



CITY OF LOWELL



Public Listening Session Webinar

May 28, 2020



WELCOME FROM THE PROJECT TEAM



ADRIA
BOYNTON



STEVE
ROY



INDRANI
GHOSH



AMANDA
KOHN



RUPSA
ROY



JOHN
TOURTELOTTE
RIVERMOOR ENERGY



WELCOME PARTICIPANTS

Translation support is available in **Spanish, Portuguese, and Khmer**

Thank you to our translators; Jeanette Cantu, Maria Dickinson, Tooch Van, and Thavy Hout!



WEBINAR LOGISTICS



- This webinar is being **recorded**
- Overview of Microsoft Teams
 - Tell us what your favorite thing is about Lowell **in the chat!**
- The webinar is paired with **online surveys**
 - A link is included at the end of the presentation

WEBINAR OUTLINE

- Overview of MVP and HMP
- Overview of Climate Change
- Strengths and Vulnerabilities
- Priority Action Items
- Next Steps

Tell us about your climate adaptation priorities by taking our **online survey!**



MVP & HMP OVERVIEW



Photo: City Facebook

MVP Program Goals



●●● MVP Process

1. MVP Planning Grant

- Define climate hazards
- Identify community vulnerabilities and strengths
- Develop and prioritize adaptation actions
- Receive MVP designation

** We're also updating Lowell's Hazard Mitigation Plan!*

2. MVP Action Grant

1. Implement priority adaptation actions identified during the planning process





What Can the MVP Action Grant Fund?



Assessments



Outreach & Education



Management Measures



Redesign & Retrofit



Nature-Based Solutions



Ecological Restoration



Water Quality & Infiltration



Flood Protection



Extreme Heat Mitigation



Drought Mitigation



Energy Resilience



Chemical Safety



Land Acquisition



Housing



Mosquito Control

Massachusetts Executive Office of Energy & Environmental Affairs (EOEEA)

Municipal Vulnerability Preparedness (MVP)


community resilience building workshop


abbreviated time frame


less competitive grants

Overlap



municipal leadership



regional collaboration



community engagement



review existing information



hazard impacts and vulnerability



existing policies/programs



identify strengths, vulnerabilities, and potential actions



report



grant funding

United States Federal Emergency Management Agency (FEMA)

Hazard Mitigation Planning (HMP)

planning committee



provide updates on development changes



document NFIP participation and compliance



define the future update process



address repetitively damaged structures



document formal plan adoption

core team

listening session

climate change hazards and projections

opportunities to improve

risk matrix

prioritize climate adaptation actions

summary of findings

state action grants

public input events

natural hazards and in-depth hazard profile

document existing

background research

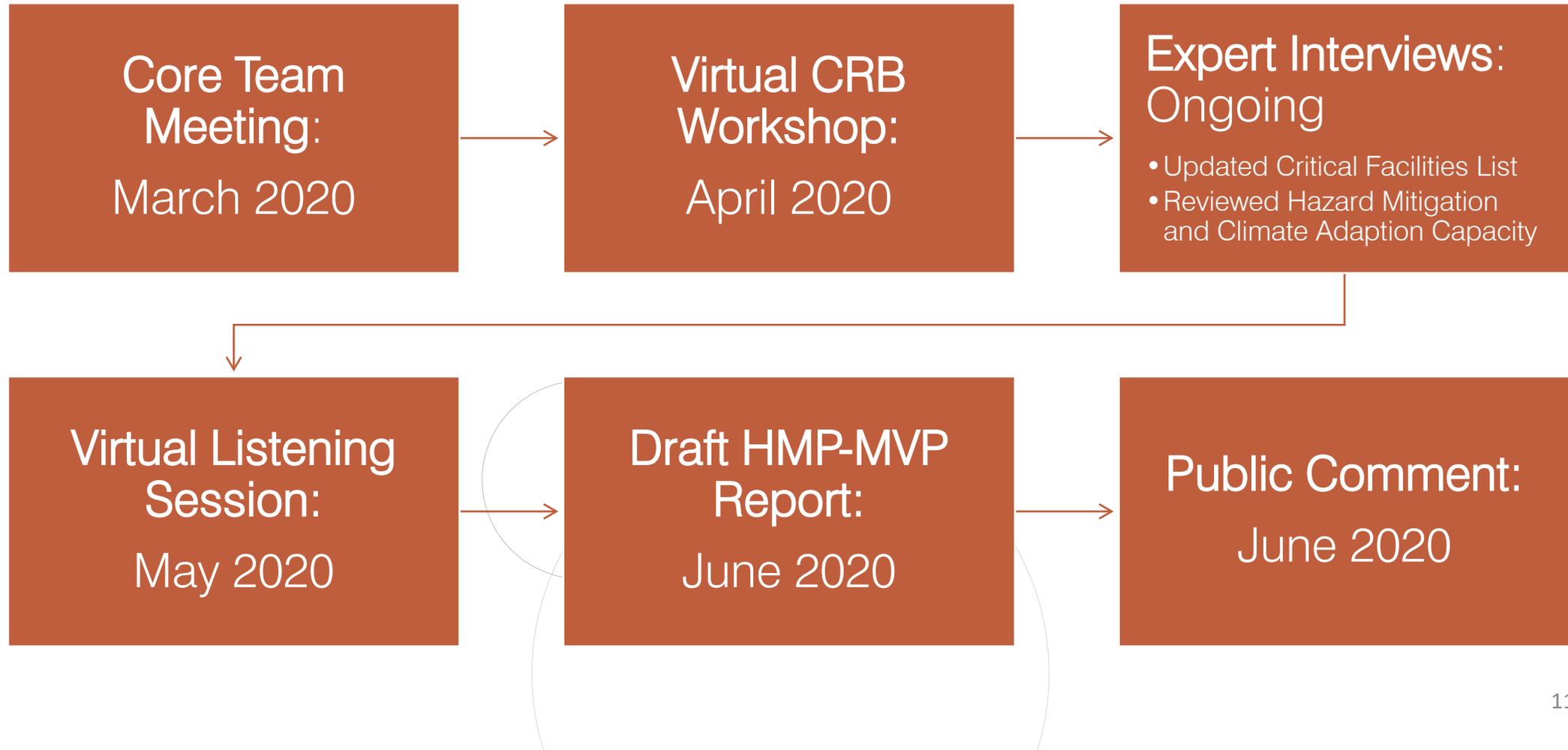
implementation plan for hazard mitigation

