rasmussen

Director of Environmental and
Transportation Planning



Joanna Nadeau

Senior Project Planner,
Weston & Sampson



Emily Judson

Resiliency Planner,
Weston & Sampson

GROUND RULES



One mic, one person speaks at a time



Step up, step back – share the air



Be as present as you can



Take away stories, not names



Be respectful, be kind



Speak from the heart, listen from the heart



Trust you will know what to say

AGENDA



Welcome & Introductions



Overview of the Hazard Mitigation Plan



Project Goals and Community Assets



Asset Inventory Activity



Reconvene + Discussion



Next Steps + Conclude



AGENDA



Welcome & Introductions



Overview of the Hazard Mitigation Plan



Project Goals and Asset Inventory



Asset Inventory Activity



Reconvene + Closing Thoughts



Next Steps + Conclude



HMP TEAM



City Staff



Steering Committee

Group of key City staff responsible for making final planning decisions. Steering Committee Meetings will guide the planning process, endorse draft Goals, and members will participate in Hazard Mitigation Planning Workshops.

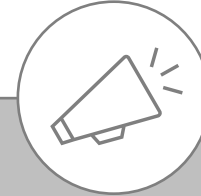
Stakeholders



Hazard Mitigation Planning Team (HMPT)

Group of stakeholders bringing a wide range of local expertise and perspectives. The group will include advocates, residents, business-owners, state and local agency representatives, and people from various other organizations.

Outreach



Outreach Team

City team who can help with in-person and virtual outreach and engagement events. This could include activity at local community organizations, schools, events, door-to-door outreach, and others engagement.

Public



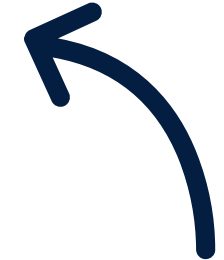
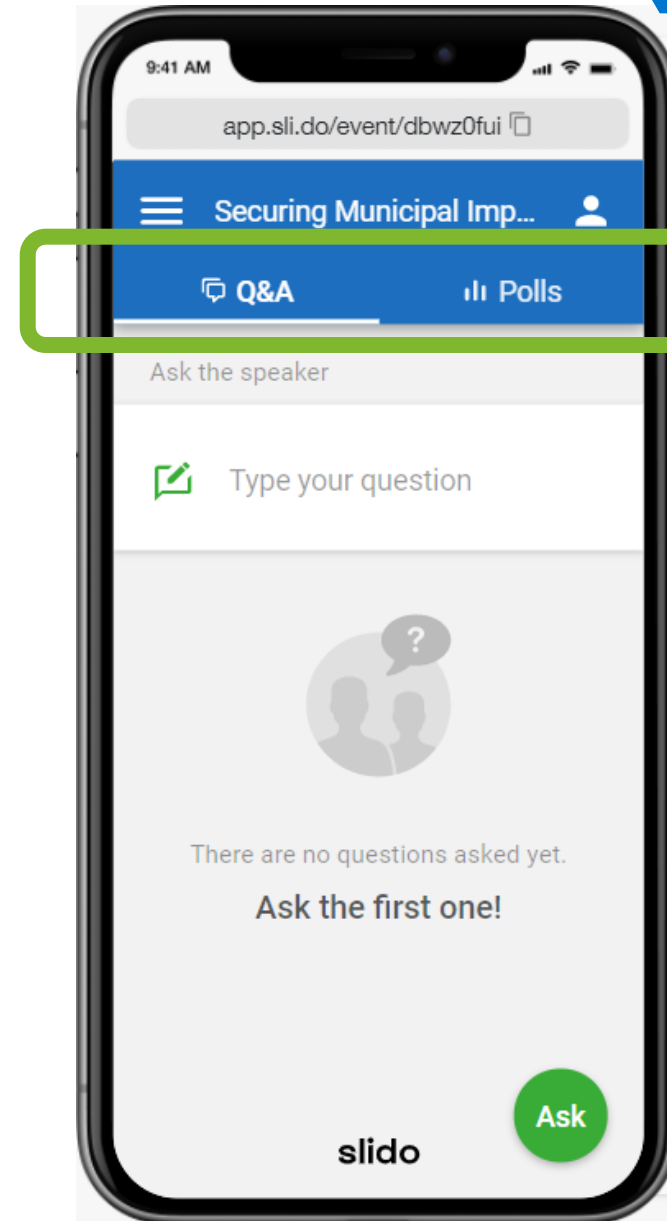
Public Engagement

Public Meetings will be an opportunity to educate about the HMP, share progress, and gather feedback and ideas. Results from these meetings and other feedback will be integrated into the final report. The group will include advocates, residents, business-owners, state and local agency representatives, and people from various other organizations.

The HMPT Members are key players in the overall engagement strategy

JOIN US ON SLIDO!

1. Get your phone ready
2. Follow instructions or use the QR code:



You can move between the Q&A tab and the polls tab!

INTRODUCTIONS



Who is here with us today?

RESULTS



City Employee



Non-profit Employee



Community Member



Neighboring Community Member



Teacher



Religious Leader



Activist / Advocate



AGENDA



Welcome & Introductions



Overview of the Hazard Mitigation Plan



Project Goals and Asset Inventory



Asset Inventory Activity



Reconvene + Closing Thoughts



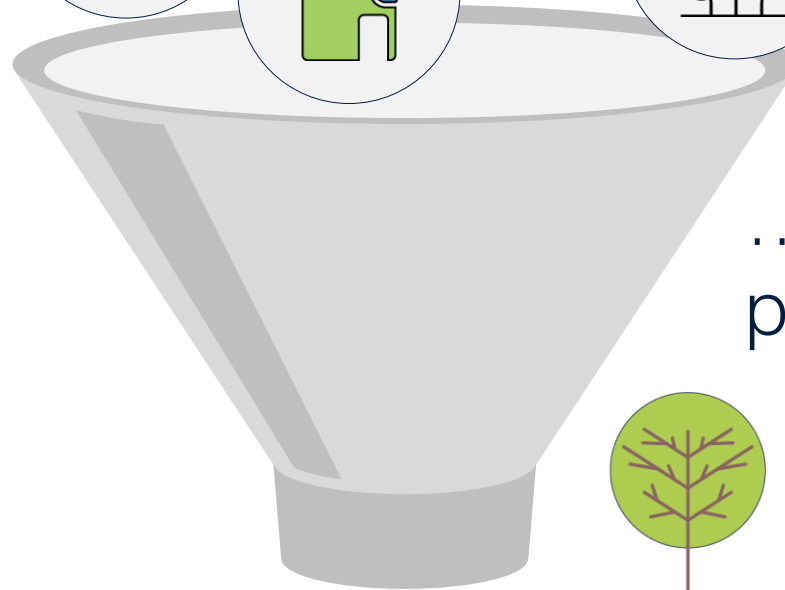
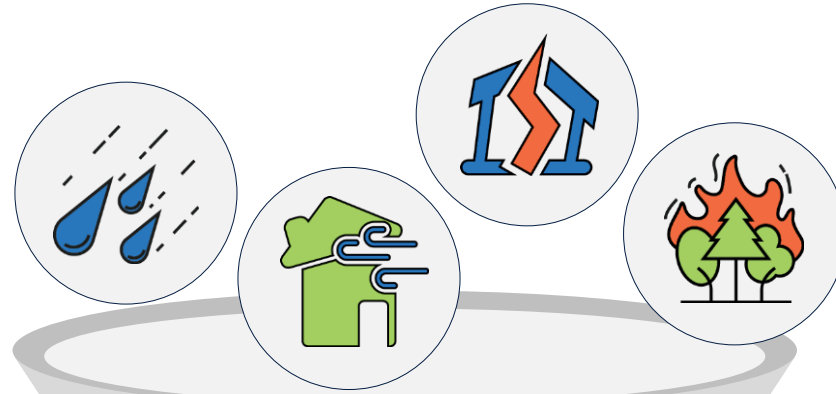
Next Steps + Conclude



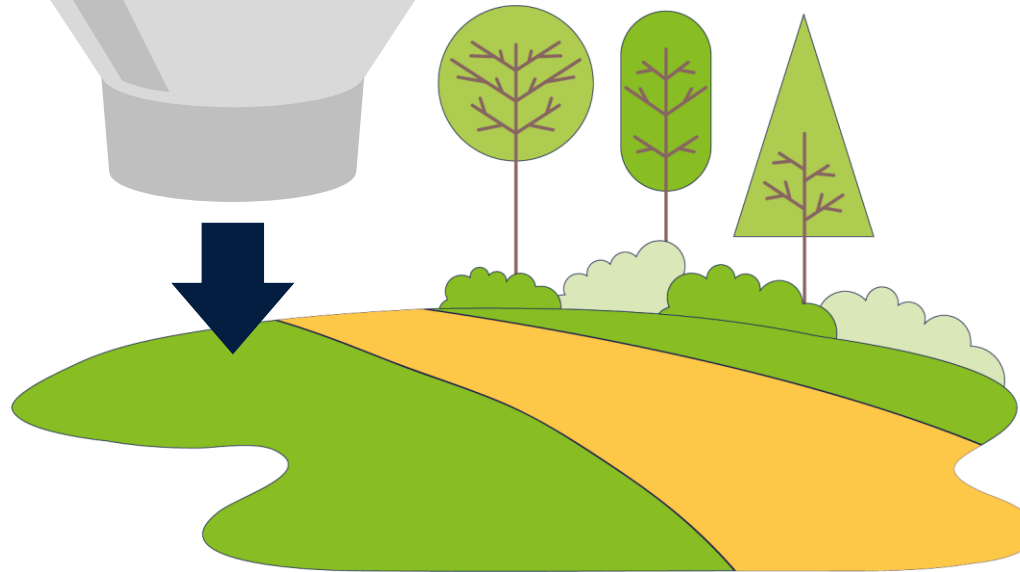
WHAT IS HAZARD MITIGATION?



Reduce impacts from
natural hazards...



...through plans,
projects, and services.



NATURAL HAZARDS



HURRICANES
/ TROPICAL
STORMS



INLAND
FLOODING



EXTREME
TEMPERATURES



SEVERE WINTER
WEATHER /
NOR'EASTERS



COASTAL
FLOODING



TSUNAMI



DROUGHT



WILDFIRE



EARTHQUAKES



TORNADOES



LANDSLIDES



INVASIVE
SPECIES

HMP OVERVIEW



Chapter 1
Introduction



Chapter 2
Planning Process



Chapter 3
Hazard Profiles



Chapter 5
Vulnerability
Assessment



Chapter 4
Facility /Asset Inventory



Chapter 6
Mitigation Goals &
Capabilities



Chapter 7
Mitigation Actions:
Past, Present,
Future



Chapter 8
Plan Maintenance
& Implementation



Appendix
Additional
information



Chapter 9
Plan Adoption

HMP OVERVIEW



WHY ARE WE HERE TODAY?



Your input today will directly impact the **Facility/Asset Inventory Chapter**, as well as the **Vulnerability Assessment** and **Mitigation Actions**

AGENDA



Welcome & Introductions



Overview of the Hazard Mitigation Plan



Project Goals and Asset Inventory



Asset Inventory Activity



Reconvene + Closing Thoughts



Next Steps + Conclude



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

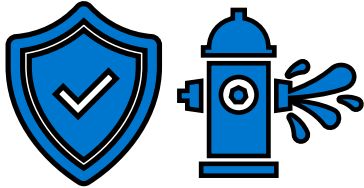


Monitor & Respond

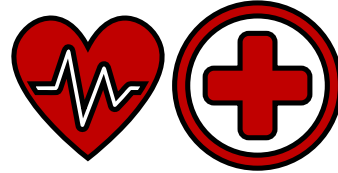
Improve Capacity to **Monitor** Natural Hazards and **Respond** to Changes



ASSET INVENTORY



Safety & Security



Health & Medical



Transportation



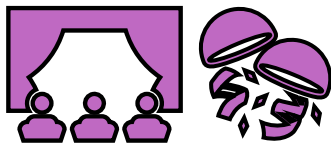
Food, Water, Shelter



Parks & Greenspace



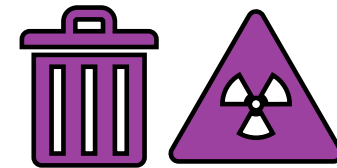
Communications



**Cultural, Historic,
& Events**



Energy



**Hazardous Material
Management**

ASSET INVENTORY EXAMPLES



People

Assets that serve populations that are more vulnerable to disaster (e.g., elderly, children, visiting populations) and/or serve densely populated areas.

Structures

Built facilities that provide community lifeline services. A community lifeline enables the continuation of critical government and business functions and is essential to human health and safety or economic security.

Systems

A collection of components that perform a critical service for the community. Examples include public transportation, railways, communications, powerlines, streets, water infrastructure.

Resources

Natural, cultural, and historic resources provide resiliency benefits, socio-economic benefits, or community benefits. They may also be sensitive habitats or assets historical significance that are vulnerable to hazard events.

Activities

Activities that benefit the community by **increasing community morale and well-being.** Activities may include education and knowledge transfer.

ASSET INVENTORY CATEGORIES



People

- Child and Youth Services
- Hospitals
- Housing
- Schools
- Shelter

Structures

- Emergency Shelters
- Grocery Stores
- Fire Stations
- Food-related Services
- Gas Stations
- Tunnels

Systems

- Power Grid
- Cell Towers
- Energy System
Power Plant
- Major Roads
- Train
- Water System

Resources

- Open Space
- Places of Worship
- Public Art
- Water Bodies
- Historic Markers
- Landmarks and Easements

Activities

- Farmer's Markets
- Street Fairs and Festivals
- Public Health Fair
- Community Bike Rides

AGENDA



Welcome & Introductions



Overview of the Hazard Mitigation Plan



Project Goals and Asset Inventory



Asset Inventory Activity



Reconvene + Closing Thoughts



Next Steps + Conclude



AGENDA



Welcome & Introductions



Overview of the Hazard Mitigation Plan



Project Goals and Asset Inventory



Asset Inventory Activity



Reconvene + Closing Thoughts



Next Steps + Conclude



CLOSING THOUGHTS



What are some valuable Activities in Cambridge?

RESULTS



- MSYEP parties and events
- Community iftar
- Head of the Charles
- Greek festivals etc at houses of worship
- Cambridge Science Fest
- Head of the Charles
- Talk to Daniel Wolf at CDD about play street and block parties. Talk to Nancy Rihan-Porter at Public Health about events she sponsors. Cambridge Community Corp out of Public Health for outreach. CET outreach teams at CDD and DHSP
- Radio in Spanish
- Head of the Charles
- Church activities
- Central sq starlight lounge
- Cambridge Dragon Boat Festival
- Danehy Family Day Fresh Pond Day Hoops-N-Health
- Riverfest, Port Pride Day, Pride Breakfast, block parties, Science Week
- Information sharing - April's Fair Housing Event
- Community building activities
- Farmers markets, community festivals
- Farmers markets, honk fest, road races
- Farmers markets; block parties;
- Jazz Fest, Annual Dance Party, Danehy Park Family Day
- Port pride day
- Events in the MIT Open Space (collaborative space between MIT and Cambridge in Kendall Sq.)

AGENDA



Welcome & Introductions



Overview of the Hazard Mitigation Plan



Project Goals and Asset Inventory



Asset Inventory Activity



Reconvene + Closing Thoughts



Next Steps + Conclude



SAVE THE DATE



Workshop 2

When: July 11th

Time: 6 PM-7:30 PM

What: Discuss actions and strategies

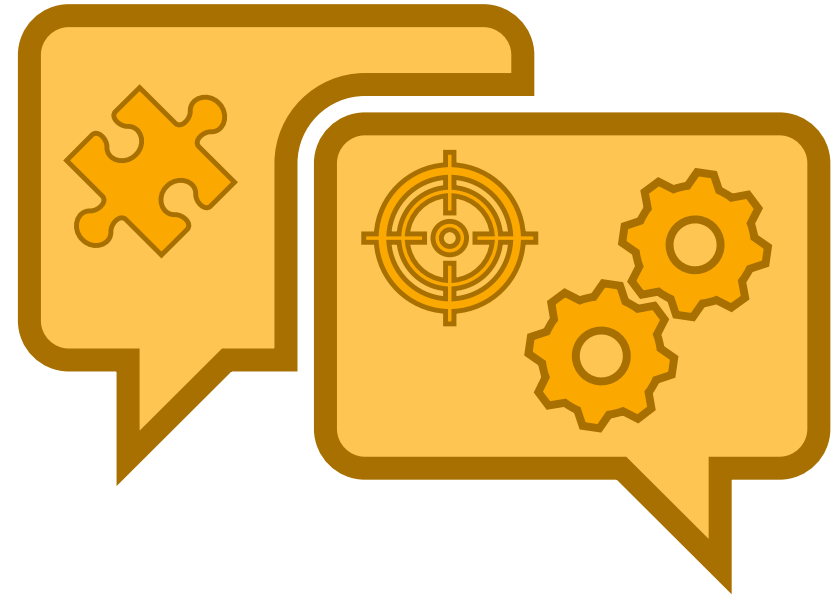


Workshop 3

When: July 25th

Time: 4 PM-5:30 PM

What: Final Discussion



TAKE THE SURVEY!



The City of Cambridge is updating its Hazard Mitigation Plan for a more resilient, safe, and prepared community.



Share your experiences of living in Cambridge to help the City understand how it can improve. Please take this short, 5-minute survey to share your insights.

tinyurl.com/CambridgeHMPsurvey



This input will help shape the **strategies, projects, policies,** and **decisions** the City makes regarding natural hazards.

**Please share with
your networks!**



Hazard Mitigation Plan Update 2023

Thank You!



**CITY OF
CAMBRIDGE**



HMPT Workshop #1: Asset Inventory

ASSET CATEGORY	ASSET TYPE	ASSETS: When you think of the people who use this asset type, which are the most important facilities or services for them in Cambridge?	Which natural hazards could most affect this asset?	How exactly might natural hazards impact the asset?	Who in the community will be most affected if this asset is impacted or unavailable?	Priority
PEOPLE Assets that serve populations that are more vulnerable to disaster (e.g., elderly, children, visiting populations) and/or serve densely populated areas.	Child and Youth Services	Out of School time Programs/ Non-profit and City Programs		The natural hazards listed can impact the asset by not allowing access to this resource.	Low income families, Black families	
	Housing	Populations: people living in affordable housing, voucher holders, people living in vulnerable housing situations, people who are doubled up, low income people	Extreme heat or cold, weather that causes outages	Both short term and long term impacts.		
		Resources: Cambridge Housing Authority, Multi-Service Center, Fuel Assistance, Cambridge Economic Opportunity Committee				
	Schools	MIT, Harvard, other schools				
		Schools (and Universities) have seasonal ebb and flow to their capacity and utilization Gyms and Athletic facilities are important as temporary University population emergency response plans / housing				
	Shelter	Shelters for Homeless Individuals: Salvation Army, CASPAR, Harvard Square Homeless Shelter, St. Patrick's Women's Shelter, Y2Y, First Church, Heading Home. Warming Centers (seasonal), People in the family shelter system	Flooding	Many shelters are located in the basements of other structures	Our shelters are currently running at capacity, While we have put up temporary shelters for extreme weather events (such as the warming center) they do not have the ability to serve people for a longer term or with the same amenities as a longer term shelter system.	
	Transportation Infrastructure	Roadways	flooding, heat			
	Dams	Charles River Dam	flooding			
		AAD	flooding			
	People with Disabilities	Making sure people are at the table, assessing everyone's needs, bringing the lens of addressing all needs and many populations intersect		canary in the coalmine		
	Accommodating all needs, especially in emergencies					
	Unhoused people not in shelters	Outside sleepers- both generally around the City and populations in Alewife Brook and on the river	Forms of extreme weather	Outside sleepers are acutely affected by forms of extreme weather and many outside sleepers are not interested in going into shelters.		
	Emergency Resources / Redundancy Planning	Emergency housing Hospital emergency spaces				
	Trusted Institutions / community centers	Cambridge Community Center - building trust over time so people know where to go in time of crisis https://www.cambridgecc.org/resiliencehub.html	Flooding, heat, storms			
	Community Organizations (local and regional)	Boston Center of Independent Living				
Warming and cooling centers	for unhoused populations - get more info on improvements (Rachel/Pheobe)					
Food distribution	Grocery stores, food pantry - affects all. Meals on wheels is a critical service for targeted group. When deliveries can't happen, could be several days and someone could not have anything to eat.	Flooding and severe winter storm - couldn't et deliveries. Power can also be an issue in that some food can't be stored but other food would be available.				

	Elderly Facilities (silver ribbon report has a list)		Extreme heat - used to worry about seniors but Cambridge housing has made a lot of improvements to adding AC, but have to be able to keep generators going and how much are we taxing the grid		
	Medication delivery	Those who receive delivery. Skinderian on Cambridge Street, Inman Sq Pharmacy. These two are locally owned and provide deliveries.	Storms, winds can down power lines and impact access		
	Public Pools	Allow people a place to go when it's hot out	Extreme heat		
	Shelters	Unhoused Individuals	Extreme heat would be a great risk		
	Hospitals/Health Centers	Mt Auburn Hospital/Cambridge Hospital			
	Youth Centers & Services	Day care facilities			
	Emergency Shelters, current shelters	Get the list from the fire chief	All	power outages, too many people needing services	ALL
Police/Fire Stations	Main police station	All	power outages, resources constraints, communication	ALL	
Ambulance Service/Emergency Response	Shelter on Albany St				
Food-Related Service/Grocery	super markets/groceries; farmers markets; convenience stores; food pantries	Hurricane, tropics storms, flooding, snow, maybe earth quakes	power outages, resource constraints	All	
Gas Station/EV chargers*(for now)	ev charging in municipal lots, Galleria parking garage	tropical storms, flooding, snow,	resource constraints	All	
Bridges & Tunnels	All, including subway tunnels. MBTA Stations	hurricanes and flooding, snow storms, earthquakes,	impassable	All	
Dams		flooding, hurricanes, winter storms	overtopping and flanking, failure	people in flood prone areas	
transfer stations	outside the city		resources constraints, overfilling,	All	
Hardware stores		snow, flooding,	Shortage of materials		
Schools	preschools, primary schools	flooding, extreme temps, snow, * check if schools have AC,	power outages, family burden	EJ	
Pharmacies	All	snow, flooding,	power outages	EJ	
Libraries	Main Library and branches	flooding, hurricanes	power outages	EJ	
Elderly Care Services	Elder care facilities, senior center	hurricane, snow, heat, flooding	any event which takes out the electricity . power outages	EJ	
Municipal Facilities	DPW, City hall, City hall annex, water treatment plant	All	power outages	All	
Community gathering places	Democracy center, Cambridge Women's Center, On the Rise, Material Aid and Advocacy Program, Salvation Army, Youth on Fire, Friday Cafe, Rindge Towers, Cambridge Community Center	hurricane, snow, heat, flooding	power outages, too many people needing services	EJ	
Faith Community Buildings	Islamic Center of Boston, First Church (maybe include survey on which offer community services)	All	power outages, too many people needing services	EJ	
Medical Facilities	Cambridge Health Alliance, Mount Auburn Hospital, Urgent Care Facilities. Maria Center(out patient care offering dialysis)	All	power outages, too many people needing services	EJ	
Cambridge WTP		Flooding. Could have salt water intrusion into fresh pond if "stars were aligned" int erms of tides/storm surge.			
Foundry					
Fresh Pond Water Treatment plant		flooding; wind or extreme storms could cause disruption to the plant operation	flooding can undermine water mains- distribution; water quality issue if treatment plant is affect; saltwater intrusion	Do have an alternative supply within 2-3 hours; everyone; hospitals (water pressure); anyone without mobility/resources to get water; businesses and industry/bio tech	

STRUCTURES

Built facilities that provide community lifeline services. A community lifeline enables the continuation of critical government and business functions and is essential to human health and safety or economic security.

	MWRA cottage farm WWTP facility						
	Payson Park (post treatment)						
SYSTEMS A collection of components that perform a critical service for the community. Systems are linear type assets. Systems may include horizontal assets associated with linear type assets.	Cell Towers/Telephone Office	Internet access via cell phone is the way that may lower income individuals. Internet network is more impact than perhaps telephone.	Flooding (inland/coastal)	Winter storm and hurricanes both have wind issue - can affect many systems and assets			
	Power Grid (ensuring power for Hospitals, police/fire communications, and backup generators)	Without functioning power, systems may fail	Severe winter weather	shut down portions of the grid			
	Citywide Wi-Fi						
	Energy System Power Plant						
	Backup Generators (Hospitals, nursing homes, assisted living, senior centers - community buildings - youth centers).	elderly, youth, vulnerable	eg protect fuel from flooding.				
	Hazardous materials and fuels	risk to flooding to cause environmental damage but also need to provide this service to all to evacuate and respond	e.g. protect gas stations from flooding				
	Major Roads (not every street needs to be power, but there are critical streets that need to be maintained for emergency response - key routes and collectors (Cambridge bike plan and collectors). Memorial Drive - DCR. Route 2/ Fresh Pond Parkway.		Severe winter weather	close all or some major roads			
	Train & Subway system	Could affect those that work at hospitals and nursing homes, provide critical response	Flooding is a big issue for red line. Flooding could be a big issue for Green line - esp. east Cambridge / north point sector. Union Square Somerville green line, too				
	Bus network	Keep Harvard square bus station open - critical. There is the electric bus facility on Mass Ave - may have particular need for power supply.					
	Water/Sewer/Stormwater	Water sewer are critical to maintain access for all health and safety					
	Police and Fire Communications and Vehicles						
	MWRA - Cottage Farm and Prison Point CSO facilities			Extreme winter storms impacts ability to get people to locations. Flooding risk is a top concern for MWRA.			
	RESOURCES Natural Resources: Areas that provide protective function to reduce magnitude of hazard impact and increase resiliency. Areas of sensitive habitat that are vulnerable to hazard events, protection of areas that are important to community objectives, such as the protection of sensitive habitat, provide socio-economic benefits, etc. Historical and Cultural Resources: Assets that possess historical, cultural, archaeological or paleontological significance.	Open Space	Charles River Reservation	Hurricane Flooding Drought Invasive Sp Fire Heat	Inundation of water, inaccessibility; downed trees/damage to natural habitat; erosion and riverbank impacts; water levels interacting with brownfields sites	Families with children losing open space access, esp. low income; ecosystem/other species; EJ Communities in denser neighborhoods, flood vulnerable locations (see clim vul plan) like the Port	
		Alewife River Reservation, incl stormwater wetland Fresh Pond Res., and Hobbs Brook distribution system	Utility infrastructure disruption		power disruptions affect people with medical vulnerabilities and older adults; hospitals - incl water pressure loss; EJ communities		
		Jerry's Pond, Russell Field Parks with water features, e.g. North Point Park	Water quality; harmful algal blooms		Evacuation	whole community affected by disrupted water supply	
		Quadrangle	Flooding		Disease from standing water, CSO backup/septic water inundation to urban fill and 21E sites/haz mat release sites	health vulnerable populations/older adults	
Places of Worship		Harvard Square church buildings CEOC Margaret Fuller House Cambridge Community Center	Extreme storms, flooding, wind; earthquakes less likely	Power loss, wind damage, flood damage, loss of access; unofficial cooling centers and food distribution	People who rely on faith communities outreach/assistance; low income		

including sites, contextual information, structures, districts, and objects significantly associated with or representative of earlier people, cultures, maritime heritage, and human activities and events.	Community Gardens	Longfellow House/Gardens			Visitors	
			Extreme storms, flooding, wind; earthquakes less likely	Power loss, wind damage, flood damage, loss of access	University community/students/staff; summer - international students/young adults (16-17)	
		Harvard Univ, MIT, incl art museums				
		Cemeteries: Mt Auburn, Cambridge	Flooding, wind damage	Damage to the site;historic resources and personal connections/families	All who value the cemetery history and those who are buried	
	Historic Sites and Districts	City Art Center (E Camb)			Families with kids losing access to this resource, affects community life	
		Austin Cooper				
		Danehy Park				
		Matignon HS				
	Arts and Cultural Facilities	Museum of Science				
	Restaurants, pharmacies, food markets, gas stations				When cooking at home is disrupted, need access to these	

NOTES HMPT WORKSHOP 1

Summary

Thirty-seven participants joined the workshop virtually and brainstormed key local assets in Cambridge, how those assets might be impacted by hazards, and who would be the most vulnerable to those impacts. The workshop format started with a presentation of natural hazards, an overview of the Hazard Mitigation Plan, and an overview of Assets. The assets were categorized by: People, Structures, Systems, Resources, and Activities. The participants were then broken into four groups to focus on one of the first four categories. After this exercise, the participants came back together to consider Activities as a group.

Key Findings

- The most concerning natural hazards were *flooding, winter storms, and extreme temperatures*.
- Assets in the *People* category that would be most impacted by natural hazards, especially for vulnerable groups, were shelters, housing, schools, and food distribution.
- Assets in the *Structures* category that would be most impacted by natural hazards, especially for vulnerable groups, were faith community buildings, medical facilities, transportation infrastructure, and Fresh Pond Water Treatment Plant.
- Assets in the *Systems* category that would be most impacted by natural hazards were the power grid, cell towers, MWRA facilities, and water/sewer system.
- Assets in the *Resources* category that would be most impacted by natural hazards, especially for vulnerable groups, were parks, open spaces, community gardens, and arts and cultural facilities.
- *Activities* included several Cambridge festivals and events like Head of the Charles, Cambridge Science Fest, farmers markets, Honk Fest, and other community-building activities that strengthen social resilience.
- The vulnerable groups that many participants were most concerned about were people with disabilities, currently unhoused people, low-income families, and households with language isolation.

AGENDA HMPT WORKSHOP 2

- 6pm** **Introductions & Overview**
- Introductions + Ground Rules
 - HMP Overview
 - HMPT Workshop #1 Recap – hazards and assets
 - What are hazard mitigation actions?
 - Example mitigation actions completed in Cambridge
- 6:20** **Presentation: Actions for Structures**
- Overview of mitigation actions for Structures Asset Category
- 6:25** **Mitigation Activity: Structures**
- Google Sheets Activity: participants will give input on actions for assets in the Structures Asset Category
- 6:35** **Presentation: Actions for People**
- Overview of mitigation actions for People Asset Category
- 6:40** **Mitigation Activity: People**
- Google Sheets Activity: participants will give input on actions for assets in the People Asset Category
- 6:50** **Presentation: Actions for Systems**
- Overview of mitigation actions for Systems Asset Category
- 6:55** **Mitigation Activity: Systems**
- Google Sheets Activity: participants will give input on actions for assets in the Systems Asset Category
- 7:05** **Presentation: Actions for Resources**
- Overview of mitigation actions for Resources Asset Category
- 7:10** **Mitigation Activity: Resources**
- Google Sheets Activity: participants will give input on actions for assets in the Resources Asset Category
- 7:20** **Reconvene + Next Steps**
- *Final HMPT Workshop*: Tue., Jul. 25: 4pm-5:30pm
 - Public Survey
- 7:30** **Conclude**



Hazard Mitigation Plan Update 2023

HMPT Workshop 2
July 11, 2023



**CITY OF
CAMBRIDGE**



WELCOME



*Introduce yourself
in the **chat***



*HMPT **Facilitators** will
help lead the workshop*



***City Officials** leading
this project are here today*



Leila Mekias

Climate Resilience
Project Planner



Robin Seidel

Project Manager,
Weston & Sampson



Janet Moonan

Project Technical Lead,
Weston & Sampson



Joanna Nadeau

Senior Project Planner,
Weston & Sampson



Emily Judson

Resiliency Planner,
Weston & Sampson



GROUND RULES



One mic, one person speaks at a time



Step up, step back – share the air



Be as present as you can



Take away stories, not names



Be respectful, be kind



Speak from the heart, listen from the heart



Trust you will know what to say

AGENDA



Introductions & Overview



Mitigation Actions: **Structures**



Mitigation Actions: **People**



Mitigation Actions: **Systems**



Mitigation Actions: **Resources**



Next Steps + Conclude



AGENDA



Introductions & Overview



Mitigation Actions: Structures



Mitigation Actions: People



Mitigation Actions: Systems



Mitigation Actions: Resources



Next Steps + Conclude



HMP TEAM



City Staff



Steering Committee

Group of key City staff responsible for making final planning decisions. Steering Committee Meetings will guide the planning process, endorse draft Goals, and members will participate in Hazard Mitigation Planning Workshops.

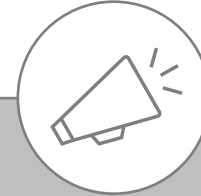
Stakeholders



Hazard Mitigation Planning Team (HMPT)

Group of stakeholders bringing a wide range of local expertise and perspectives. The group will include advocates, residents, business-owners, state and local agency representatives, and people from various other organizations.

Outreach



Outreach Team

City team who can help with in-person and virtual outreach and engagement events. This could include activity at local community organizations, schools, events, door-to-door outreach, and others engagement.

Public

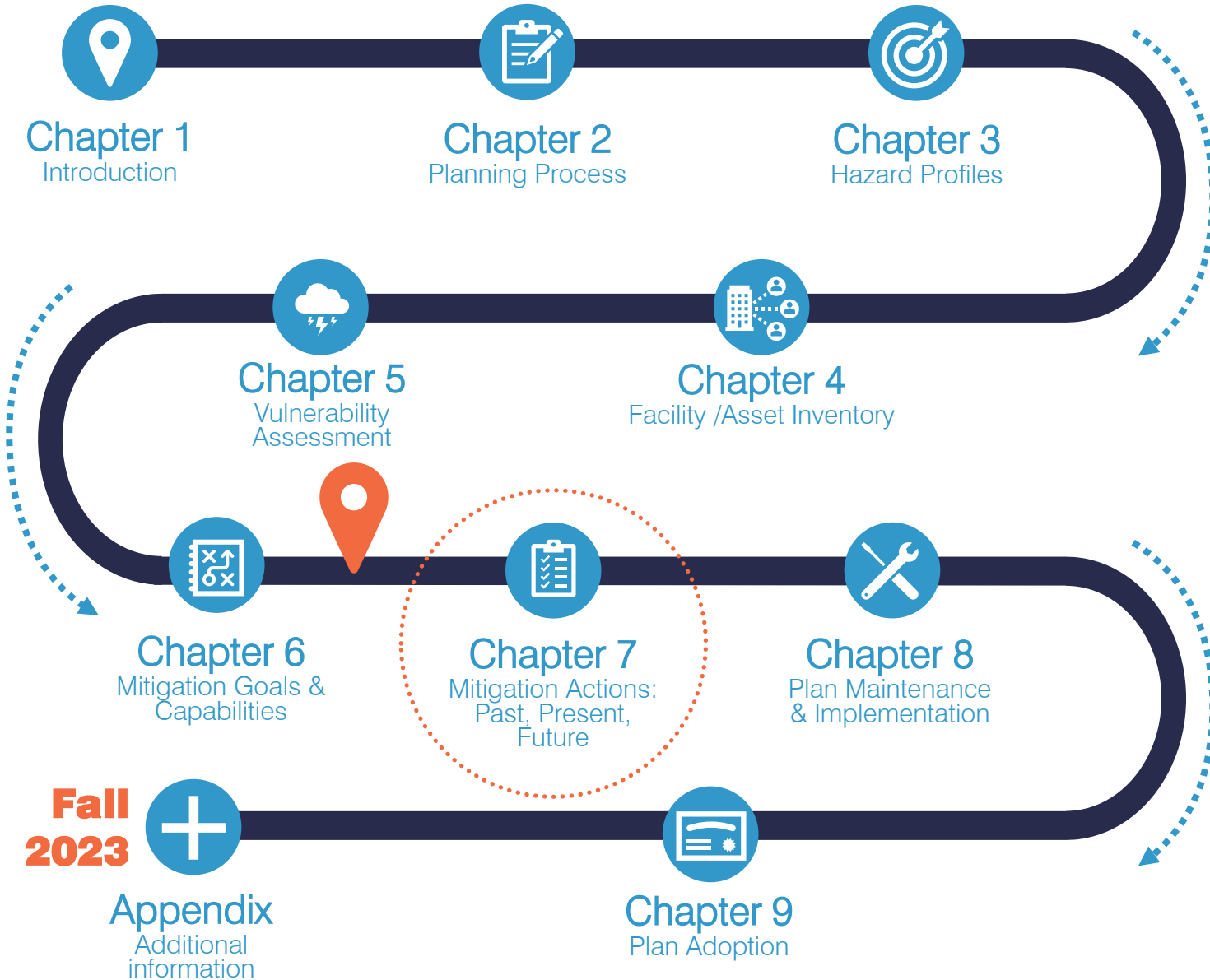


Public Engagement

Public Meetings will be an opportunity to educate about the HMP, share progress, and gather feedback and ideas. Results from these meetings and other feedback will be integrated into the final report. The group will include advocates, residents, business-owners, state and local agency representatives, and people from various other organizations.

The HMPT Members are key players in the overall engagement strategy

WHY ARE WE HERE TODAY?

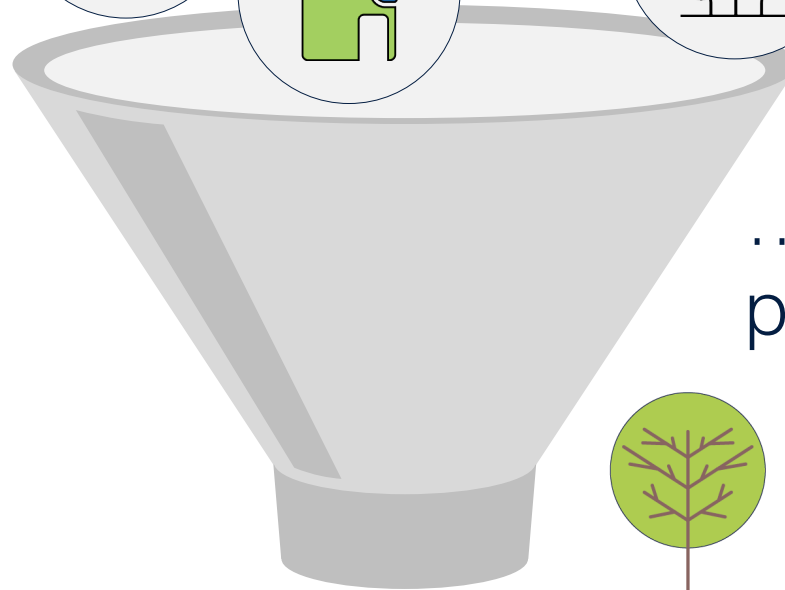
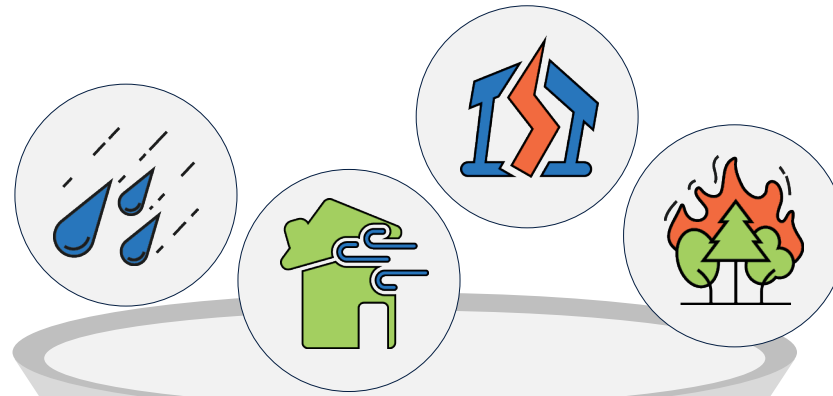


Your input today will directly impact the **Mitigation Actions** and how these actions can be **implemented** effectively and equitably.

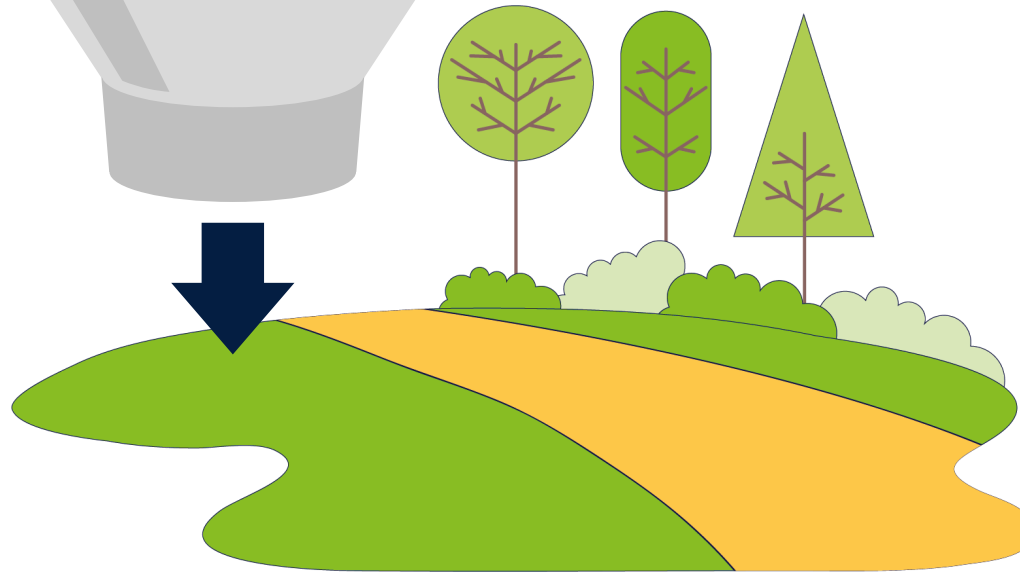
WHAT IS HAZARD MITIGATION?



Reduce impacts from
natural hazards...



...through plans,
projects, and services.



NATURAL HAZARDS



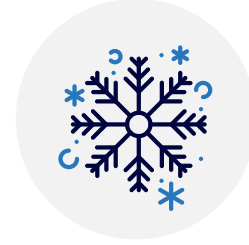
HURRICANES
/ TROPICAL
STORMS



INLAND
FLOODING



EXTREME
TEMPERATURES



SEVERE WINTER
WEATHER /
NOR'EASTERS



COASTAL
FLOODING



TSUNAMI



DROUGHT



WILDFIRE



EARTHQUAKES



TORNADOES



LANDSLIDES

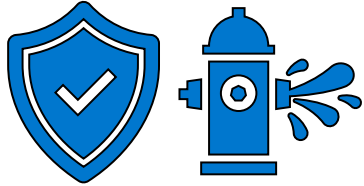


INVASIVE
SPECIES

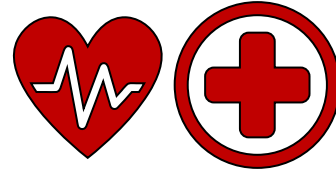
CAMBRIDGE MITIGATION GOALS



ASSET INVENTORY



Safety & Security



Health & Medical



Transportation



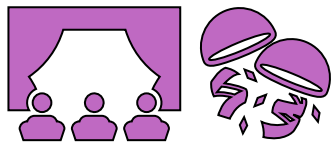
Food, Water, Shelter



Parks & Greenspace



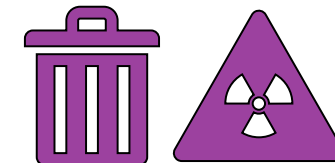
Communications



**Cultural, Historic,
& Events**



Energy



**Hazardous Material
Management**

HAZARD MITIGATION ACTIONS



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

Before an event

- Local code and regulations
- Maintenance
- Proactive Structural Projects

During an event

- Warnings
- Protection of critical facilities
- Emergency response

Following an event

- Clean up
- Restoration
- Enhancement

COMMUNICATIONS

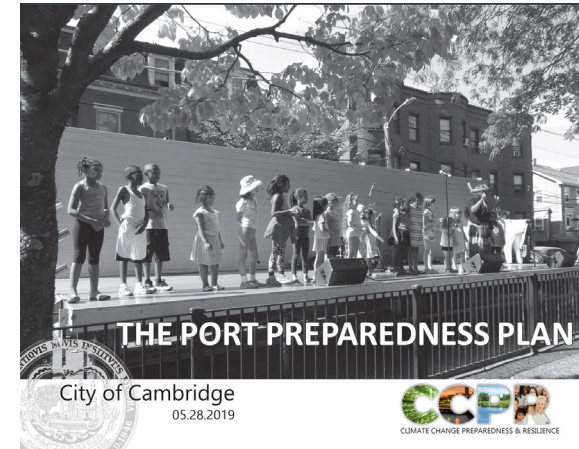
This actions will create resilience for the City of Cambridge (ability to withstand and swiftly recover from an extreme event). These actions will support adaptation to climate change.

EXAMPLE MITIGATION ACTIONS COMPLETED IN CAMBRIDGE



Since 2015, the City has:

- ✓ Completed Climate Change Vulnerability Assessment
- ✓ Prepared Climate Change Preparedness & Resilience Plans
- ✓ Developed the Envision Cambridge Comprehensive Plan
- ✓ Reviewed Evacuation Protocol
- ✓ Completed hydraulic modeling for city
- ✓ Undertaken sewer separation projects
- ✓ Undertaken stormwater management projects
- ✓ Developed the Resilient Cambridge Plan
- ✓ Shared Cambridge Heat Viewer and Cambridge Flood Viewer
- ✓ Adopted climate resilience zoning amendment



Summary Report

Resilient City Resilient People is an easy to read summary of the Resilient Cambridge Plan.

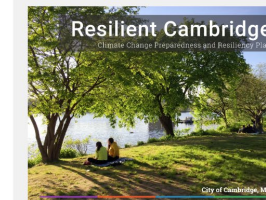
[Download Resilient City Resilient People](#)



Resilient Cambridge Plan

The Plan lays out the risks from climate change, the strategies, and the implementation schedule.

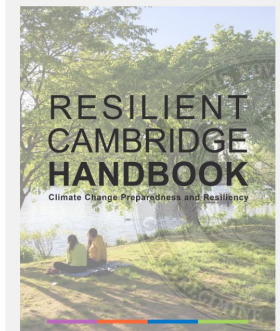
[Download the Resilient Cambridge Plan](#)



Resilient Cambridge Handbook

The handbook describes in detail the four categories of strategies in the Plan.

[Download the Resilient Cambridge Handbook](#)



AGENDA



Introductions & Overview



Mitigation Actions: **Structures**



Mitigation Actions: **People**



Mitigation Actions: **Systems**



Mitigation Actions: **Resources**



Next Steps + Conclude



STRATEGIES: STRUCTURES



Built facilities that provide community lifeline services. A community lifeline enables the continuation of critical government and business functions and is essential to human health and safety or economic security.



EXAMPLE IMPACTS TO STRUCTURES



MOST LIKELY HAZARDS

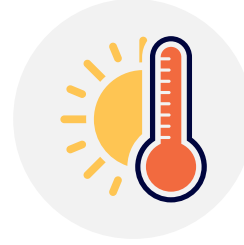
HURRICANES
/ TROPICAL
STORMS



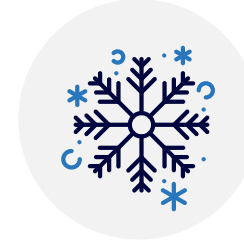
INLAND
FLOODING



EXTREME
TEMPERATURES



SEVERE WINTER
WEATHER /
NOR'EASTERS



EARTHQUAKES



Damage

- Structural Failure
- Roof collapse

Occupant Health & Comfort

- Air quality
- Mold
- Public safety

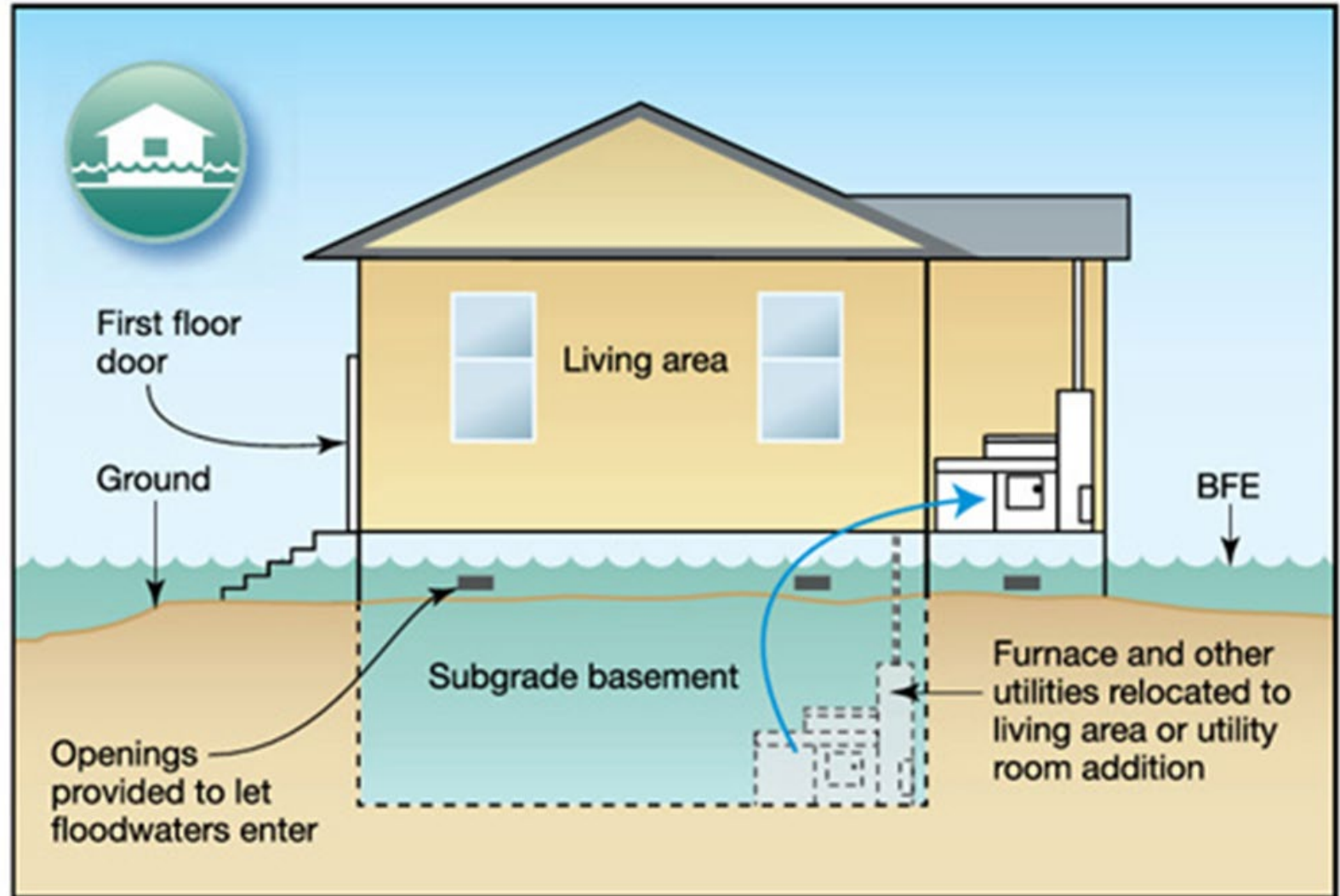
Loss of Use

- Business downtime
- Relocation
- Lack of access to goods and services

FLOODING STRATEGIES



- Require new structures to build/protect to the 2070 10-year flood and recover from the 2070 100-year flood elevation
- Elevate or protect vulnerable utilities, such as fuel storage, furnaces, and electrical panels above 2070 100-year flood elevation
- Avoid using finished basements as living space if at risk of flooding
- Retreat
- Flood insurance



HEAT STRATEGIES



- Design buildings with passive strategies including building orientation, high-performance insulation and windows, shading, and natural ventilation, and cool or green roofs
- Design buildings with a high-performance building envelope
- Install cool, high solar reflectivity roofs
- Maximize opportunities for natural ventilation, upgrade building mechanical systems, and install ceiling fans (where applicable) for improved passive survivability

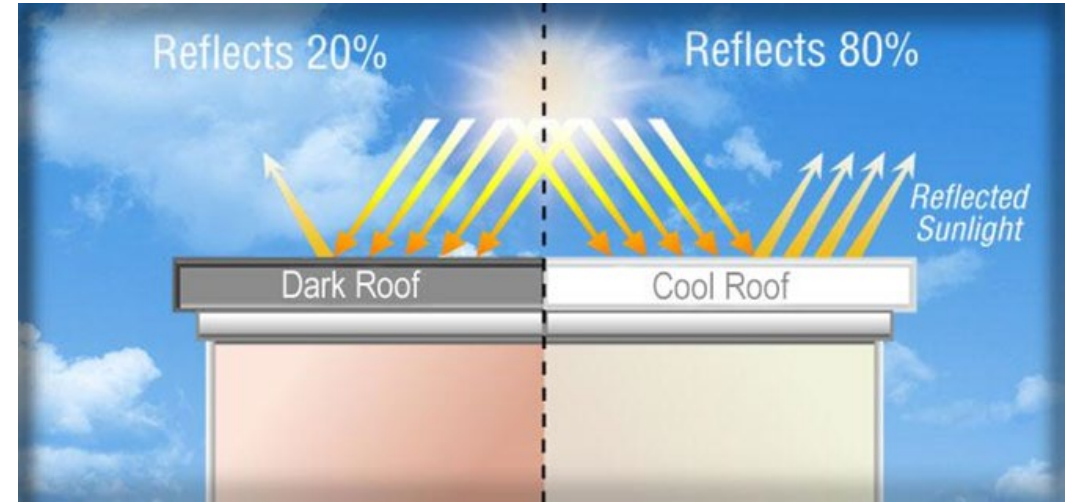


Figure 1: Dark vs. Cool Roof Surface Temperatures



A dark roof (left) becomes much hotter than a cool white roof (right) on a sunny afternoon.

AGENDA



Introductions & Overview



Mitigation Actions: **Structures**



Mitigation Actions: **People**



Mitigation Actions: **Systems**



Mitigation Actions: **Resources**



Next Steps + Conclude



STRATEGIES: PEOPLE



Assets that serve populations that are more vulnerable to disaster (e.g., elderly, children, visiting populations) and/or serve densely populated areas.



EXAMPLE IMPACTS TO PEOPLE



MOST LIKELY HAZARDS

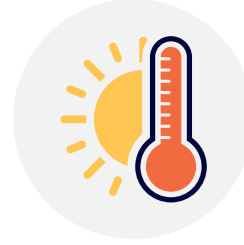
HURRICANES
/ TROPICAL
STORMS



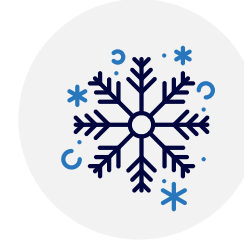
INLAND
FLOODING



EXTREME
TEMPERATURES



SEVERE WINTER
WEATHER /
NOR'EASTERS



WILDFIRE



Public Safety

- Building damage
- Windborne debris
- Medical transport

Health & Comfort

- Air quality
- Hypothermia
- Heat Exhaustion
- Long-term health affects

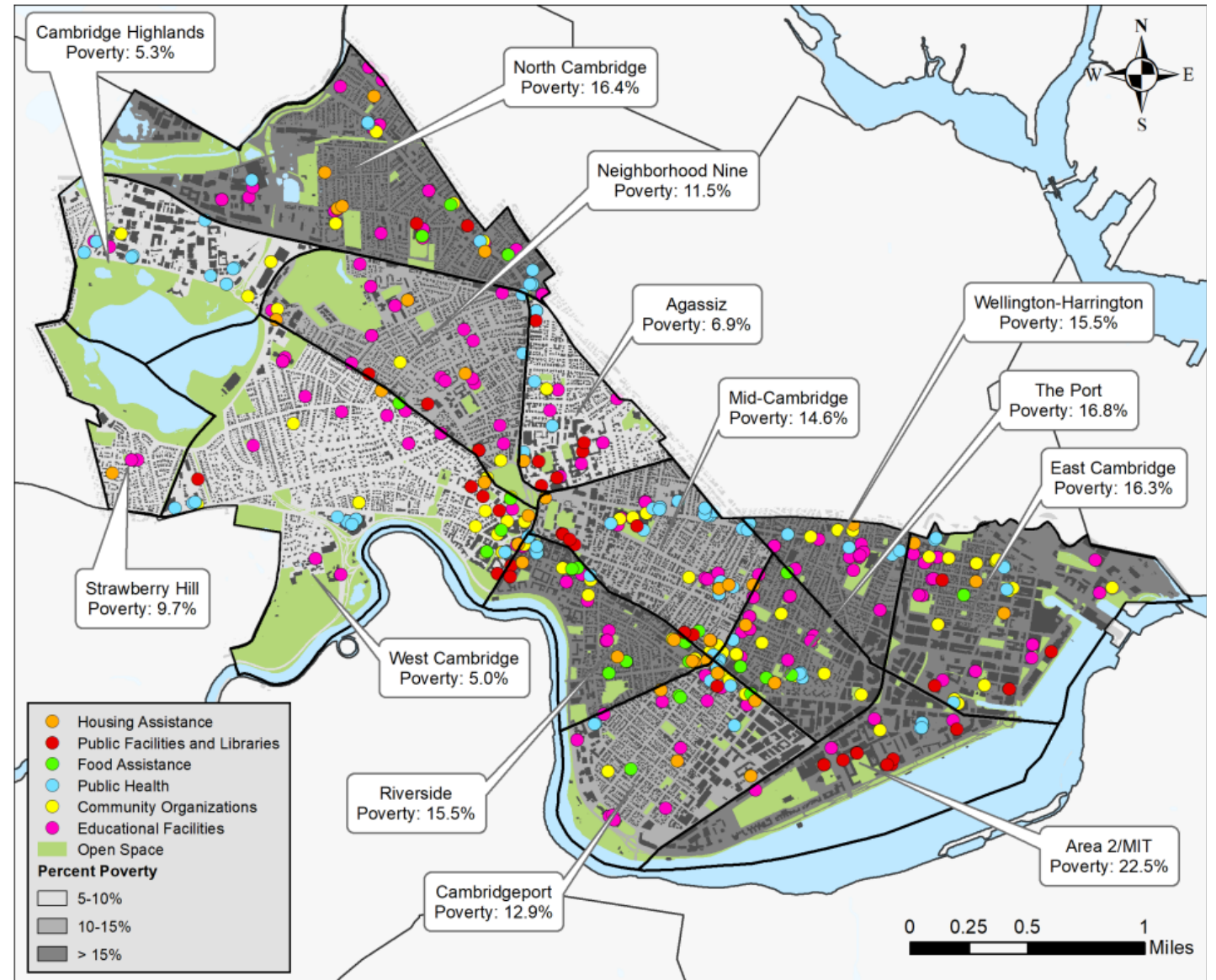
Loss of Use

- School closures
- Places to sleep (shelters, outdoors)
- Deliveries (meals, medication)
- Closed grocery/pharmacy

LOSS OF USE STRATEGIES



- Enhance Resilient Public Amenities
- Support Business and Organizational Preparedness
- Protect Community Resource Buildings
- Enhance Emergency Response Plans
- Provide For Healthcare Continuity and Access



HEALTH & COMFORT STRATEGIES



- Provide Neighborhood Resilience Hubs
- Create Support Systems For Populations At Risk
- Strengthen Emergency Communication Systems
- Encourage Stronger Social Network
- Continue Climate Education
- Support Renter Preparedness



AGENDA



Introductions & Overview



Mitigation Actions: **Structures**



Mitigation Actions: **People**



Mitigation Actions: **Systems**



Mitigation Actions: **Resources**



Next Steps + Conclude





STRATEGIES: SYSTEMS

A collection of components that perform a critical service for the community. Systems are linear type assets. Systems may include horizontal assets associated with linear type assets.



EXAMPLE IMPACTS TO SYSTEMS



MOST LIKELY HAZARDS

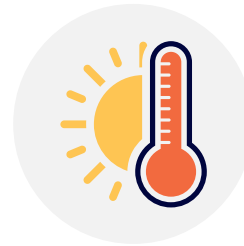
HURRICANES
/ TROPICAL
STORMS



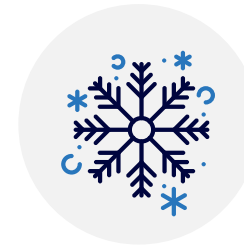
INLAND
FLOODING



EXTREME
TEMPERATURES



SEVERE WINTER
WEATHER /
NOR'EASTERS



DROUGHT



Public Safety

- Drinking water supply
- Emergency communications

Health & Comfort

- Release of hazardous materials
- Combined Sewer Overflows, Sanitary Sewer Overflows/Basement Backups

Loss of Use

- Internet/Cellular connection
- Power grid
- Subway and buses

WATER STRATEGIES



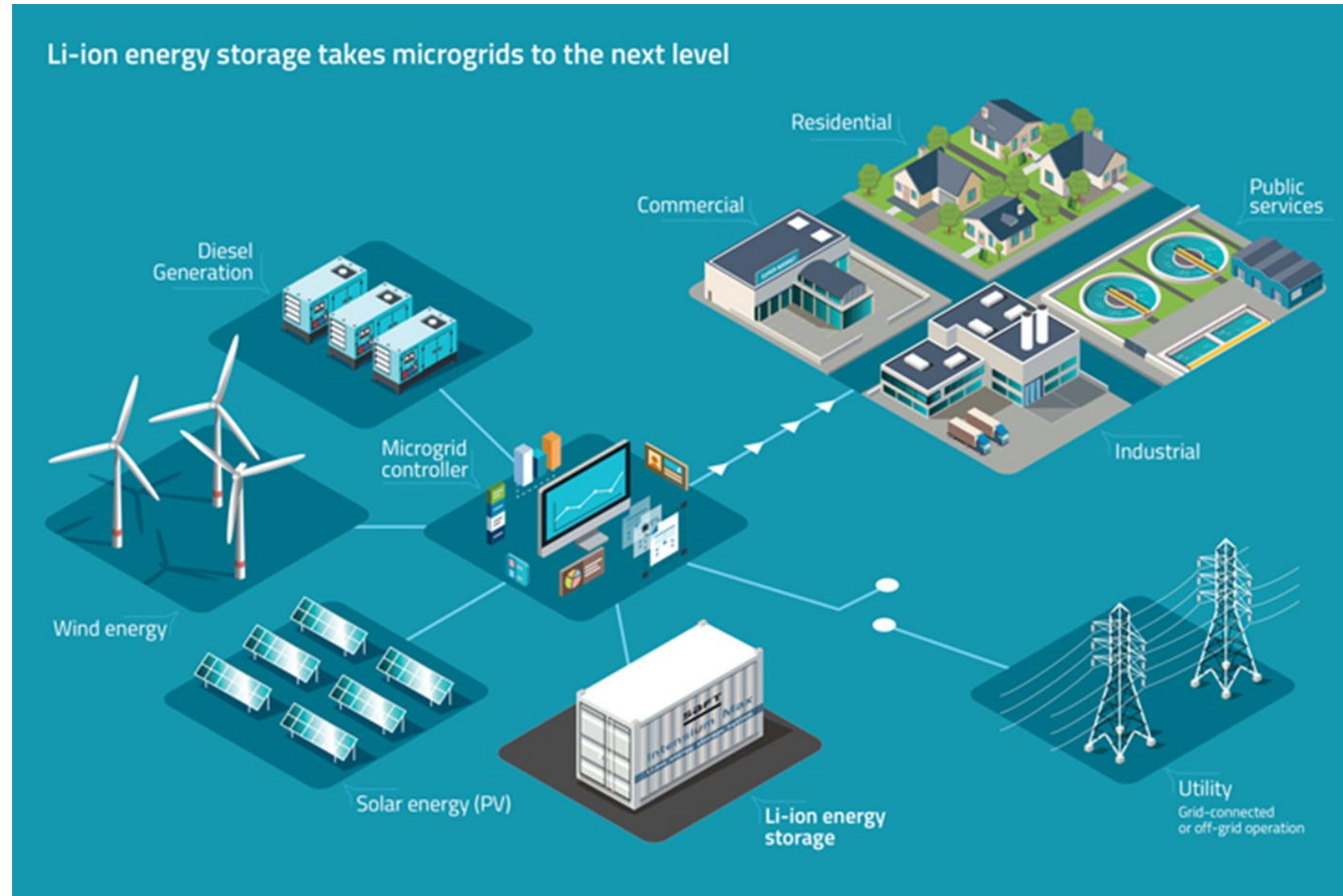
- Continue the Combined Sewer Separation
- Upgrade Stormwater Storage
- Implement Green Infrastructure (GI) Opportunities For Stormwater Management
- Reduce Impervious Area



POWER & TRANSIT STRATEGIES



- Encourage the Resiliency of the Electrical Distribution System
- Enhance the Resiliency of the Transportation System
- Support Sustainable Energy Infrastructure
- Support a Resilient Telecommunication Network



AGENDA



Introductions & Overview



Mitigation Actions: **Structures**



Mitigation Actions: **People**



Mitigation Actions: **Systems**



Mitigation Actions: **Resources**



Next Steps + Conclude



STRATEGIES: RESOURCES



Natural Resources: Areas that provide protective function to reduce magnitude of hazard impact and increase resiliency, areas of sensitive habitat that are vulnerable, and areas that are important to community.

Historical and Cultural Resources: Assets that possess historical, cultural, archaeological or paleontological significance, including sites, contextual information, structures, districts, and objects significantly associated with or representative of earlier people, cultures, maritime heritage, and human activities and events.

EXAMPLE IMPACTS TO RESOURCES



MOST LIKELY HAZARDS

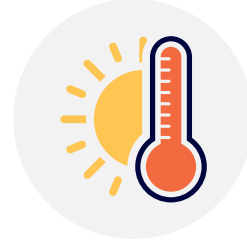
HURRICANES
/ TROPICAL
STORMS



INLAND
FLOODING



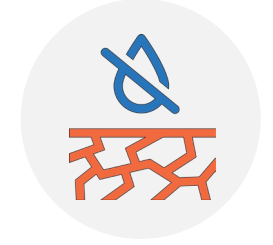
EXTREME
TEMPERATURES



INVASIVE
SPECIES



DROUGHT



Public Safety

- Downed trees

Public Health

- Vector-borne illness
- Recreation
- Harmful algal blooms

Loss of Use

- Playgrounds
- Open spaces
- Historic resources
- Art centers

Environmental

- Habitat loss
- Invasive species

COMMUNITY STRATEGIES



- Enhance Outdoor Thermal Comfort
- Seek Green Infrastructure Opportunities
- Expand and Improve Open Spaces
- Elevate or retrofit historic and culturally important buildings
- Create environmental corridors or areas of connected greenspace



ENVIRONMENTAL STRATEGIES



- Protect Fresh Pond Reservoir
- Provide For a Resilient Urban Forest
- Reduce Impervious Area
- Seek Green Infrastructure Opportunities
- Increase public education and outreach about the importance of native species and the dangers of invasive species



AGENDA



Introductions & Overview



Mitigation Actions: **Structures**



Mitigation Actions: **People**



Mitigation Actions: **Systems**



Mitigation Actions: **Resources**



Next Steps + Conclude



SAVE THE DATE



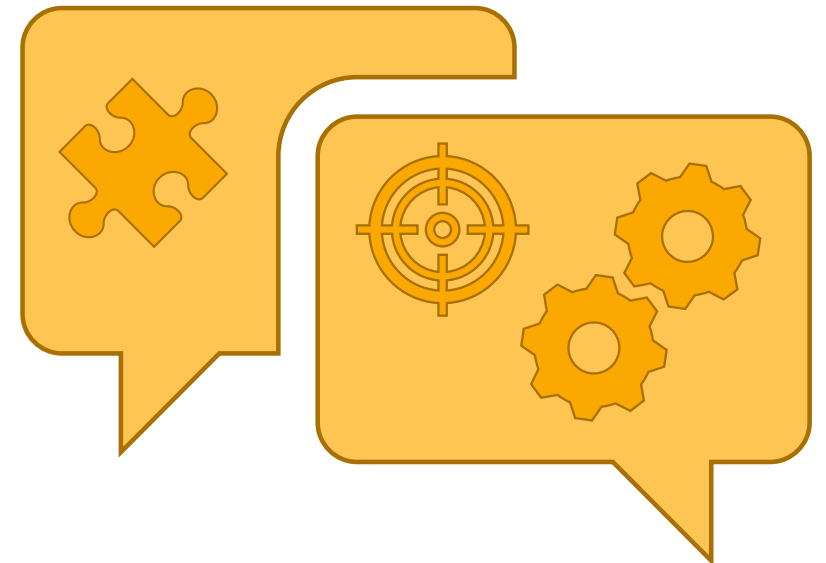
Workshop 3

When: July 25th

Time: 4:00 PM-5:30 PM

What: Prioritization of Mitigation Actions

**Final workshop
is two weeks
from today!**



TAKE THE SURVEY!



The City of Cambridge is updating its Hazard Mitigation Plan for a more resilient, safe, and prepared community.



Share your experiences of living in Cambridge to help the City understand how it can improve. Please take this short, 5-minute survey to share your insights.

tinyurl.com/CambridgeHMPsurvey



This input will help shape the **strategies, projects, policies,** and **decisions** the City makes regarding natural hazards.

**Please share with
your networks!**



Hazard Mitigation Plan Update 2023

Thank You!



**CITY OF
CAMBRIDGE**



ASSET CATEGORY	ASSET TYPE	What hazard is this asset type (or specific asset) vulnerable to?	What are potential Mitigation Actions that could help?
STRUCTURES Built facilities that provide community lifeline services. A community lifeline enables the continuation of critical government and business functions and is essential to human health and safety or economic security.	Ambulance Service/Emergency Response	Hurricanes/Tropical Storms	structural eval of buildings of a certain age
	Bridges & Tunnels	Inland Flooding	how to coordinate with private facilities for emergency planning.
	Cambridge Water Treatment Plant	Extreme Temperatures	site specific resilience evaluation (electrical, backup electrical) - what would happen in an
	Community gathering places	Severe Winter Storms/Nor'Easters	
	Dams	Earthquakes	is there a plan in place if something were to
	Elderly Care Services	Coastal Flooding	disrupt? Ensure emergency plan exists. Be ready
	Shelters (Emergency)	Tsunami	space available for additional shelters. can do a shelter assessment plan.
	Faith Community Buildings	Drought	
	Food-Related Service/Grocery	Wildfire	
	Foundry	Earthquakes	
	Fresh Pond Water Treatment plant	Tornadoes	
	Gas Station/EV chargers*(for now)	Landslides	
	Hardware stores	Invasive Species	
	Libraries		
	Medical Facilities		
	Municipal Facilities		
	MWRA cottage farm WWTP facility		
	Payson Park (post treatment)		
	Pharmacies		
	Police/Fire Stations		
Schools			
Transfer stations			
PEOPLE Assets that serve populations that are more vulnerable to disaster (e.g., elderly, children, visiting populations) and/or serve densely populated areas.	Accommodating all needs, especially in emergencies	Hurricanes/Tropical Storms	create campaigns for natural disasters (remember "stop drop and roll" and when you see a bear...we still remember these) what are tips we can share re: heat and other hazards.
		Inland Flooding	Catchy, plain language communication
		Extreme Temperatures	rindge ave swimming pool is a key resource when it's hot and the building AC is not working well. Ensure that the pools remain operational in power
	Child and Youth Services	Severe Winter Storms/Nor'Easters	other to support each other during extreme weather and other events...e.g. check-in on
	Community Organizations (local and regional)	Earthquakes	when it's extremely hot and extremely cold, are there ways to have neighborhood communications to foster improved resilience. Build a map of neighbors to check on.
Dams	Coastal Flooding		
	Tsunami		

	Elderly Facilities	Drought	Could something similar be done for elderly community for hot events. can't put AC in windows - buddy program	
	Emergency Resources / Redundancy Planning		Wildfire	
	Food distribution		Earthquakes	
	Hospitals/Health Centers		Tornadoes	extend swimming pool hours
	Housing		Landslides	"first time retrofitters" program like "first time homebuyers"
	Medication delivery		Invasive Species	
	People with Disabilities			
	Public Pools			
	Schools			
	Shelter			
	Transportation Infrastructure			
	Trusted Institutions / Community centers			
	Unhoused people not in shelters			
	Waming and cooling centers			Informational page on hubs that can be used - go here to get wifi, go here to get a meal, needs to be accessible to any range of impairments.

