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CONNECTICUT INSTITUTE FOR RESILIENCE & CLIMATE ADAPTATION (CIRCA)

Resilient Connecticut

CIRCA

A RESILIENCE ROAD MAP FOR CONNECTICUT

November 13th, 2024

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UCONN
AVERY POINT

CIRCA
Connecticut Institute for Resilience and Climate Adaptation

CIRCA Mission:

Increase the resilience and sustainability of vulnerable communities in Connecticut's coastal and inland areas to severe storms and the growing impacts of climate change on the natural, built, and human environment in response to critical, identified needs and priorities.

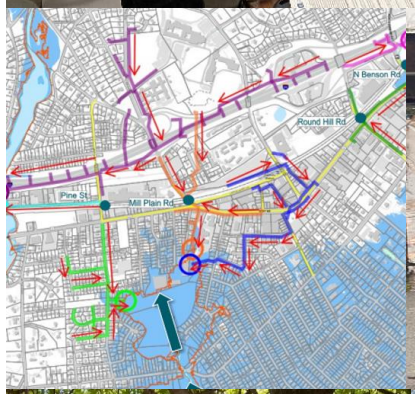
Resilient Connecticut

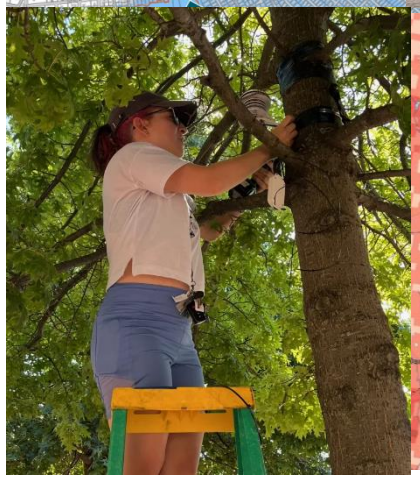
- The CT Institute for Resilience & Climate Adaptation (CIRCA) initiated Resilient CT in Fairfield and New Haven Counties 2018 – 2023. Program expanded to New London, Middlesex, Hartford, and Tolland Counties in 2021-2024.

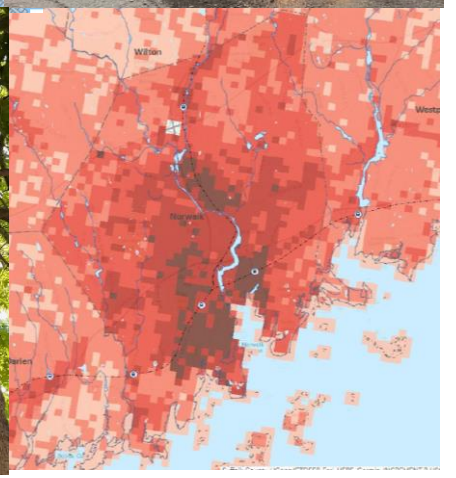
- Goals are to support development of a statewide resilience project pipeline, increase coordination across municipal, regional, and state planning.

- Data & mapping tools to support project development include: Climate Change Vulnerability Index (CCVI) for flooding and heat, zones of shared risk, resilience opportunity areas.

- EJ projects include creation of a statewide EJ Screen mapping tool in partnership with DEEP/DPH and EJ community organizations, and Climate & Equity Grants program w/ DEEP.