hazard mitigation plan

federal grants



SCHEDULE



● ● ● ●

COMMUNITY RESILIENCE BUILDING WORKSHOP



Focused on **Four Hazards**

Identified:

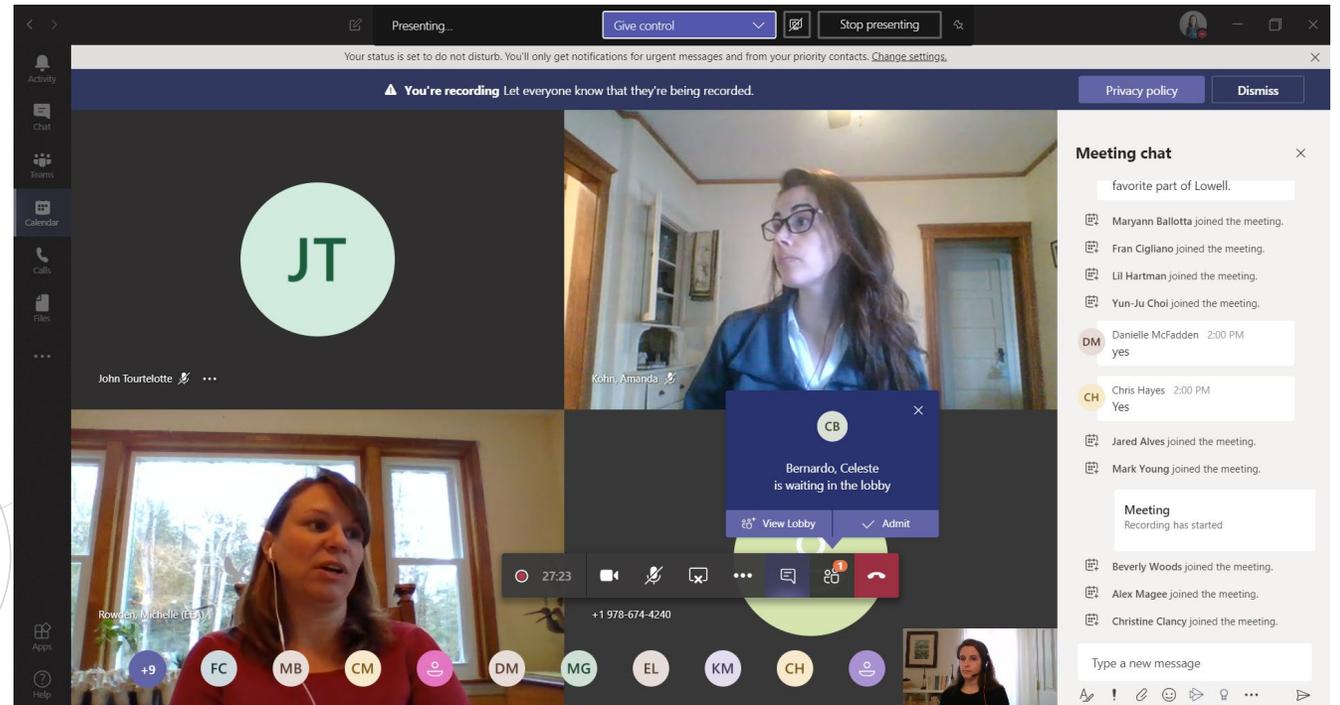


- Vulnerabilities
- Strengths
- Priority Action Items

Across Three Categories:



- Infrastructure
- Societal
- Environmental



**Any questions
about the MVP
program or the
hazard mitigation
planning process?**



CLIMATE HAZARDS

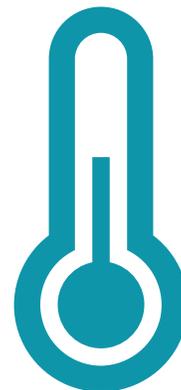


Photo: City Facebook



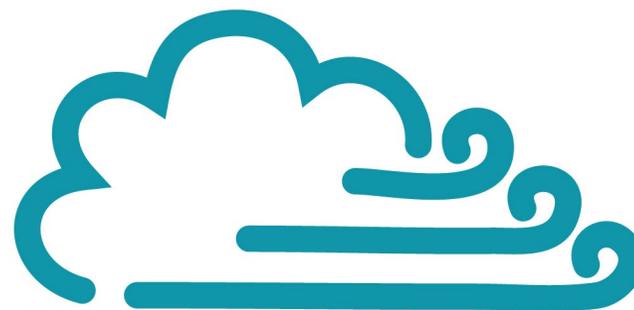
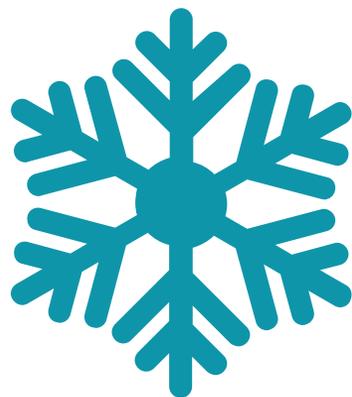
TOP HAZARDS IN LOWELL