SYSTEMS A collection of components that perform a critical service for the community. Systems are linear type assets. Systems may include horizontal assets associated with linear type assets.	Backup Generators @ Hospitals, nursing homes, assisted living, senior centers - community buildisngs - youth centers	Hurricanes/Tropical Storms		
	Bus network		Inland Flooding	
	Cell Towers/Telephone Office		Extreme Temperatures	
	Citywide Wifi		Severe Winter Storms/Nor'Easters	community program for messaginging - loudspeaker. Door knocking program. All of life is so reliant on internet connection. May need reminder on old ways to communicate with one another. Way to get the word out to get to the community - groups,
	Energy System Power Plant		Earthquakes	
	Hazardous materials and fuels		Coastal Flooding	
	Major Roads (esp. critical streets that need to be maintained for emergency response - key routes and collectors (Cambridge bike plan and collectors). Memorial Drive - DCR. Route 2/ Fresh Pond Parkway.)		Tsunami	
	MWRA - Cottage Farm and Prison Point CSO facilities		Drought	
	Police and Fire Communications and Vehicles		Wildfire	
			Earthquakes	
	Tornadoes			
	Landslides			

	Power Grid (ensuring power for Hospitals, police/fire communications, and backup generators)	Invasive Species	
	Train & Subway system		
	Water/Sewer/Stormwater		messaging that the drinking water is okay to drink.
			rapid deployment signage so there is wayfinding in addition to where things are available.
RESOURCES Natural Resources: Areas that provide protective function to reduce magnitude of hazard impact and increase resiliency. Areas of sensitive habitat that are vulnerable to hazard events, protection of areas that are important to community objectives, such as the protection of sensitive habitat, provide socio-economic benefits, etc. Historical and Cultural Resources: Assets that possess historical, cultural, archaeological or paleontological significance, including sites, contextual information, structures, districts, and objects significantly associated with or representative of earlier people, cultures, maritime heritage, and human activities and events.	Arts and Cultural Facilities Community Gardens Historic Sites and Districts Open Space (parks) Places of Worship Restaurants, pharmacies, food markets, gas stations	Hurricanes/Tropical Storms Inland Flooding Extreme Temperatures Severe Winter Storms/Nor'Easters Earthquakes Coastal Flooding Tsunami Drought Wildfire Earthquakes Tornadoes Landslides Invasive Species	Public art, collaboratively developed, can make public spaces more welcoming, reiterate that if a park isn't welcoming in normal times, it won't be welcoming in an emergency. Provide public water for community gardens? The City has a farming program? share informatino on the farming program. People are relying ont hese. add shade structure? people do sports, yoga, dance, mutli use place. Important City make those places more wecloming and more accomodating to people. Make parks more accomodating and welcoming. Drought would be a big concern - no trash pickup, no regulations enforced, dog walking, safety issues. where to go during an earhtquake. Fire in churche at Prosect and Broadway - church, synogauge, mosque, sharing resouces. City can play a role in coordinating of

ASSET CATEGORY	ASSET TYPE	What hazard is this asset type (or specific asset) vulnerable to?	What are potential Mitigation Actions that could help?	
STRUCTURES Built facilities that provide community lifeline services. A community lifeline enables the continuation of critical government and business functions and is essential to human health and safety or economic security.	Ambulance Service/Emergency Response	Hurricanes/Tropical Storms	power structures have backup power/generators	
	Bridges & Tunnels	Inland Flooding	For inland flooding, coastal flooding, update flood maps to identify the areas that are most at risk of additional flooding	
	Cambridge Water Treatment Plant	Extreme Temperatures	Pre storm - inspect infrastructure and make sure we clean out sediment and remove obstructions to allow stormwater to flow unimpeded	
	Community gathering places	Severe Winter Storms/Nor'Easters	To enhance inventory of shelters (e.g. war memorial) - get polling places list bc they have been vetted for access, e.g. have working bathrooms (from Election Commission)	
	Dams	Earthquakes	Conduct inventory of muni buildings, schools, senior centers for power backups/generators, accessibility, evacuation capacity to build list.	
	Elderly Care Services	Coastal Flooding	For access disruptions (can't get to the central area), is there somewhere with backup resources/beds for sheltering in place	
	Shelters (Emergency)	Tsunami	disruptions, what backups do you have? Explore a range of options, social media, TV, radio (incl people without smart phones)	
	Faith Community Buildings	Drought	Impassable roads/isolated people means communication is essential - distribute info about channels where to get emergency info	
	Food-Related Service/Grocery	Wildfire	Identify critical power loads within the buildings are identified and linked to backup (e.g. refrigerators)	
	Foundry	Earthquakes	Use clean energy solutions for power, solar, battery	
	Fresh Pond Water Treatment plant	Tornadoes	Evaluate resiliency of specific services on a case by case basis, e.g. Food pantries are often on the first floor and vulnerable to flooding	
	Gas Station/EV chargers*(for now)	Landslides	Coordinating with adjacent communities for event prep and response - community members use services across	
	Hardware stores	Invasive Species		
	Libraries			
	Medical Facilities			
	Municipal Facilities			
	MWRA Cottage Farm WWTP facility			
	MWRA Payson Park (post treatment)			
	PEOPLE Assets that serve populations that are more vulnerable to disaster (e.g., elderly, children, visiting populations) and/or serve	Accommodating all needs, especially in emergencies	Hurricanes/Tropical Storms	people who need daily support (e.g. home health aid, dialysis, diabetes/insulin) - when their support networks may not be available (long term). e.g. Dialysis center and PCA
			Inland Flooding	

densely populated areas.	Child and Youth Services	Extreme Temperatures Severe Winter Storms/Nor'Easters Earthquakes Coastal Flooding Tsunami Drought Wildfire Earthquakes Tornadoes Landslides Invasive Species	Encourage disability indicator 911 enrollment for list needing additional follow up response in an emergency
	Community Organizations (local and regional)		Increase emergency response personnel staffing and training on medical issues
			Evaluate safe routes for people without cars who rely on other access (walk, bike, transit) - e.g. high points for flooding on a map
	Dams		Warming/cooling facilities
	Elderly Facilities		Outreach about financial measures to protect cooling and heating services
	Emergency Resources / Redundancy Planning		water fountains and cooling locations for people who are traveling on foot/bike during extreme heat
	Food distribution		
	Hospitals/Health Centers		
	Housing		
	Medication delivery		
	People with Disabilities		
	Public Pools		
	Schools		
	Shelter		
	Transportation Infrastructure		
	Trusted institutions / community centers		
	Unhoused people not in shelters		
	Warming and cooling centers		
SYSTEMS A collection of components that perform a critical service for the community. Systems are linear type assets. Systems may include horizontal assets associated with linear type assets.	Backup Generators @ Hospitals, nursing homes, assisted living, senior centers - community buildings - youth centers	Hurricanes/Tropical Storms Inland Flooding	Evaluate and develop redundancies for systems, e.g. water sewer pumps alternate and have a backup.
	Bus network	Extreme Temperatures Severe Winter Storms/Nor'Easters	Develop backup plans for transportation, MBTA staffing, which could include other/private shuttle services Backup/public wifi at the library, notspots you can sign out.
	Cell Towers/Telephone Office	Earthquakes	(see above - resilient energy systems as backups)
	Citywide Wifi	Coastal Flooding	Support existing gathering places for support - library, school - as opposed to new locations regular testing and checking of backup generators and power systems (every 6 mo) before emergency
	Energy System Power Plant	Tsunami	alerts, i.e. megaphone driving through the streets; e.g. phone tree; color coded flag system at muni buildings, fire
	Hazardous materials and fuels need to be maintained for emergency response - key routes and collectors	Drought	City communicate what the go-to information source people should use, e.g. air quality sites
	MWRA - Cottage Farm and Prison Point CSO facilities	Wildfire	Access to T stations floods in Central St station - City could consider vulnerabilities of those sites
	Police and Fire Communications and Vehicles		

	Power Grid (ensuring power for Hospitals, police/fire communications, and backup generators)	Earthquakes	
	Train & Subway system	Tornadoes	
	Water/Sewer/Stormwater	Landslides	
		Invasive Species	

<p>RESOURCES</p> <p>Natural Resources: Areas that provide protective function to reduce magnitude of hazard impact and increase resiliency. Areas of sensitive habitat that are vulnerable to hazard events, protection of areas that are important to community objectives, such as the protection of sensitive habitat, provide socio-economic benefits, etc.</p> <p>Historical and Cultural Resources: Assets that possess historical, cultural, archaeological or paleontological significance, including sites, contextual information, structures, districts, and objects significantly associated with or representative of earlier people, cultures, maritime heritage, and human activities and events.</p>		Hurricanes/Tropical Storms	with existing problems or projected impacts, identify potential grant funding/other funding sources, and pursue projects to secure the building, roof, fire prevention (smoke
			protecting/mitigating risks to and replacing public art associated with public buildings, including Mass Cultural Council and other funding sources interested in the
			Engage City Arts Council in mitigation planning
	Arts and Cultural Facilities		
	Community Gardens		
	Historic Sites and Districts		
	Open Space		
Places of Worship			
Restaurants, pharmacies, food markets, gas stations			

ASSET CATEGORY	ASSET TYPE	What hazard is this asset type (or specific asset) vulnerable to?	What are potential Mitigation Actions that could help?
<p>STRUCTURES</p> <p>Built facilities that provide community lifeline services. A community lifeline enables the continuation of critical government and business functions and is essential to human health and safety or economic security.</p>	Emergency Services/Response	Hurricanes/Tropical Storms	Public works has contract for city
	Bridges & Tunnels	Inland Flooding	eversource updates critical facilities annually
	Cambridge Water Treatment Plant	Extreme Temperatures	Cambidge housing authority(elder care services and shleters - have emergency back up in the
	Community gathering places	Severe Winter Storms/Nor'Easters	for extreme temps - dpw is conscious about roofing materials.
	Dams	Earthquakes	
	Elderly Care Services	Coastal Flooding	
	Shelters (Emergency)	Tsunami	
	Faith Community Buildings	Drought	
	Food-Related Service/Grocery	Wildfire	
	Foundry	Earthquakes	
	Fresh Pond Water Treatment plant	Tornadoes	
	Gas Station/EV chargers*(for now)	Landslides	
	Hardware stores	Invasive Species	
	Libraries		
	Medical Facilities		
	Municipal Facilities		
	MWRA cottage farm WWTP facility		
	Payson Park (post treatment)		
	Pharmacies		
	Police/Fire Stations		
Schools			
Transfer stations			
<p>PEOPLE</p> <p>Assets that serve populations that are more vulnerable to disaster (e.g., elderly, children, visiting populations) and/or serve densely populated areas.</p>	recommending all roads, especially in emergencies	Hurricanes/Tropical Storms	Create an emergency response higher ed and city collaboration
	Child and Youth Services	Inland Flooding	Cambidge housing authority(elder care services and shleters - have emergency back up in the buildings for life safety) One of the issues for high
	Community Organizations (local and regional)	Extreme Temperatures	using for colling centers and shelters during storms if they include commericaial kitchens. How
	Dams	Severe Winter Storms/Nor'Easters	Food for free opportunities
	Elderly Facilities	Earthquakes	when there is a declared event - eversource identified heating and cooling centers.
	Emergency Resources / Redundancy Planning	Coastal Flooding	eversource has super generators that could be available.
	Food distribution	Tsunami	dunkin donuts- identifying vendors open all the time for needs for first responders.
	Hospitals/Health Centers		
	Housing	Drought	

	Medication delivery	Wildfire	
	People with Disabilities	Earthquakes	
	Public Pools	Tornadoes	
	Schools	Landslides	
	Shelter	Invasive Species	
	Transportation Infrastructure		
	Trusted institutions / community centers		
	Unhoused people not in shelters		
	Warming and cooling centers		
	Parks		
SYSTEMS A collection of components that perform a critical service for the community. Systems are linear type assets. Systems may include horizontal assets associated with linear type assets.	homes, assisted living, senior centers - community buildings - youth centers	Hurricanes/Tropical Storms	Shade structures, trees for bus stops
	Bus network	Inland Flooding	There are snow routes, but perhaps coordinate on additional hazard routes.
	Cell Towers/Telephone Office	Extreme Temperatures	Materials and plan to close roads when they are impassable. Need an operations plan.
	Citywide Wifi	Severe Winter Storms/Nor'Easters	Coordinate with everource on flooding related to power distribution system. Kendall power station brookford street gas connection include flood resiliency
	Energy System Power Plant	Earthquakes	facility at terminal road should be studied flood resiliency
	Hazardous materials and fuels	Coastal Flooding	have a screening report for but not detailed- to be studied.
	Major Roads (esp. critical streets that need to be maintained for emergency	Tsunami	the city? if not this could be a pre hazard plan to distribute radios
	MWRA - Cottage Farm and Prison Point CSO facilities	Drought	
	Police and Fire Communications and Vehicles	Wildfire	hardining regional radio towers
	Power Grid (ensuring power for Hospitals, police/fire communications,	Earthquakes	more stormwater tanks - baldwin, cambridgeport. updating metering stations for combined sewers.
	Train & Subway system	Tornadoes	
	Water/Sewer/Stormwater	Landslides	
		Invasive Species	
RESOURCES Natural Resources: Areas that provide protective function to reduce magnitude of hazard impact and increase resiliency. Areas of sensitive habitat that are vulnerable to hazard events, protection of areas that are important to community	Arts and Cultural Facilities	Hurricanes/Tropical Storms	restore some of the neglected ponds , depaving
		Inland Flooding	historic resiliency guidance - refer council of library information resources
		Extreme Temperatures	where to hold deceased in mass casualty event.
		Severe Winter Storms/Nor'Easters	

<p>that are important to community objectives, such as the protection of sensitive habitat, provide socio-economic benefits, etc.</p> <p>Historical and Cultural Resources: Assets that possess historical, cultural, archaeological or paleontological significance, including sites, contextual information, structures, districts, and objects significantly associated with or representative of earlier people, cultures, maritime heritage, and human activities and events.</p>	Community Gardens	Earthquakes	connection, and community - before/after/during - if these were lost, could lose community connections (Moses Youth Center, Cambridge
	Historic Sites and Districts	Coastal Flooding	
		Tsunami	
		Drought	
		Wildfire	
		Earthquakes	hard copy documents - much of this is still paper. archive vaults of records at city hall and public works- study vulnerability of these vaults.
		Tornadoes	
		Landslides	Libraries and back-up copies of public records: Where are these stored? Are all of the library collections within City boundaries? Are there other historical document collections that need to be scanned? (Or an organization that needs help scanning docs)
	Open Space(cemetaries, basketball courts, parks)	Invasive Species	
Places of Worship			
Restaurants, pharmacies, food markets, gas stations			

NOTES HMPT WORKSHOP 2

Summary

Twenty-two participants joined the workshop virtually and brainstormed Mitigation Actions that would prevent the impacts discussed in Workshop #1. The Mitigation Actions used almost the same categories as the assets: Structure, People, Systems, and Resources. The workshop format started with an overview presentation of the Hazard Mitigation Plan, assets, and Mitigation Actions. Then, there was a short introductory presentation on Mitigation Actions for Structures followed by a brainstorming exercise where participants were broken into groups to create Mitigation Actions for Structures. This format (presentation then breakout group brainstorming activity) repeated for all four categories and resulted in Mitigation Actions in all four categories.

Key Findings

- Key Mitigation Actions for *Structures* included coordinated emergency planning, a shelter assessment plan, and back-up power/generator plans.
- Key Mitigation Actions for *People* included public campaigns for hazard preparedness, neighbor buddy system and community connections, and warming/cooling centers or resources.
- Key Mitigation Actions for *Systems* included non-electrical communications systems (i.e. loudspeaker or door-knocking), redundancies in the water supply system, and energy system flood resiliency.
- Key Mitigation Actions for *Resources* included improving parks and public pools, incorporating public art into resiliency projects, and assessing tree vulnerability to pests.

AGENDA HMPT WORKSHOP 3

- 4:00 PM** **Welcome & Introductions**
- Introductions + Ground Rules
- 4:10 PM** **Overview & Mitigation Actions**
- HMP Overview
 - HMPT Workshop #1 + 2 Recap – hazards, assets, and actions
 - What are hazard mitigation actions?
 - Example mitigation actions completed in Cambridge
 - Mitigation Actions for HMP 2023
- 4:20 PM** **Mitigation Actions: Prioritization Process**
- Introduction to Prioritization Process
- 4:25 PM** **Mitigation Actions: Prioritization Activity**
- Doing the Prioritization Process
- 5:20 PM** **Final Thoughts & Next Steps**
- Further Feedback Opportunities
 - Public Survey
- 5:30 PM** **Conclude**



Hazard Mitigation Plan Update 2023

HMPT Workshop 3
July 25, 2023



**CITY OF
CAMBRIDGE**



AGENDA



Welcome & Introductions



Overview & Previous HMPT Workshops



Mitigation Actions: **Prioritization Overview**



Mitigation Actions: **Prioritization Activity**



Final Thoughts & Next Steps



Conclude



AGENDA



Welcome & Introductions



Overview & Previous HMPT Workshops



Mitigation Actions: **Prioritization Overview**



Mitigation Actions: **Prioritization Activity**



Final Thoughts & Next Steps



Conclude



WELCOME



*Introduce yourself
in the **chat***



*HMPT **Facilitators** will
help lead the workshop*



***City Officials** leading
this project are here today*



Leila Mekias

Climate Resilience
Project Planner



Robin Seidel

Project Manager,
Weston & Sampson



Janet Moonan

Project Technical Lead,
Weston & Sampson



Joanna Nadeau

Senior Project Planner,
Weston & Sampson



Emily Judson

Resiliency Planner,
Weston & Sampson



GROUND RULES



One mic, one person speaks at a time



Step up, step back – share the air



Be as present as you can



Take away stories, not names



Be respectful, be kind



Speak from the heart, listen from the heart



Trust you will know what to say

HMP TEAM



City Staff



Steering Committee

Group of key City staff responsible for making final planning decisions. Steering Committee Meetings will guide the planning process, endorse draft Goals, and members will participate in Hazard Mitigation Planning Workshops.

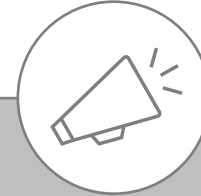
Stakeholders



Hazard Mitigation Planning Team (HMPT)

Group of stakeholders bringing a wide range of local expertise and perspectives. The group will include advocates, residents, business-owners, state and local agency representatives, and people from various other organizations.

Outreach



Outreach Team

City team who can help with in-person and virtual outreach and engagement events. This could include activity at local community organizations, schools, events, door-to-door outreach, and others engagement.



Public Engagement

Public Meetings will be an opportunity to educate about the HMP, share progress, and gather feedback and ideas. Results from these meetings and other feedback will be integrated into the final report. The group will include advocates, residents, business-owners, state and local agency representatives, and people from various other organizations.

The HMPT Members are key players in the overall engagement strategy

AGENDA



Welcome & Introductions



Overview & Previous HMPT Workshops



Mitigation Actions: **Prioritization Overview**



Mitigation Actions: **Prioritization Activity**



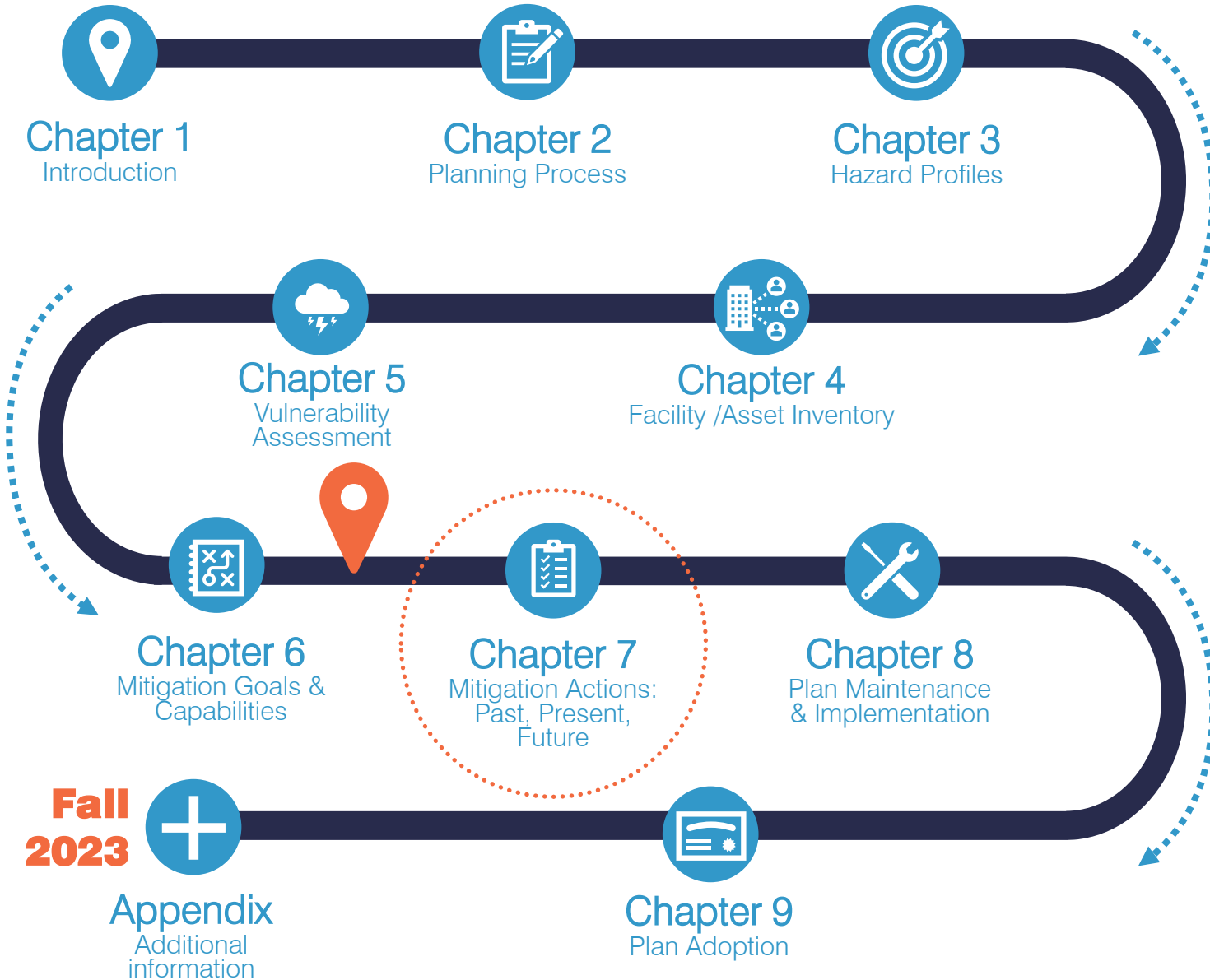
Final Thoughts & Next Steps



Conclude



WHY ARE WE HERE TODAY?

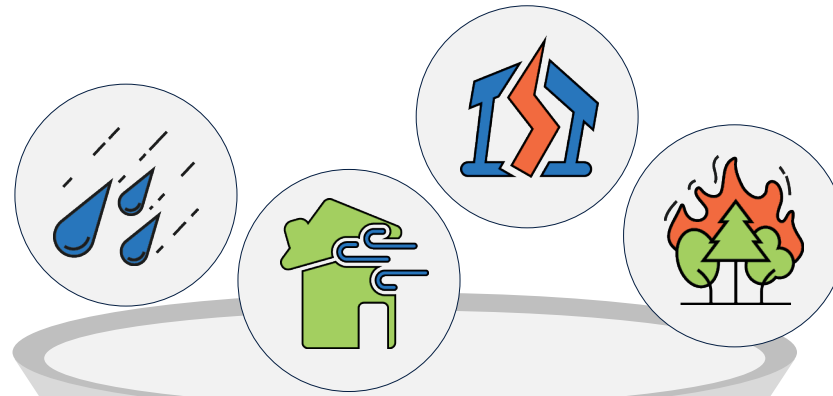


Your input today will directly impact the **Mitigation Actions** and how these actions can be **implemented** effectively and equitably.

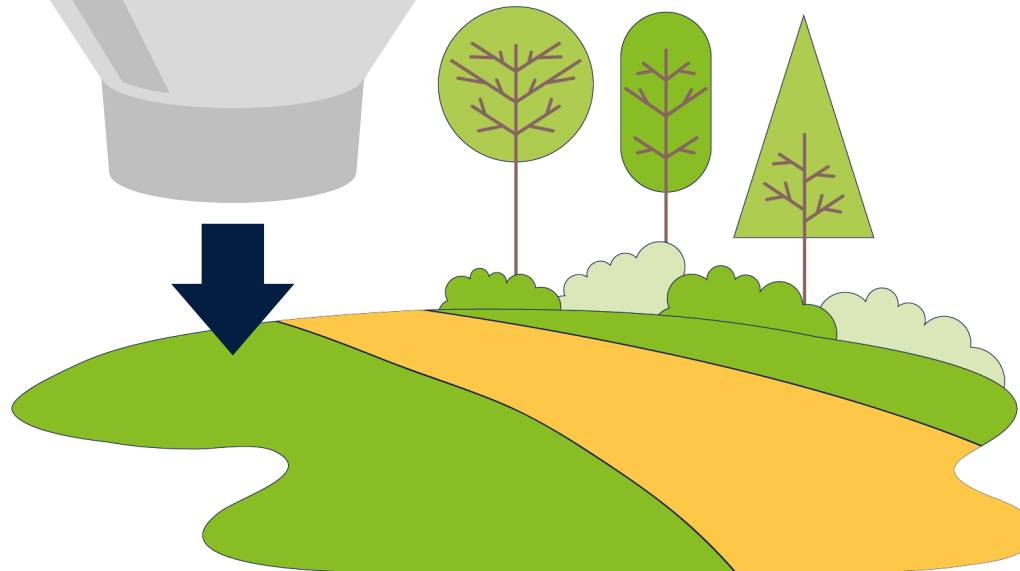
WHAT IS HAZARD MITIGATION?



Reduce impacts from
natural hazards...



...through plans,
projects, and services.



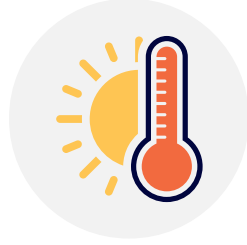
NATURAL HAZARDS



HURRICANES
/ TROPICAL
STORMS



INLAND
FLOODING



EXTREME
TEMPERATURES



SEVERE WINTER
WEATHER /
NOR'EASTERS



COASTAL
FLOODING



TSUNAMI



DROUGHT



WILDFIRE



EARTHQUAKES



TORNADOES



LANDSLIDES



INVASIVE
SPECIES

HOW DO NATURAL HAZARDS AFFECT...



PEOPLE

Assets that serve populations that are more vulnerable to disaster (e.g., elderly, children, visiting populations) and/or serve densely populated areas.



STRUCTURES

Built facilities that provide community lifeline services. A community lifeline enables the continuation of critical government and business functions and is essential to human health and safety or economic security.



SYSTEMS

A collection of components that perform a critical service for the community. Systems are linear type assets. Systems may include horizontal assets associated with linear type assets.



NATURAL, HISTORICAL, & CULTURAL RESOURCES

Areas that provide protective function to reduce magnitude of hazard impact and increase resiliency. Assets that possess historical, cultural, archaeological or paleontological significance



ACTIVITIES

Activities that have Value to the Community

HAZARD MITIGATION ACTIONS



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

Before an event

- Local code and regulations
- Maintenance
- Proactive Structural Projects

During an event

- Warnings
- Protection of critical facilities
- Emergency response

Following an event

- Clean up
- Restoration
- Enhancement

COMMUNICATIONS

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.

AGENDA



Welcome & Introductions



Overview & Previous HMPT Workshops



Mitigation Actions: **Prioritization Overview**



Mitigation Actions: **Prioritization Activity**



Final Thoughts & Next Steps



Conclude



MITIGATION ACTION: PRIORITIZATION PROCESS OVERVIEW



1. Consider the **Risks and Vulnerabilities** facing the City & City **Goals**



2. Identify the top **Categories and Actions**

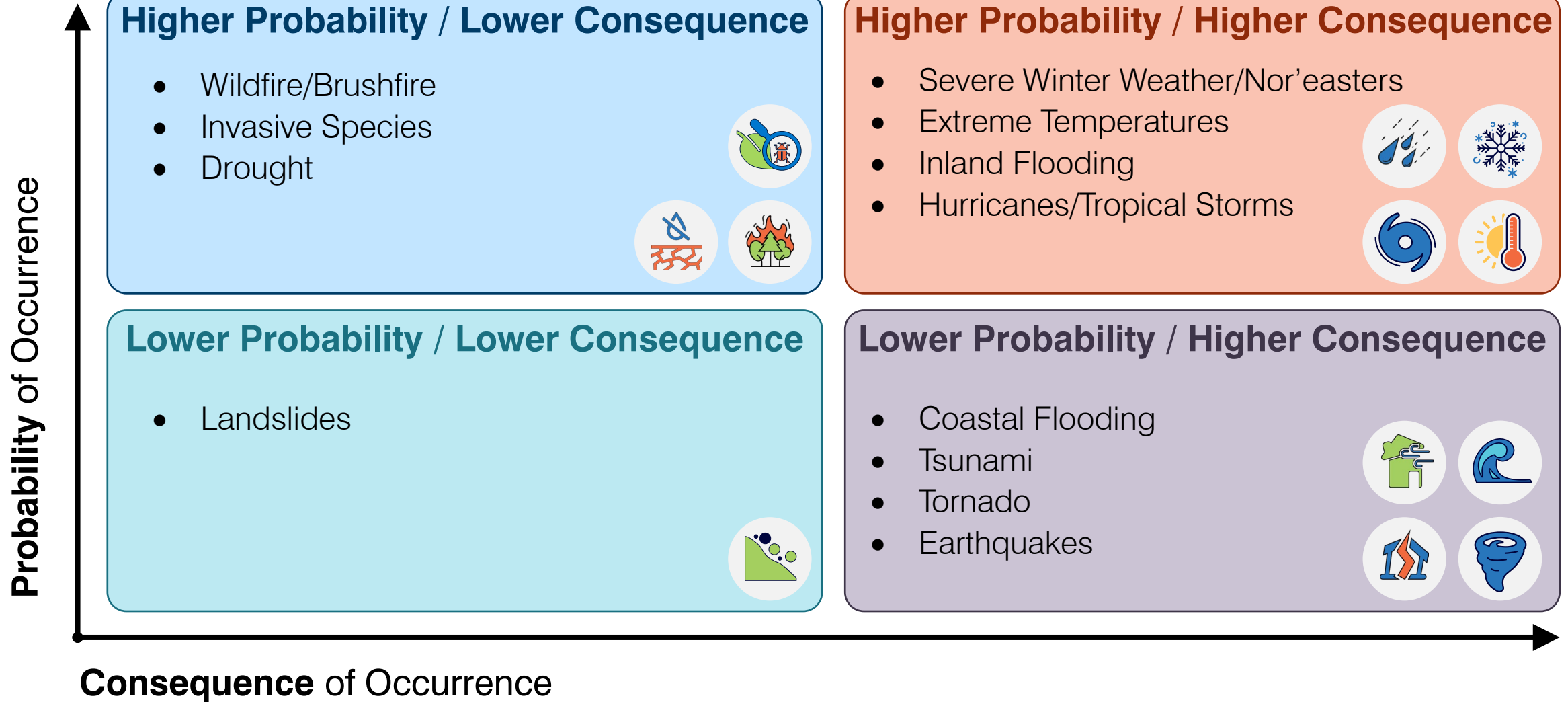


3. Project Team and Steering Committee to **review the results**



4. Finalize Prioritization Groups: **Low, Medium, High**

CONSIDER RISKS AND VULNERABILITIES



CITY'S 2023 HMP MITIGATION GOALS



1

Equitably *Protect*
Health and Safety of
the Community

2

Promote Public
Awareness and Resilience
through *Communication*

3

Coordinate and Collaborate in Hazard Mitigation
Planning and Climate Adaptation

4

Invest in and Plan for
Priority Hazard Mitigation
Implementation

5

Improve Capacity to
Monitor Existing
Changes

AGENDA



Welcome & Introductions



Overview & Previous HMPT Workshops



Mitigation Actions: **Prioritization Overview**



Mitigation Actions: **Prioritization Activity**



Final Thoughts & Next Steps

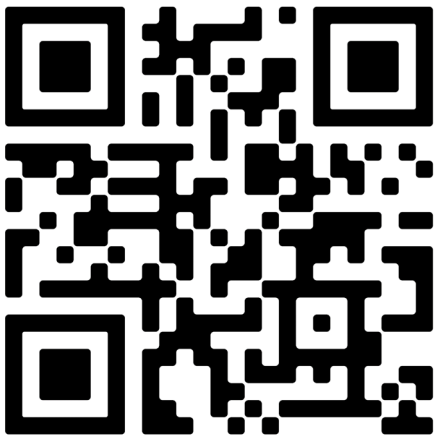


Conclude

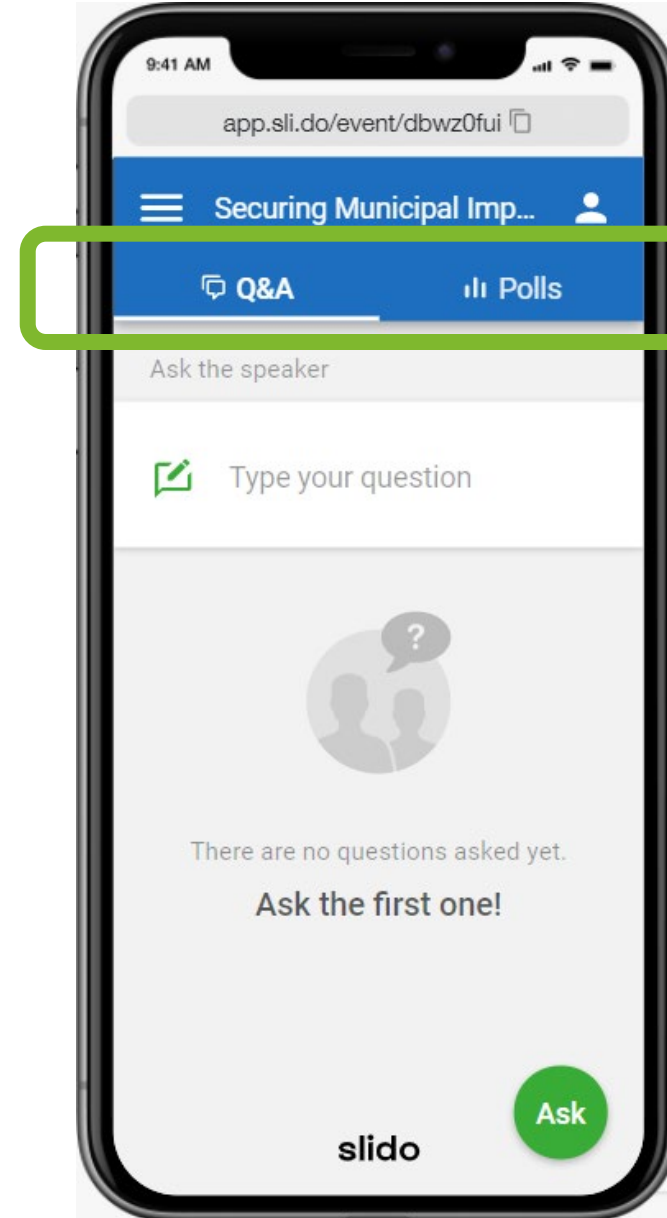


JOIN US ON SLIDO!

1. Get your phone ready
2. Follow instructions or use the QR code:



Or type URL:
Slido.com/Cambridge3



You can move between the Q&A tab and the polls tab!

ACTION CATEGORY: COMMUNICATIONS



Action A.1: Develop an enhanced communication plan and program related natural hazards (e.g., communications about resilience hubs and resources, a program for outdoor messaging, rapid deployment signage for wayfinding in emergency, etc.) in collaboration with community groups

Action A.2: Develop an annual media campaign about signing up for code red notifications

Action A.3: 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.

Action A.4: 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.

Action A.5: Harden regional radio towers

slido



Which of the following actions should be highest priority? Choose as many as you like.

(A)

ⓘ Start presenting to display the poll results on this slide.

RESULTS

COMMUNICATIONS



A1: Develop an enhanced communication plan and program related natural hazards in collaboration with community groups



A2: Develop an annual media campaign about signing up for code red notifications



A3: 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.



A4: 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.



A5: Harden regional radio towers



ACTION CATEGORY:

DRINKING WATER / SNOW REMOVAL



Action B.1: For components of the drinking water system (e.g., interconnections to MRWA, sluice gates at Winter Street Gatehouse, etc.), evaluate replacement of manually operated components with remote operated components, and flood proof doors/electrical components.

Action B.2: Hardening of Pason Park water storage tanks to protect from flooding

Action B.3: Improve/update cybersecurity measures for public water supply system

Action B.4: Design, permit, and construct flood walls for Fresh Pond reservoir to protect from saltwater intrusion

Action B.5: Upgrade deicing / snow removal equipment, including smaller equipment that is able to accommodate bicycle facilities

Action B.6: Create an emergency snow response plan which identifies overflow snow stockpile locations and salt storage.

slido



Which of the following actions should be highest priority? Choose as many as you like.
(B)

ⓘ Start presenting to display the poll results on this slide.

RESULTS:

DRINKING WATER / SNOW REMOVAL



B1: For components of the drinking water system (e.g., interconnections to MRWA, sluice gates at Winter Street Gatehouse), evaluate replacement of manually operated components with remote operated components, and flood proof doors/electrical components.



B2: Hardening of Pason Park water storage tanks to protect from flooding



B3: Improve/update cybersecurity measures for public water supply system



B4: Design, permit, and construct flood walls for Fresh Pond reservoir to protect from saltwater intrusion



B5: Upgrade deicing / snow removal equipment, including smaller equipment that is able to accommodate bicycle facilities



B6: Create an emergency snow response plan which identifies overflow snow stockpile locations and salt storage.



ACTION CATEGORY:

HOMES + HOMEOWNERS / SHELTERS / PUBLIC HEALTH



Action C.1: Develop a program to provide funding to property owners located in the 2070 10% flood area according to the City's flood viewer to make resiliency improvements to their properties.

Action C.2: Develop and update materials to support homeowners in completing retrofits related to flooding & heat (e.g., trainings, educational materials, and/or funding assistance)

Action C.3: Implement a policy to provide notification at point of sale/point of rental regarding anticipated future status in City flood viewer

Action C.4: Develop regulations of new basement apartments in flood zones

Action C.5: Complete a Shelter Assessment Plan

Action C.6: Create a list of health services which are operational during extreme events for community reference (i.e. dialysis centers)

Action C.7: Identify locations to hold deceased in mass casualty event.

slido



Which of the following actions should be highest priority? Choose as many as you like.
(C)

ⓘ Start presenting to display the poll results on this slide.

RESULTS:

HOMES + HOMEOWNERS / SHELTERS / PUBLIC HEALTH



C1: Develop a program to provide funding to property owners located in the 2070 10% flood area according to the City's flood viewer to make resiliency improvements to their properties.



C2: Develop and update materials to support homeowners in completing retrofits related to flooding & heat (e.g., trainings, educational materials, and/or funding assistance)



C3: Implement a policy to provide notification at point of sale/point of rental regarding anticipated future status in City flood viewer



C4: Develop regulations of new basement apartments in flood zones



C5: Complete a Shelter Assessment Plan



C6: Create a list of health services which are operational during extreme events for community reference(i.e. dialysis centers)



C7: Identify locations to hold deceased in mass casualty event.



ACTION CATEGORY:

COMMUNITY FACILITIES & STRUCTURES



Action D.1: Evaluate resiliency of community services on a case by case basis, e.g. food pantries are often on the first floor and vulnerable to flooding

Action D.2: Work with large property owners on resiliency assessments and emergency power needs.

Action D.3: 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.

Action D.4: Identify municipally owned buildings with more than 8 floors to perform assessment of water vulnerability during power outages

Action D.5: Ensure renovations of buildings with vulnerability populations (such as elderly housing and care facilities) incorporating resiliency strategies such as raising heating/cooling equipment

slido



Which of the following actions should be highest priority? Choose as many as you like.
(D)

ⓘ Start presenting to display the poll results on this slide.

RESULTS:

COMMUNITY FACILITIES & STRUCTURES



D1: Evaluate resiliency of community services on a case by case basis, e.g. Food pantries are often on the first floor and vulnerable to flooding



D2: Work with large property owners on resiliency assessments and emergency power needs.



D3: 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.



D4: Identify municipally owned buildings with more than 8 floors to perform assessment of water vulnerability during power outages



D5: Ensure renovations of buildings with vulnerability populations (such as elderly housing and care facilities) incorporating resiliency strategies such as raising heating/cooling equipment



ACTION CATEGORY:

COOLING + TREE CANOPY



Action E.1: Implement actions of Cambridge Urban Forest Master Plan (e.g., increase urban canopy on private property, increase public education on the benefits and proper care of trees on private property, etc.)

Action E.2: Identify areas for green stormwater infrastructure and reducing impervious surfaces

Action E.3: Integrate resiliency strategies and considerations into the City of Cambridge Open Space Plan update

Action E.4: Complete study evaluate shade needs (other than trees) referred to as "The Shade Study", and implement recommendations (e.g., adding shade structures)

Action E.5: Install water fountains and cooling features locations along bus/bike routes

Action E.6: Purchase portable emergency generators to power cooling facilities such as sprays pad and pools during prolonged heat waves and power outages.

Action E.7: Extend swimming pool operational hours.

Action E.8: Identify Cambridge housing- community rooms to use as cooling centers and shelters during storms if they include commercial kitchens.

slido



Which of the following actions should be highest priority? Choose as many as you like.
(E)

ⓘ Start presenting to display the poll results on this slide.

RESULTS:

COOLING + TREE CANOPY



E1: Implement actions of Cambridge Urban Forest Master Plan (e.g., increase urban canopy on private property, increase public education on the benefits and proper care of trees on private property, etc.)



E2: Identify areas for green stormwater infrastructure and reducing impervious surfaces



E3: Integrate resiliency strategies and considerations into the City of Cambridge Open Space Plan



E4: Complete study evaluate shade needs (other than trees) referred to as "The Shade Study", and implement recommendations (e.g., adding shade structures)



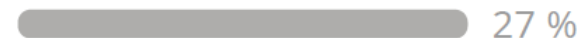
E5: Install water fountains and cooling features locations along bus/bike routes



E6: Purchase portable emergency generators to power cooling facilities such as sprays pad and pools during prolonged heat waves and power outages.



E7: Extend swimming pool operational hours.



E8: Identify Cambridge housing- community rooms to use as cooling centers and shelters during storms if they include commercial kitchens.



ACTION CATEGORY: STORMWATER & SEWER



Action F.1: Update and Improve Floodplain Mapping (Cambridge Flood Viewer)

Action F.2: Undertake interventions as a regional collaboration at Charles River and Amelia Earhart Dam to reduce overtopping/flanking

Action F.3: Design and construct stormwater holding tanks for Baldwin and Cambridgeport neighborhoods

Action F.4: City led program to install valves to mitigate basement backups of stormwater/sewage due to wet weather events

Action F.5: Improve collection and conveyance system at area east of 2nd Street and north of Charles Street (area #27)

Action F.6: Implement additional stormwater management measures: School, Pine, Cherry and Windsor Streets (area #26)

Action F.7: Complete Cambridgeport stormwater management program: Newton, Green, Franklin and Sidney Streets (CAM 017, area #28)

Action F.8: Design and construct updates to metering stations for Combined Sewers

Action F.9: Inspect and maintain targeted infrastructure pre-storm events (e.g. remove sediment and obstructions to allow stormwater to flow unimpeded)

slido

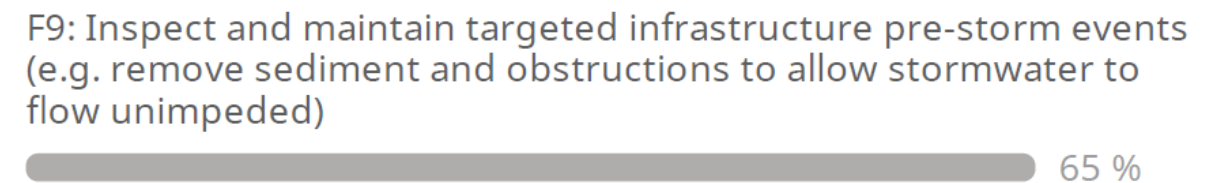
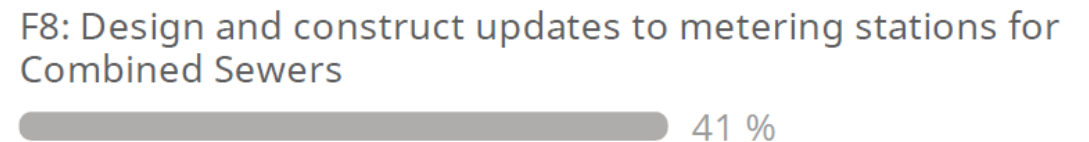
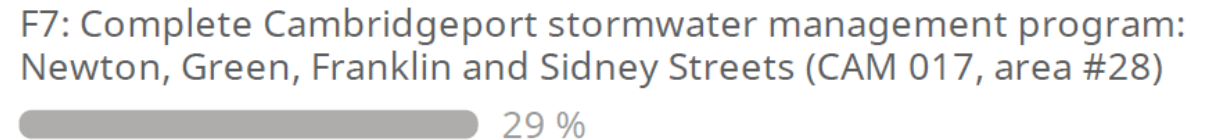
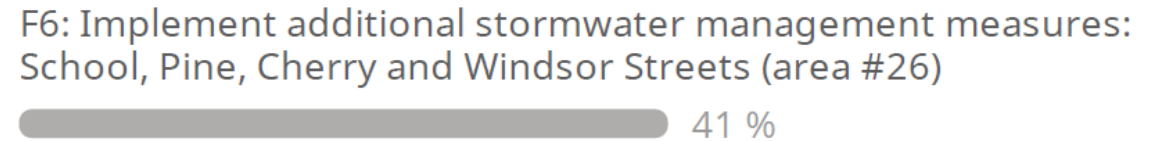
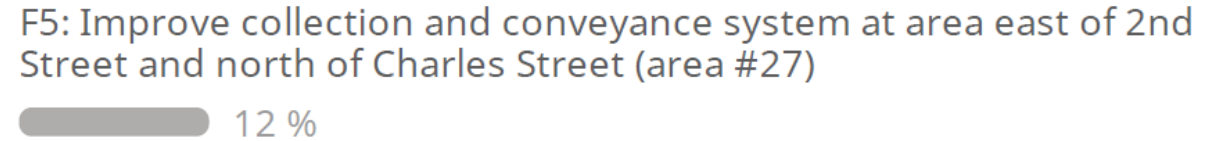
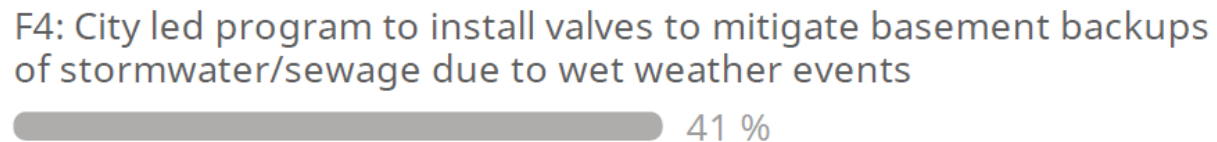
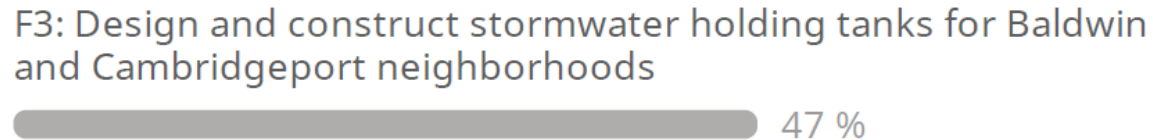
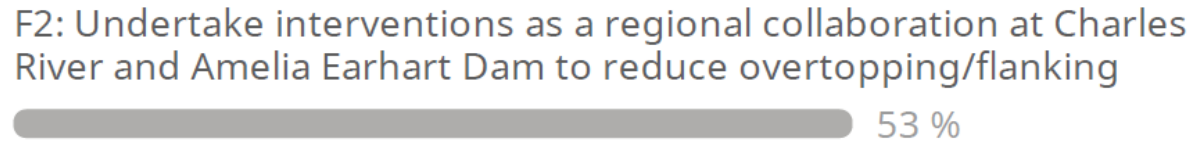
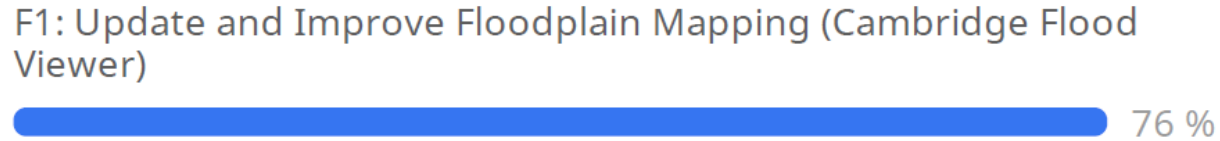


Which of the following actions should be highest priority? Choose as many as you like.
(F)

ⓘ Start presenting to display the poll results on this slide.

RESULTS:

STORMWATER & SEWER



ACTION CATEGORY:

ENERGY & BACK UP POWER



Action G.1: Collaborate with energy providers to protect critical community infrastructure

Action G.2: Work the MBTA on identifying and protecting critical power to the systems (i.e. substations)

Action G.3: Encourage installation of solar photovoltaic systems, cogeneration, and other energy supplies

Action G.4: Encourage energy efficiency in buildings through zoning requirements and community outreach

Action G.5: Evaluate use of Microgrid(s) for critical facilities and implement recommendations

Action G.6: Coordinate with Eversource on flooding related to power distribution system. Kendall power station will be flood resilient.

Action G.7: Prioritize clean energy solutions for power such as solar, battery, geothermal, etc. where feasible.

slido



Which of the following actions should be highest priority? Choose as many as you like.
(G)

ⓘ Start presenting to display the poll results on this slide.

RESULTS:

ENERGY & BACK UP POWER



G1: Collaborate with energy providers to protect critical community infrastructure



G2: Work the MBTA on identifying and protecting critical power to the systems (i.e. substations)



G3: Encourage installation of solar photovoltaic systems, cogeneration, and other energy supplies



G4: Encourage energy efficiency in buildings through zoning requirements and community outreach



G5: Evaluate use of Microgrid(s) for critical facilities and implement recommendations



G6: Coordinate with Eversource on flooding related to power distribution system. Kendall power station will be flood resilient.



G7: Prioritize clean energy solutions for power such as solar, battery, geothermal, etc. where feasible.



ACTION CATEGORY:

TRANSPORTATION + EVACUATION / COMMUNITY PARTNERSHIPS



Action H.1: Coordinate with the MBTA on backup plans for transportation

Action H.2: Develop a City-wide operations plan DPW and Police for how to respond to flooding.

Action H.3: Coordinating with adjacent communities for hazard preparation and response

Action H.4: Create an emergency response higher education and city collaboration

Action H.5: Support and seek funding sources for protecting/mitigating risks to and replacing public art associated with public buildings, including Mass Cultural Council and other funding sources interested in the overlap between emergency response/preparedness and art

Action H.6: Engage City Arts Council in mitigation planning

slido



Which of the following actions should be highest priority? Choose as many as you like. (H)

ⓘ Start presenting to display the poll results on this slide.

RESULTS

TRANSPORTATION + EVACUATION / COMMUNITY PARTNERSHIPS



H1: Coordinate with the MBTA on backup plans for transportation



81 %

H2: Develop a City-wide operations plan DPW and Police for how to respond to flooding.



75 %

H3: Coordinating with adjacent communities for hazard preparation and response



94 %

H4: Create an emergency response higher education and city collaboration



69 %

H5: Support and seek funding sources for protecting/mitigating risks to and replacing public art associated with public buildings



19 %

H6: Engage City Arts Council in mitigation planning



19 %

ACTION CATEGORY:

HISTORIC & DOCUMENT PRESERVATION / EARTHQUAKE, BRUSHFIRE, INVASIVE SPECIES MANAGEMENT



Action I.1: Develop a historic resources resilience plan

Action I.2: Perform a vulnerability assessment of vaults where hard copy records are kept.

Action I.3: Prepare an Earthquake Emergency Plan

Action I.4: Conduct maintenance activities to monitor and reduce brushfire risks

Action I.5: Prepare a Pest Vulnerability Matrix or similar pest and disease threat assessment and management options report utilizing 2014 street tree inventory data

slido



Which of the following actions should be highest priority? Choose as many as you like. (I)

ⓘ Start presenting to display the poll results on this slide.

RESULTS:



HISTORIC & DOCUMENT PRESERVATION / EARTHQUAKE, BRUSHFIRE, INVASIVE SPECIES MANAGEMENT

I1: Develop a historic resources resilience plan



I2: Perform a vulnerability assessment of vaults where hard copy records are kept.



I3: : Prepare an Earthquake Emergency Plan



I4: Conduct maintenance activities to monitor and reduce brushfire risks



I5: Prepare a Pest Vulnerability Matrix or similar pest and disease threat assessment and management options report utilizing 2014 street tree inventory data



ACTION CATEGORY:

EQUITABLE EMERGENCY RESPONSE PLANNING



Action J.1: Ensure Emergency Response Plan is multi-lingual

Action J.2: Encourage disability indicator 911 enrollment for list needing additional follow up response in an emergency

Action J.3: Increase emergency response personnel staffing and training on medical issues

Action J.4: Provide backup/public Wi-Fi at the library, hotspots you can sign out.

Action J.5: Create contracts for supplying emergency responders with food/ refreshments

slido



Which of the following actions should be highest priority? Choose as many as you like. (J)

ⓘ Start presenting to display the poll results on this slide.

RESULTS:

EQUITABLE EMERGENCY RESPONSE PLANNING



J1: Ensure Emergency Response Plan is multi-lingual



J2: Encourage disability indicator 911 enrollment for list needing additional follow up response in an emergency



J3: Increase emergency response personnel staffing and training on medical issues



J4: Provide backup/public Wi-Fi at the library, hotspots you can sign out.



J5: Create contracts for supplying emergency responders with food/ refreshments



J6: Develop a centralized emergency response management system (e.g. communications and coordination)



AGENDA



Welcome & Introductions



Overview & Previous HMPT Workshops



Mitigation Actions: **Prioritization Overview**



Mitigation Actions: **Prioritization Activity**



Final Thoughts & Next Steps



Conclude

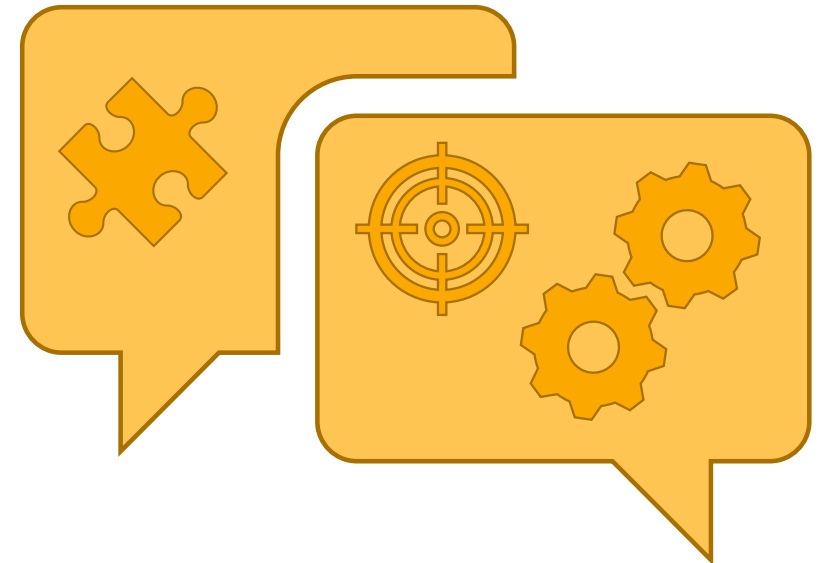


PUBLIC MEETING



Virtual: Sept. 13 from 12PM - 1PM

In-Person & Virtual: Sept. 13 from 6PM-7PM



TAKE THE SURVEY!



The City of Cambridge is updating its Hazard Mitigation Plan for a more resilient, safe, and prepared community.

Share your experiences of living in Cambridge to help the City understand how it can improve. Please take this short, 5-minute survey to share your insights.

tinyurl.com/CambridgeHMPsurvey

This input will help shape the **strategies, projects, policies,** and **decisions** the City makes regarding natural hazards.

Please share with your networks!



Hazard Mitigation Plan Update 2023

Thank You!



**CITY OF
CAMBRIDGE**



NOTES HMPT WORKSHOP 3

Attendees

1. Ali Sorrels
2. Melissa Castillo
3. Nahid Chowdhury
4. Celeste DePalma
5. Lindsay Diaz
6. Eric
7. Julie Greenwood-Torelli
8. Julie Wood
9. Jennifer Letourneau
10. Leila Mekias
11. Mikayla Criger
12. Nancy Porter
13. Pasang Lhamo
14. Susanne Rasmussen
15. Sherry Bernard
16. Michele Scott
17. Steven Nutter
18. Suzanne Blake
19. Rachel Tanenhaus
20. Peter Vellucci
21. Catherine Woodbury
22. Jason W Wright

General Notes

- Shelters for emergencies
 - Include assessing how people get there
 - Include what kinds of catastrophes they will be using them for because different people will come and different shelters will be appropriate or not
 - And assess how to know if we need them because sometimes no one shows up
- Public Arts with enhancing resilience work is already happening (H5 + H6)
- Add action: Continue to engage with the Charles River Climate Compact - regional collaboration
- Include historic and other cultural resources in public art funded projects
- Coordinating with higher education on emergencies is already happening

- Tree inventory: change 2014 to latest data
- Add action: create centralized emergency response plan, centralized emergency response management between departments
- People with disabilities rely on government programs but also have good reason to not trust government (in response to disability registry), maybe action could actually be training staff and emergency responders

Chat Votes

- A1 + A3
- B3
- C6 then C5 then C3
- D1, D3, D5
- E2, E8
- All F – all are important
- F1, F2, F6, F7, F8, F9
- G1, G5, G7
- H1, H2, H3, H4
- I1



Appendix C

HMP Fact Sheet and Public Survey Results

CAMBRIDGE HAZARD MITIGATION PLAN



Have you wondered if the City is prepared to withstand these events?

Are you concerned about rising heat and unusually warm winters?

Are you concerned about more extreme storms, hurricanes, and weather events?



Are you, or someone close to you, vulnerable to interruptions in electricity, transportation, or access to shelter?



What is the City Doing?

The City of Cambridge is working hard now to prepare for a more resilient and safe community. The City is updating its Hazard Mitigation Plan, which will study risks from natural hazards and introduce strategies to address these hazards now and in the future. The City will be incorporating community feedback, vulnerability data, and City planning goals.

Natural hazards are likely to become more severe and more frequent due to projected climate change. The HMP seeks to document vulnerabilities and strengths related to historic natural hazards and projected climate change. Based on this analysis and community input, the HMP will outline projects and policies to improve resilience and reduce the potential social and economic losses resulting from natural hazards.



What Risks Does Cambridge Face?

- Hurricanes / storms
- Extreme temperatures
- Severe winter weather / nor'easters
- Drought
- Flooding
- Invasive species
- Climate Change
- Brush fire



Share Your Thoughts!

Public feedback is an essential component to ensure the hazard mitigation and climate adaptation planning process reflects your input. **You can share your experiences of living in Cambridge through this short, 5-minute survey, to help the City understand how it can improve.** We look forward to hearing your experiences, ideas, and concerns.



tinyurl.com/CambridgeSurveyHMP



Are you concerned about rising heat, unusually warm winters, and other extreme events?



The City of Cambridge is working hard to prepare for a more resilient and safe community by updating its Hazard Mitigation Plan, which will study risks and introduce strategies to address natural hazards now and in the future.

Share your experiences of living in Cambridge to help the City understand how it can improve.

Please take this short, 5-minute survey to share your insights.

Scan the QR code or type in the link to access the online survey.

tinyurl.com/CambridgeSurveyHMP





The City of Cambridge is updating its Hazard Mitigation Plan for a more resilient, safe, and prepared community.



Share your experiences of living in Cambridge to help the City understand how it can improve. Please take this short, 5-minute survey to share your insights.

tinyurl.com/CambridgeSurveyHMP



1.1 Public Survey Results

The Hazard Mitigation Plan Public Survey was distributed to community members through virtual, hard copy, and community outreach network methods. These included the City Daily Update Email, City social media, virtual and hard copy flier distribution, and promotion in partnership with Cambridge Community Corp, the Climate Leaders, and the Community Engagement Team. The survey was also distributed through the Hazard Mitigation Planning Team and Steering Committee networks.

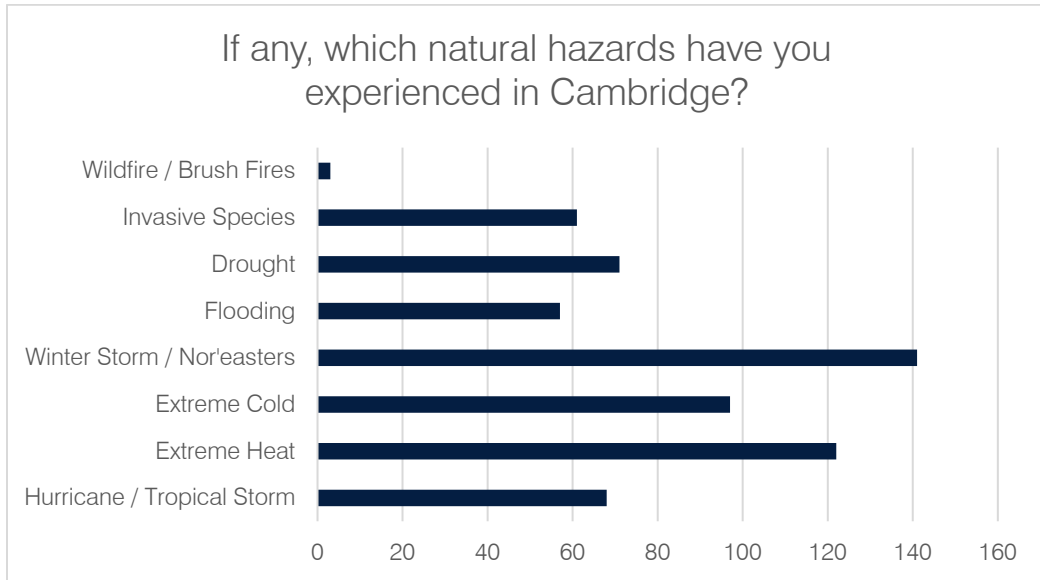
Over 150 residents responded to the survey in July 2023. All the responses were in English, although additional languages were provided. All Cambridge neighborhoods were represented among the Survey respondents. A variety of ages, racial identities, and amount of time spent living in Cambridge were also represented among the Survey respondents. A full report of survey responses can be found in Appendix C.

Below is a full compilation of the results.

1.1.1 | If any, which natural hazards have you experienced in Cambridge?

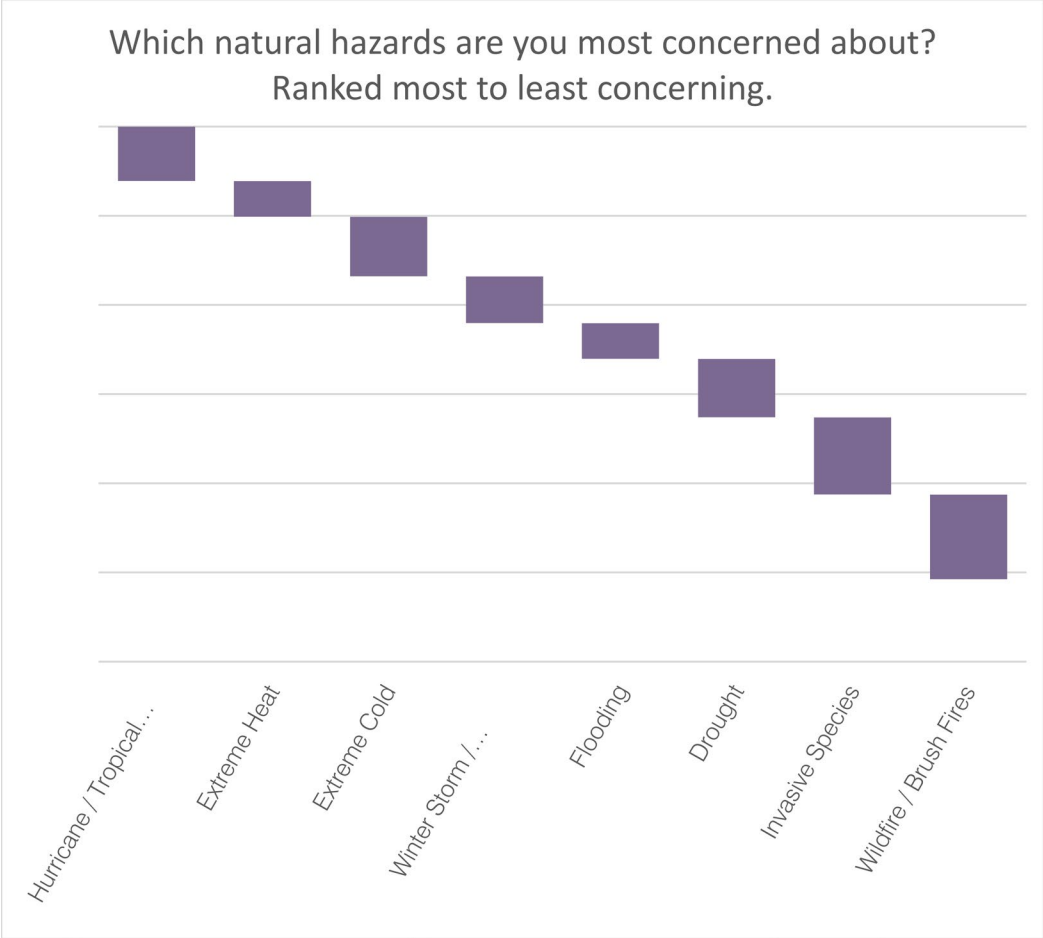
Answered: 149

Skipped: 6



1.1.2 | Which natural hazards are you most concerned about? Rank 1 for most concerned and 8 for least concerned. You can drag the responses or use the arrow buttons to change the order.

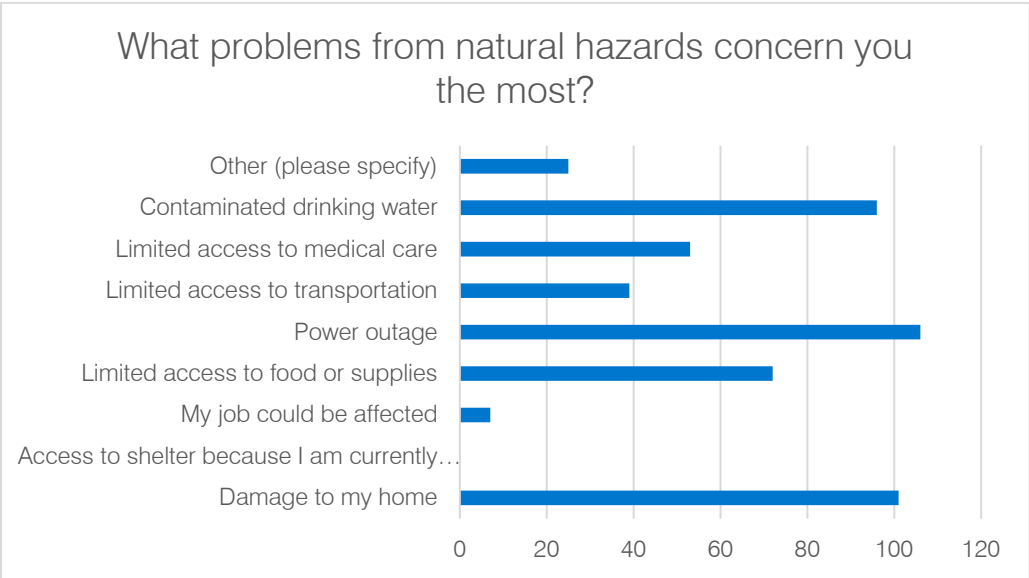
Answered: 141
Skipped: 14



1.1.3 | What problems from natural hazards concern you the most?

Answered: 138

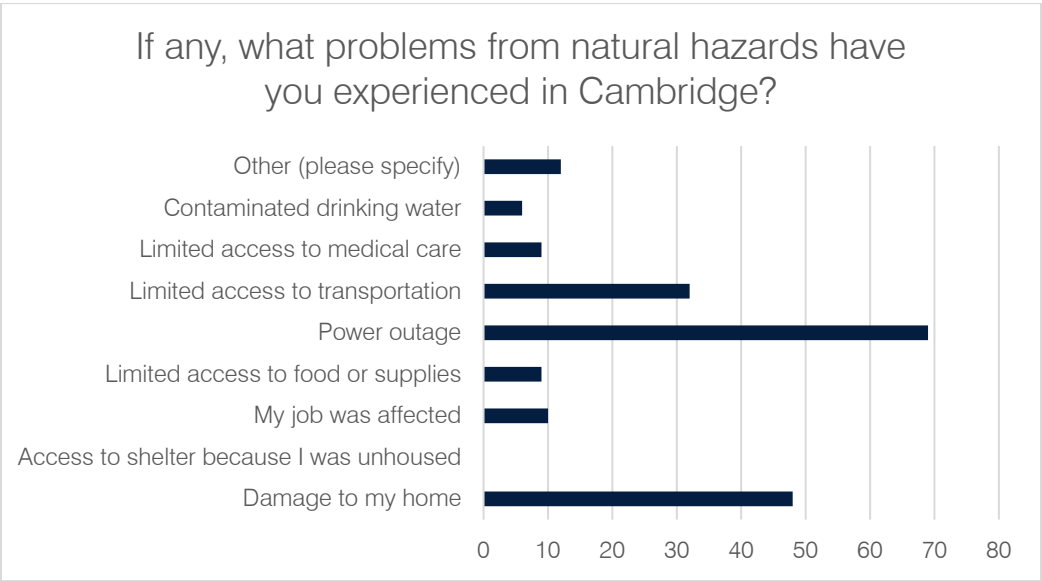
Skipped: 17



1.1.4 | If any, what problems from natural hazards have you experienced in Cambridge?

Answered: 96

Skipped: 59



1.1.5 | Tell us about your experiences with natural hazards and how they have impacted your life.

Answered: 60

Skipped: 95

- A great deal of stress due to heavy rains that cause leaks into my living space
- n/a
- basement flooded
- Heavy rains caused water damage in our apt; wildfire smoke kept us inside; a polar vortex caused our boiler to fail and a carbon monoxide leak
- Any natural hazards that affect public transportation or make it risky to walk anywhere have impacted my life. I have mobility issues that limit my activities.
- Plenty of memories of taping up the windows for a hurricane. Trying to figure out how to remove the excess snow from the eaves, or where to put the 'new' snow to keep the driveway and sidewalk clear. Having my back go out trying to clear the ice-berm the snowplows would leave across the driveway, blocking emergency egress from the house.
- The large tree in front of my house came down in the hurricane in 1985.
- Consideration of where to buy property due to potential flooding.
- We had a tree go down in a hurricane and smash our fence, shed, rip up private road made of vintage bricks the road cant afford to fix, and expose our gas line. the city cut off the part of the tree over the road and we were left to find someone to remove the tree despite the gas line and it was hard, our neighbor's same tree is threatening to hit our house but they cant afford the aborist required to assess or remove if approved and it could kills us, we lost cars when flooded and it appeared to be a badly routed sewer issue, camb took down the two trees next to our house without replacing them, heating up our yard, we had a 12 alarm fire four blocks away (may have been human caused), the T broke down during the snowpocalypse and our house leaked from ice dams, we can not get the black swallow wort, norway maple seedlings, bittersweet to stop coming up in our yard, and the river where I row keeps having toxic run off and algae and invasive weeds, and there are no safe places to go in wind storms - we have no basement.
- There was floods in my building and now insurance has risen spectacularly
- 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.
- I used to live in an apartment without air conditioning, and it could get miserably hot in the summers. 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.
- a few months ago there were thought to be 'forever chemicals' in cambridge water supply , when we switched temporarily to boston's supply... we got a water filter
- NA
- Not much impact yet. I fear more drastic impacts in the future.

- The first floor of my home in the Port was flooded about a decade ago. I'm worried about it happening again. Six of us live here, and our kitchen is on the first floor.
- I've been in Cambridge since the fall of 1991 -- just after Hurricane Bob blew through. My experience in the city between then and now has been very good with respect to natural hazards and I've experienced minimal disruption. The city does a very good job of dealing with big snow storms, which are the primary natural hazard I've experienced. I was most affected by the April Fool's Day storm and the 100+ inch winters, but the impacts were largely just inconveniences. There have also been instances of flooding. In one case I hydro-locked my car's engine driving through a deeper-than-I-thought puddle at the intersection of Columbia and Bishop Allen. I have only experienced minor basement flooding after extremely heavy rains.
- No impact yet, but storms and weather extremes seem to be more common.
- Recent wildfire smoke affected my health
- only COVID, but I was an essential worker so still had a job
- Very little impact, actually. During our recent three year drought my garden suffered. There have been very few power outages. My concerns lie more with the unhoused.
- Dead birds and trees from man/nature caused loss of habitat; dangerous air quality from fires elsewhere
- Mostly second hand from friends in New Orleans and California and other things I have learned. -being stuck inside, isolation (esp for older adults) -unhoused and poor being affected most, often w racial intersections - environmental damage/local ecosystems affected
- During extreme weather, MBTA is usually impacted and often my internet access is as well. And I am concerned about the water since they found too much PFAS in it recently.
- My basement has flooded twice when we had storms that dumped 7-8 inches in 48 hours.
- I have not experienced extreme natural hazards that have impacted my life. I'm not sure what to expect
- This past winter we experienced a cold snap of -9 F. A heating pipe in my house froze solid and burst, causing flooding and damage. It would have been worse, but we had stayed up all night running hair dryers on other pipes to keep them from freezing as well. (Our toilets wouldn't flush because of ice in the pipes.) Even with the heat working nonstop some rooms got as cold as 50 F and the walls were colder. I ended up staying in the bathroom with the heated floor as the only place warm enough. If I had been ill at the time or if the power had gone out, it would have been much worse. What will happen next time?
- Our basement flooded right years ago with 2-6" of water. We lost a few items but most was already in plastic bins or elevated.
- I grew up in an area with frequent hurricanes and have experienced a few powerful named storms and the aftermath left behind
- After damage from hurricane Sandy, I installed a generator running on city gas. Also, my car has been damaged twice by falling tree limbs.
- worries about elders in community
- Trees /limbs falling on house and garage . One summer two years ago I had to replace my garage roof twice because of fallen huge limbs from neighbors trees
- As above. Few people seem to make the connection between the natural world (insects and plants especially) and the survival of humans. I speak for these because they cannot

speak for themselves and I see the decline in the quality of the ecosystem on a daily basis. Just looking on any street there is obvious the damage to trees - not just falling but also greater susceptibility to pest and disease. And drought and at least the city/state should be able to water trees during a drought. What a waste. Doing things like building more cooling shelters is fine but does not address the root of the problem.

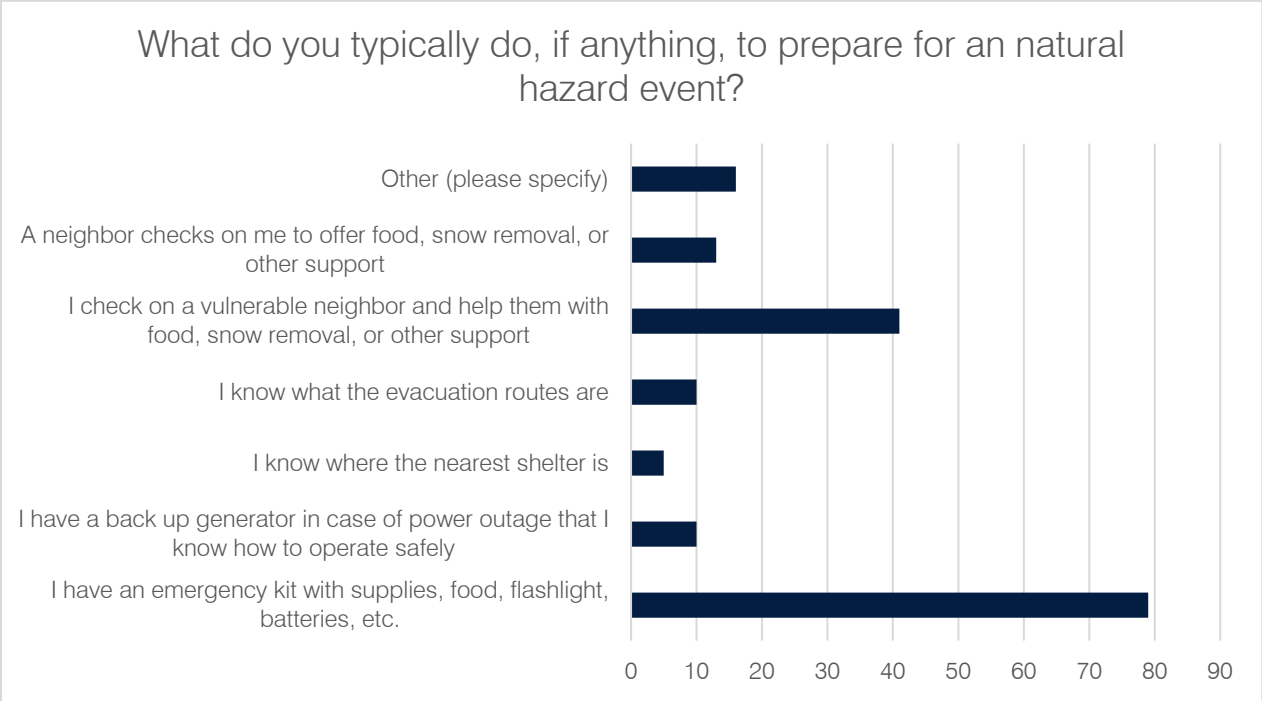
- It's a hoax.
- I've never personally experienced a natural hazard where I felt particularly in danger except extreme heat. Not everyone has access to A.C. or understands how dangerous heat can be.
- Power outages lasting a few days in cold weather. Fortunately, had a gas-fired fireplace that did not need electricity to keep at least part of the house warm.
- Heat alert - like today!- keeps my family inside, and I worry about residents without AC. All extremes of temperature or drought have damaged to trees and plants nearby. Flooding has caused damage to my home, also creates hazards for young children
- I have been relatively unaffected other than costs to repair home & fences, but am still concerned about wider hazards to buildings, utilities, common areas, and underground utilities
- Blizzards can't get out at all very deep snow heat sometimes causes power to fail which is very uncomfortable
- Major rainstorm in 2010ish dropped 6 inches of rain in just a few hours. High winds blew off my chimney cap, so we had water damage from water entering via the chimney and spreading through the walls (but basement stayed dry. Yeah French drain and dump pump). This caused about 25k in damage (we had to remove all plaster/insulation on that side of the house). If we hadn't had the cash reserves to act immediately, it would have also been a huge mold/mildew issue.
- none really - maybe occasional brief power outage
- Mostly nor'easters and associates regional issues.
- No great impact yet.
- Most of my neighbors have basements and have had floods that destroyed appliances etc. We do not have a basement but lack storage. Our neighborhood electrical power has been affected often by issues with the transformer that powers our block, despite requests to update and secure. I worry that the infrastructure here is not adequate for homes to exclusively use electricity - nor am I convinced that electric power is free of fossil fuels or reliant.
- Frozen pipes, T shutdowns, difficult driving conditions
- Home flooding due to flash flood conditions (extremely heavy rain).
- The street I previously lived on flooded frequently. My primary mode is walking so that made it hard to get around. Walking and outdoor exercise are also less viable in extreme heat, during poor aqi days, or on icy, unshoveled sidewalks.
- Our electricity went out 2 winters ago on the coldest day. Because our heat is electric, we had to leave our home until Eversource fixed the issue in the street.
- Winter Blizzards with over 6ft of snow
- water in the basement
- I have had water damage at three different addresses in Cambridge. Repair costs are high and not always covered by insurance.

