



Energy Cohort: Extreme Heat

Bridging the gap between building decarbonization and community resilience in Affordable Housing communities

Monday, October 28, 2024 | 11:00 AM ET

LLSC MA

MACDC
Massachusetts Association of Community Development Corporations

NEW ECOLOGY
Community-Based Sustainable Development

About the Energy Cohort:

- A learning, networking, and collaboration group for affordable housing professionals interested in energy efficiency, decarbonization, climate resiliency, and resident health.
- Co-convened with MACDC and New Ecology
- Topics are sourced through direct partner requests and community field surveys



LLSC MA

**MACDC**
Massachusetts Association of Community Development Corporations

NEW ECOLOGY

Community-Based Sustainable Development

Today's Session:



How does extreme heat affect communities?

What concrete measures can building owners take to mitigate these effects?

What initiatives are underway at state and local levels to address extreme heat?

✦ **Building-Level Approaches to Extreme Heat**

Alexander Jarrah, Senior Research Analyst, ACEEE

✦ **Building a Resilient Massachusetts: Extreme Heat Impacts & Actions**

Mia Mansfield, Asst. Sec. for Climate Resilience, EEA

Building-Level Approaches to Extreme Heat

Alexander Jarrah

10/28/2024



About ACEEE:

The American Council for an Energy-Efficient Economy (ACEEE), is a nonprofit research organization that develops policies to reduce energy waste and combat climate change. Its independent analysis advances investments, programs, and behaviors that use energy more effectively and help build an equitable clean energy future.

Learn more at [aceee.org](https://www.aceee.org)



Presenter



Alexander Jarrah, Senior Research Analyst, ACEEE

Alexander Jarrah assists with research on the local policy team and contributes to the *City Clean Energy Scorecard* and the Energy Equity for Renters technical assistance initiative.

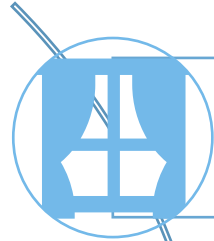
Protecting Residents from Extreme Heat

Measures to Consider Throughout the Building Upgrade Process

ACEEE



Measures to consider in buildings undergoing renovation



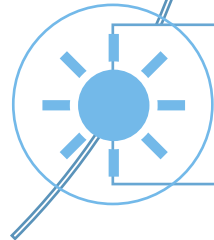
Insulation, air sealing, and weatherization



Roof upgrades: cool roofs, green roofs, and solar photovoltaics with battery storage

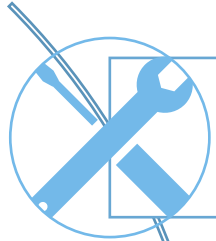


Green stormwater infrastructure: trees, rain gardens, bioswales



Cool pavements and surfaces

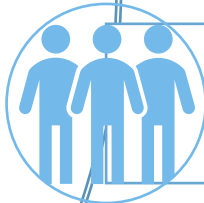
Things to do to prepare for a renovation



Routine maintenance, commissioning, and retrocommissioning of building equipment



Account for equipment and systems for upgrade and determine energy-efficient replacements and funding sources