CIRCA

CONNECTICUT ENERGY ENVIRONMENT

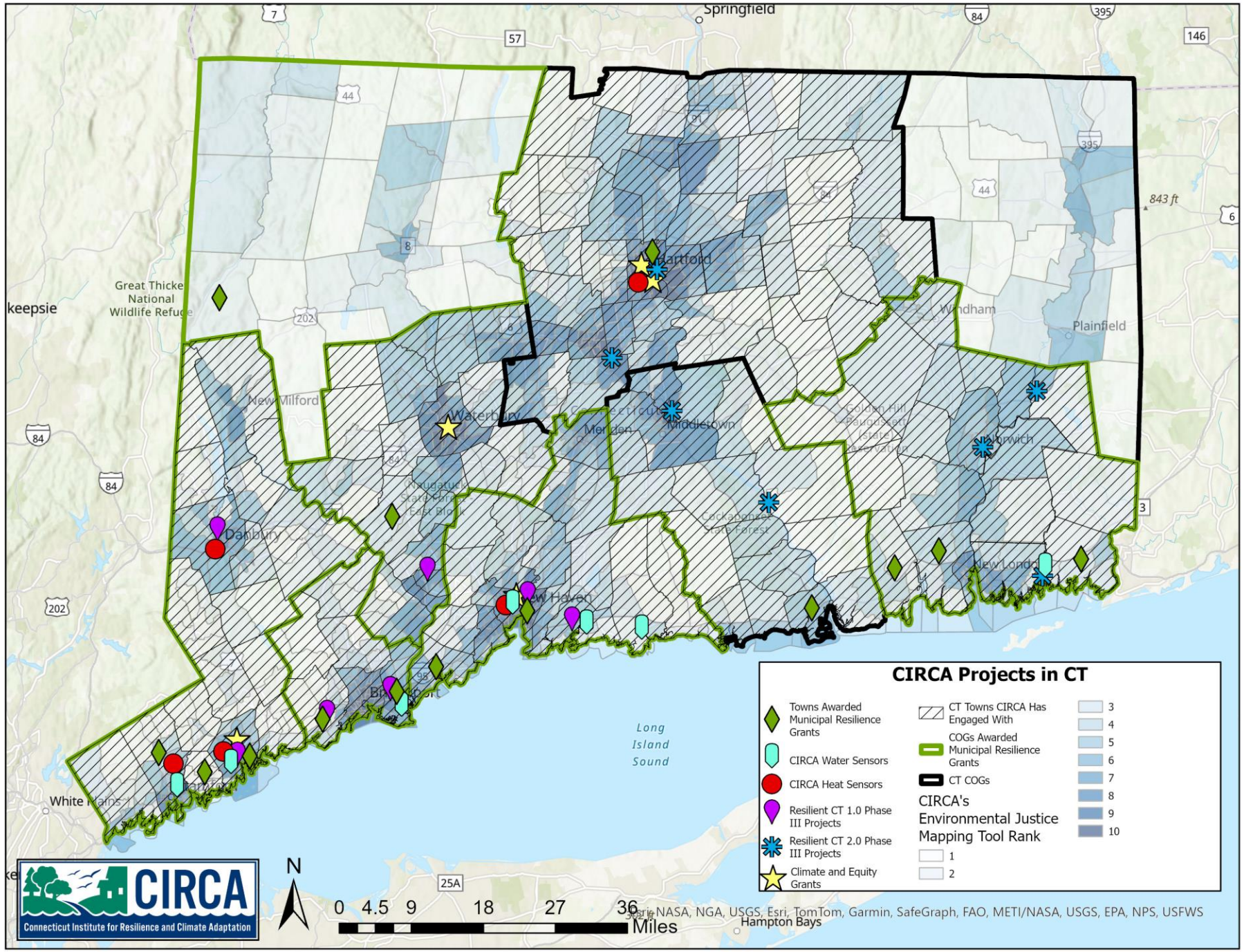
CONNECTICUT Department of Housing

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

CONNECTICUT DIVISION EMERGENCY MANAGEMENT & HOMELAND SECURITY

U.S. DEPARTMENT OF HOMELAND SECURITY

FEMA


CIRCA Projects in CT
Towns Awarded Municipal Resilience Grants
CIRCA Water Sensors
CIRCA Heat Sensors
Resilient CT 1.0 Phase III Projects
Resilient CT 2.0 Phase III Projects
Climate and Equity Grants
CT Towns CIRCA Has Engaged With
COGs Awarded Municipal Resilience Grants
CT COGs
CIRCA's Environmental Justice Mapping Tool Rank
1
2
3
4
5
6
7
8
9
10
Long Island Sound
Springfield
Hartford
Waterbury
New Milford
Danbury
Middletown
Meriden
New Haven
Windham
Plainfield
Norwich
New London
Hampton Bays
White Plains
Great Thicke National Wildlife Refuge
keepsie
843 ft
CIRCA
Connecticut Institute for Resilience and Climate Adaptation
N
0 4.5 9 18 27 36
Miles
Esri, NASA, NGA, USGS, Esri, TomTom, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS, USFWS

RESILIENT FAIR HAVEN

RECOMMENDED ACTIONS

1. **370 James Street Parking Lot & Urban Cooling Center -** Shade trees, parking garage, walking path, natural restoration area, plantings
   Estimated Cost: $17,500,000

2. **Mill River Trail -** Overlooks, shade trees, walking paths
   Estimated Cost: $2,000,000