- A tree collapsed in front of my house. My basement floods. I have fallen on the ice. I am sensitive to extreme temperatures. I am elderly and poor and I live alone.
- I forgot the year but I suffered snow storm makes problem in my life to take medical access.
- Mainly through gardening, seeing the changes and lack of constancy over the past forty years. The \$1000 water bills one year and the floods the next. No peaches this year.
- It's impact of my job.
- flooding in basement and combined sewage overflows
- Less transmission, pure water and less food.
- I work at MIT's Humanitarian Supply Chain Lab and help FEMA respond to natural hazards. Its my day job. I've lived in the Caribbean. Been in earthquakes, hurricanes, floods...
- n/a
- During hurricane Sandy a tree fell on my house. Not in Cambridge.

1.1.6 | What do you typically do, if anything, to prepare for a natural hazard event?

Answered: 103

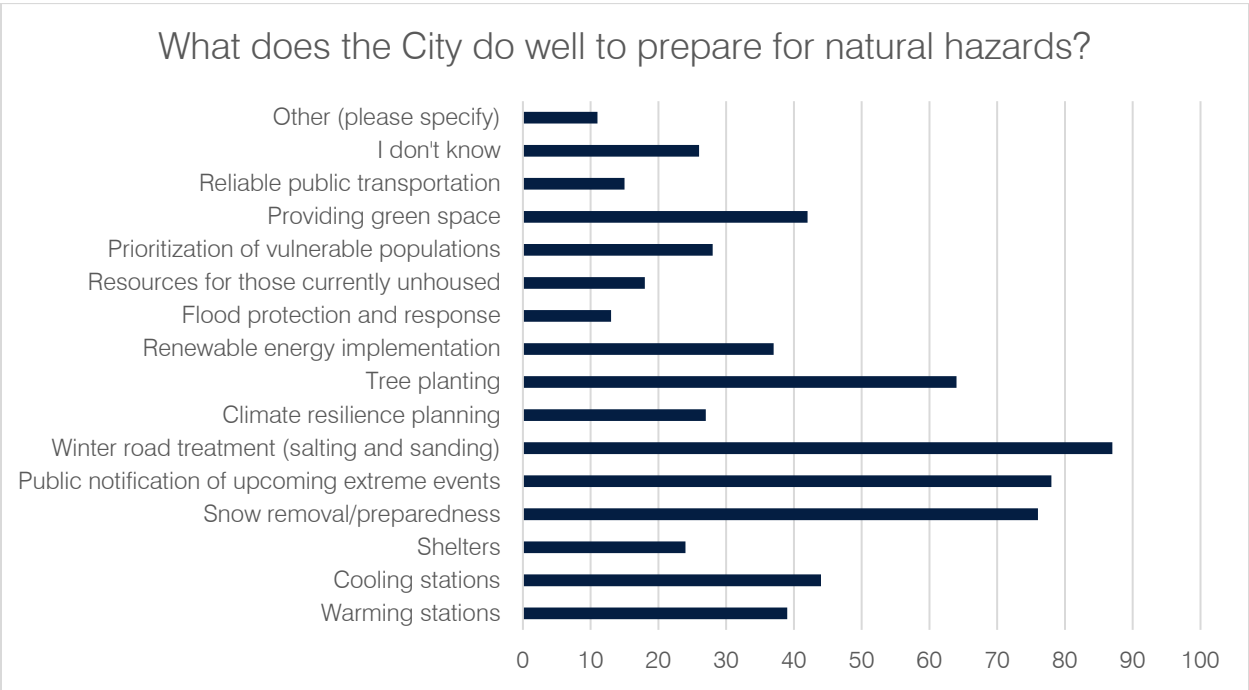
Skipped: 52



1.1.7 | What does the City do well to prepare for natural hazards?

Answered: 133

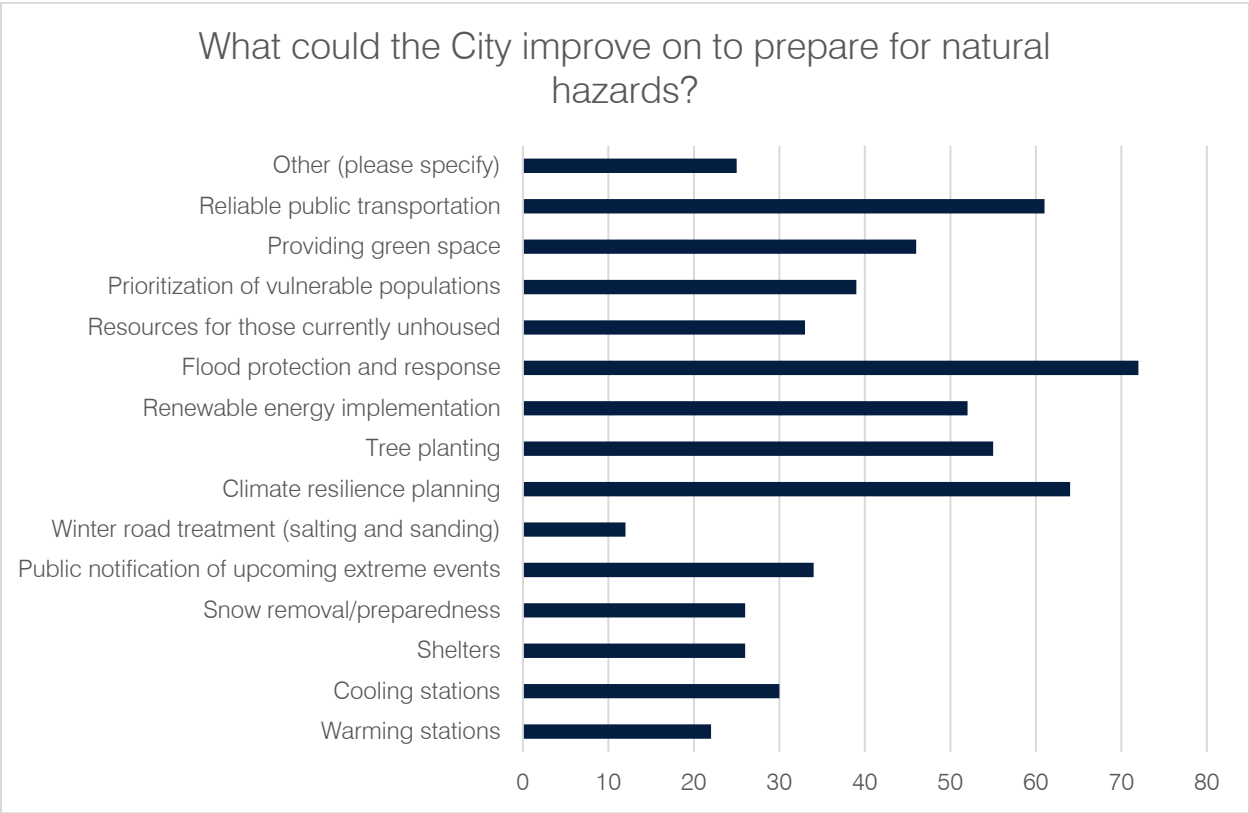
Skipped: 22



1.1.8 | What could the City improve on to prepare for natural hazards?

Answered: 128

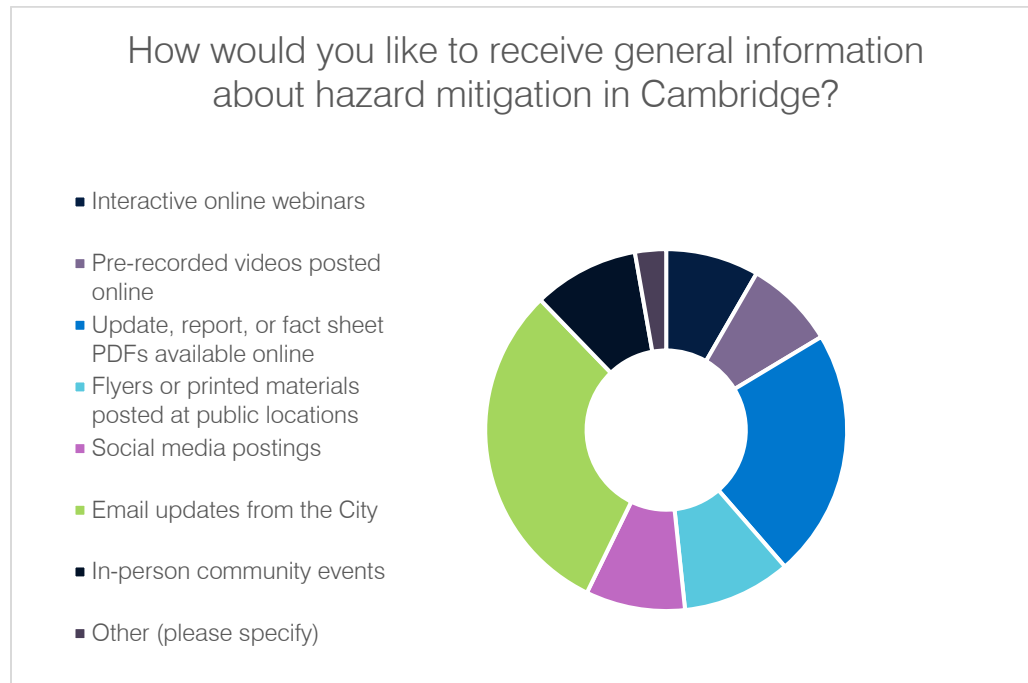
Skipped: 27



1.1.9 | How would you like to receive general information about hazard mitigation in Cambridge?

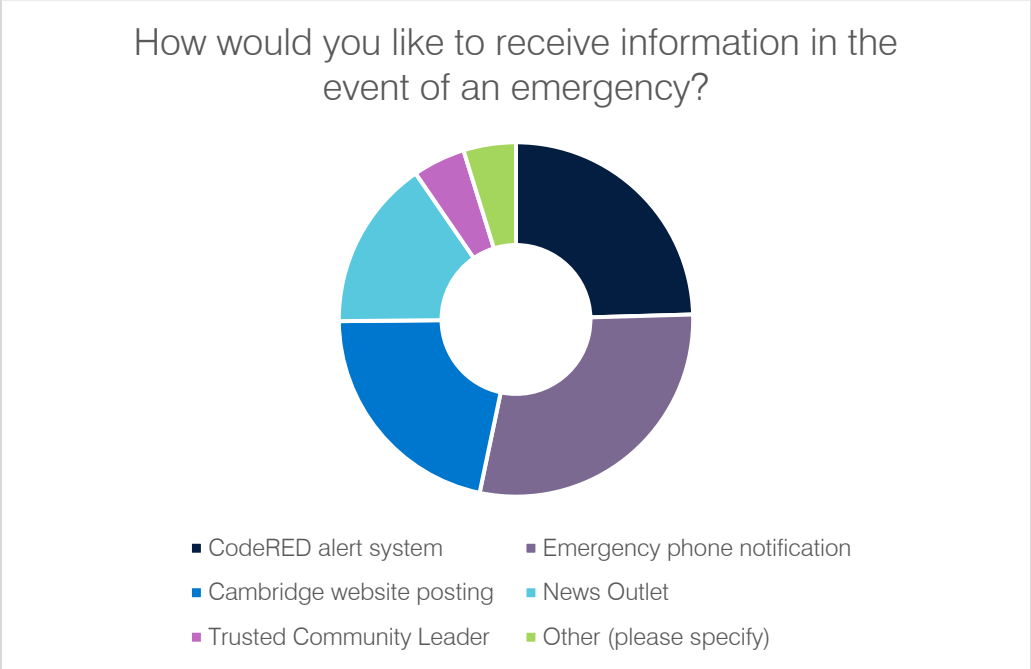
Answered: 129

Skipped: 26



1.1.10 | How would you like to receive information in the event of an emergency? Check all that apply. You can sign up to receive CodeRED alerts here.

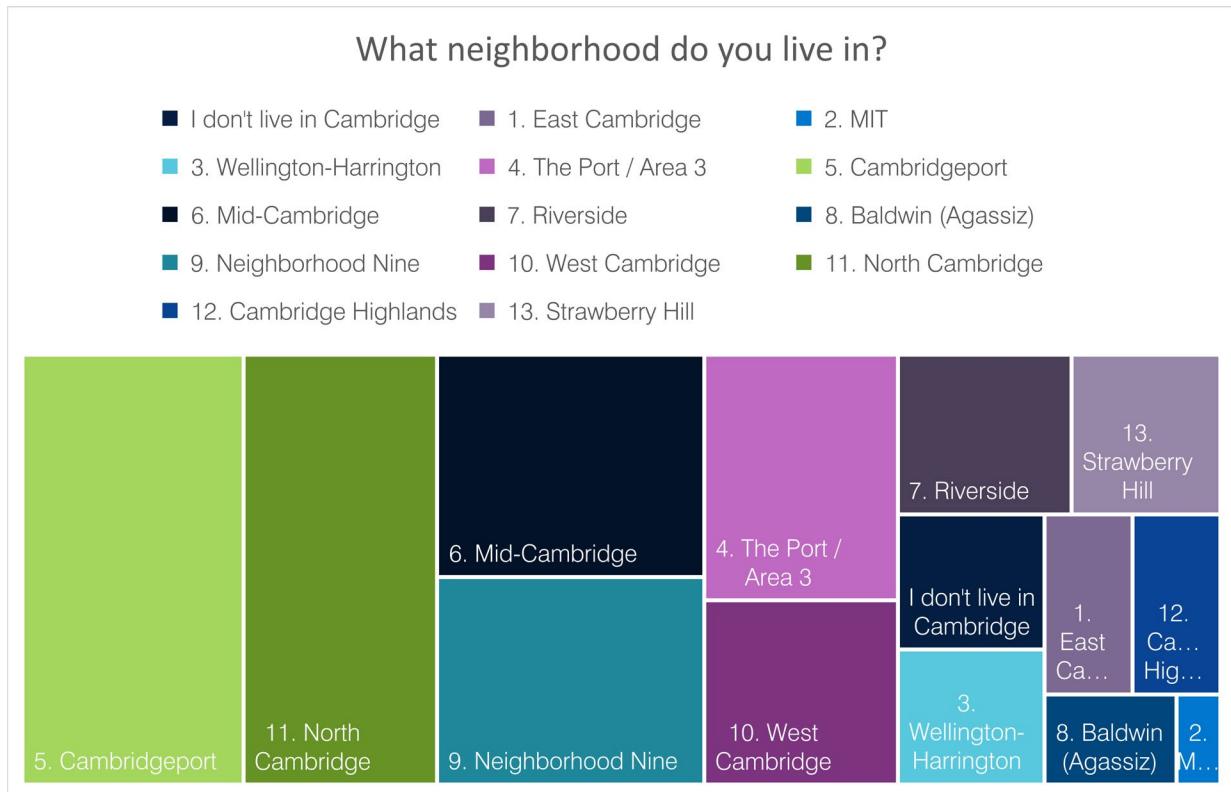
Answered: 129
Skipped: 26



1.1.11 | What neighborhood do you live in?

Answered: 130

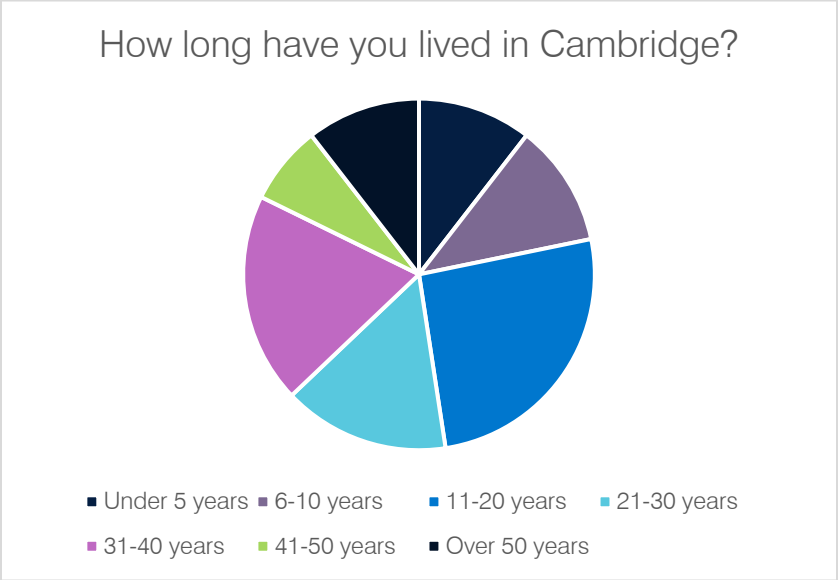
Skipped: 25



1.1.12 | How long have you lived in Cambridge?

Answered: 124

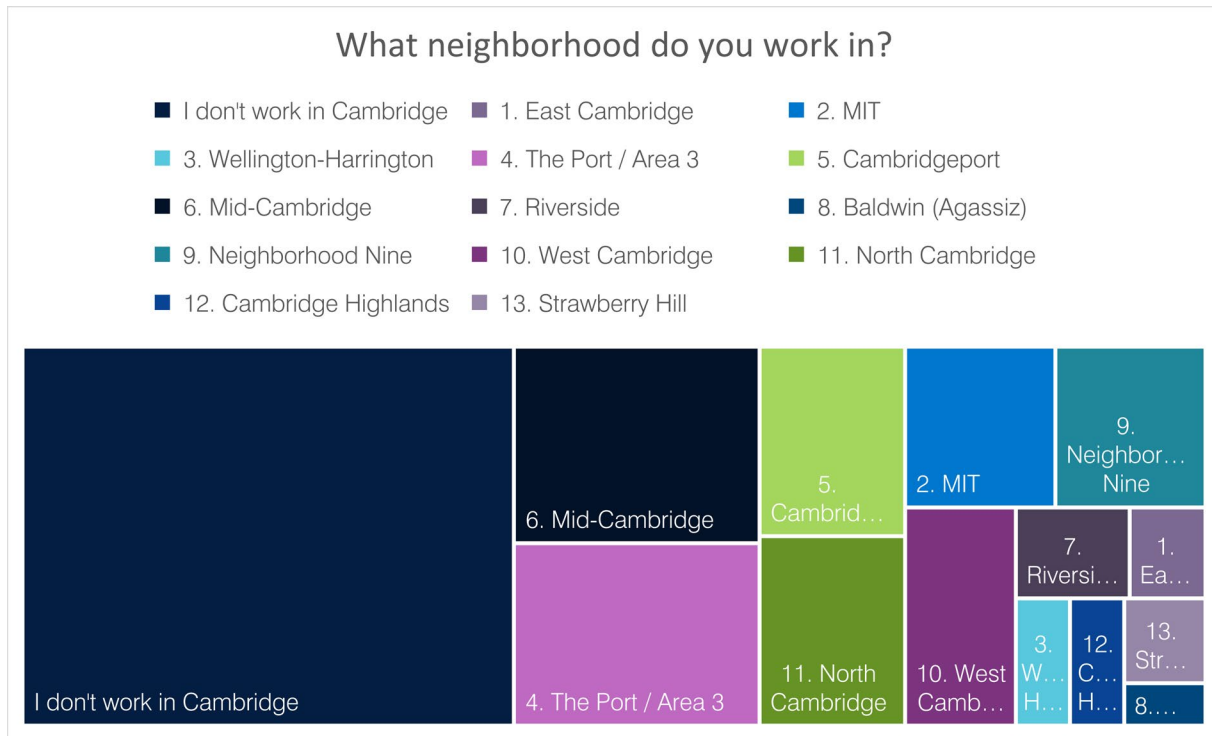
Skipped: 31



1.1.13 | What neighborhood do you work in?

Answered: 130

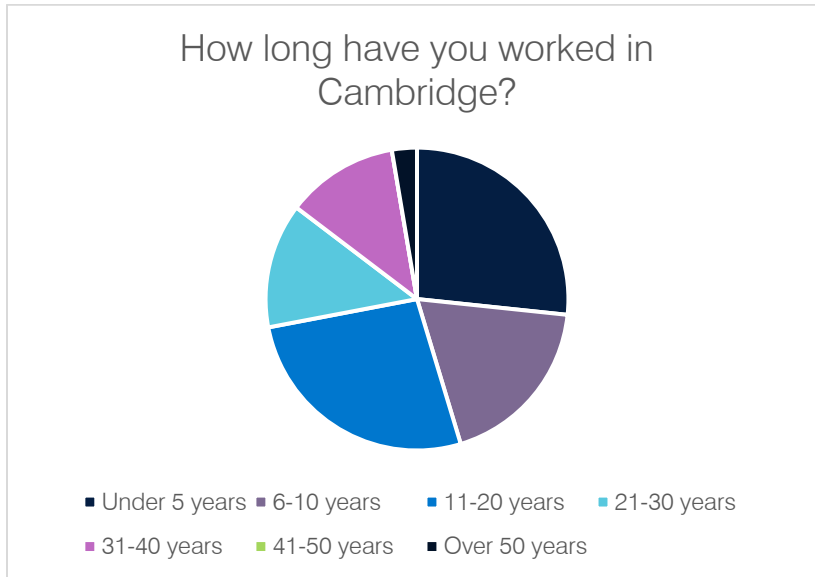
Skipped: 25



1.1.14 | How long have you worked in Cambridge?

Answered: 75

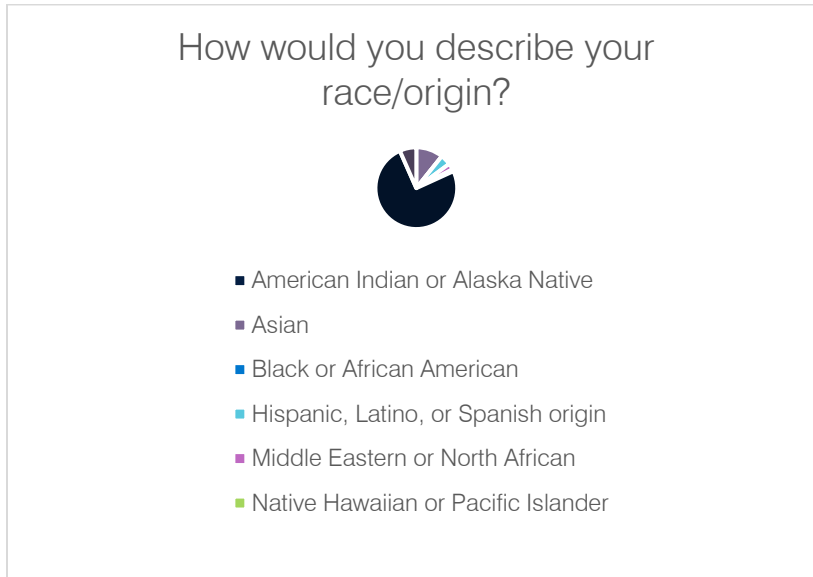
Skipped: 80



1.1.15 | How would you describe your race/origin?

Answered: 118

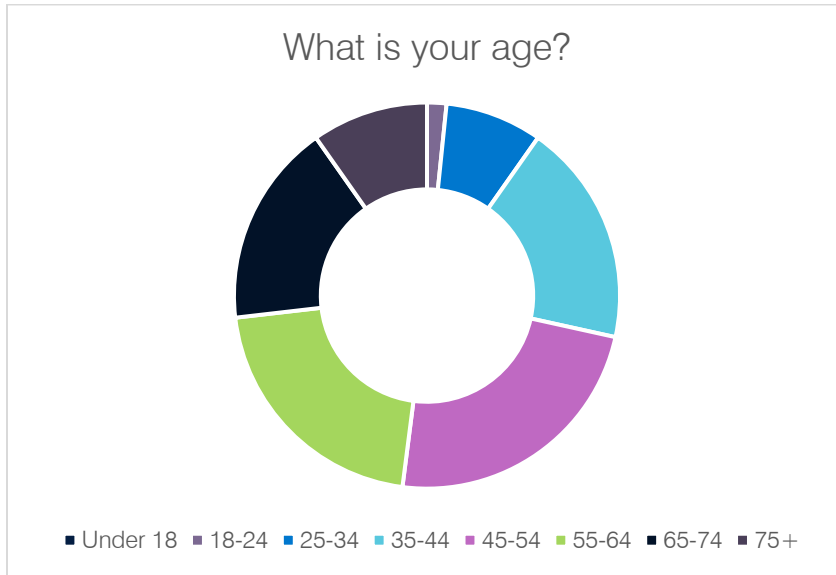
Skipped: 37



1.1.16 | What is your age?

Answered: 123

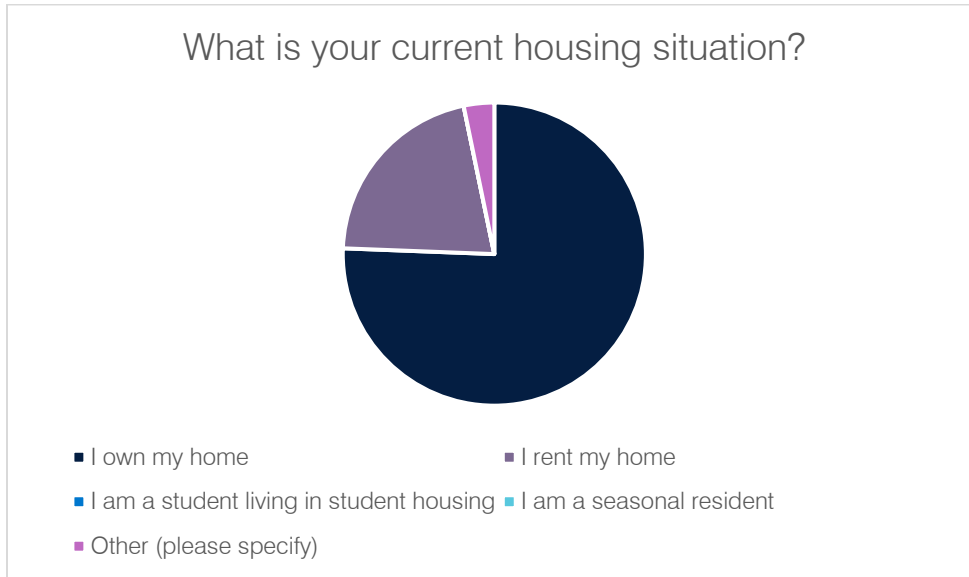
Skipped: 32



1.1.17 | What is your current housing situation?

Answered: 123

Skipped: 32



1.1.18 | What else would you like us to know about hazards that you or others face in Cambridge?

Answered: 53

Skipped: 102

- Rats are still a problem. I'm seeing fewer than a year ago but they are a big pest
- n/a
- Cambridge is wonderful. But the climate changes we are seeing are scary. We need to more swiftly move from fossil fuel and take all remediation steps we can.
- Constantly changing traffic patterns. No reliable public transportation that is accessible to people with mobility issues. No real understanding of the needs of older people who can't ride bicycles, or handle giant recycling bins.
- Global warming is going to accelerate faster than we can really imagine.
- North Cambridge is most proximally affected by sewage overflows from the combined system.
- Do we consider sea level rise and knock-on effects from that to fall explicitly under flooding? It would seem that challenges from that and salt-water contamination wouldn't be exactly the same as excess rainfall, for instance.
- welling up of ground water
- Increasing numbers of fast moving people on motorized vehicles such as scooters, skateboards, bicycles in pedestrian and bicycle lanes with lack of adherence to stopping and yielding. This makes it unsafe to walk and to drive. My sense is that there is no regulation of these forms of transport which take place off roadways.
- What the city is doing right now. What the initiatives are.
- I think there should be more warnings and info made available about air quality issues due to the current Canadian wildfires. Most people I talk to seem not to be aware of those hazards. It would also be good to provide sun/rain shelter at more bus stops.
- In the hottest summer on record I appreciate Cambridge is thinking of how to survive in this new normal
- I feel relatively safe in my neighborhood, but there are heat islands in other neighborhoods that I feel need to be mitigated for the future.
- I feel I have been very fortunate regarding natural hazards that have occurred while I have lived in Cambridge. I am concerned that we are due for a strong hurricane and don't have a good understanding of what kinds of risks we would face in that scenario and what the city's response would look like. As the climate shifts, I worry about water -- both too much of it and too little of it. While I put invasive species low on my list relative to the other possible hazards, I would like to see Cambridge work toward eradication of tree of heaven -- regardless of the current restrictions on tree removals -- and Japanese knotweed. It would also be helpful to develop a resource to match residents with snow removal options. Right now, as a homeowner, it's difficult to travel at any point during the winter due to the need to be present to shovel in case of snow.

- emphasize pets staying with owners also -- need specific plan for physically and/or mentally disabled
- Food insecurity, which is not a hazard for the purposes of this survey, but is hazardous. I appreciate that natural disasters are part of the City's planning, but even more I appreciate our future free pre-K funding, our tree planting, the construction of safer bike lanes, our affiliation with Food for Free, etc.
- Combined sewer system backups and flooding should be in these hazards.
- Cant find link but some city water or other departments give seeds of native plants to citizens to mitigate some ecosystem problems around water.
- Unreliable public transport is very impactful
- Add requirements for landowners (like Condos) to install dry wells to manage surface water. Allow owners to attach surface water drainage to the surface water side of the drainage/sewer system. If there is an annual fee that is fine.
- Cambridge has a high water table. Severe flooding is a distinct possibility if the Charles River Dam fails in a storm surge. So how is it going to be protected, and what are the flood mitigation plans?
- My answers might seem like an error. But, the things Cambridge is doing well are things I want Cambridge to be doing more of. Hazard Mitigation should center those most impacted by systemic barriers. Personally, I'd like to understand what to expect/prepare for for the expected flood that will come to our neighborhood in the future with global warming.
- I would love if there was some help from the city that that trees on private property that are part of the city canopy could receive. We treat for the emerald ash borer every year and take other steps to maintain our trees but many in our neighborhood have been lost to neglect. If only there were a way the city could aid in their maintenance?
- I'm most worried about long term flooding risk for low-lying neighborhoods such as riverside and Kendall, due to sea level rise from climate change.
- When you do snow removal, please clear school bus stops and corners of public houses. it would be good for people that we got our houses before this crazy market, to have support from the city to help us keep our houses in good condition, not everyone that own a house in Cambridge are high income families.
- Mobility for non-handicapped seniors
- biohazards from labs, possible radiation exposure, concerned about the aging telephone landline system, the poles, electrical wires etc, the drains that tend to get blocked by leaves in the fall, growing reliance on web based interactions when cellular service as well as landlines could be interrupted in a disaster.
- I am concerned about climate change above all other issues.
- Effects of Charles river rise/ocean rise
- I think having climate resilience and investing in trees and renewable resources is the way to go
- I appreciate your asking for input. Thank you. Please find a way to stop people cutting down large trees. Planting new ones does not compare to preserving the old ones.
- It's a hoax.

- Reminder that hazards don't affect everyone evenly. Many in Cambridge that are most vocal also have a ton of money, which during hazardous events can mean safety and easier ability to rebuild/adapt. Do not forget to target efforts to help those most vulnerable please
- It seemed like the initial survey questions missed asking about hazards to health - humans, pets, wildlife, yes and plants. Those are the biggest concerns. Urban heat mitigation is critical, let's be creative about all the ways that residents, homeowners and the city can do this. Don't forget air quality (wildfires!) And increased flooding as seas rise.
- Air quality is definitely degraded not only by motor vehicles! No one seems to have any concerns about trendy wood-fired pizza ovens, or how much fuel of every type the restaurant industry wastes, just as an example
- It's confusing to have the city prepare a hazard mitigation plan and also a climate change plan. Seems like a lot of overlap.
- The biggest hazard is cars. Eliminate parking - plant trees in that space instead of constantly making the sidewalks narrower. Make owning a car more expensive via excise/fees. Make parking on city streets MUCH more expensive. It should be a minimum of \$100/month for resident parking - and even that is a bargain for at least 100 Sq ft of space.
- more about flooding and actual likelihood of some event similar to Montpelier VT happening in Cport, also how rising oceans might impact Cport
- What are the evacuation routes in Cambridge in case of a natural disaster? Do we have a plan?
- We will increasingly be having heavy rainstorms during winters when there is a lot of snow at curbsides. There needs to be a better effort to promptly clear drains. Also, isolated bike routes are sometimes extremely hazardous after snow and freezing rain - those need to be thoroughly cleared as quickly as are roadways; otherwise they are endangering bicyclists.
- Provide a list of shelters, cooling stations, and warming centers, and make sure they are in all sections of the city not just central square, use every public school as a shelter, cooling center, and warming center.
- This city is collapsing under its own weight, we alone cannot solve the housing crisis or global warming, please stop blaming the citizens of Cambridge before you look at the city's wastage of resources and taxpayer's dollars.
- One question mentioned evacuation routes. I don't know which routes they are or how to find them. I contacted a city department years ago asking and was told that info couldn't be released for security reasons, which seems dubious. Does the city have established evacuation routes, and how can they public learn what they are?
- Traffic !!! Cars buses bikes
- Uneven sidewalks are a hazard and there are too many of them around Cambridgeport.
- Air quality is an issue we need to prepare for. My child's daycare doesn't have a policy related to outdoor time when air quality is bad. That's a problem. We need more aggressive cooling work done. We need to push Harvard and MIT to help us get onto a sustainable grid faster. This can be part of their research and teaching missions! Put the pressure on these places NOW!
- The city government's mania for building more, more, more and taller, taller, taller and ever closer together is making it hotter, reducing absorption of stormwater, reducing sunlight for

green growing things, and displacing groundwater as foundations go deeper and deeper for taller buildings. At some point, it may also increase fire hazards as well. We think that talking about heat islands while creating more of them isn't hypocritical and counterproductive. We think that storage tanks can replace natural absorption of storm water. We think that refusing to protect solar panels legally won't come back to bite us. We think that shading out trees and making it harder and harder to find anywhere to plant them is perfectly fine; I still remember someone saying, "If you want to see a tree, you can go to Concord." We think that it's okay that the only place we work hard to preserve open space is in Lincoln or Lexington or other places that aren't Cambridge, because we care about our reservoirs in the suburbs more than we care about the people who live in Cambridge and need open space and greenery.

- It is especially hard for the elderly and disabled and poor who live alone. Thank you for your consideration.
- Thank you for giving us information about Cambridge weather.
- I'd like to better understand the whole water system in Cambridge.
- Longer winter time and in this summer very humid.
- Food and medical services problems
- Leaking city building.

HAZARD MITIGATION PLAN UPDATE

2023

The City of Cambridge is currently updating their Hazard Mitigation Plan and has drafted these proposed actions. **The City would like your input on these actions, feedback on improvement, missing actions, actions that should be removed, or questions about actions.**

Each action is a project, plan, or coordination effort that the City will undertake (or has already started) to address **one or multiple hazards** and **support one or multiple Goals** laid out in the Plan.

The five key goals of the plan are:

- 1. Protect** - Equitably *Protect* Health and Safety of the Community
- 2. Communication** - Promote Public Preparedness and Resilience through *Communication*
- 3. Coordinate and Collaborate** - *Coordinate and Collaborate* among City Departments and with Community Partners on Hazard Mitigation Planning & Climate Adaptation
- 4. Sustainably Invest** - Plan for & *Sustainably Invest* in Priority Hazard Mitigation Implementation
- 5. Monitor & Respond** - Improve Capacity to *Monitor* Natural Hazards and *Respond* to Changes

The hazards that the plan is focused on mitigating are:

1. Hurricanes/Tropical Storms
2. Inland Flooding
3. Extreme Temperatures
4. Severe Winter Weather/Nor'easters
5. Coastal Flooding
6. Tsunami
7. Drought
8. Wildfire
9. Earthquakes
10. Tornadoes
11. Landslides
12. Invasive Species

For more information, please visit:

<https://www.cambridgema.gov/CDD/climateandenergy/naturalhazardmitigationplan>

1. Below are Draft Mitigation Actions that the City would like your feedback on. Please click on the mitigation actions you would like to comment on and proceed to leave your feedback in the following step. Please feel free to leave comments for as many actions as you would like.

Mark only one oval.

- Develop program for enhanced staffing for disaster recovery *Skip to question 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 *Skip to question 3*
- Integrate resiliency strategies and considerations into implementation of open space projects. *Skip to question 4*
- Extend swimming pool operational hours and season *Skip to question 5*
- Collaborate with Cambridge public housing authority and community centers to identify community rooms to use as cooling centers and shelters during storms
 Skip to question 6
- Develop an operations plan for DPW and Police on how to respond to flooding
 Skip to question 7
- Create an emergency response higher education and city collaboration plan
 Skip to question 8
- Perform a vulnerability assessment of vaults where hard copy records are kept
 Skip to question 9
- Conduct maintenance activities to monitor and reduce brushfire risks
 Skip to question 10
- Prepare a Tree Pest Vulnerability Matrix or similar pest and disease threat assessment and management options report utilizing the most recent tree inventory
 Skip to question 11
- Conduct study to identify how to engage with the disability community during an emergency. *Skip to question 12*
- Develop an annual media campaign about signing up for code red notifications
 Skip to question 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. *Skip to question 14*
- Identify areas for green stormwater infrastructure and reducing impervious surfaces
 Skip to question 15
- Perform a study to identify how to best protect Fresh Pond reservoir from saltwater intrusion *Skip to question 16*
- Prepare an Earthquake Emergency Plan *Skip to question 17*

- Develop an enhanced communication plan and program related natural hazards in collaboration with community groups *Skip to question 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. *Skip to question 19*
- Upgrade deicing / snow removal equipment, including smaller equipment that is able to accommodate bicycle facilities and pedestrian paths *Skip to question 20*
- Install water fountains and cooling features locations along bus/bike routes *Skip to question 21*
- Evaluate use of Microgrid(s) for critical facilities and implement recommendations *Skip to question 22*
- Undertake interventions as a regional collaboration at Charles River and Amelia Earhart Dam to reduce overtopping/flanking *Skip to question 23*
- Improve collection and conveyance system in the Port Neighborhood *Skip to question 24*
- Complete in-progress stormwater management program: Green, Franklin + Sidney Streets, School, Pine, Cherry and Windsor Streets *Skip to question 25*
- Update and improve the City's HeatViewer with best available information *Skip to question 26*
- Update and Improve Floodplain Mapping* (Cambridge Flood Viewer) *Skip to question 27*
- Develop and update materials to support homeowners in completing retrofits related to flooding & heat (e.g., trainings, & educational materials on funding assistance) *Skip to question 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) *Skip to question 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 *Skip to question 30*
- Implement actions of Cambridge Urban Forest Master Plan *Skip to question 31*
- Complete study to evaluate shade needs (other than trees) referred to as "The Shade Study", and implement recommendations (e.g., adding shade structures) *Skip to question 32*
- Encourage energy efficiency in buildings through zoning requirements and community engagement and support *Skip to question 33*
- Prioritize clean energy solutions for power such as solar, battery, geothermal, etc. where feasible *Skip to question 34*

- Coordinate with the MBTA their efforts to protect critical regional transit infrastructure in Cambridge *Skip to question 35*
- Coordinating with adjacent communities for hazard preparation and response *Skip to question 36*
- Continue to engage with the Charles River Climate Compact and Mystic River Watershed Association on regional collaboration *Skip to question 37*
- Begin to develop a central emergency response plan and centralize emergency response within the city *Skip to question 38*
- Design and construct updates to metering stations for Combined Sewers *Skip to question 39*
- Collaborate with energy providers to protect critical community infrastructure *Skip to question 40*
- Each department shall ensure identified staff have been trained in ICS and NIMS and continuing education and training shall be determined by each department head or training division.
- Succession planning should be integrated into the City's Continuity of Operations Plan (COOP) and revisited on a yearly basis by June 30 of every year and updated to reflect staff changes and required trainings for staff identified as part of the planning process.

Action 1: Develop program for enhanced staffing for disaster recovery

Timeframe to Start: 1-2 years
Associated Goal(s): #5 Monitor & Respond
Hazards: All

2. Please leave comments for this action below.

After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 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

Timeframe to Start: 1-2 years

Associated Goal(s): #5 Monitor & Respond

Hazards: All

3. Please leave comments for this action below.

After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 3: Integrate resiliency strategies and considerations into implementation of open space projects.

Timeframe to Start: 1-2 years

Associated Goal(s): #1 Protect

Hazards: Extreme Heat, Precipitation Flooding, Drought

4. Please leave comments for this action below.

After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 4: Extend swimming pool operational hours and season

Timeframe to Start: 1-2 years
Associated Goal(s): #1 Protect
Hazards: Extreme Heat

5. Please leave comments for this action below.
After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 5: Collaborate with Cambridge public housing authority and community centers to identify community rooms to use as cooling centers and shelters during storms

Timeframe to Start: 1-2 years
Associated Goal(s): #1 Protect
Hazards: All

6. Please leave comments for this action below.
After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 6: Develop an operations plan for DPW and Police on how to respond to flooding

Timeframe to Start: 1-2 years

Associated Goal(s):

#1 Protect, #5 Monitor & Respond

Hazards:

Precipitation Flooding, Coastal Flooding

7. Please leave comments for this action below.

After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 7: Create an emergency response higher education and city collaboration plan

Timeframe to Start: 1-2 years

Associated Goal(s):

#3 Coordinate & Collaborate, #5 Monitor & Respond

Hazards: All

8. Please leave comments for this action below.

After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 8: Perform a vulnerability assessment of vaults where hard copy records are kept

Timeframe to Start: 2-5 years

Associated Goal(s):

#3 Coordinate & Collaborate, #5 Monitor & Respond

Hazards:

Precipitation Flooding, Coastal Flooding

9. Please leave comments for this action below.

After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 9: Conduct maintenance activities to monitor and reduce brushfire risks

Timeframe to Start: 1-2 years

Associated Goal(s):

#5 Monitor & Respond

Hazards:

Brushfire

10. Please leave comments for this action below.

After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 10: Prepare a Tree Pest Vulnerability Matrix or similar pest and disease threat assessment and management options report utilizing the most recent tree inventory

Timeframe to Start: 2-5 years

Associated Goal(s):

4. Sustainably Invest, #5 Monitor & Respond

Hazards:

Invasive Species

11. Please leave comments for this action below.

After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 11: Conduct study to identify how to engage with the disability community during an emergency.

Timeframe to Start: 1-2 years
Associated Goal(s): #1 Protect
Hazards: All

12. Please leave comments for this action below.

After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 12: Develop an annual media campaign about signing up for code red notifications

Timeframe to Start: 1-2 years
Associated Goal(s):

#2 Communication

Hazards: All

13. Please leave comments for this action below.

After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 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.

Timeframe to Start: 1-2 years

Associated Goal(s):

#2 Communication

Hazards: All

14. Please leave comments for this action below.

After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 14: Identify areas for green stormwater infrastructure and reducing impervious surfaces

Timeframe to Start:

in-progress/ongoing

Associated Goal(s):

#4 Sustainably Invest

Hazards:

Precipitation Flooding

15. Please leave comments for this action below.
After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 15: Perform a study to identify how to best protect Fresh Pond reservoir from saltwater intrusion

Timeframe to Start:

2-5 years

Associated Goal(s):

#1 Protect, #3 Coordinate & Collaborate, #4 Sustainably Invest

Hazards:

Coastal Flooding

16. Please leave comments for this action below.
After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 16: Prepare an Earthquake Emergency Plan

Timeframe to Start:

2-5 years

Associated Goal(s):

#1 Protect, # Monitor & Respond

Hazards:

Earthquake

17. Please leave comments for this action below.
After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 17: Develop an enhanced communication plan and program related natural hazards in collaboration with community groups

Timeframe to Start:

2-5 years

Associated Goal(s):

#2 Communication

Hazards: All

18. Please leave comments for this action below.
After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 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.

Timeframe to Start:

1-2 years

Associated Goal(s):

#5 Monitor & Respond

Hazards:

All

19. Please leave comments for this action below.

After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 19: Upgrade deicing / snow removal equipment, including smaller equipment that is able to accommodate bicycle facilities and pedestrian paths

Timeframe to Start:

in progress

Associated Goal(s):

#5 Monitor & Respond

Hazards:

Winter Storms

20. Please leave comments for this action below.

After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 20: Install water fountains and cooling features locations along bus/bike routes

Timeframe to Start:

Ongoing

Associated Goal(s):

#1 Protect, # Monitor & Respond

Hazards:

Extreme Heat

21. Please leave comments for this action below.

After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 21: Evaluate use of Microgrid(s) for critical facilities and implement recommendations

Timeframe to Start:

2-5 years

Associated Goal(s):

#5 Monitor & Respond

Hazards:

All

22. Please leave comments for this action below.

After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 22: Undertake interventions as a regional collaboration at Charles River and Amelia Earhart Dam to reduce overtopping/flanking

Timeframe to Start:

in-progress

Associated Goal(s):

#3 Coordinate & Collaborate, #4 Sustainably Invest

Hazards:

Coastal Flooding

23. Please leave comments for this action below.

After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 23: Improve collection and conveyance system in the Port Neighborhood

Timeframe to Start:

In progress

Associated Goal(s):

#1 Protect, # Monitor & Respond

Hazards:

Precipitation Flooding

24. Please leave comments for this action below.

After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 24: Complete in-progress stormwater management program: Green, Franklin + Sidney Streets, School, Pine, Cherry and Windsor Streets

Timeframe to Start:

Less than 1 year

Associated Goal(s):

#1 Protect, #4 Sustainably Invest

Hazards: Precipitation Flooding

25. Please leave comments for this action below.
After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 25: Update and improve the City's HeatViewer with best available information

Timeframe to Start:

2-5 years

Associated Goal(s):

#2 Communication

Hazards:

Extreme Heat

26. Please leave comments for this action below.
After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 26: Update and Improve Floodplain Mapping* (Cambridge Flood Viewer)

Timeframe to Start:

in progress

Associated Goal(s):

#2 Communication

Hazards:

Precipitation Flooding, Coastal Flooding

27. Please leave comments for this action below.
After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 27: Develop and update materials to support homeowners in completing retrofits related to flooding & heat (e.g., trainings, & educational materials on funding assistance)

Timeframe to Start:

2-5 years

Associated Goal(s):

#1 Protect

Hazards:

Extreme Heat, Precipitation Flooding, Coastal Flooding

28. Please leave comments for this action below.
After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 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)

Timeframe to Start:

1-2 years

Associated Goal(s):

#1 Protect, #2 Communications

Hazards:

All

29. Please leave comments for this action below.
After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 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

Timeframe to Start:

2-5 years

Associated Goal(s):

#3 Coordinate & Collaborate

Hazards:

Extreme Heat, Precipitation Flooding, Coastal Flooding

30. Please leave comments for this action below.
After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 30: Implement actions of Cambridge Urban Forest Master Plan

Timeframe to Start:

in progress/ongoing

Associated Goal(s):

#1 Protect, #4 Sustainably Invest

Hazards:

Extreme Heat, Precipitation Flooding, Drought

31. Please leave comments for this action below.
After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 31: Complete study to evaluate shade needs (other than trees) referred to as "The Shade Study", and implement recommendations (e.g., adding shade structures)

Timeframe to Start:

in progress

Associated Goal(s):

#1 Protect

Hazards:

Extreme Heat

32. Please leave comments for this action below.
After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 32: Encourage energy efficiency in buildings through zoning requirements and community engagement and support

Timeframe to Start:

Less than 1 year

Associated Goal(s):

#5 Monitor & Respond

Hazards:

Extreme Heat, Extreme Cold

33. Please leave comments for this action below.

After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 33: Prioritize clean energy solutions for power such as solar, battery, geothermal, etc. where feasible

Timeframe to Start:

Less than 1 year

Associated Goal(s):

#5 Monitor & Respond

Hazards:

All

34. Please leave comments for this action below.

After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 34: Coordinate with the MBTA their efforts to protect critical regional transit infrastructure in Cambridge

Timeframe to Start:

Less than 1 year

Associated Goal(s):

#3 Coordinate & Collaborate, #4 Sustainably Invest

Hazards:

All

35. Please leave comments for this action below.

After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 35: Coordinating with adjacent communities for hazard preparation and response

Timeframe to Start:

1-2 years

Associated Goal(s):

#3 Coordinate & Collaborate

Hazards:

All

36. Please leave comments for this action below.

After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 36: Continue to engage with the Charles River Climate Compact and Mystic River Watershed Association on regional collaboration

Timeframe to Start:

in-progress

Associated Goal(s):

#3 Coordinate & Collaborate

Hazards:

Precipitation Flooding, Coastal Flooding, Extreme Heat

37. Please leave comments for this action below.

After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 37: Begin to develop a central emergency response plan and centralize emergency response within the city

Timeframe to Start:

Less than 1 year

Associated Goal(s):

#3 Coordinate & Collaborate

Hazards:

All

38. Please leave comments for this action below.

After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 38 Design and construct updates to metering stations for Combined Sewers

Timeframe to Start:

in-progress

Associated Goal(s):

#5 Monitor & Respond

Hazards:

Precipitation Flooding

39. Please leave comments for this action below.

After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 39: Collaborate with energy providers to protect critical community infrastructure

Timeframe to Start:

Less than 1 year

Associated Goal(s):

#3 Coordinate & Collaborate, #4 Sustainably Invest

Hazards:

All

40. Please leave comments for this action below.

After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 40: Each department shall ensure identified staff have been trained in ICS and NIMS and continuing education and training shall be determined by each department head or training division.

Timeframe to Start:

1-2 years

Associated Goal(s):

#3 Coordinate & Collaborate, #5 Monitor & Respond

Hazards:

All

41. Please leave comments for this action below.

After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

Action 41: Succession planning should be integrated into the City's Continuity of Operations Plan (COOP) and revisited on a yearly basis by June 30 of every year and updated to reflect staff changes and required trainings for staff identified as part of the planning process.

Timeframe to Start:

1-2 years

Associated Goal(s):

#3 Coordinate & Collaborate, #5 Monitor & Respond

Hazards:

All

42. Please leave comments for this action below.

After you submit your comments for this action, you can click "submit another response" to leave comments on more actions. Thank you for your participation!

This content is neither created nor endorsed by Google.

Google Forms

MITIGATION ACTIONS PUBLIC SURVEY RESULTS

November 1, 2023

Public Survey – Mitigation Actions

Introduction

On November 1, 2023, the City of Cambridge released a Public Survey to gather input on the Mitigation Actions included in the Natural Hazard Mitigation Plan Update 2023. All actions were included, and respondents had the opportunity to provide comments on an unlimited number of actions through the survey. Out of the 42 Actions, 8 received comments from the public. Below is a documentation of the Mitigation Actions that received comments, content of the comments, and the City response in the Plan.

Mitigation Action numbering correlates to the Survey numbering.

Mitigation Action #3:

Action:

Integrate resiliency strategies and considerations into implementation of open space projects.

Public Comment:

Heat is a dangerous aspect of climate change which is increasing in severity and one of the best solutions is to plant more trees. Cambridge is building large cisterns to hold flood waters, but is not doing a very good job at planting trees.

How Comment is Addressed in NHMP:

The hazard profile for Extreme Heat is discussed in detail in Chapter 3 and the vulnerabilities caused by Extreme Heat are detailed in Chapter 5. Mitigation Actions that address Extreme Heat include implementation of the Urban Forest Master Plan, stormwater and green infrastructure improvements, additional water fountains and shading to bike routes, among several heat-related actions.

Mitigation Action #4:

Action:

Extend swimming pool operational hours and season.

Public Comments:

This would be terrific. It would also be good to optimize usage by DHSP summer camps versus other Cambridge residents. Often the camps have the Gold Star Pool reserved but are not actually using it.

Please extend season thanks

How Comment is Addressed in NHMP:

One of the mitigation actions included in Chapter 7 (#21) is to extend swimming pool operational hours and season. As part of undertaking this action, we will consider other pool locations and coordination needs.

Mitigation Action #5:

Action:

Collaborate with Cambridge public housing authority and community centers to identify community rooms to use as cooling centers and shelters during storms

Public Comment:

You should also work with CHA to build more housing with wraparound services to help unhoused people get off the street and into secure housing with A/C.

How Comment is Addressed in NHMP:

Many of the City Departments who support the unhoused populations in Cambridge participated in the development of the NHMP. While building new housing as suggested in the comment is not an action in the plan, many of the actions in this plan support heat resilience for priority populations.

Mitigation Action #14:

Action:

Identify areas for green stormwater infrastructure and reducing impervious surfaces

Public Comment:

This is a clear area where Cambridge is falling short. Boston has elevated green infrastructure to a cabinet level position, while Cambridge appears to be prioritizing gray infrastructure. Jerry's Pond is a clear example where City investment could contribute funds to de-pave 2-3 acres of land which is paved around the pond and plant 150-175 trees along Rindge Ave. Instead, the City is content contributing \$0 to improve the developer's vision which appears to be heading towards 15-20 trees on Rindge and far more limited de-paving.

How Comment is Addressed in NHMP:

The hazard profile for Extreme Heat and Extreme Precipitation is discussed in detail in Chapter 3 and the vulnerabilities are detailed in Chapter 5. Mitigation Actions that address green infrastructure include Identify areas for green stormwater infrastructure and reducing impervious surfaces, Implement actions of Cambridge Urban Forest Master Plan, and Integrate resiliency strategies and considerations into implementation of open space projects.

Mitigation Action #20:

Action:

Install water fountains and cooling feature locations along bus/bike routes

Public Comment:

We need more water bottle refill stations as well as drinking fountains.

How Comment is Addressed in NHMP:

Implementation of this action will consider a variety of water features to support pedestrians and bicyclists.

Mitigation Action #22:

Action:

Undertake interventions as a regional collaboration at Charles River and Amelia Earhart Dam to reduce overtopping/flanking.

Public Comment:

Thank you for your focus on this as sea levels and water ways levels rise.

How Comment is Addressed in NHMP:

No further action needed.

Mitigation Action #30:

Action:

Implement actions of Cambridge Urban Forest Master Plan

Public Comment:

The City is falling short on protecting and expanding the tree canopy. Having observed the canopy since the early 1990s, it has been a slow and steady decline with the loss of large legacy trees and an insufficient number of new, smaller plantings. There are few opportunities to plant large numbers of trees, particularly in environmental justice

neighborhoods and Jerry's Pond is one such example which the City appears to be missing. Where else can we plant 150-175 trees in an EJ neighborhood? The UFMP specifically calls out EJ neighborhoods and suggests that we need to rethink our streets and sidewalks to plant more trees. Jerry's Pond could be one such location.

How Comment is Addressed in NHMP:

The hazard profile for Extreme Heat and Extreme Precipitation is discussed in detail in Chapter 3 and the vulnerabilities are detailed in Chapter 5. Mitigation Actions that address green infrastructure include Identify areas for green stormwater infrastructure and reducing impervious surfaces, Implement actions of Cambridge Urban Forest Master Plan, and Integrate resiliency strategies and considerations into implementation of open space projects.

Mitigation Action #32:

Action:

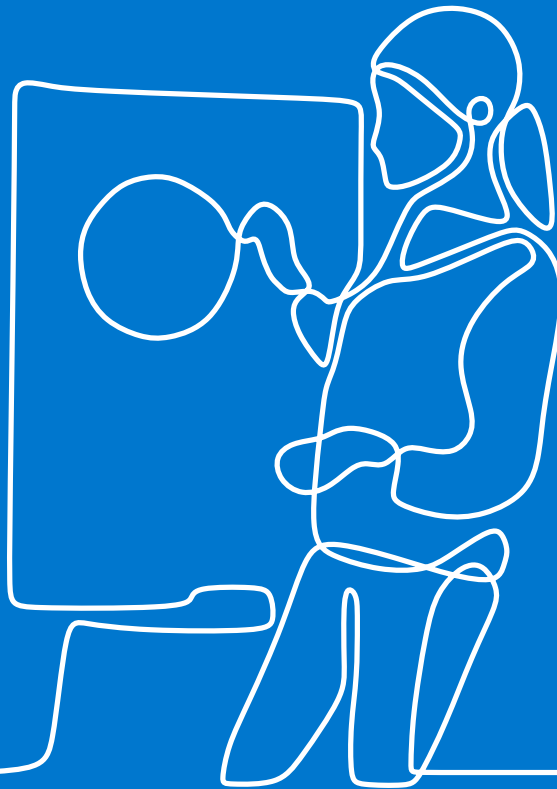
Encourage energy efficiency in buildings through zoning requirements and community engagement and support.

Public Comment:

All of these actions need to be sensitive to the need to avoid driving up housing costs. Passing unfunded mandates onto landlords drives up the rents and displaces residents to other municipalities that are not as focused on mitigation and prevents climate refugees from being able to afford to live in Cambridge.

How Comment is Addressed in NHMP:

No further action needed.



Appendix D

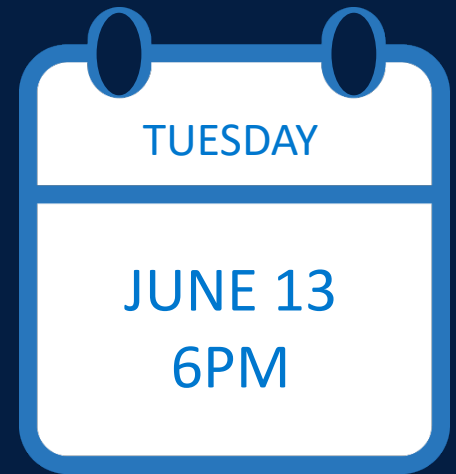
Public Meeting Materials

Are you concerned about rising heat, unusually warm winters, and other extreme events?



The City of Cambridge is working hard to prepare for a more resilient and safe community by updating its Hazard Mitigation Plan, which will study risks and introduce strategies to address natural hazards now and in the future.

Join us for a public meeting to learn more about the Plan and make your voice heard!



Register using the QR code and link at right. After registering, you will receive a Zoom link to attend virtually via email.

To request an interpreter for this event, please call 617-349-4396 by June 2, 2023



tinyurl.com/CambridgeHMPrsvp2



Are you concerned about rising heat, unusually warm winters, and other extreme events?

Join us for a public meeting to learn more about the Plan and make your voice heard!



**JUNE
13
6PM**

Register using the QR code and link at right. After registering, you will receive a Zoom link to attend virtually via email.



tinyurl.com/CambridgeHMPrsvp1



Hazard Mitigation Plan Update 2023

Public Meeting
June 13, 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



Emily Judson
Resiliency Planner,
Weston & Sampson



Also Joining Us Tonight:

Jim Wilcox
Department of Public
Works

Sam Lipson
Cambridge Public
Health Department

**Chief Colin S.
Walsh**
Fire Department

Janet Moonan
Project Technical Lead,
Weston & Sampson

AGENDA



Welcome & Introductions



Overview of the Hazard Mitigation Plan



Natural Hazards in Cambridge



Project Goals and Community Assets



Next Steps and Discussion



Conclude



AGENDA



Welcome & Introductions



Overview of the Hazard Mitigation Plan



Natural Hazards in Cambridge



Project Goals and Community Assets



Next Steps and Discussion

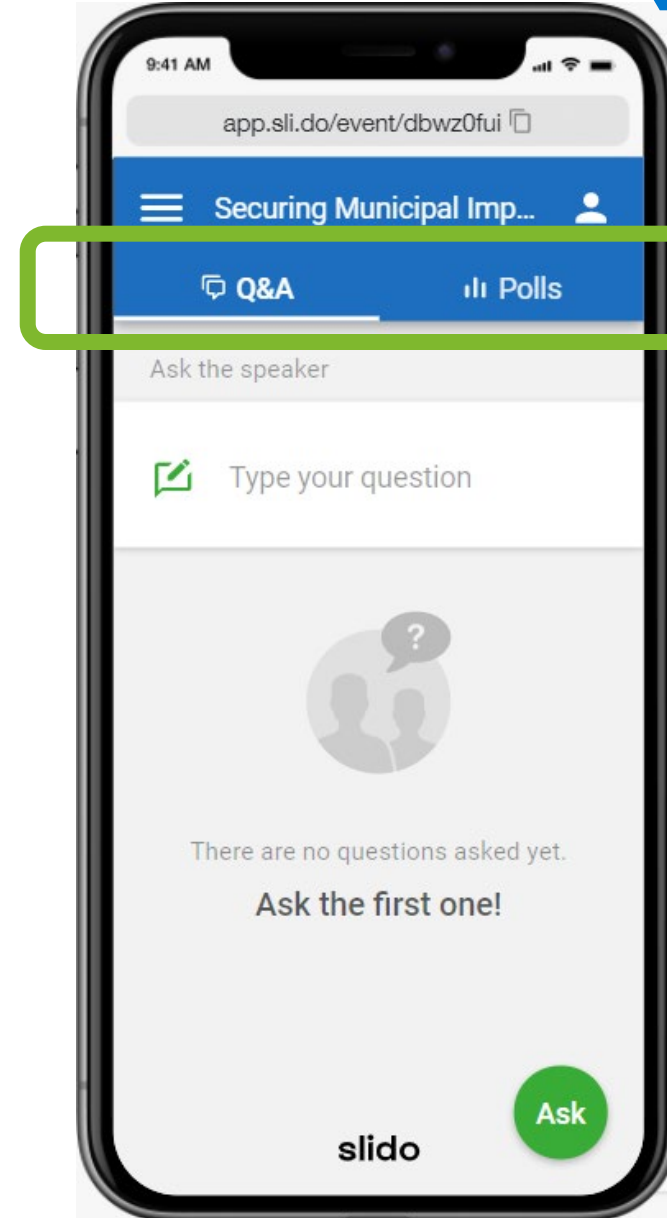


Conclude



JOIN US ON SLIDO!

1. Get your phone ready
2. Follow instructions or use the QR code



You can move between the Q&A tab and the polls tab!



What do you love about Cambridge?

The people

The health department!

street fairs

paths by the river

When memorial drive is closed for biking

Trees

Energy

我喜欢骑自行车

Walkable

Coffee shops

Parks

AGENDA



Welcome & Introductions



Overview of the Hazard Mitigation Plan



Natural Hazards in Cambridge



Project Goals and Community Assets



Next Steps and Discussion



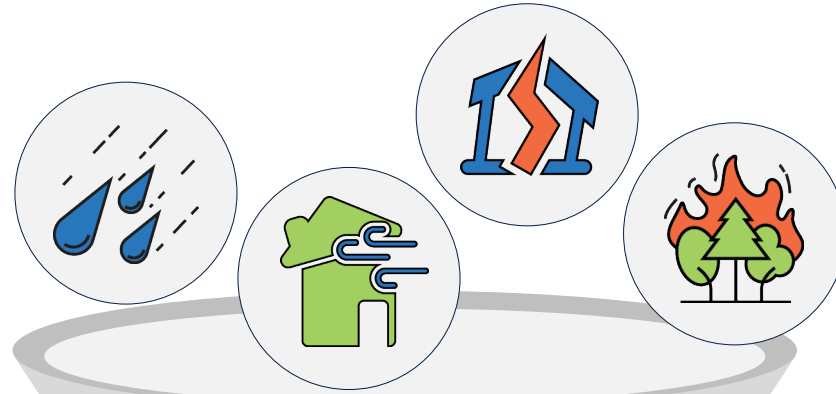
Conclude



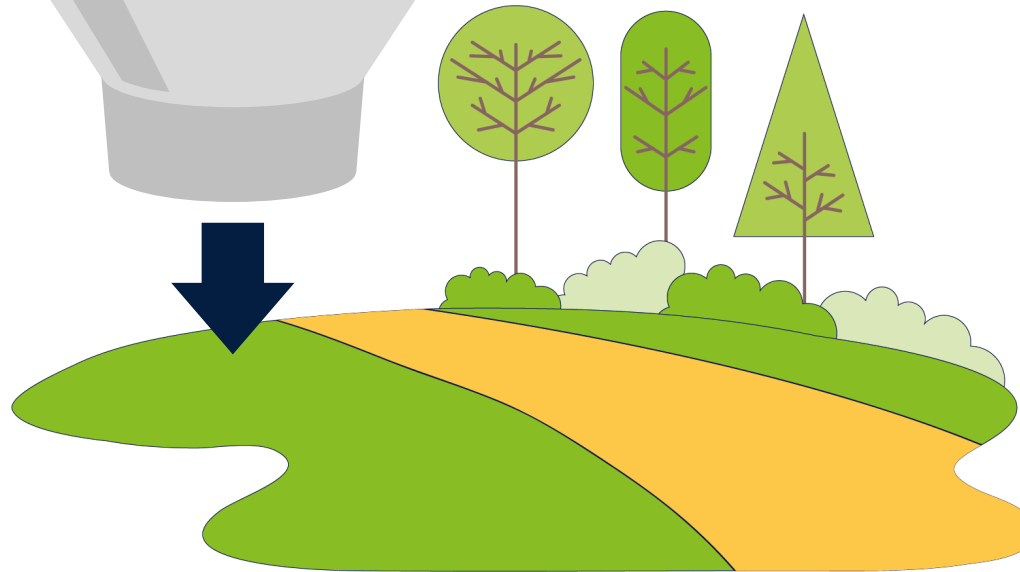
WHAT IS HAZARD MITIGATION?



Reduce impacts from
natural hazards...



...through plans,
projects, and services.



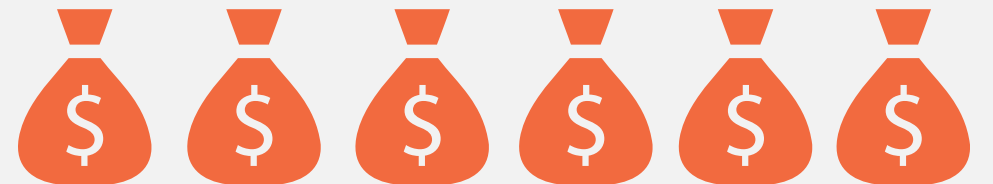
VALUE OF HAZARD MITIGATION PLANNING

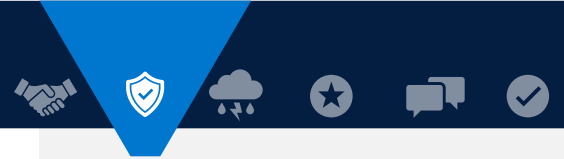
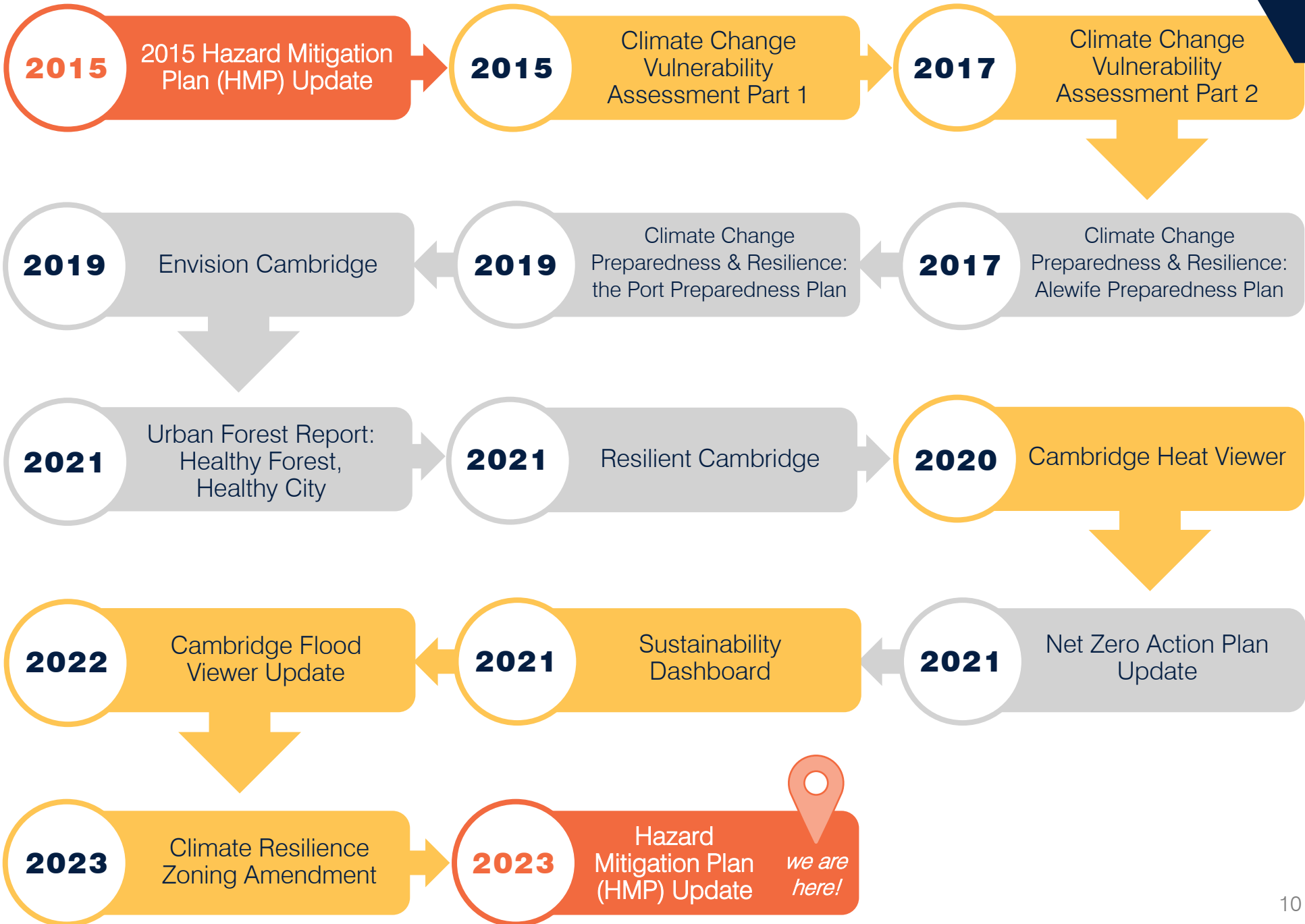


EVERY \$1 SPENT ON MITIGATION



SAVES \$6 ON DISASTER RECOVERY





How the HMP is different from other efforts!

- HMPs
- City Plans
- City Actions

HMP OVERVIEW



Chapter 1
Introduction



Chapter 2
Planning
Process



Chapter 3
Hazard Profiles



Chapter 5
Vulnerability
Assessment



Chapter 4
Facility /Asset Inventory



Chapter 6
Mitigation Goals &
Capabilities



Chapter 7
Mitigation Actions:
Past, Present,
Future



Chapter 8
Plan Maintenance
& Implementation



Appendix
Additional
information



Chapter 9
Plan Adoption

HMP OVERVIEW



WHY ARE WE HERE TODAY?



Learn about
HMPs



Discuss local
hazards



Gather stories &
experiences



AGENDA



Welcome & Introductions



Overview of the Hazard Mitigation Plan



Natural Hazards in Cambridge



Project Goals and Community Assets



Next Steps and Discussion



Conclude



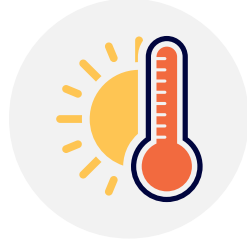
HAZARD PROFILES



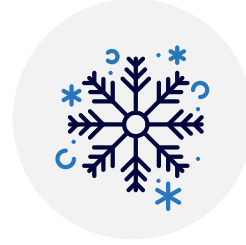
HURRICANES
/ TROPICAL
STORMS



INLAND
FLOODING



EXTREME
TEMPERATURES



SEVERE WINTER
WEATHER /
NOR'EASTERS



COASTAL
FLOODING



TSUNAMI



DROUGHT



WILDFIRE



EARTHQUAKES



TORNADOES

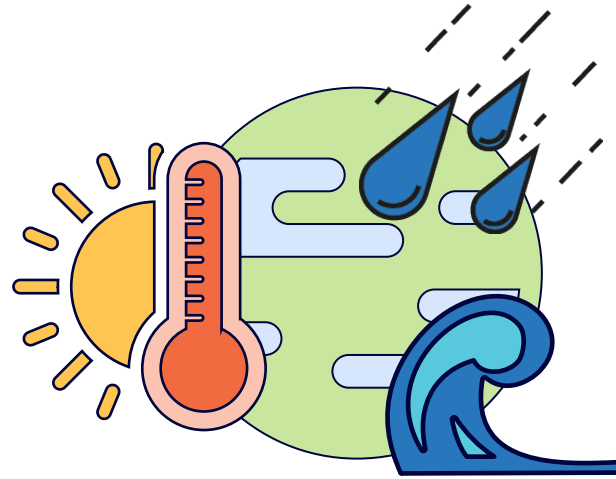


LANDSLIDES



INVASIVE
SPECIES

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

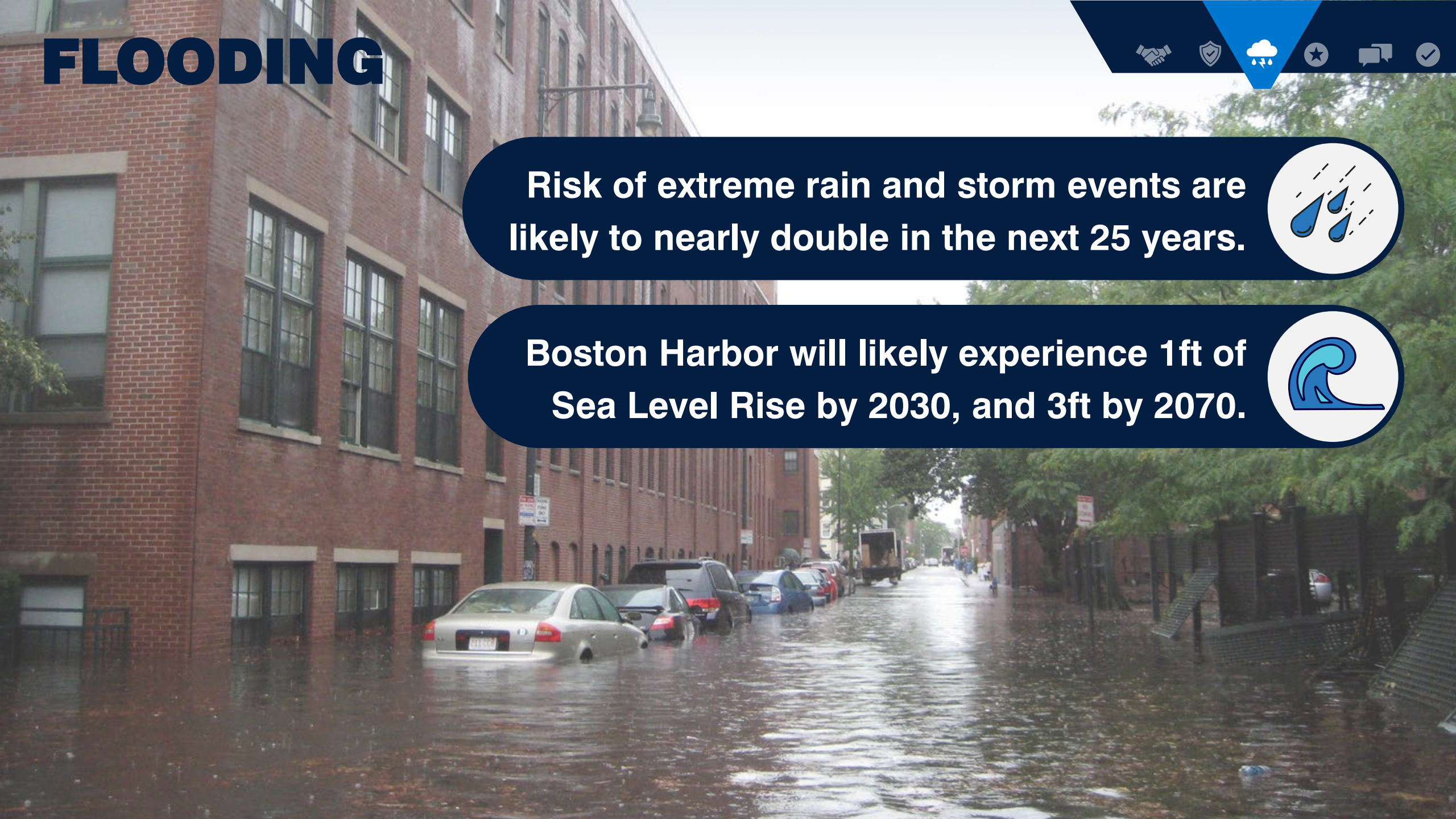
FLOODING



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.



