



# Gaps and Opportunities for Local Resilience Planning in Connecticut

**Joanna Wozniak-Brown,**  
PhD, AICP  
Assistant Director of  
Resilience Planning  
UConn CIRCA

**September 2022**

Partial funding for this project is provided by the U.S. Department of Housing and Urban Development through the Community Development Block Grant National Disaster Recovery Program, as administered by the Connecticut Department of Housing



**DISCLAIMER:** This white paper addresses issues of general interest and does not give any specific legal advice pertaining to any specific circumstance. Parties should obtain advice from a lawyer or other qualified professional before acting on the information in this paper.

Executive Summary.....	2
I. Problem Statement.....	3
II. Identified Gaps .....	3
III. Potential Remedies .....	9
IV. Conclusions.....	16
Endnotes .....	17

More Information on CIRCA projects can be found at [circa.uconn.edu](http://circa.uconn.edu).

More information on Resilient Connecticut can be found at [resilientconnecticut.uconn.edu](http://resilientconnecticut.uconn.edu).

Suggested citation: Wozniak-Brown, Joanna. 2022. *Gaps and Opportunities for Local Resilience Planning in Connecticut*. UConn Connecticut Institute for Resilience and Climate Adaptation. <https://doi.org/10.56576/WXNJ9369>

## Executive Summary

---

As of this writing, there are numerous efforts underway at the local, regional, and state level across the state of Connecticut to address the impacts of climate change. Scientific assessments, community engagement, and adaptation project designs are just a few of the key activities. Additionally, climate-related goals are being integrated into some local planning processes and some municipalities have undertaken resilience plans. The expansion of climate vulnerability data and mapping tools will likely increase the capacity for climate change planning across the state.

Despite these projects, there are gaps in the existing authority or obligations of local governments that potentially hinder climate planning at the local level. The systems analysis presented here highlights specific planning obligations that could but have not yet incorporated climate impacts and potential adaptations. For example, natural hazard mitigation planning can address climate impacts as they relate to natural hazards and plans of conservation and development can address climate impacts or solutions as they relate to land use planning. For the former, new guidance (not regulation) describes some inclusion of climate change vulnerabilities. The latter is narrowly on one particular climate and does not have specifics as to how it should be considered regarding land use.

Optimizing or expanding existing local authority or planning obligations regarding climate change could significantly advance adaptation across the state. Firstly, it would make climate planning an ongoing effort as opposed to episodic. Secondly, it could enable or reduce disruptions to projects currently underway. Thirdly, it could advance efforts to address historically excluded and harmed communities across the state by ensuring they are included in climate change planning and that adaptation projects or resilience efforts redress those inequities. This white paper outlines the gaps in resilience planning authority and planning mechanisms then provides potential opportunities to address the gaps.

### I. Problem Statement

---

As a home-rule state, significant land use planning and regulation in Connecticut occurs at the local level. Land use, by limiting or encouraging activities in specific locations, can be a powerful climate change adaptation tool.

State regulations require local Planning & Zoning Commission (Ch. 124. Sec. 8-1 and Ch 126. Sec. 8-19.), updates to comprehensive plans every 10 years (Ch 126. Sec. 8-23(a)(1)), and consideration of “the most recent sea level change scenario” in Plans of Conservation and Development (POCDs) (Ch 126. Sec 8-23(d)(11)). There are additional planning parameters



from federal programs that influence local planning such as FEMA’s National Flood Insurance Program (NFIP) regulations (floodplain regulations) and a requirement to develop Hazard Mitigation Plans (HMPs) per the Disaster Mitigation Act to receive disaster funds. Connecticut has been a leader in mitigating its contributions to climate change with aggressive greenhouse gas reduction targets<sup>1</sup>. It has also made great strides in developing an adaptation program at the state level, including a renewed Governor’s Council on Climate Change, additional funding to UConn CIRCA for resilience planning, expansion of CT Green Bank funding mechanisms to include resilience, creation of resiliency teams in several state agencies, etc. Land use power held at the local level, however, remains a significant opportunity to deepen adaptation efforts and increase community resiliency across the state. However, the diffusion of land use planning across the state’s 169 municipalities (or even 176 NFIP jurisdictions) can present inefficiency or even obstruction to significant action; however, this is unlikely to change in the present or near future.