Flooding



Extreme
Temperatures

Extreme Winter
Weather



Wind and
Microbursts



EXTREME TEMPERATURES



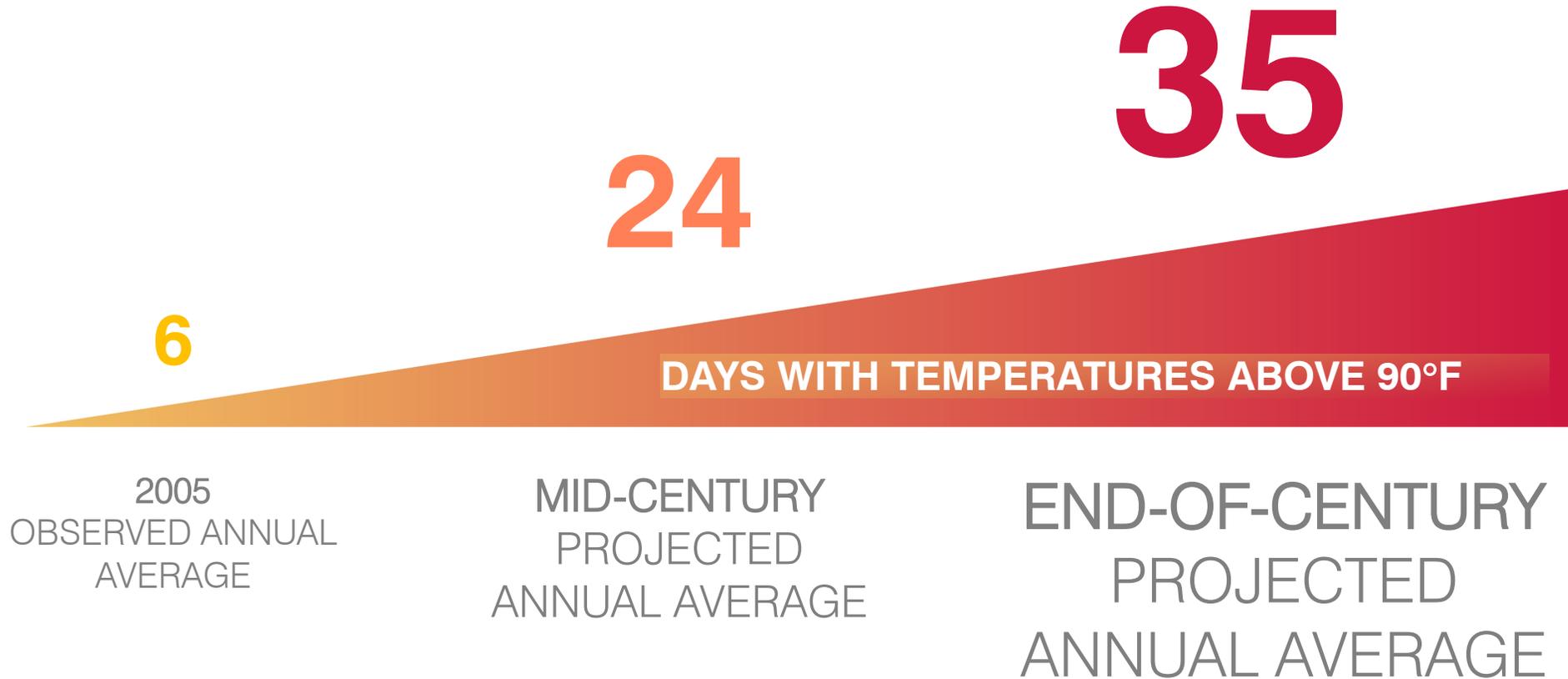
WARMER ANNUAL AIR TEMPERATURES
UP 0.5°F PER DECADE SINCE 1970, ON AVERAGE



WARMER WINTERS
UP 1.3°F PER DECADE SINCE 1970, ON AVERAGE



EXTREME TEMPERATURES IN MASSACHUSETTS



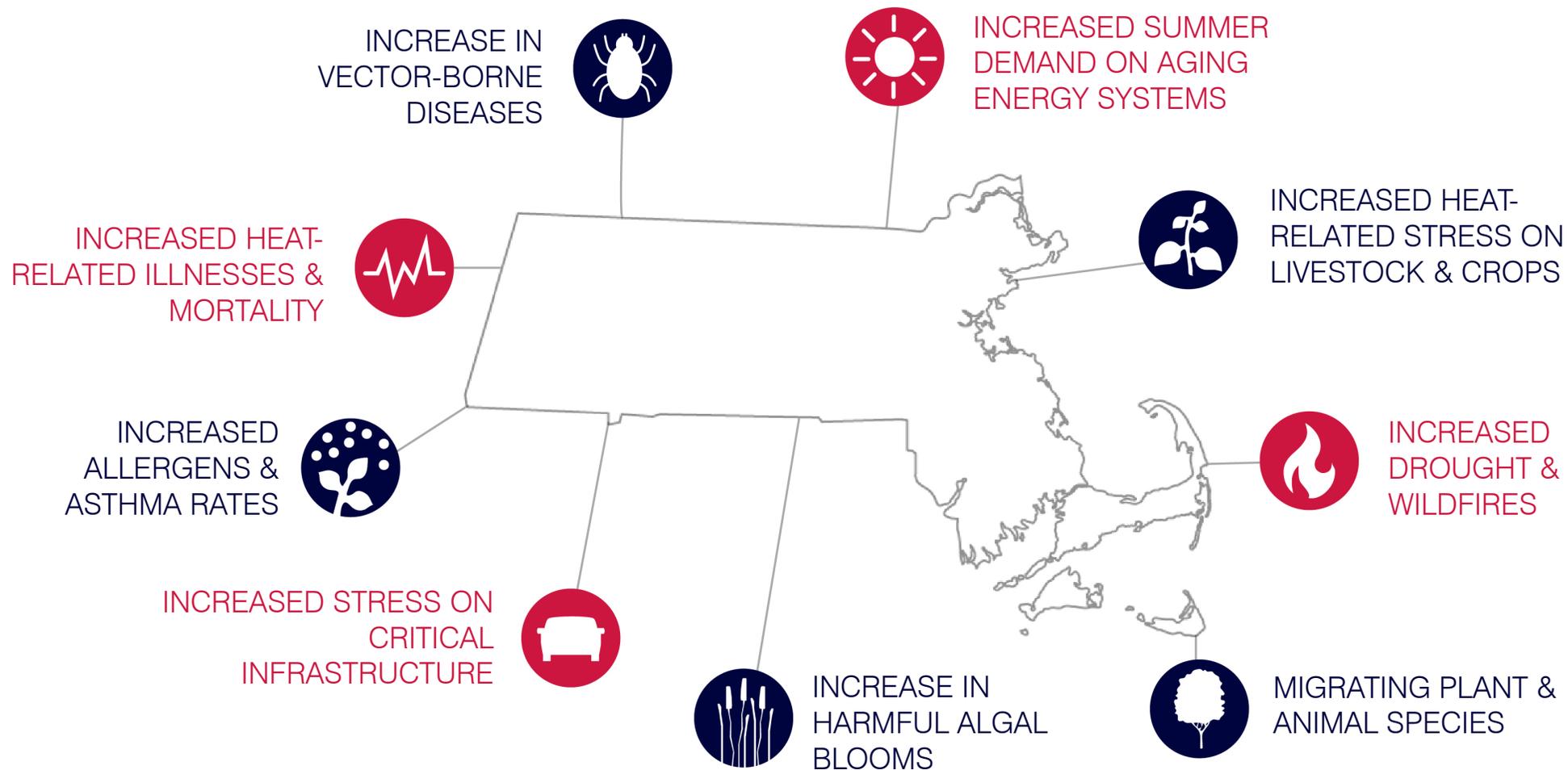
IMPACTS OF RISING TEMPERATURES



WARMER ANNUAL AIR TEMPERATURES
UP 0.5°F PER DECADE SINCE 1970, ON AVERAGE



WARMER WINTERS
UP 1.3°F PER DECADE SINCE 1970, ON AVERAGE





CHANGES IN PRECIPITATION

MORE INTENSE & FREQUENT EXTREME RAIN EVENTS

PRECIPITATION DURING
HEAVY EVENTS IN THE
NORTHEAST HAS
INCREASED
BY MORE THAN

70%

BETWEEN 1958-2010

HEAVY EVENTS ARE DEFINED AS THE HEAVIEST 1% OF ALL DAILY EVENTS



EXTREME PRECIPITATION

8%

**Increase in extreme
precipitation events
by **midcentury****

13%

**Increase in extreme
precipitation events
by **2100****

Extreme precipitation events are defined as events with greater than 2" of rain per day



LOCAL FLOODING NEAR WATERBODIES

- Northern banks of the Merrimack River near the Water Treatment Plant