FLOODING IMPACTS



Buildings and infrastructure



Evacuations



Emergency responders



Businesses and deliveries



Power outage and energy



Food availability and supply chain



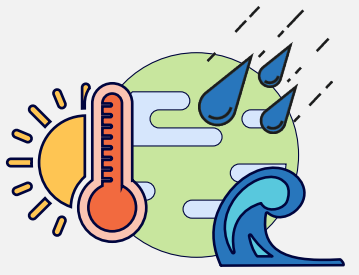
Shelters and people without housing



Ecosystem and soil stability



Water quality



Climate Change is expected to worsen flooding and impacts associated with flooding, especially for those with other environmental, health, and economic difficulties.

FLOODING



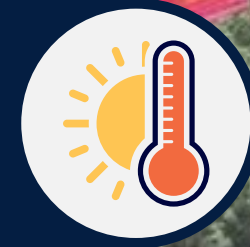
What are your experiences with flooding in Cambridge?

Answers:

- Splashed by cars when walking
- Driving conditions
- Street puddles not draining
- Water coming almost over Curb to sidewalks
- Wet socks
- My basement floods sometimes
- Some plants dying
- Have not experienced flooding in cambridge
- storm drains not draining



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



HEAT IMPACTS



Buildings and infrastructure



Schools and learning loss



Health, injuries, and mortality



Air quality and wildfires



Stress on energy systems



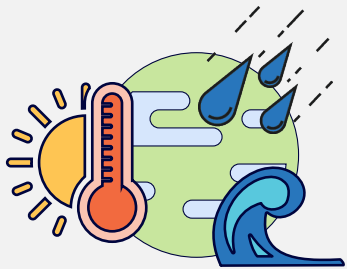
People outdoors or without housing



Animal and plant loss



Drought and Water Supply



Climate Change is expected to worsen heat trends and impacts associated with heat, especially for those with other environmental, health, and economic difficulties.

HEAT



How do you and your family stay cool when it's hot out?

Answers:

- Ceiling fans
- Air conditioning Water parks
- stay in shade
- Take kids to the park
- Windows shut shades down in day, AC as needed
- stay inside
- Stay indoors in ac
- Splash pads

SEVERE WINTER WEATHER



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



SEVERE WINTER IMPACTS



Buildings and infrastructure



Repair costs and construction delays



Health, injuries, and mortality



Business and deliveries



Power outage



Food availability



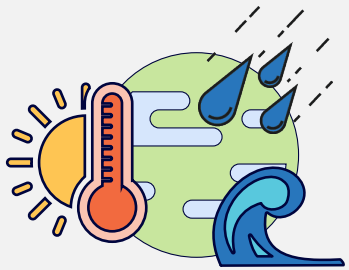
Shelter and displacement



Ecosystem and habitats



Re-shaping the river



Climate Change is expected to worsen severe winter weather and associated impacts, especially for those with other environmental, health, and economic difficulties.

SEVERE WINTER WEATHER



What's the biggest challenge for you and your family when it snows?

Answers:

- Visibility issues due to snow
- mountains on Cambridge streets
- 冻伤和摔倒
- Buses not arriving on time
- Walking to work on icy sidewalks
- can't bike in the snow
- Unshoveled sidewalks
- Difficulty on sidewalks
- icy streets
- Shoveling driveway
- Sidewalks not being cleaned
- Shoveling
- shoveling the sidewalk
- Slipping and falling
- while commuting
- Power outage
- Train delays

AGENDA



Welcome & Introductions



Overview of the Hazard Mitigation Plan



Natural Hazards in Cambridge



Project Goals and Community Assets



Next Steps and Discussion



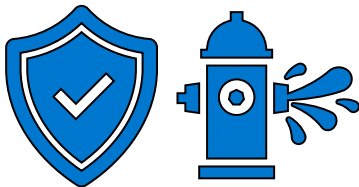
Conclude



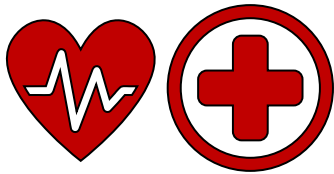
MITIGATION GOALS



COMMUNITY ASSETS



Safety & Security



Health & Medical



Transportation



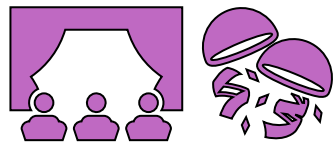
Food, Water, Shelter



Parks & Greenspace



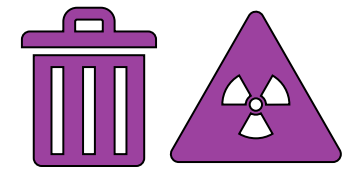
Communications



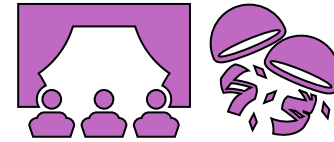
**Cultural, Historic,
& Events**



Energy



Hazardous Material

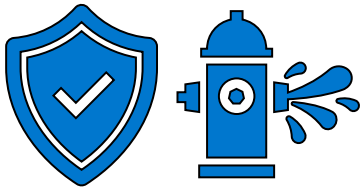


Which events are important for community resilience?

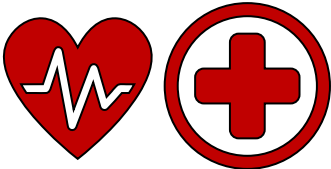
Answers:

- YWCA
- Settlement Houses (MFNH, CCC)
- Farmers market
- farmers market
- Fairs
- Dragon boat races

COMMUNITY ASSETS



Safety & Security



Health & Medical



Transportation



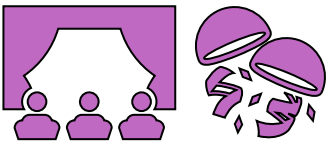
Food, Water, Shelter



Parks & Greenspace



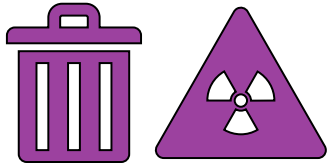
Communications



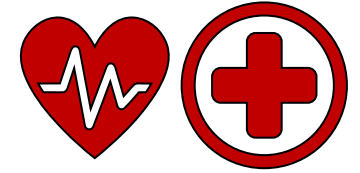
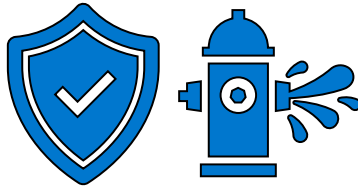
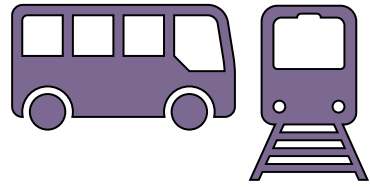
**Cultural, Historic,
& Events**



Energy



Hazardous Material



As you deal with extreme weather events, what buildings or services do you need to access?

Answers:

- City buildings (heating, cooling centers)
- Dunks
- pharmacy
- Grocery store
- gas station
- Gas station
- Electrical or plumbing help
- grocery store
- Offices
- Market

AGENDA



Welcome & Introductions



Overview of the Hazard Mitigation Plan



Natural Hazards in Cambridge



Project Goals and Community Assets



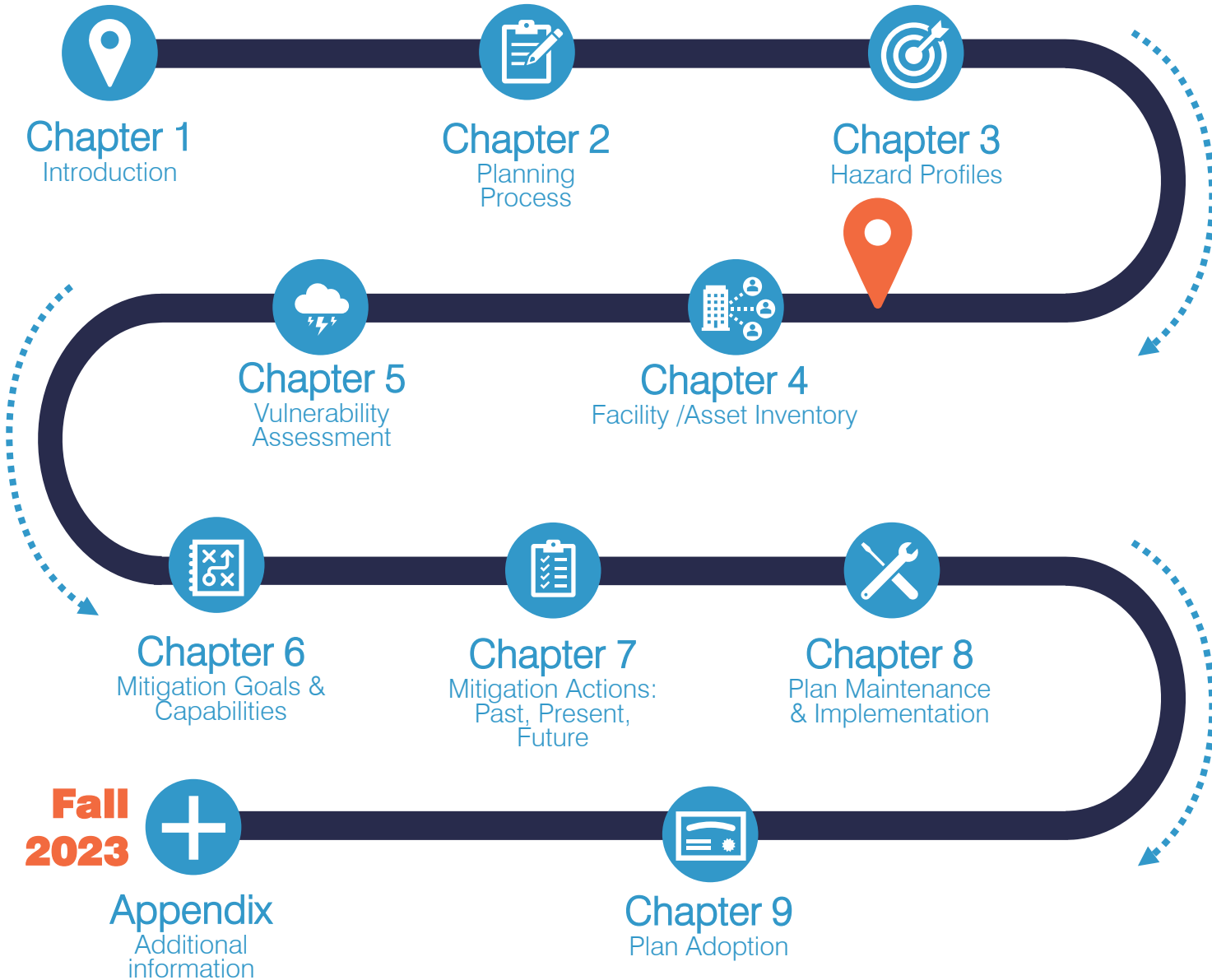
Next Steps + Discussion



Conclude



NEXT STEPS



- **Develop Actions**
- **Assess Capabilities**
- **Integrate Public Feedback**
- **Analyze Community Assets**

TAKE THE SURVEY!



The City of Cambridge is updating its Hazard Mitigation Plan for a more resilient, safe, and prepared community.



Share your experiences of living in Cambridge to help the City understand how it can improve. Please take this short, 5-minute survey to share your insights.

tinyurl.com/CambridgeSurveyHMP



Your input will help shape the **strategies, projects, policies,** and **decisions** the City makes regarding natural hazards.

Stay connected by visiting the City's website and look out for the final public meetings in September.



Questions or comments?



Hazard Mitigation Plan Update 2023

Thank You!



**CITY OF
CAMBRIDGE**



HAZARD MITIGATION PLAN 2023 UPDATE

PUBLIC MEETING #1

ATTENDANCE AND RECORDING

June 13, 2023

Attendees

City of Cambridge

- Leila Mekias, CDD
- Susanne Rasmussen, CDD
- Deputy Chief Colin Walsh, Fire Dept.
- Jim Wilcox, DPW
- Crystal Rosa, Human Rights Commission
- Sam Lipson, CPHD
- Vedad Konjic, CPS Facilities
- Nancy Porter, CPHD
- Marlees Owayda
- Rachel Williams, IT
- Denise Garcia
- Annie, Mandarin Interpreter
- Rachel Tanenhaus, CCPD

Members of the Public

- Amelia Joselow
- Fabiola Alikpokou
- Guoying Liu
- Jessica Sgrignuoli
- Nahid Chowdhury
- Pe Kutcher
- Qumrunnessa A Huda
- Sharmila Chandrasekaran
- Unknown Number

Weston & Sampson

- Robin Seidel, Project Manager
- Jennie Moonan, HMP Technical Lead
- Emily Judson, Resiliency Planner

Recording

To view the recording, please click on the following link and enter the passcode if prompted: https://cambridgema.zoom.us/rec/share/R39YO7zeTghd_c8Ss-LCZzswTPXt-sVPgQuxiWed3kB5sl0ryAeOMEghY66WYNjj.paaasHEPnUFXQWQj?startTime=1686693879000

Passcode: 0cfHef&n

Learn more by
viewing the
public
meeting
recording at:

[www.cambridgema.gov/
CDD/climateandenergy/
naturalhazardmitigationplan](http://www.cambridgema.gov/CDD/climateandenergy/naturalhazardmitigationplan)



The City of Cambridge is
updating its Hazard Mitigation
Plan for a more resilient, safe,
and prepared community.

Share your experiences of
living in Cambridge to help
the City understand how it
can improve. Please take
this short, 5-minute survey
to share your insights.

tinyurl.com/CambridgeSurveyHMP





Hazard Mitigation Plan
Update 2023
Public Meeting
October 25, 2023

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

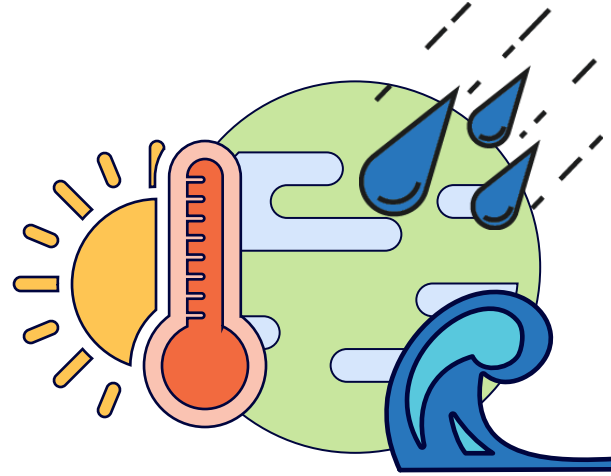


Next Steps and Discussion



Conclude





Climate 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.

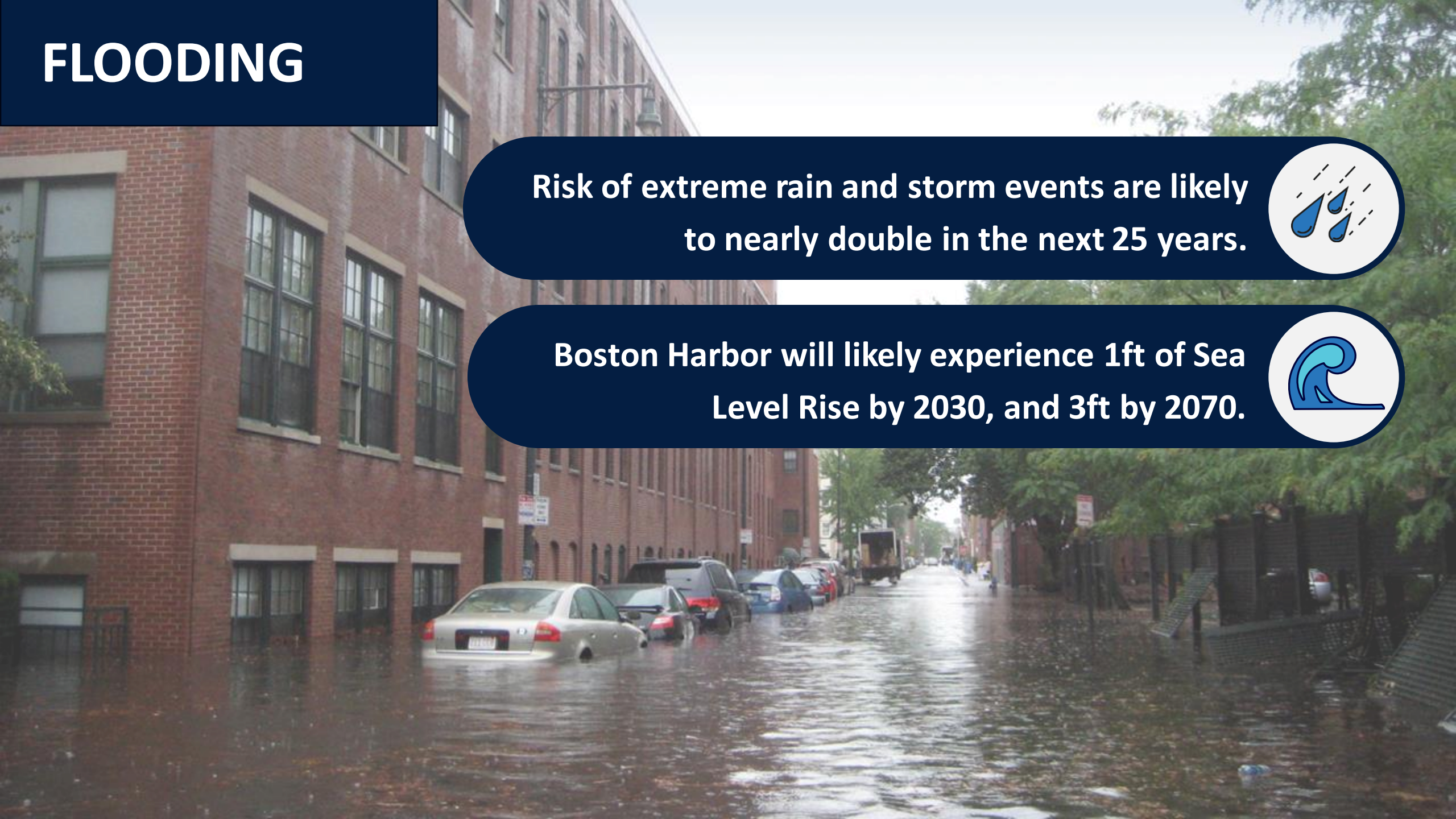
- Resilient Cambridge Report

FLOODING

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

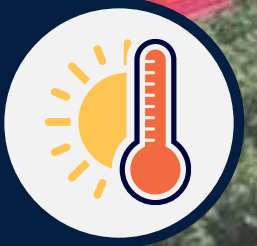


Boston Harbor will likely experience 1ft of Sea Level Rise by 2030, and 3ft by 2070.



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.



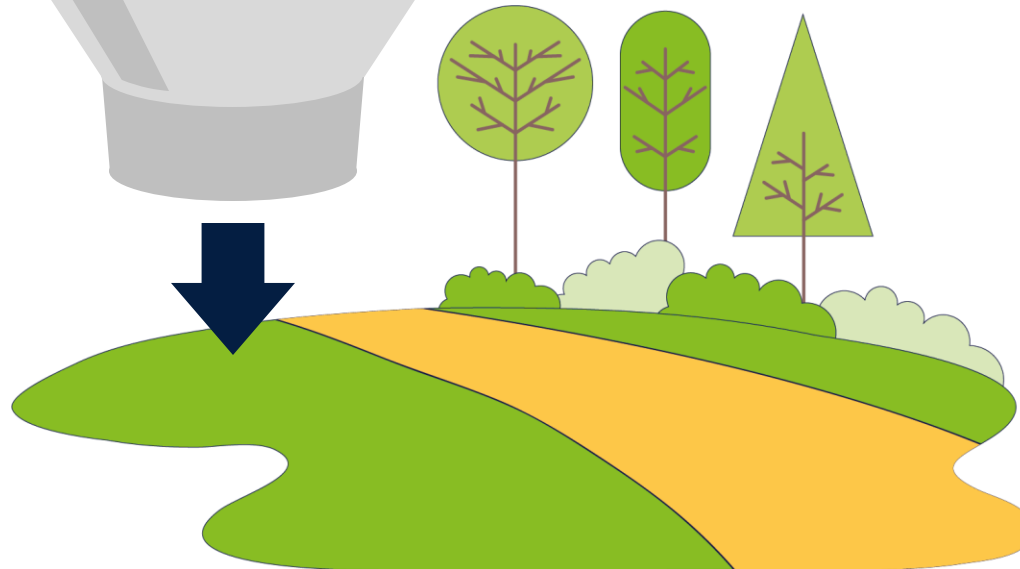
WHAT IS HAZARD MITIGATION?



Reduce impacts from
natural hazards...



...through plans, projects,
and services.



VALUE OF HAZARD MITIGATION PLANNING



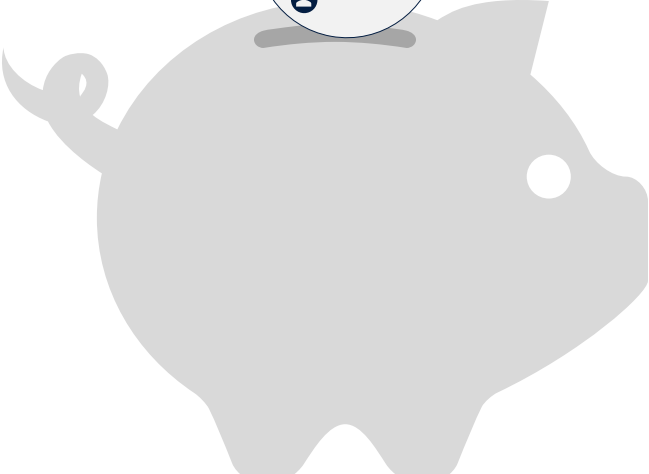
 Health & safety

Grant eligibility 

 Equitable outcomes

Preparedness planning 

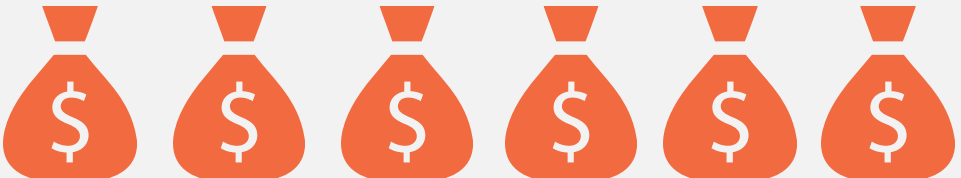
 Building consensus



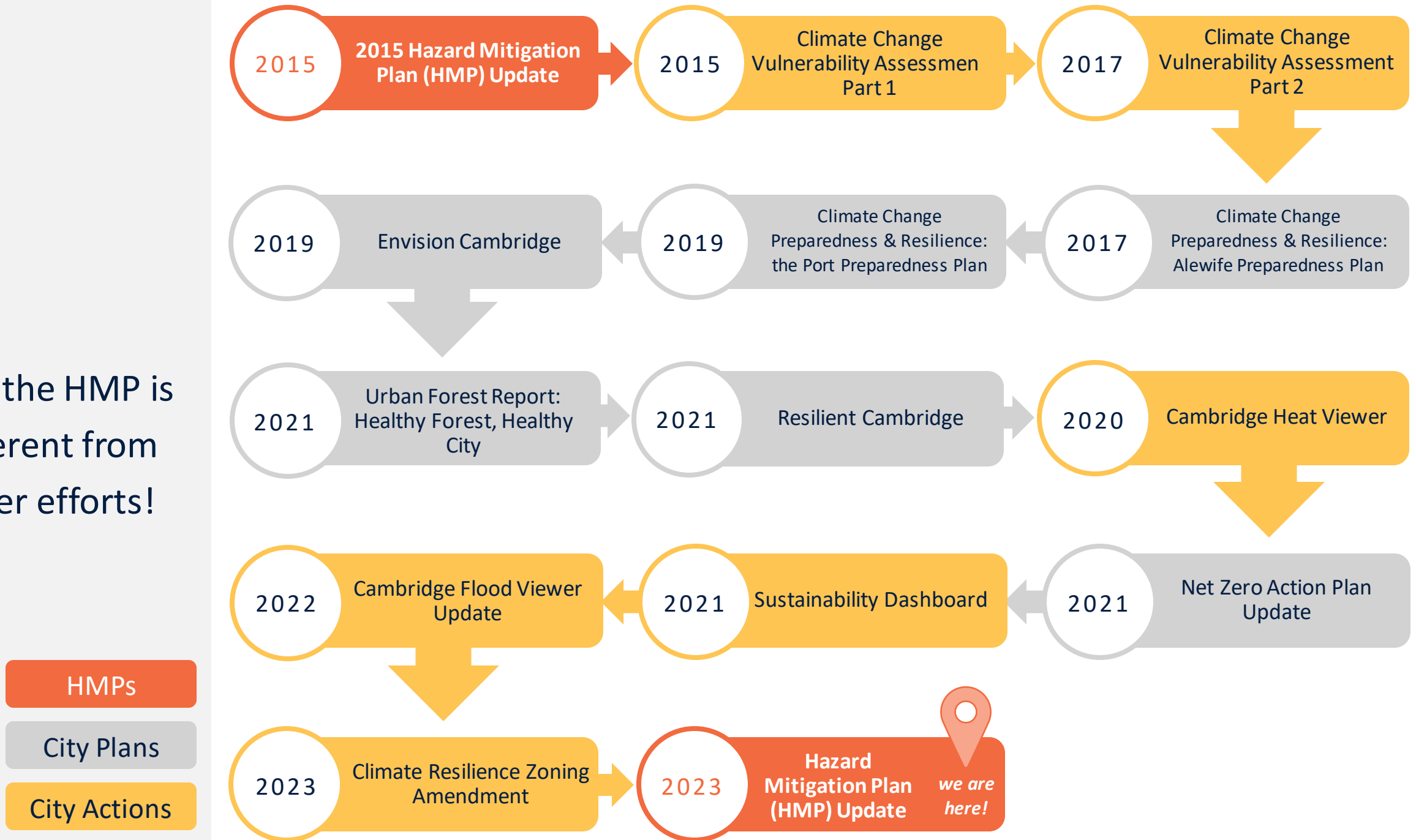
EVERY \$1 SPENT ON MITIGATION



SAVES \$6 ON DISASTER RECOVERY



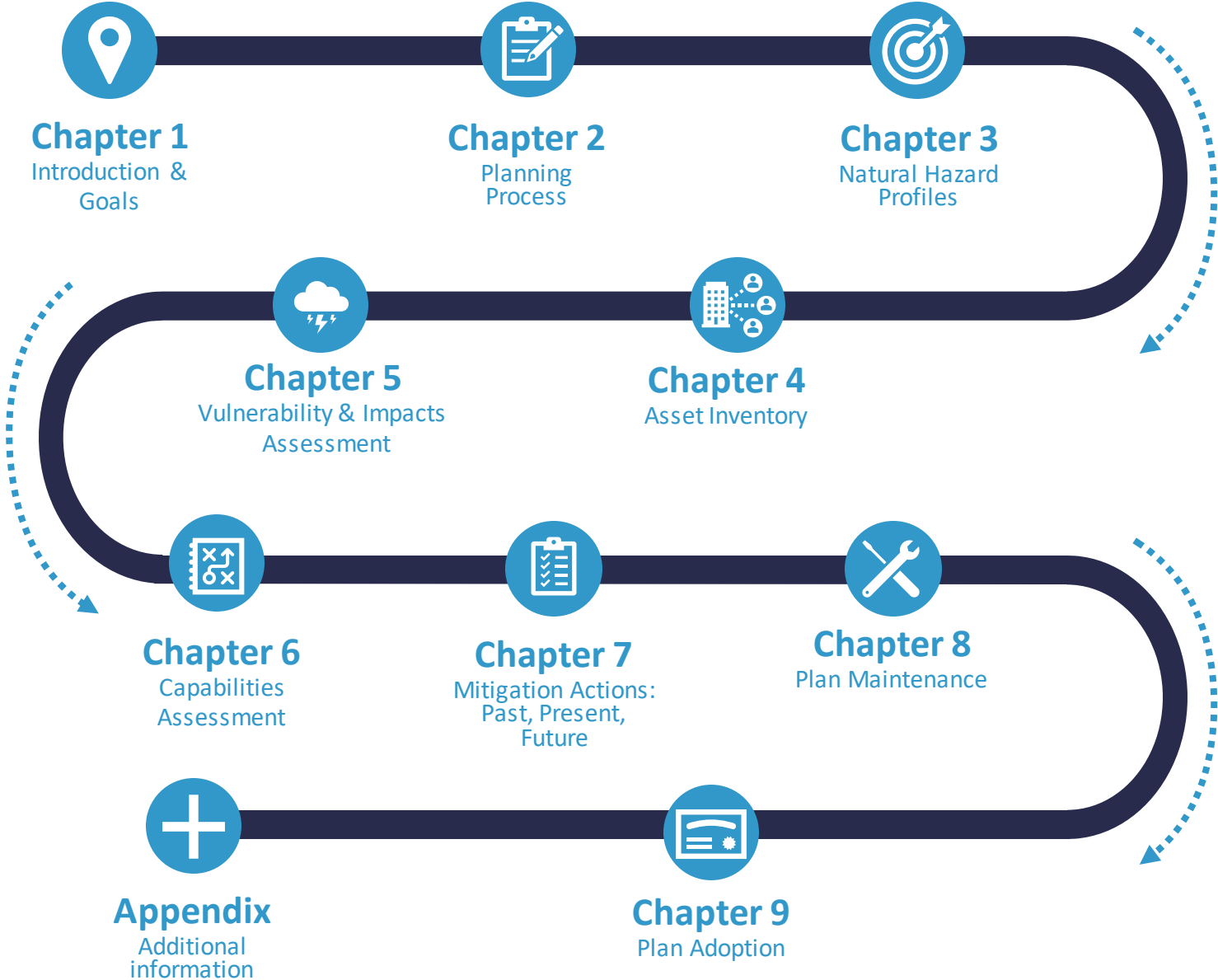
How the HMP is different from other efforts!





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



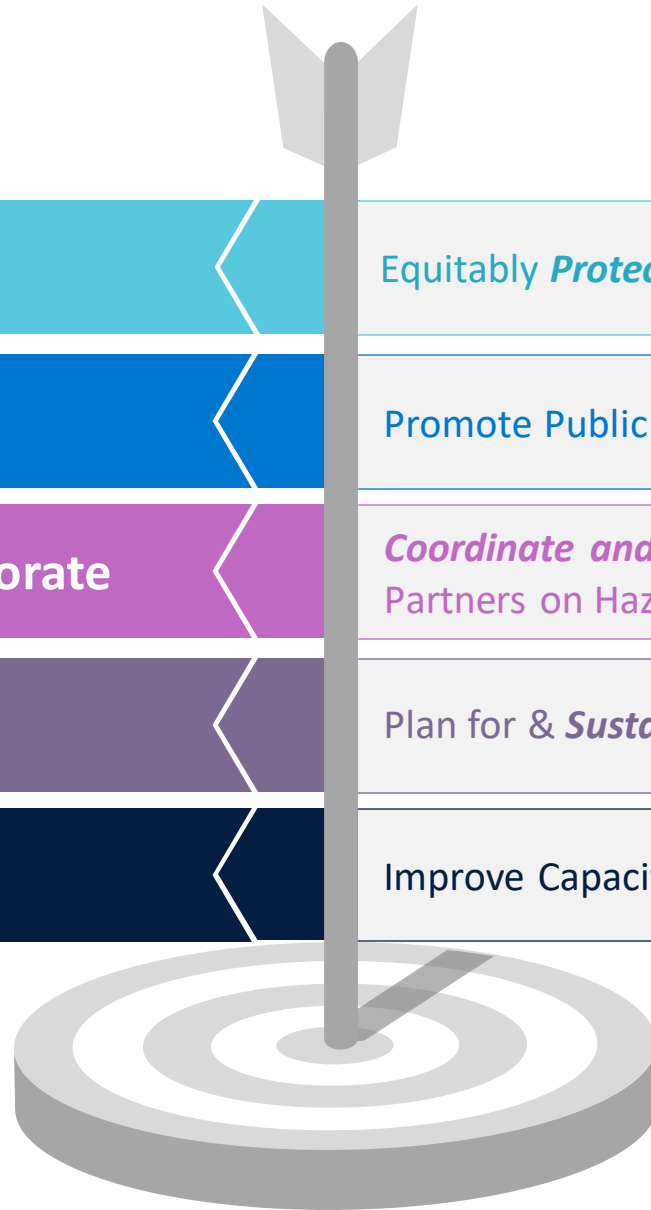
Sustainably Invest

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



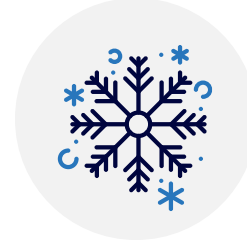
HURRICANES/
TROPICAL
STORMS



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



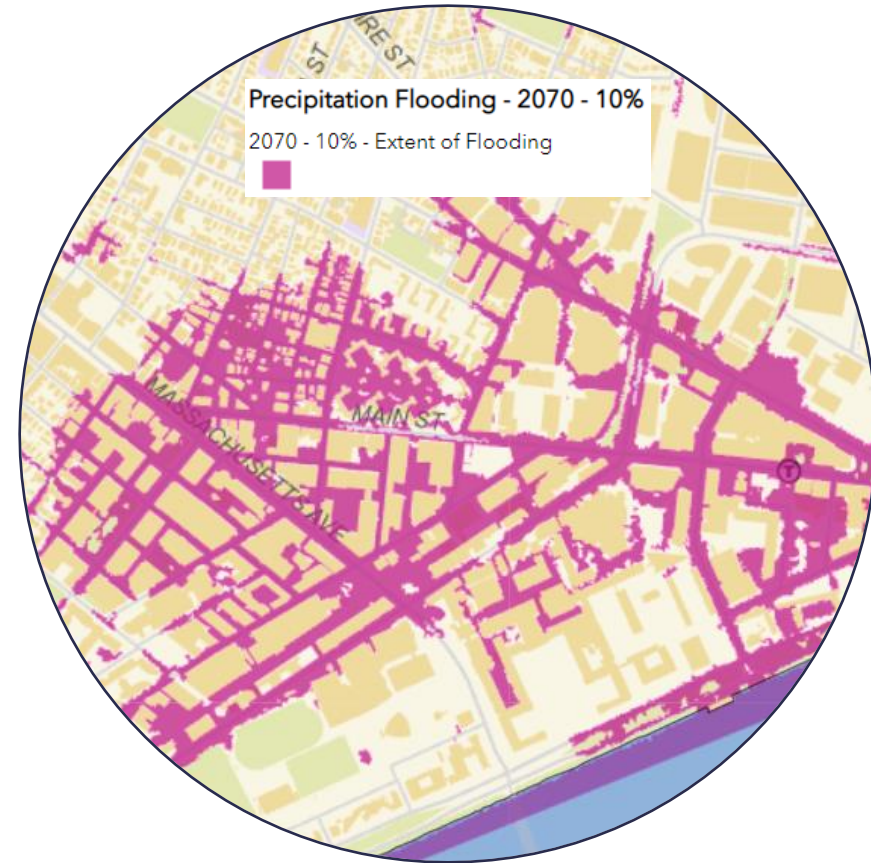
Chapter 3 Identifies the natural hazards that can affect the city:

Location: Areas of Cambridge that might be affected

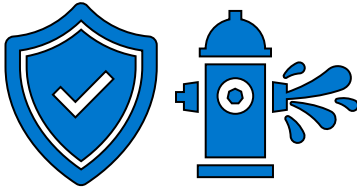
Level of Intensity: Potential size of natural hazard event

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

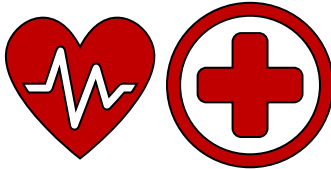
Future Probability: How likely they are to occur in the future?



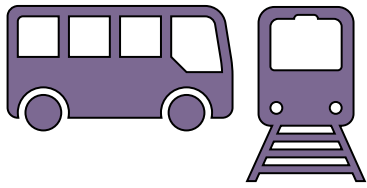
CH 4: ASSET INVENTORY



Safety & Security



Health & Medical



Transportation



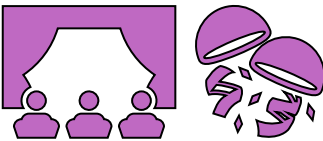
Food, Water, Shelter



Parks & Greenspace



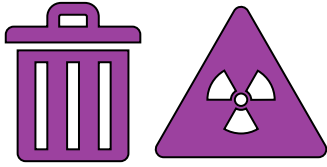
Communications



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



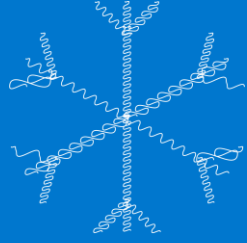
CH 5: VULNERABILITY & IMPACT ASSESSMENT



VULNERABILITY =
ASSETS that could be impacted by HAZARDS



WHAT WE'VE HEARD FROM YOU...



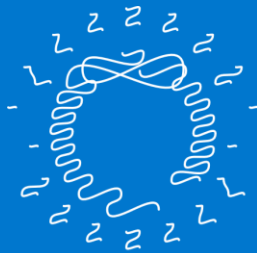
Major blizzards have disrupted daily life and work, with power outages, mountains of snow to shovel, digging out the car, difficulty navigating on foot due to relentless ice that's never fully addressed by community.
- Survey Respondent



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

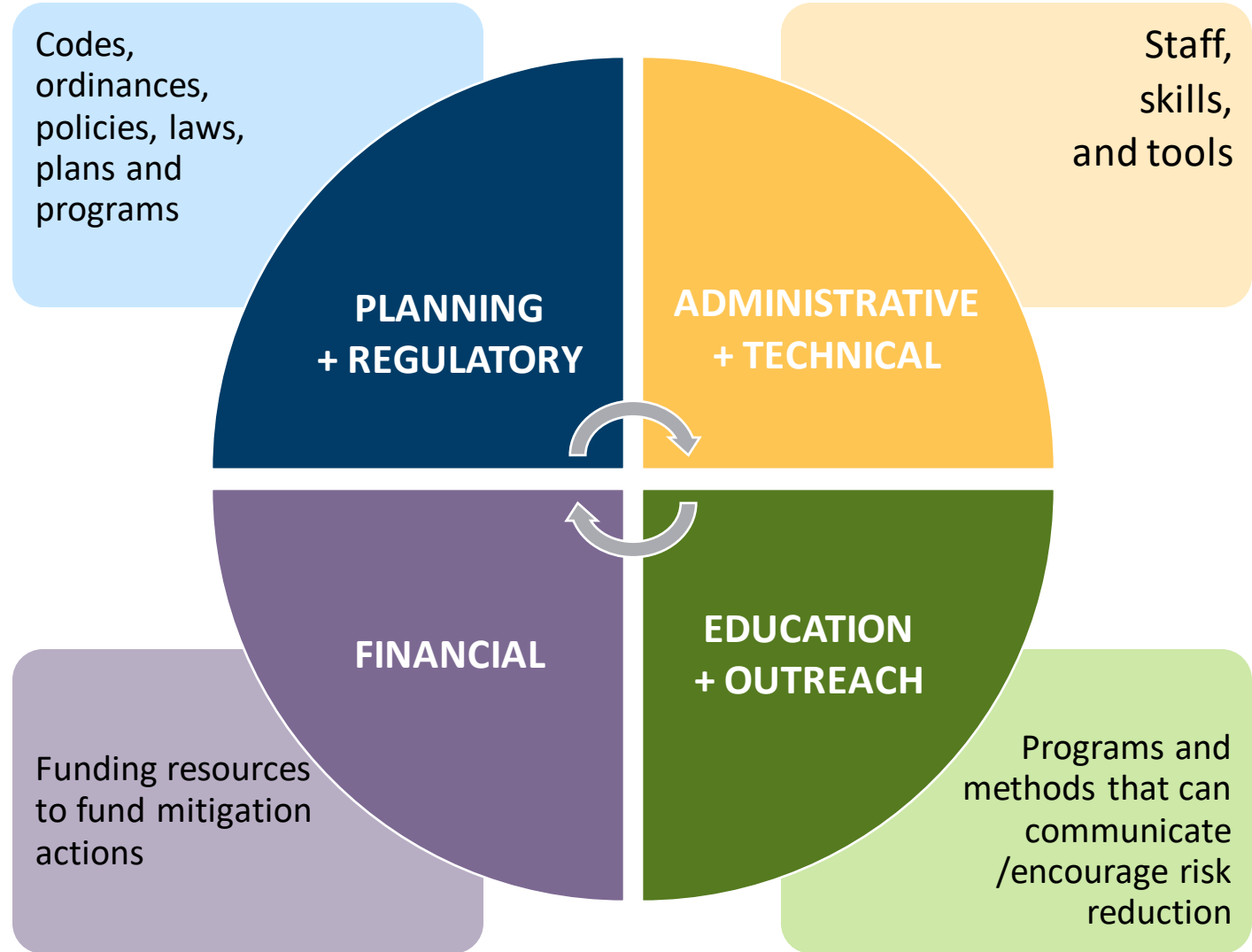


Extremes of heat and cold or heavy snow make it difficult and unpleasant for me to get around. I don't have a car, and I still have to walk to or from the bus stop or T station and wait for the bus in bad weather conditions.
-Survey Respondent

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.



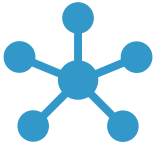
EVALUATING THE PLAN

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

1 

Assemble Core Team/Steering Committee

2 


Determine Stakeholders

3 


Hold Public Outreach Meeting

4 


Workshops

9 

Send to FEMA/Address Comments

8 

Adopt

7 

Send to State EMA/Address Comments

6 

Public Meeting/Listening Session

5 

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!

HAZARD MITIGATION PLAN 2023 UPDATE PUBLIC MEETINGS #2 AND #3 ATTENDANCE AND RECORDING

October 25, 2023

Attendees

City of Cambridge

- Leila Mekias, CDD
- Catherine Woodbury, DPW
- Deputy Chief Colin Walsh, Fire Dept.
- Jim Wilcox, DPW
- Julie Torelli-Greenwood, CWD
- Sam Lipson, CPHD
- Vedad Konjic, CPS Facilities
- Marlees Owayda
- Denise Garcia
- Peter Vellucci
- Rachel Tanenhaus, CCPD

Members of the Public

- Amelia Joselow
- Dawn Baxter
- Jennifer Letourneau
- John Nardone
- Julie Wood
- Latoya Weaver
- Mikayla Criger
- Pe Kutcher
- Qumrunnessa A Huda
- Rebecca Feuntes
- Salley Watermulder
- Steve Miller
- Cathie Zusy
- Jeanne Petropoulos
- Nahid Chowdhury
- Olivia Hallstein
- Sue Reinert
- Susan Pacheco

- Tom Rawson

Weston & Sampson

- Robin Seidel, Project Manager
- Jennie Moonan, HMP Technical Lead
- Emily Judson, Resiliency Planner

Recording

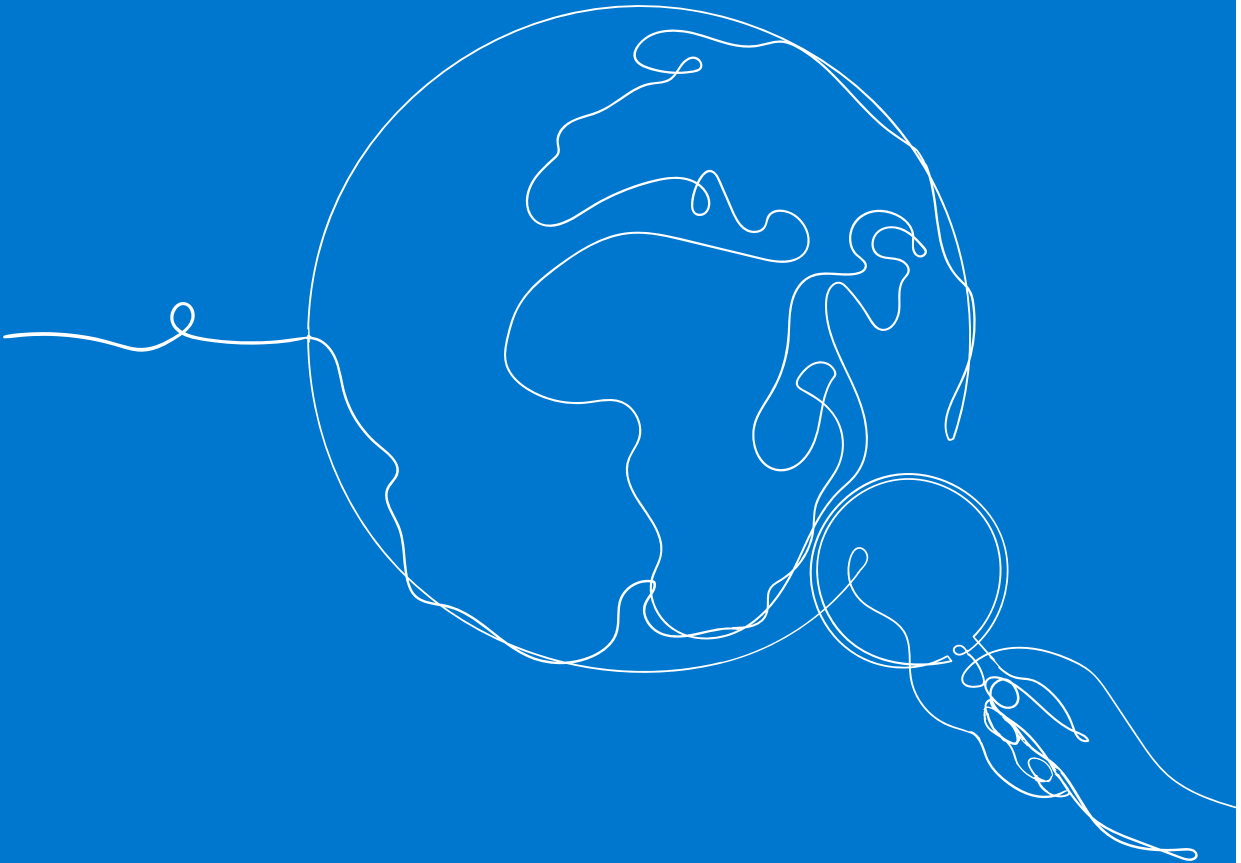
The recordings for public meetings two and three are available at the links below. Enter the passcode if prompted.

Public meeting 2:

- [Presentation Recording](#)
- Passcode: F77P#&TO

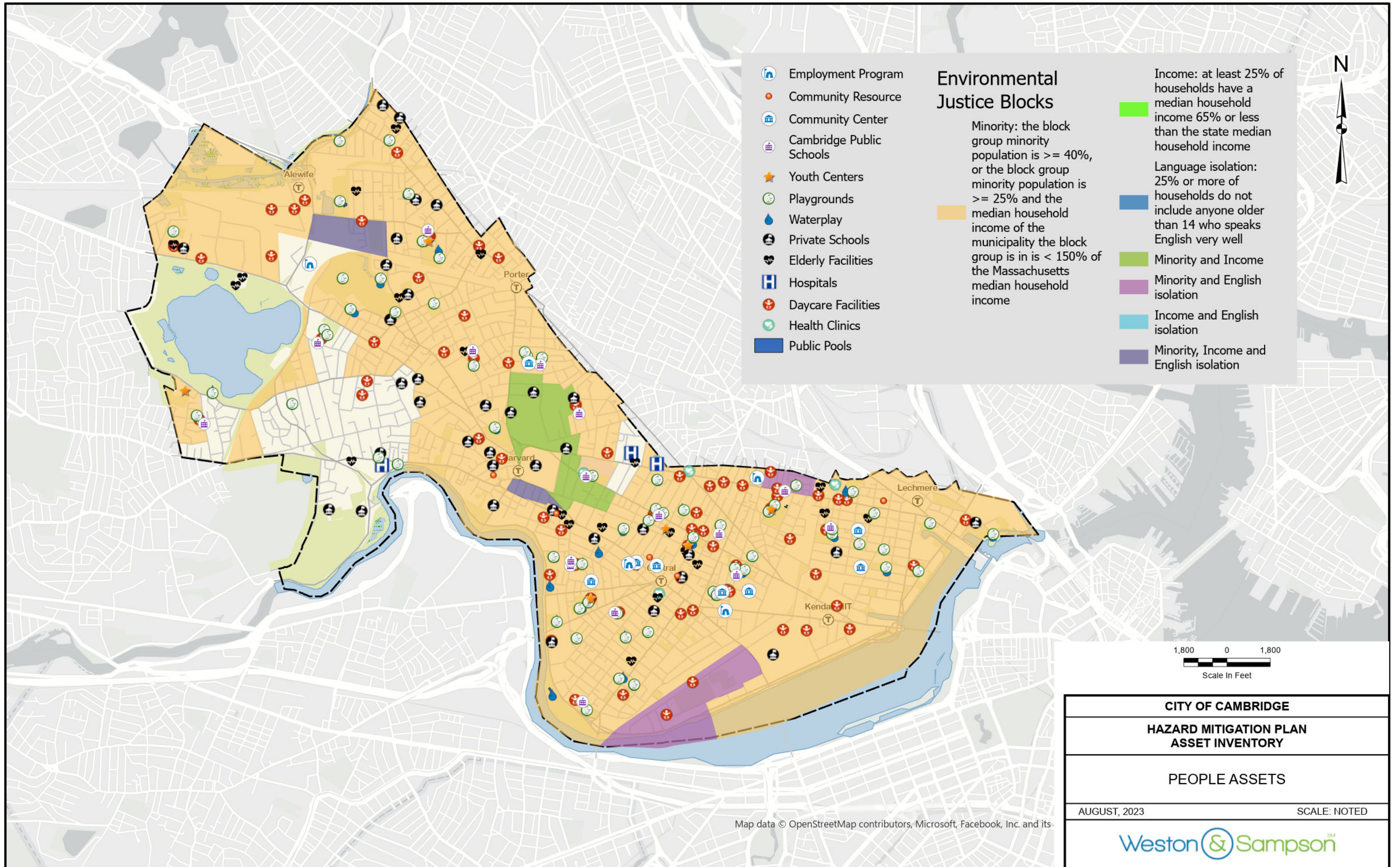
Public meeting 3:

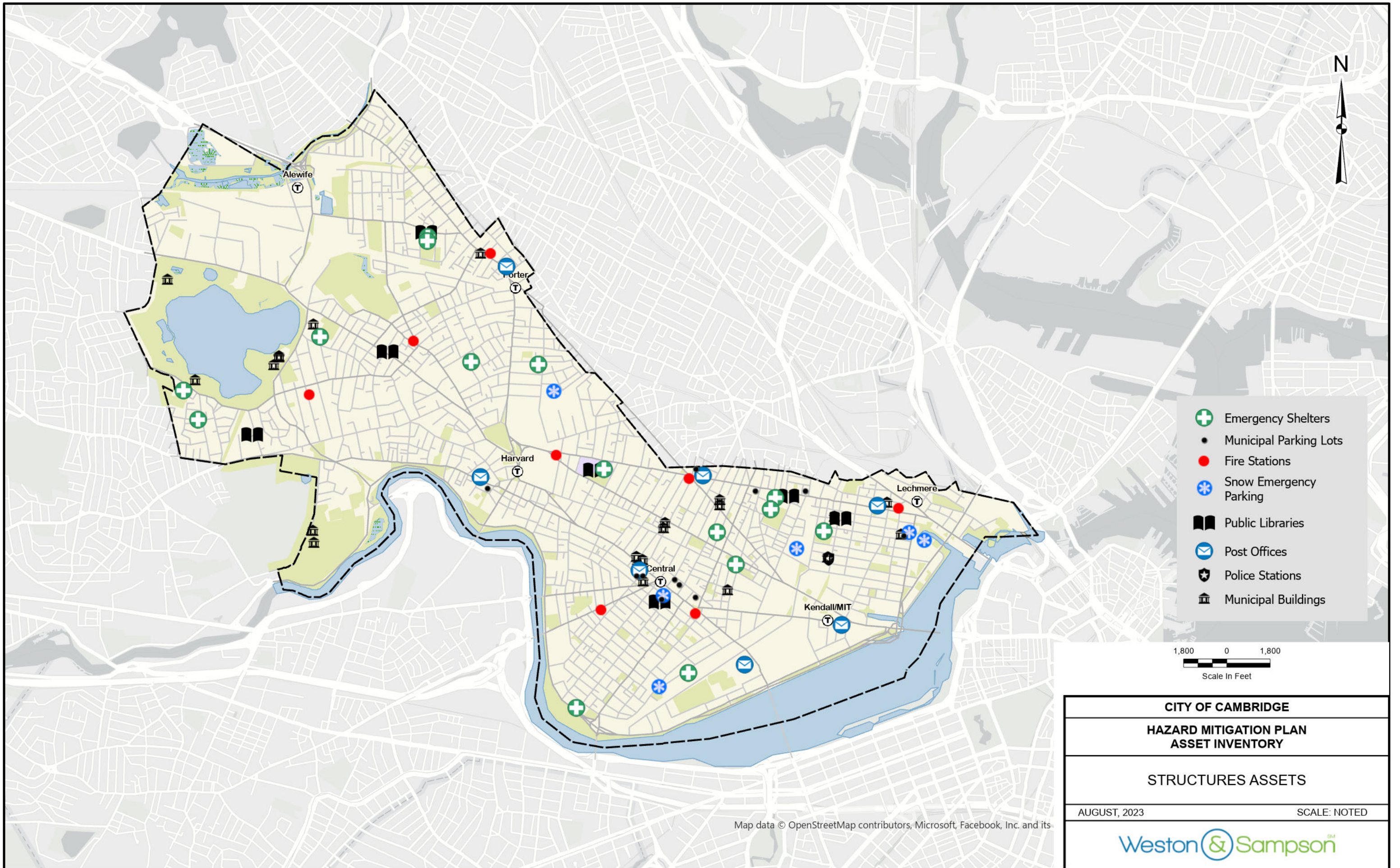
- [Presentation Recording](#)
- Passcode: FX4ct#Z+











Appendix E


Asset Maps

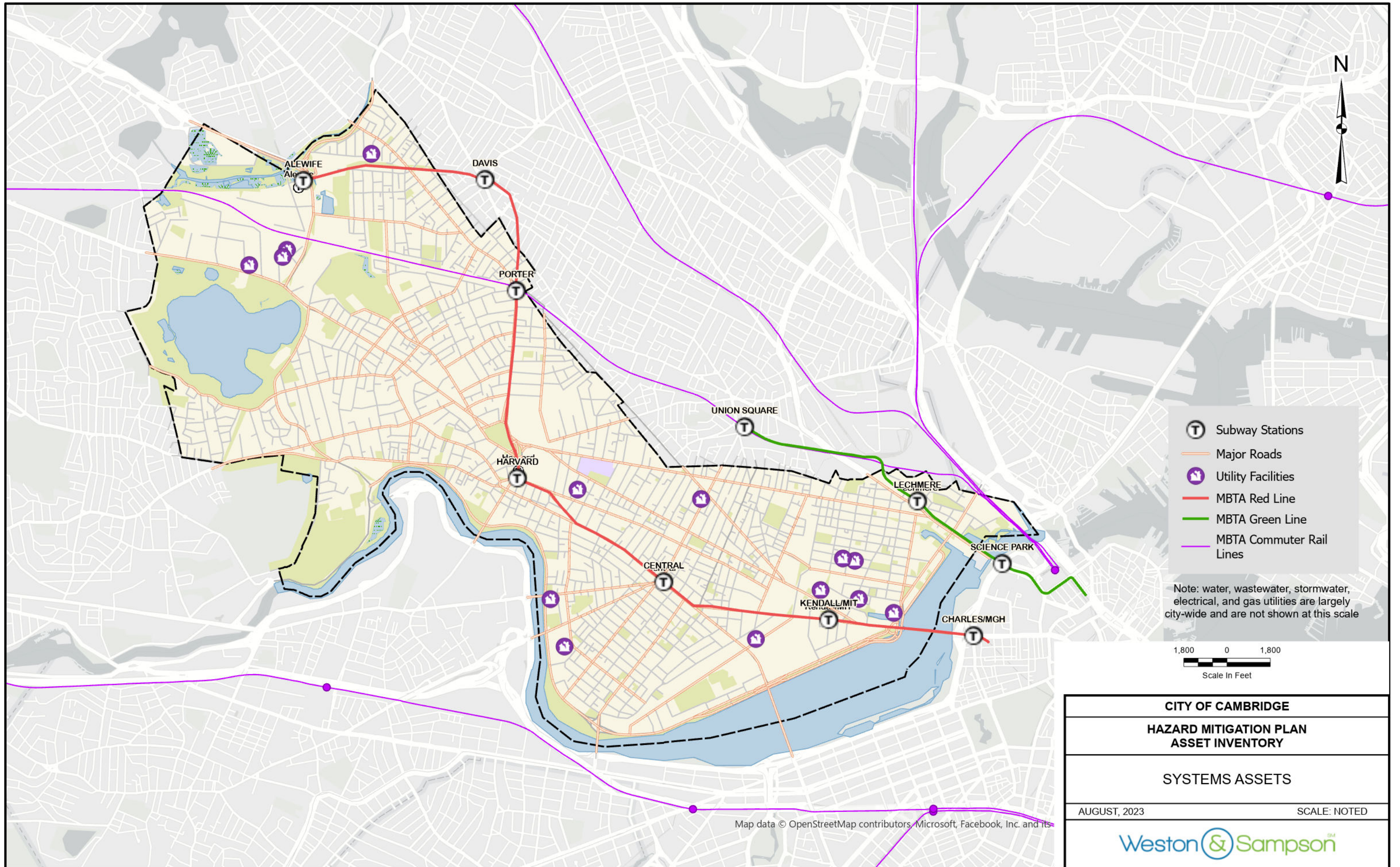










-  Emergency Shelters
-  Municipal Parking Lots
-  Fire Stations
-  Snow Emergency Parking
-  Public Libraries
-  Post Offices
-  Police Stations
-  Municipal Buildings

1,800 0 1,800
Scale In Feet


CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
STRUCTURES ASSETS	
AUGUST, 2023	SCALE: NOTED
	



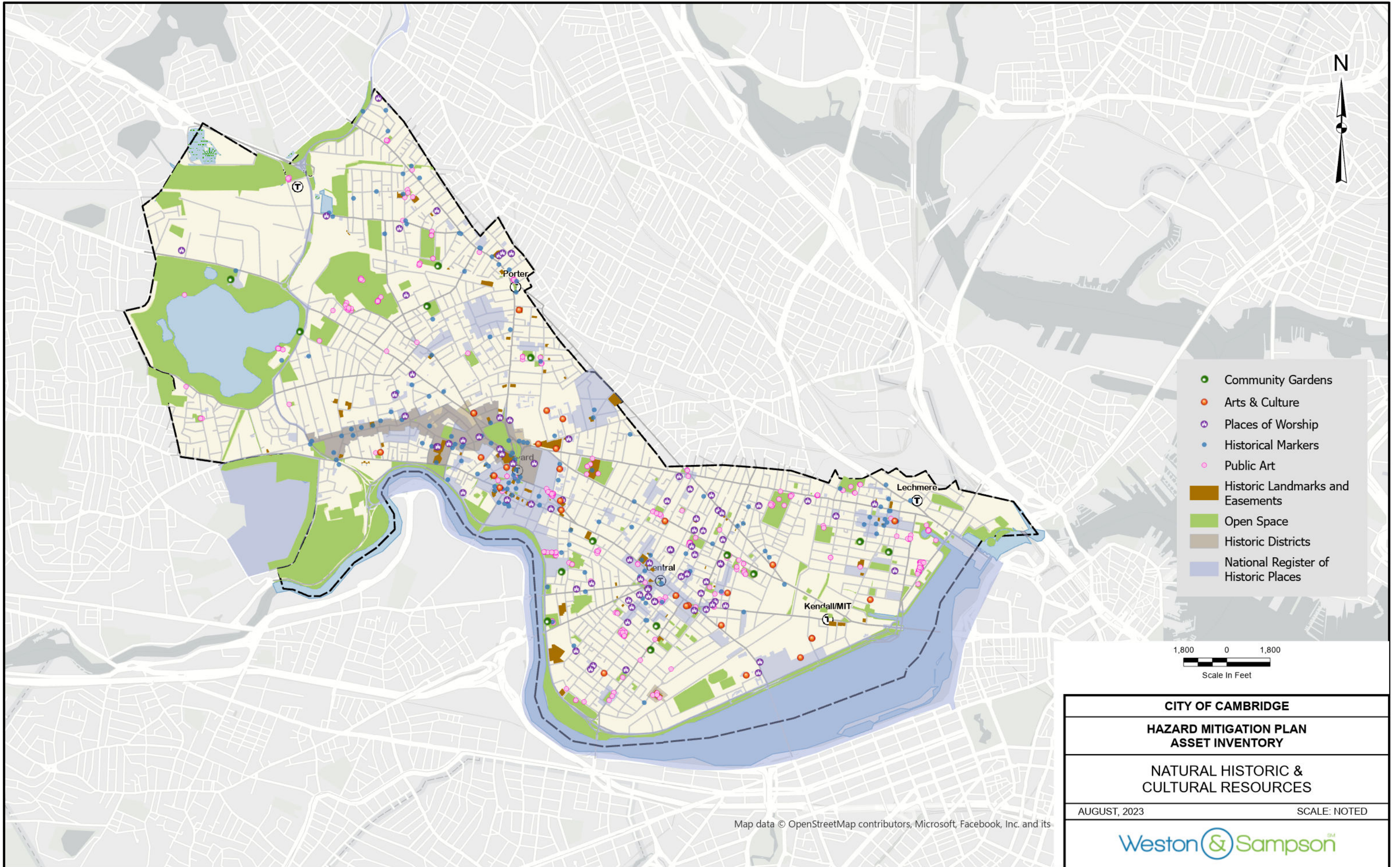
-  Subway Stations
-  Major Roads
-  Utility Facilities
-  MBTA Red Line
-  MBTA Green Line
-  MBTA Commuter Rail Lines

Note: water, wastewater, stormwater, electrical, and gas utilities are largely city-wide and are not shown at this scale



CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
SYSTEMS ASSETS	
AUGUST, 2023	SCALE: NOTED
	

Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its



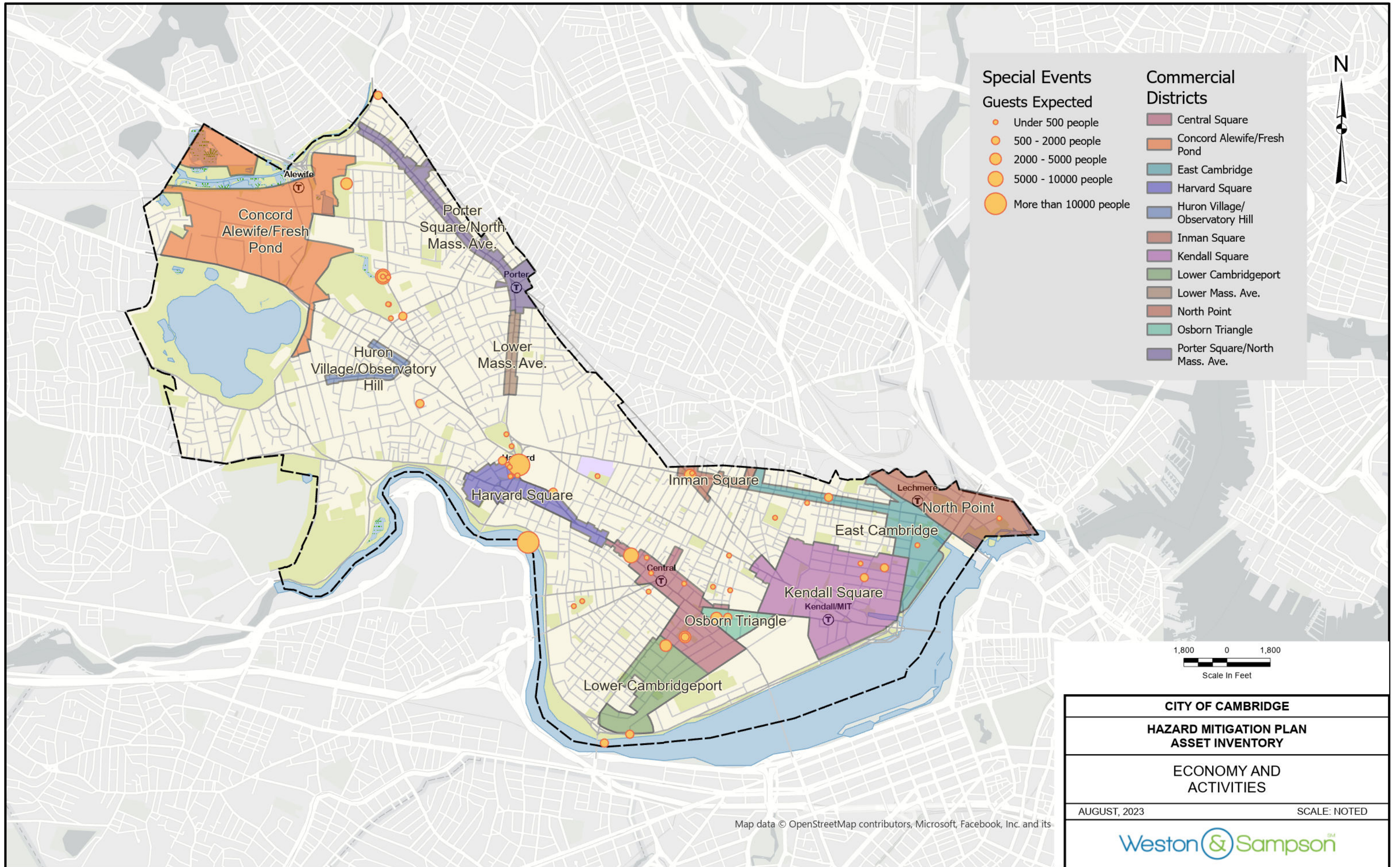
- Community Gardens
- Arts & Culture
- Places of Worship
- Historical Markers
- Public Art
- Historic Landmarks and Easements
- Open Space
- Historic Districts
- National Register of Historic Places

1,800 0 1,800
 Scale In Feet

CITY OF CAMBRIDGE
HAZARD MITIGATION PLAN
ASSET INVENTORY
NATURAL HISTORIC &
CULTURAL RESOURCES
 AUGUST, 2023 SCALE: NOTED



Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its

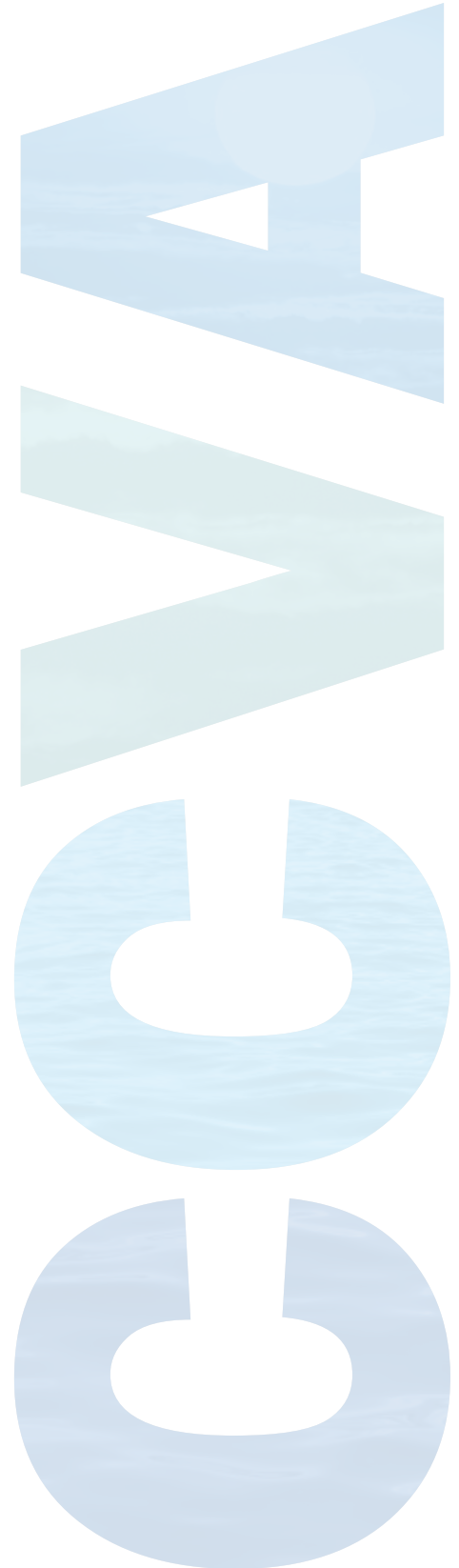


CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
ECONOMY AND ACTIVITIES	
AUGUST, 2023	SCALE: NOTED

Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its

Appendix A

Critical Assets and Community Resources Maps



Climate Change Vulnerability Assessment

City of Cambridge, Massachusetts

November 2015

Maps - Critical Assets and Community Resources

The Built Environment

Energy

- E.1: Buildings by Heating Fuel Type, City of Cambridge
- E.2: Energy Infrastructures Systems, City of Cambridge

Transportation

- Tr.1: MBTA Transit Ridership, City of Cambridge
- Tr.2: MBTA support infrastructure
- Tr.3: Road System and Traffic Count, City of Cambridge
- Tr.4: Bridges, Tunnels and Underpasses, City of Cambridge
- Tr.5: Parking Garages, City of Cambridge
- Tr. 6: Bicycle Infrastructures
- Tr. 7: Bicycle Critical Assets

Water

- W.1: Location of surface water bodies, wetlands and dams in Cambridge
- W.2: Surface water supply source area, City of Cambridge
- W.3: Water distribution system, City of Cambridge
- W.4: Stormwater collection system, City of Cambridge
- W.5: Combined sewer collection system, City of Cambridge
- W.6: Impervious surfaces, City of Cambridge

Telecommunications

- Te.1: Telecommunication critical assets, City of Cambridge

Critical Services

- CS.1: Critical Services, City of Cambridge

The Urban Forests

- UF.1: Percentage of tree canopy in Cambridge
- UF.2: Cooling impact of trees in Cambridge

The Social Environment

- CR.1: K-12 Schools and Day Care Facilities in Cambridge
- CR.2: Affordable Housing, City of Cambridge
- CR.3: Pharmacies & Food Assistance, City of Cambridge
- CR.4: Municipal Resources, City of Cambridge
- CR.5: Community-Based Organizations and Services, City of Cambridge
- CR.6: Hazardous Material Sites, City of Cambridge









Cambridge Buildings by Fuel Type

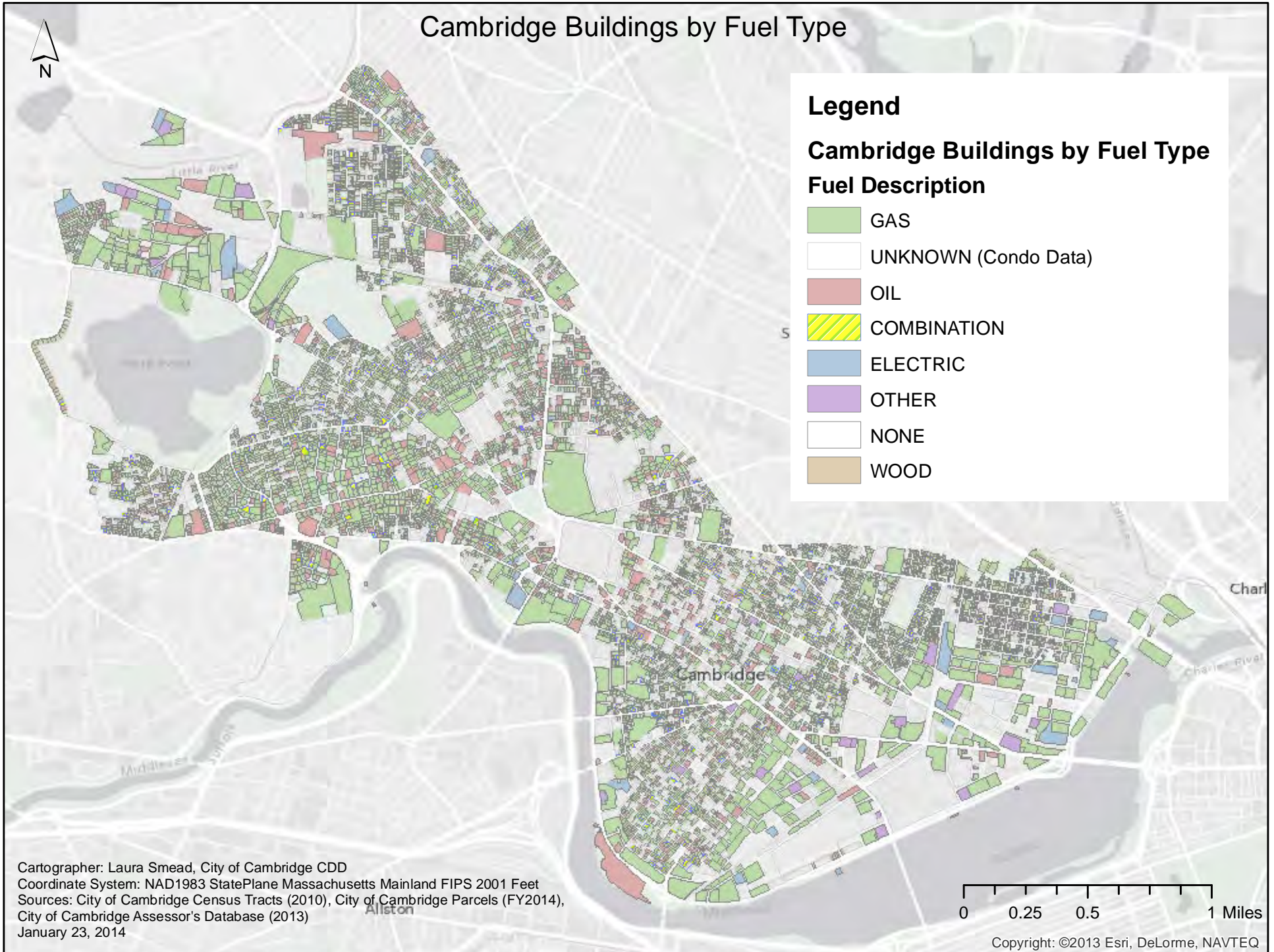


Legend

Cambridge Buildings by Fuel Type

Fuel Description

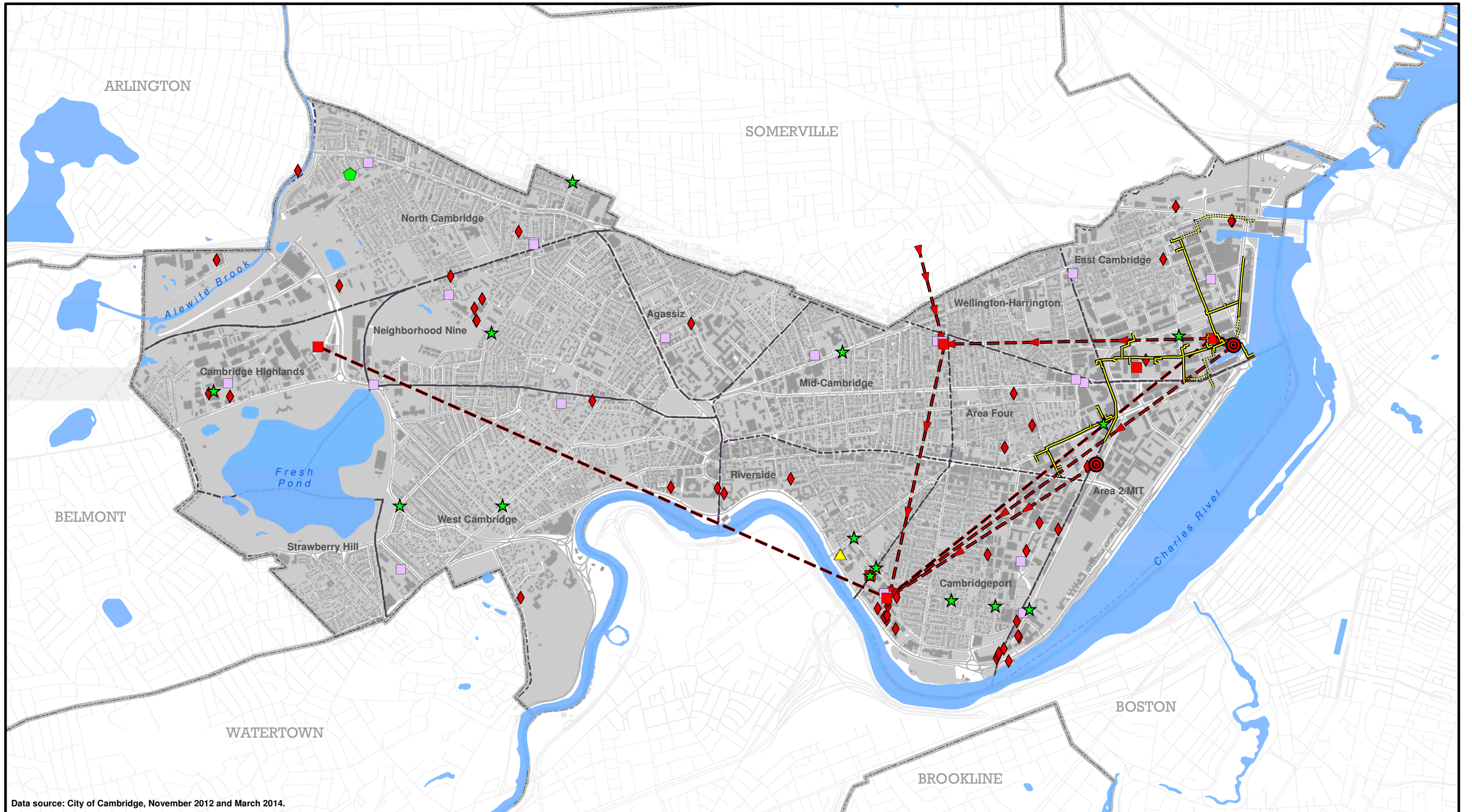
-  GAS
-  UNKNOWN (Condo Data)
-  OIL
-  COMBINATION
-  ELECTRIC
-  OTHER
-  NONE
-  WOOD



Cartographer: Laura Smead, City of Cambridge CDD
Coordinate System: NAD1983 StatePlane Massachusetts Mainland FIPS 2001 Feet
Sources: City of Cambridge Census Tracts (2010), City of Cambridge Parcels (FY2014),
City of Cambridge Assessor's Database (2013)
January 23, 2014

0 0.25 0.5 1 Miles

Copyright: ©2013 Esri, DeLorme, NAVTEQ

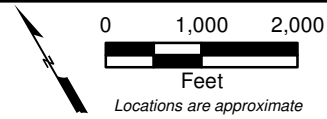


Data source: City of Cambridge, November 2012 and March 2014.