Engage residents on building issues and preferred upgrades

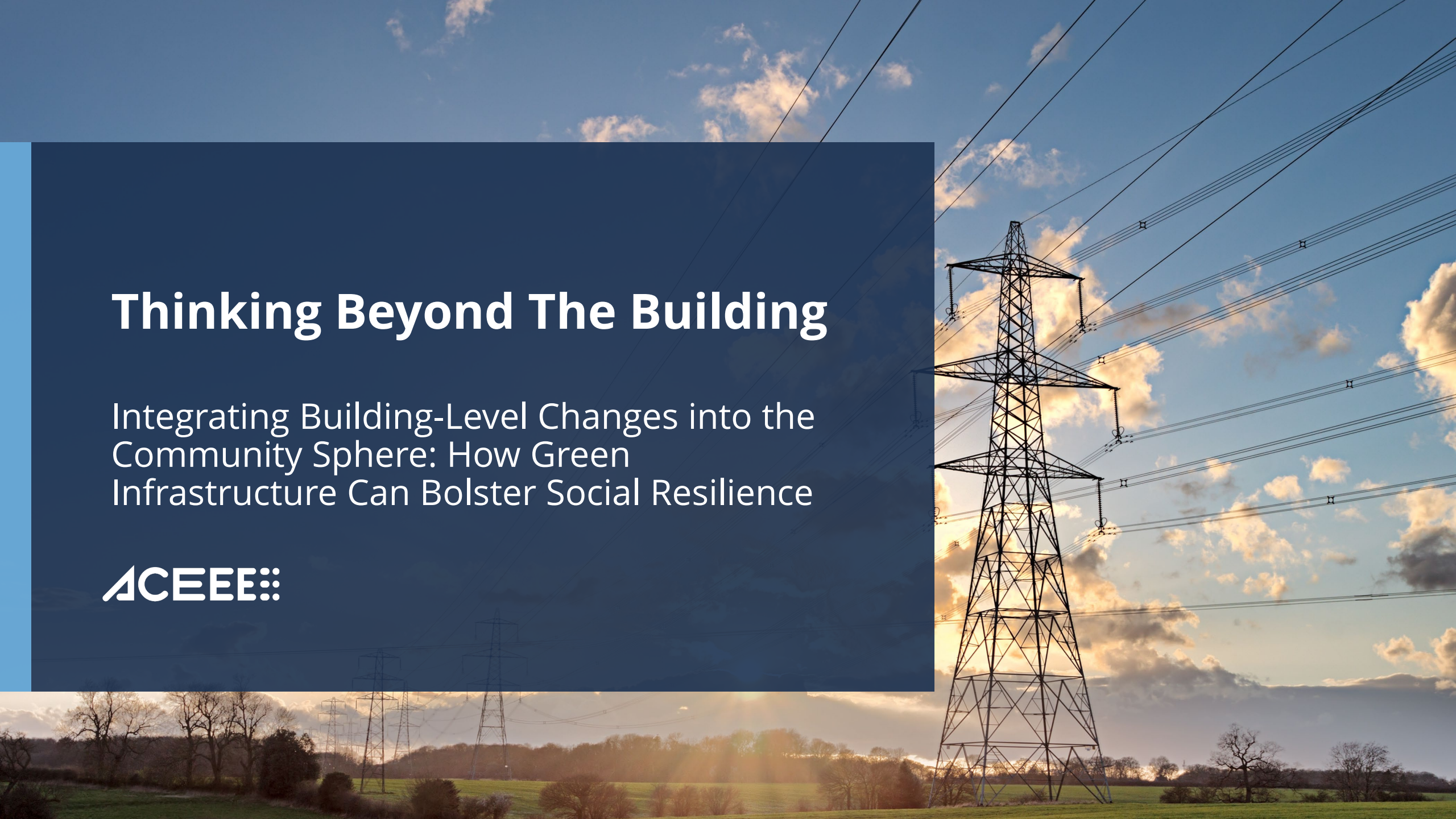


Consider net-zero energy and/or emissions feasibility studies for major retrofits and renovations

Thinking Beyond The Building

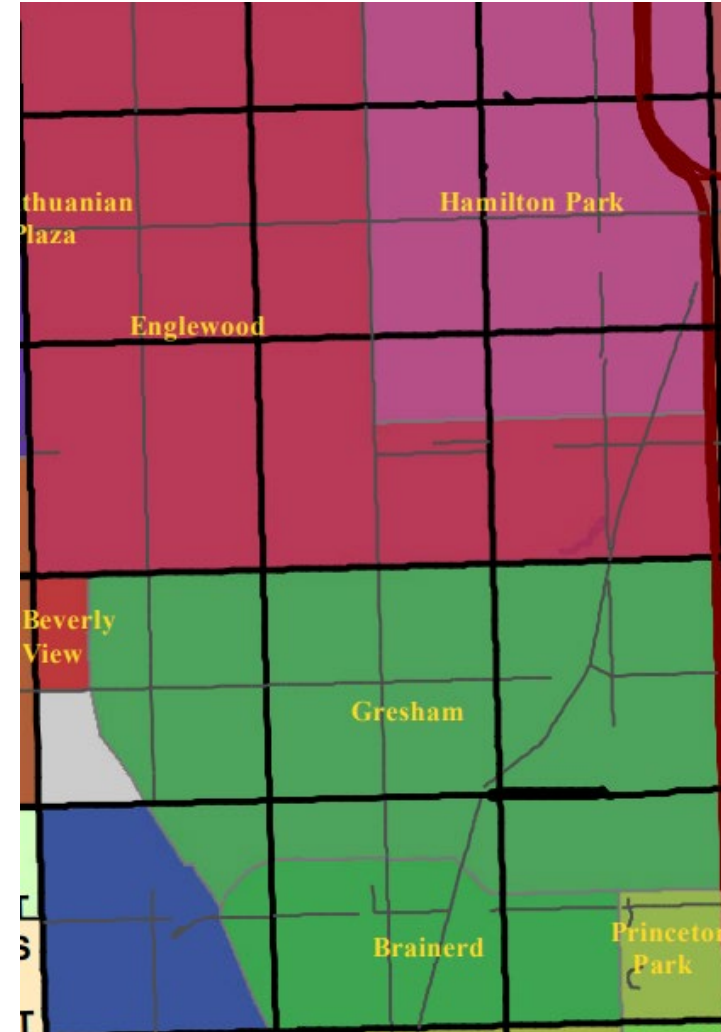
Integrating Building-Level Changes into the Community Sphere: How Green Infrastructure Can Bolster Social Resilience

ACEEE



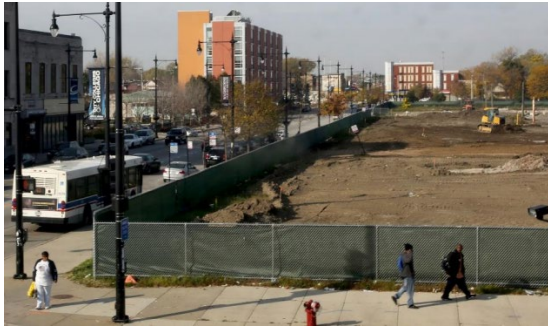
1995 Chicago Heat Wave: Englewood and Auburn Gresham

- Similarities
 - Adjacent neighborhoods
 - Both 99% African American
 - Similar proportion of senior citizens
 - Both neighborhoods had high rates of poverty, unemployment, and crime
- Death rates during heat wave
 - Englewood: 33 per 100,000
 - Auburn Gresham: 3 per 100,000



What can these pictures tell us about the survival rates in these two neighborhoods?