In this white paper, I outline prominent obstructions or gaps that may hinder deep and systematic adaptation and resilience planning across the state’s towns and cities<sup>2</sup>. Then, I describe potential solutions to these issues to strengthen, clarify, and enable municipal authority and action on climate change. In Connecticut, municipalities are also members of regional councils of governments (COGs) as county government was abolished in 1960. The COGs are not able to levy taxes or establish regulations. They do, however, support regional planning with both federal and state funding and can foster inter-municipal coordination. Regional planning efforts are discussed here where they incorporate local goals and projects. While mentioned, other geographic scales (e.g., state agencies, sub-municipal entities, or other COG functions) are not the primary focus of this paper. This white paper is intended to provide guidance to the state legislature, state agencies, and municipalities about the unseen but potentially transformative mechanisms that affect local land use to optimize resilience.

## II. Identified Gaps in Local Resilience Planning Authority & Activities

### **Gap #1: Inclusion of Climate Change in Primary Local Planning Documents is Voluntary and Sporadic<sup>3</sup>.**

State and federal regulations directing local comprehensive plans (plans of conservation and development or POCD) and local HMPs do not require climate change to be assessed and addressed.

- In Connecticut, state statute Chapter 476a Sec. 25-68o, ‘*Consideration of sea level change scenarios re municipal evacuation and hazard mitigation plans publishing of sea level change scenarios,*’ says “(a) On and after October 1, 2019, in the preparation of any municipal evacuation plan or hazard mitigation plan, such municipality shall consider the most recent sea level change scenario updated pursuant to subsection (b) of this section”. Commissions updating a local POCD shall similarly consider “the most recent

sea level change scenario” (Sec. 8-23(d)). Sea level rise is an anticipated impact from climate change in Connecticut. Neither the POCD or the hazard mitigation plan statutory sections describe how sea level rise would be considered e.g., how it impacts the other required considerations, how land use would mitigate its impacts, or how emergency preparedness would be updated per the scenario. Since POCDs are required to be updated every ten years and HMPs every five, current plans as of this publication are not yet required to consider this. Notably, many municipal evacuation plans are not publicly available on town websites and there is no known shared GIS file for the coastline available for analysis by a technical partner.

### **Plans of Conservation and Development.**

- Inclusion of climate change, except for that reference to sea level rise, in the POCD is not prohibited or required. Inclusion is currently dependent on the interest and commitment from local leadership, staff, or stakeholders. If there is local interest in addressing climate change in the POCD, it must also be within the capacity, expertise, or experience of the staff or consultant preparing the plan. Degree and depth of inclusion depends on availability of vulnerability assessment information and adequate local understanding of applicable planning remedies.
- CGS 126 Sec 8-23(2) requires that municipalities contiguous to Long Island Sound must be: (A) consistent with the municipal coastal program requirements of sections 22a-101 to 22a-104. The referenced statutes say, “coastal municipalities **may** [emphasis added] adopt a municipal coastal program”. Sec 22a-101 also refers to other applicable plans, which may or may not reference climate change<sup>4</sup>. Climate change impacts are not listed as an adverse impact on coastal resources (Ch 444 Sec 22a-93(15)). Sec 22a-102 does not require addressing or limiting the adverse impacts in the POCD. Secs 22a- 103 and 104 similarly do not address climate change.

### **Local Natural Hazard Mitigation Plans.**

- In 44 CFR § 201.6, the Federal Emergency Management Agency (FEMA) offers regulatory boundaries for the performance of local HMPs.
  - Vulnerability is to be described in terms of “(A) The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas; (B) An estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate; (C) Providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.” It does not include vulnerability in terms of people. Assessing and comparing vulnerability by built environment metrics provides a narrow view of vulnerability by avoiding impacts on individual people (especially injury or death) and ignores a community’s ability to recover.

- “Hazard” is not defined in accompanying federal statutes. In 44 CFR § 201.2, there is a definition that states “*Hazard mitigation means any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards.*” In a separate subchapter, 44 CFR § 312.2 within the same Title (Emergency Management and Assistance) and Chapter (Chapter I Federal Emergency Management Agency, Department of Homeland Security) as the *Local Mitigation Plans*, “(b) The term natural disaster means any hurricane, tornado, storm, flood, high water, wind-driven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, drought, fire, or other catastrophe in any part of the United States which causes, or which may cause, substantial damage or injury to civilian property or persons and, for the purposes of the Act, any explosion, civil disturbance, or any other manmade catastrophe shall be deemed to be a natural disaster.” Connecticut General Statutes Chapter 476a Sec. 25-68j defines hazard mitigation as “activities that include, but are not limited to, actions taken to reduce or eliminate long-term risk to human life, infrastructure and property resulting from natural hazards including, but not limited to, flooding, high winds and wildfires.” **The lack of a coordinating definition within the regulations and a non-climate description for hazard mitigation drive climate change further away from the center of hazard mitigation plans.**
  - The combinations of these definitions indicate a focus on long-term risk from intense and discrete, time-limited events.
  - The natural disasters listed in 44 CFR § 312.2 are like natural hazards described in Connecticut HMPs except for unlikely hazards to Connecticut such as tsunamis and volcanic eruptions. Some of these disaster events may be altered by climate change or occur because of climate change.
- Likewise, the requirements for State Mitigation Plans are discussed in 44 CFR § 201.4 and similarly does not require climate change to be evaluated or planned for in the document. Each element required for state hazard mitigation plans is outlined in FEMA’s State Mitigation Planning Policy Guide (Effective April 19, 2023) and the corresponding federal regulation is referenced for each element. Text in four of the seven elements<sup>5</sup> in the Policy Guide (planning process; hazard identification and risk assessment; state mitigation capabilities; local planning coordination and capability building) describe climate change and how it could be related to each element; however, the corresponding regulations do not require climate change. Reliance on guidance to replace codified requirements perpetuates confusion and reduces the likelihood of climate change inclusion. It may also result in gaps between generations of plans either from one version to the next or between the state and local plans as federal guidance changes.
- Each element required for local hazard mitigation plans is outlined in FEMA’s Local Mitigation Planning Policy Guide (Effective April 19, 2023) and the