LEGEND

- Power Plant (10 MW or more)
- Gas Distribution System Regulator Station
- Natural Gas Gate Station

- Steam Generating Facility
- Minor Substation
- Backup Electrical Generator
- Transmission Line (Schematic)
 - 13.8 kV (unidirectional)
 - 115 kV (bi-directional)
- Steam Distribution Line Active
- Steam Distribution Line Inactive

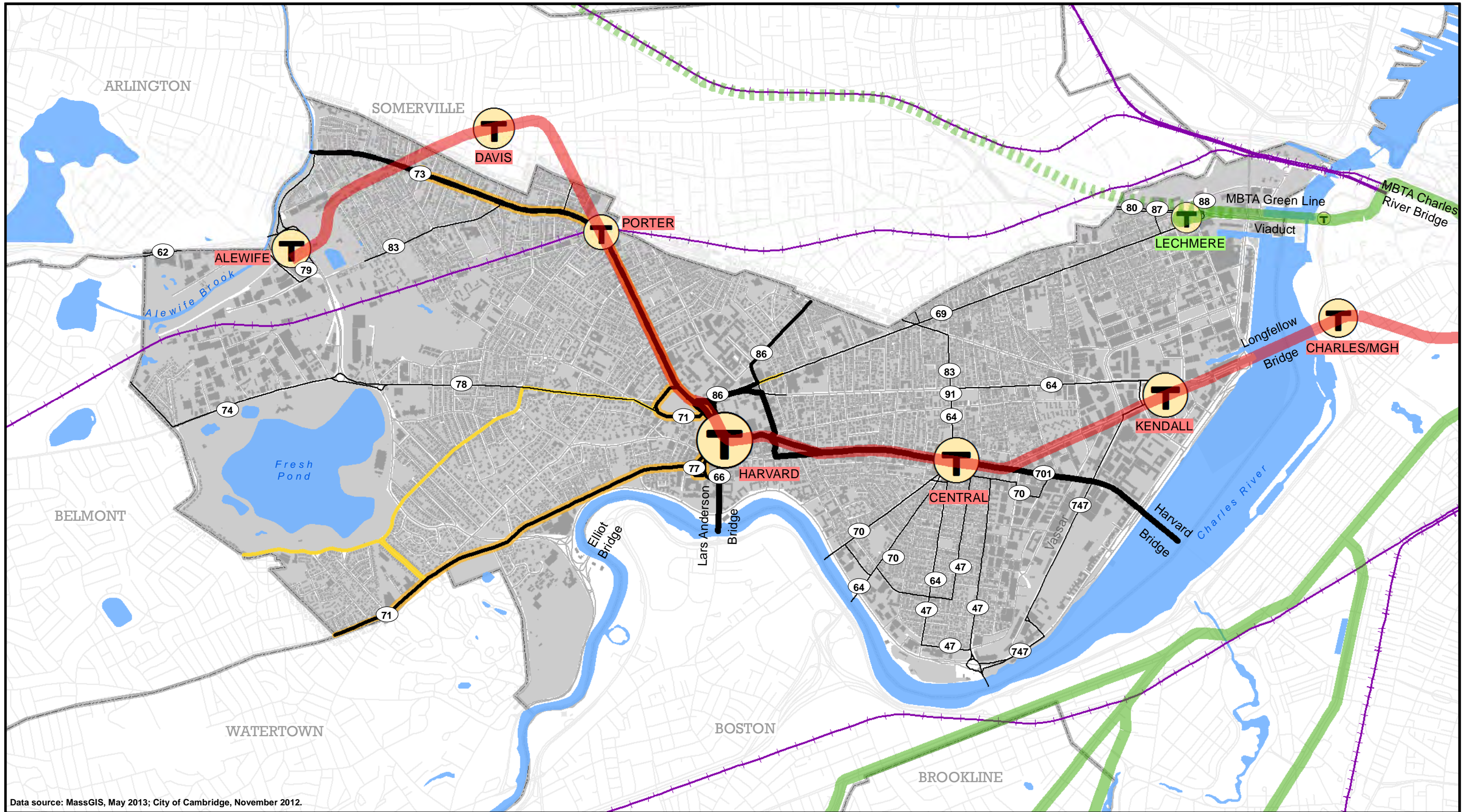


THIS MAP HAS BEEN PREPARED FOR THE CITY OF CAMBRIDGE CLIMATE CHANGE VULNERABILITY ASSESSMENT. IT IS BASED ON GIS DATA PROVIDED BY THE CITY (11/2012) AND FROM MASSGIS. USERS OF THIS MAP SHOULD CONSULT PRIMARY SOURCES FOR VERIFICATION OF THE INFORMATION CONTAINED ON THIS MAP. THE CITY OF CAMBRIDGE AND ITS MAPPING CONTRACTORS ASSUME NO LIABILITY FOR THE INFORMATION CONTAINED HEREIN.



PROJECT NO.	20100259
DRAWN:	10/1/2014
DRAWN BY:	KFH
CHECKED BY:	NB
FILE NAME:	E.2-Infrastructure.mxd

ENERGY INFRASTRUCTURE SYSTEMS	MAP
Climate Change Vulnerability Assessment Cambridge, Massachusetts	E.2



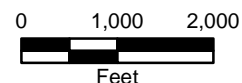
Data source: MassGIS, May 2013; City of Cambridge, November 2012.

LEGEND

- █ Green Line
- █ Red Line
- - - Green Line Extension (schematic)
- █ Trackless Trolley
- + + + Fitchburg Commuter Rail

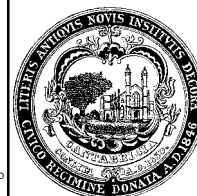
- Weekday Entries
- T 1,000
 - T 5,000
 - T 10,000

- MBTA Bus Weekday Boarding
- > 1,000
 - > 5,000
 - > 10,000



Locations are approximate

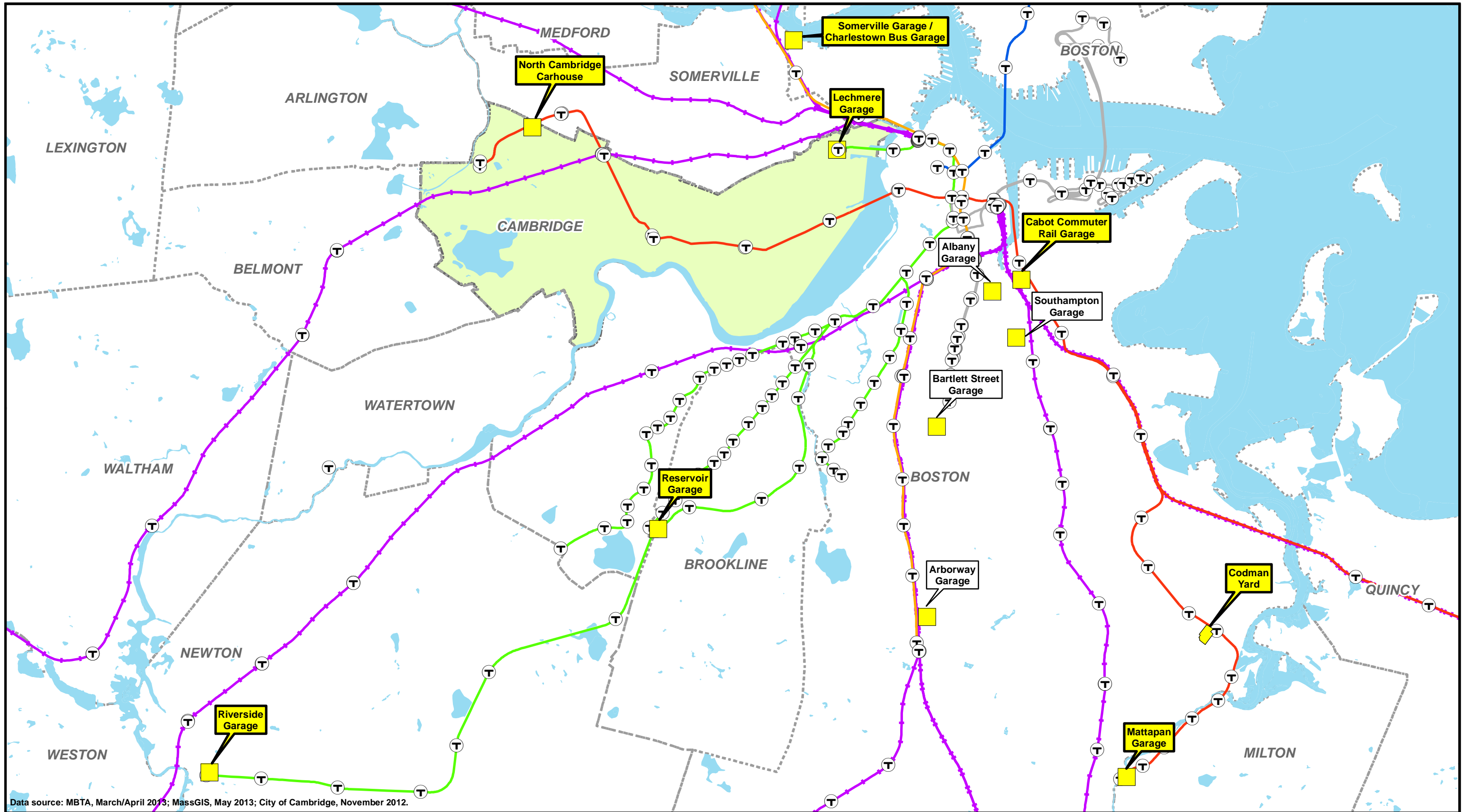
THIS MAP HAS BEEN PREPARED FOR THE CITY OF CAMBRIDGE CLIMATE CHANGE VULNERABILITY ASSESSMENT. IT IS BASED ON GIS DATA PROVIDED BY THE CITY (11/8/2012) AND FROM MASSGIS. USERS OF THIS MAP SHOULD CONSULT PRIMARY SOURCES FOR VERIFICATION OF THE INFORMATION CONTAINED ON THIS MAP. THE CITY OF CAMBRIDGE AND ITS MAPPING CONTRACTORS ASSUME NO LIABILITY FOR THE INFORMATION CONTAINED HEREIN.



PROJECT NO.	20100259
DRAWN:	04/07/2015
DRAWN BY:	KFH
CHECKED BY:	NB
FILE NAME:	Tr.1-Transit.mxd

MBTA TRANSIT RIDERSHIP
Climate Change Vulnerability Assessment Cambridge, Massachusetts

MAP
Tr.1



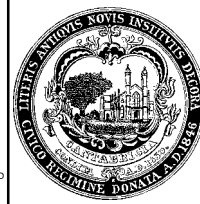
Data source: MBTA, March/April 2013; MassGIS, May 2013; City of Cambridge, November 2012.

LEGEND

- MBTA Garage
- Riverside Garage
- Support Infrastructure Impacting Green and Red Lines
- Commuter Rail
- MBTA Blue Line
- MBTA Green Line
- MBTA Orange Line
- MBTA Red Line
- MBTA Silver Line
- Town Boundary

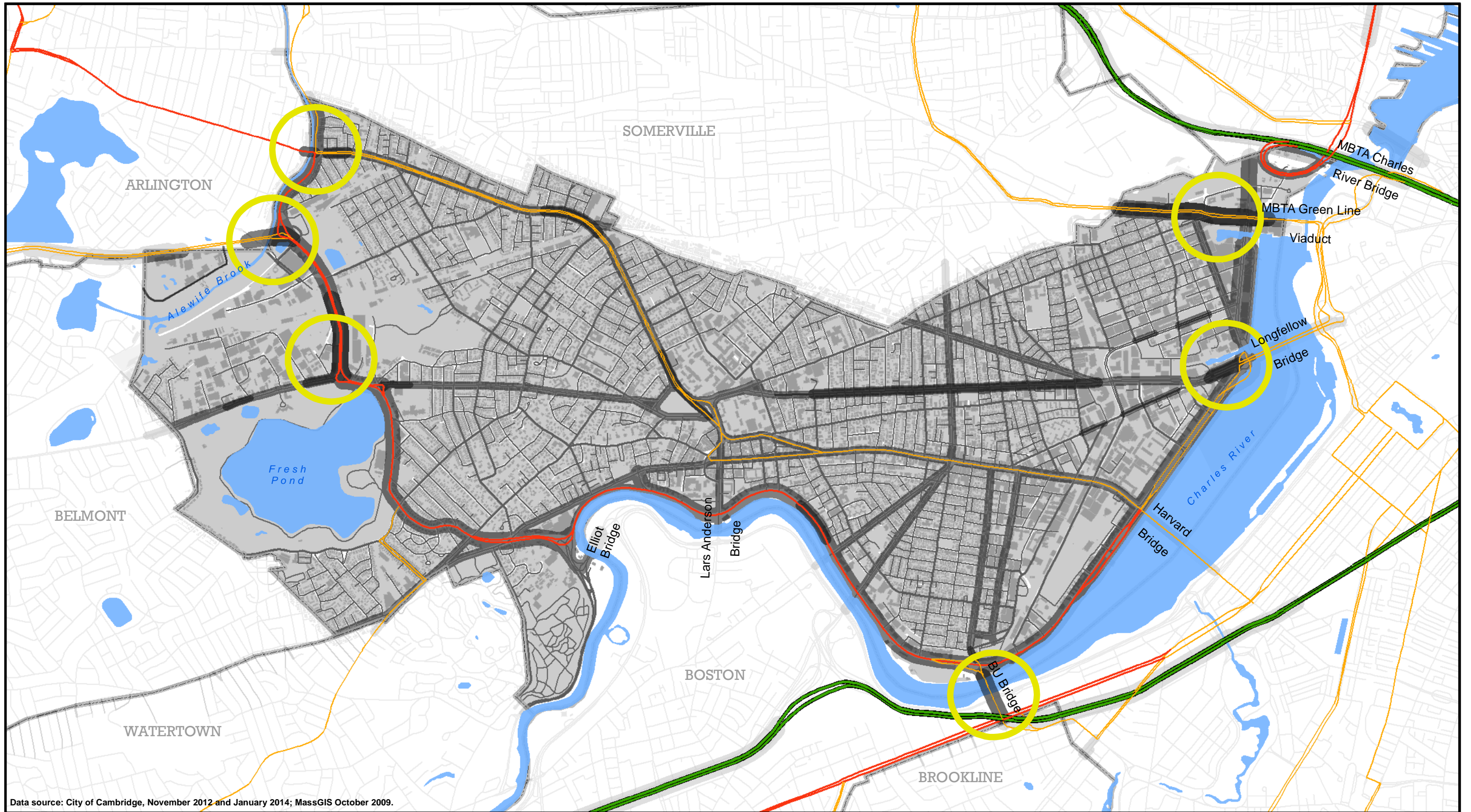


THIS MAP HAS BEEN PREPARED FOR THE CITY OF CAMBRIDGE CLIMATE CHANGE VULNERABILITY ASSESSMENT. IT IS BASED ON GIS DATA PROVIDED BY THE CITY (11/8/2012) AND FROM MASSGIS. USERS OF THIS MAP SHOULD CONSULT PRIMARY SOURCES FOR VERIFICATION OF THE INFORMATION CONTAINED ON THIS MAP. THE CITY OF CAMBRIDGE AND ITS MAPPING CONTRACTORS ASSUME NO LIABILITY FOR THE INFORMATION CONTAINED HEREIN.



PROJECT NO.	20100259
DRAWN:	04/07/2015
DRAWN BY:	KFH
CHECKED BY:	NB
FILE NAME:	Tr.2-RegionalMBTA.mxd

MBTA SUPPORT INFRASTRUCTURE		MAP Tr.2
Climate Change Vulnerability Assessment Cambridge, Massachusetts		

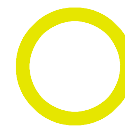


Data source: City of Cambridge, November 2012 and January 2014; MassGIS October 2009.

LEGEND

- Roads by Jurisdiction
- Interstate
 - US Highway
 - State Route

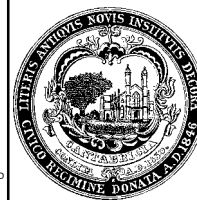
- Roads by Traffic Count (Average Daily Traffic)
- < 10,000
 - 10,000 - 20,000
 - 20,001 - 30,000
 - > 30,000



Critical Node
Convergence of two or more vehicular access routes with total traffic count exceeding 30,000.

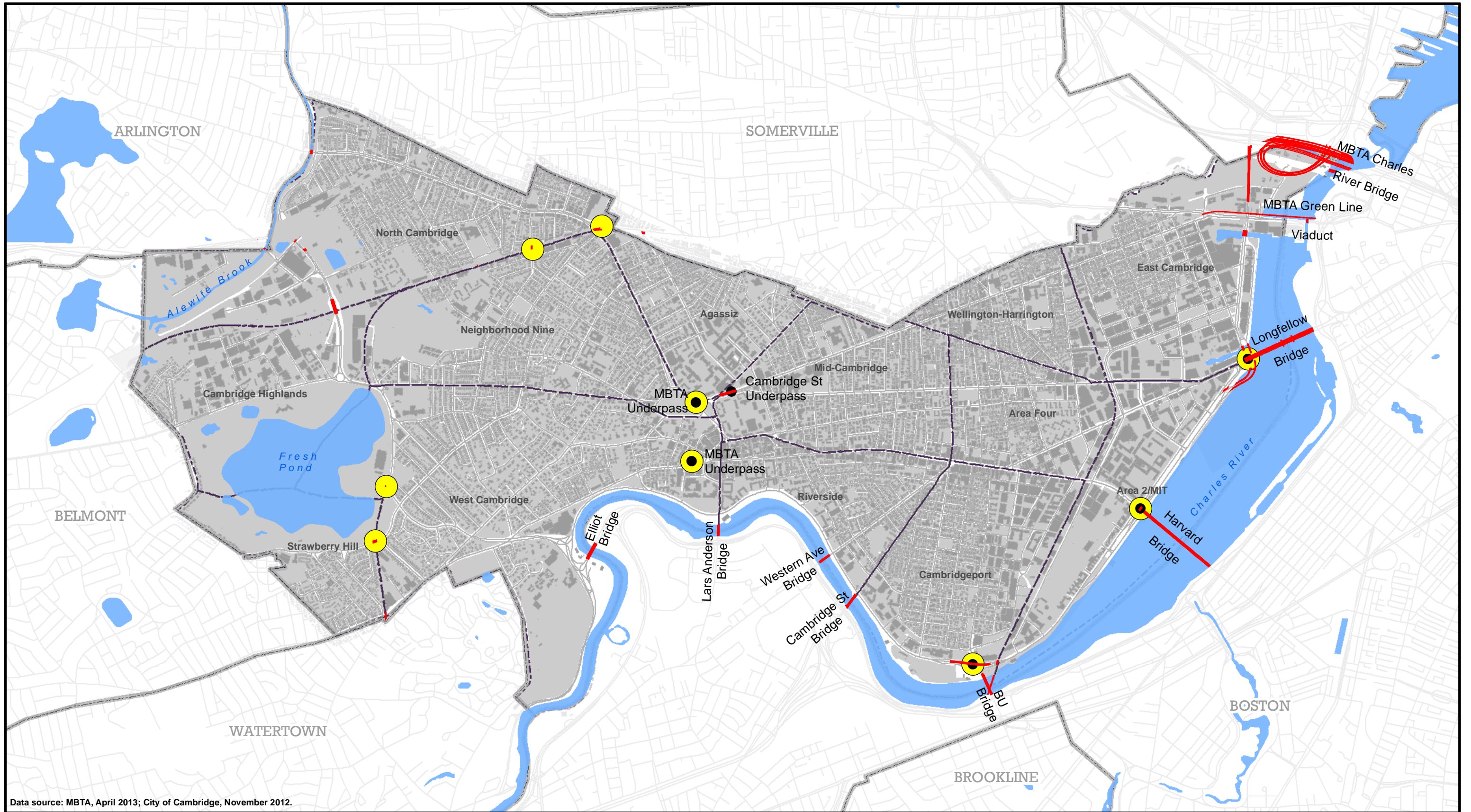


THIS MAP HAS BEEN PREPARED FOR THE CITY OF CAMBRIDGE CLIMATE CHANGE VULNERABILITY ASSESSMENT. IT IS BASED ON GIS DATA PROVIDED BY THE CITY (11/8/2012) AND FROM MASSGIS. USERS OF THIS MAP SHOULD CONSULT PRIMARY SOURCES FOR VERIFICATION OF THE INFORMATION CONTAINED ON THIS MAP. THE CITY OF CAMBRIDGE AND ITS MAPPING CONTRACTORS ASSUME NO LIABILITY FOR THE INFORMATION CONTAINED HEREIN.



PROJECT NO.	20100259
DRAWN:	04/07/2015
DRAWN BY:	KFH
CHECKED BY:	NB
FILE NAME:	Tr.3-TrafficCounts.mxd

ROAD SYSTEM AND TRAFFIC COUNT		MAP
Climate Change Vulnerability Assessment Cambridge, Massachusetts		Tr.3



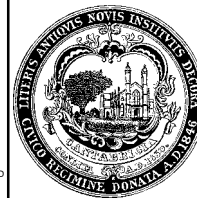
Data source: MBTA, April 2013; City of Cambridge, November 2012.

LEGEND

- MBTA Ownership
- Bridge or Overpass
- Tunnel or Underpass



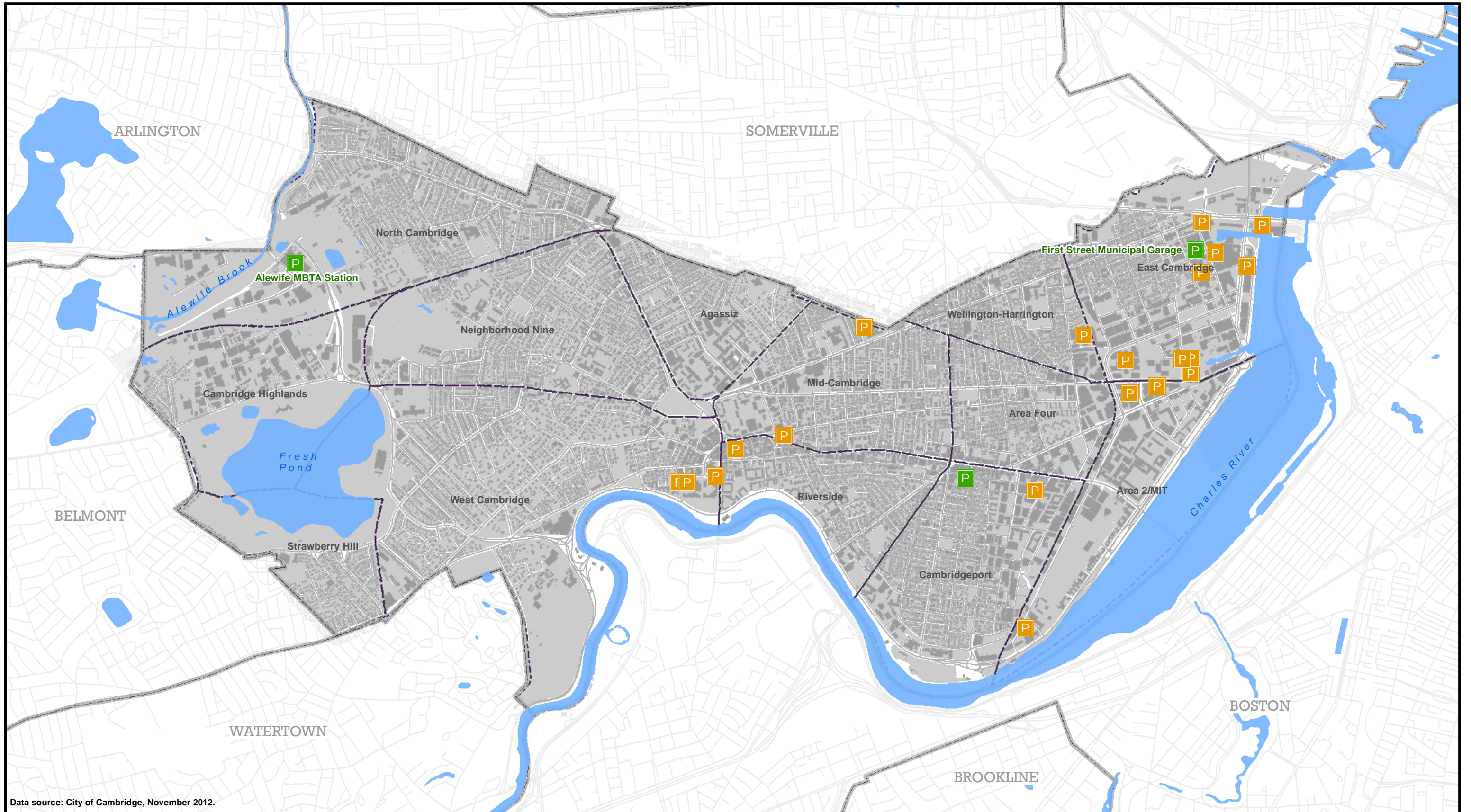
THIS MAP HAS BEEN PREPARED FOR THE CITY OF CAMBRIDGE CLIMATE CHANGE VULNERABILITY ASSESSMENT. IT IS BASED ON GIS DATA PROVIDED BY THE CITY (11/8/2012) AND FROM MASSGIS. USERS OF THIS MAP SHOULD CONSULT PRIMARY SOURCES FOR VERIFICATION OF THE INFORMATION CONTAINED ON THIS MAP. THE CITY OF CAMBRIDGE AND ITS MAPPING CONTRACTORS ASSUME NO LIABILITY FOR THE INFORMATION CONTAINED HEREIN.



PROJECT NO.	20100259
DRAWN:	04/07/2015
DRAWN BY:	KFH
CHECKED BY:	NB
FILE NAME:	Tr.4-Bridges.mxd

BRIDGES, TUNNELS AND UNDERPASSES	
Climate Change Vulnerability Assessment Cambridge, Massachusetts	

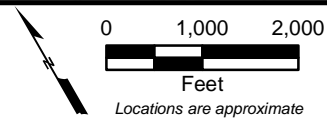
MAP
Tr.4



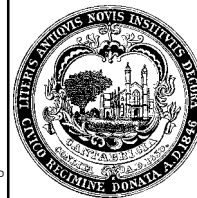
Data source: City of Cambridge, November 2012.

LEGEND

- Municipal Parking Garage
- Private Parking Garage
- Neighborhood Boundary



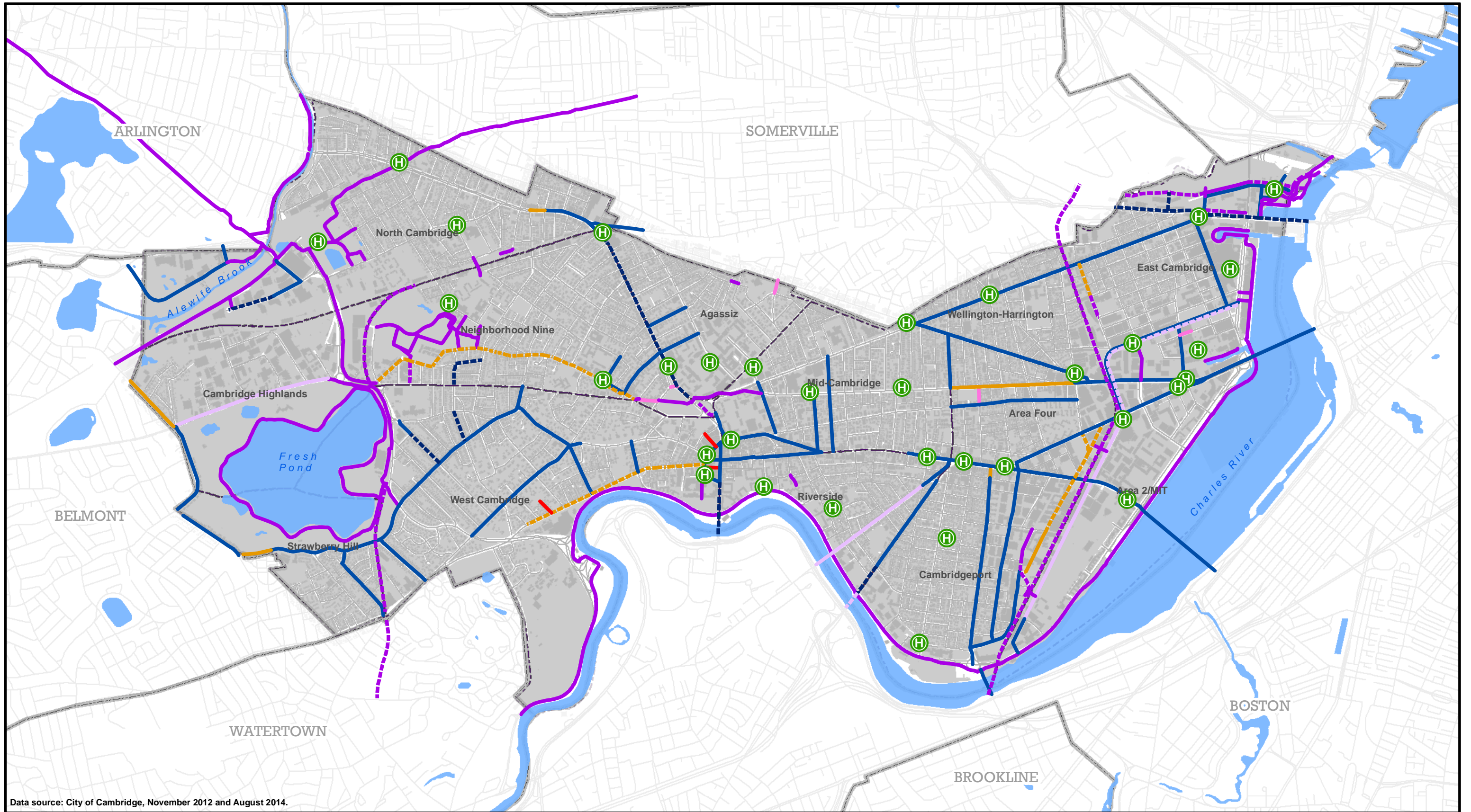
THIS MAP HAS BEEN PREPARED FOR THE CITY OF CAMBRIDGE CLIMATE CHANGE VULNERABILITY ASSESSMENT. IT IS BASED ON GIS DATA PROVIDED BY THE CITY (11/8/2012) AND FROM MASSGIS. USERS OF THIS MAP SHOULD CONSULT PRIMARY SOURCES FOR VERIFICATION OF THE INFORMATION CONTAINED ON THIS MAP. THE CITY OF CAMBRIDGE AND ITS MAPPING CONTRACTORS ASSUME NO LIABILITY FOR THE INFORMATION CONTAINED HEREIN.



PROJECT NO.	20100259
DRAWN:	04/07/2015
DRAWN BY:	KFH
CHECKED BY:	NB
FILE NAME:	Tr.5-Garages.mxd

PARKING GARAGES
Climate Change Vulnerability Assessment Cambridge, Massachusetts

MAP
Tr.5



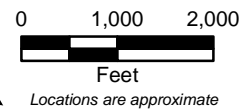
Data source: City of Cambridge, November 2012 and August 2014.

LEGEND

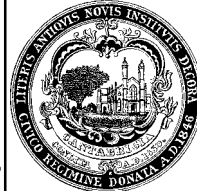
- Bike Paths and Road Markings**
- Bike Path/Multi-Use Path
 - - - Planned Bike Path/Multi-Use Path
 - Bike Lane
 - - - Planned Bike Lane
 - Contra-flow
 - Cycle Track
 - - - Planned Cycle Track

- Shared Lane Pavement Marking
- - - Planned Shared Lane Pavement Marking
- Edge Line
- - - Planned Edge Line
- Shared Street
- - - Planned Shared Street

H Hubway Stations



THIS MAP HAS BEEN PREPARED FOR THE CITY OF CAMBRIDGE CLIMATE CHANGE VULNERABILITY ASSESSMENT. IT IS BASED ON GIS DATA PROVIDED BY THE CITY (11/8/2012) AND FROM MASSGIS. USERS OF THIS MAP SHOULD CONSULT PRIMARY SOURCES FOR VERIFICATION OF THE INFORMATION CONTAINED ON THIS MAP. THE CITY OF CAMBRIDGE AND ITS MAPPING CONTRACTORS ASSUME NO LIABILITY FOR THE INFORMATION CONTAINED HEREIN.



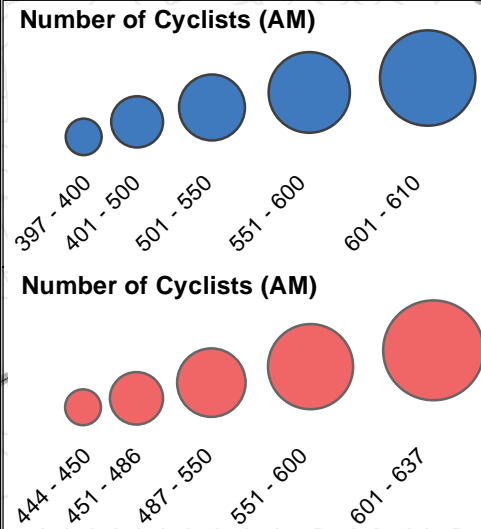
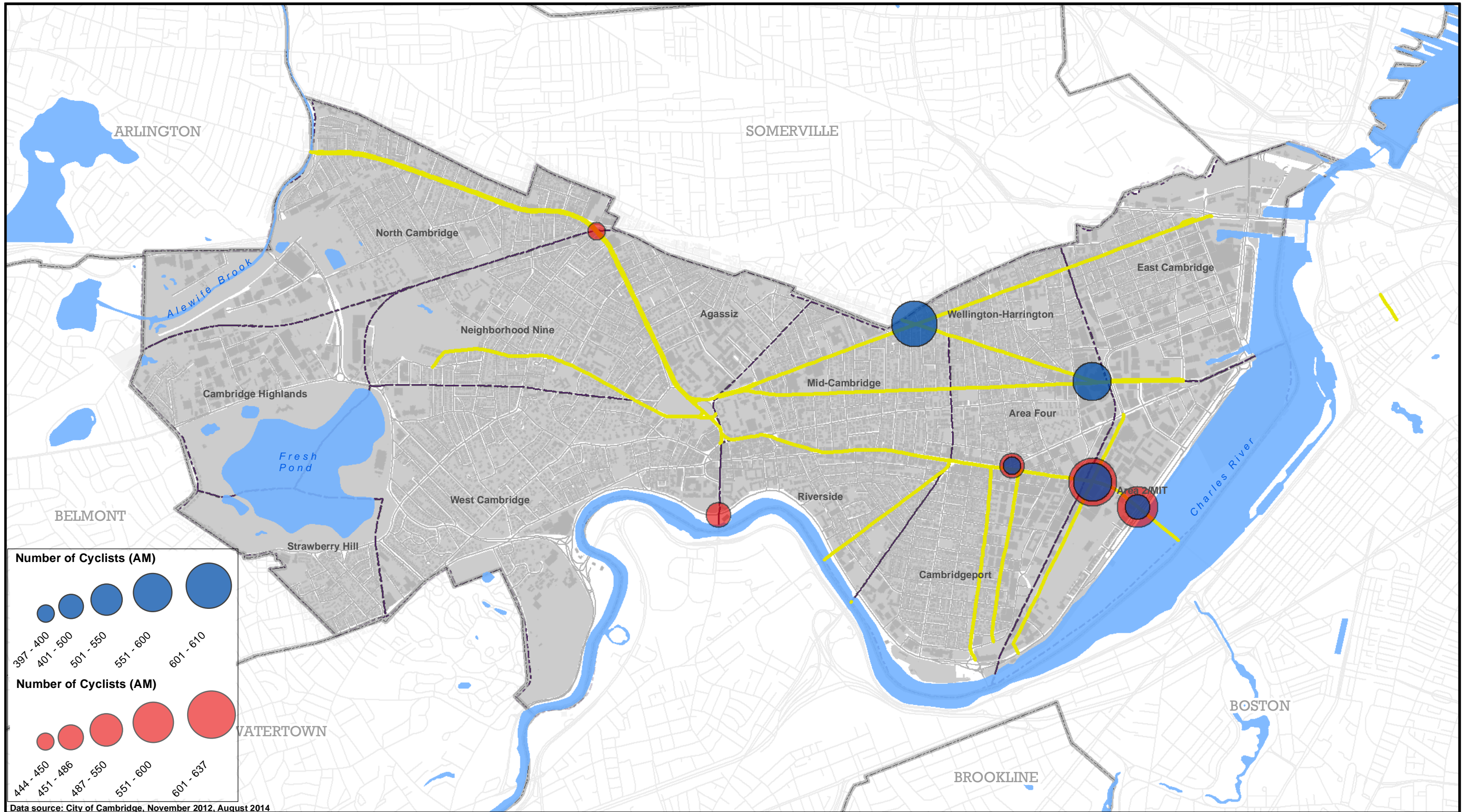
PROJECT NO.	20100259
DRAWN:	04/07/2015
DRAWN BY:	KFH
CHECKED BY:	NB
FILE NAME:	Tr.6-BikeFacilities.mxd

BICYCLING INFRASTRUCTURE

Climate Change Vulnerability Assessment
Cambridge, Massachusetts

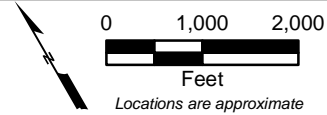
MAP

Tr.6

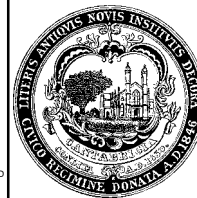


Data source: City of Cambridge, November 2012, August 2014

LEGEND
 Main Bicycle Corridors



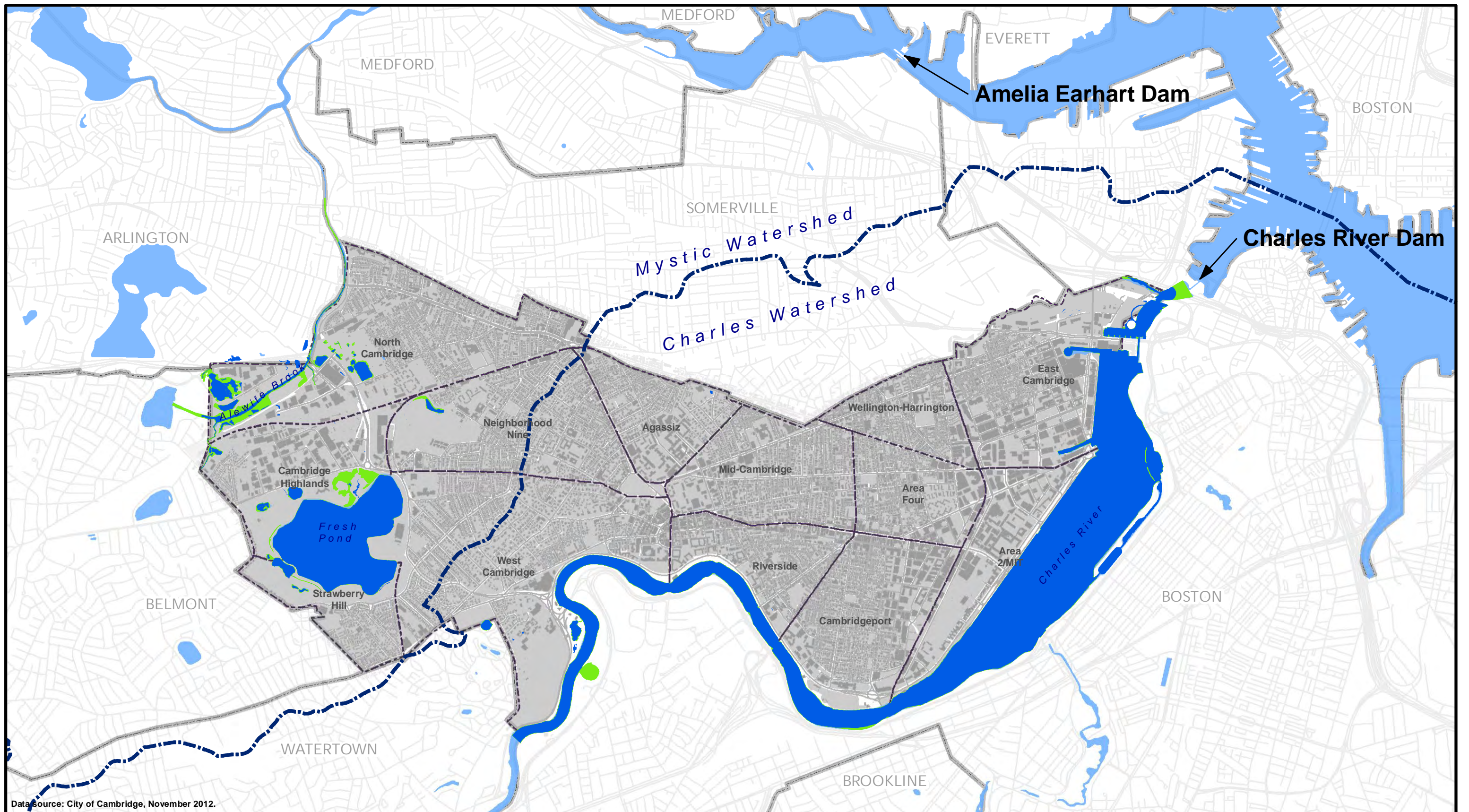
THIS MAP HAS BEEN PREPARED FOR THE CITY OF CAMBRIDGE CLIMATE CHANGE VULNERABILITY ASSESSMENT. IT IS BASED ON GIS DATA PROVIDED BY THE CITY (11/8/2012) AND FROM MASSGIS. USERS OF THIS MAP SHOULD CONSULT PRIMARY SOURCES FOR VERIFICATION OF THE INFORMATION CONTAINED ON THIS MAP. THE CITY OF CAMBRIDGE AND ITS MAPPING CONTRACTORS ASSUME NO LIABILITY FOR THE INFORMATION CONTAINED HEREIN.



PROJECT NO.	20100259
DRAWN:	04/07/2015
DRAWN BY:	KFH
CHECKED BY:	NB
FILE NAME:	Tr.7.BikeCriticalAssets.mxd

BICYCLE CRITICAL ASSETS
 Climate Change Vulnerability Assessment
 Cambridge, Massachusetts

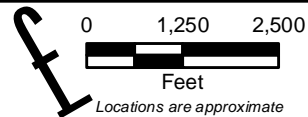
MAP
 Tr.7



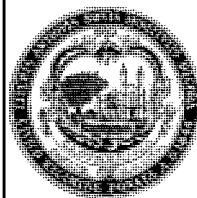
Data source: City of Cambridge, November 2012.

LEGEND

- Surface Water Body
- Wetland
- Watershed Boundary
- Neighborhood Boundary



THIS MAP HAS BEEN PREPARED FOR THE CITY OF CAMBRIDGE CLIMATE CHANGE VULNERABILITY ASSESSMENT. IT IS BASED ON GIS DATA PROVIDED BY THE CITY (11/15/2012) AND FROM MASSGIS. USERS OF THIS MAP SHOULD CONSULT PRIMARY SOURCES FOR VERIFICATION OF THE INFORMATION CONTAINED ON THIS MAP. THE CITY OF CAMBRIDGE AND ITS MAPPING CONTRACTORS ASSUME NO LIABILITY FOR THE INFORMATION CONTAINED HEREIN.



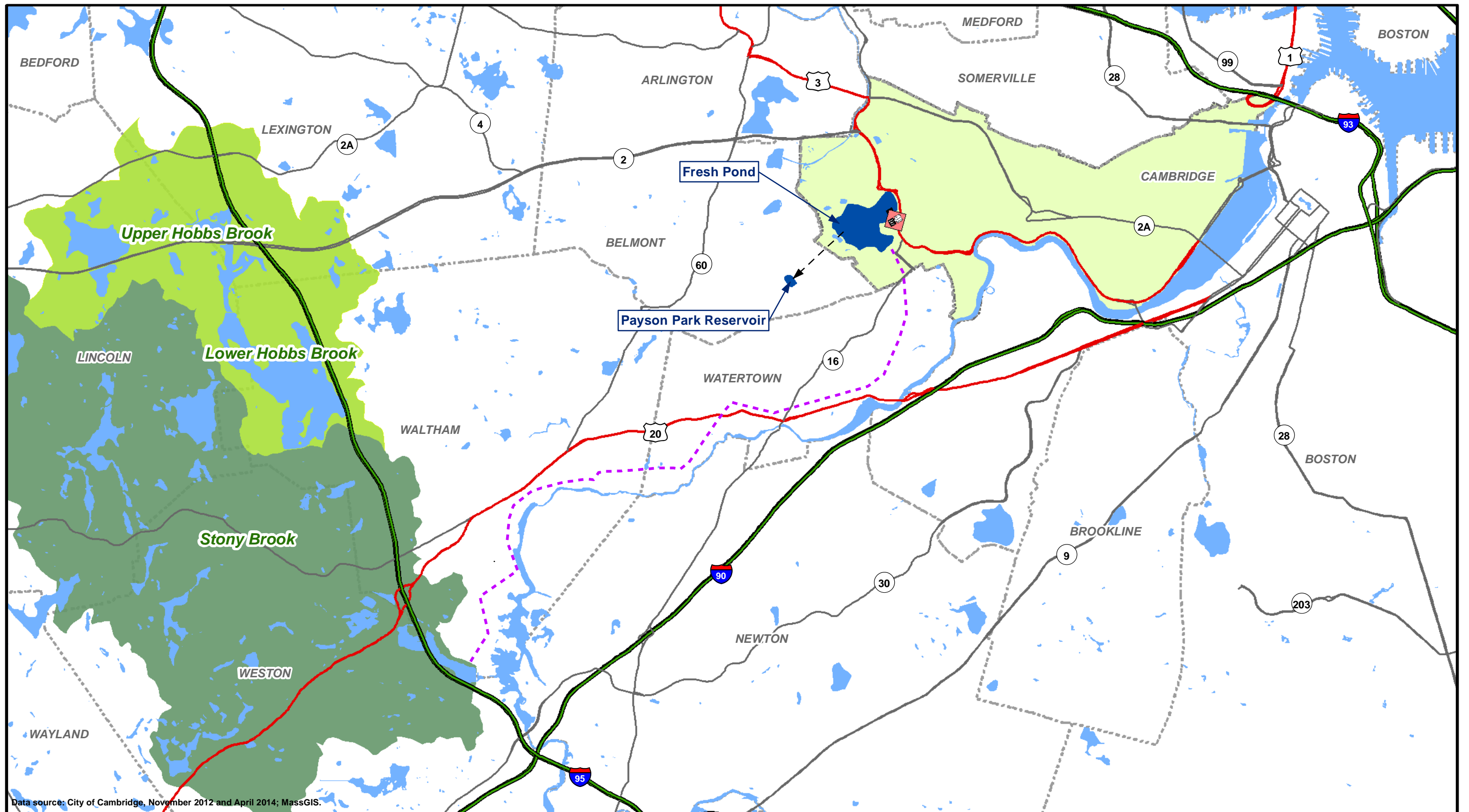
PROJECT NO.	20100259
DRAWN:	4/28/2014
DRAWN BY:	KFH
CHECKED BY:	NB
FILE NAME:	W.1-SurfaceWater.mxd

SURFACE WATER BODIES, WETLANDS AND DAMS

Climate Change Vulnerability Assessment
Cambridge, Massachusetts

MAP

W.1



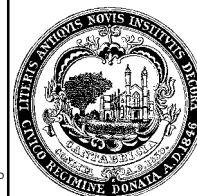
Data source: City of Cambridge, November 2012 and April 2014; MassGIS.

LEGEND

- Hobbs Brook Watershed
- Stony Brook Watershed
- Surface Water Body Used for Storage
- Surface Water Body
- Aqueduct to Fresh Pond
- J Walter Sullivan Water Treatment Plant
- Interstate
- U.S. Highway
- State Route

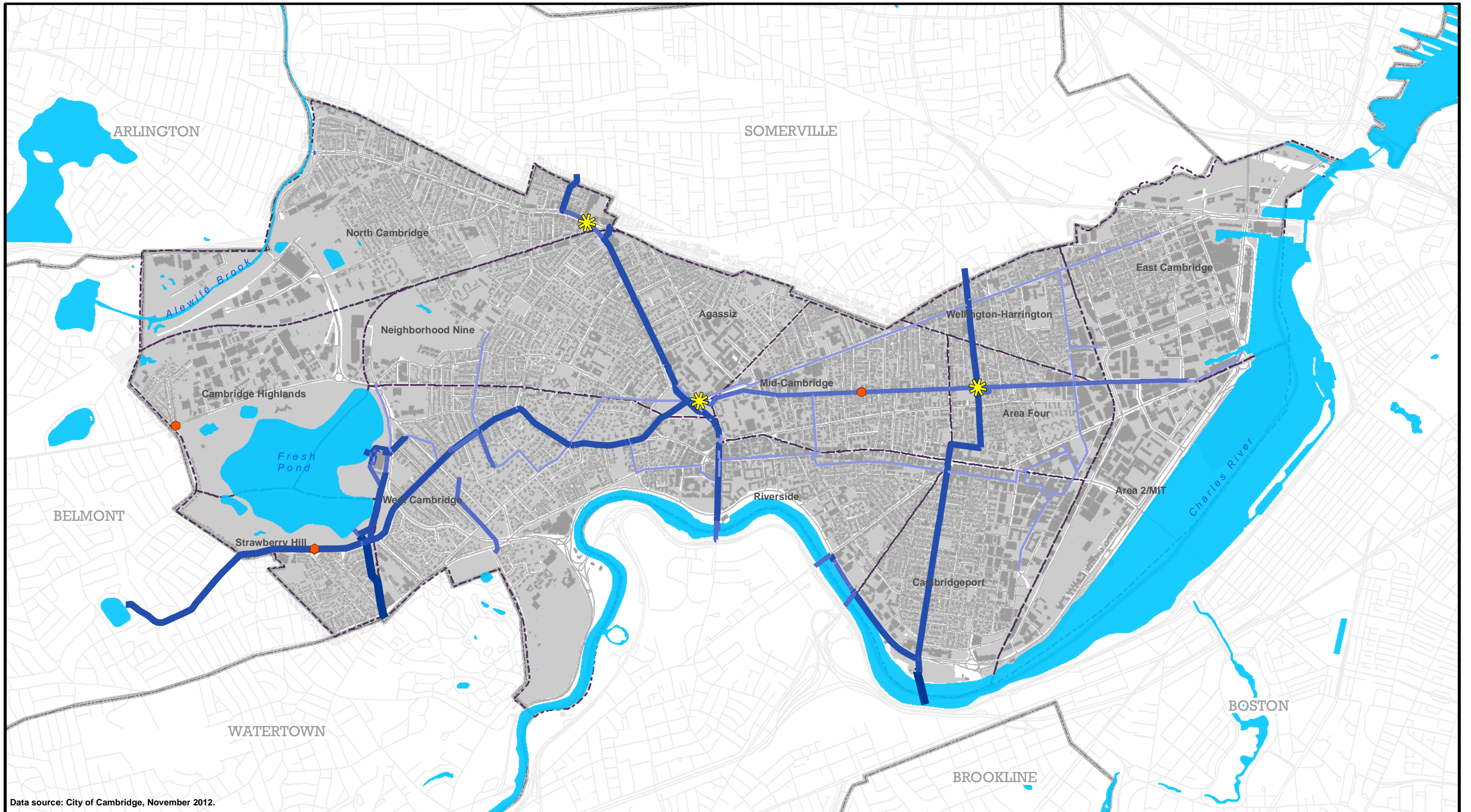


THIS MAP HAS BEEN PREPARED FOR THE CITY OF CAMBRIDGE CLIMATE CHANGE VULNERABILITY ASSESSMENT. IT IS BASED ON GIS DATA PROVIDED BY THE CITY (11/2012) AND FROM MASSGIS. USERS OF THIS MAP SHOULD CONSULT PRIMARY SOURCES FOR VERIFICATION OF THE INFORMATION CONTAINED ON THIS MAP. THE CITY OF CAMBRIDGE AND ITS MAPPING CONTRACTORS ASSUME NO LIABILITY FOR THE INFORMATION CONTAINED HEREIN.



PROJECT NO.	20100259
DRAWN:	4/28/2014
DRAWN BY:	KFH
CHECKED BY:	NB
FILE NAME:	W.2-WaterSupply.mxd

SURFACE WATER SUPPLY SOURCE AREAS	MAP
Climate Change Vulnerability Assessment Cambridge, Massachusetts	W.2



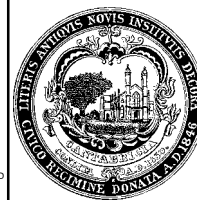
Data source: City of Cambridge, November 2012.

LEGEND

- Water Main (diameter)
- ≥ 16 inches
- ≥ 24 inches
- ≥ 36 inches
- ≥ 48 inches
- ◆ Air Relief Valve
- ★ MWRA connections
- Neighborhood Boundary



THIS MAP HAS BEEN PREPARED FOR THE CITY OF CAMBRIDGE CLIMATE CHANGE VULNERABILITY ASSESSMENT. IT IS BASED ON GIS DATA PROVIDED BY THE CITY (11/8/2012) AND FROM MASSGIS. USERS OF THIS MAP SHOULD CONSULT PRIMARY SOURCES FOR VERIFICATION OF THE INFORMATION CONTAINED ON THIS MAP. THE CITY OF CAMBRIDGE AND ITS MAPPING CONTRACTORS ASSUME NO LIABILITY FOR THE INFORMATION CONTAINED HEREIN.



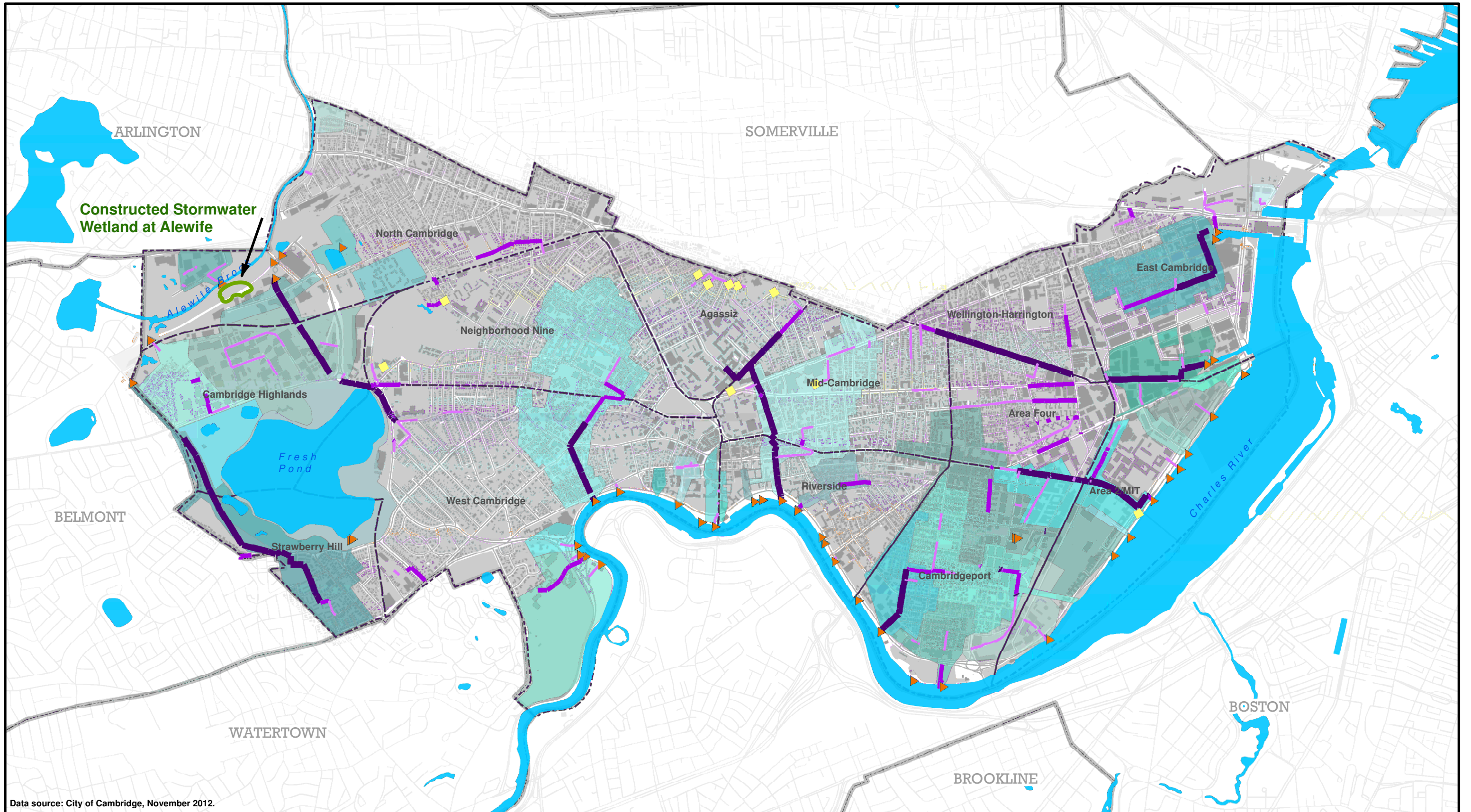
PROJECT NO.	20100259
DRAWN:	4/28/2014
DRAWN BY:	KFH
CHECKED BY:	NB
FILE NAME:	W.3-Distribution.mxd

WATER DISTRIBUTION SYSTEM

Climate Change Vulnerability Assessment
Cambridge, Massachusetts

MAP

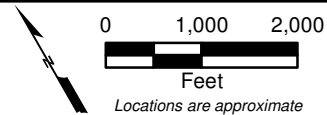
W.3



Data source: City of Cambridge, November 2012.

LEGEND

- Stormwater Main (diameter)
 - >= 24 inches
 - >= 36 inches
 - >= 48 inches
- Pump Stations for Flood Control
- ▲ Stormwater Outfalls (>24 inches)
- Stormwater Catchment Area
- Neighborhood Boundary

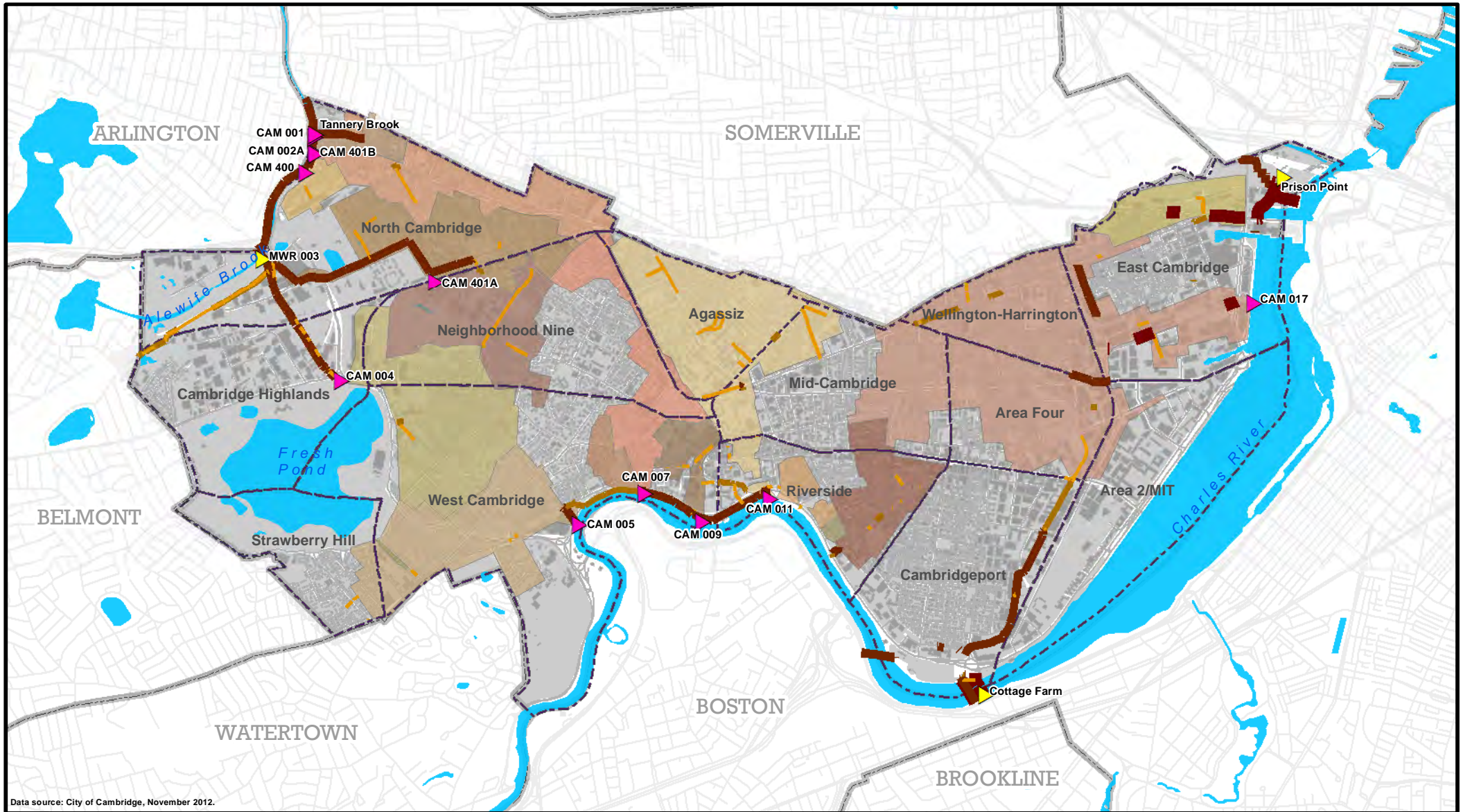


THIS MAP HAS BEEN PREPARED FOR THE CITY OF CAMBRIDGE CLIMATE CHANGE VULNERABILITY ASSESSMENT. IT IS BASED ON GIS DATA PROVIDED BY THE CITY (11/2012) AND FROM MASSGIS. USERS OF THIS MAP SHOULD CONSULT PRIMARY SOURCES FOR VERIFICATION OF THE INFORMATION CONTAINED ON THIS MAP. THE CITY OF CAMBRIDGE AND ITS MAPPING CONTRACTORS ASSUME NO LIABILITY FOR THE INFORMATION CONTAINED HEREIN.



PROJECT NO.	20100259
DRAWN:	4/28/2014
DRAWN BY:	VK
CHECKED BY:	NB
FILE NAME:	W.4-Stormwater.mxd

STORMWATER COLLECTION SYSTEM		MAP
Climate Change Vulnerability Assessment Cambridge, Massachusetts		W.4



Data source: City of Cambridge, November 2012.

LEGEND

- Combined Mains (diameter)
 - >= 18 inches
 - >= 36 inches
 - >= 48 inches
 - >= 72 inches
- CSO Locations - MWRA ▲
- CSO Locations - CDPW ▲
- Combined Catchment Area
- Neighborhood Boundary



THIS MAP HAS BEEN PREPARED FOR THE CITY OF CAMBRIDGE CLIMATE CHANGE VULNERABILITY ASSESSMENT. IT IS BASED ON DATA PROVIDED BY THE CITY OF CAMBRIDGE AND FROM PUBLICLY AVAILABLE SOURCES. FOR THE PURPOSES OF THIS MAP, KLEINFELDER HAS CONDUCTED VISUAL VERIFICATION OF THE INFORMATION CONTAINED ON THIS MAP. THE CITY OF CAMBRIDGE AND ITS ENGINEERING CONTRACTORS ASSUME NO LIABILITY FOR THE INFORMATION CONTAINED HEREIN.

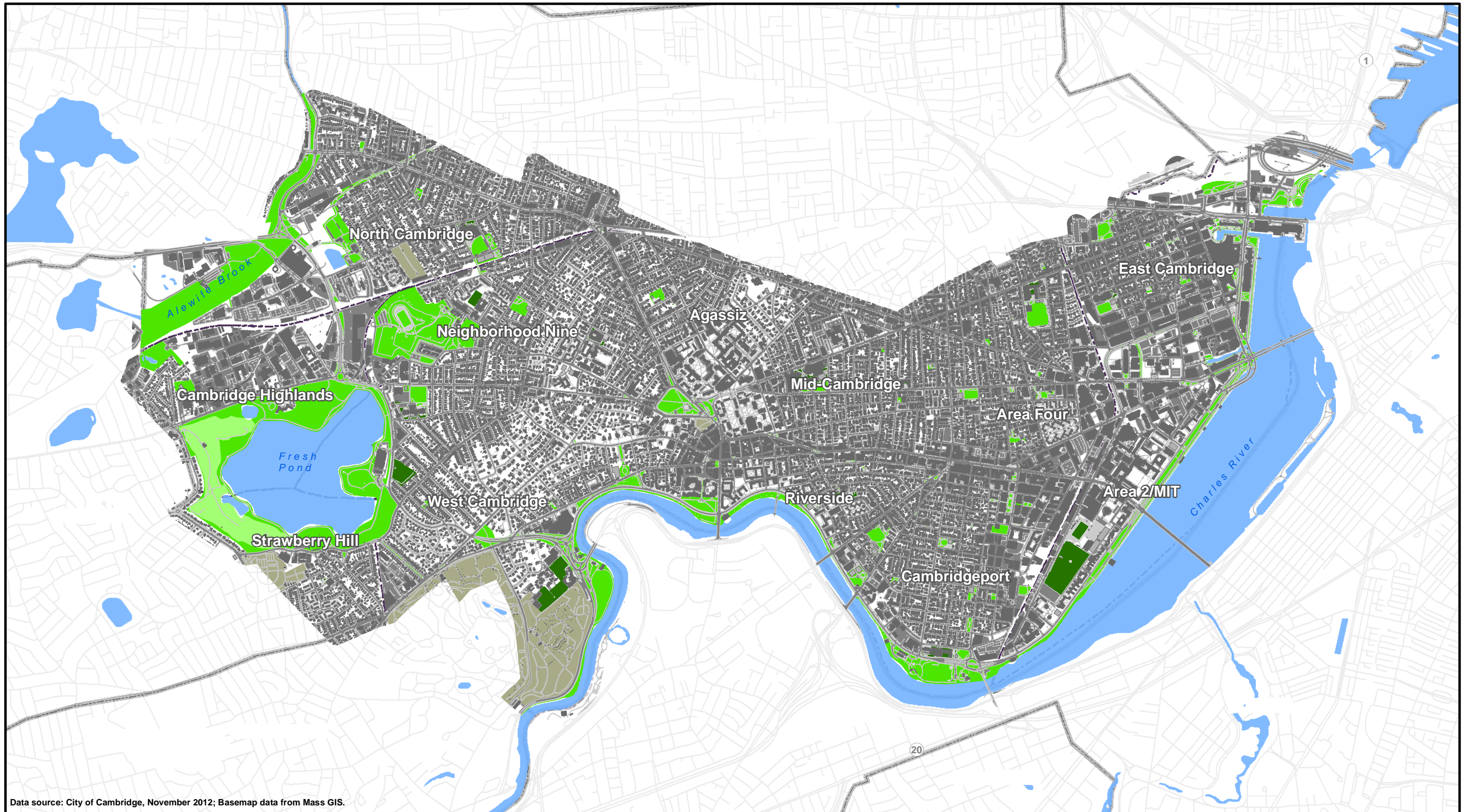


PROJECT NO. 201 00259
 DRAWN: 4/28/2014
 DRAWN BY: VK
 CHECKED BY: NB
 FILE NAME:
 W5-CombinedCollection.mxd

COMBINED STORMWATER AND SEWER COLLECTION SYSTEM

Climate Change Vulnerability Assessment
 Cambridge, Massachusetts

MAP
 W.5

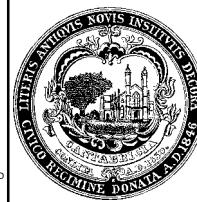


Data source: City of Cambridge, November 2012; Basemap data from Mass GIS.

LEGEND		
Impervious Surface	Athletic Field	Neighborhood Boundary
Structure	Rooftop Park	
Paved Surface	Park	
Surface	Golf Course	
Other	Cemetery	

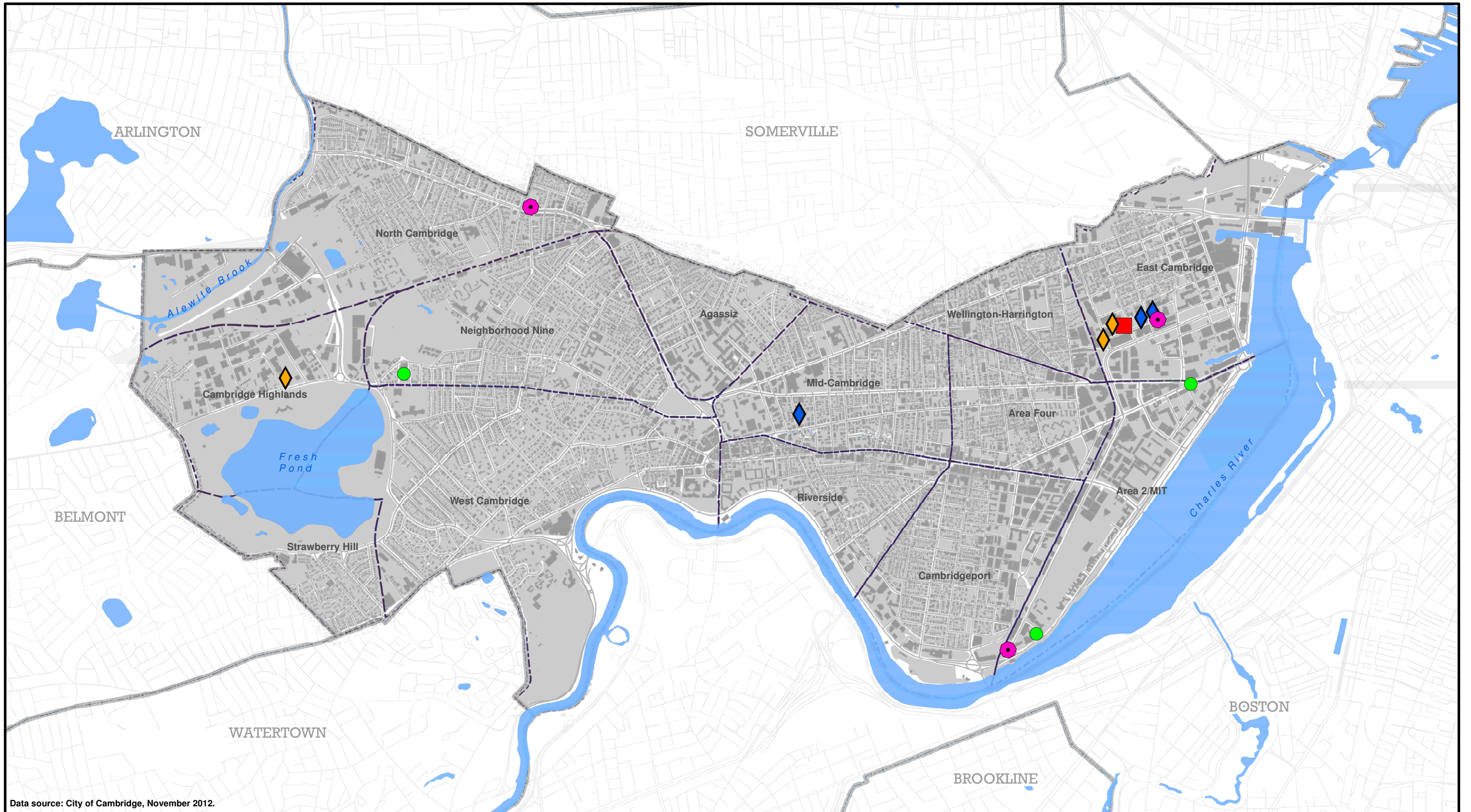


THIS MAP HAS BEEN PREPARED FOR THE CITY OF CAMBRIDGE CLIMATE CHANGE VULNERABILITY ASSESSMENT. IT IS BASED ON GIS DATA PROVIDED BY THE CITY (11/8/2012) AND FROM MASSGIS. USERS OF THIS MAP SHOULD CONSULT PRIMARY SOURCES FOR VERIFICATION OF THE INFORMATION CONTAINED ON THIS MAP. THE CITY OF CAMBRIDGE AND ITS MAPPING CONTRACTORS ASSUME NO LIABILITY FOR THE INFORMATION CONTAINED HEREIN.



PROJECT NO.	20100259
DRAWN:	4/28/2014
DRAWN BY:	VK
CHECKED BY:	NB
FILE NAME:	W.6-ImperviousSurface.mxd

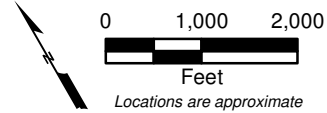
IMPERVIOUS SURFACE		MAP W.6
Climate Change Vulnerability Assessment Cambridge, Massachusetts		



Data source: City of Cambridge, November 2012.