Englewood



Auburn Gresham



Green Space and Social Resilience

- Auburn Gresham’s green space and downtown areas coupled as venues for **social interaction and relationship building**
- These relationships can be critical during extreme heat events → allow vulnerable residents to form connections with those that can support them when needed
- Green space at the building-level can function in the same way and create relationships between residents

How to Create Social Infrastructure across various Real Estate Sectors			
Multifamily	Office	Retail	Hospitality
Build green spaces for residents (e.g., communal courtyards, gardens, or natural areas and trail networks).	Build green spaces and recreational areas (e.g., plazas, parks, or green roofs).	Build interstitial and transit spaces (e.g., atriums or arcades).	Build green spaces and recreational areas (e.g., plazas, parks, swimming pools, or sports courts).
Include internal recreational areas for residents (e.g., recreation or exercise areas, child playrooms, or meeting spaces).	Include third place-like amenities for employees that encourage social gathering (e.g., wellness spaces, coffee bars and shared dining areas, or lounge areas).	Build green spaces or recreational areas (plazas, parks).	Emphasize well-designed common or interstitial spaces for guests or local residents (e.g., attractive lobbies or co-working spaces with seating and amenities), or game rooms.
Create pocket neighborhoods.	Reserve leasable space for community support facilities run by local nonprofits or community groups.	Reserve tenant spaces for locally owned commercial establishments and third places, especially those owned or operated by socioeconomically marginalized groups.	Include third spaces (bars, cafés, or restaurants) for guests or residents.
Include community-oriented features in interstitial spaces such as front porches or shared balconies.	Include community support facilities such as child-care spaces for employees.	Include a diverse mix of third places that promote social experiences, such as cafés, restaurants, play spaces, or entertainment facilities.	Incorporate event and meeting space for local arts and culture organizations, especially for socioeconomically marginalized groups.

Source: Urban Land Institute

Resources

- Reports

- [Cool Policies for Cool Cities: Best Practices for Mitigating Urban Heat Islands in North American Cities](#) - ACEEE
- [Energy Equity for Renters Toolkit](#) – ACEEE
- [Strategies for Multifamily Building Resilience](#) – Enterprise Green Communities
- [Social Spaces, Resilient Communities](#) - Urban Land Institute

- Blogs and Articles

- [Smart Surfaces Reduce Heat. Wider City Adoption Can Protect Disadvantaged Communities](#) by Alexander Jarrah and Miriam Inaimi
- [Want to Survive Climate Change? You'll Need a Good Community](#) by Eric Klinenberg

The background of the slide is a photograph of a large metal power line tower in a green field. The sun is setting behind the tower, creating a warm, golden glow and long shadows. The sky is a mix of blue and orange, with some clouds. Several power lines stretch across the sky from the tower towards the right.

Thank you!

Contact: ajarrah@aceee.org

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Building a Resilient Massachusetts: Extreme Heat Impacts and Actions

Mia G. Mansfield

Assistant Secretary for Climate Resilience

MA Executive Office of Energy and Environmental Affairs



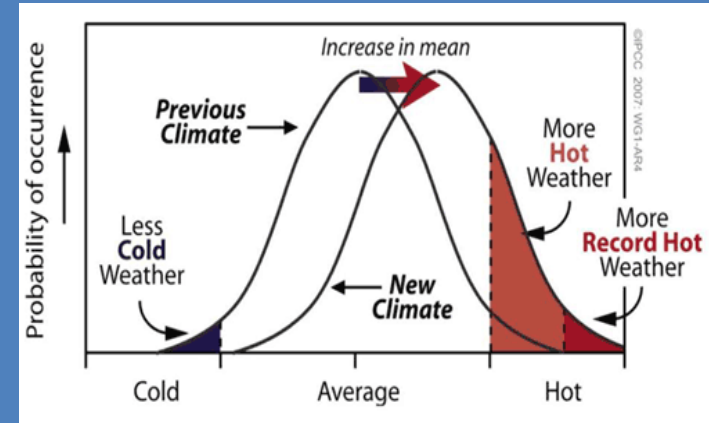
Heat Trends and Projections in MA



Rising Temperatures

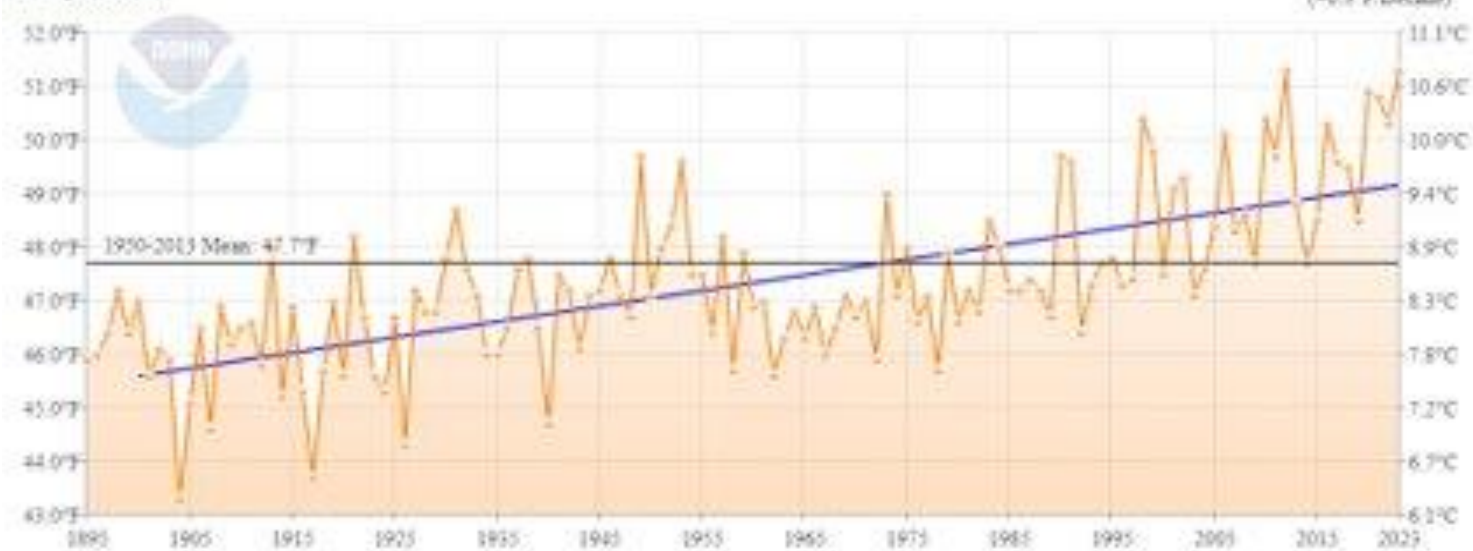
Annual average temperature in MA has risen by $\sim 3.5^{\circ}\text{F}$ since the beginning of the 1900s.

