City of Newton Community Resilience Building Workshop Summary of Findings December 2018





City of Newton Community Resilience Building Workshop Municipal Vulnerability Preparedness Program Summary of Findings

OVERVIEW

Recent years have seen notable weather extremes in Newton. The winter of 2015 brought record-breaking snow, resulting in delays and shutdowns in MBTA service. The following year, Newton was under a drought warning from August to November 2016. The winter of 2018 once again brought severe winter storms with a succession of four nor'easters pummeling the city. In March 2010 rainfall was so significant that a federal disaster was declared for eastern Massachusetts. Over 300 properties in Newton received flood claim payments, and estimates for total properties damaged range from 700 to 2,000. Globally, the years 2012 through 2017 all rank among the ten hottest on record.

In 2016, the City of Newton initiated a project with the Metropolitan Area Planning Council (MAPC) to develop a Climate Change Vulnerability Assessment and Action Plan (CCVAAP). The plan reviews all climate risks and identifies vulnerabilities across natural resources, vulnerable populations, and city, state and private infrastructure. A menu of more than forty action items (see Appendix) are included in the plan. Staff from city departments served as a Steering Committee for the project. The Newton/Needham Chamber of Commerce sponsored a forum where participants provided feedback on the plan. The plan was also reviewed by representatives of Green Newton and the League of Women Voters.

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

In 2018, the City applied for a state grant to complete the Community Resilience Building (CRB) Workshop under the MVP program. Participation in the MVP program provided opportunities for more extensive public review of Newton's draft CCVAAP. Concurrent with the MVP program, Newton is updating its Hazard Mitigation Plan (HMP). The HMP is a five-year plan, developed under the auspices of FEMA that identifies strategies to address natural hazards. Upon completion of the two projects, the City of Newton will be eligible to apply for state and federal grant funds to address identified natural hazards and climate risks.

The City of Newton partnered with the Metropolitan Area Planning Council (MAPC) to complete the MVP program and the Hazard Mitigation Plan. Aspects of the CRB workshop were adapted to reflect the fact that Newton has already completed a comprehensive climate vulnerability analysis. As City staff served on the Steering Committee for the CCVAAP, the MVP Core Planning Team focused on recruiting members of city boards and commissions, and community stakeholders to participate in the CRB Workshop. Twenty-five participants gathered on October 29 (see Workshop Participants page 8). The Workshop's central objectives were to:

- Define extreme weather and natural and climate related hazards;
- Identify existing and future strengths and vulnerabilities;
- Develop and prioritize opportunities to take action to reduce risk and build resilience



Materials provided for the workshop included local and regional data for changes in temperature, precipitation, and sea level recorded to date, as well as future projections to the end of the century. Posters provided information and mapping specific to Newton infrastructure, demographics, and natural resources identified in the CCVAAP. The posters also included all of the action items proposed in the CCVAAP.

The participants considered Newton's vulnerabilities focusing on infrastructure, society, and the environment. Working in small groups they reviewed the proposed actions in the CCVAAP, proposed additional action items, and then prioritized actions designed to increase Newton's resilience to future extreme weather events.

TOP HAZARDS AND VULNERABLE AREAS

Top climate hazards facing Newton based on the CCVAAP include flooding, heat waves, severe storms (wind, snow, ice) and drought.

Top Hazards

• Flooding

- Severe Storms (wind, snow, ice)
- Extreme Heat
- Drought

CURRENT CONCERNS AND CHALLENGES PRESENTED BY HAZARDS

A key concern is flood damage from rainstorms. An issue identified in the CCVAAP is that more than 75% of identified flood claims are for properties located outside of FEMA flood zones. This is likely related to overburdened storm drain systems and/or to filled or buried historic wetlands and waterways: a preponderance of the claims outside flood zones align with "areas requiring drainage" shown on an 1892 map of Newton. Properties outside of FEMA flood zones are not subject to floodplain regulations, and property owners are not formally warned of their flood risk.

Future development that increases impervious surfaces or further alters natural drainage will exacerbate flooding problems. The CCVAAP identifies critical facilities in flood zones, in Cityidentified flood prone areas, in proximity to previous flood claims, and overlapping historic wetlands identified in the 1892 map of Newton. In addition to city-wide stormwater flooding, participants identified Charles River flooding along the Quinobequin Road as an area of concern.

For natural resources, participants highlighted the loss of street trees documented in the Open Space plan. Participants also stressed the damage done to street trees by gas leaks. An additional concern is threats to water quality from flooding.