- Land around Black Brook and the Trull Brook tributary between Phoenix Ave and Clark Road
- Areas in the 100-year floodplain along major waterways:
 - Concord River
 - Marginal Brook
 - River Meadow Brook
 - Beaver Brook
 - Clay Pitt Brook (including floods in 2006 and 2007)
- Marsh along Wentworth Avenue
- The mouth of Black Brook
- The mouth of Marginal Brook



LOCAL FLOODING ALONG STREETS

- Wentworth Avenue/Douglas Road area
- Area behind the Wentworth Health Care Facility
- Along Douglas Road near the Janas Skating Rink
- Intersection of Gorham Street (Route 3A, evacuation route) and Moore Street
- Hadley and Pratt Streets
- North of Princeton Street along Black Brook
- Area north of Varnum Avenue and east of Laurel Lane
- Area south of Varnum Avenue and east of Lebanon Street
- Area west of Bridge Street and North of Billings Street
- Area north of Cawley Stadium
- Area south of Hollis Avenue

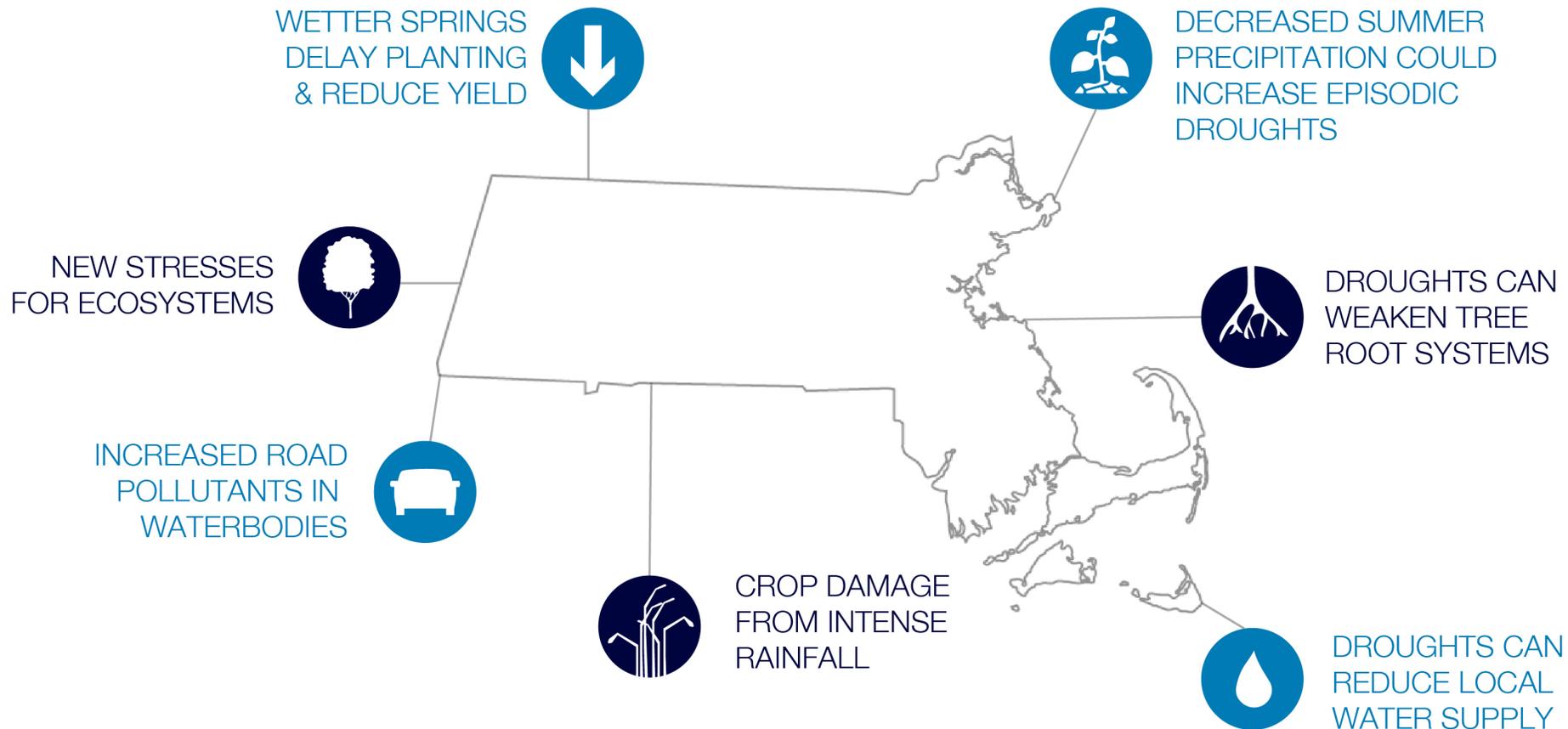
A rainstorm in the summer of 2003 filled the Gorham and Moore Street intersection with up to 4' of water