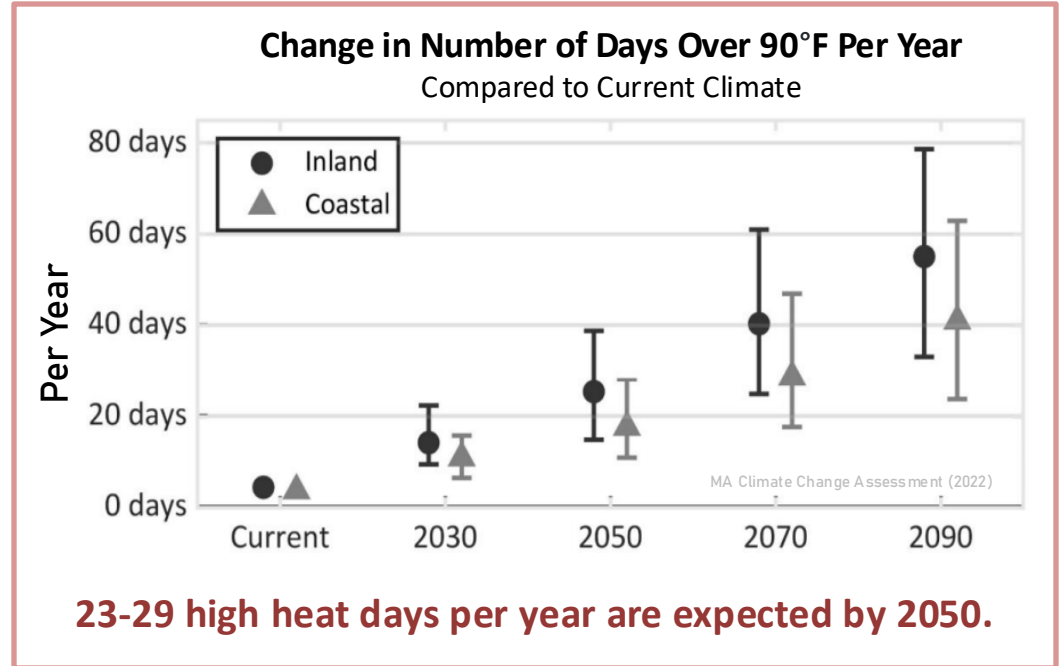
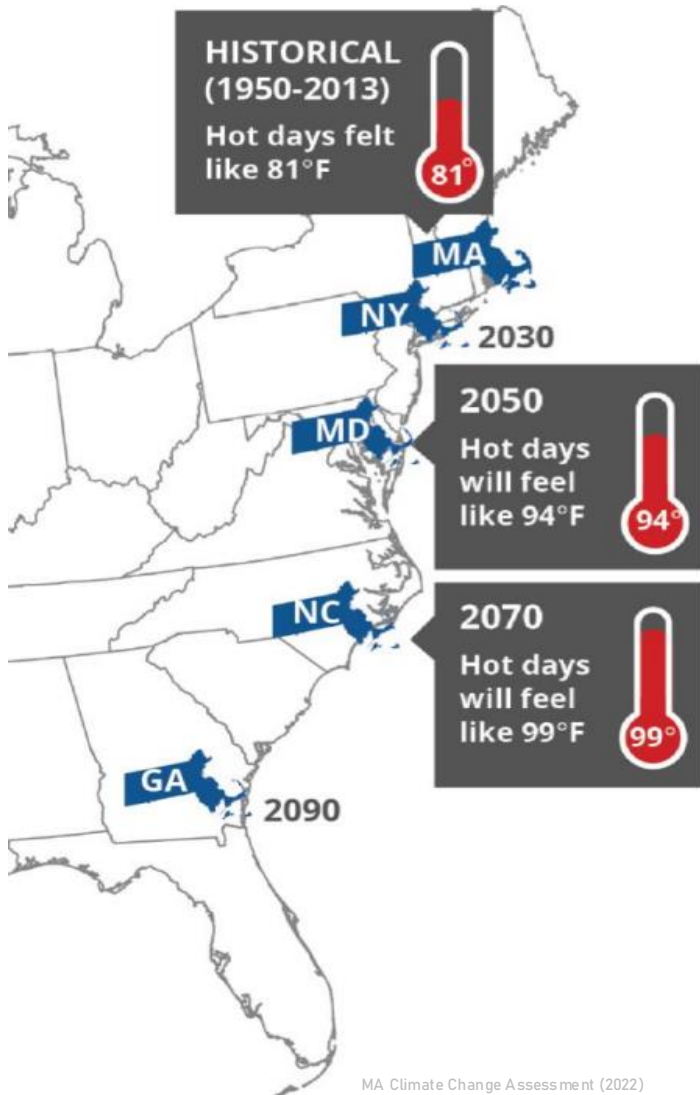
As overall MA climate becomes warmer, high heat days are expected to become more frequent.