3. **Outfall Improvements -** Check valve/backflow retrofit, daylighting and new headwall
   Estimated Cost: $1,000,000

4. **Floodable Park and Gateway Property -** Acquisition and demolition of building at 451 Grand Avenue (and re-location of existing business), shade trees, floodable park development
   Estimated Cost: $4,600,000

5. **John W. Murphy Drive Elevation and Flood Barrier -** Road raising and flood berm/sheet pile, interior drainage/pump station, utility relocation, shade trees, paving, fencing/guide rail, side street connections
   Estimated Cost: $25,000,000

6. **Grand Avenue Road and Bridge Elevation -** Road raising, utility relocation, paving, retaining walls, bridge elevation/replacement
   Estimated Cost: $19,900,000

7. **Cooling/Resilience Corridors -** Tree plantings, green stormwater infrastructure
   Estimated Cost: $6,000,000

8. **Family Academy of Multilingual Exploration (FAME) School Parking Lot Cooling Improvements -** Shade structure and green roof, shade trees, plantings in existing play yard
   Estimated Cost: $2,600,000

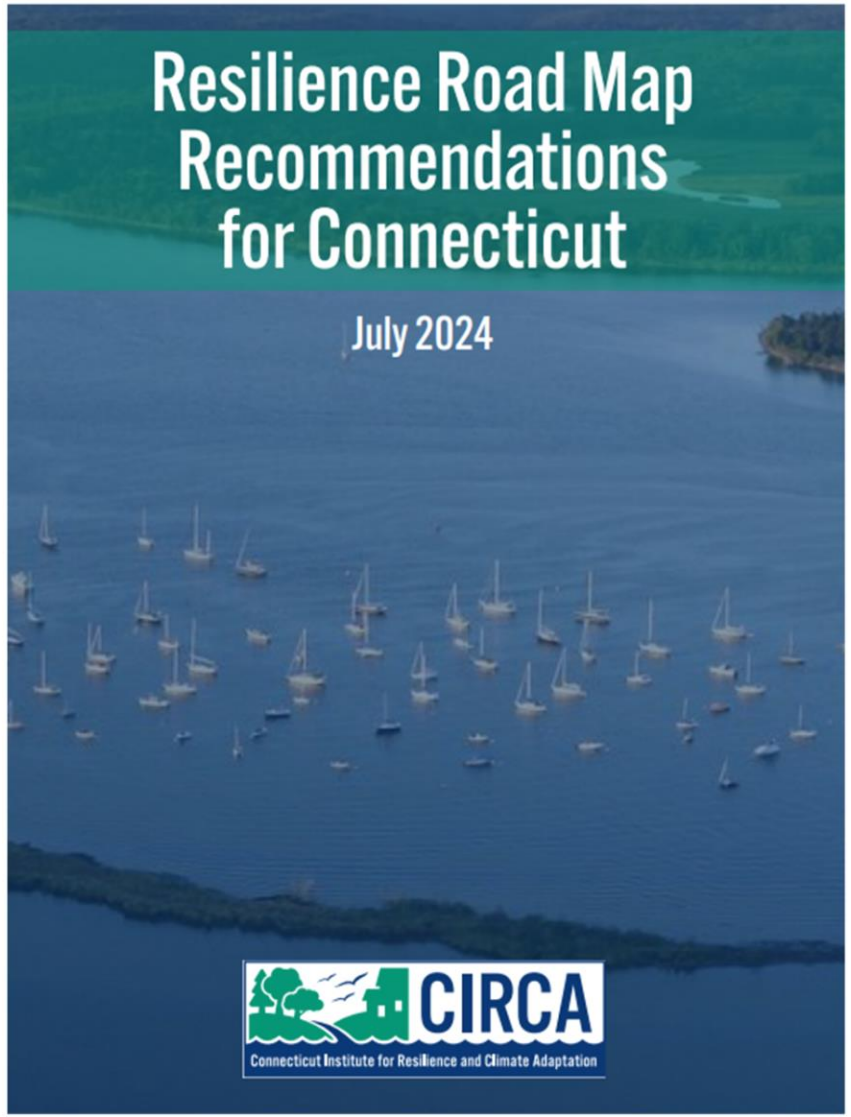
TOTAL COST (-30% TO +50% ROUNDED): $85,000,000 - $127,900,000

Resilience Roadmap

What is the Resilience Roadmap?