LEGEND

- Antenna Towers (publicly sourced)
- Cell Towers
- ◆ Telephone Office/Switch
- ◆ Major Data Hub and Colocation Centers
- Emergency Communications Center
- Neighborhood Boundary

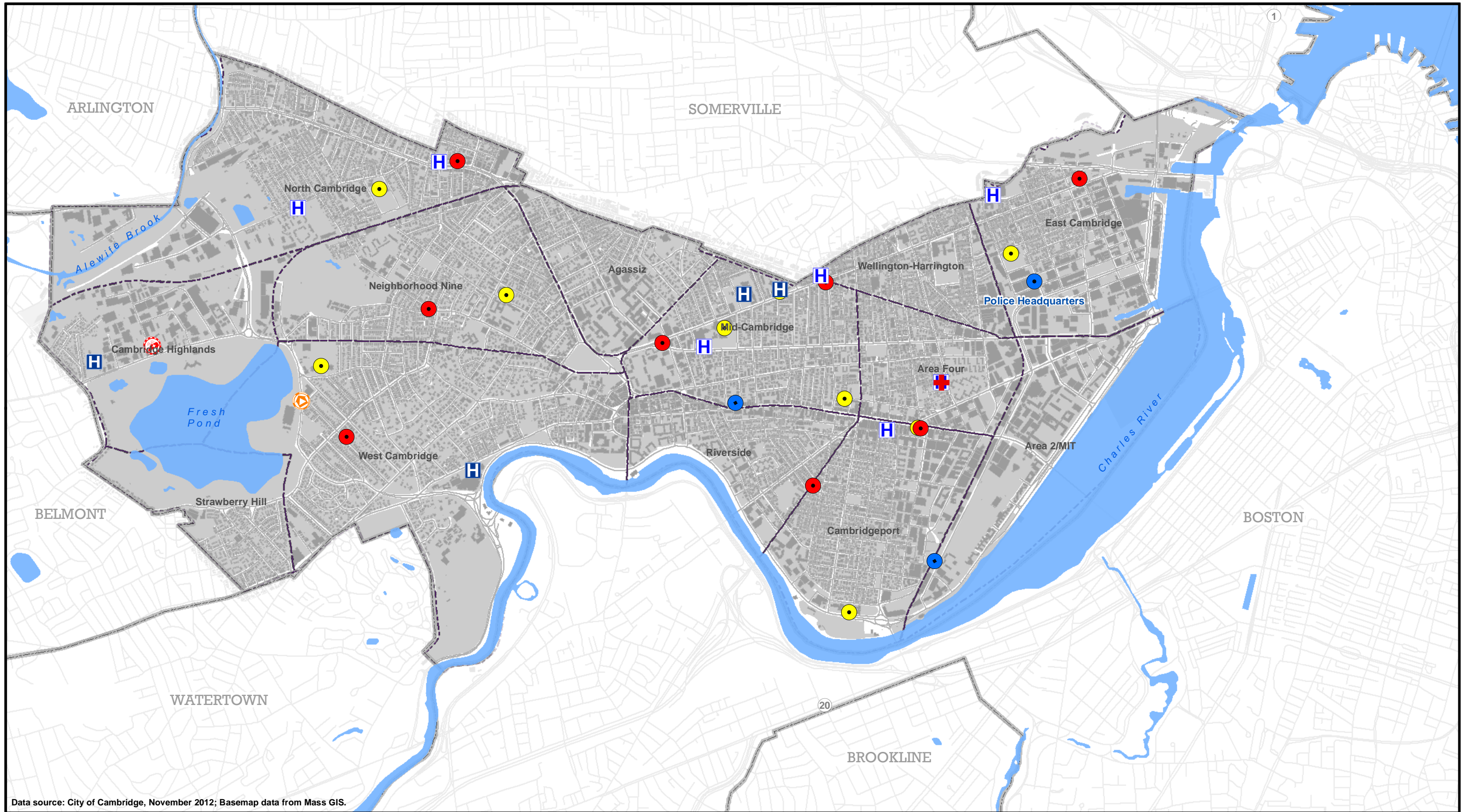


THIS MAP HAS BEEN PREPARED FOR THE CITY OF CAMBRIDGE CLIMATE CHANGE VULNERABILITY ASSESSMENT. IT IS BASED ON GIS DATA PROVIDED BY THE CITY (11/05/2012) AND FROM MASSGIS. USERS OF THIS MAP SHOULD CONSULT PRIMARY SOURCES FOR VERIFICATION OF THE INFORMATION CONTAINED ON THIS MAP. THE CITY OF CAMBRIDGE AND ITS MAPPING CONTRACTORS ASSUME NO LIABILITY FOR THE INFORMATION CONTAINED HEREIN.












PROJECT NO.	20100259
DRAWN:	4/28/2014
DRAWN BY:	KFH
CHECKED BY:	NB
FILE NAME:	Te.1-Telecommunications.mxd

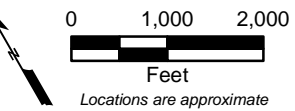
TELECOMMUNICATIONS SYSTEM	MAP
Climate Change Vulnerability Assessment Cambridge, Massachusetts	Te.1



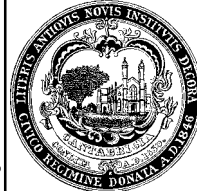
Data source: City of Cambridge, November 2012; Basemap data from Mass GIS.

LEGEND

-  Public Health Office
-  Police Station
-  Emergency Operations Center
-  Hospital
-  Fire Station
-  Professional Ambulance Service
-  Health Clinic
-  Emergency Shelter
-  Neighborhood Boundary

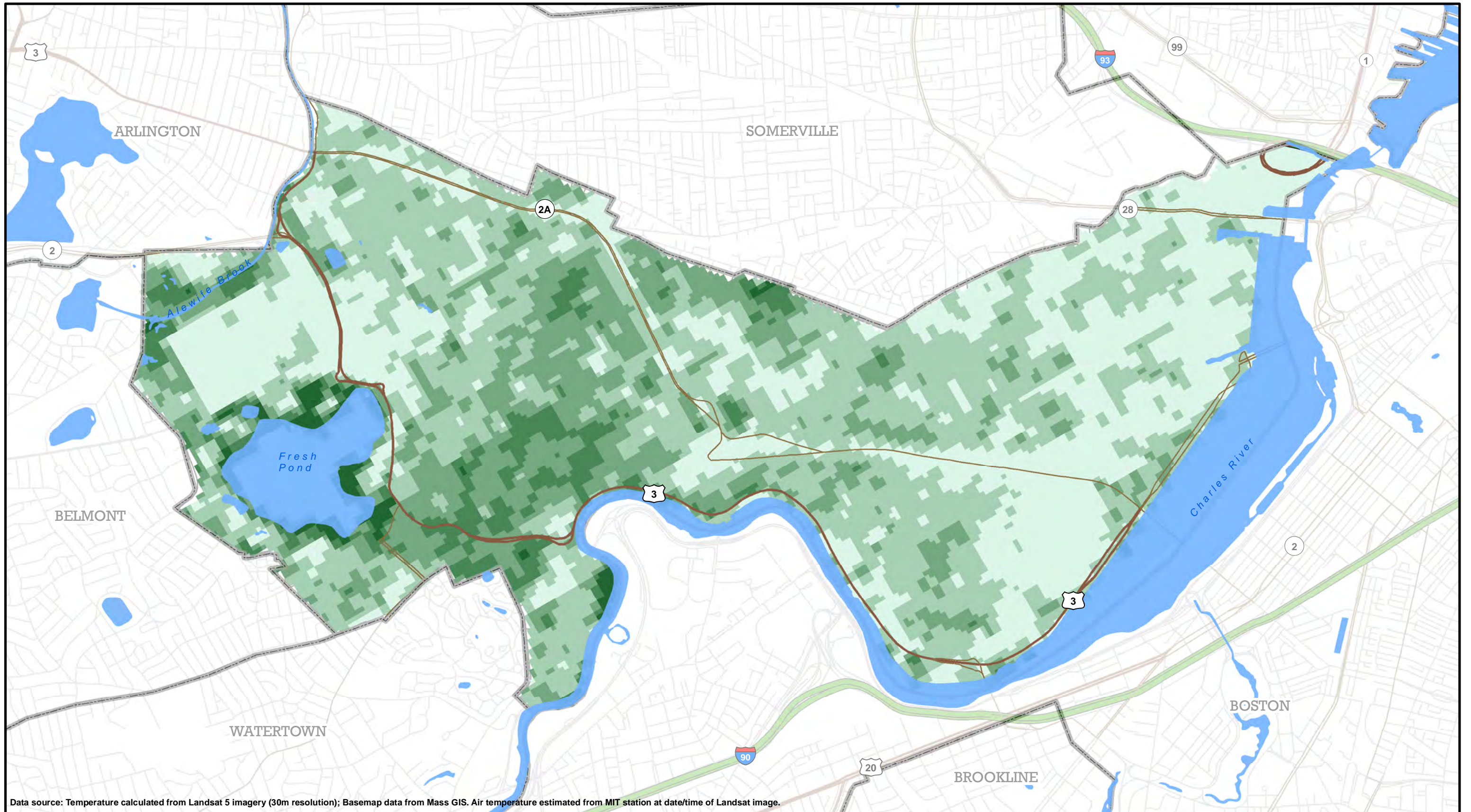


THIS MAP HAS BEEN PREPARED FOR THE CITY OF CAMBRIDGE CLIMATE CHANGE VULNERABILITY ASSESSMENT. IT IS BASED ON GIS DATA PROVIDED BY THE CITY (11/8/2012) AND FROM MASSGIS. USERS OF THIS MAP SHOULD CONSULT PRIMARY SOURCES FOR VERIFICATION OF THE INFORMATION CONTAINED ON THIS MAP. THE CITY OF CAMBRIDGE AND ITS MAPPING CONTRACTORS ASSUME NO LIABILITY FOR THE INFORMATION CONTAINED HEREIN.



PROJECT NO.	20100259
DRAWN:	04/07/2015
DRAWN BY:	KFH
CHECKED BY:	NB
FILE NAME:	CS.1-CriticalServices.mxd

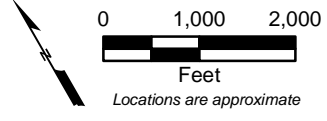
CRITICAL SERVICES	MAP
Climate Change Vulnerability Assessment Cambridge, Massachusetts	CS.1



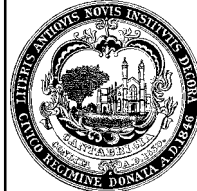
Data source: Temperature calculated from Landsat 5 imagery (30m resolution); Basemap data from Mass GIS. Air temperature estimated from MIT station at date/time of Landsat image.

LEGEND
Existing Tree Canopy (%)

0 - 20	40 - 60	80 - 100
20 - 40	60 - 80	



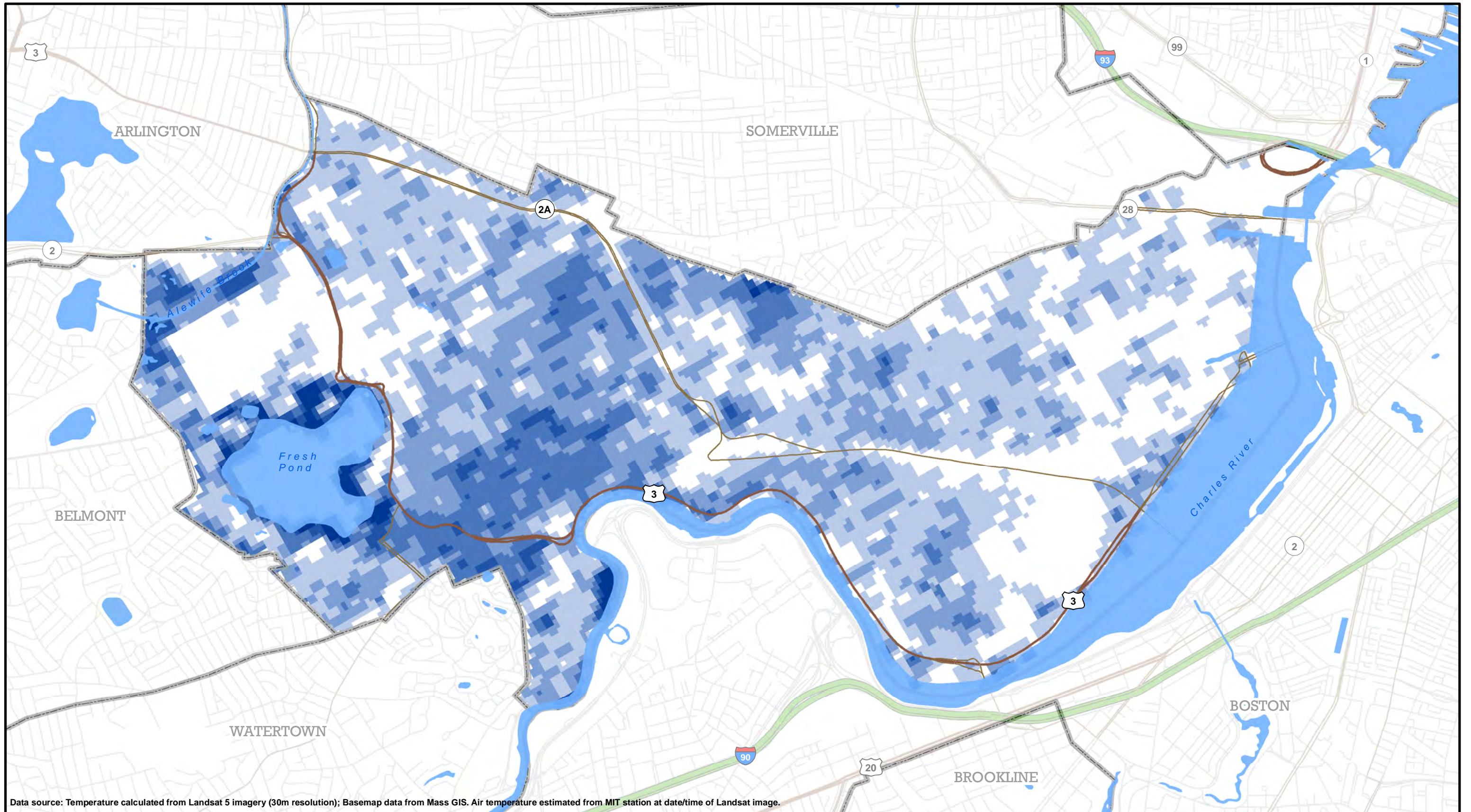
THIS MAP HAS BEEN PREPARED FOR THE CITY OF CAMBRIDGE CLIMATE CHANGE VULNERABILITY ASSESSMENT. IT IS BASED ON GIS DATA PROVIDED BY THE CITY (11/8/2013) AND FROM MASSGIS. USERS OF THIS MAP SHOULD CONSULT PRIMARY SOURCES FOR VERIFICATION OF THE INFORMATION CONTAINED ON THIS MAP. THE CITY OF CAMBRIDGE AND ITS MAPPING CONTRACTORS ASSUME NO LIABILITY FOR THE INFORMATION CONTAINED HEREIN.



PROJECT NO.	20100259
DRAWN:	4/08/2015
DRAWN BY:	AW
CHECKED BY:	NB
FILE NAME:	PresentConditions_TreeCanopy_2013.mxd

PERCENTAGE OF TREE CANOPY IN CAMBRIDGE
Climate Change Vulnerability Assessment Cambridge, Massachusetts

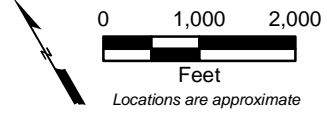
MAP
UF.1



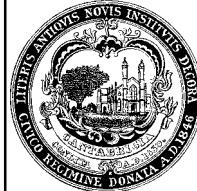
Data source: Temperature calculated from Landsat 5 imagery (30m resolution); Basemap data from Mass GIS. Air temperature estimated from MIT station at date/time of Landsat image.

LEGEND
Estimated Cooling Impact of Tree Canopy (°F)

0 - 2	4 - 6	8 - 10
2 - 4	6 - 8	10 - 12



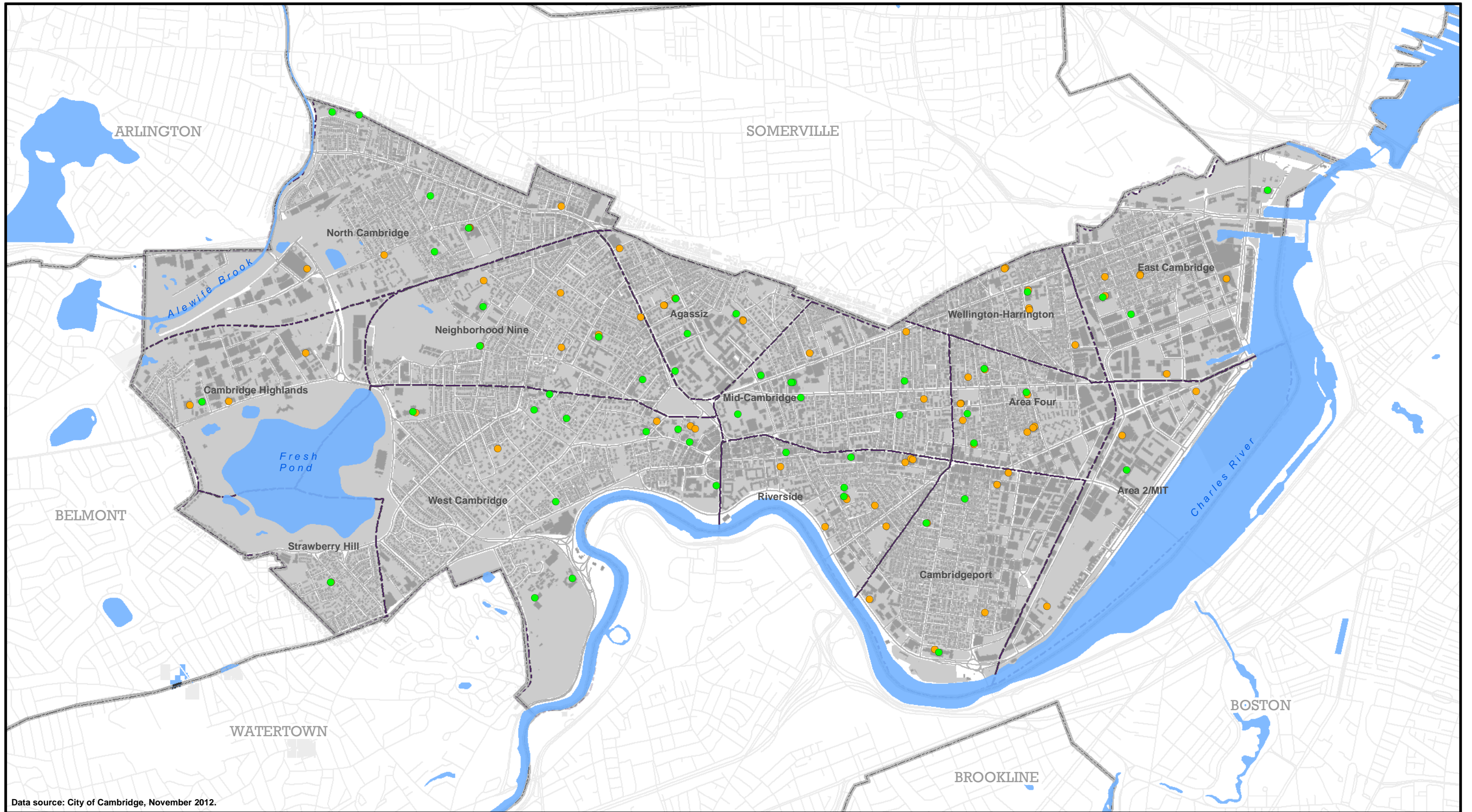
THIS MAP HAS BEEN PREPARED FOR THE CITY OF CAMBRIDGE CLIMATE CHANGE VULNERABILITY ASSESSMENT. IT IS BASED ON GIS DATA PROVIDED BY THE CITY (11/8/2012) AND FROM MASSGIS. USERS OF THIS MAP SHOULD CONSULT PRIMARY SOURCES FOR VERIFICATION OF THE INFORMATION CONTAINED ON THIS MAP. THE CITY OF CAMBRIDGE AND ITS MAPPING CONTRACTORS ASSUME NO LIABILITY FOR THE INFORMATION CONTAINED HEREIN.



PROJECT NO.	20100259
DRAWN:	4/9/2015
DRAWN BY:	AW
CHECKED BY:	NB
FILE NAME:	PresentConditions_CoolingImpactTreeCanopy_2015.mxd

COOLING IMPACT OF TREES IN CAMBRIDGE	
Climate Change Vulnerability Assessment Cambridge, Massachusetts	

MAP
UF.2



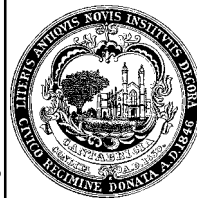
Data source: City of Cambridge, November 2012.

LEGEND

- School - K-12 Public or Private
- Daycare Facility
- Neighborhood Boundary



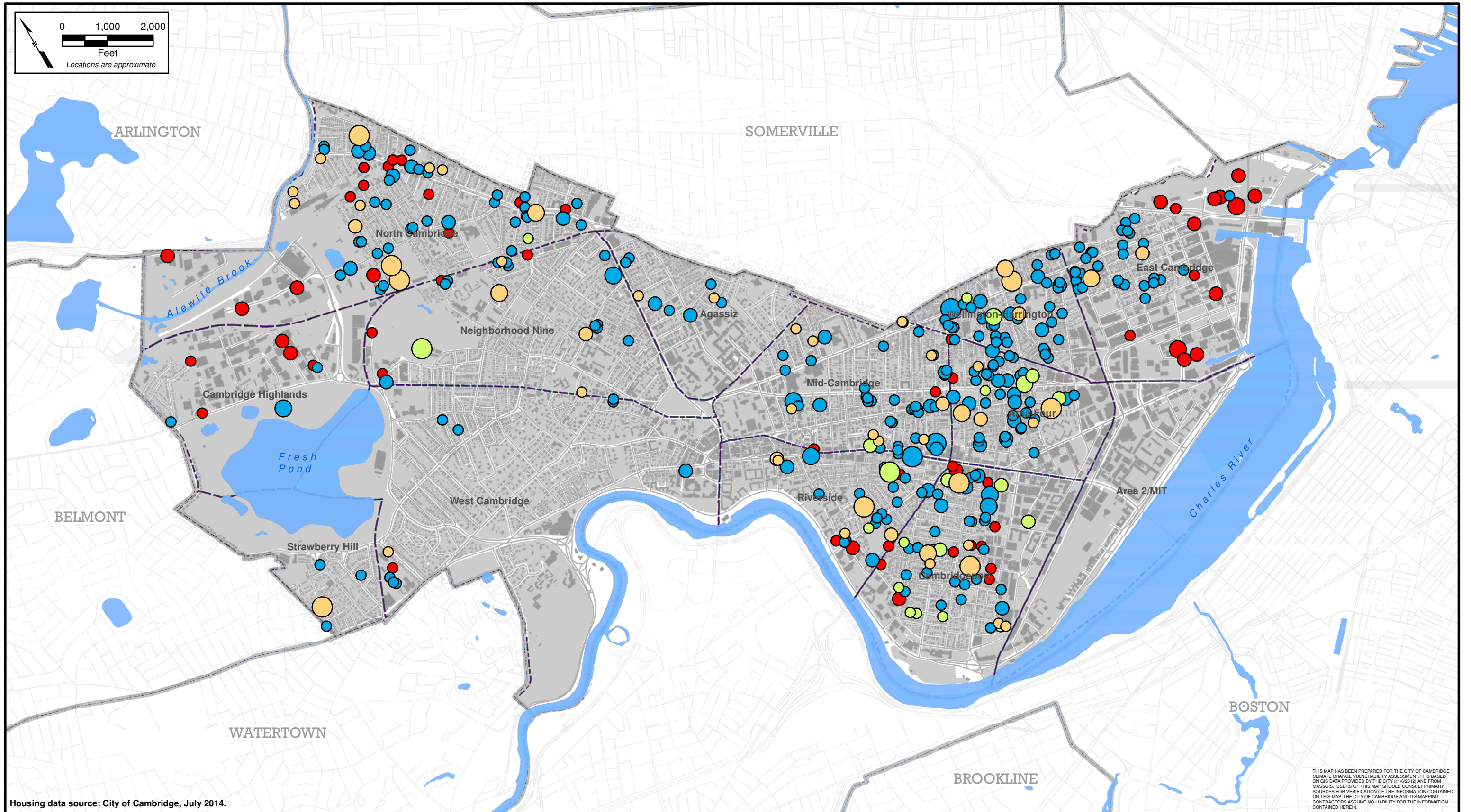
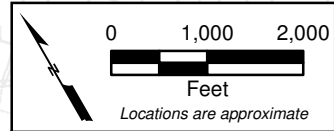
THIS MAP HAS BEEN PREPARED FOR THE CITY OF CAMBRIDGE CLIMATE CHANGE VULNERABILITY ASSESSMENT. IT IS BASED ON GIS DATA PROVIDED BY THE CITY (11/02/12) AND FROM MASSGIS. USERS OF THIS MAP SHOULD CONSULT PRIMARY SOURCES FOR VERIFICATION OF THE INFORMATION CONTAINED ON THIS MAP. THE CITY OF CAMBRIDGE AND ITS MAPPING CONTRACTORS ASSUME NO LIABILITY FOR THE INFORMATION CONTAINED HEREIN.



PROJECT NO.	20100259
DRAWN:	04/07/2015
DRAWN BY:	KFH
CHECKED BY:	NB
FILE NAME:	CR.1-Schools.mxd

K-12 SCHOOLS AND DAY CARE FACILITIES
Climate Change Vulnerability Assessment Cambridge, Massachusetts

MAP
CR.1



Housing data source: City of Cambridge, July 2014.

THIS MAP HAS BEEN PREPARED FOR THE CITY OF CAMBRIDGE CLIMATE CHANGE VULNERABILITY ASSESSMENT. IT IS BASED ON GIS DATA PROVIDED BY THE CITY (11/6/2012) AND FROM MASSGIS. USERS OF THIS MAP SHOULD CONSULT PRIMARY SOURCES FOR VERIFICATION OF THE INFORMATION CONTAINED ON THIS MAP. THE CITY OF CAMBRIDGE AND ITS MAPPING CONTRACTORS ASSUME NO LIABILITY FOR THE INFORMATION CONTAINED HEREIN.

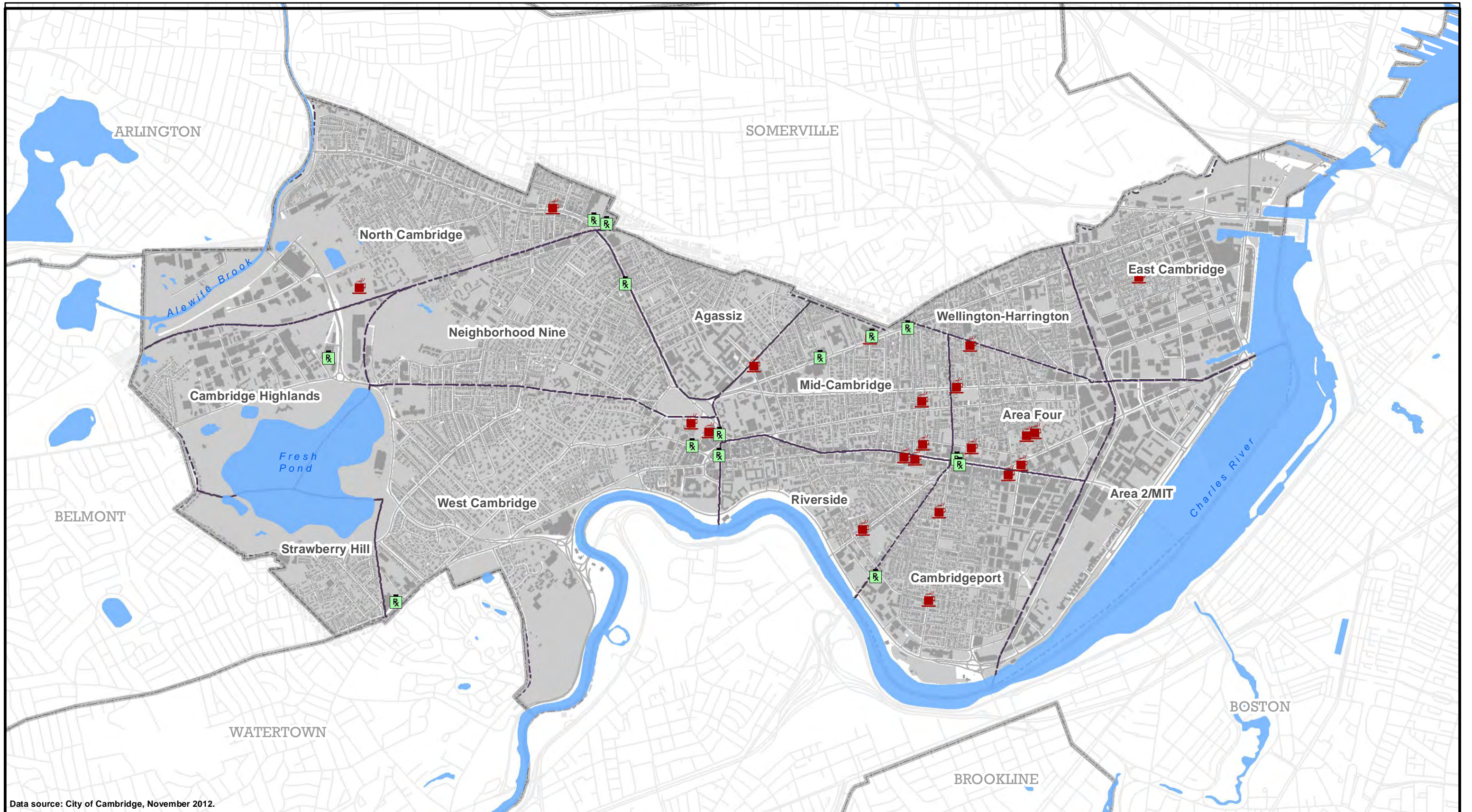
LEGEND		Public Housing	Private	Non-profit/Scattered site H/O	Inclusionary
●	Less than 10 units	● Less than 10 units	● Less than 10 units	● Less than 10 units	● Less than 10 units
●	10 to 49 units	● 10 to 49 units	● 10 to 49 units	● 10 to 49 units	● 10 to 49 units
●	50 to 99 units	● 50 to 99 units	● 50 to 99 units	● 50 to 99 units	● 50 to 99 units
●	More than 100 units	● More than 100 units	● More than 100 units	● More than 100 units	● More than 100 units



PROJECT NO.	20100259
DRAWN:	8/21/2014
DRAWN BY:	VK
CHECKED BY:	NB
FILE NAME:	CR.2-Housing082114.mxd




AFFORDABLE HOUSING		CR.2
Climate Change Vulnerability Assessment Cambridge, Massachusetts		

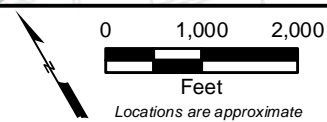
MAP



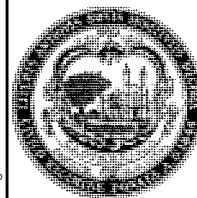
Data source: City of Cambridge, November 2012.

LEGEND

-  Community Food Program
-  Pharmacy
-  Neighborhood Boundary

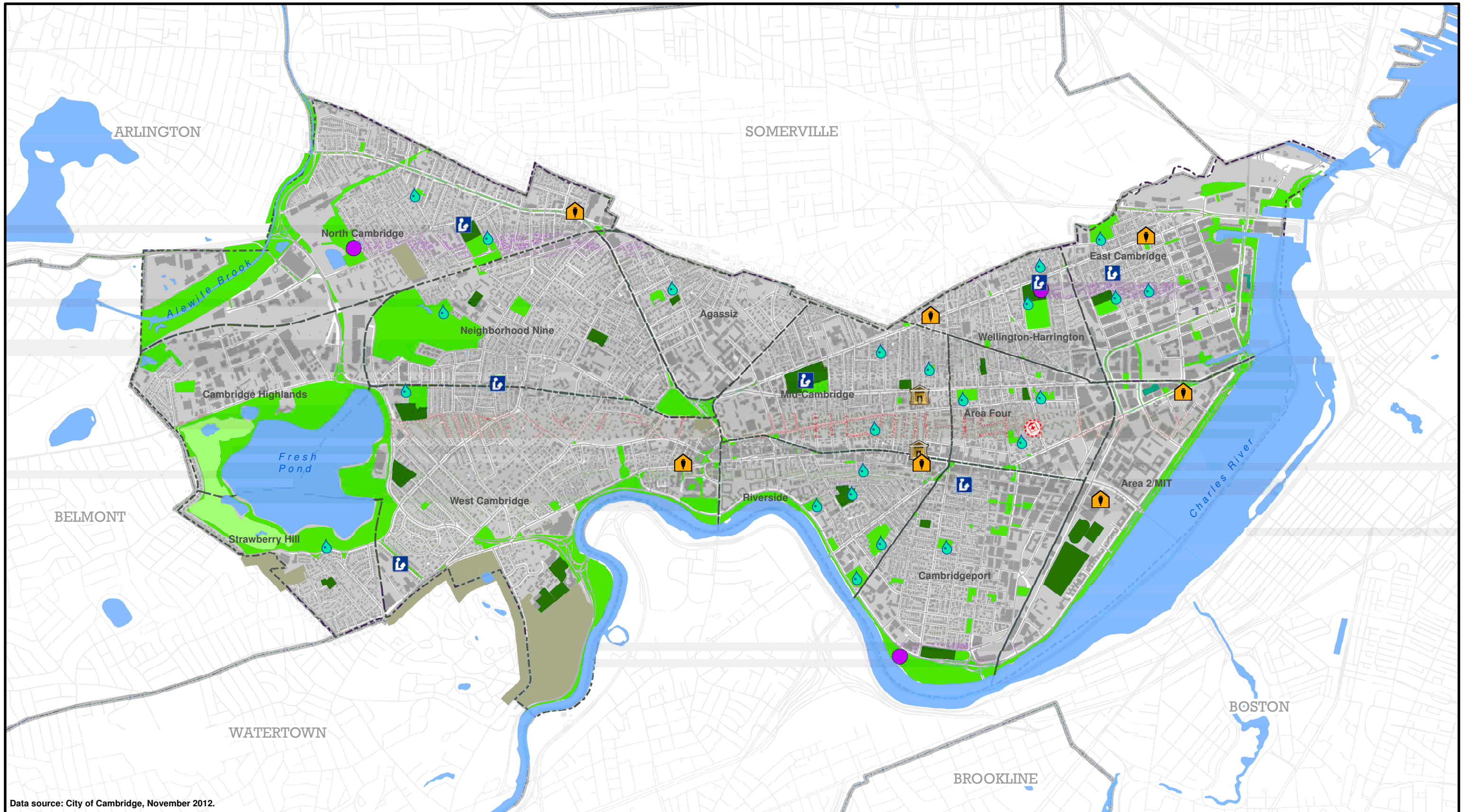


THIS MAP HAS BEEN PREPARED FOR THE CITY OF CAMBRIDGE CLIMATE CHANGE VULNERABILITY ASSESSMENT. IT IS BASED ON GIS DATA PROVIDED BY THE CITY (11/6/2012) AND FROM MASSGIS. USERS OF THIS MAP SHOULD CONSULT PRIMARY SOURCES FOR VERIFICATION OF THE INFORMATION CONTAINED ON THIS MAP. THE CITY OF CAMBRIDGE AND ITS MAPPING CONTRACTORS ASSUME NO LIABILITY FOR THE INFORMATION CONTAINED HEREIN.



PROJECT NO.	20100259
DRAWN:	14/15/2014
DRAWN BY:	VK
CHECKED BY:	NB
FILE NAME:	CR.3-FoodPharma.mxd

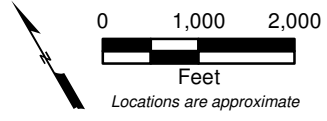
FOOD AND PHARMACIES		MAP CR.3
Climate Change Vulnerability Assessment Cambridge, Massachusetts		



Data source: City of Cambridge, November 2012.

LEGEND

-  City Hall; City Hall Annex
-  Public Libraries
-  Post Offices
-  Public Health Dept.
-  Waterplay Areas
-  Public Pools
-  Neighborhood Boundary
-  Park
-  Rooftop Park
-  Golf Course
-  Athletic Field
-  Cemetery

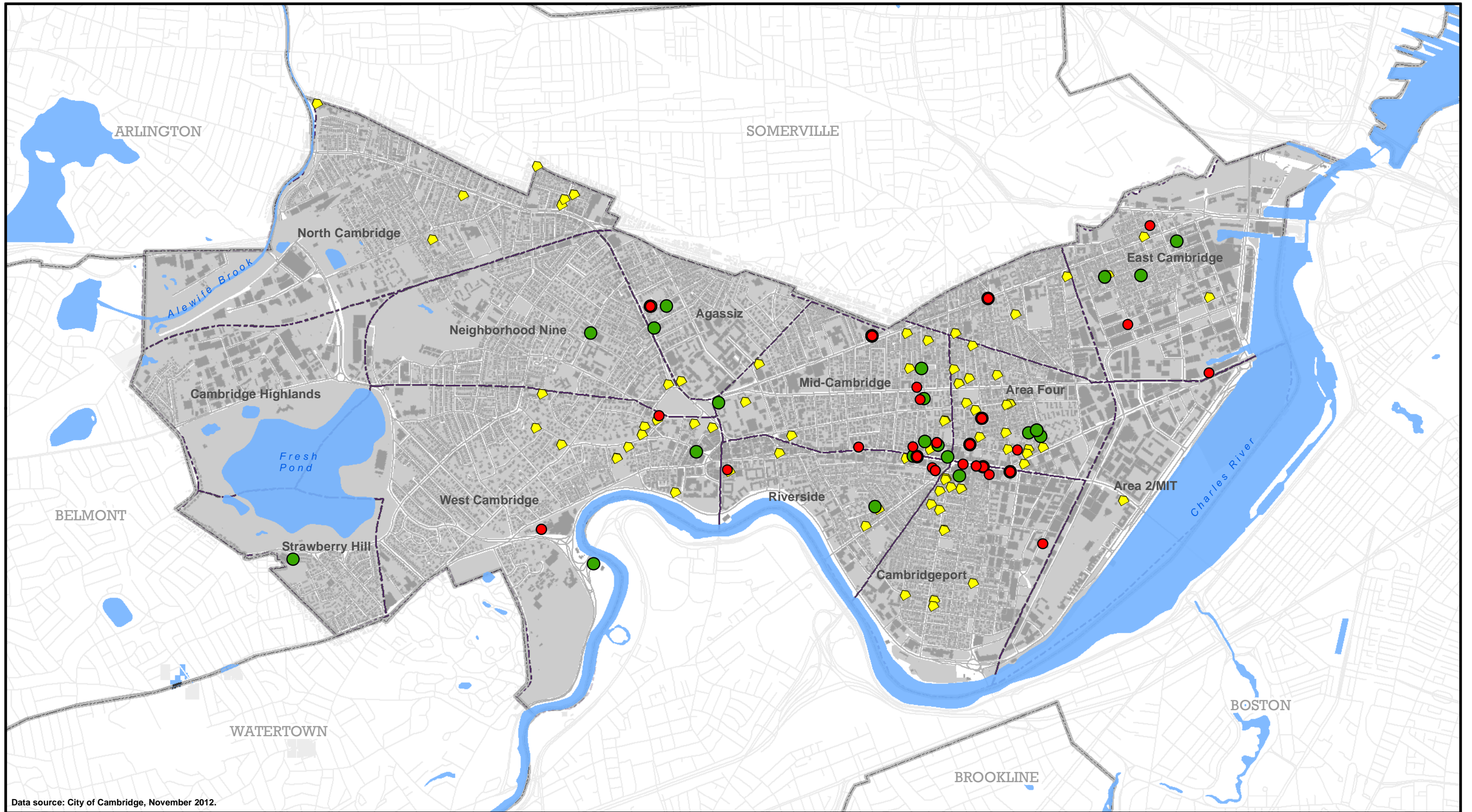


THIS MAP HAS BEEN PREPARED FOR THE CITY OF CAMBRIDGE CLIMATE CHANGE VULNERABILITY ASSESSMENT. IT IS BASED ON GIS DATA PROVIDED BY THE CITY (11/02/12) AND FROM MASSGIS. USERS OF THIS MAP SHOULD CONSULT PRIMARY SOURCES FOR VERIFICATION OF THE INFORMATION CONTAINED ON THIS MAP. THE CITY OF CAMBRIDGE AND ITS MAPPING CONTRACTORS ASSUME NO LIABILITY FOR THE INFORMATION CONTAINED HEREIN.



PROJECT NO.	20100259
DRAWN:	4/28/2014
DRAWN BY:	KFH
CHECKED BY:	NB
FILE NAME:	CR.4-MuniResources.mxd

MUNICIPAL RESOURCES	MAP
Climate Change Vulnerability Assessment Cambridge, Massachusetts	CR.4



Data source: City of Cambridge, November 2012.

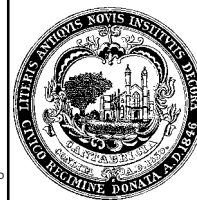
LEGEND

- Community-based service
- Vulnerable population support
- ▲ Faith-Based Organizations

Neighborhood Boundary



THIS MAP HAS BEEN PREPARED FOR THE CITY OF CAMBRIDGE CLIMATE CHANGE VULNERABILITY ASSESSMENT. IT IS BASED ON GIS DATA PROVIDED BY THE CITY (11/8/2012) AND FROM MASSGIS. USERS OF THIS MAP SHOULD CONSULT PRIMARY SOURCES FOR VERIFICATION OF THE INFORMATION CONTAINED ON THIS MAP. THE CITY OF CAMBRIDGE AND ITS MAPPING CONTRACTORS ASSUME NO LIABILITY FOR THE INFORMATION CONTAINED HEREIN.



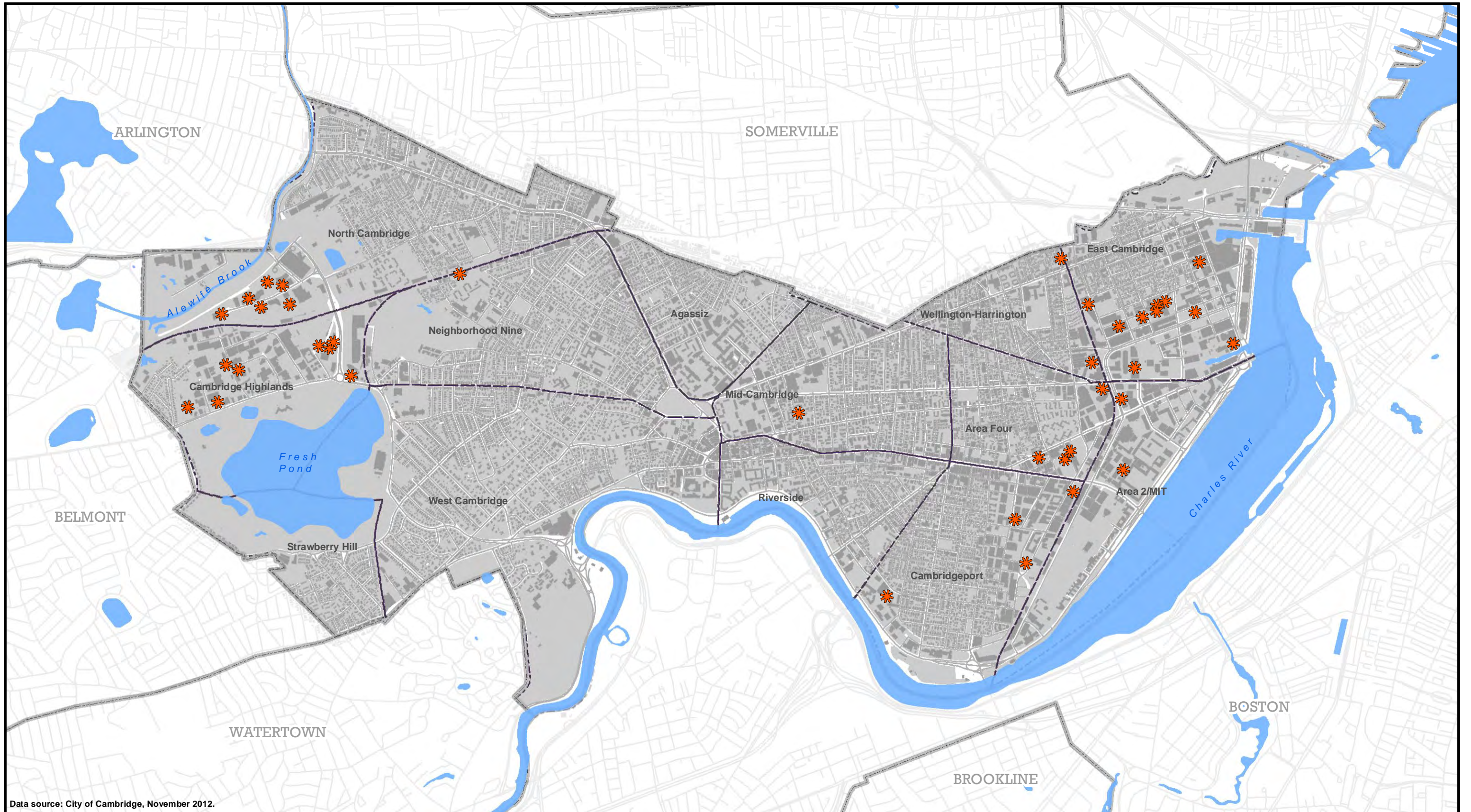
PROJECT NO.	20100259
DRAWN:	04/07/2015
DRAWN BY:	KFH
CHECKED BY:	NB
FILE NAME:	CR.5-CommResources.mxd

COMMUNITY RESOURCES

Climate Change Vulnerability Assessment
Cambridge, Massachusetts

MAP

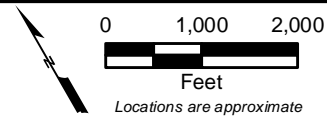
CR.5



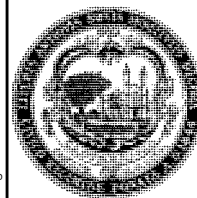
Data source: City of Cambridge, November 2012.

LEGEND

- Hazardous Materials Site
- Neighborhood Boundary



THIS MAP HAS BEEN PREPARED FOR THE CITY OF CAMBRIDGE CLIMATE CHANGE VULNERABILITY ASSESSMENT. IT IS BASED ON GIS DATA PROVIDED BY THE CITY (11/16/2012) AND FROM MASSGIS. USERS OF THIS MAP SHOULD CONSULT PRIMARY SOURCES FOR VERIFICATION OF THE INFORMATION CONTAINED ON THIS MAP. THE CITY OF CAMBRIDGE AND ITS MAPPING CONTRACTORS ASSUME NO LIABILITY FOR THE INFORMATION CONTAINED HEREIN.



PROJECT NO.	20100259
DRAWN:	04/07/2015
DRAWN BY:	KFH
CHECKED BY:	NB
FILE NAME:	CR.6-HazMat.mxd

HAZARDOUS MATERIALS SITES

Climate Change Vulnerability Assessment
Cambridge, Massachusetts

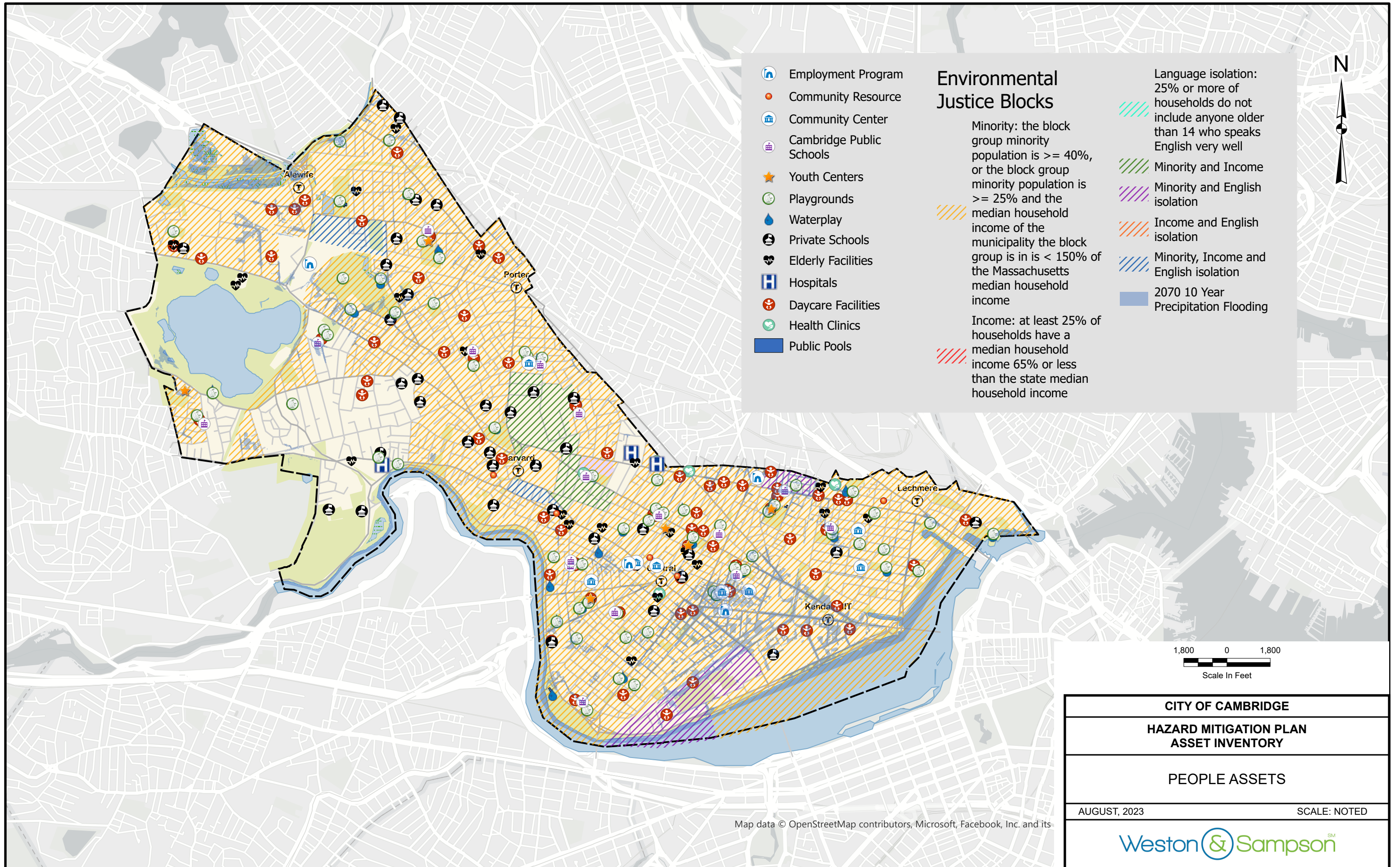
MAP

CR.6



Appendix F

Vulnerability Maps



- Employment Program
- Community Resource
- Community Center
- Cambridge Public Schools
- Youth Centers
- Playgrounds
- Waterplay
- Private Schools
- Elderly Facilities
- Hospitals
- Daycare Facilities
- Health Clinics
- Public Pools

Environmental Justice Blocks

Minority: the block group minority population is $\geq 40\%$, or the block group minority population is $\geq 25\%$ and the median household income of the municipality the block group is in is $< 150\%$ of the Massachusetts median household income

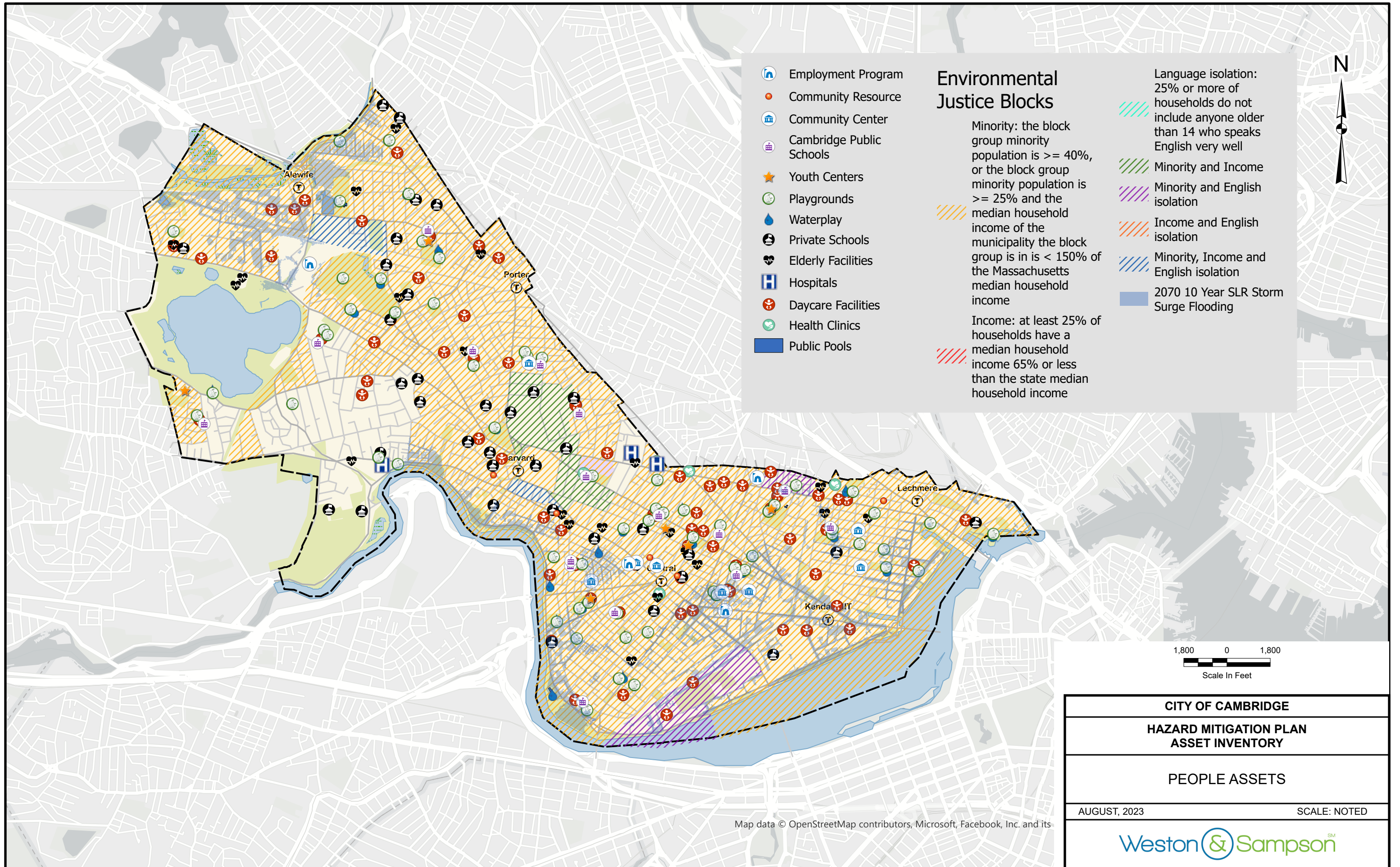
Income: at least 25% of households have a median household income 65% or less than the state median household income

- Language isolation: 25% or more of households do not include anyone older than 14 who speaks English very well
- Minority and Income
- Minority and English isolation
- Income and English isolation
- Minority, Income and English isolation
- 2070 10 Year Precipitation Flooding



CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
PEOPLE ASSETS	
AUGUST, 2023	SCALE: NOTED

Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its



- Employment Program
- Community Resource
- Community Center
- Cambridge Public Schools
- Youth Centers
- Playgrounds
- Waterplay
- Private Schools
- Elderly Facilities
- Hospitals
- Daycare Facilities
- Health Clinics
- Public Pools

Environmental Justice Blocks

Minority: the block group minority population is $\geq 40\%$, or the block group minority population is $\geq 25\%$ and the median household income of the municipality the block group is in is $< 150\%$ of the Massachusetts median household income

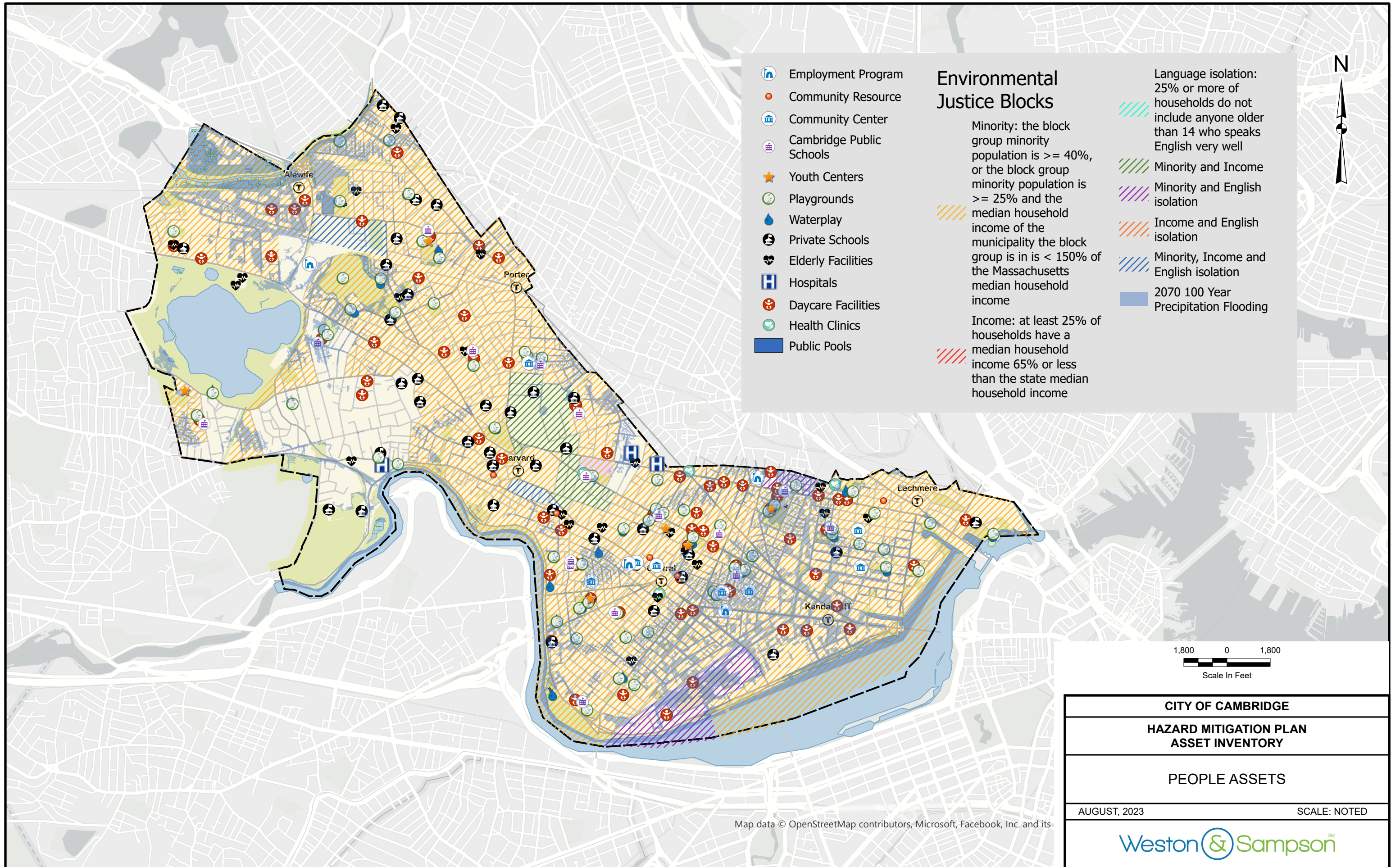
Income: at least 25% of households have a median household income 65% or less than the state median household income

- Language isolation: 25% or more of households do not include anyone older than 14 who speaks English very well
- Minority and Income
- Minority and English isolation
- Income and English isolation
- Minority, Income and English isolation
- 2070 10 Year SLR Storm Surge Flooding



CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
PEOPLE ASSETS	
AUGUST, 2023	SCALE: NOTED

Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its



- Employment Program
- Community Resource
- Community Center
- Cambridge Public Schools
- Youth Centers
- Playgrounds
- Waterplay
- Private Schools
- Elderly Facilities
- Hospitals
- Daycare Facilities
- Health Clinics
- Public Pools

Environmental Justice Blocks

Minority: the block group minority population is $\geq 40\%$, or the block group minority population is $\geq 25\%$ and the median household income of the municipality the block group is in is $< 150\%$ of the Massachusetts median household income

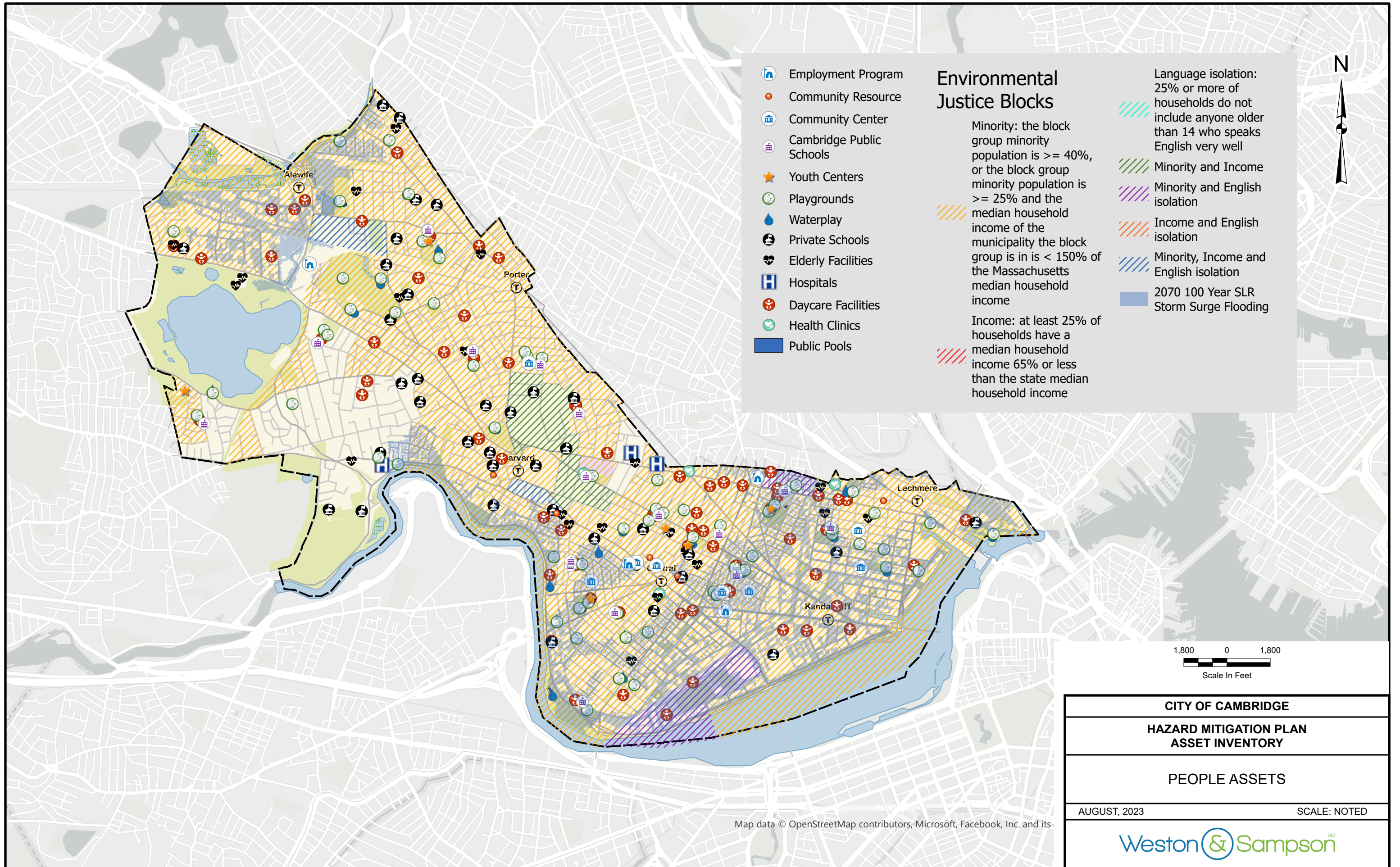
Income: at least 25% of households have a median household income 65% or less than the state median household income

- Language isolation: 25% or more of households do not include anyone older than 14 who speaks English very well
- Minority and Income
- Minority and English isolation
- Income and English isolation
- Minority, Income and English isolation
- 2070 100 Year Precipitation Flooding



CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
PEOPLE ASSETS	
AUGUST, 2023	SCALE: NOTED

Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its



- Employment Program
- Community Resource
- Community Center
- Cambridge Public Schools
- Youth Centers
- Playgrounds
- Waterplay
- Private Schools
- Elderly Facilities
- Hospitals
- Daycare Facilities
- Health Clinics
- Public Pools

Environmental Justice Blocks

Minority: the block group minority population is $\geq 40\%$, or the block group minority population is $\geq 25\%$ and the median household income of the municipality the block group is in is $< 150\%$ of the Massachusetts median household income

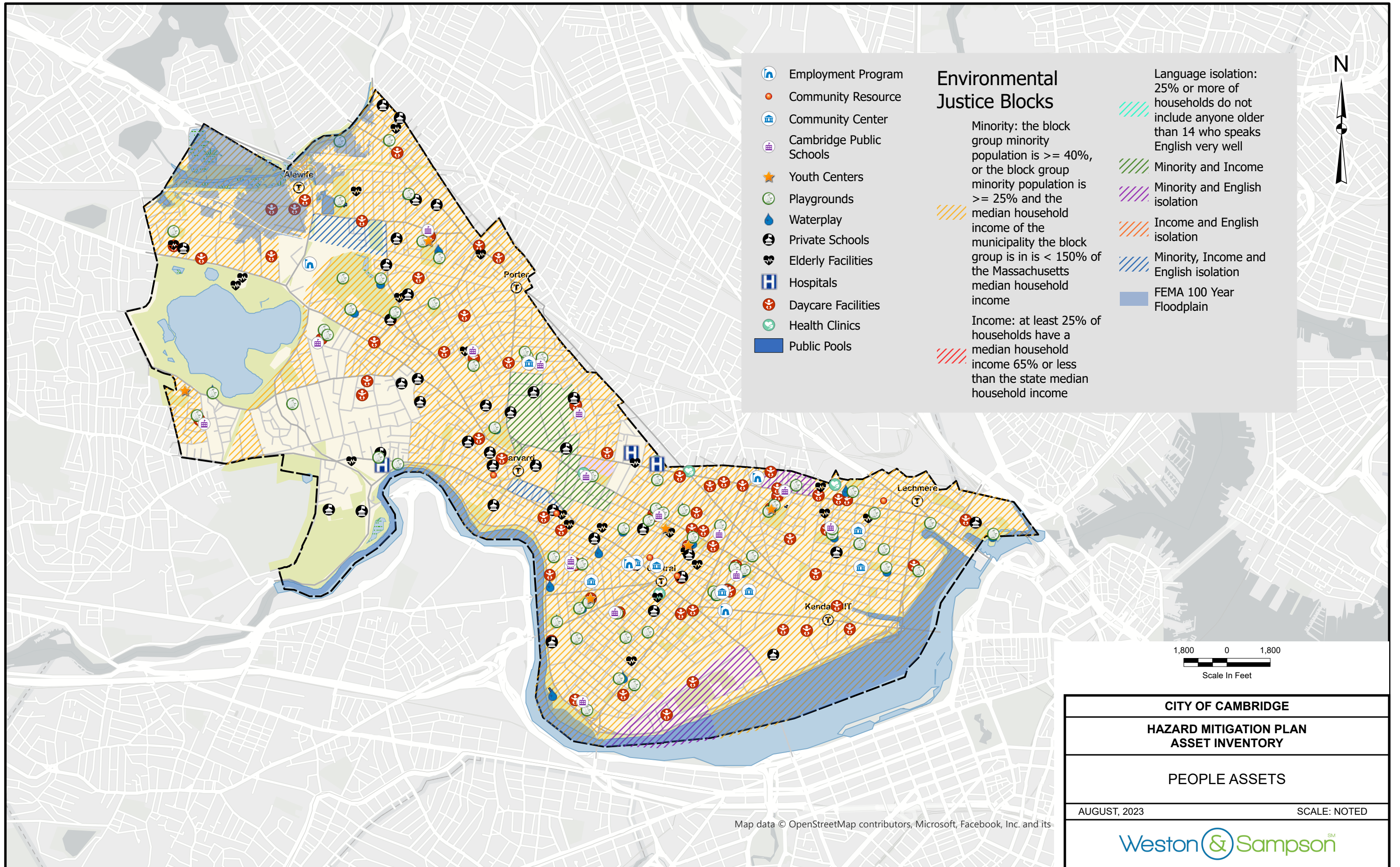
Income: at least 25% of households have a median household income 65% or less than the state median household income

- Language isolation: 25% or more of households do not include anyone older than 14 who speaks English very well
- Minority and Income
- Minority and English isolation
- Income and English isolation
- Minority, Income and English isolation
- 2070 100 Year SLR Storm Surge Flooding



CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
PEOPLE ASSETS	
AUGUST, 2023	SCALE: NOTED

Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its



- Employment Program
- Community Resource
- Community Center
- Cambridge Public Schools
- Youth Centers
- Playgrounds
- Waterplay
- Private Schools
- Elderly Facilities
- Hospitals
- Daycare Facilities
- Health Clinics
- Public Pools

Environmental Justice Blocks

Minority: the block group minority population is $\geq 40\%$, or the block group minority population is $\geq 25\%$ and the median household income of the municipality the block group is in is $< 150\%$ of the Massachusetts median household income

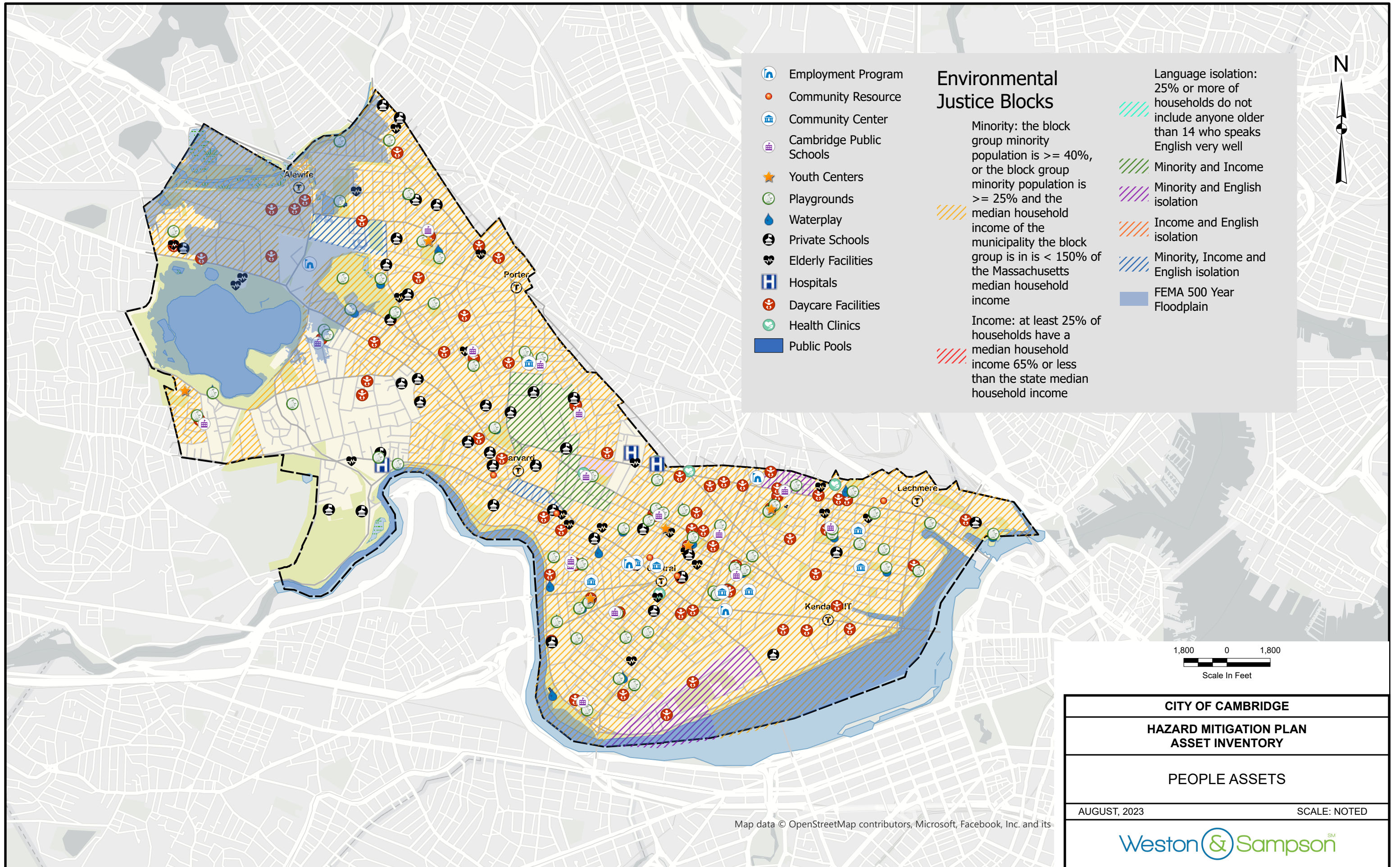
Income: at least 25% of households have a median household income 65% or less than the state median household income

- Language isolation: 25% or more of households do not include anyone older than 14 who speaks English very well
- Minority and Income
- Minority and English isolation
- Income and English isolation
- Minority, Income and English isolation
- FEMA 100 Year Floodplain



CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
PEOPLE ASSETS	
AUGUST, 2023	SCALE: NOTED

Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its



- Employment Program
- Community Resource
- Community Center
- Cambridge Public Schools
- Youth Centers
- Playgrounds
- Waterplay
- Private Schools
- Elderly Facilities
- Hospitals
- Daycare Facilities
- Health Clinics
- Public Pools

Environmental Justice Blocks

Minority: the block group minority population is $\geq 40\%$, or the block group minority population is $\geq 25\%$ and the median household income of the municipality the block group is in is $< 150\%$ of the Massachusetts median household income

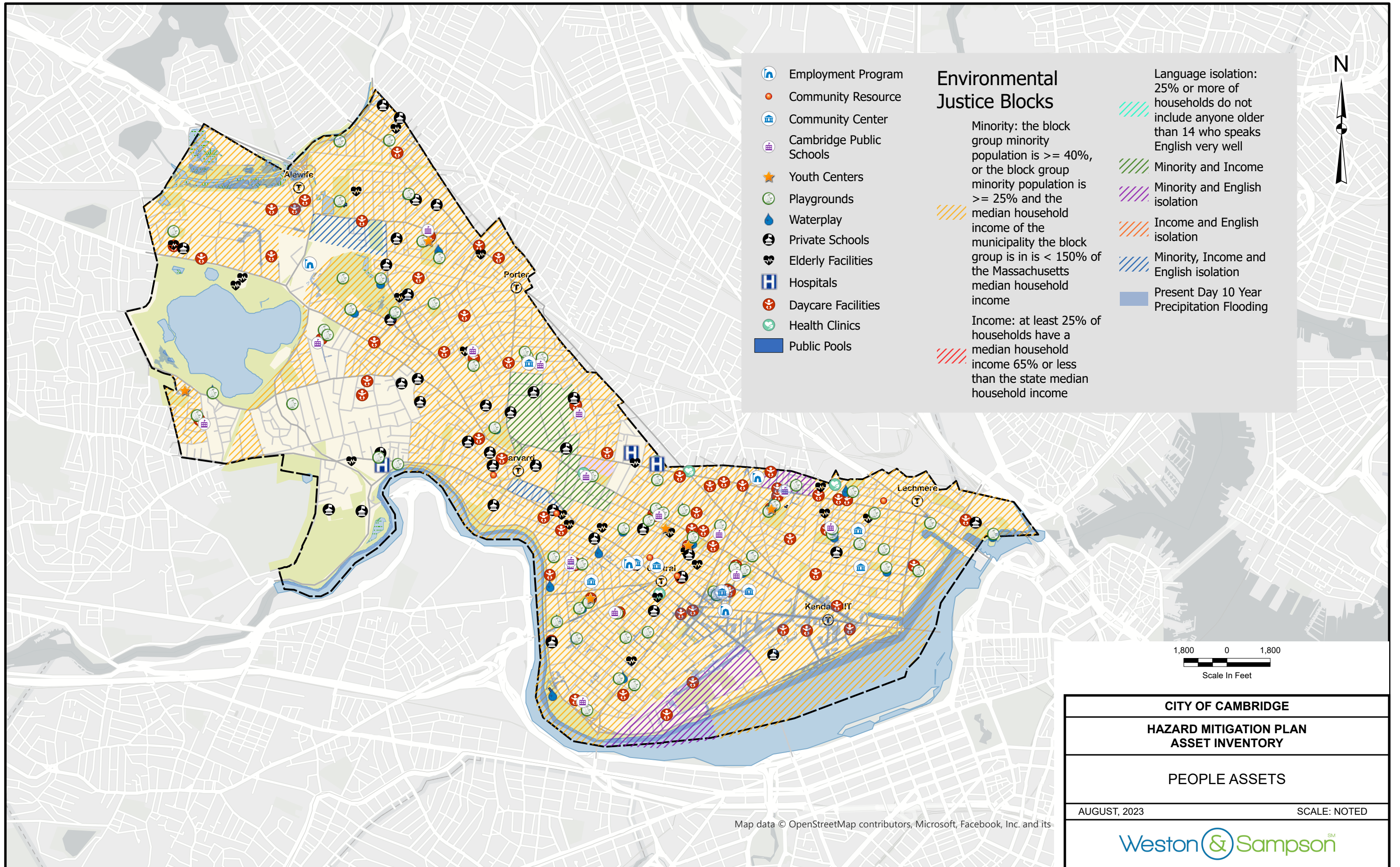
Income: at least 25% of households have a median household income 65% or less than the state median household income