Massachusetts Average Temperature

January-December





Additional increase of 5.9-7.9°F in annual average temperature is expected by midcentury.

Hot summer days in MA will start to feel like those currently in more southern states.

Extreme heat affects MA people, ecosystems, and infrastructure, especially those most vulnerable

Extreme heat is a current and growing climate risk in MA. **Average temperatures are rising across the state, with the number of days over 90 degrees expected to increase by up to 15-46 more days by 2050.**



Heat is the top climate-related cause of death in the US;
2023 was the hottest global year on record

Key impacts include:



Human health and cognitive effects including increased incidence of asthma, heat stroke and premature death, injuries, learning loss, and other adverse health impacts



Productivity and economic impacts including loss of output and revenues in businesses due to heat-related closures, agricultural production losses, and lost educational opportunities for students due to closures



Environmental impacts including loss of ecosystem services such as forests' ability to store carbon, along impacts on wildlife and biodiversity



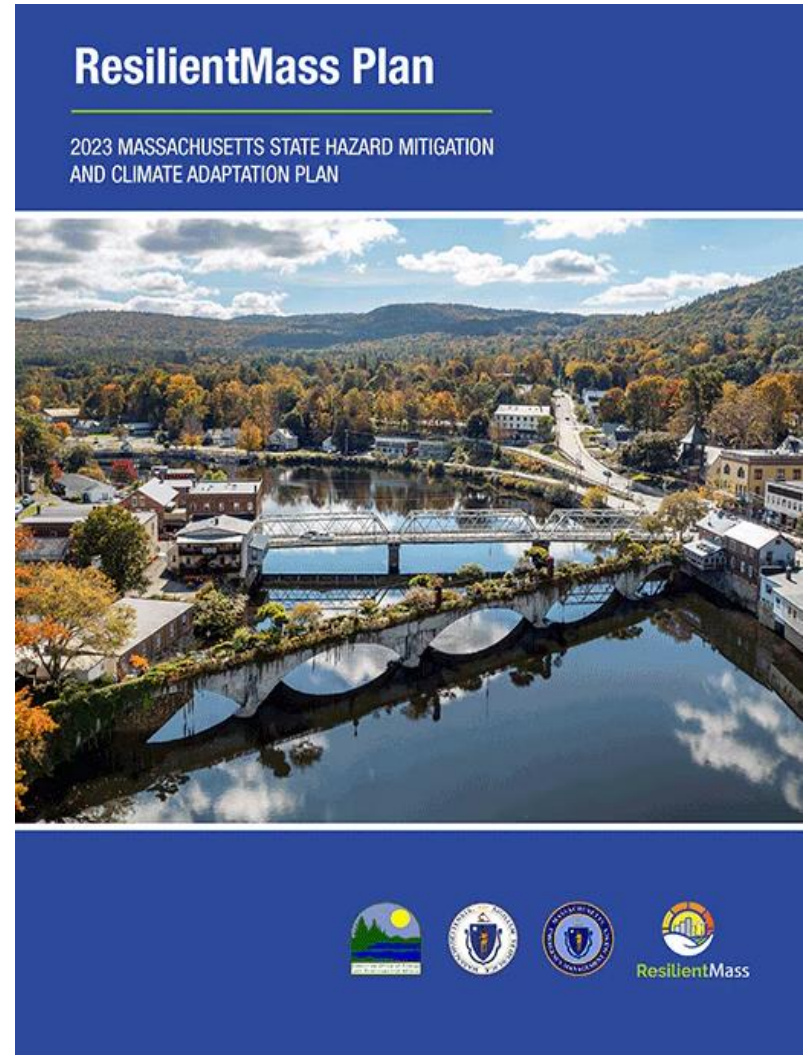
Disproportionate impacts on environmental justice communities and other vulnerable populations such as children, the elderly, people who work outdoors, unhoused populations, others

Extreme heat is a focus of the ResilientMass Plan

The ResilientMass Plan identifies strategies and specific, measurable actions state agencies can take to address risks to the human health and safety, communities, critical assets and infrastructure, natural resources, governance, and economy of the Commonwealth.

Key Impacts Related to Extreme Heat Identified in the plan as “Most Urgent” Include:

- Health and Cognitive Effects
- Reduced Ability to Work
- Damage to Electric Transmission and Utility Distribution Infrastructure
- Damage to Rails and Loss of Rail/Transit Service



resilient.mass.gov

Agency actions in the ResilientMass Plan and Climate Chief Report that address extreme heat

Labor and Workforce Development

Workforce heat exposure outreach

Capital Asset Management and Maintenance

Address the risk of extreme heat to building occupants

Veteran Services

Use relevant programs to provide education and outreach to vulnerable veterans

Conservation and Recreation

- Inventory and categorize shade shelters on DCR sites, and strategically improve shading and cooling structures in parks, prioritizing those located in Environmental Justice communities
- Expand DCR's Greening the Gateway Cities program into four Environmental Justice communities.