Over the course of developing the Resilient Connecticut project, including the pilot project in the 1.0 area and the expansion through the 2.0 area, CIRCA and its partners documented lessons learned and recommendations for the future. These recommendations can provide a pathway forward for the state as we continue to experience the impacts of climate change. For a full discussion of lessons learned and detailed recommendations for the following overarching themes, please see the Resilience Roadmap Report. .pdf

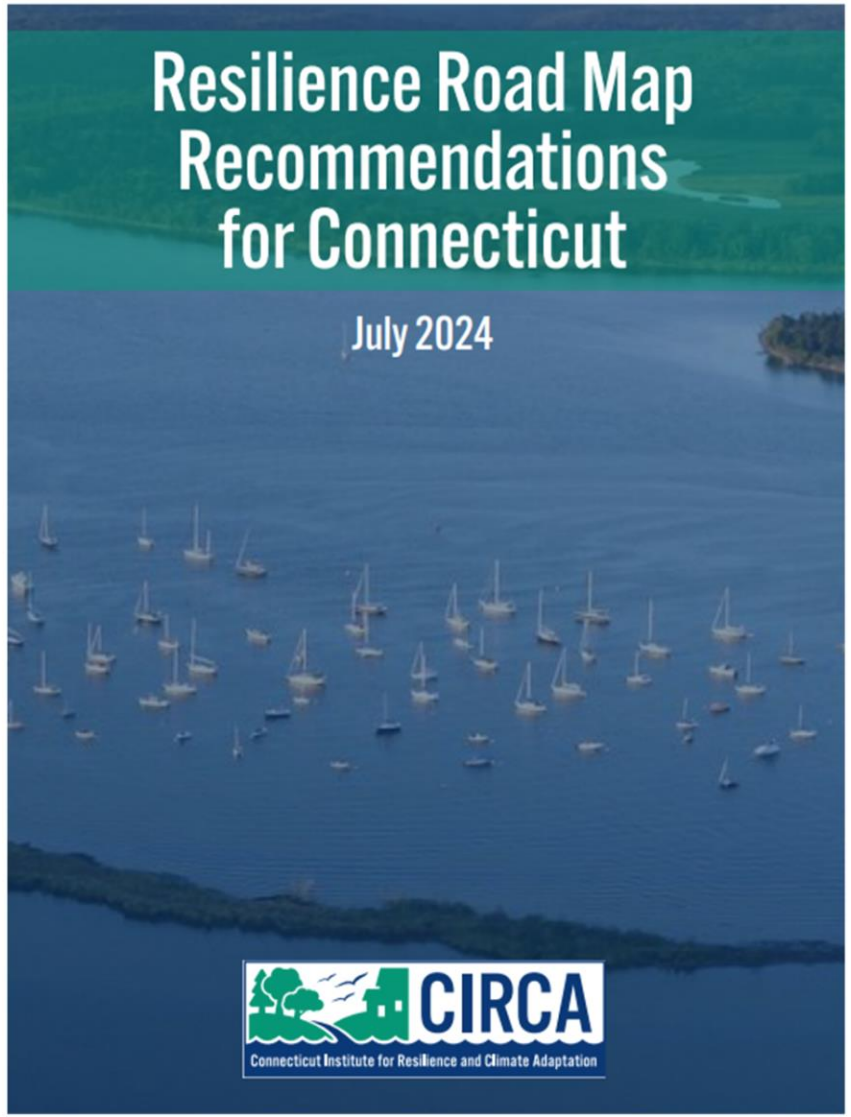
https://resilientconnecticut.media.uconn.edu/wp-content/uploads/sites/3830/2024/09/Resilience-Road-Map-Recommendations-for-Connecticut-9524-V2.pdf