corresponding federal regulation is referenced for each element. Four of the six elements<sup>6</sup> in the *policy guide* (risk assessment, mitigation strategy requirements, plan maintenance, and plan update) describe climate change and how it could be related to each element; however, the corresponding regulations do not require climate change. An argument could be made that climate change could be included in the definition of hazard mitigation in 44 CFR 201.2, “Hazard mitigation means any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards.” Yet, this gradual shift to interpret this to mean climate change happens by interest of the local jurisdiction and the contemporary policy guide not by regulation across all jurisdictions.

**Gap #2: Local Responsibility for Climate Resilience is Not Clear.** While most sectors within municipalities have traditional assignments of responsibility (e.g., local road maintenance is overseen by the local public works department; building departments oversee building construction and renovation; and health departments monitor prevailing illnesses or environmental exposure), climate change has not been assigned to a formal department or job title at the local level. Resilience, as a concept, generally includes systematic capacity to address climate change impacts while adaptation refers to specific strategies. The use of “resilience” in this context refers to a program, policy, or systematic approach to address these impacts, which will include adaptation. Resilience is not exclusive of hazard mitigation or emergency management but is inclusive, thus requiring a thoughtful method to coordinate activities where they merge with climate change.

- Current planning capacities are varied across Connecticut municipalities. Planning and/or zoning commissions and staff are not required of municipalities. Present planning staff may not have the time or technical capacity to conduct these activities; moreover, municipalities may not have any dedicated staff for planning activities outside of building departments, administrative staff, and/or an unpaid planning and zoning commission. For example, municipalities in Connecticut currently have difficulty designating floodplain managers and where there is not one, CT Department of Energy and Environmental Protection (CT DEEP) and NFIP must recognize the chief elected official as the floodplain manager. According to responses to the Connecticut Conference of Municipalities (CCM) 2020 salary survey, at least 91 of 169 municipalities have a full-time planning staff member, where 8 of those planners have additional duties such as zoning administration or economic development. Thirteen municipalities have part-time or contracted staff.
- Connecticut General Statutes, Ch. 368 Sec. 19a discusses local health administration with noted topical purview areas of properties with filth, streams, wells, water service, sewage disposal systems, removal of refuse, swampy lands, mosquito breeding places, fuel oil and bottled gas retail, reportable illnesses and health conditions, blindness in newborns, vaccinations, anchorage of houseboats, inspections of salons, etc. Climate change, extreme heat, or flooding are not listed.

- Several components of Connecticut Public Act 21–115: *An Act Concerning Climate Change Adaptation*, enacted July 6, 2021, offered additional local authority for stormwater management specifically. This act grants municipalities additional authorities that relate to stormwater and flood concerns related to climate change and authorizes use of funds towards a control system. It enabled municipalities to create stormwater authorities that will hold significant power in the ability to “plan, lay out, acquire, construct, reconstruct, repair, maintain, supervise, operate and manage a flood [or] prevention, climate resilience and erosion control system” and to “to enter upon and to take and hold, by purchase, condemnation or otherwise, any real property or interest therein which it determines is necessary for use in connection with the...system.” In these activities, “such board (1) shall consider all applicable regional and municipal hazard mitigation plans, resilience plans and identifications of vulnerable communities, as defined in subsection (a) of section 16-243y, as well as all applicable municipal plans of conservation and development adopted pursuant to section 8-23, and (2) may consult with the Connecticut Institute for Resilience and Climate Adaptation.” At present, HMPs and POCDs, mentioned in that statute, are not required to include climate change.<sup>7</sup>
- In Ch 517 Sec 28-8a, “(a) The chief executive officer of the municipality in which a major disaster or emergency occurs, or his designee, may take such action as he deems necessary to mitigate the major disaster or emergency and to secure and preserve any documents and evidence pertinent to and necessary for a future investigation.” A definition is also provided but a process not defined for a “Local civil preparedness emergency” or “disaster emergency” [which] means an emergency declared by the chief executive officer of any town or city in the event of serious disaster affecting such town or city” Ch 517 Sec 28-1(8). Climate change is not described in the “major disaster” or “emergency” definitions; however, some municipalities have used executive powers to declare “climate emergencies.”