For societal issues, participants focused on populations more vulnerable to climate impacts, in particular elders, limited English-speaking households, and low-income residents.

CURRENT STRENGTHS AND ASSETS

The City of Newton has already taken numerous steps to improve its resilience to extreme weather. Flooding, heat waves, and drought are projected to become more frequent and severe over the course of this century, but they are not new concerns. Thus, while planning for climate resilience is a relatively new endeavor, Newton starts with a firm foundation to support its future efforts.

- Funding of a Director of Sustainability position to coordinate climate efforts
- Creation of a stormwater utility with incentives for stormwater infiltration
- Incorporating updated 10-year, 24-hour rainfall rates into DPW stormwater requirements
- Purchasing open space that provides flooding buffers and preserves habitat
- Opening of cooling centers during heat waves
- Adopting a stretch code for energy conservation and resilience to heat events
- Investing in stormwater analysis and improvements, including green infrastructure projects
- Establishing strong emergency planning
- Administering public health and wellness programs
- Conducting senior outreach and support activities

• Including green infrastructure in the Complete Streets policy

TOP RECOMMENDATIONS TO IMPROVE RESILIENCE

Each of the three workshop tables reviewed the action items in the CCVAAP and proposed additional solutions. Participants at each table identified their top priorities. The highest priorities listed below reflect the combined priorities of the workshop participants. They are identical to the top priorities from the Chamber of Commerce forum held one year earlier.

Highest Priorities

1) Ensure that the current zoning/ordinance review



incorporates climate resilience. This included support for Green Infrastructure, Low-Impact Development, and Green Building and Landscaping requirements that would reduce paving, and address stormwater and heat-island impacts. Workshop participants included recommendations for mandatory standards (rather than guidelines), no net loss of permeable surfaces, and tax incentives to minimize runoff.

- Increase tree planting. Participants emphasized the importance of reversing the decline of street trees and utilizing trees to manage heat islands and stormwater. Workshop participants highlighted the need to fix gas leaks as part of protecting street trees.
- 3) Incorporate climate resilience in open space planning.
- 4) Improve emergency communications and support to vulnerable populations including the linguistically isolated, low income, and those unable to evacuate.
- 5) Establish relationships with state agency staff responsible for climate resilience (DCR, DOT, MBTA, MWRA). Communicate City concerns and priorities, and stay abreast of agency planning. Workshop participants emphasized working cooperatively with state agency representatives.

Business owners at the Chamber of Commerce forum indicated that power outages are their primary climate concern. They added another priority from among the recommendations:

6) Encourage use of microgrids, district energy, and battery storage for critical facilities.

Additional Priorities

The following list includes all action items that were new suggestions, or extension of action items in the CCVAAP. In addition to identifying action items related to people, natural resources and environment, participants focus on transportation and education oriented proposals. Also included was a suggestion to incorporate lifetime cost/benefit analysis in budget discussions.

Socio-Economic

Develop neighborhood social networks to support vulnerable populations (Brookline Buddies program that partners older adults with volunteers, as an example).

Create a list of vulnerable populations.

Plan for potential climate related in-migration from other communities.

Include community centers in disaster planning.

Encourage block parties for climate change awareness and social cohesion.

Develop kits of emergency supplies to distribute, set up distribution centers, and consider bulk purchase.

Natural Resources

Promote local agriculture and food production.

Develop a food waste reduction program for the schools.

Increase protected open space.

Support ecological restoration to ensure ecosystem function.

Develop a reuse plan for golf courses.

Ban toxic lawn chemicals and encourage natural landscaping.

Ban plastic bags and reduce plastic waste/Styrofoam.

Plant trees on lawns.

Identify places where water can be stored (increase capacity in advance of storms).

Infrastructure

Prioritize implementation of the Stormwater Improvement Plan.

Address flood mitigation in high risk areas with new development through zoning.

Assess fees for heat island impacts.

Move utilities underground.

Upgrade electric distribution system (for EV's, heat pumps, etc.).

Install heat pumps in schools and municipal buildings.

Electrify the grid and new building development.

Develop waste management systems that create energy.

Solarize: encourage power purchase agreements for local businesses.

Fix gas leaks.

Get rid of gas pipelines – plan for future transformation.

Direct the City's pension funds out of fossil fuels.

Education

Incorporate climate change in the school curriculum.

Develop a public communication strategy for climate change and sustainability.

Educate the public about green infrastructure, adaptation, and vulnerability.