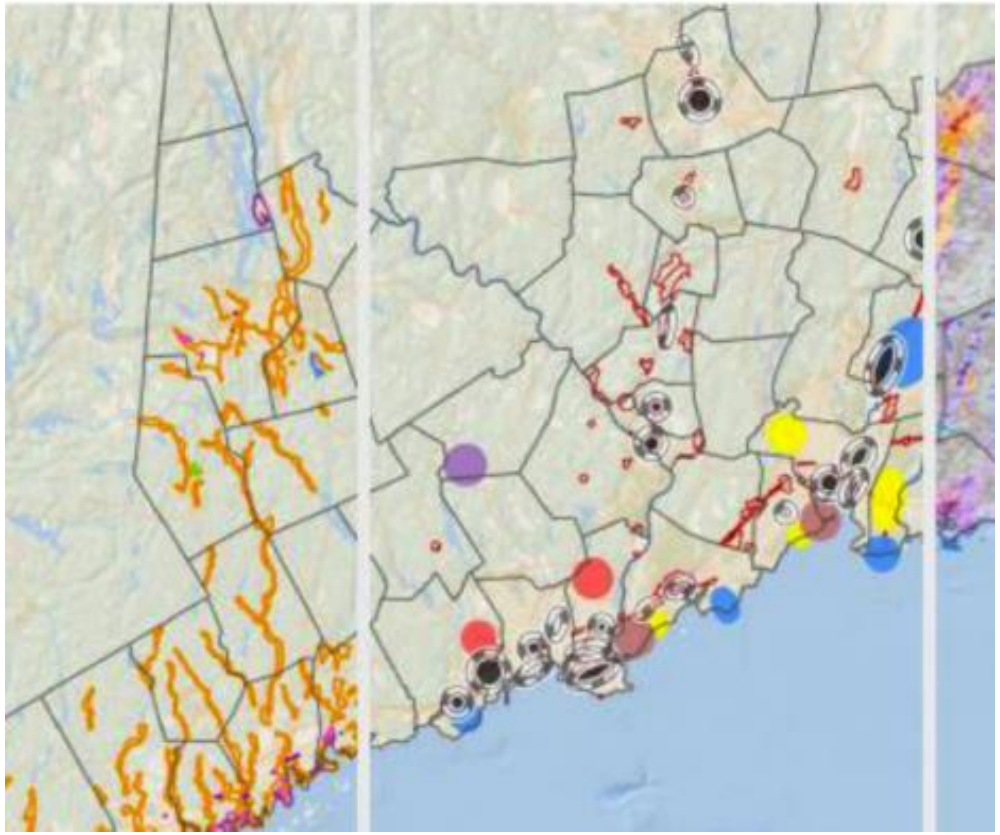
Common Themes, Challenges, and Lessons Learned:

1. Enhanced Planning through Local, Regional, and State Collaboration
2. Economic Development and Floodplain Management Conflicts
3. Agency Engagement and Coordination
4. Challenges Associated with Resources, Staffing, and Sustained Education (aka Capacity)
5. Integrating Technical Information into Planning
6. Issues of Timing and Readiness

https://resilientconnecticut.media.uconn.edu/wp-content/uploads/sites/3830/2024/09/Resilience-Road-Map-Recommendations-for-Connecticut-9524-V2.pdf



1. Take action on existing vulnerabilities, zones of shared risk, and resilience opportunities.



The Resilient Connecticut planning process resulted in the identification of 177 Resilience Opportunity Areas (ROARs) across the 1.0 and 2.0 regions. These represent unmet needs for local and regional planning, project development and implementation support. The database of ROARs can be found on the Resilient Connecticut website.

1. Take action on existing vulnerabilities, zones of shared risk, and resilience opportunities.

1. Move forward with design and implementation of projects that were advanced during Phase III site planning in Downtown Danbury, Downtown Ansonia, South Norwalk, Downtown Fairfield, South End Stratford, Fair Haven, and Branford.

2. Prioritize engagement and planning support for additional Resilience Opportunity Areas, that were identified in Phase II in other vulnerable locations in Fairfield and New Haven Counties

3. Assign responsibility to a lead agency or office to maintain a statewide inventory of climate resilience plans, actions, and projects as references for previous, existing, and ongoing resilience planning work.

4. Strengthen the role of regional Councils of Governments (COGs) to conduct monitoring and progress updates on Natural Hazard Mitigation Plans (NHMPs), Coastal Resilience Plans (CRPs), Climate Adaptation Plans (CAPs), and Plans of Conservation and Development (POCD), to evaluate whether towns are acting on plans and identify barriers and ongoing challenges to implementing actions and projects.

2. Improve agency coordination and take advantage of existing programs and capacity.

Climate adaptation and resilience planning in Connecticut has evolved over the past decade. Today there are many different programs and partners that have built a solid foundation of knowledge, plans, data, and tools to support communities in planning for and adapting to climate change impacts. Going forward, existing programs and partners will need to better coordinate and work together to leverage this foundation for the benefit of communities across the state. This includes leveraging staff capacity and expertise across different state agencies to incentivize more collaboration

2. Improve agency coordination and take advantage of existing programs and capacity.

1. Expand the Resilient Connecticut Program statewide and designate roles and responsibilities for state planning and technical assistance partners with a lead coordination entity (CIRCA).