IMPACTS OF CHANGING **PRECIPITATION**



HIGHER AVERAGE ANNUAL PRECIPITATION
INCREASED BY ABOUT 10% IN THE NORTHEAST IN THE LAST 50 YEARS





EXTREME WINTER WEATHER

The blizzard of 2013 left nearly **400,000 Massachusetts residents without power**

Heavy blizzards are among the **most costly and disruptive** weather events for Massachusetts communities



Nor'easters along the Atlantic coast are increasing in frequency and intensity

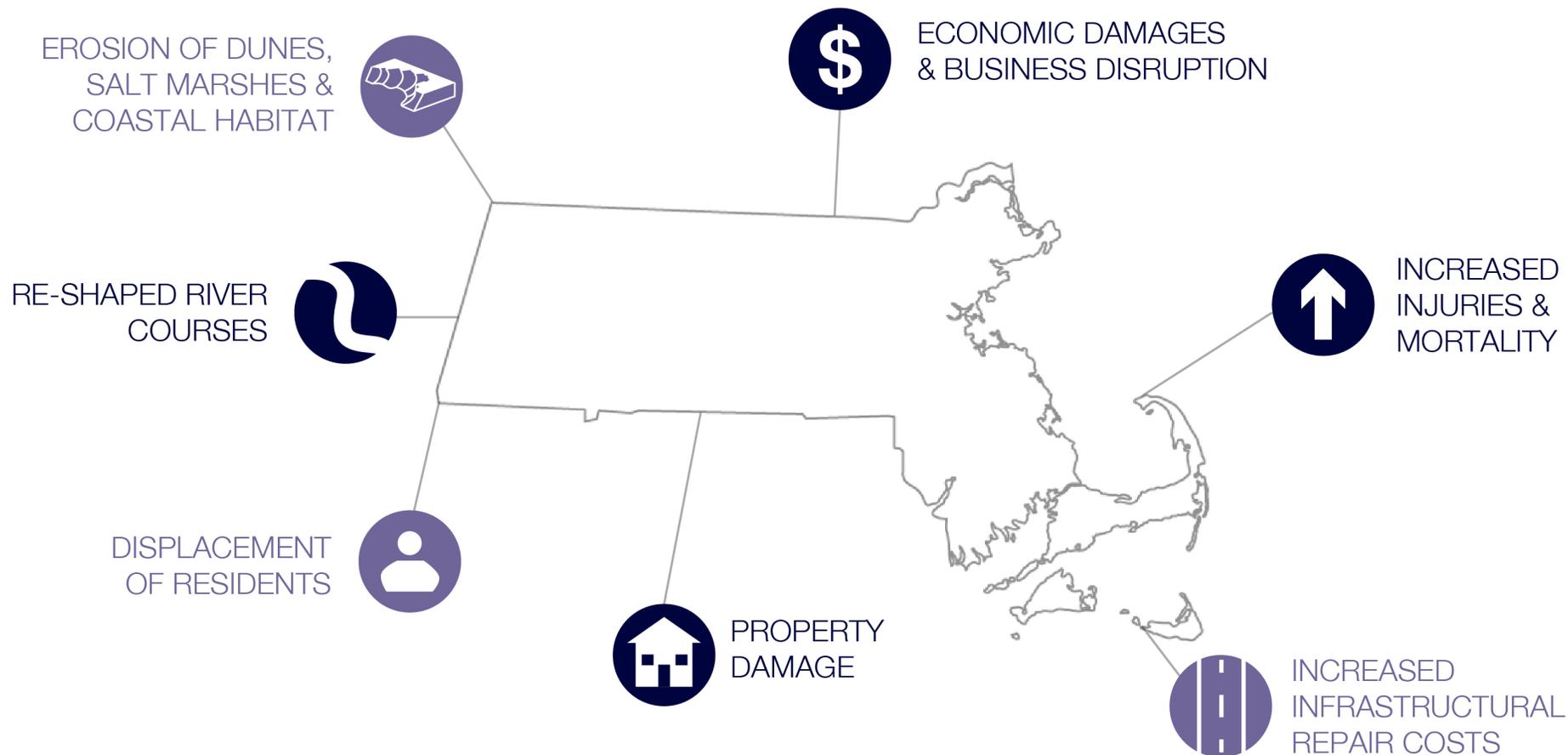
Jan 3-4, 2018: Winter Storm Grayson
March 2, 2018: Winter Storm Riley
March 8, 2018: Winter Storm Quinn
March 13, 2018: Winter Storm Skylar