Educate the public about invasive species.

Train local officials on green infrastructure. Develop staff capacity on climate issues across all departments.

Encourage families to develop a climate vulnerability plan.

Transportation

Develop Green and resilient transportation infrastructure. Create a low-stress multi-modal transportation system. Lower or eliminate parking minimums in zoning. Create safe bike lanes and pedestrian walkways, and walkable village centers.

LISTENING SESSION

On December 10, 2018, a public hearing to review the plan was held before a joint meeting of the City Council's Zoning and Planning Committee, and the Planning and Development Board. Over twenty residents attended the listening session. Comments from the two committees included:

- Requests for future MAPC assistance with issues related to solar power, model stormwater ordinance, management of urbans forests, suggestions for capital planning.
- Comment that climate is having negative impacts on Newton parks and playing fields.
- Request for communication strategies that have proven effective in changing human behavior.
- Request to provide mapping of flooding areas at the parcel level.
- Clarification that proposals for reduced parking and high-density development are not mandates.
- Requests to focus on transportation, and the loss of trees on private property in addition to street trees.

Comments from the public included:

- Comment that persuasive education is critical
- Suggestion to link climate resilience to mitigation
- Request for updated data in the plan
- Comment emphasizing the importance of engaging the community
- Comment that zoning is critical, and suggestion that tree removal not be allowed
- Suggestion that zoning be strengthened
- Request to prioritize moving utilities underground
- Comments that the city should note accomplishments, monitor progress, and update the plan more often that every 5 years
- Suggestion that the city work with the schools to educate kids
- Comment that the city should promote composting
- Encouragement for all to work together to make rapid progress

At the conclusion of the public hearing the committees voted unanimously to recommend that the City Council adopt the Climate Change Vulnerability Assessment as an amendment to the Comprehensive Plan. On December 17, the City Council unanimously adopted the Climate Change Vulnerability Assessment as an amendment to the Newton Comprehensive Plan. The full CCVAAP is available from the City of Newton's Planning for Climate Change website: http://www.newtonma.gov/gov/planning/Irplan/city%E2%80%99s climate action plan.asp

CRB WORKSHOP INVITED PARTICIPANTS

* = representative attended Newton Solid Waste Commission* Newton Economic Development Commission* Newton 350Mass* Newton City Council* (4 members) Newton Council on Aging* Newton Community Engagement* Newton Conservation Commission* Green Newton* Newton Conservators* Bike Newton* Newton Highlands Neighborhood Council* Newtonville Neighborhood Council* Waban Neighborhood Council* Newton Upper Falls Neighborhood Council Citizens Commission on Energy* Newton Environmental Science Program* Newton interested residents* Commission on Disability Fair Housing Committee Human Rights Commission Newton Housing Authority Parks and Recreation Commission School Committee Urban Tree Commission Youth Commission Jewish Community Housing for the Elderly CAN-DO Carrol Center for the Blind Good Shepard Community Care The Second Step Inc. Newton Food Pantry Family Access of Newton NWW Committee for Community Living Chinese School of Newton Parent's Association Greater Boston Chinese Cultural Association League of Women Voters **CRWA Democratic Committee Republican Committee**

Rotary Club of Newton National Grid Newton Community Education MBTA DOT MWRA Newton-Needham Chamber of Commerce Newton Innovation Center Newton Interfaith Clergy Association Greater Boston Interfaith Organization Jewish Community Centers of Greater Boston Mass Interfaith Power and Light Lasell University

CRB WORKSHOP PROJECT TEAM

<u>Newton Core Team</u>	
Jennifer Steel	Planning, Project Lead
Claire Rundelli	Planning
Facilitation Team	
Anne Herbst	Metropolitan Area Planning Council (Lead Facilitator)
Martin Pillsbury	Metropolitan Area Planning Council
Ralph Willmer	Metropolitan Area Planning Council
Darci Schofield	Metropolitan Area Planning Council
Iolando Spinola	Metropolitan Area Planning Council

CITATION

Metropolitan Area Planning Council. 2018. City of Newton Municipal Vulnerability Preparedness Program. Community Resilience Building Workshop Summary of Findings. Newton, Massachusetts

ACKNOWLEDGEMENTS

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APPENDIX A – ACTION PRIORITIZATION, AND WORKSHOP MATERIALS

Action Prioritization

Green Table

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Red Table



Blue Table



Base Map



PowerPoint Presentation



Global Temperature and CO₂ **Trends**



Temperature change: observed For the Northeast United States: temperature increased by almost 2 degrees, between 1895 and 2011 (US National Climate Assessment 2014)



Blue Hill Observatory Annual Temperature, 1831-2017



Precipitation change: observed

For the Northeast United States: 71% increase in the amount of rain that falls in the top 1% events from 1958 – 2012.