2. Refresh the State Agencies Fostering Resilience (SAFR) Council. We recommend the development of a mission statement (To ensure effective cooperation and coordination among agencies to accelerate adaptation to the effects of climate change), designated representatives, quarterly meetings and monthly meetings of work groups.

3. Create a planning partners collaborative or council to better organize existing programs and avoid duplication between climate resilience planning service providers.

4. Provide training and application of tools and resources for resilience planning.

5. Create a regional working group (New England, or Northeast) to continually exchange ideas and progress updates between technical and planning partner programs.

3. Utilize equitable and inclusive planning approaches.

The entire community must be engaged in the assessment of adaptation needs, priorities, and projects. Broad participation is essential to ensure public support and to identify the needs of the most vulnerable. Communities that have been traditionally marginalized or disengaged from planning must be included from the start in setting priorities and developing solutions to climate resilience challenges. This requires resources to support participation and develop local capacity in EJ communities. The state should continue to build on the GC3's efforts to remove barriers and move towards more equitable participation in the resilience planning process.

3. Utilize equitable and inclusive planning approaches.

1. Build on the successful pilot rounds of the CIRCA/DEEP Climate and Equity Grants Program to fund capacity building grants for environmental justice-oriented community-based organizations (CBOs) to lead resilience planning and take action in their communities

2. Invest in local community-based resource hubs that can provide a venue and staff to facilitate planning for traditionally overburdened and underserved communities.

3. Integrate the Connecticut Environmental Justice Screening Tool into state grant programs, projects, and investments. CT EJ Screen 2.0 was created through an extensive process that included engagement with EJ community-based organizations.

4. Prioritize emergency preparedness and recovery planning.

Prioritize preparedness for disruptive and extreme weather hazards by incorporating climate change into local and regional emergency planning and identify "Community Lifelines" that must function in the aftermath of a disaster. These are essential to human health and safety and sustain the operation of critical community services, government and business functions.

4. Prioritize emergency preparedness and recovery planning.

1. Create a network of resilience hubs that can serve as points of contact with local communities, provide services, coordinate with local and state government, and pass through resilience-related grants and technical assistance to residents.

2. Help communities plan for resilience hubs. Create a planning, technical assistance, and funding program to help communities do the work of establishing resilience hubs.

3. Update the State Emergency Response Framework to include the role of resilience hubs for improving local community capacity to support emergency operations and long-term recovery.

4. Establish a network of real-time water level and flood level sensors in coastal communities to support local emergency operations, flood alerts, and evacuations.

5. Work with coastal communities to install traffic gates at railroad underpasses that frequently flood to keep people out of harm's way during hazard events.

6. Create a central GIS database of evacuation routes and resilient corridors to support longer term emergency planning that integrates sea-level rise and increased flooding into a coordinated evacuation strategies.

5. Build adaptation into infrastructure investments to avoid future costs.

To minimize future costs and social disruption, municipalities and state agencies should integrate climate change adaptation into all planning decisions and investments immediately. Every town's Plan of Conservation and Development and Hazard Mitigation Plan, for example, should enhance long-term resilience by including an assessment of climate change impacts into plans. Routine repairs and improvements that recognize future risk will yield a high return on investment.

5. Build adaptation into infrastructure investments to avoid future costs.

1. Add detailed climate vulnerability assessment requirements to local and regional Plans of Conservation and Development (POCD).

2. Plans should clearly identify problems that need external support in addition to local municipal resources and include budget reporting for issues that require state support.

3. Municipalities should consider updating zoning codes to move towards resilient development consistent with the Resilient Zoning library and toolkit.

4. Encourage and incentivize towns to utilize other local boards with newly established authorities for climate resilience activities like Flood Prevention, Climate Resilience, and Erosion Control Boards which now have infrastructure maintenance, construction authority and can bond to fund projects.