IMPACTS OF **EXTREME WEATHER**



STORMS ARE BECOMING MORE INTENSE AND DAMAGING





What climate changes have you observed?

What memories do you have of local natural hazards?

STRENGTHS & VULNERABILITIES





INFRASTRUCTURE

Vulnerabilities

- Public buildings, including schools
- Roads, bridges, and public transit
- Stormwater system, including the drainage system, culverts, and catch basins
- Aging canal system and walls



INFRASTRUCTURE

Both Strengths and Vulnerabilities

- Energy resilience
- Communications, including fiber optic, internet, phones and cell phones, and municipal communication through CodeRED or social media
- Water supply and distribution. Supply is a strength, but distribution and aging infrastructure are vulnerabilities.
- Wastewater infrastructure. Recent upgrades and financial investments are strengths, but the collection system is vulnerable to climate impacts.
- Dams and gate houses, including the Pawtucket gate house and Francis Gate. Dams that are re-certified are strengths. The age and condition of some gate houses are vulnerabilities.



ENVIRONMENTAL

Vulnerabilities

- Waterbodies and wetlands, including the Merrimack and Concord Rivers, River Meadow Brook, Beaver Brook, Clay Pitt Brook, and others
- Street trees and citywide tree canopy
- Contaminated sites including the Silresim Superfund Site and brownfield sites
- Invasive species, including both plants and insects



ENVIRONMENTAL

Strengths

- Parks and public spaces, including Eastern Canal Park, Lelacheur Park, JFK Plaza, National Park, and others

Both Strengths and Vulnerabilities

- State forest and park trees, including the Lowell-Tyngsborough State Forest
- Development and land use regulations
- Endangered species, including native plant species



SOCIETY

Vulnerabilities

- Public health concerns, including vector-borne diseases
- Residents at risk of isolation, including seniors, children, residents with disabilities, and residents with limited English proficiency if emergency communications are in English
- Residents with challenges to prepare or adapt to extreme events, including low-income residents and residents experiencing homelessness
- Housing, including low income housing and other housing



SOCIETY

Strengths

- Municipal and emergency services
- The non-profit community and volunteers

Both Strengths and Vulnerabilities

- Shelters including the high school, senior center, and homeless shelter
- Local businesses



What do you view as some of Lowell's top vulnerabilities and strengths?

HAZARD MITIGATION & CLIMATE ADAPTATION STRATEGIES





EXISTING HAZARD PROTECTION

- Greater Lowell Regional Emergency Planning Committee
- Upper Merrimack Valley Medical Reserve Corp
- Communication Infrastructure, including social media and CodeRED
- Emergency shelters
- Backup generators
- Open Space and Recreation Plan 2019-2023
- Comprehensive Emergency Management Plan
- Participation in the National Flood Insurance Program (NFIP)
- Stormwater System maintenance, including removing debris from catch basins
- Tree maintenance
- Snow plowing and removal
- Public education on fire risk
- Green Communities Program
- Complete Streets Implementation Plan
- 100% Renewable Resolution



HIGH PRIORITIES: INFRASTRUCTURE

- **Roads, bridges, and public transit:**

- Identify at-risk bridges and develop an emergency plan for each.
- Update snow removal plan and enforce rules for clearing sidewalks. Develop a formal parking ban. Buy new plow equipment.
- Update tree pruning and maintenance program. Hire a City Arborist and work with the National Grid. Develop a list of appropriate street trees.
- Develop an emergency tornado response plan for the LRTA Bus system.