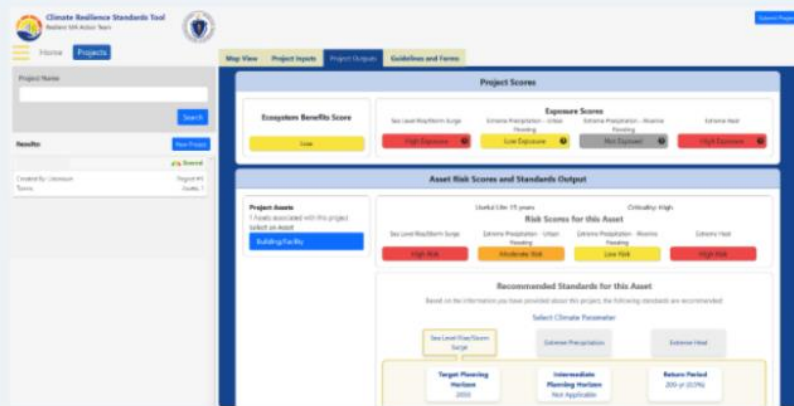
Greening the Gateway City team from Lynn

Health and Human Services

- Develop and implement a new Heat Flag System to identify days of extreme heat to urge preparedness and caution to people outdoors, particularly children and the elderly
- Identify opportunities to improve cooling standards in buildings to address extreme heat impacts
- Develop outreach materials for climate change and health
- Consider appointing a Chief Heat Officer
- Work with MEMA and other stakeholders to compile a comprehensive plan for heat-events

Identifying climate risks and recommended standards at the project level

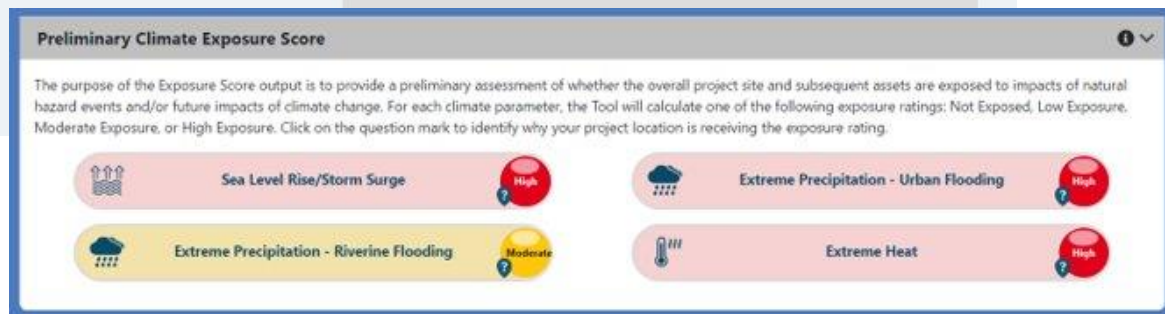
Climate Resilience Design Standards Tool



This is the beta version of the **Climate Resilience Design Standards Tool**. Log in or register below to pilot the tool. Please submit feedback to support our piloting and improvements process by [using this form](#).

[LOG-IN / REGISTER >](#)

An interactive web-based tool that automates MA's available climate change data and provides a preliminary climate exposure screening and planning recommendations for projects (resilient.mass.gov)

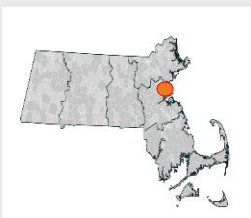


Municipalities are leading heat actions plans and partnerships

Metro Boston Mayors Cool Roofs Project



Metropolitan Area Planning Council FY23/24



Learn more:

- [Project Website](#)

AWARD

\$88,500

MATCH

\$30,000

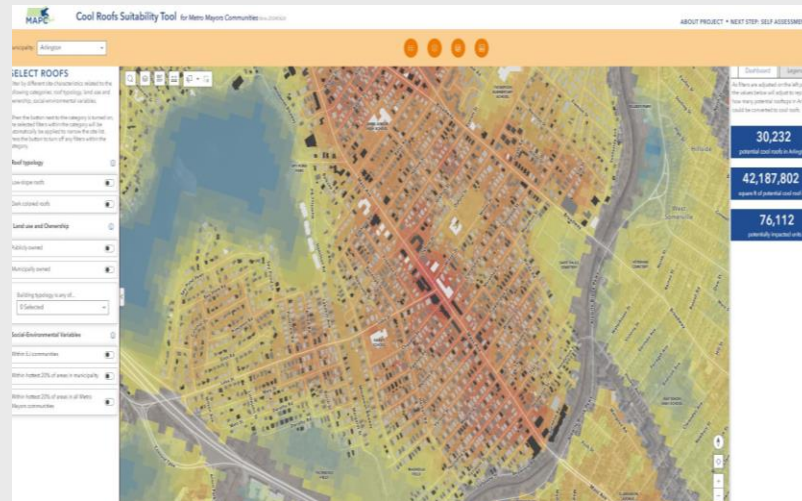
PROJECT TYPE

**CORE PRINCIPLES
DEMONSTRATED**

Utilizing climate change data for a proactive solution; utilizing regional solutions for regional benefit.

DESCRIPTION

MAPC created a suite of tools and resources to support municipalities and other property owners in installing cool roofs. This includes an educational toolkit, guidance for creating an incentive program, and a procurement template for public buildings, among others. MAPC also developed an online mapping tool for all properties in Metro Mayors communities to assess their suitability for a cool roof.



City of Boston Heat Resilience Planning Study (the "Boston Heat Plan")



Boston FY21-22

Learn More:

- [Preparing for Heat](#)
- [Heat Resilience Solutions for Boston](#)

AWARD

\$280,070

MATCH

\$94,622

PROJECT TYPE

Planning, Assessments, and Regulatory Updates

CORE PRINCIPLES
DEMONSTRATED

DESCRIPTION

- Developed a comprehensive framework of 26 strategies for citywide heat resilience with a focus on environmental justice communities experiencing disproportionate heat impacts.
- Produced updated heat maps including daytime and nighttime air temperature, urban heat island index, and heat event duration.
- A Community Advisory Board (CAB) was formed to inform the development of the strategies and the community engagement strategy.
- Set up catalytic projects to increase access to cooling and build awareness of existing resources.