6. Adapt existing and resist new development in coastal and riverine floodplains.

Higher mean sea levels will increase the frequency of flooding in areas that are currently flood prone. Enforcement and strengthening of existing policies will reduce risk to people, property, and municipal tax bases and make new commercial and residential development less vulnerable. Existing homes and businesses that were previously built in areas of flood risk will need to consider the full range of flood mitigation options including elevation, flood proofing, and voluntary acquisition of repetitive and severe repetitive loss properties, among others. New development should be avoided in areas where coastal flood risks are currently known as these areas will continue to flood more frequently by 2050. If municipalities, developers, and property owners choose to site new buildings and development in areas of known coastal and riverine flood risk going forward, future liabilities and costs should be fully assumed by property owners.

6. Adapt existing and resist new development in coastal and riverine floodplains.

1. Promote strategies to encourage existing owners to make their properties resilient to flooding. Programs such as FEMA flood mitigation assistance as well as new programs like the CT Green Bank's C-PACE and Smart-e loan program are available to assist with funding and financing property level resiliency improvements.

2. Create, and make accessible, high resolution, more accurate coastal flood risk maps for the entire coastline that can be used to supplement FEMA risk maps. These maps would be forward looking using actionable science to inform municipal land use and property owners of future risks and guide decision making.

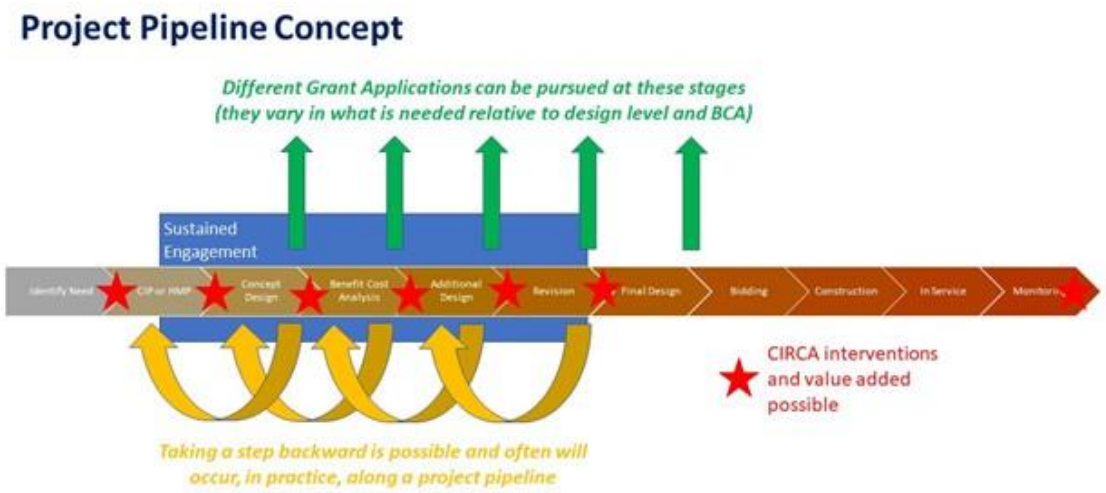
3. Municipalities should create resilience overlay zones which designate requirements and design guidelines for existing uses in flood zones. These zones should clarify requirements for meeting state and federal flood risk management standards for freeboard requirements and access. Overlay zones should be conservative and encompass not only areas currently experiencing flooding but also include areas that are anticipated to be vulnerable in 2050 due to sea level rise.

4. Strengthen flooding disclosure requirements for real-estate transactions. Other coastal states have recently made efforts to improve flood related disclosure, such as adding requirements to disclose whether a property is mandated to carry federal flood insurance as well as information about previous flood damage and flood insurance claims.

5. Enable the effective use of transferable development rights (TDR's) through legalizing the creation of TDR banks.

6. Consider designating a high frequency or chronic floodplain (e.g. 1–10-year annual exceedance probabilities in 2050) to prioritize help for property owners to equitably access FEMA funding for flood mitigation assistance, including options for property elevations and/or voluntary acquisitions of repetitively flooded properties.

7. Develop a resilience project pipeline.



In many towns, there are several areas at-risk, and all need attention. Having a series of resilience projects underway will increase the likelihood of winning state and federal adaptation grants and increase support for the local share of matching costs. In addition, state agency resilience projects may need coordination with local projects. The creation of a central project pipeline database will allow for project planning and implementation between and across jurisdictions.

7. Develop a resilience project pipeline.

1. Conduct and complete the vulnerability assessment of state assets and operations as required by Governor Lamont's Executive Order 3.

2. Update the state resilience strategy based on the assessment of state assets and operations. Develop strategies to inform state and local policies and processes to allow for coordinated action among agencies, regional planning (COGs), and local municipalities.