Source: US National Climate Assessment 2014



71%

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

Precipitation change: projected

Expected size of a 10-year, 24-hour storm



Sea level rise: observed

- · Boston tide station
- Record from 1921-2017
- · Equivalent to 11 inches in 100 years





Sea level rise: projected



Projected Sea Level Rise 2070 Newton Impacts



Source: Massachusetts Hazard Mitigation Plan 2018

POSTERS

Newton

Built Environment

Increasing large rainfall events may subject roads, bridges, dams, and buildings to more frequent or severe flooding. Areas that don't flood today may become vulnerable. FEMA flood zones reflect only current conditions, and do not generally capture stormwater flooding. Power outages affecting infrastructure and communications may become more frequent as a result of high energy demands during heatwaves. Winter outages could be caused by ice storms if warming results in temperatures hovering around freezing. The potential for more intense hurricanes could cause outages due to falling trees. Finally, buildings, roadways, and railways can be stressed by extreme heat. Heat can cause damage to expansion joints on bridges and highways and may cause roadways to deteriorate more rapidly.





MAPC, MassGIS (Bureau of Geographic Information): City of Newton, DCR, FEMA, USGS, DEP

Newton Social Vulnerability

MAP

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

Who is most at risk from climate change impacts?

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

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

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

Communities of Color People with Health Conditions **Older Adults and Young Children** ithers. For example, Black and Latino residents have a much higher rate of asthma hospitalization Newton Recent and Projected Population by Age **Newton Asthma** 10000 Hospitalizations Newton is becoming more diverse... In 2030, seniors are 800 65+ years **Asian Populations in Newton** Other 200 projected to be almost 100% 60000 25% of Newton's 7% Other. 14% Indian 100.000 Latino 150 total population. 80% 40000 3% Korea 5 60% 20000 40% Under 5 years 4% Japanese 20% 2020 2030 2010 1990 2000 (projection) (projection) 2000 2010 1990 **Limited English Speakers** Low-Income Households **People Living Alone People Who Work Outside** 25%^{± 1.7%} 5%~ As of 2010, about 1/4 of First Newton households responders. consisted of someone living some town alone. 1 ± .78% employees Speak English at Home Almost 50% of construction Below poverty level Speak Another Language at Home Seniors eople living alone workers, and landscapers are among those who living were over 65. Limited English Speaking may be at added risk from extra exposure to *A four-person household earning less than \$78,150 is alone high heat and poor air quality. considered low-income: a four-person household earning 69% less than \$24,563 is below poverty level Single-person household