26 strategies to increase access to resource and reduce localized extreme temperatures.



OPERATIONS AND COMMUNICATIONS



COOLING DURING HEAT WAVES



LOOKING OUT FOR NEIGHBORS



AWARENESS, EDUCATION, AND TRAINING



BUILDINGS



PARKS, TREES, AND OPEN SPACE



TRANSPORTATION AND INFRASTRUCTURE



PLANNING, ZONING, AND PERMITTING



Chelsea Urban Heat Island Mitigation Project



Chelsea FY21-22

Learn More:

[Chelsea Heat Island Mitigation Project Website](#)



AWARD

\$ 262,996

MATCH

\$ 98,950

PROJECT TYPE

Design, Implementation and Construction



**CORE PRINCIPLES
DEMONSTRATED**

- Performed urban heat island and social vulnerability assessment, prioritized corridors for public and private heat mitigation interventions

DESCRIPTION

- Devised and carried out the CoolBlock Project, in collaboration with GreenRoots and B.U. School of Public Health, a proof-of-concept nature-based solution.

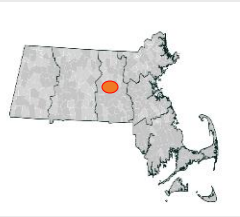
- Conducted bilingual community engagement regarding extreme urban heat, in partnership with local community-based organizations.



Worcester Resilient Community Place-Making and Urban Forests



Worcester FY24



Learn More:

- [Worcester Miyawaki Forests Story Map](#)
- [Worcester CoolPockets Story Map](#)
- [CoolPockets Resilience Summit Slideshow](#)

AWARD

\$409,461

MATCH

\$136,600

PROJECT TYPE

Employing Nature-Based Solutions; Achieving Broad and Multiple Community Benefits

CORE PRINCIPLES DEMONSTRATED

The project's main goal was to promote climate resilience to extreme heat of the community's most vulnerable populations.

DESCRIPTION

Designed and planted 2 urban forests in the EJ heat-prone areas with deep community engagement; and designed 2 others, allowing the community to be grant-proposal ready for the implementation phase.





Municipal Vulnerability Preparedness (MVP) Program

A state and local partnership to build resilience to climate change by building capacity to respond to climate effects at the local level and pilot innovative adaptation practice.

MVP Planning 1.0

99% participation
349 communities

MVP Planning 2.0

FY24 Pilot: 32 municipalities & 1 Tribe

Action Grant Projects

FY 18: 37

FY 19: 36

FY 20: 53

FY 21: 41

FY 22: 66

FY 23: 73

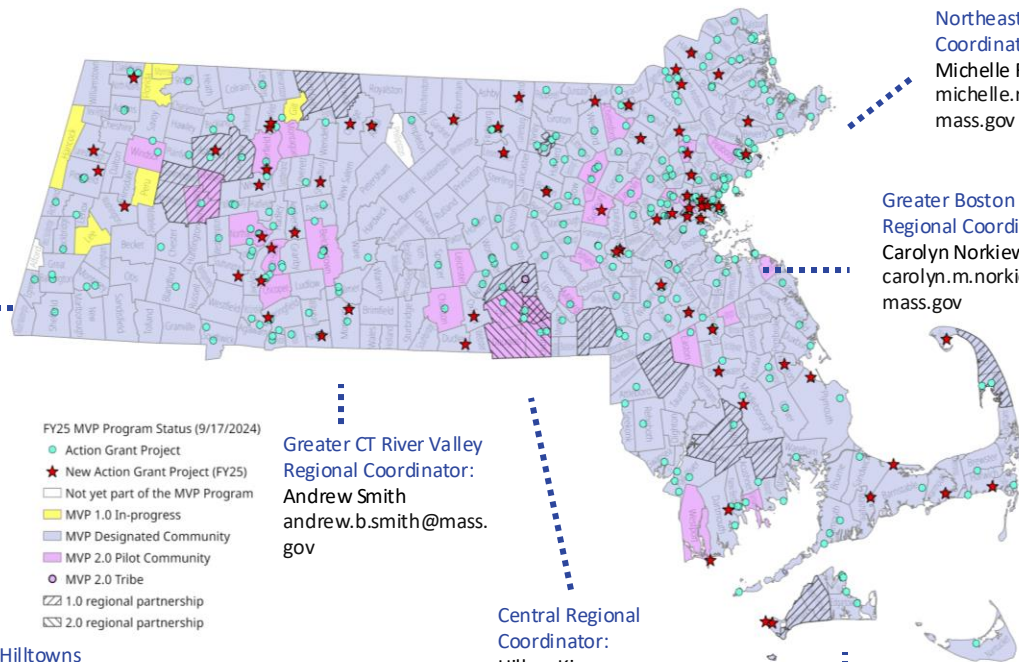
FY 24: 79

FY 25: 71 (\$52.4M)

Total Awards

Planning & Action

\$180M to date



Northeast Regional Coordinator:
Michelle Rowden
michelle.rowden@mass.gov

Greater Boston Regional Coordinator:
Carolyn Norkiewicz
carolyn.m.norkiewicz@mass.gov

Greater CT River Valley Regional Coordinator:
Andrew Smith
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Central Regional Coordinator:
Hillary King
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Southeast Regional Coordinator:
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Berkshires & Hilltowns Regional Coordinator:
Emma Sass
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MVP Director: Kara Runsten - kara.runsten@mass.gov

MVP Deputy Director: Marissa Robertson - marissa.robertson2@mass.gov

MVP Program Coordinator: Elder González Trejo - elder.gonzaleztrejo@mass.gov

GIS Specialist: Sula Watermulder - sula.watermulder2@mass.gov

MVP 2.0...