3. Make sure state agency project pipelines are disclosed to COGs and towns. Document challenges and vulnerabilities that require coordination between local and state entities. (e.g. local drainage systems that connect to state drainage infrastructure, or local flooding concerns related to state roads).

4. Create a project pipeline database, map, and CIS data portal to track progress on implementing the state resilience project pipeline. This should be coordinated with a state planning inventory and other state data through a centralized data office (see recommendation 1.3).

8. Establish and invest in new local funding sources.

Municipalities must begin to develop sustainable funding sources for longer term investments in resilience. A resilience project pipeline receiving federal and/or state support will require local cost-sharing, so a strategy for raising local funds is essential. In addition, many local projects may not qualify or receive significant federal funding. New policy tools in Connecticut have recently been created for this purpose. For example, Public Act 19-77 allows a municipality to create a resiliency reserve fund.pdf and PA 21-115, “An Act Concerning Climate Change Adaptation,” also provides municipalities with a suite of voluntary tools to fund climate resilience, including enabling of stormwater authorities.pdf and a new Environmental Infrastructure Fund within the Connecticut Green Bank.

8. Establish and invest in new local funding sources.

1. Create municipal resiliency reserve funds. Towns should be incentivized to set aside funding for climate resilience and adaptation in budget plans utilizing a climate resilience reserve fund. This acknowledges that every community will be affected by climate change, impacting infrastructure, public health and safety, and that cost sharing will be a necessary component to funding solutions.

2. Create a grant or revolving loan fund for municipalities that want to establish stormwater authorities and Flood Prevention, Climate Resilience, and Erosion Control boards.

3. Encourage and enable municipalities to establish “resiliency improvement districts” that utilize a tax-increment financing model to fund improvements in vulnerable areas.

4. Create a state matching fund to help municipalities with bigger projects.

9. Integrate emissions reductions and renewable energy deployment with adaptation and resilience planning.

Ultimately, the path forward to more sustainable communities includes large investments in reducing greenhouse gas emissions while also reducing risks and vulnerabilities to climate change impacts. It remains a critical goal to ensure these investments are coordinated to maximize our impact with limited resources. In many cases greenhouse gas reduction strategies can meet multiple objectives such as reducing heat risk to vulnerable residents, improving grid resilience, and improving the connectivity of multi-modal transportation.

9. Integrate emissions reductions and renewable energy deployment with adaptation and resilience planning.

1. Help vulnerable residents make their home more energy efficient and cooler. Prioritize outreach and engagement with building owners, residents, municipalities and utilities to access state and federal incentives for renewable energy programs, in locations of high heat vulnerability.

2. Improve grid resiliency through targeted microgrid deployment. Work with community-based organizations, municipalities, developers, utilities, and state agencies to implement microgrids in areas that are particularly vulnerable to extended power loss.

3. Develop a climate resilient standards for multifamily housing that can help to reduce costs for residents and improve resilience to extreme heat, flooding, wind, and other hazards.

4. Invest in climate resilient TOD. Transit Oriented Development (TOD) is an important tool for climate mitigation, as well as climate resilience. Require that transit-oriented development (TOD) plans consider sea level rise and flood hazard areas in planning.

5. Municipalities should consider zoning and land use planning for heat and emissions reductions. Incorporate design standards in zoning regulation to mitigate projected heat increases like green roofs, reflective roofs and pavement, and protections for existing tree canopy cover.

10. Track changes in climate projections and policy options.

Since 2014, CIRCA's research has provided Connecticut specific guidance on local projections of sea-level rise.pdf, precipitation, and temperature due to climate change. This research has been instrumental in helping the state establish planning guidance and policies. As climate science evolves, updated guidance based on the latest findings will be needed to continue informing Connecticut's approach to adaptation and resilience. In addition, efforts to make climate science broadly accessible and understandable to the public will help to enable and inform action.

10. Track changes in climate projections and policy options.

1. Move from “Best available science” to “actionable science.” Project designs and decision making on priorities requires information grounded in measurement and data

2. Develop resilience metrics and track progress of strategies, actions, and projects.

3. Develop a sustained broader public education program to inform the public about climate risks and ongoing progress on strategies.

4. Continue to track the evolution of climate science and update state guidance such as PA-18-82, the CT Physical Climate Science Assessment Report, and the Science and Technology working group report of the GC3.

Thank You!

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