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

Newton

MAP

Natural Resources

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



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

ACTION ITEMS FROM THE DRAFT CLIMATE CHANGE VULNERABILITY ASSESSMENT AND ACTION PLAN

Proposed Actions	Priority	Infrastructure	
Societal		Provide funding for training city staff, as needed, on implementing new techniques for green infrastructure.	
Communicate emergency preparedness information to linguistically isolated households.			
Develop shelter-in-place and communication strategies for residents who may not be able to evacuate during emergencies.		Publicize hot spot and potential flooding areas to current residents, businesses, and permit applicants. Develop and/or distribute materials on climate related technologies and practices.	
Assist local businesses to develop emergency preparedness plans.		Assess municipal properties for Low Impact Development/Green Infrastructure retrofits.	
Review the City's emergency communications infrastructure to ensure redundancy during emergencies.		Prioritize retrofits and emergency planning for City facilities vulnerable to flooding and heat impacts.	
Identify gaps in services to vulnerable populations and develop strategies to address gaps. Coordinate with		Continue to prioritize energy efficiency and stormwater management in capital planning.	
community partners to strengthen relations.		Highlight ways to improve conditions through intensive outreach to property owners and City Green	
Prioritize Public Health programs that address illnesses forecast to be exacerbated by climate change. Create an outreach campaign focused on the impacts of extreme heat and managing it.		Infrastructure and stormwater projects in a specific catchment area, as a pilot project. Locations could include a chronic flooding area or an important resource area such as the Crystal Lake watershed.	
Place informational signage at recreation areas regarding tick/morguite risk		Ensure that bridge and culvert repairs take into account future precipitation projections.	
Place informational signage at recreation areas regarding tick/mosquito risk.		Work with Eversource to address vulnerabilities and coordinate work, including vegetation management, to ensure	
Target affordable housing sites and low-income residents for flood and heat protection upgrades.		protection of Newton assets.	
Support facilities that serve vulnerable populations. Assess retrofit needs and emergency readiness.		Consider options to address flooding that takes place outside of FEMA flood zones, including: expanding wetlands protection jurisdiction, restricting, or requiring flood proofing for basements, expanding the floodplain ordinance to	
Work with local health providers to provide emergency response information to clients with physical and mental		documented areas of flooding.	
Natural Resources		Establish relationships with state agency staff responsible for climate resilience (DCR, DOT, MBTA, MWRA).	
Encourage de-paving and use of permeable concrete and asphalt.		Encourage use of microgrids, district energy, and battery storage for critical facilities.	
Look for stream daylighting or naturalizing opportunities to restore natural habitat.		Utilize flood claim (losses) mapping to target stormwater improvements.	
Incorporate climate resilience in open space planning. Consider: 1) ecological resilience and biodiversity; 2)			
cooling "hot spots"; 3) protecting water quality; 4) stormwater infiltration for groundwater and stream flow.		Ensure that the zoning/ordinance review requires Green Infrastructure/Low Impact Development/Renewable	
Increase tree planting efforts to address net losses and increase tree canopy. Increase tree diversity. Focus on street-tree planting and landscaping at public facilities in "hot spot" areas.		Energy. Integrate design guidelines for Green Infrastructure and Low Impact Development. Include incentives for green landscaping, reflective pavements, and cool or green roofs. Establish green building requirements.	

APPENDIX B – TABLE MATRIX RESULTS

Participants worked in small groups identified by color. Concerns were categorized as Environmental, Infrastructure, or Society. Participants prioritized climate action items from the CCVAAP and from new suggestions proposed by the group. All items that received a vote as a top priority are listed below.

Table	Category	Solutions	CCVAAP Priority	New Priority
Blue	Society	Develop shelter-in-place and communication strategies for resident who may not be able to evacuation during emergencies.	X	
Blue	Society	Identify gaps in services to vulnerable populations and develop strategies to address gaps. Coordinate with community partners to strengthen relations.	Х	
Blue	Society	Prioritize Public Health Programs that address illnesses forecast to be exacerbated by climate change. Create an outreach campaign focused on the impacts of extreme heat and managing it.	X	
Blue	Environment	Mandate and plan for de-paving and use of permeable concrete and asphalt.	X	
Blue	Environment	Incorporate climate resilience in open space planning.	Х	
Blue	Infrastructure	Provide training for city staff, as need, on implementing new techniques for green infrastructure	X	
Blue	Infrastructure	Publicize hot spot and potential flooding areas to current residents, businesses, and permit applicants. Develop and/or distribute materials on climate related technologies and practices.	X	
Blue	Infrastructure	Prioritize retrofits and emergency planning for City facilities vulnerable to flooding and heat impacts.	X	
Blue	Infrastructure	Ensure zoning review includes GI, LID, renewable energy – make it mandatory.	X	Х
Blue	Society	Train local officials about green infrastructure		Х
Blue	Environment	No net loss of permeable surfaces		
Blue	Environment	Plant more trees but understand positive impacts of tree planting		Х
Blue	Infrastructure	Get rid of gas pipelines, plan for transformation from reliance on gas		Х

Blue	Infrastructure	Fix the stormwater fee		Х
Green	Society	Prioritize Public Health Programs that address illnesses forecast to be exacerbated by climate change. Create an outreach campaign focused on the impacts of extreme heat and managing it. Use multiple languages	Х	X
Green	Environment	Incorporate climate resilience in open space planning.	Х	
Green	Environment	Increase tree planting efforts to address net losses and increase tree canopy. Increase tree diversity. Focus on street-tree planting and landscaping at public facilities in "hot spot" areas.	Х	
Green	Infrastructure	Establish relationships with state agency staff responsible for climate resilience (DCR, DOT, MBTA, MWRA). Cooperatively mitigate infrastructure.	Х	X
Green	Infrastructure	Ensure zoning review includes GI, LID, renewable energy – make it mandatory	Х	
Green	Society	Improve communications to residents. Translate all materials.		X
Green	Society	Incorporate climate change in school curriculum		Х
Green	Environment	Natural landscape lawns, encourage biodiversity, eliminate pollutants in runoff		X
Green	Infrastructure	Use zoning to mitigation flooding in high risk areas with new development.		X
Green	Infrastructure	Make transportation infrastructure green and resilient		X
Red	Society	Develop shelter-in-place and communication strategies for resident who may not be able to evacuation during emergencies.	Х	
Red	Environment	Look for stream daylighting or naturalizing opportunities to restore habitat.	Х	
Red	Environment	Increase tree planting efforts to address net losses and increase tree canopy. Increase tree diversity. Focus on street-tree planting and landscaping at public facilities in "hot spot" areas.	Х	
Red	Infrastructure	Continue to prioritize energy efficiency and stormwater management in capital planning.	X	
Red	Infrastructure	Work with Eversource to address vulnerabilities and coordinate work, including vegetation management, to ensure protection of Newton assets.	Х	