What's MVP 2.0?

MVP 2.0 continues to support Massachusetts communities in increasing resilience to climate change by building off of and filling gaps from the MVP 1.0 (Planning Grant) process. In particular, MVP 2.0 focuses on revisiting local climate resilience priorities through an equitable and inclusive process and building out and implementing these priorities.

- Convenes **a community team** to do equitable climate resilience work
- Provides **training** on strategies for building resilience, equity, and climate justice
- Revisits resilience priorities with the **involvement of the wider community**
- Helps the municipality and community co-develop and **implement a project**, with guaranteed funding for implementation
- Provides a process that can be replicated for **future Action Grants**



Eligible entities: Municipalities, MVP-eligible Tribes, and MVP-eligible RPAs applying on behalf a municipality/ies

How is MVP 2.0 different than the original MVP Planning Grant (1.0)?

- ▶ Not a traditional planning process
- ▶ Expands community involvement
- ▶ Dives deeper into social resilience
- ▶ Focuses on translating priorities into action
- ▶ Trains a community team

The MVP 2.0 Process



Phase 1 (5 months)

Developing a Core Team

- (1) Starting to Build Your Team
- (2) Identifying Lived Expertise
- (3) Recruiting the Rest of Your Team

Phase 2 (5 months)

Revisiting Resilience Priorities

- (4) Kicking off Collaboration
- (5) Uncovering Social Resilience
- (6) Revisiting Community Resilience Priorities

Phase 3 (13 months)

Implementing a Seed Project

- (7) Selecting a Seed Project
- (8) Developing an Implementation Plan
- (9) Implementing a Seed Project
- (10) Reflecting, Adjusting, and Next Steps

MVP 2.0 Process Guide walks through steps in detail.

The MVP Planning 1.0 Core Team

Town A

- Director of Public Works
- Council on Aging Director
- Director of Planning and Land Use
- Fire Chief
- Conservation Director
- Facilities Director
- Town Administrator
- Police Chief
- Water Department Superintendent

Town B

- Town Planner & Conservation Agent
- Regional Planning Agency Staff



Town C

- Director of Public Works
- Town Engineer
- Town Administrator
- Historical Commission
- Town Planner
- Conservation Agent
- Fire Chief
- Police Chief
- Asst Town Administrator
- Council on Aging Director

The MVP Planning 2.0 Core Team



Town A

Municipal staff

- Asst Director of Planning & Land Use
- Information Technology Director
- Conservation Planner
- Building & Board of Health staff member

Community liaisons

- Local farmer
- Food pantry staff member
- Renter in an affordable housing complex

Town B

Municipal staff

- Town Planner & Conservation Agent
- Library Director
- Council on Aging
- Health Director

Community liaisons

- CBO working with older adults and persons with disabilities
- Member of faith-based community
- Local community resource center staff member

Town C

Municipal staff

- Council on Aging Director
- Select Board member
- Asst Planner & Conservation Agent

Community liaisons

- Member of immigrant and renter communities
- Teacher of multilingual families and students with special education needs
- K-12 student
- Social activist



Thank you!

Please reach out with any questions or feedback!

mia.mansfield@mass.gov

Resources:



Funding for Building-Level Measures:

Name	Type	Funds
MassCEC's BETA Project Planning	No-Cost Technical Assistance	Building Decarbonization Assessment
Affordable Housing Decarbonization TA Hub	No-Cost Technical Assistance	Building Decarbonization Assessment
Climate Ready Housing	Project Financing	Comprehensive Energy Retrofit
LEAN DER	Project Financing	Comprehensive Energy Retrofit
Affordable Housing Decarbonization Grant	Project Financing	Comprehensive Energy Retrofit
Solar Tax Credit	Federal Tax Incentive	Credit/direct payment for solar PVs and battery storage systems
RMI Gap Grants for Building Retrofits	Project Gap Financing	Energy Retrofit (Complete Survey by 10/30)

MVP Resources
MVP Grantees Map
About MVP 2.0
Upcoming MVP Opportunities

Resources:



Miscellaneous Reports & Resources:

Title	Type	Source
Ready to Respond: Strategies for Multifamily Building Resilience	Report	Enterprise
Optimizing retro-reflective surfaces to untrap radiation and cool cities	Report	Nature
Enhancing Resilience in Buildings Through Energy Efficiency	Report	DOE
Energy Equity for Renters Toolkit	Toolkit	ACEEE
Nobody Left Behind: Preliminary Review of Strategies to Support Affordable Housing Compliance with Building Performance Standards	Report	ACEEE
Want to Survive Climate Change? You'll Need a Good Community	Article	Wired
Social Spaces, Resilient Communities	Report	ULI
Extreme Heat Quick Guide	Guide	HUD
Business Continuity Toolkit for Affordable Housing Organizations	Toolkit	Enterprise
ResilientMass Plan	State Plan	MA EEA
Climate Resilience Design Standards Tool	Toolkit	MA EEA
Climate Resilience Design Standards Tool	Toolkit	MA EEA
ResilientMass Plan Action Tracker	Tracking Tool	MA EEA
Cool Roof Suitability in Greater Boston	Mapping Tool	MAPC
IRA & BIL Resource Guide	Guide	Icast

Thank you for joining us!

If you have any questions, would like more resources, or have suggestions/requests for future energy cohort topics, please reach out to:



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