- **Water supply and distribution:**

- Invest in aging infrastructure. Protect the distribution system from the freeze/thaw cycle and proactively secure funding to address breaks. Assess and track “hot spots” with frequent breaks and identify potential solutions.
- Floodproof the Water Plant Intake Station.



HIGH PRIORITIES: INFRASTRUCTURE

- **Stormwater system:**

- Upgrade culverts near Clay Pitt Brook. Assess and map the entire drainage system. Ensure appropriate capacity of catch basins.
- Develop a beaver management program.
- Continue to encourage Low Impact Development and assess options for regulatory mechanisms.

- **Wastewater Infrastructure:**

- Assess floodproofing options for vulnerable pump and combined sewer overflow stations.
- Add backflow prevention to combined outfalls.
- Integrate new battery storage to the existing solar array and backup generator at the Water Treatment Plant. Consider a similar approach at the Wastewater Plant.



HIGH PRIORITIES: INFRASTRUCTURE

- **Canal system and walls:**

- Conduct an inventory and assessment of the walls and identify needed repairs.
- Increase public education and outreach related to trash removal and encourage residents and visitors to avoid throwing trash in the canals.
- Participate in the ongoing Federal Energy Regulatory Commission (FERC) study and re-licensing process and review their materials.
- Manage trees along the canals through increased coordination with DCR.

- **Dams and gate houses:**

- Model and assess the impact of the 500-year flood on the gate houses and develop an overall response plan.
- Identify and address vulnerabilities of the earthen dam near Beaver Brook Bridge.
- Coordinate with dam operators and the hydropower entity on flood mitigation.



HIGH PRIORITIES: ENVIRONMENT

- **Waterbodies and wetlands:**
 - Update the floodplain overlay district and local wetlands ordinance.
 - Map at-risk banks and seek funding for combined trail and bank mitigation projects
 - Evaluate alternatives to salting/sanding. Identify snow storage locations and provide education on environmentally friendly snow clearing.
- **Development and land use regulations:**
 - Integrate the Stormwater Team standards with Planning Office regulations.
 - Evaluate options for setting maximum parking requirements



HIGH PRIORITIES: SOCIETY

- **Public health:**

- Increase public education related to the risks of vector-borne diseases (ticks) and how to protect yourself.

- **Shelters:**

- Increase capacity of homeless shelter during extreme cold events.
- Increase capacity of shelter system to allow for social distancing if needed.
- Inventory shelter supplies and increase staff, volunteers, and training. Develop contingency plans. Install alarms for high food storage temperatures.
- Identify potential short-term shelters for use during power outages.
- Develop a formal plan with the City, LTC, local organizations, and others to get the word out about risks and resources. Develop a contact or distribution list.



HIGH PRIORITIES: SOCIETY

- **Residents at risk of isolation:**
 - Work with local partners to share information and get the word out.
 - Translate announcements into multiple languages. Use accessible visuals.
 - Partner with schools to share information with parents. Share information through a range of means, including digital, TV, and messaging signs.
 - Develop a database of at-risk residents with emergency service providers and the senior center. Conduct wellness checks.
- **Residents with challenges to prepare or adapt:**
 - Evaluate safe areas for informal housing (outside of flood-prone areas). Assess best practices.
 - Work with social services and local organizations to provide support to residents experiencing homelessness.



HIGH PRIORITIES: SOCIETY

- **Municipal and emergency services:**
 - Update the existing Emergency Management Plan.
 - Review available City resources and capacity, including emergency generators.
- **Housing:**
 - Identify grants for climate-resilient housing, including floodproofing, fire resilience, and energy efficiency for denser and older housing.
 - Provide short-term tenant support if an extreme events prevents residents from working and puts them at risk of eviction.
- **Local businesses:**
 - Develop and share a toolkit for improving your business' resilience. Provide short-term support for local businesses, including mobile generators and refrigerated trucks during extended power outages.
 - Assess ability of local businesses to assist with crisis response, including sewing masks or assisting with food production for food banks.



What project ideas do you think are the highest priorities?



Want to be part of
the solution?

- Start by visiting our project webpage to learn more, watch our videos, and **take our online survey!**

tinyurl.com/LowellMVP

- Then, share on Facebook and Twitter with the hashtag **#ResilientLowell**