Red	Infrastructure	Ensure zoning review includes GI, LID, renewable energy.	X	
Red	ed Society Educate youth/schools about resilience.			Х
Red	Society	Develop neighborhood social networks to support vulnerable populations (Brookline Buddies).		Х
Red	Society	Use community centers to plan for disaster.		Х
Red	Society	Plan for refugees from other communities.		Х
Red	Environment	Plant trees on lawns.		Х
Red	Environment	Support local food productions		Х
Red	Infrastructure	Fix gas leaks – save trees		Х
Red	Infrastructure	Upgrade electrical distribution for EV's and heat pumps, etc.		X
Red	Infrastructure	Prioritize implementation of stormwater improvement plan.		X

APPENDIX C – CCVAAP ACTION MATRIX

Appropriate Plan/I	Process	Recommended Action	Lead Department(s)	Possible Timing	Category and Action #
• ALL		The Steering Committee, or a successor group, should continue to meet to establish priorities, incorporate new information, and monitor progress on climate goals. The City should expand the Steering Committee to include additional relevant departments, such as Senior Services, Inspectional Services, and Urban Forestry.	 Steering Committee 	FY18-19 on	A3
• ALL		Establish relationships with state agency staff responsible for climate resilience. Communicate City concerns and priorities and stay abreast of agency planning (e.g. DCR and MWRA).	SustainabilityExecutive Office	On-going	G1
 Annual Departmental Budget 	S	Provide training to empower City staff to implement cutting edge techniques for green practices. ⁱ	• ALL	FY18-19 on	E2
Capital Improvement Plan (C	IP)	Place signage at popular park and recreation areas to inform residents about tick/mosquito protection measures.	Parks and RecPlanningHHS	FY19	СЗ
Capital Improvement Plan (C	IP)	Assess municipal properties for opportunities for LID/GI retrofits. "	 Public Facilities 	On-going	E5
Capital Improvement Plan (C	IP)	Prioritize retrofits and emergency planning for City facilities vulnerable to flooding and heat impacts.	 Public Facilities 	On-going	E15
Capital Improvement Plan (C	IP)	Target affordable housing sites and low-income residents for flood and heat protection upgrades.	• Planning	FY20	ВЗ
Capital Improvement Plan (C	IP)	Prioritize public health education programs that address the illnesses and conditions forecast to be exacerbated by climate change (e.g., extreme heat). ^{iii iv}	• HHS	FY20	C1
Capital Improvement Plan (C	IP)	Publicize hot spot and potential flooding areas to current residents, businesses, and to permit applicants. Direct them to educational materials.	PlanningISD	FY22	E14
Capital Improvement Plan (C	IP)	Develop and distribute education and outreach materials on climate related technologies and practices including, for example, elevating utilities, preventing backflow, protecting basements, and weatherization. Consider targeting flooding areas outside of flood zones, including areas with older housing stock, and properties with chronic mold issues. ^v	• ISD	FY20	E13
Capital Improvement Plan (C Stormwater Infrastructure Imp	IP) provement Plan (SIIP)	Prioritize energy efficiency and stormwater management in capital planning.	SustainabilityDPWExecutive Office	FY18-19 on	E8
Stormwater Infrastructure Imp	provement Plan (SIIP)	Utilize flood claim (losses) mapping to target stormwater improvements.	• DPW	On-going	E7