- Language isolation: 25% or more of households do not include anyone older than 14 who speaks English very well
- Minority and Income
- Minority and English isolation
- Income and English isolation
- Minority, Income and English isolation
- FEMA 500 Year Floodplain



CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
PEOPLE ASSETS	
AUGUST, 2023	SCALE: NOTED

Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its



- Employment Program
- Community Resource
- Community Center
- Cambridge Public Schools
- Youth Centers
- Playgrounds
- Waterplay
- Private Schools
- Elderly Facilities
- Hospitals
- Daycare Facilities
- Health Clinics
- Public Pools

Environmental Justice Blocks

Minority: the block group minority population is $\geq 40\%$, or the block group minority population is $\geq 25\%$ and the median household income of the municipality the block group is in is $< 150\%$ of the Massachusetts median household income

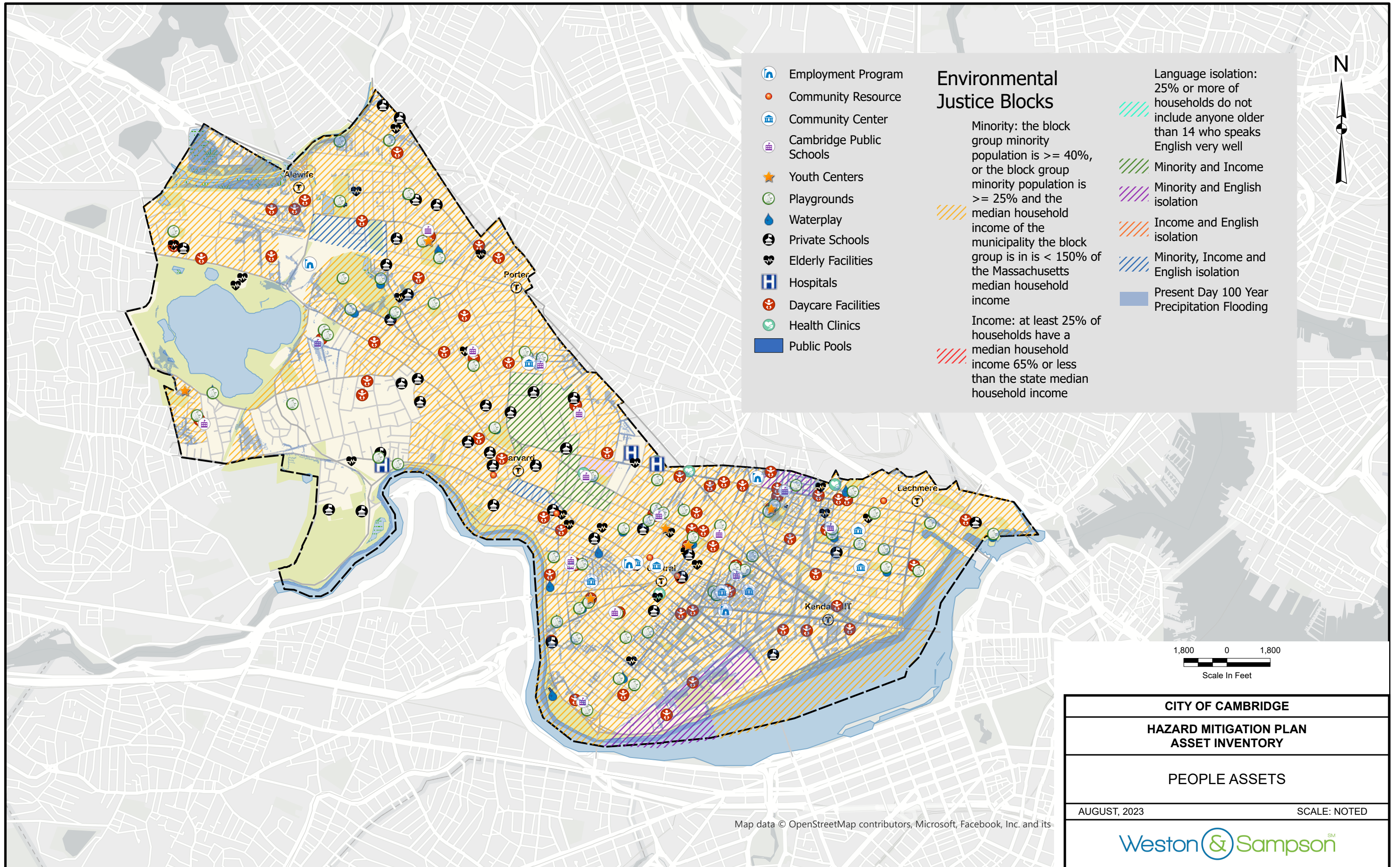
Income: at least 25% of households have a median household income 65% or less than the state median household income

- Language isolation: 25% or more of households do not include anyone older than 14 who speaks English very well
- Minority and Income
- Minority and English isolation
- Income and English isolation
- Minority, Income and English isolation
- Present Day 10 Year Precipitation Flooding



CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
PEOPLE ASSETS	
AUGUST, 2023	SCALE: NOTED

Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its



- Employment Program
- Community Resource
- Community Center
- Cambridge Public Schools
- Youth Centers
- Playgrounds
- Waterplay
- Private Schools
- Elderly Facilities
- Hospitals
- Daycare Facilities
- Health Clinics
- Public Pools

Environmental Justice Blocks

Minority: the block group minority population is $\geq 40\%$, or the block group minority population is $\geq 25\%$ and the median household income of the municipality the block group is in is $< 150\%$ of the Massachusetts median household income

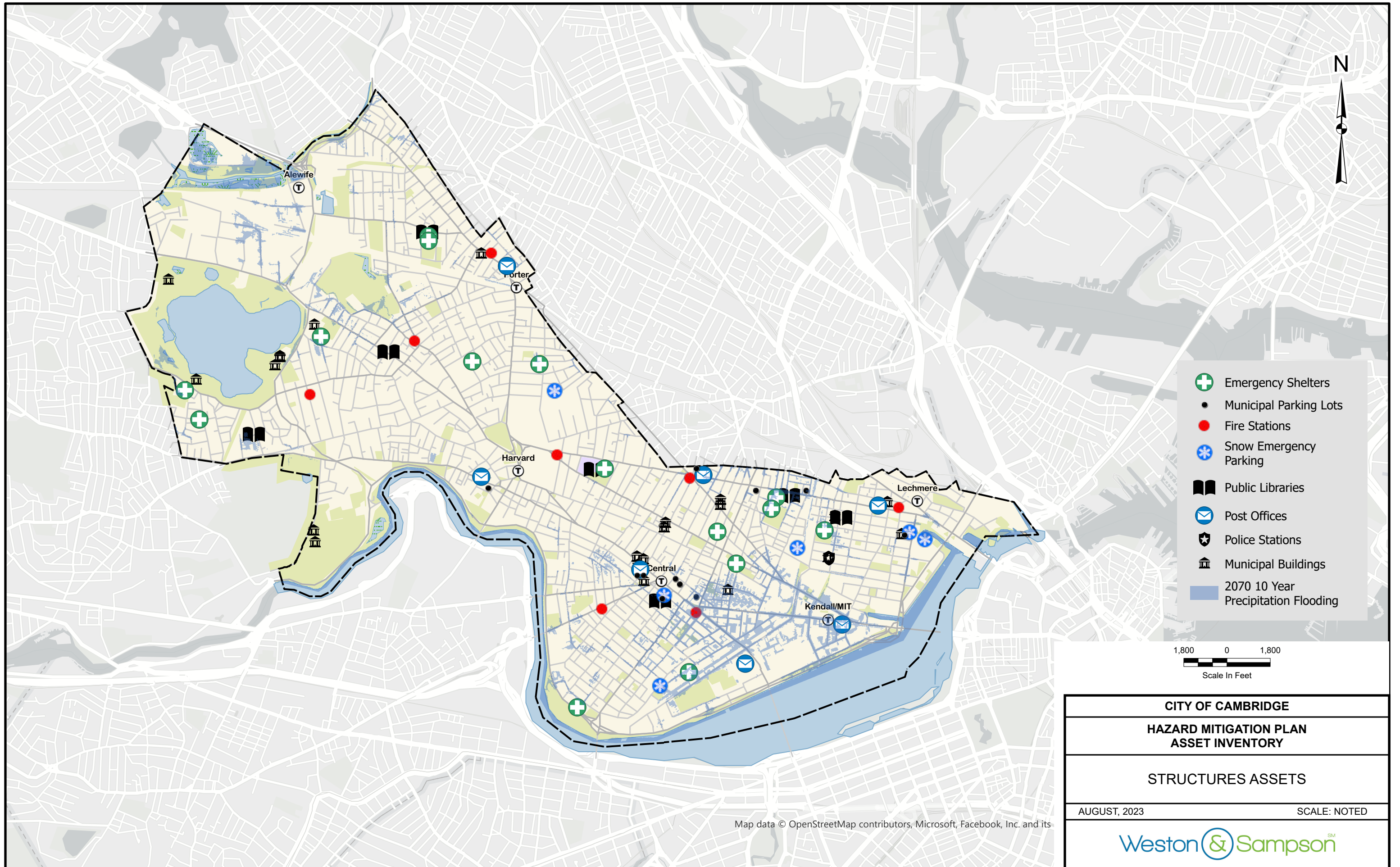
Income: at least 25% of households have a median household income 65% or less than the state median household income










- Language isolation: 25% or more of households do not include anyone older than 14 who speaks English very well
- Minority and Income
- Minority and English isolation
- Income and English isolation
- Minority, Income and English isolation
- Present Day 100 Year Precipitation Flooding




CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
PEOPLE ASSETS	
AUGUST, 2023	SCALE: NOTED

Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its

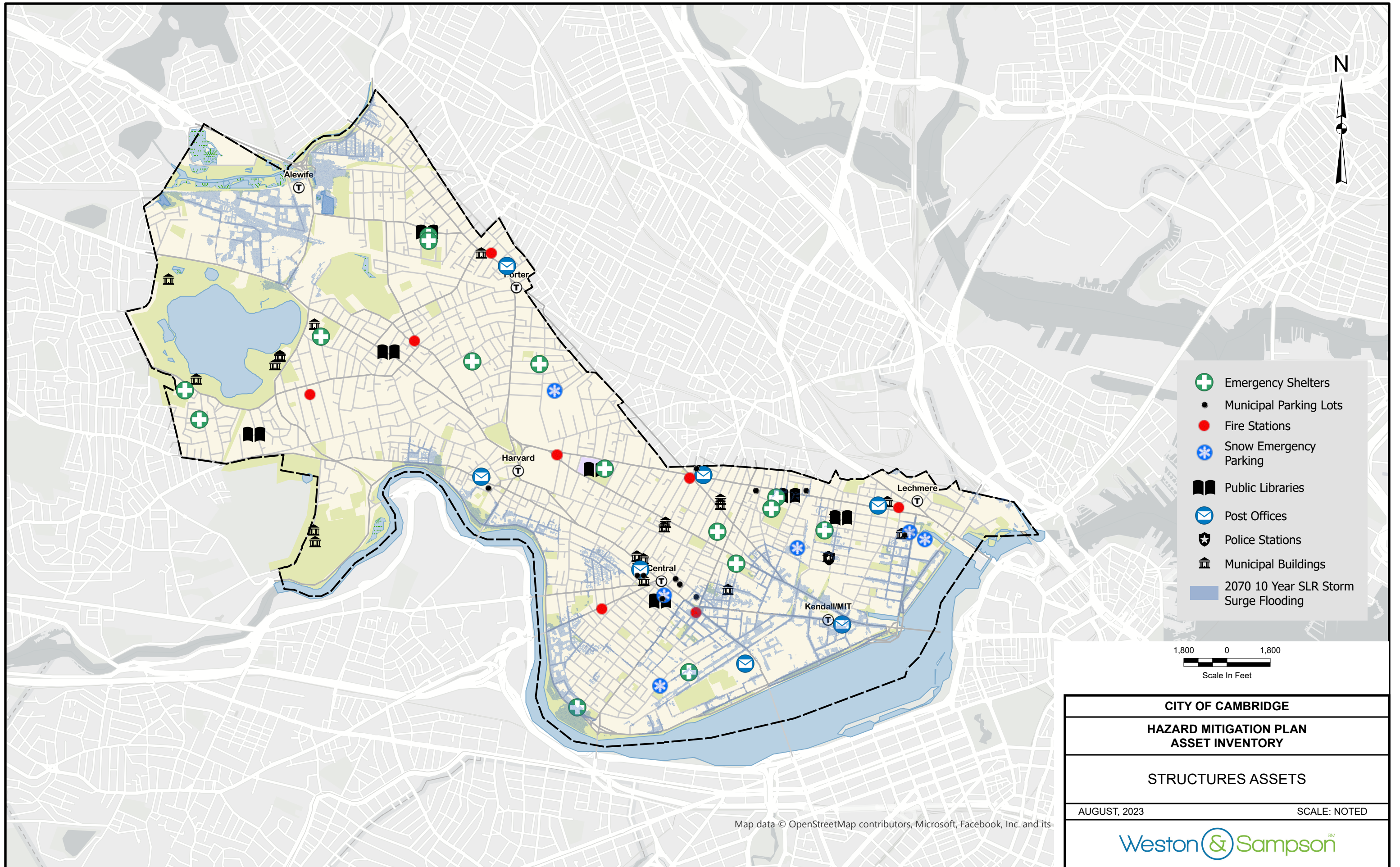











-  Emergency Shelters
-  Municipal Parking Lots
-  Fire Stations
-  Snow Emergency Parking
-  Public Libraries
-  Post Offices
-  Police Stations
-  Municipal Buildings
-  2070 10 Year Precipitation Flooding

1,800 0 1,800
Scale In Feet


CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
STRUCTURES ASSETS	
AUGUST, 2023	SCALE: NOTED
	

Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its affiliates

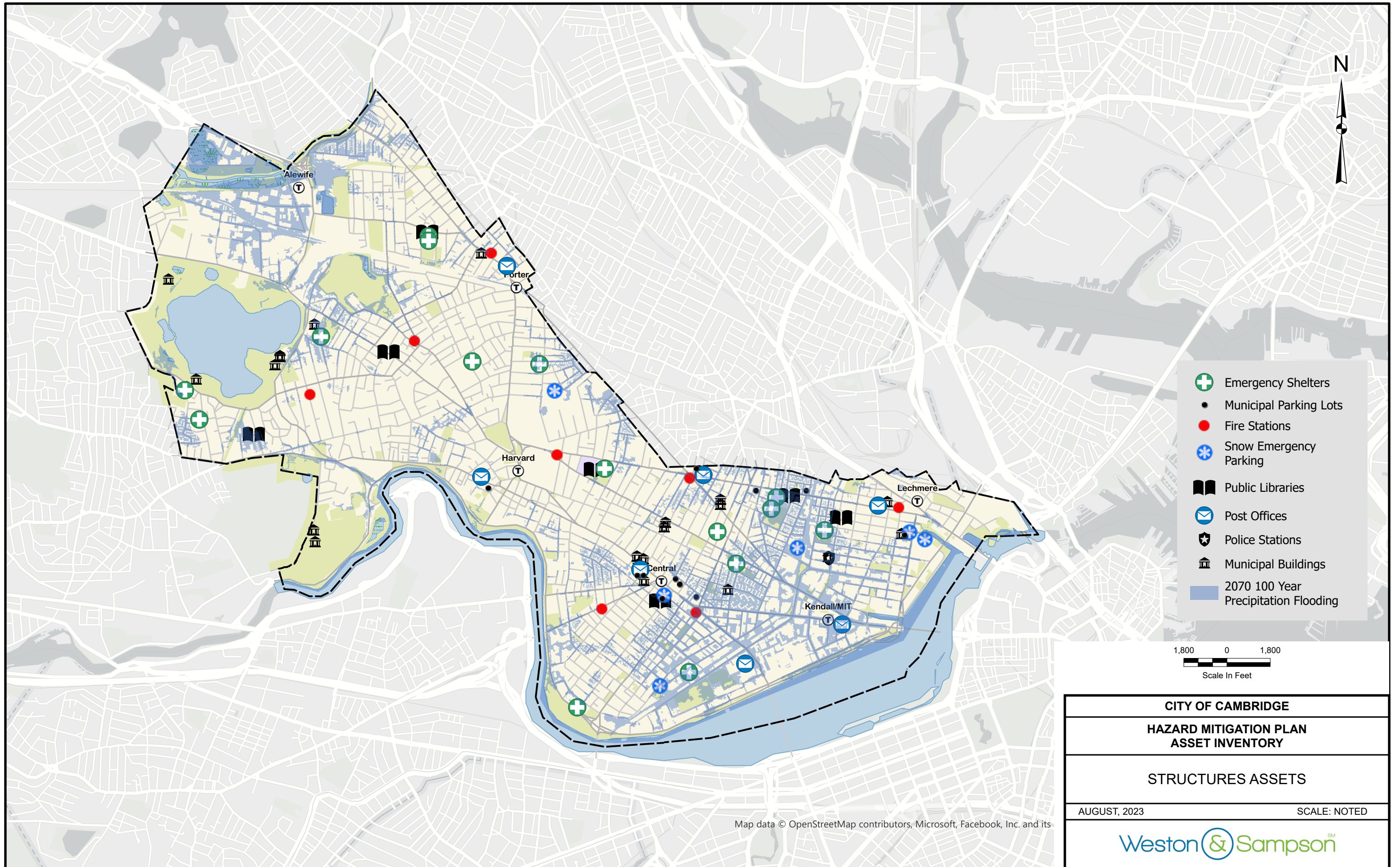











-  Emergency Shelters
-  Municipal Parking Lots
-  Fire Stations
-  Snow Emergency Parking
-  Public Libraries
-  Post Offices
-  Police Stations
-  Municipal Buildings
-  2070 10 Year SLR Storm Surge Flooding

1,800 0 1,800
Scale In Feet


CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
STRUCTURES ASSETS	
AUGUST, 2023	SCALE: NOTED
	

Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its affiliates

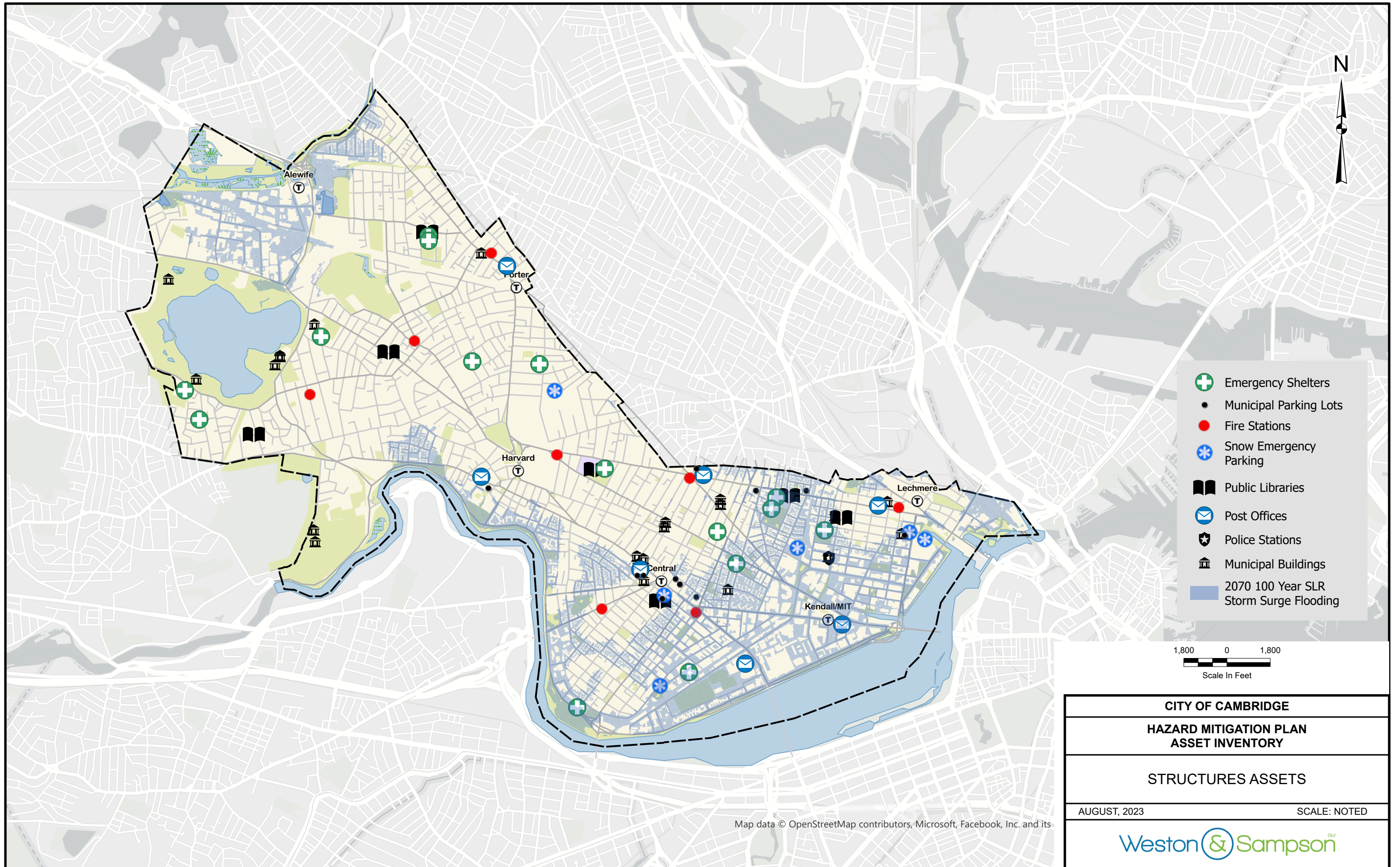











-  Emergency Shelters
-  Municipal Parking Lots
-  Fire Stations
-  Snow Emergency Parking
-  Public Libraries
-  Post Offices
-  Police Stations
-  Municipal Buildings
-  2070 100 Year Precipitation Flooding

1,800 0 1,800
Scale In Feet


CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
STRUCTURES ASSETS	
AUGUST, 2023	SCALE: NOTED
	

Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its affiliates.

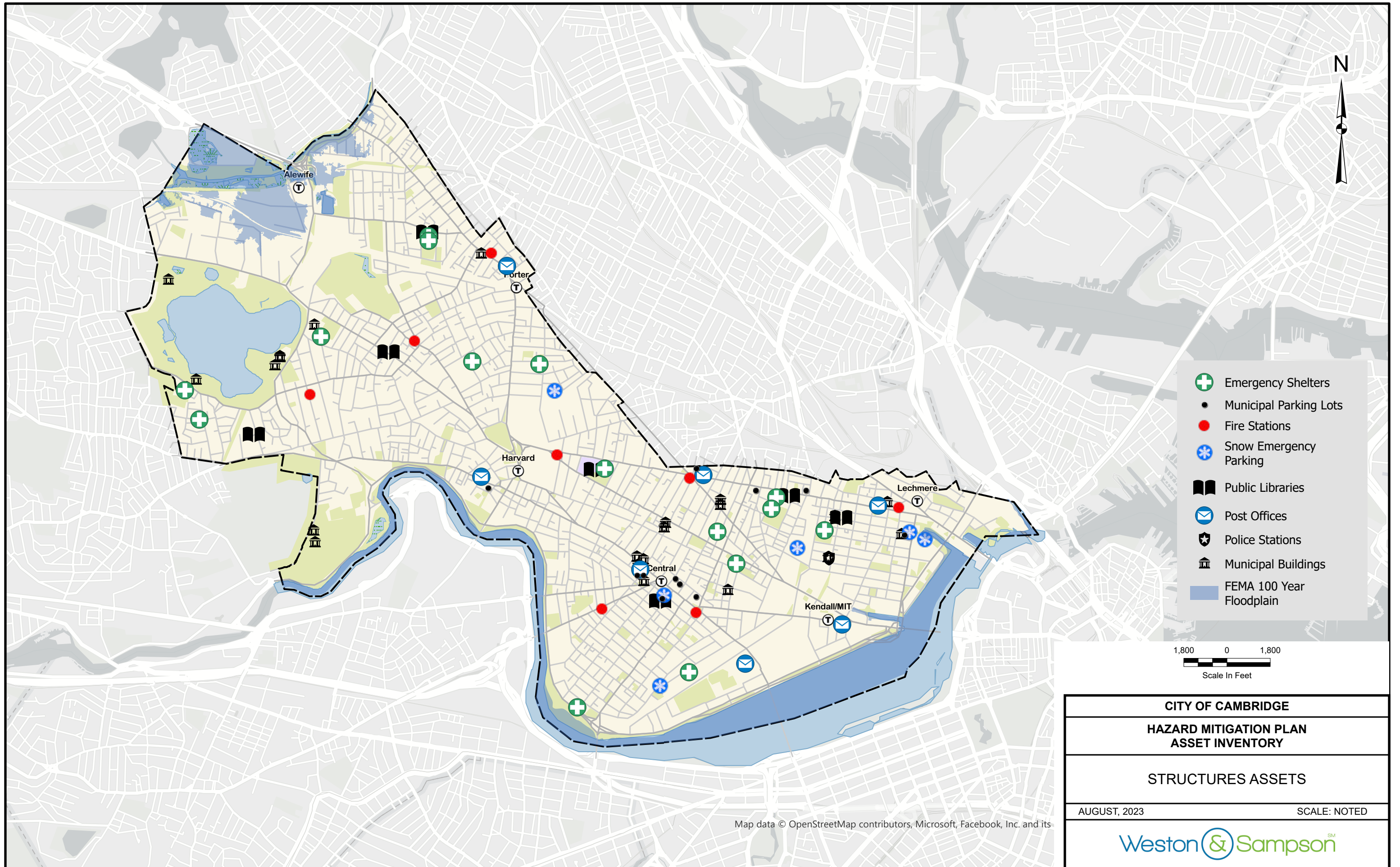


-  Emergency Shelters
-  Municipal Parking Lots
-  Fire Stations
-  Snow Emergency Parking
-  Public Libraries
-  Post Offices
-  Police Stations
-  Municipal Buildings
-  2070 100 Year SLR Storm Surge Flooding

1,800 0 1,800
Scale In Feet

CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
STRUCTURES ASSETS	
AUGUST, 2023	SCALE: NOTED
	

Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its

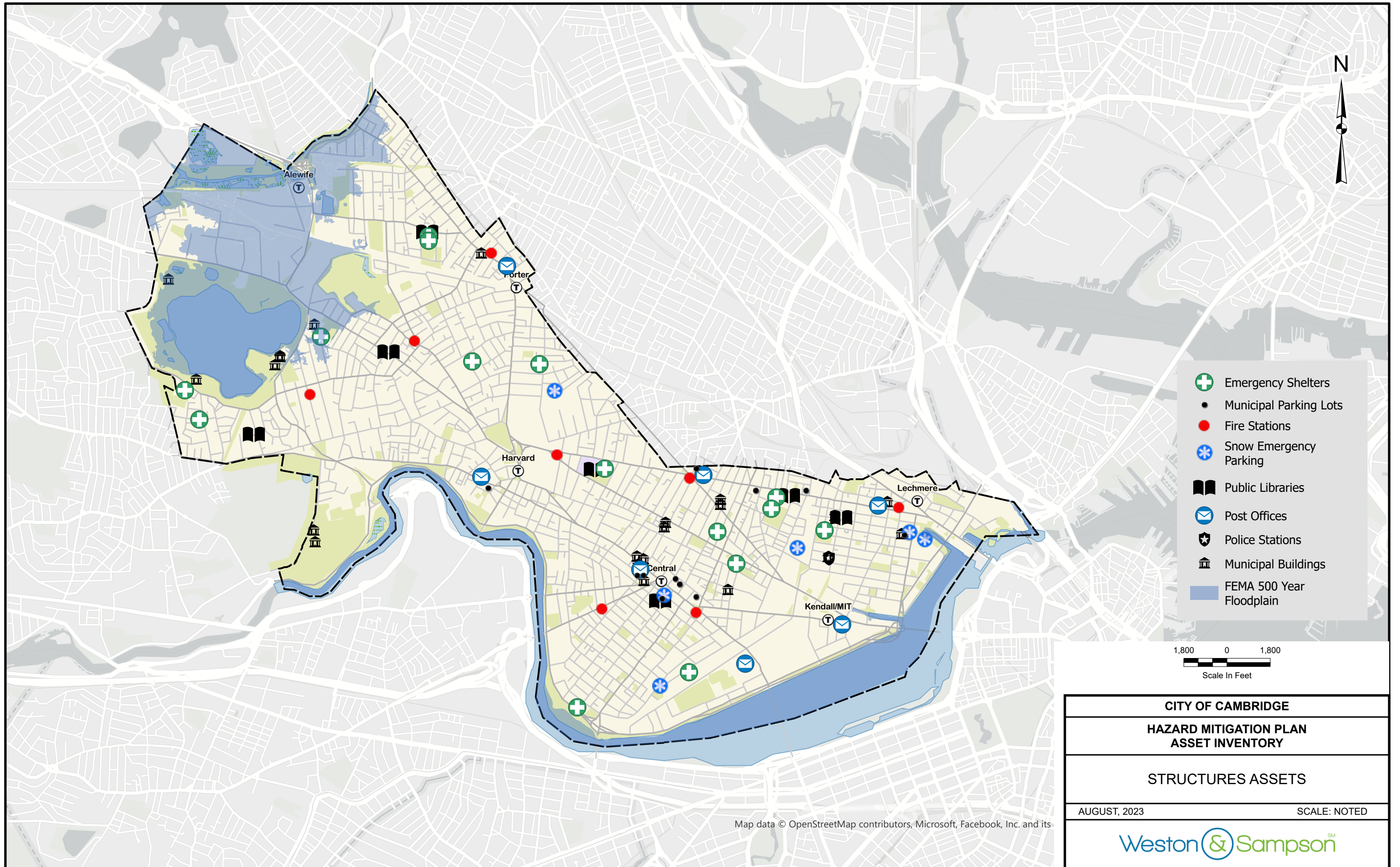











- Emergency Shelters
- Municipal Parking Lots
- Fire Stations
- Snow Emergency Parking
- Public Libraries
- Post Offices
- Police Stations
- Municipal Buildings
- FEMA 100 Year Floodplain

1,800 0 1,800
Scale In Feet


CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
STRUCTURES ASSETS	
AUGUST, 2023	SCALE: NOTED

Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its

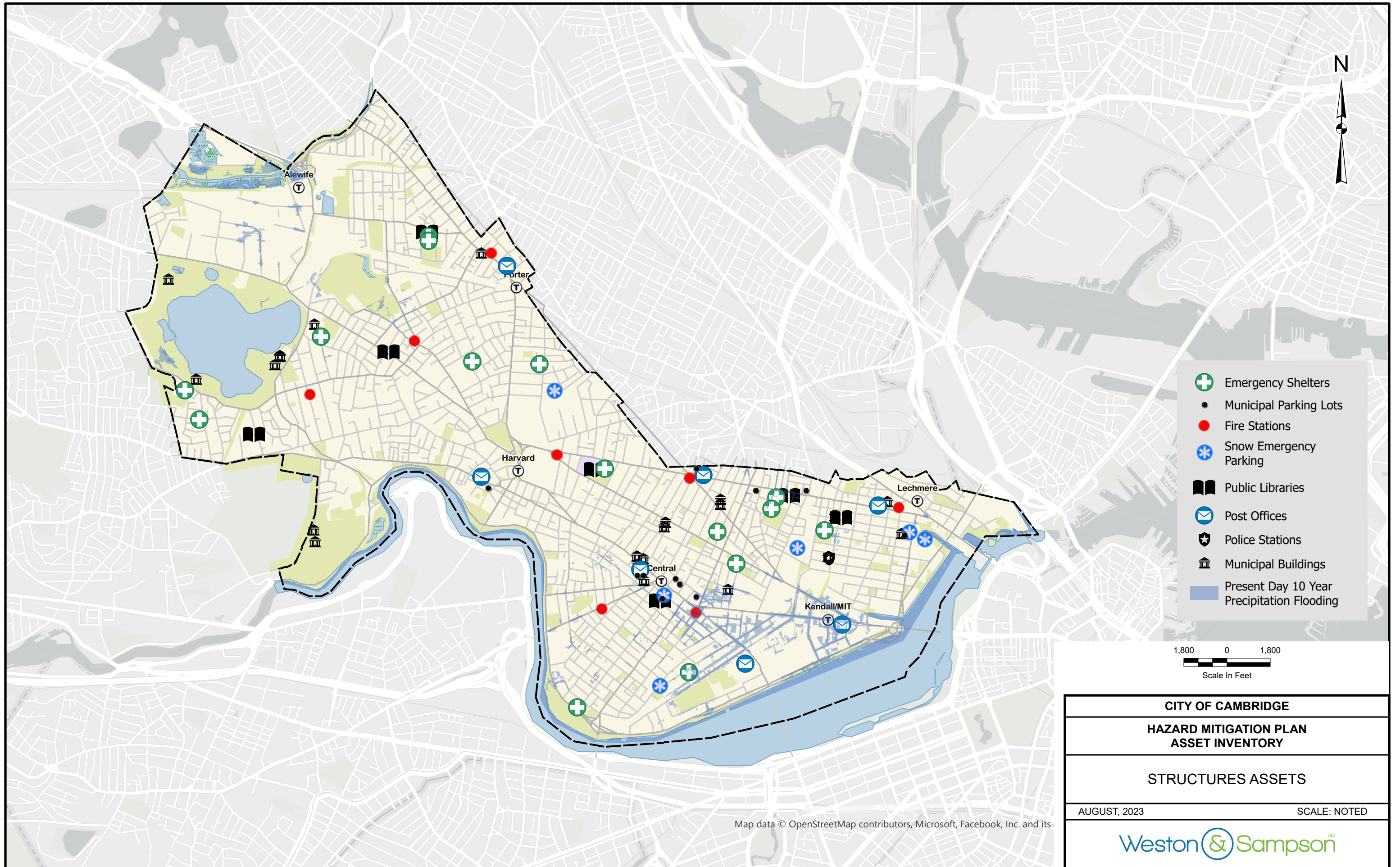


-  Emergency Shelters
-  Municipal Parking Lots
-  Fire Stations
-  Snow Emergency Parking
-  Public Libraries
-  Post Offices
-  Police Stations
-  Municipal Buildings
-  FEMA 500 Year Floodplain

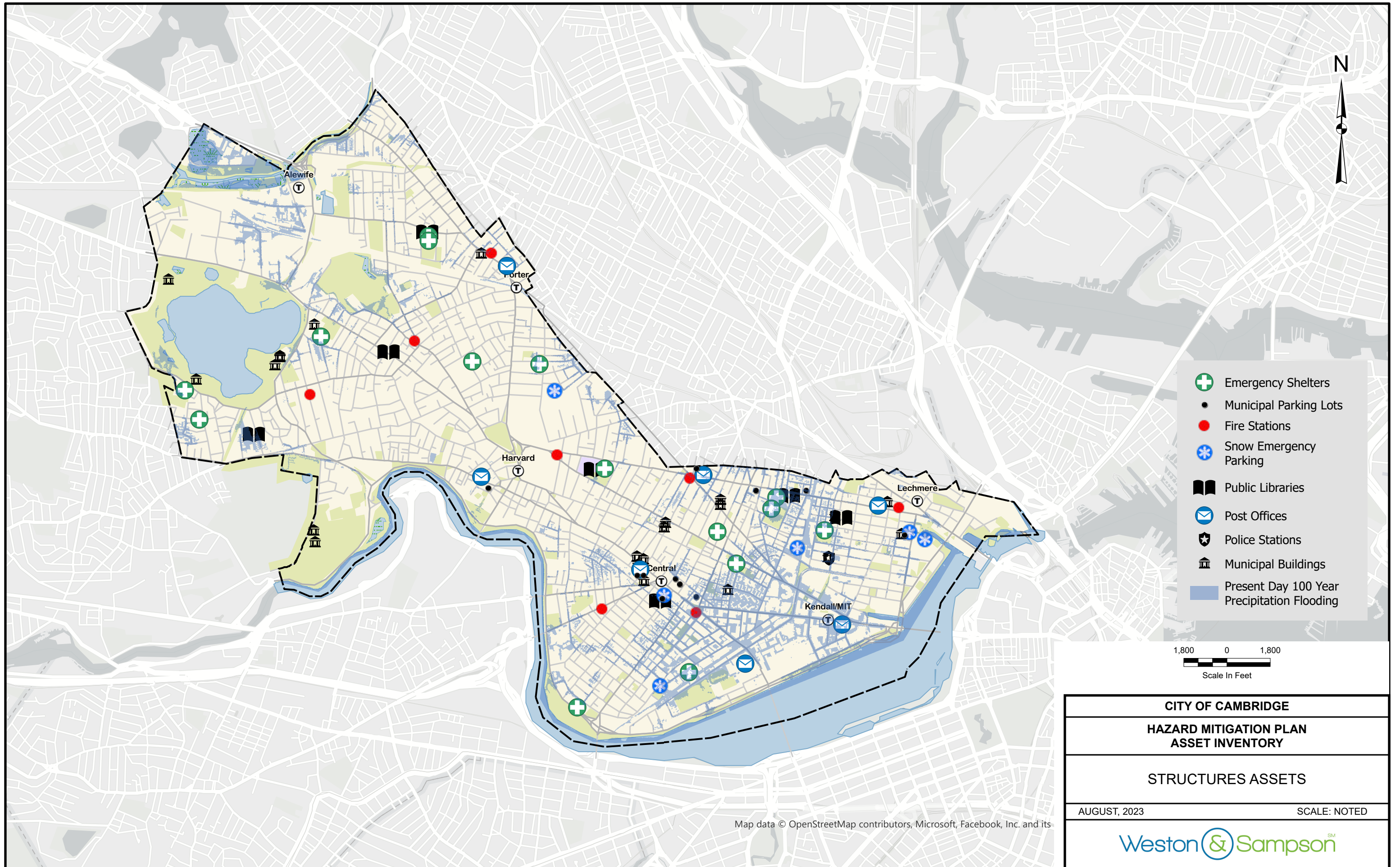
1,800 0 1,800
Scale In Feet










CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
STRUCTURES ASSETS	
AUGUST, 2023	SCALE: NOTED
	

Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its




CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
STRUCTURES ASSETS	
AUGUST, 2023	SCALE: NOTED

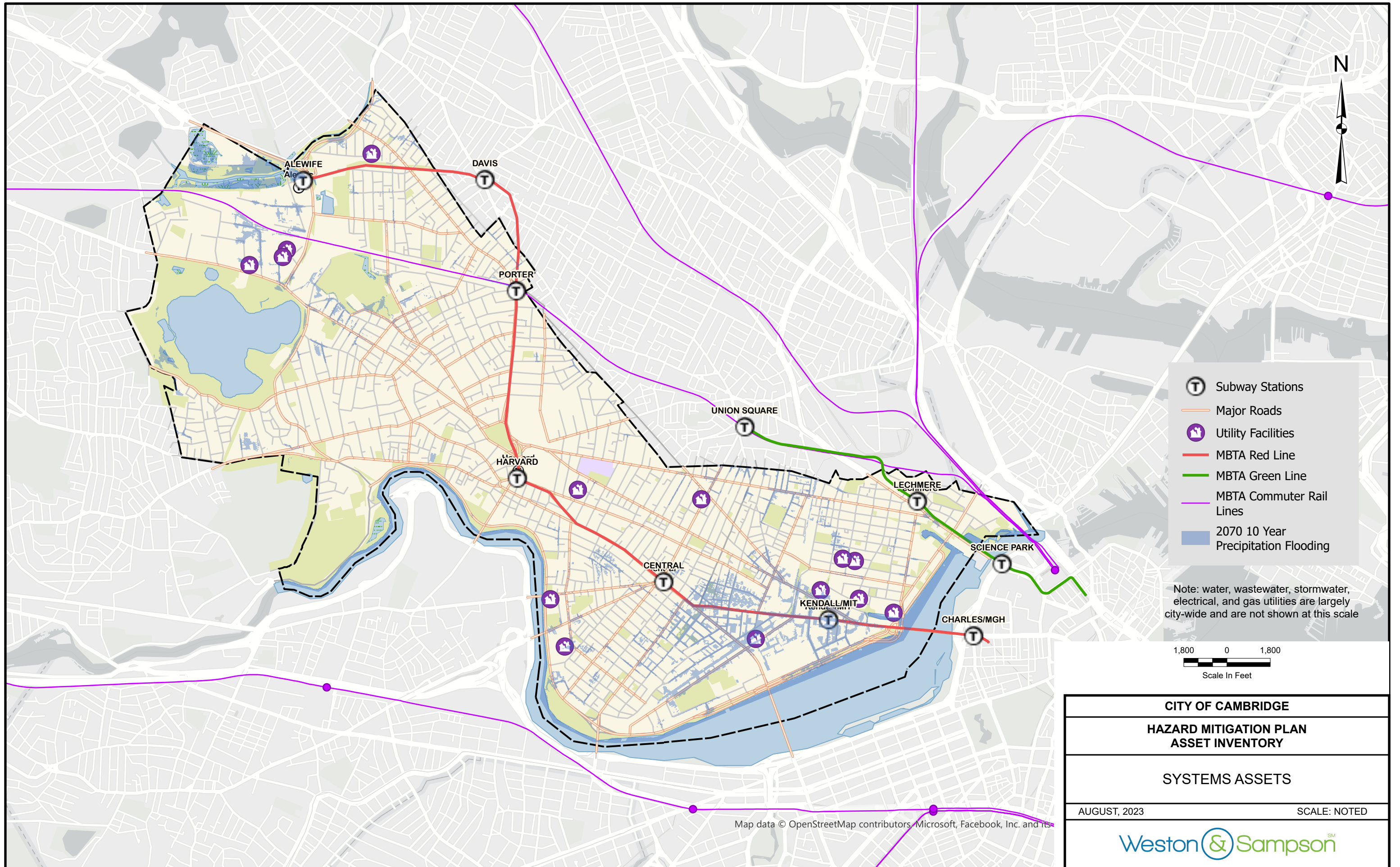


-  Emergency Shelters
-  Municipal Parking Lots
-  Fire Stations
-  Snow Emergency Parking
-  Public Libraries
-  Post Offices
-  Police Stations
-  Municipal Buildings
-  Present Day 100 Year Precipitation Flooding

1,800 0 1,800
Scale In Feet

CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
STRUCTURES ASSETS	
AUGUST, 2023	SCALE: NOTED
	

Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its



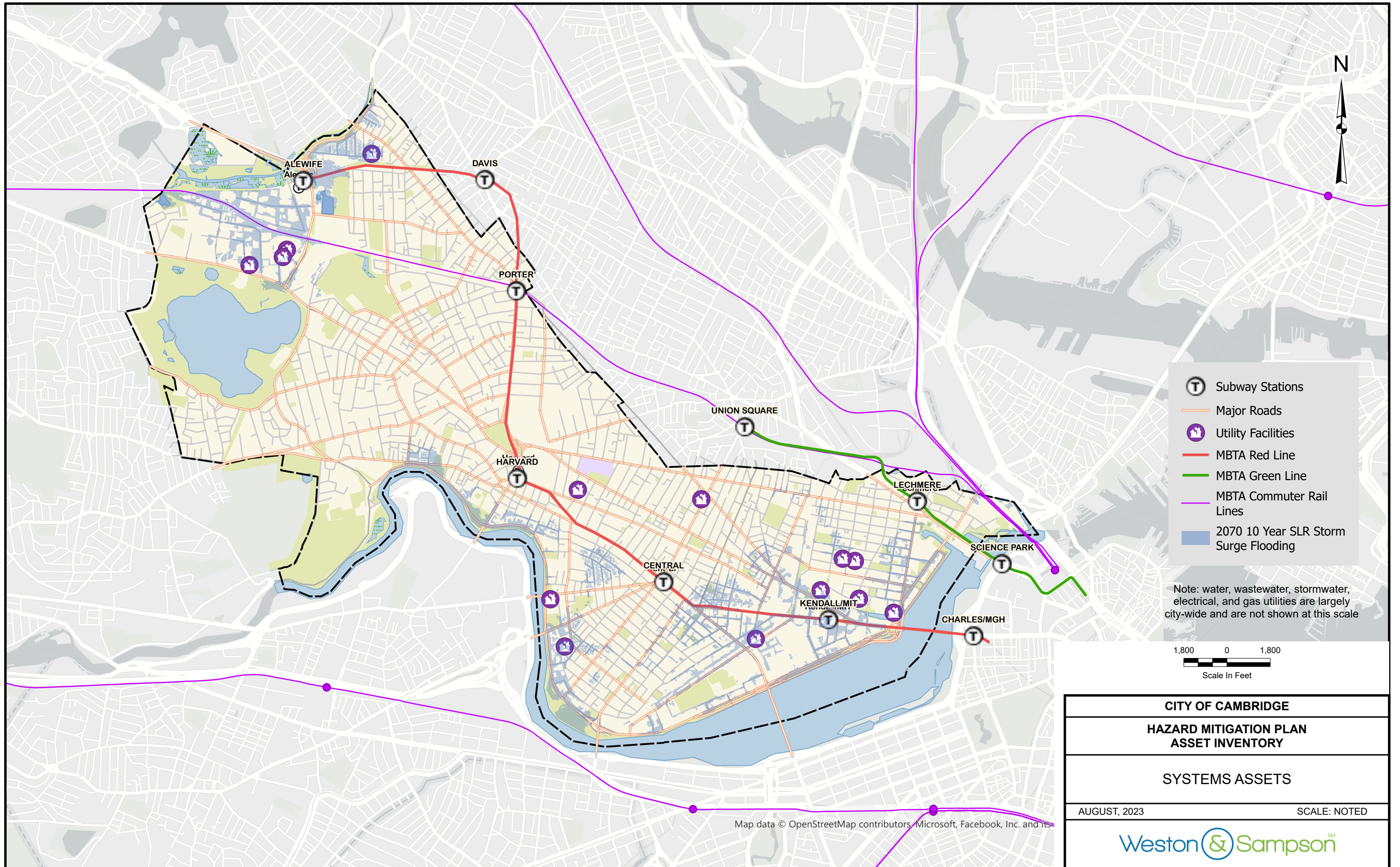
- Subway Stations
- Major Roads
- Utility Facilities
- MBTA Red Line
- MBTA Green Line
- MBTA Commuter Rail Lines
- 2070 10 Year Precipitation Flooding

Note: water, wastewater, stormwater, electrical, and gas utilities are largely city-wide and are not shown at this scale

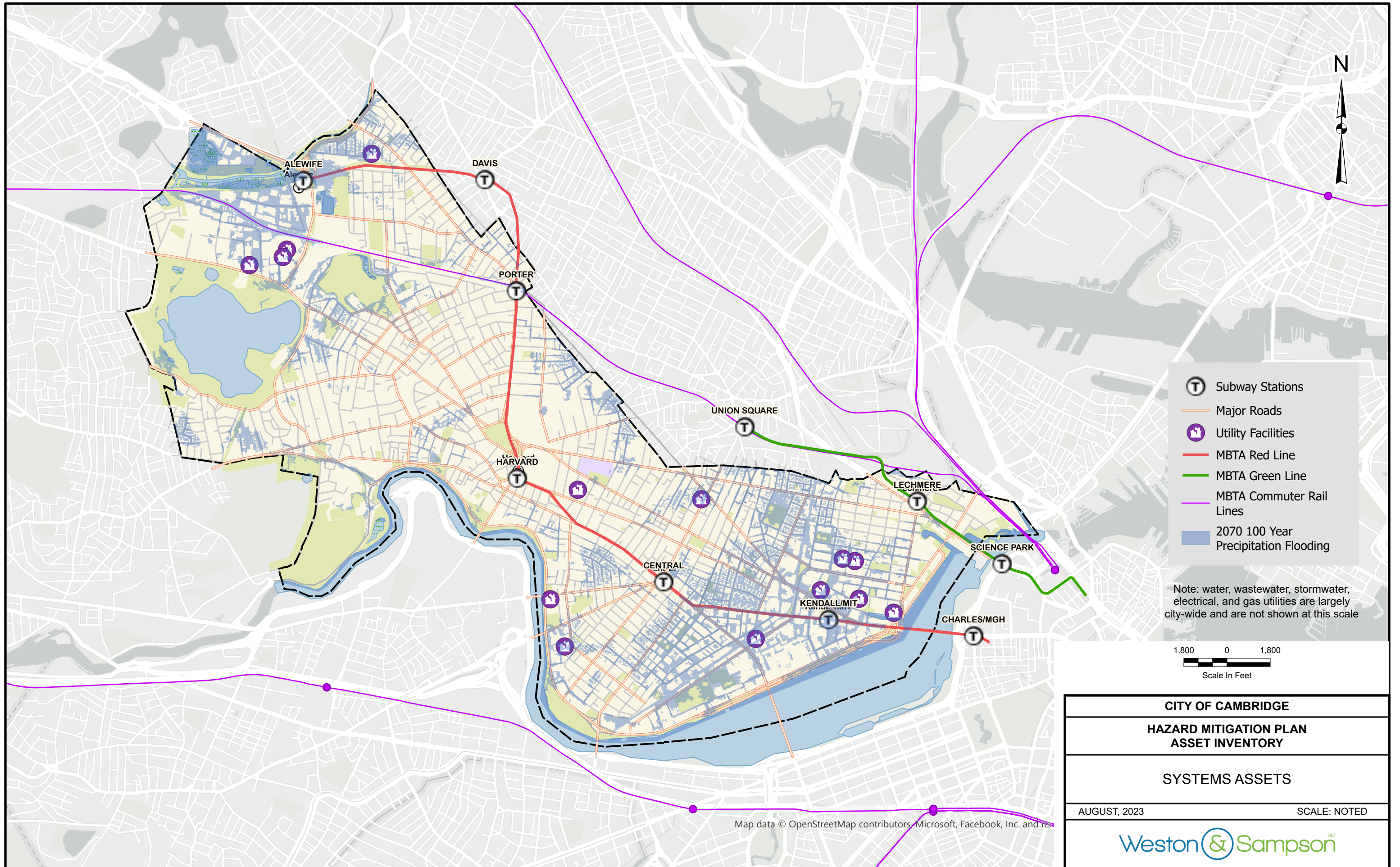


CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
SYSTEMS ASSETS	
AUGUST, 2023	SCALE: NOTED

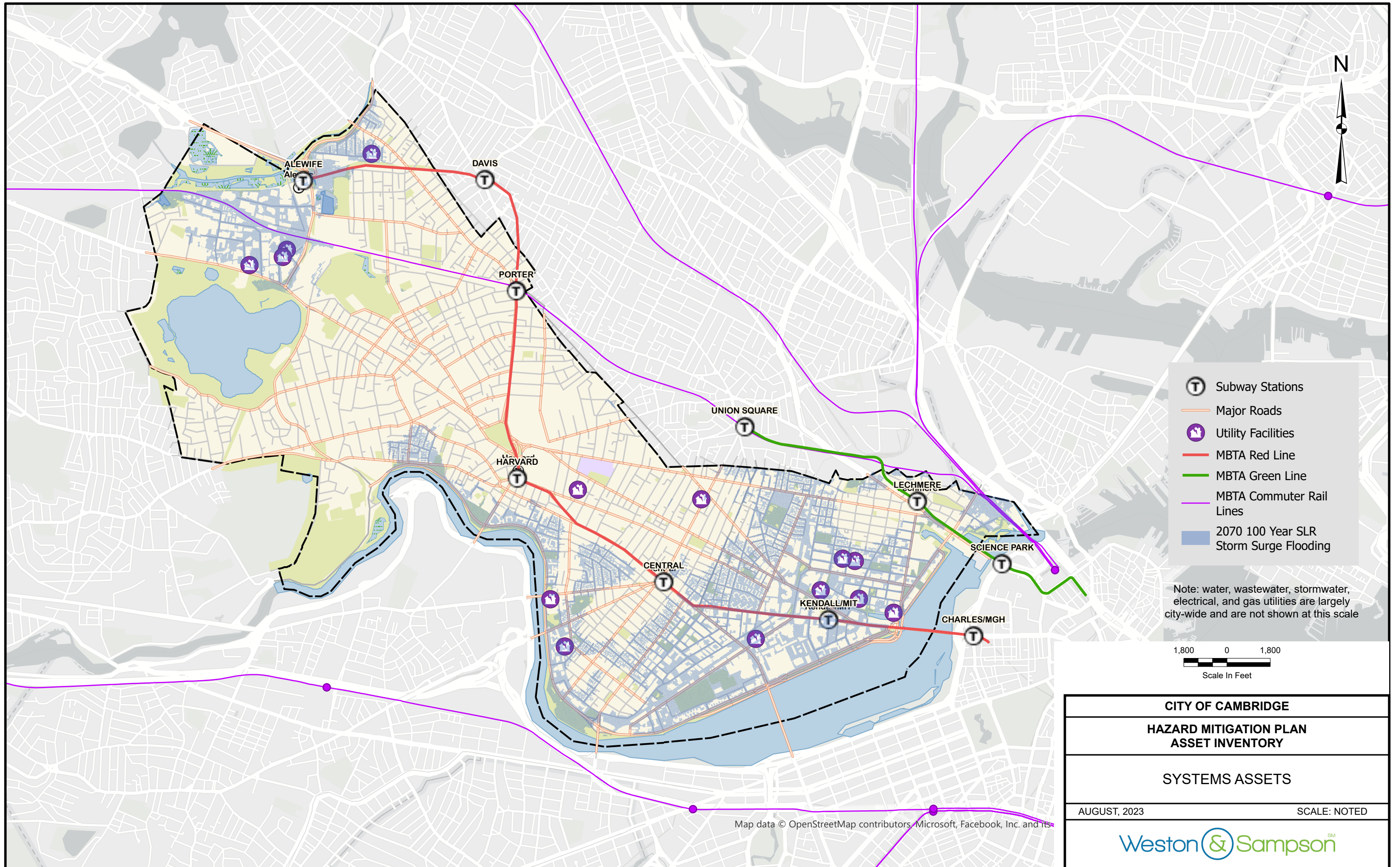
Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its



CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
SYSTEMS ASSETS	
AUGUST, 2023	SCALE: NOTED

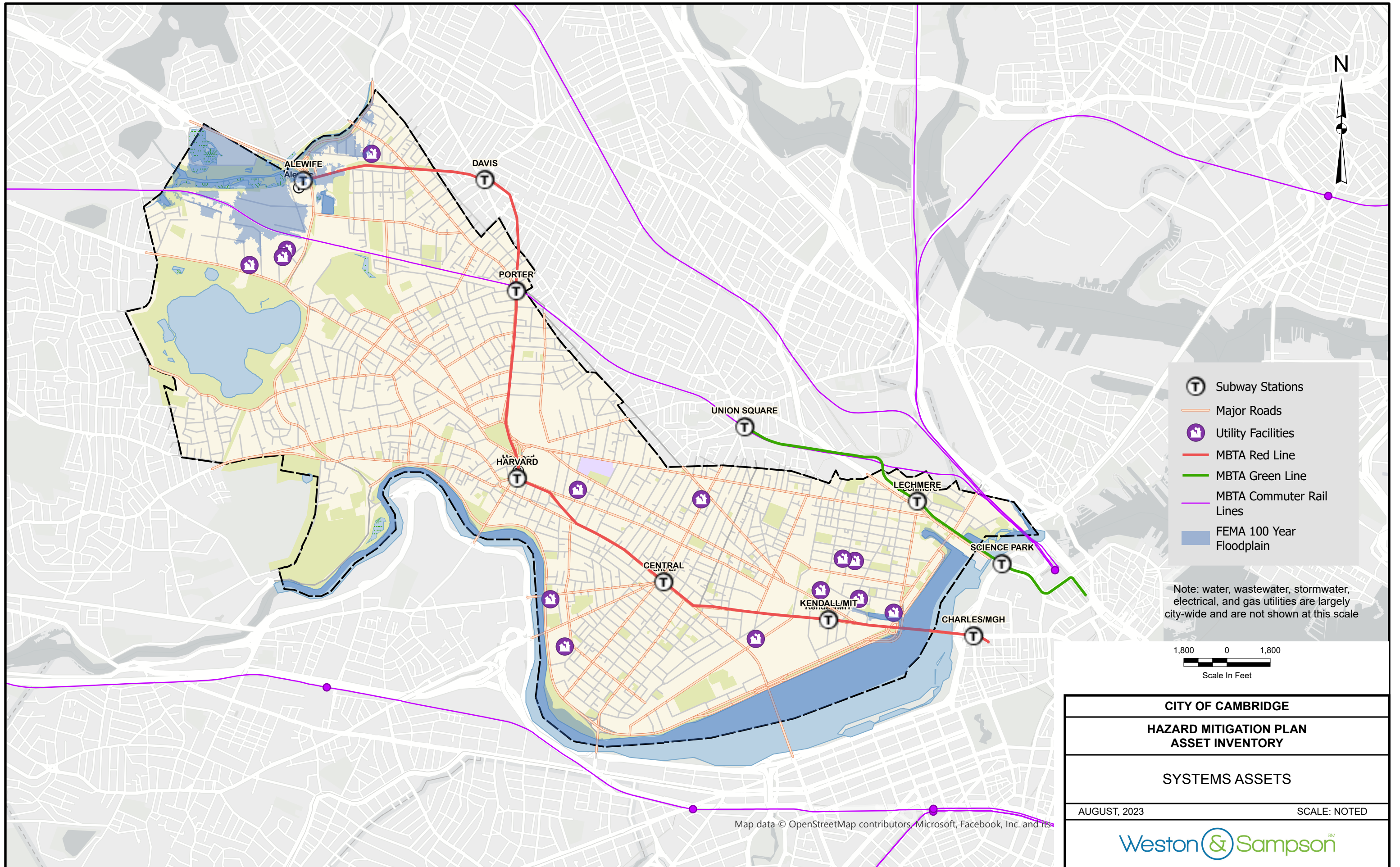


CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
SYSTEMS ASSETS	
AUGUST, 2023	SCALE: NOTED



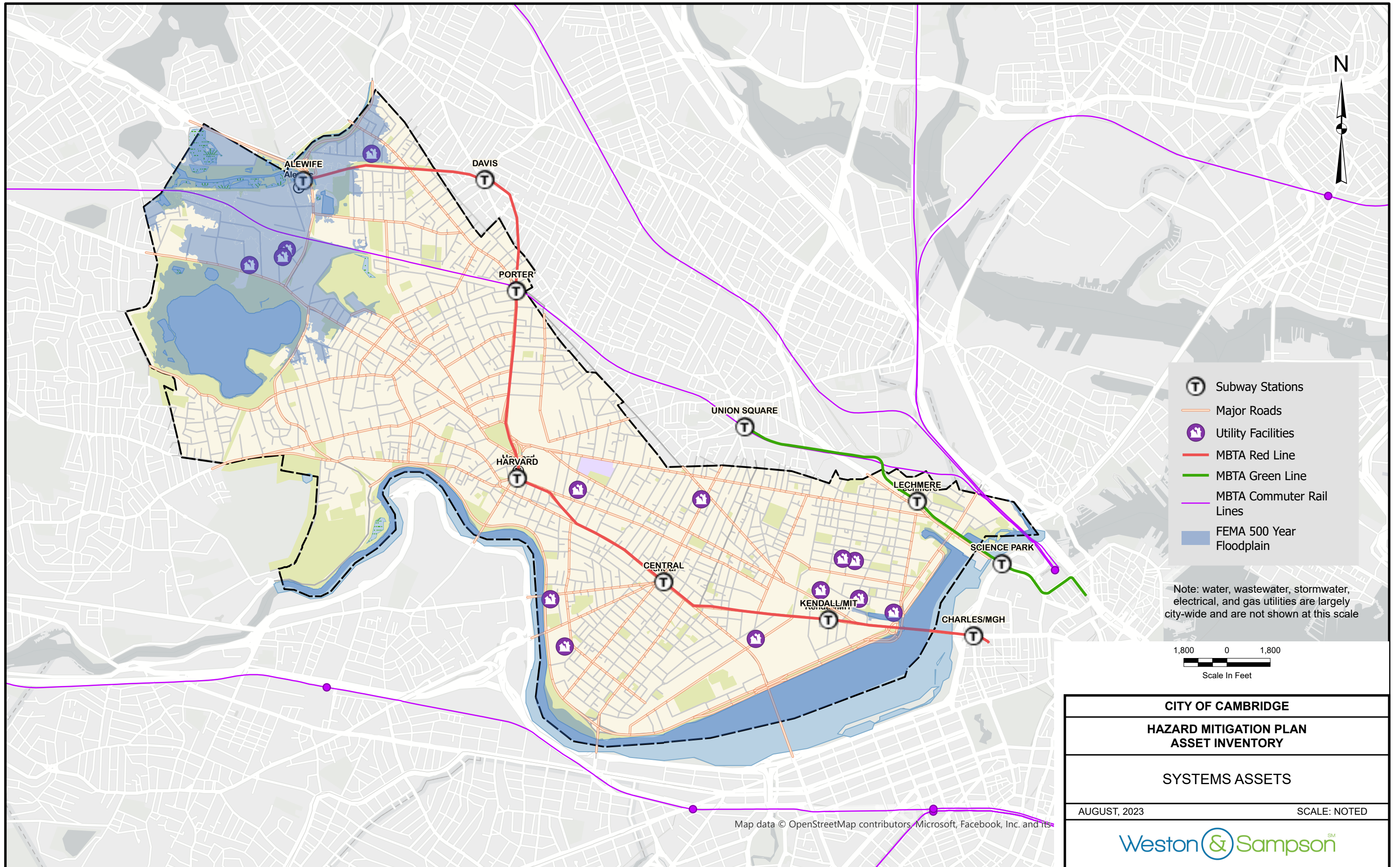
CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
SYSTEMS ASSETS	
AUGUST, 2023	SCALE: NOTED

Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its

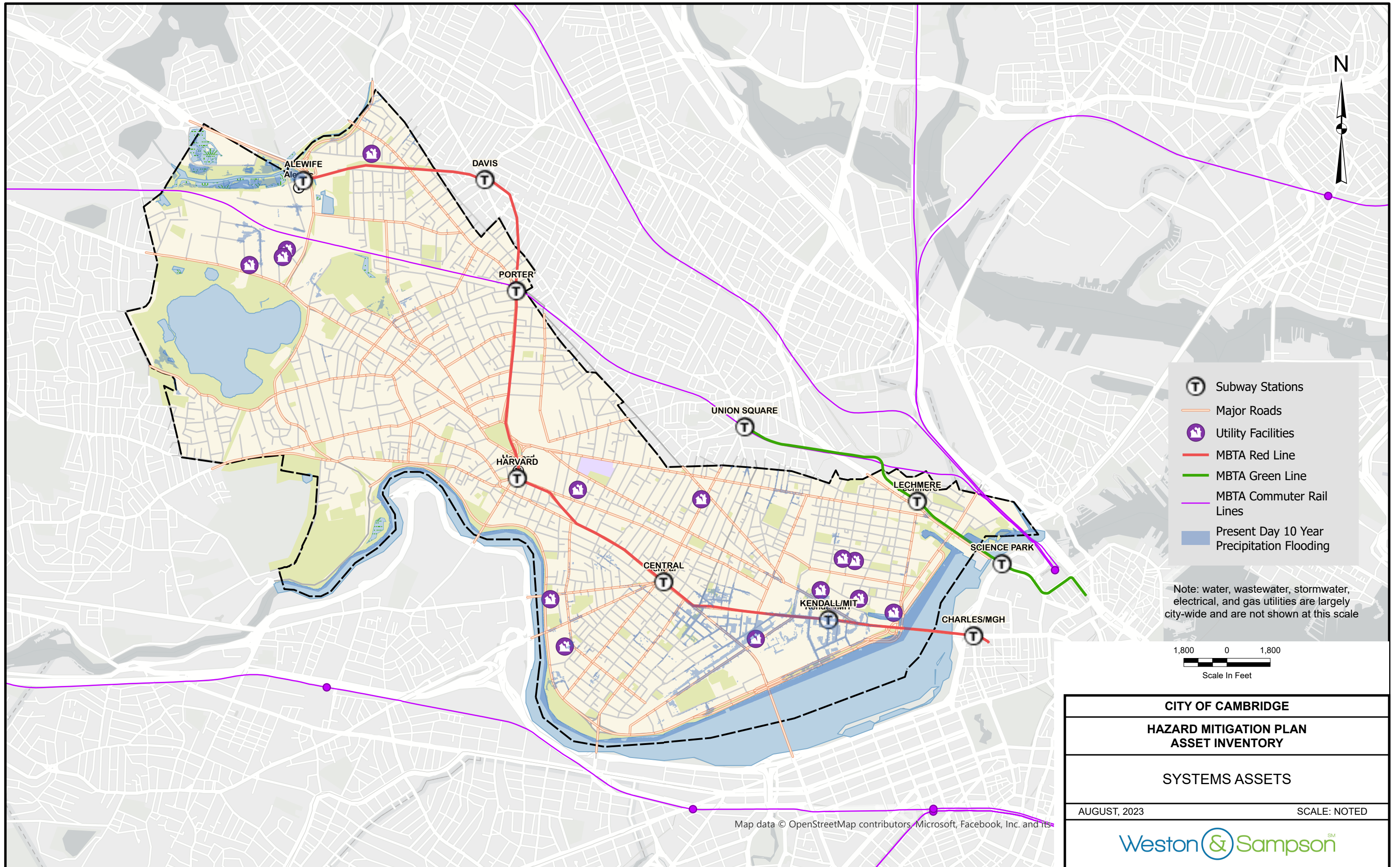


CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
SYSTEMS ASSETS	
AUGUST, 2023	SCALE: NOTED

Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its

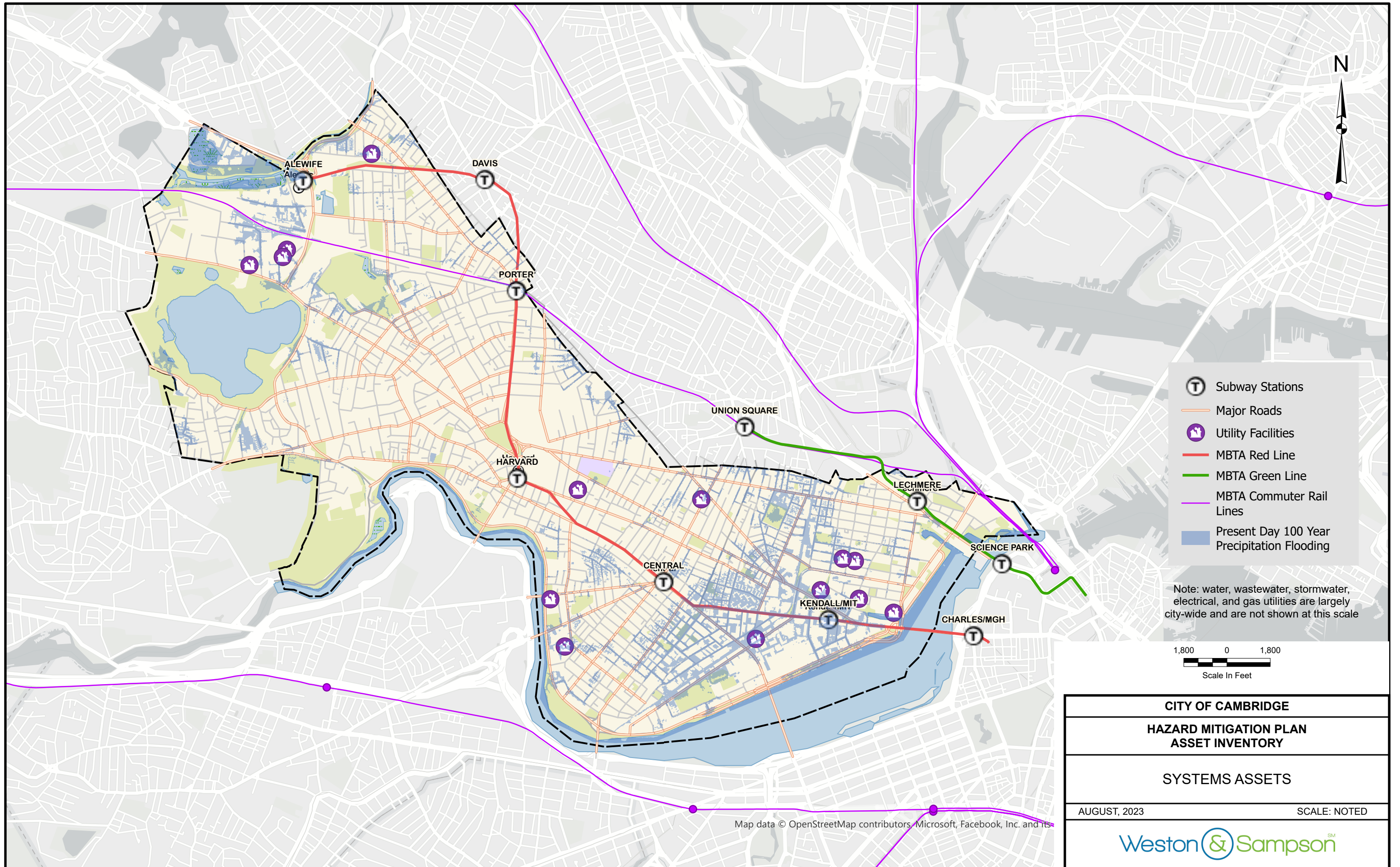


CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
SYSTEMS ASSETS	
AUGUST, 2023	SCALE: NOTED



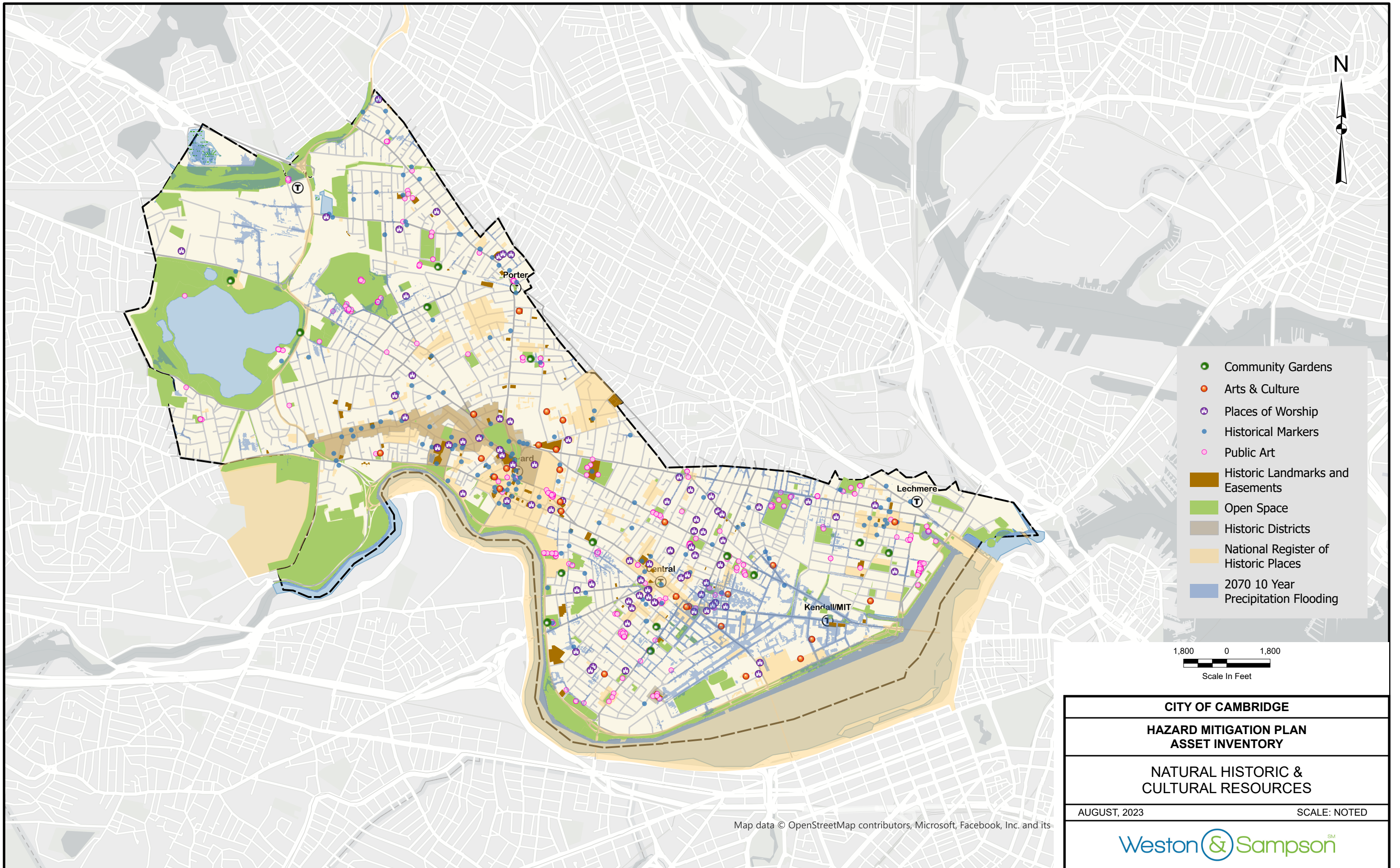
CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
SYSTEMS ASSETS	
AUGUST, 2023	SCALE: NOTED

Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its




CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
SYSTEMS ASSETS	
AUGUST, 2023	SCALE: NOTED

Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its

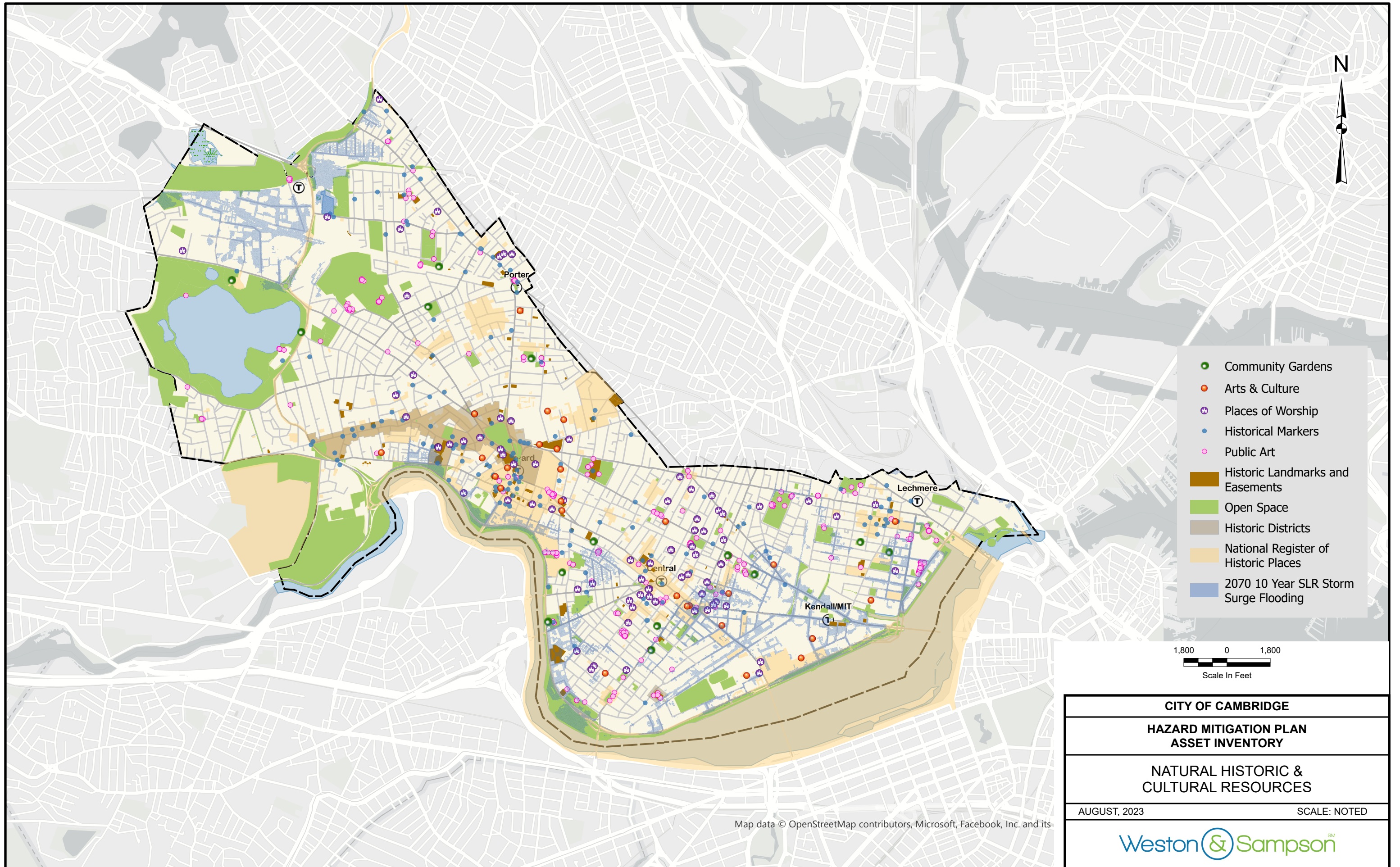


- Community Gardens
- Arts & Culture
- Places of Worship
- Historical Markers
- Public Art
- Historic Landmarks and Easements
- Open Space
- Historic Districts
- National Register of Historic Places
- 2070 10 Year Precipitation Flooding

1,800 0 1,800
Scale In Feet

CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
NATURAL HISTORIC & CULTURAL RESOURCES	
AUGUST, 2023	SCALE: NOTED
	

Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its



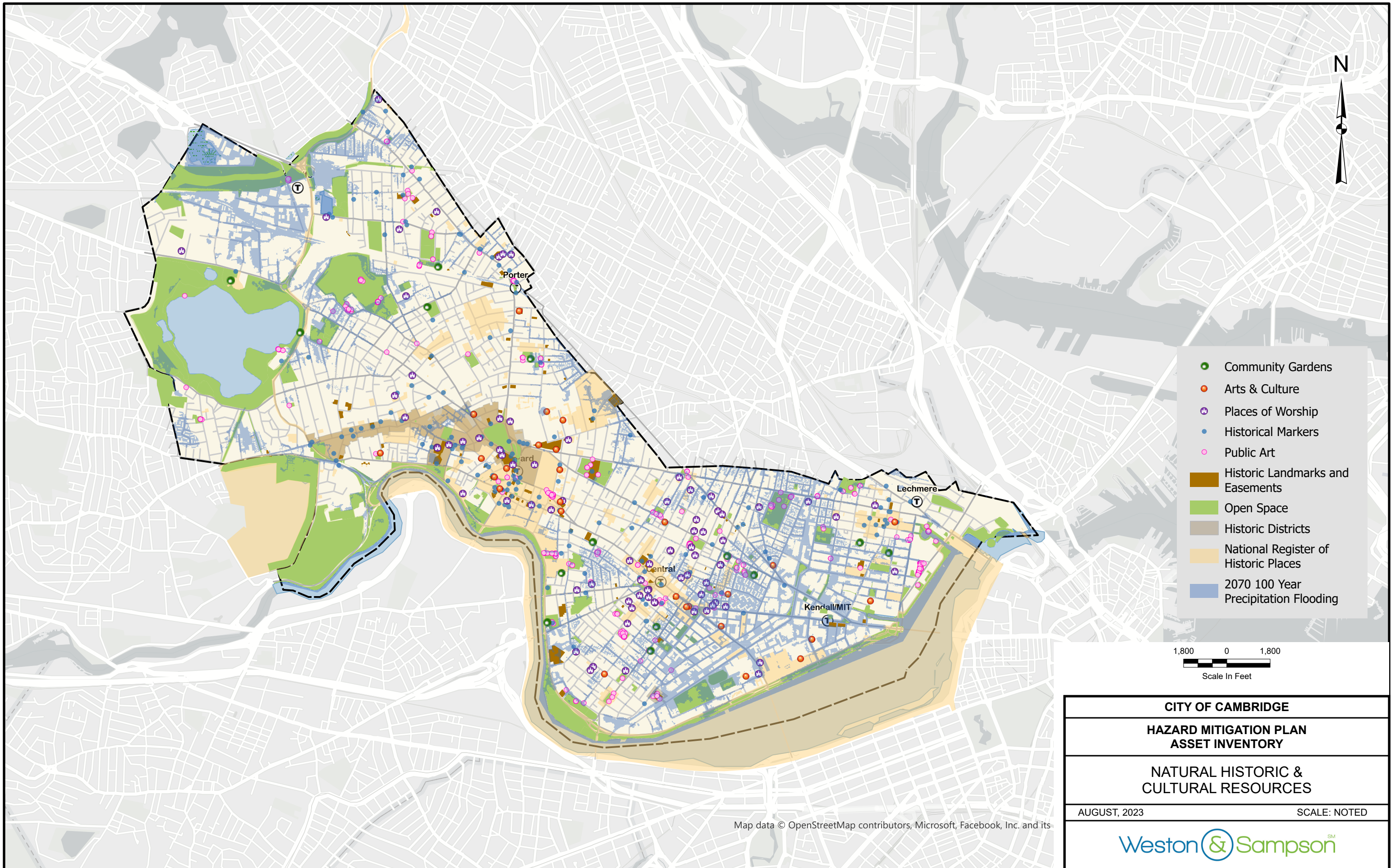
- Community Gardens
- Arts & Culture
- ⦿ Places of Worship
- Historical Markers
- Public Art
- Historic Landmarks and Easements
- Open Space
- Historic Districts
- National Register of Historic Places
- 2070 10 Year SLR Storm Surge Flooding

1,800 0 1,800
Scale In Feet

CITY OF CAMBRIDGE
HAZARD MITIGATION PLAN
ASSET INVENTORY
NATURAL HISTORIC &
CULTURAL RESOURCES
 AUGUST, 2023 SCALE: NOTED



Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its

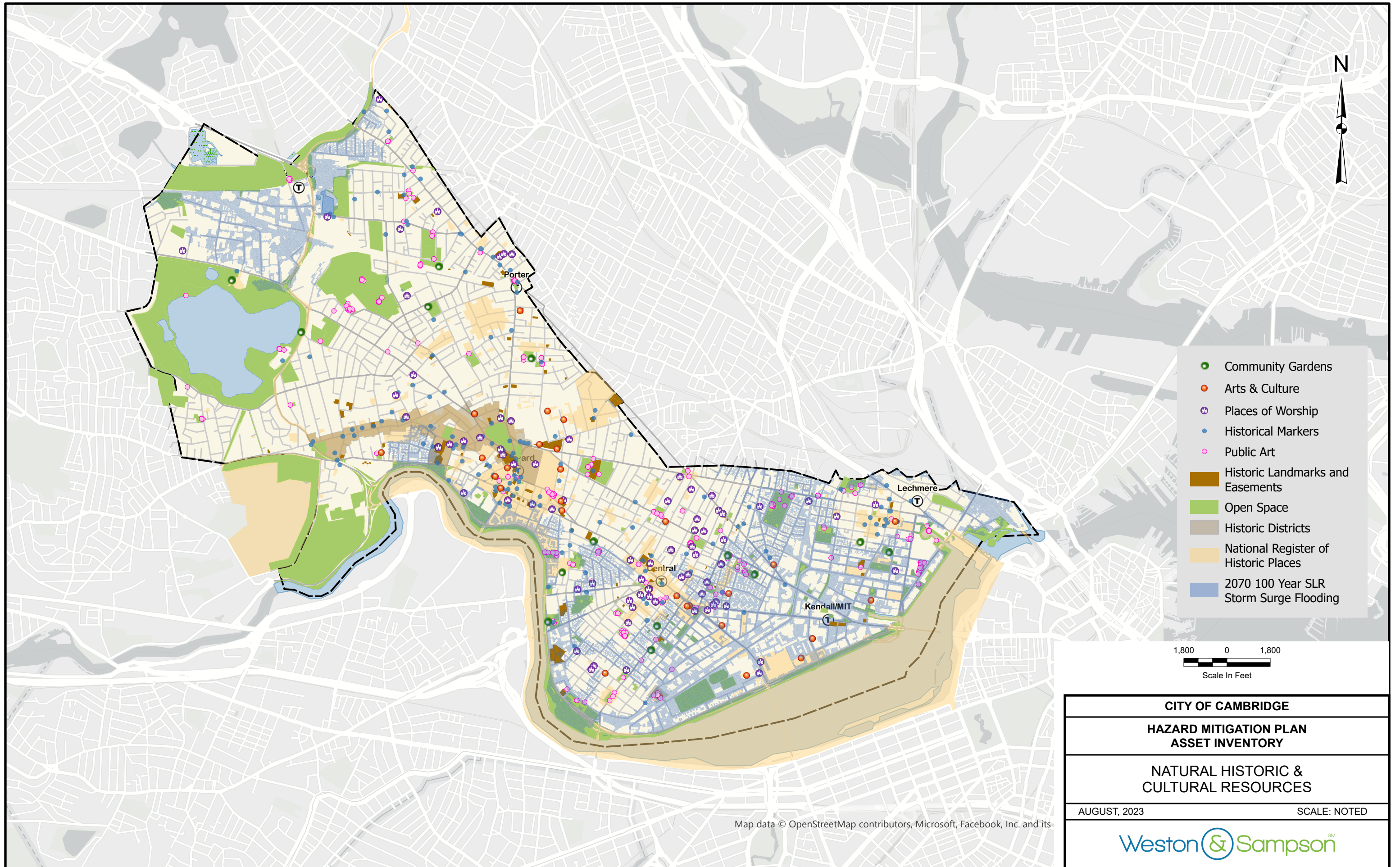


- Community Gardens
- Arts & Culture
- Places of Worship
- Historical Markers
- Public Art
- Historic Landmarks and Easements
- Open Space
- Historic Districts
- National Register of Historic Places
- 2070 100 Year Precipitation Flooding

1,800 0 1,800
Scale In Feet

CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
NATURAL HISTORIC & CULTURAL RESOURCES	
AUGUST, 2023	SCALE: NOTED

Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its

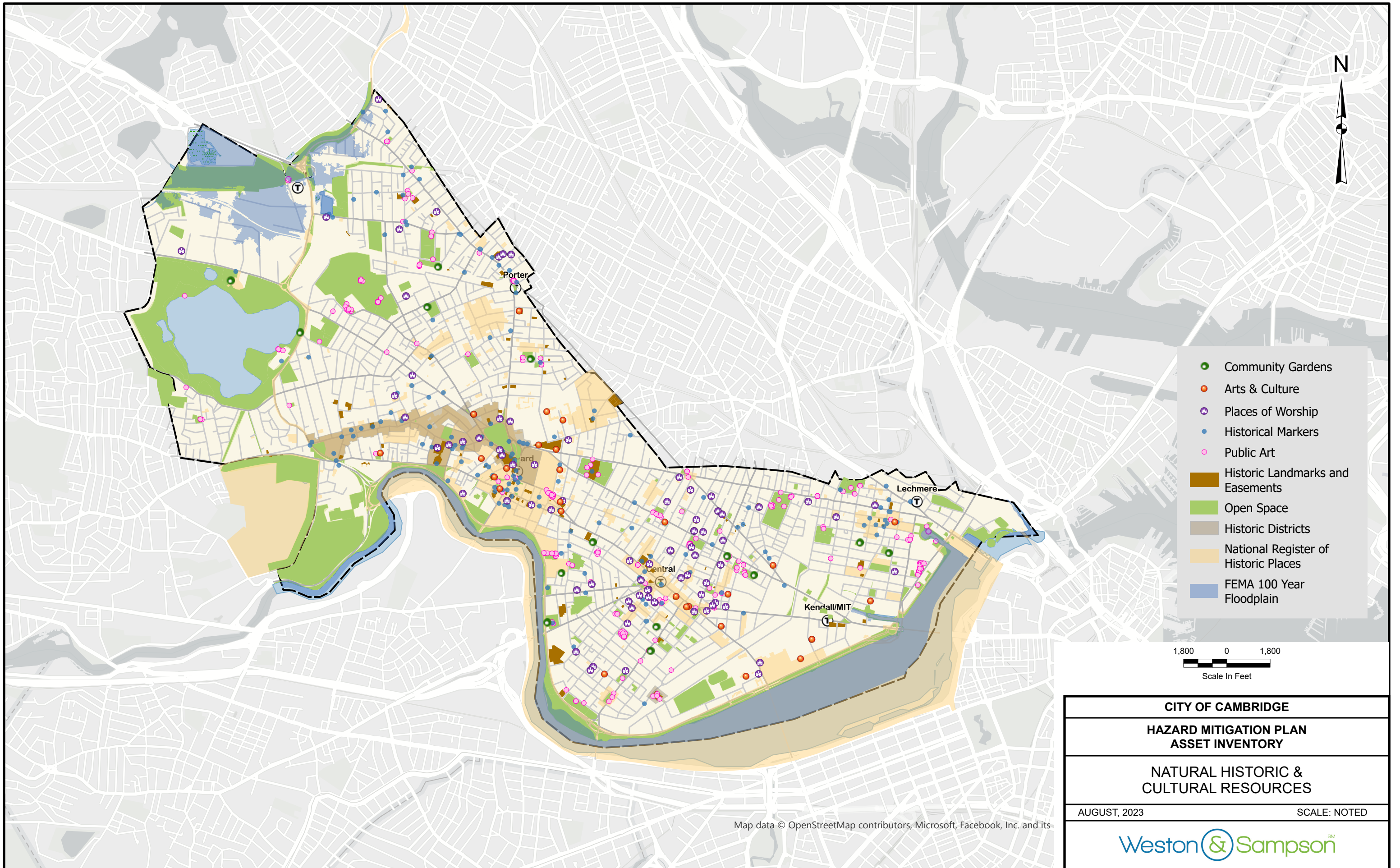


- Community Gardens
- Arts & Culture
- Places of Worship
- Historical Markers
- Public Art
- Historic Landmarks and Easements
- Open Space
- Historic Districts
- National Register of Historic Places
- 2070 100 Year SLR Storm Surge Flooding

1,800 0 1,800
Scale In Feet


CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
NATURAL HISTORIC & CULTURAL RESOURCES	
AUGUST, 2023	SCALE: NOTED

Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its

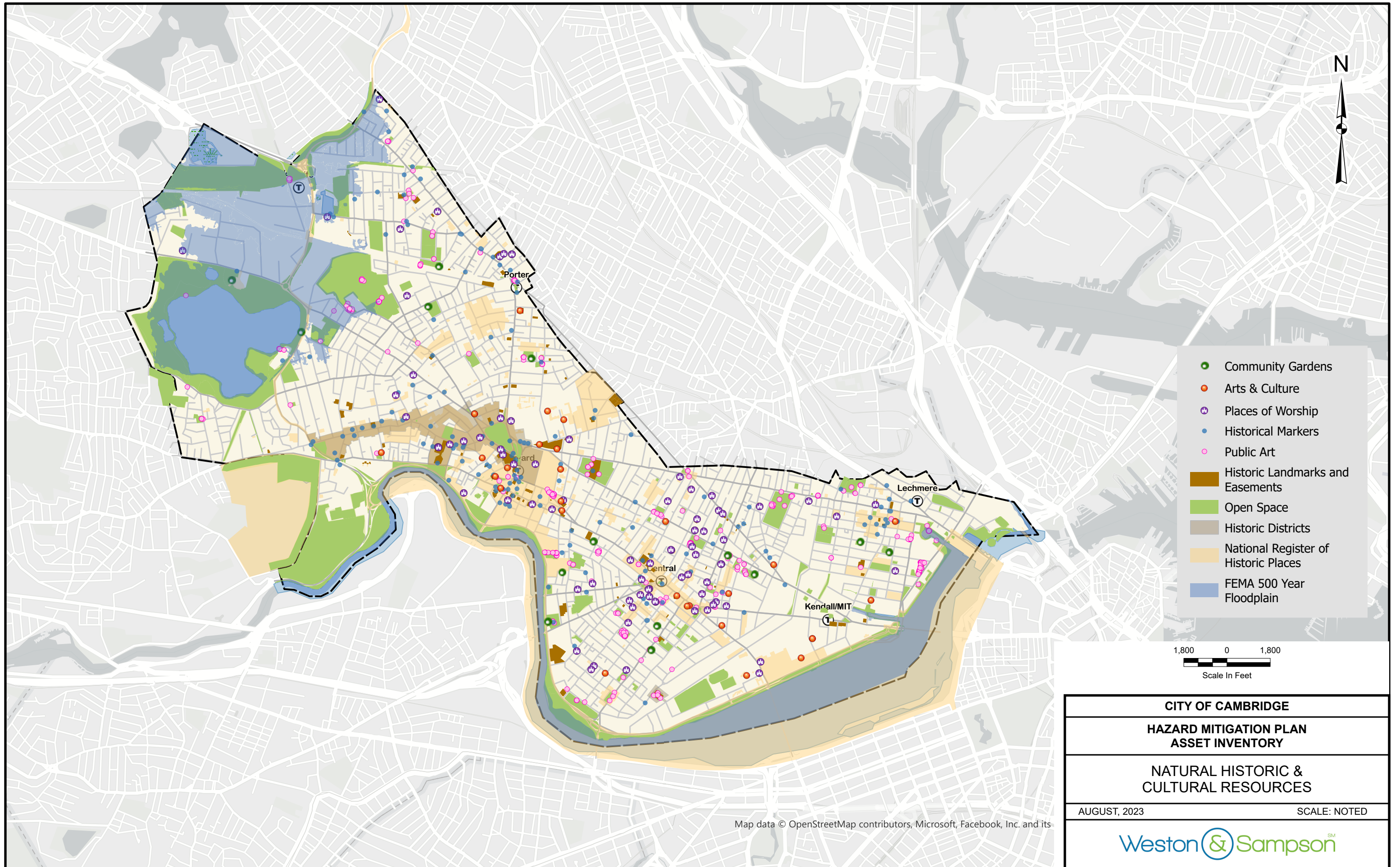


- Community Gardens
- Arts & Culture
- Places of Worship
- Historical Markers
- Public Art
- Historic Landmarks and Easements
- Open Space
- Historic Districts
- National Register of Historic Places
- FEMA 100 Year Floodplain

1,800 0 1,800
Scale In Feet


CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
NATURAL HISTORIC & CULTURAL RESOURCES	
AUGUST, 2023	SCALE: NOTED
	

Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its

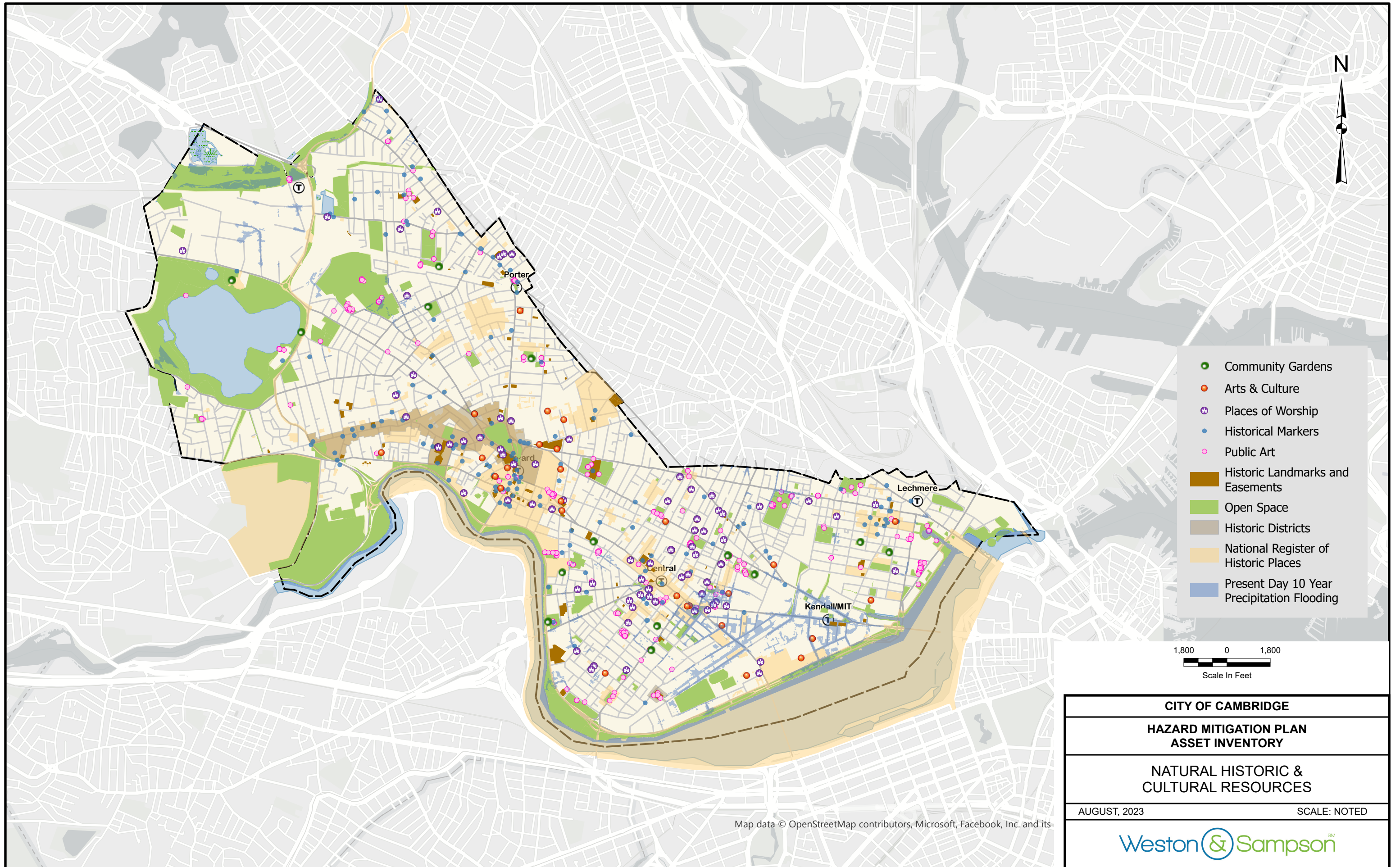


- Community Gardens
- Arts & Culture
- Places of Worship
- Historical Markers
- Public Art
- Historic Landmarks and Easements
- Open Space
- Historic Districts
- National Register of Historic Places
- FEMA 500 Year Floodplain

1,800 0 1,800
Scale In Feet

CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
NATURAL HISTORIC & CULTURAL RESOURCES	
AUGUST, 2023	SCALE: NOTED
	

Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its



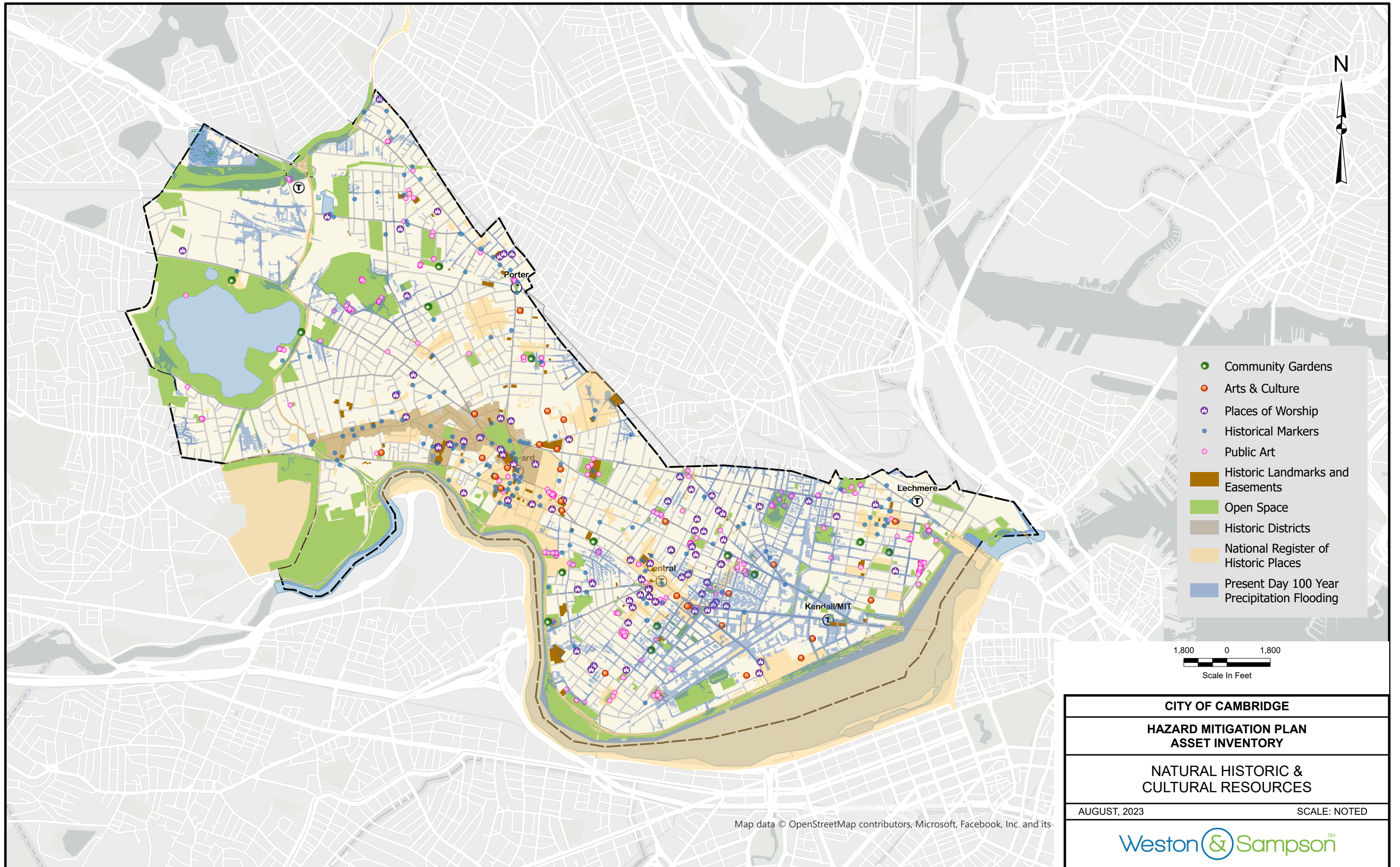
- Community Gardens
- Arts & Culture
- Places of Worship
- Historical Markers
- Public Art
- Historic Landmarks and Easements
- Open Space
- Historic Districts
- National Register of Historic Places
- Present Day 10 Year Precipitation Flooding

1,800 0 1,800
Scale In Feet

CITY OF CAMBRIDGE
HAZARD MITIGATION PLAN
ASSET INVENTORY
NATURAL HISTORIC &
CULTURAL RESOURCES
 AUGUST, 2023 SCALE: NOTED



Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its

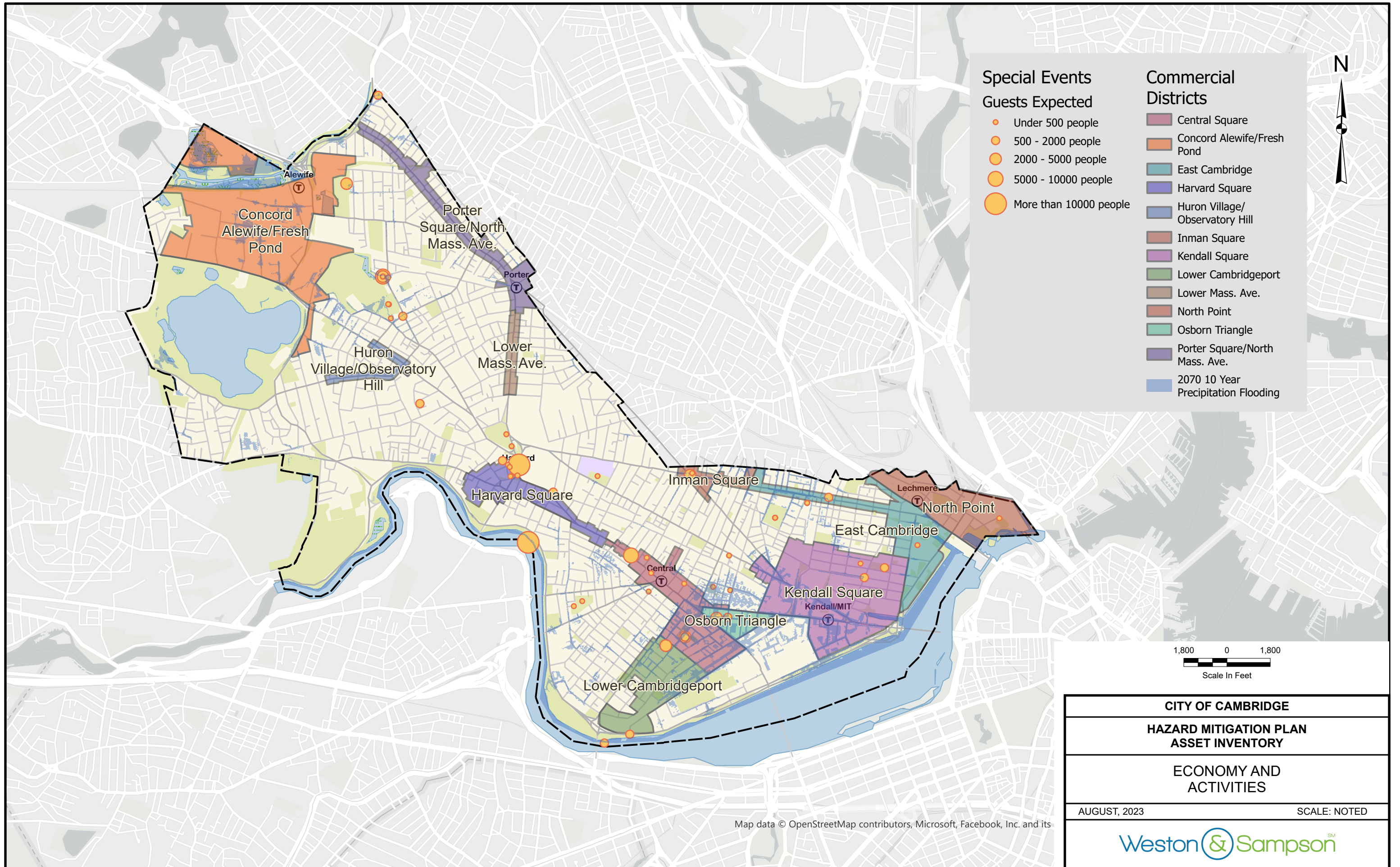


- Community Gardens
- Arts & Culture
- Places of Worship
- Historical Markers
- Public Art
- Historic Landmarks and Easements
- Open Space
- Historic Districts
- National Register of Historic Places
- Present Day 100 Year Precipitation Flooding

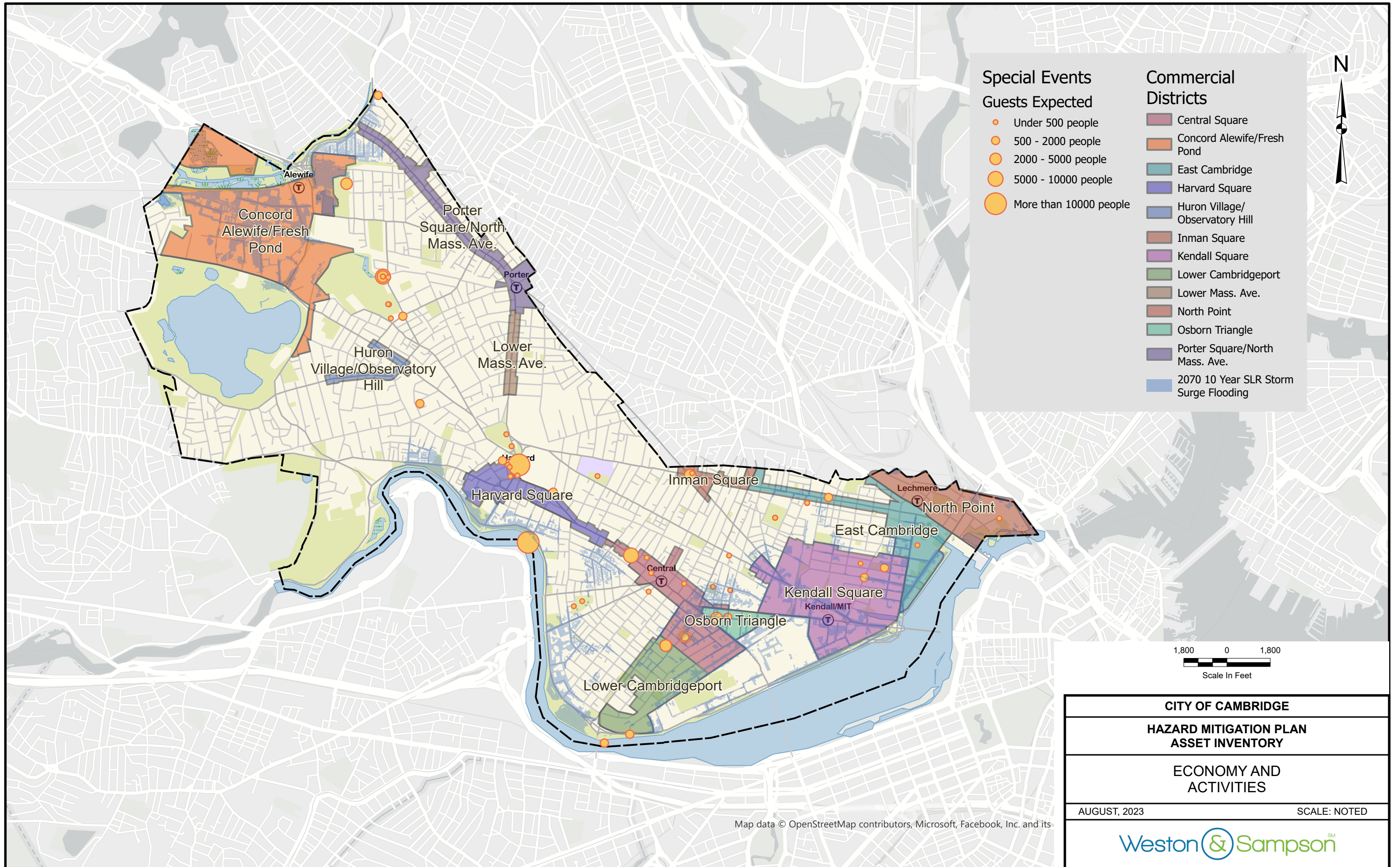
1,800 0 1,800
Scale In Feet

CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
NATURAL HISTORIC & CULTURAL RESOURCES	
AUGUST, 2023	SCALE: NOTED

Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its

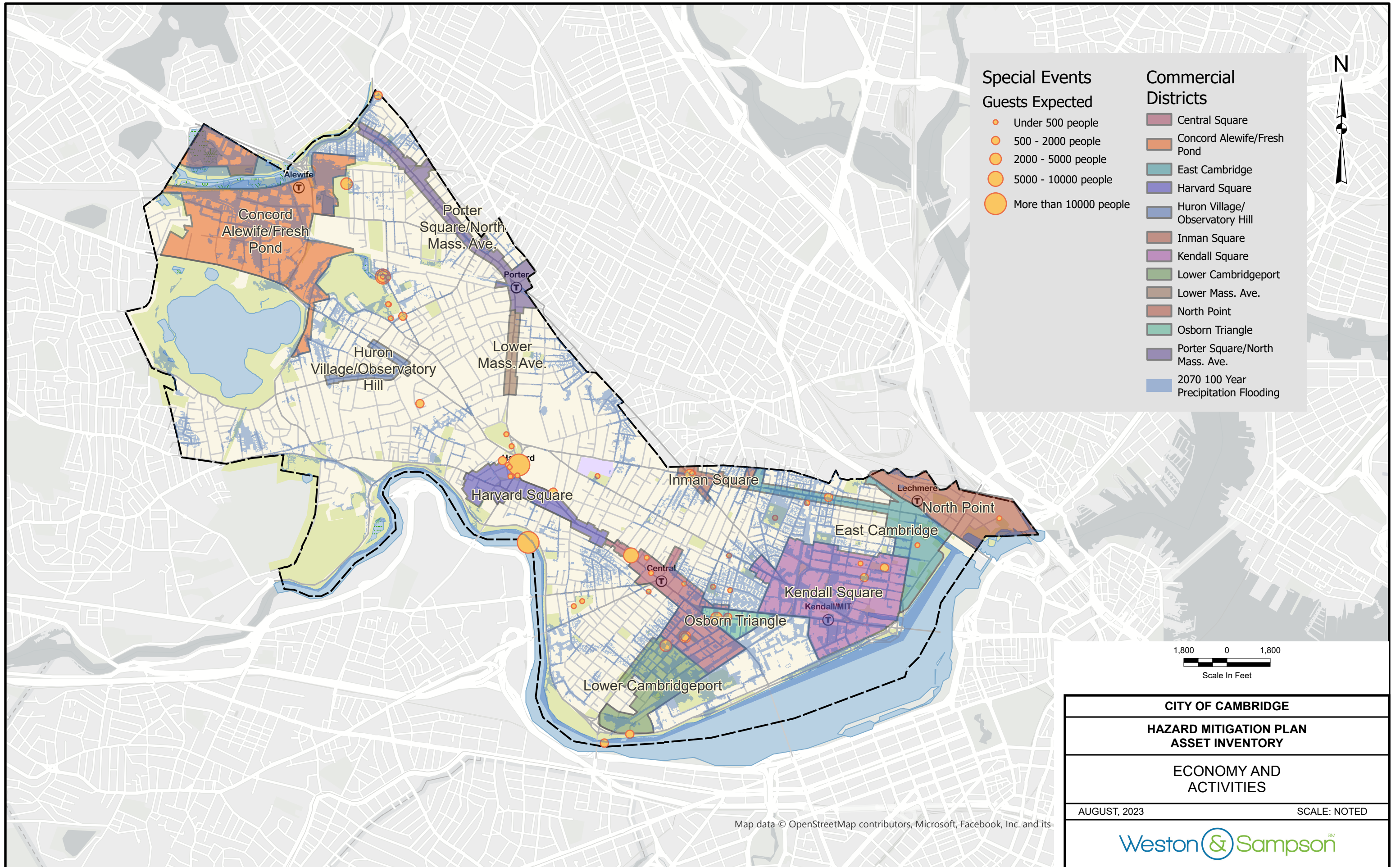


CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
ECONOMY AND ACTIVITIES	
AUGUST, 2023	SCALE: NOTED



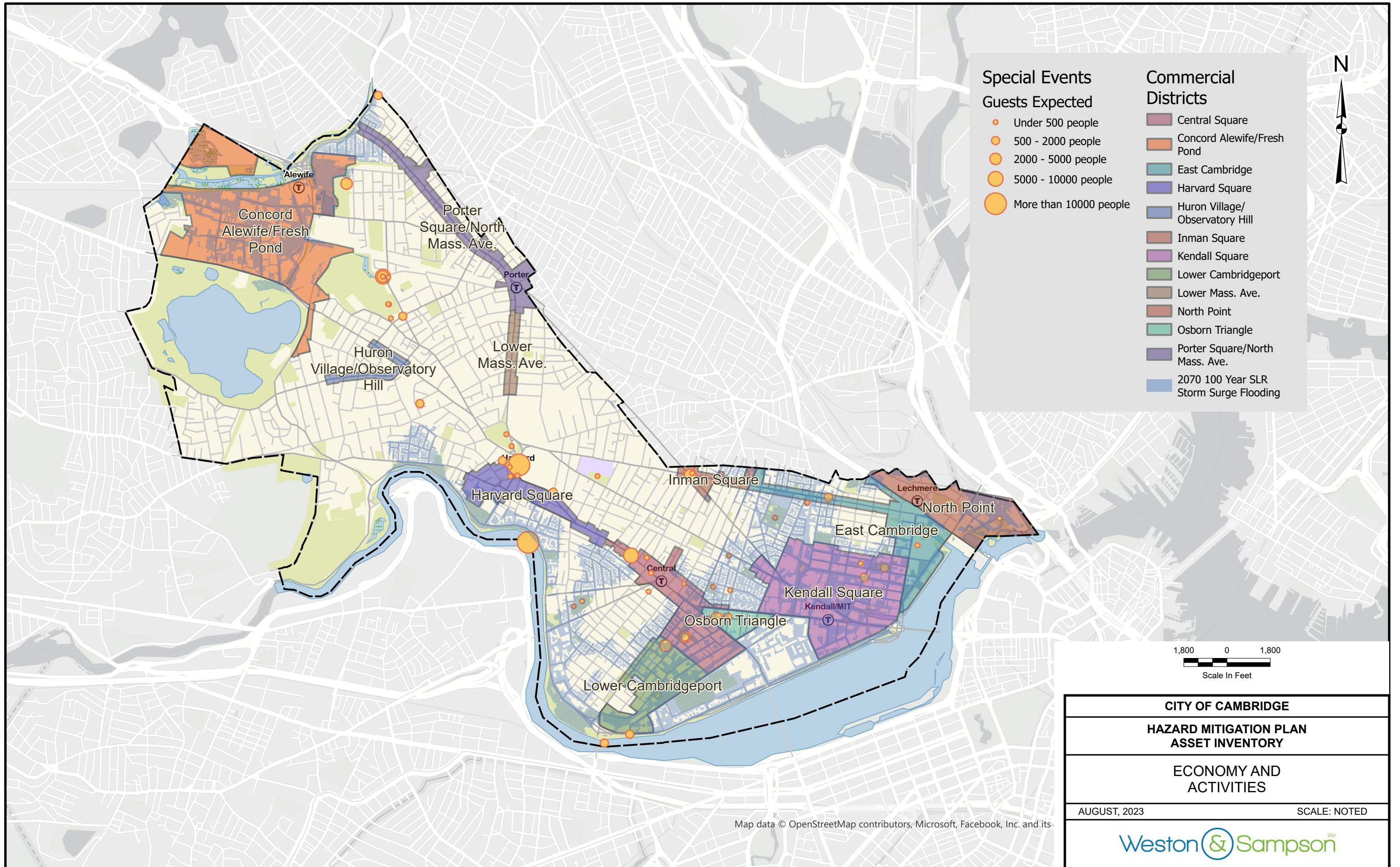
CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
ECONOMY AND ACTIVITIES	
AUGUST, 2023	SCALE: NOTED

Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its



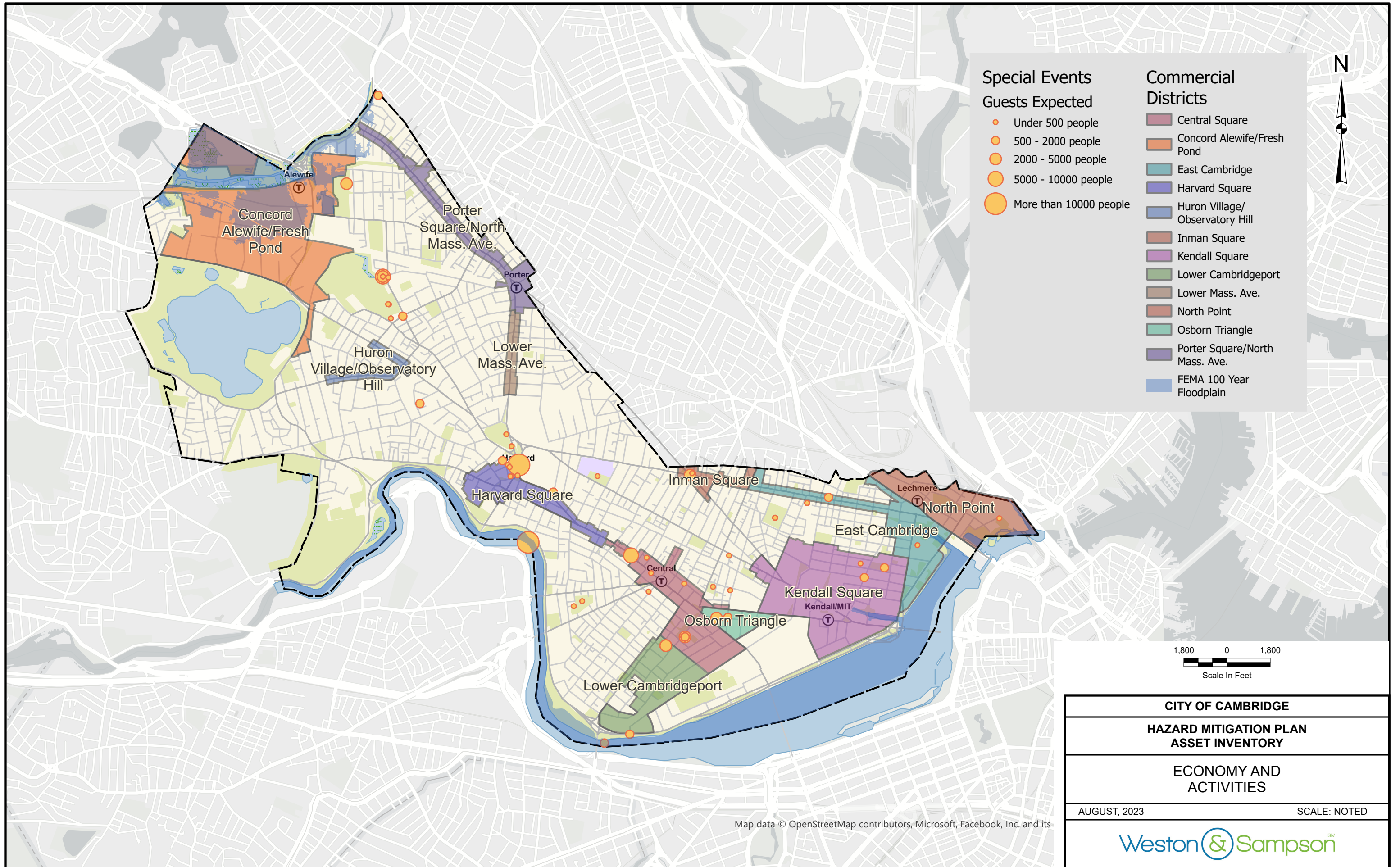
CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
ECONOMY AND ACTIVITIES	
AUGUST, 2023	SCALE: NOTED

Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its



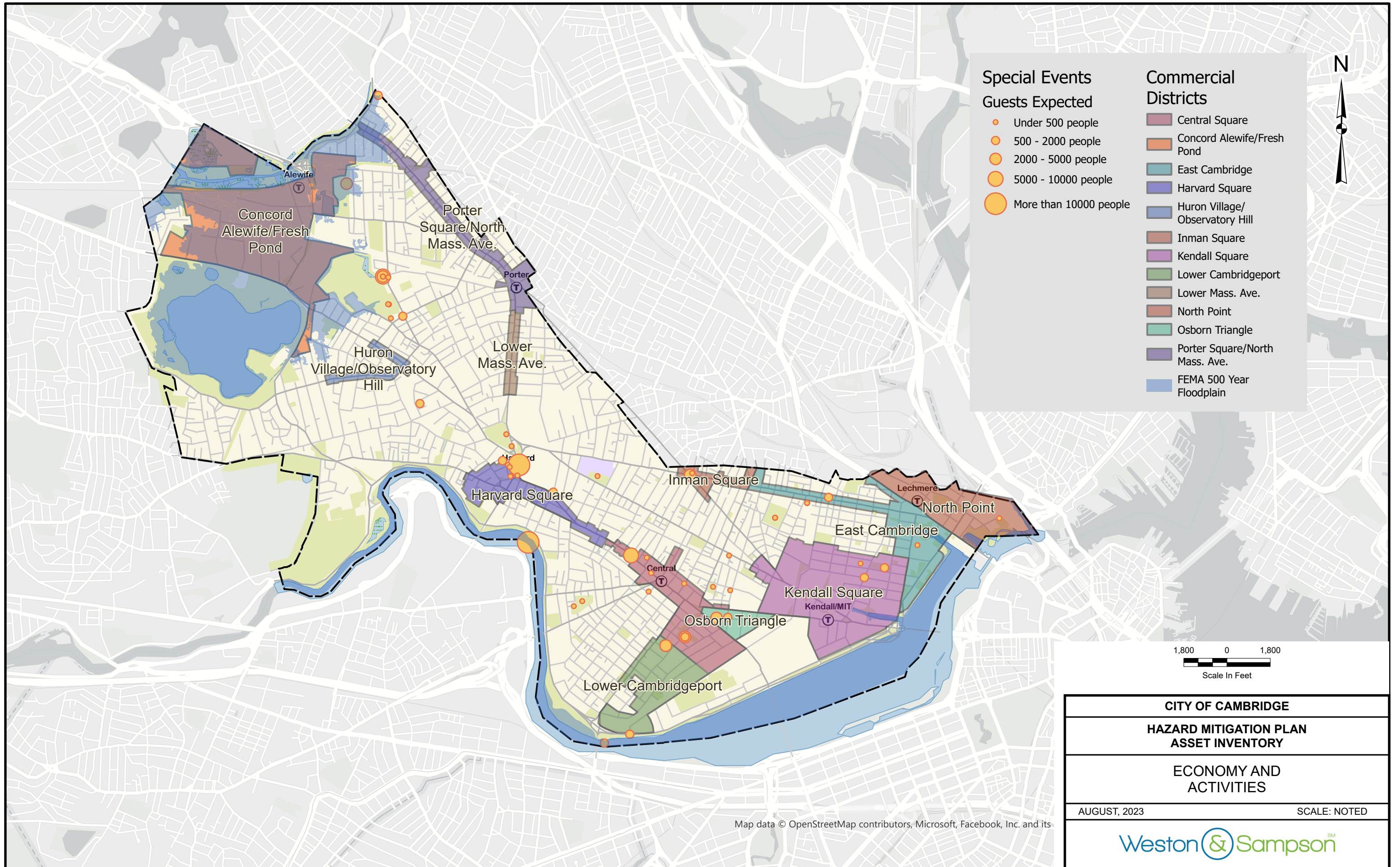
CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
ECONOMY AND ACTIVITIES	
AUGUST, 2023	SCALE: NOTED

Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its

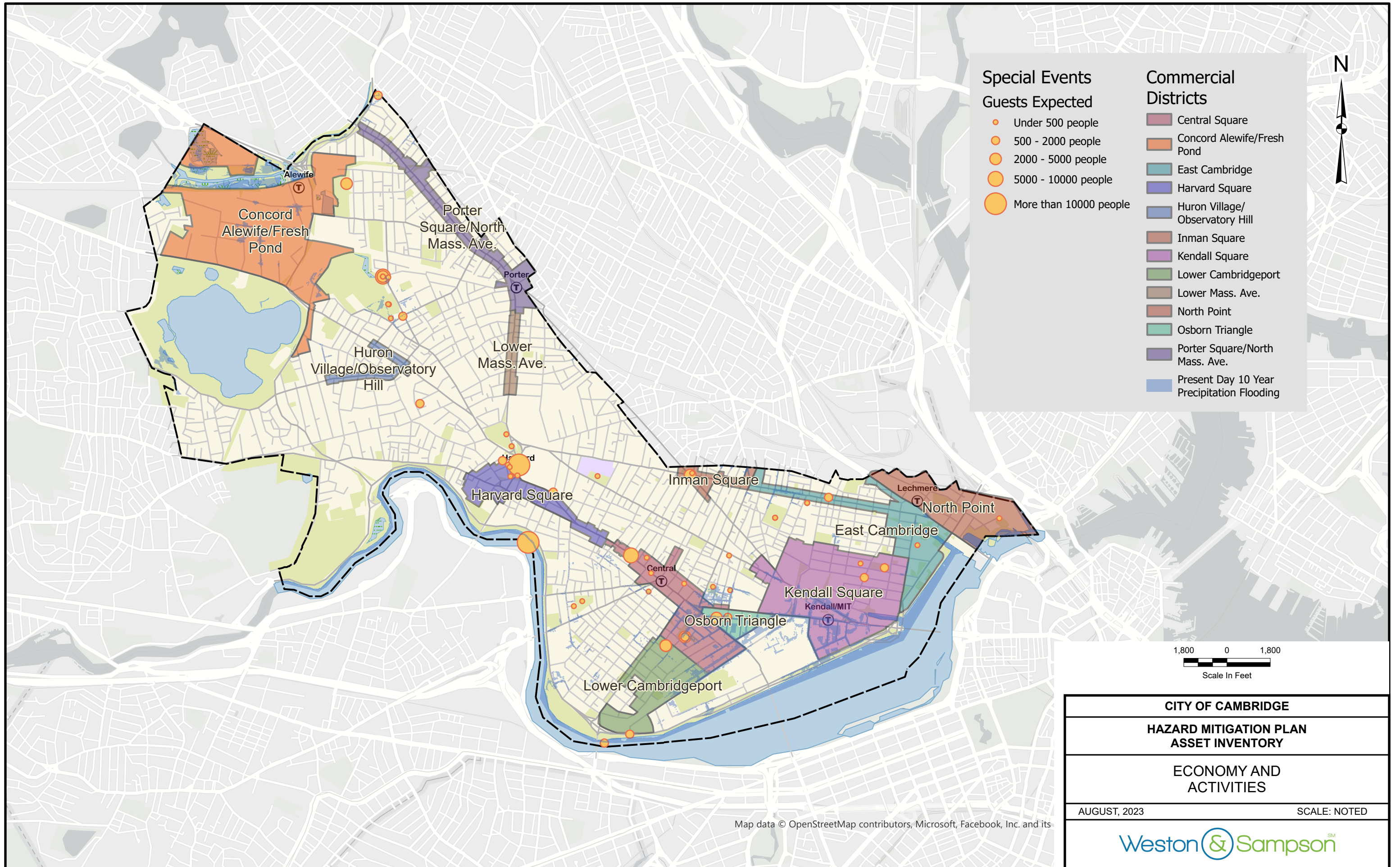


CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
ECONOMY AND ACTIVITIES	
AUGUST, 2023	SCALE: NOTED

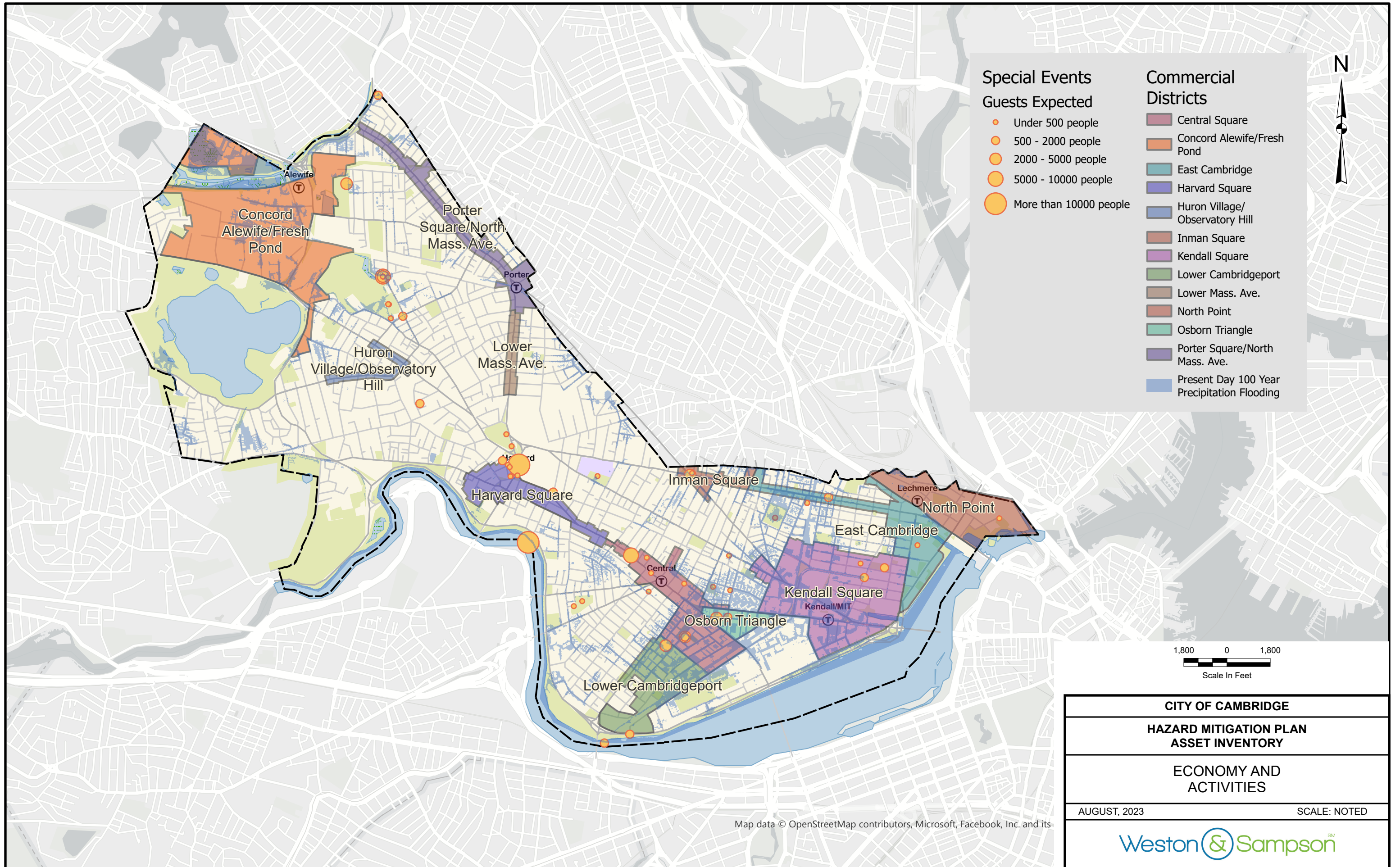
Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its



CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
ECONOMY AND ACTIVITIES	
AUGUST, 2023	SCALE: NOTED



CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
ECONOMY AND ACTIVITIES	
AUGUST, 2023	SCALE: NOTED



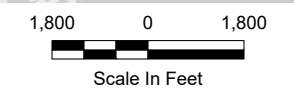
Special Events

Guests Expected

- Under 500 people
- 500 - 2000 people
- 2000 - 5000 people
- 5000 - 10000 people
- More than 10000 people

Commercial Districts

- Central Square
- Concord Alewife/Fresh Pond
- East Cambridge
- Harvard Square
- Huron Village/Observatory Hill
- Inman Square
- Kendall Square
- Lower Cambridgeport
- Lower Mass. Ave.
- North Point
- Osborn Triangle
- Porter Square/North Mass. Ave.
- Present Day 100 Year Precipitation Flooding



CITY OF CAMBRIDGE	
HAZARD MITIGATION PLAN ASSET INVENTORY	
ECONOMY AND ACTIVITIES	
AUGUST, 2023	SCALE: NOTED

Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its



Appendix G

FEMA Local Mitigation Plan Review Tool

Local Mitigation Plan Review Tool

Cover Page

The Local Mitigation Plan Review Tool (PRT) demonstrates how the local mitigation plan meets the regulation in 44 CFR § 201.6 and offers states and FEMA Mitigation Planners an opportunity to provide feedback to the local governments, including special districts.

1. The Multi-Jurisdictional Summary Sheet is a worksheet that is used to document how each jurisdiction met the requirements of the plan elements (Planning Process; Risk Assessment; Mitigation Strategy; Plan Maintenance; Plan Update; and Plan Adoption).
2. The Plan Review Checklist summarizes FEMA’s evaluation of whether the plan has addressed all requirements.

For greater clarification of the elements in the Plan Review Checklist, please see Section 4 of this guide. Definitions of the terms and phrases used in the PRT can be found in Appendix E of this guide.

Plan Information	
Jurisdiction(s)	City of Cambridge, Massachusetts
Title of Plan	Natural Hazard Mitigation Plan 2023 Update
New Plan or Update	Update
Single- or Multi-Jurisdiction	Single
Date of Plan	November 29, 2023
Local Point of Contact	
Title	Deputy City Manager
Agency	City Manager’s Office
Address	795 Massachusetts Avenue, Cambridge, MA 02139
Phone Number	617-349-4300
Email	ooriordan@cambridgema.gov

Additional Point of Contact	
Title	Director of Environmental and Transportation Planning
Agency	Cambridge Community Development Department
Address	344 Broadway, Cambridge, MA 02139
Phone Number	617-349-4600
Email	srasmussen@cambridgema.gov or cddat344@cambridgema.gov

Review Information	
State Review	
State Reviewer(s) and Title	
State Review Date	
FEMA Review	
FEMA Reviewer(s) and Title	
Date Received in FEMA Region	
Plan Not Approved	
Plan Approvable Pending Adoption	
Plan Approved	

Multi-Jurisdictional Summary Sheet

#	Jurisdiction Name	Requirements Met (Y/N)						
		A. Planning Process	B. Risk Assessment	C. Mitigation Strategy	D. Plan Maintenance	E. Plan Update	F. Plan Adoption	G. State Requirements
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

Plan Review Checklist

The Plan Review Checklist is completed by FEMA. States and local governments are encouraged, but not required, to use the PRT as a checklist to ensure all requirements have been met prior to submitting the plan for review and approval. The purpose of the checklist is to identify the location of relevant or applicable content in the plan by element/sub-element and to determine if each requirement has been “met” or “not met.” FEMA completes the “required revisions” summary at the bottom of each element to clearly explain the revisions that are required for plan approval. Required revisions must be explained for each plan sub-element that is “not met.” Sub-elements in each summary should be referenced using the appropriate numbers (A1, B3, etc.), where applicable. Requirements for each element and sub-element are described in detail in Section 4: Local Plan Requirements of this guide.

Plan updates must include information from the current planning process.

If some elements of the plan do not require an update, due to minimal or no changes between updates, the plan must document the reasons for that.

Multi-jurisdictional elements must cover information unique to all participating jurisdictions.

Element A: Planning Process

Element A Requirements	Location in Plan (section and/or page number)	Met / Not Met
A1. Does the plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement 44 CFR § 201.6(c)(1))		
A1-a. Does the plan document how the plan was prepared, including the schedule or time frame and activities that made up the plan’s development, as well as who was involved?	Chapter 2 Schedule: Figure 2-1 Activities: Chapter 2 Who was involved: Chapter, 2.2, 2.3, 2.4, 2.5 Appendix A, B, C, and D provide supporting materials.	Met
A1-b. Does the plan list the jurisdiction(s) participating in the plan that seek approval, and describe how they participated in the planning process?	Chapter 2 and Appendix A and B	Met

Element A Requirements	Location in Plan (section and/or page number)	Met / Not Met
A2. Does the plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development as well as businesses, academia, and other private and non-profit interests to be involved in the planning process? (Requirement 44 CFR § 201.6(b)(2))		
A2-a. Does the plan identify all stakeholders involved or given an opportunity to be involved in the planning process, and how each stakeholder was presented with this opportunity?	Chapter 2.4 and Appendix B	Met
A3. Does the plan document how the public was involved in the planning process during the drafting stage and prior to plan approval? (Requirement 44 CFR § 201.6(b)(1))		
A3-a. Does the plan document how the public was given the opportunity to be involved in the planning process and how their feedback was included in the plan?	Chapter 2.2, 2.5 Appendix C and D	Met
A4. Does the plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement 44 CFR § 201.6(b)(3))		
A4-a. Does the plan document what existing plans, studies, reports and technical information were reviewed for the development of the plan, as well as how they were incorporated into the document?	Chapter 2.6 and 2.7	Met
ELEMENT A REQUIRED REVISIONS		
<p>Required Revision:</p> <p>Click or tap here to enter text.</p>		

Element B: Risk Assessment

Element B Requirements	Location in Plan (section and/or page number)	Met / Not Met
B1. Does the plan include a description of the type, location, and extent of all natural hazards that can affect the jurisdiction? Does the plan also include information on previous occurrences of hazard events and on the probability of future hazard events? (Requirement 44 CFR § 201.6(c)(2)(i))		
B1-a. Does the plan describe all natural hazards that can affect the jurisdiction(s) in the planning area, and does it provide the rationale if omitting any natural hazards that are commonly recognized to affect the jurisdiction(s) in the planning area?	Chapter 3 N/A for omitting	Met

Element B Requirements	Location in Plan (section and/or page number)	Met / Not Met
B1-b. Does the plan include information on the location of each identified hazard?	Chapter 3	Met
B1-c. Does the plan describe the extent for each identified hazard?	Chapter 3	Met
B1-d. Does the plan include the history of previous hazard events for each identified hazard?	Chapter 3	Met
B1-e. Does the plan include the probability of future events for each identified hazard? Does the plan describe the effects of future conditions, including climate change (e.g., long-term weather patterns, average temperature and sea levels), on the type, location and range of anticipated intensities of identified hazards?	Chapter 3	Met
B1-f. For participating jurisdictions in a multi-jurisdictional plan, does the plan describe any hazards that are unique to and/or vary from those affecting the overall planning area?	N/A	Met
B2. Does the plan include a summary of the jurisdiction’s vulnerability and the impacts on the community from the identified hazards? Does this summary also address NFIP-insured structures that have been repetitively damaged by floods? (Requirement 44 CFR § 201.6(c)(2)(ii))		
B2-a. Does the plan provide an overall summary of each jurisdiction’s vulnerability to the identified hazards?	Chapter 4 Chapter 5	Met
B2-b. For each participating jurisdiction, does the plan describe the potential impacts of each of the identified hazards on each participating jurisdiction?	Chapter 5	Met
B2-c. Does the plan address NFIP-insured structures within each jurisdiction that have been repetitively damaged by floods?	Chapter 3.1.2.3	Met
ELEMENT B REQUIRED REVISIONS		
<p>Required Revision: Click or tap here to enter text.</p>		

Element C: Mitigation Strategy

Element C Requirements	Location in Plan (section and/or page number)	Met / Not Met
C1. Does the plan document each participant’s existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement 44 CFR § 201.6(c)(3))		
C1-a. Does the plan describe how the existing capabilities of each participant are available to support the mitigation strategy? Does this include a discussion of the existing building codes and land use and development ordinances or regulations?	Chapter 6 Chapter 6.2.1	Met
C1-b. Does the plan describe each participant’s ability to expand and improve the identified capabilities to achieve mitigation?	Chapter 6 “Capability Gaps”	Met
C2. Does the plan address each jurisdiction’s participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement 44 CFR § 201.6(c)(3)(ii))		
C2-a. Does the plan contain a narrative description or a table/list of their participation activities?	Chapter 6.1	Met
C3. Does the plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement 44 CFR § 201.6(c)(3)(i))		
C3-a. Does the plan include goals to reduce the risk from the hazards identified in the plan?	Chapter 1.4	Met
C4. Does the plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement 44 CFR § 201.6(c)(3)(ii))		
C4-a. Does the plan include an analysis of a comprehensive range of actions/projects that each jurisdiction considered to reduce the impacts of hazards identified in the risk assessment?	Chapter 2.4 and Appendix B Chapter 7	Met
C4-b. Does the plan include one or more action(s) per jurisdiction for each of the hazards as identified within the plan’s risk assessment?	Table 7.2	Met
C5. Does the plan contain an action plan that describes how the actions identified will be prioritized (including a cost-benefit review), implemented, and administered by each jurisdiction? (Requirement 44 CFR § 201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))		
C5-a. Does the plan describe the criteria used for prioritizing actions?	Chapter 7.3.2	Met

Element C Requirements	Location in Plan (section and/or page number)	Met / Not Met
C5-b. Does the plan provide the position, office, department or agency responsible for implementing/administrating the identified mitigation actions, as well as potential funding sources and expected time frame?	Table 7.2 Chapter 7.3.3	Met
ELEMENT C REQUIRED REVISIONS		
<p>Required Revision:</p> <p>Click or tap here to enter text.</p>		

Element D: Plan Maintenance

Element D Requirements	Location in Plan (section and/or page number)	Met / Not Met
D1. Is there discussion of how each community will continue public participation in the plan maintenance process? (Requirement 44 CFR § 201.6(c)(4)(iii))		
D1-a. Does the plan describe how communities will continue to seek future public participation after the plan has been approved?	Chapter 8.5	Met
D2. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a five-year cycle)? (Requirement 44 CFR § 201.6(c)(4)(i))		
D2-a. Does the plan describe the process that will be followed to track the progress/status of the mitigation actions identified within the Mitigation Strategy, along with when this process will occur and who will be responsible for the process?	Chapter 8.1 and 8.5	Met
D2-b. Does the plan describe the process that will be followed to evaluate the plan for effectiveness? This process must identify the criteria that will be used to evaluate the information in the plan, along with when this process will occur and who will be responsible.	Chapter 8.2	Met
D2-c. Does the plan describe the process that will be followed to update the plan, along with when this process will occur and who will be responsible for the process?	Chapter 8.3	Met

Element D Requirements	Location in Plan (section and/or page number)	Met / Not Met
D3. Does the plan describe a process by which each community will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement 44 CFR § 201.6(c)(4)(ii))		
D3-a. Does the plan describe the process the community will follow to integrate the ideas, information and strategy of the mitigation plan into other planning mechanisms?	Chapter 8.4	Met
D3-b. Does the plan identify the planning mechanisms for each plan participant into which the ideas, information and strategy from the mitigation plan may be integrated?	Chapter 8.4	Met
D3-c. For multi-jurisdictional plans, does the plan describe each participant's individual process for integrating information from the mitigation strategy into their identified planning mechanisms?	N/A	Met
ELEMENT D REQUIRED REVISIONS		
<p>Required Revision: Click or tap here to enter text.</p>		

Element E: Plan Update

Element E Requirements	Location in Plan (section and/or page number)	Met / Not Met
E1. Was the plan revised to reflect changes in development? (Requirement 44 CFR § 201.6(d)(3))		
E1-a. Does the plan describe the changes in development that have occurred in hazard-prone areas that have increased or decreased each community's vulnerability since the previous plan was approved?	Chapter 4.2.3	Met
E2. Was the plan revised to reflect changes in priorities and progress in local mitigation efforts? (Requirement 44 CFR § 201.6(d)(3))		
E2-a. Does the plan describe how it was revised due to changes in community priorities?	Chapter 2.1	Met
E2-b. Does the plan include a status update for all mitigation actions identified in the previous mitigation plan?	Chapter 7 Table 7.1	Met

Element E Requirements	Location in Plan (section and/or page number)	Met / Not Met
E2-c. Does the plan describe how jurisdictions integrated the mitigation plan, when appropriate, into other planning mechanisms?	Chapter 8.4	Met
ELEMENT E REQUIRED REVISIONS		
<p>Required Revision: Click or tap here to enter text.</p>		

Element F: Plan Adoption

Element F Requirements	Location in Plan (section and/or page number)	Met / Not Met
F1. For single-jurisdictional plans, has the governing body of the jurisdiction formally adopted the plan to be eligible for certain FEMA assistance? (Requirement 44 CFR § 201.6(c)(5))		
F1-a. Does the participant include documentation of adoption?	Chapter 9	Met
F2. For multi-jurisdictional plans, has the governing body of each jurisdiction officially adopted the plan to be eligible for certain FEMA assistance? (Requirement 44 CFR § 201.6(c)(5))		
F2-a. Did each participant adopt the plan and provide documentation of that adoption?	Chapter 9	Met
ELEMENT F REQUIRED REVISIONS		
<p>Required Revision: Click or tap here to enter text.</p>		

Element G: High Hazard Potential Dams

HHPD Requirements	Location in Plan (section and/or page number)	Met / Not Met
HHPD1. Did the plan describe the incorporation of existing plans, studies, reports and technical information for HHPDs?		
HHPD1-a. Does the plan describe how the local government worked with local dam owners and/or the state dam safety agency?	Chapter 2.4 and Appendix B Chapter 4.2.3.3	Met
HHPD1-b. Does the plan incorporate information shared by the state and/or local dam owners?	Chapter 4.2.3.3	Met
HHPD2. Did the plan address HHPDs in the risk assessment?		
HHPD2-a. Does the plan describe the risks and vulnerabilities to and from HHPDs?	Chapter 3.3	Met
HHPD2-b. Does the plan document the limitations and describe how to address deficiencies?	Chapter 3.3 Table 7.2	Met
HHPD3. Did the plan include mitigation goals to reduce long-term vulnerabilities from HHPDs?		
HHPD3-a. Does the plan address how to reduce vulnerabilities to and from HHPDs as part of its own goals or with other long-term strategies?	Chapter 3.3 Chapter 4.2.3.3 Table 7.2	Met
HHPD3-b. Does the plan link proposed actions to reducing long-term vulnerabilities that are consistent with its goals?	Table 7.2	Met
HHPD4-a. Did the plan include actions that address HHPDs and prioritize mitigation actions to reduce vulnerabilities from HHPDs?		
HHPD4-a. Does the plan describe specific actions to address HHPDs?	Table 7.2	Met
HHPD4-b. Does the plan describe the criteria used to prioritize actions related to HHPDs?	Chapter 7.3.2	Met

HHPD Requirements	Location in Plan (section and/or page number)	Met / Not Met
HHPD4-c. Does the plan identify the position, office, department or agency responsible for implementing and administering the action to mitigate hazards to or from HHPDs?	Chapter 3.3 Chapter 4.2.3.3 Table 7.2	Met
HHPD Required Revisions		
Required Revision: Click or tap here to enter text.		

Element H: Additional State Requirements (Optional)

Element H Requirements	Location in Plan (section and/or page number)	Met / Not Met
This space is for the State to include additional requirements		
Click or tap here to enter text.	Click or tap here to enter text.	Choose an item.

Plan Assessment

These comments can be used to help guide your annual/regularly scheduled updates and the next plan update.

Element A. Planning Process

Strengths

- Participation in plan development by a wide range of city staff in many departments.
- Broad stakeholder group available for support of plan development
- Cambridge has in-house staff dedicated applying equitable access who heavily participated in plan development.
- Cambridge has developed numerous plans, studies, reports, and prepared technical information that facilitated plan development,

Opportunities for Improvement

- Improved advertisement of opportunities to provide input on the plan.

Element B. Risk Assessment

Strengths

- Cambridge has some of the most advanced climate resilience planning work in the region that supported plan development.

Opportunities for Improvement

- Cambridge could take next steps to improve its Community Rating System class ranking from a 9 to an 8.

Element C. Mitigation Strategy

Strengths

- Cambridge streamlined the goals and objectives of hazard mitigation planning that facilitate rapid understanding but decision makers and the public.
- The city has identified funding to implement many of the high priority mitigation actions.
- Mitigation actions address all natural hazards.
- There are a variety of departments who were actively involved in development of the plan who have agreed to champion mitigation actions.

Opportunities for Improvement

- The number of actions may be challenging to implement in 5 years. In the next update, the city should evaluate whether reduction in the number of actions results in a more streamlined and effective HMP.

Element D. Plan Maintenance

Strengths

- City pursuing single role for managing all hazard mitigation and climate resilience actions across various plans and department city-wide.

Opportunities for Improvement

- Identifying how to better engage the community as the plan is maintained.

Element E. Plan Update

Strengths

- Strong local regulations related to mitigating impacts from flooding, heat, and other natural hazards are applied to redevelopment projects.
- Diversity, equity, and inclusion was a priority for this plan and will continue to be integrated into actions undertaken to reduce risk from natural hazards and climate change.

Opportunities for Improvement

- The City is currently working on regional projects to provide resilience from coastal flooding. The results of this work should be integrated in the next HMP.

Element G. HHPD Requirements (Optional)

Strengths

- Cambridge actively is coordinating with the Charles River and Amelia Earhart dam owners on evaluation and upgrades to further protect the city from coastal flooding.
- Cambridge addresses state requirements for the two dams owned and operated by the city for their public water supply.

Opportunities for Improvement

- During the next HMP update, Weston & Waltham should be engaged in discussions about the city's owned/operated dams during plan development.

Element H. Additional State Requirements (Optional)

Strengths

- [insert comments]

Opportunities for Improvement

- [insert comments]