	Appropriate Plan/Process	Recommended Action	Lead Department(s)	Possible Timing	Category and Action #
•	Stormwater Infrastructure Improvement Plan (SIIP)	Look for stream daylighting or re-naturalizing opportunities to restore natural habitat as part of stormwater or other infrastructure projects. ^{vi}	DPWPlanning	As needed	D3
•	Stormwater Infrastructure Improvement Plan (SIIP)	Reach out to property owners in a specific catchment area (as a pilot project) about ways to improve conditions through Green Infrastructure and stormwater projects. Locations could include an area prone to chronic flooding or an important resource area such as the Crystal Lake watershed.	DPWPlanning	FY20	E6
•	Comprehensive Emergency Management Plan (CEMP)	Identify gaps in services to vulnerable populations and prioritize: developing strategies to address gaps, coordinating with community partners to strengthen relations, and considering staff/Medical Reserve Corps involvement in emergency plans.	 Emergency Management Steering Committee 	On-going	В1
•	Comprehensive Emergency Management Plan (CEMP)	Update the Comprehensive Emergency Management Plan to incorporate changes in emergency situations and response activities that may result from climate impacts.	 Emergency Management 	At next cycle	C4
•	Comprehensive Emergency Management Plan (CEMP)	Develop advance shelter-in-place and communication strategies for residents who may not be able to evacuate during emergencies.	 Emergency Management 	On-going	B6
•	Comprehensive Emergency Management Plan (CEMP)	Assist local businesses in developing emergency preparedness plans. vii	SustainabilityPlanning	On-going	F1
•	Comprehensive Emergency Management Plan (CEMP)	Identify and support vulnerable households most in need of air conditioning. Encourage use of efficient air conditioning.	• HHS	FY20	C5
•	Comprehensive Emergency Management Plan (CEMP)	Ensure redundancy in the City's emergency communications infrastructure.	 Emergency Management 	On-going	H2
•	Comprehensive Emergency Management Plan (CEMP) Hazard Mitigation Plan (HMP) Emergency Support Functions (ESF) Model	Review climate projections and revise and update climate resilience priorities every five years.	 Sustainability 	FY23	A1
•	Comprehensive Emergency Management Plan (CEMP) Hazard Mitigation Plan (HMP)	Communicate emergency preparedness information to linguistically isolated households.	 Emergency Management 	On-going	B4
•	Comprehensive Emergency Management Plan (CEMP) Hazard Mitigation Plan (HMP)	Incorporate and prioritize climate resilience and energy efficiency, stormwater management into all City planning documents and activities.	Executive OfficePlanning	On-going	A4
•	Comprehensive Emergency Management Plan (CEMP) Hazard Mitigation Plan (HMP)	City departments should review the projections and reevaluate climate vulnerabilities relevant to their assets and mission and identify potential and current activities that bolster resilience.	• All	FY18-19	A2
•	Hazard Mitigation Plan (HMP)	Explore joint procurement opportunities with MAPC to purchase emergency generators and pumps.	 Facilities Emergency Management 	As needed	E12

	Appropriate Plan/Process	Recommended Action	Lead Department(s)	Possible Timing	Category and Action #
•	Hazard Mitigation Plan (HMP)	Evaluate readiness of facilities that serve vulnerable populations (e.g. group homes). Assess retrofit needs and evacuation plans. Assess air conditioning and back-up generators. Encourage sign-up for the emergency notification system.	 Emergency Management 	On-going	B2
•	Hazard Mitigation Plan (HMP)	Work with local health providers to provide emergency preparedness information to clients with physical and mental disabilities.	 Health and Human Services 	On-going	B5
•	Street Tree Planting Plan (STPP)	Increase funding for increased street-tree planting and landscaping at public facilities in "hot spot" areas. Continue to increase tree diversity and consider trees well-adapted to warming temperatures to boost climate resilience. ^{viii}	 Parks and Rec/Forestry 	On-going	C2
•	Zoning Redesign	Ensure that the zoning ordinance requires Green Infrastructure/Low Impact Development/Renewable Energy through, e.g., green buildings, creative approaches to parking, driveways, street width, stormwater, and site plan review in all development and redevelopment. Include incentives to increase green landscaping, reflective pavements, and cool or green roofs to lessen heat island impacts. ^{ix x}	• Planning	FY18-19	El
•	Zoning Ordinance	Establish green building requirements. ^{xi}	PlanningISD	FY19-20	E9
•	Floodplain Ordinance	Expand the floodplain ordinance to include documented areas of flooding. x ⁱⁱ	• Planning	FY21	E3
•	Floodplain Ordinance	Develop plans to address flooding outside of FEMA flood zones (e.g., expand wetlands protection jurisdiction, restrict basements, or require flood proofing for basements).	PlanningISD	FY20	5E4
•	Open Space and Recreation Plan (OSRP) Conservation Restrictions (CR s)	In open space planning include: 1) protecting large, connected or buffering green spaces to foster ecological resilience and biodiversity; 2) removing asphalt; 3) planting trees; and 4) identifying locations where soil will support stormwater infiltration ^{xiii}	• Planning	FY18-19 (plan due in 2020)	DI
•	DPW evaluation of specific bridge and culvert projects	Ensure that bridge and culvert repairs take into account future precipitation projections. xiv	• DPW	As needed	D2
•	DPW review of special permits, administrative site plans, and proposed subdivisions. Zoning Ordinance or LID Ordinance. Complete Streets Policy	Incorporate depaving permeable concrete, and GI/LID stormwater management guidelines into street design for construction and reconstruction. Use GIS to prioritize areas where such activities will address flooding.	DPWPlanning	FY20	E10
•	DPW monthly meetings with Eversource (electrical distribution), National Grid (gas distribution), and Verizon (communication distribution).	Work with Eversource to address vulnerabilities and coordinate work, including capital improvements and vegetation management, to ensure protection of Newton assets.	SustainabilityDPW	On-going	H1
•	Newton North High School microgrid plan. Newton Wellesley Hospital microgrid plan.	Encourage use of microgrids, district energy, and battery storage to keep critical facilities functioning in the event of power loss. ^{xv}	 Sustainability 	FY19-20	E11

ⁱ The University of New Hampshire Stormwater Center conducts research and offers technical training on innovative stormwater treatments.

" Possible project with MAPC.

iii The Bureau of Environmental Health of the Massachusetts Department of Public Health has online resources, including a conceptual pathways matrix that identifies hazards, exposures, vulnerable groups, and health risks https://matracking.ehs.state.ma.us/Climate-Change/conceptual-pathways.html.

^{iv} Center for Disease Control Extreme heat guidebook: <u>https://www.cdc.gov/climateandhealth/pubs/extreme-heat-guidebook.pdf</u> MAPC's Keep Cool App. <u>MAPC's Keep Cool App</u>.

^v Example: Basement protection materials from Kingston, Ontario, Canada (<u>https://utilitieskingston.com/Wastewater/BasementFlooding/Protect).</u>

^{vi} Example: The Muddy River project in Brookline and Boston has restored natural habitat and reduced flooding risk.

- vii Example: The City of Cambridge and MAPC partnered in providing workshops to small business owners. The City of Cambridge maintains a Business Emergency Preparedness website: <a href="https://www.cambridgema.gov/CDD/econdev/resourcesforbusinesses/smallbusiness/emergencypreparednessforbusinesses/smallbusiness/emergencypreparedn
- viii The U.S. Forest Service has developed a comprehensive manual, "Forest Adaptation Resources: Climate Tools and Approaches for Land Managers," available at https://www.fs.fed.us/nrs/pubs/gtr/gtr nrs87-2.pdf.

^{ix} MAPC Low Impact Development Toolkit, ex. Town of Littleton Low Impact Development Manual.

* Examples: Seattle Green Factor establishes green landscaping requirements for projects of a certain size. Sacramento Parking Lot Shading Requirement mitigates urban heat island impacts.

xⁱ The Boston Planning and Development Agency has a climate resiliency checklist that could be modified for use in Newton. LEED resources include climate resilience screening tools. Example: The City of Cambridge has developed sustainable building requirements.

xiv Massachusetts Stream Crossing Handbook: <u>http://www.mass.gov/eea/docs/dfg/der/pdf/stream-crossings-handbook.pdf and State grant program for replacement of high ecological value culverts.</u>

^{xii} The Town of Braintree floodplain by-law includes documented areas of flooding outside FEMA flood zones.

xiii The Metro Mayors Climate-Smart Region (CSR) Decision Support Tool is a new GIS-based program developed to prioritize locations for green infrastructure. The CSR program analyzes spatial data in four climate strategies: Connect (carbon-free transportation links), Cool (shade areas to reduce heat), Absorb (innovative stormwater management), and Protect (natural land buffers for sea level rise). MAPC can provide training on use of the tool.

x^v The state's Advancing Commonwealth Energy Storage (ACES) program, and the Mass Clean Energy Center Community Micro grids program. Examples: The City of Northampton is building a microgrid to power its DPW, emergency shelter, and local hospital.