**Gap #3: Primary Regional Planning Documents Do Not Require that Climate Change be Addressed.**

In Connecticut, regional planning includes: regional Plans of Conversation and Development created in addition to local and state POCDs; multi-jurisdictional HMPs that are not a regional planning document but are instead a compendium of hazard mitigation narratives for the included municipalities with some regional objectives; and transportation planning conducted by the inclusive metropolitan planning organizations. These plans typically include specific projects or strategies that will impact municipalities. Regulations for transportation planning by Metropolitan Planning Organizations (MPOs)<sup>8</sup> (which are usually similar jurisdictional areas with COGs) include but do not define “resilience” with respect to climate change nor, by absence of a definition, is it bounded<sup>9</sup> to a reasonable and commonly understood expectation.

- In 23 CFR 450.306 ‘*Scope of the metropolitan transportation planning process*’, “(b) The metropolitan transportation planning process shall be continuous, cooperative, and comprehensive, and provide for consideration and implementation of projects,



strategies, and services that will address the following factors: (9) Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation." A nearly verbatim regulation exists for the statewide and nonmetropolitan transportation planning process (23 CFR 450.206). Neither regulation references climate change nor defines resilience. MPOs are required to prepare Long-range Transportation Plans (LRTP) and a Transportation Improvement Program (TIP), but resiliency is not described in 23 CFR 450.324 *'Development and content of the metropolitan transportation plan'* or 23 CFR 450.326 *'Development and content of the transportation improvement program'* (TIP). A definition of resilience was added via the Bipartisan Infrastructure Law to 23 USC 101, which provides definitions to 23 CFR 450; therefore, the generation of plans prior to fall of 2021 were not required to abide by the definition of resiliency, which still limits resilience to the context of "weather events and natural disasters." State transportation asset management plans are required to consider "current and future environmental conditions including extreme weather events, climate change, and seismic activity" (23 CFR 515.7(b)).

- The requirements<sup>10</sup> for the long range (20-year or greater) metropolitan transportation plan, does include "reduce the vulnerability of the existing transportation infrastructure to natural disasters." Neither natural disaster or vulnerability are defined or given a time prospective (See discussion in Gap #1 for distinctions of risks from natural disasters or hazards).<sup>11</sup>
- MPOs also develop Transportation Improvement Program (TIP) at four-year intervals which includes a list of priority capital and non-capital surface transportation projects. They have to be 'fiscally constrained,' i.e. they have to have demonstrated available or committed funds. These projects have to be consistent with the long-range transportation plans.
- Connecticut has two rural councils of governments (Northwest Hills and Northeast COG) that do not also serve as an MPO and are therefore not required to complete an LRTP. Connecticut DOT, in the June 2017 "CTDOT Handbook for Councils of Governments and Metropolitan Planning Organizations," encourages the rural COGs to complete an LRTP. According to 23 CFR § 450.210(b), "the State shall provide for nonmetropolitan local official participation in the development of the long-range statewide transportation plan and the STIP". The STIP must be in cooperated with the affected nonmetropolitan area.
- Climate change, resilience, hazards, or vulnerability or other related concepts are not in 23 U.S.C. 150 National goals and performance management measures. Metropolitan planning organizations and statewide transportation processes must establish performance targets to meet those goals<sup>12</sup>.

**Gap #4: Spatial Data across Connecticut is varied in availability, accessibility, adequacy, and accordance.**



In Connecticut, Geographic Information Systems (GIS) data is generated by multiple levels of government, academic institutions, utilities, nonprofit organizations, and consultants. The generated data may be created for a singular purpose on a limited time frame. It may or may not be maintained or available for other potential users. Coverage of any particular data type across Connecticut may be sporadic and even similar datasets may not be easily reconcilable.

- Federal regulation on the prevailing datasets for particular topics limits the usage of additional datasets and, if using non-federal data, requires additional actions that may discourage the use of non-federal data. For example, 40 CFR 60.3 says “If the Federal Insurance Administrator has not provided sufficient data to furnish a basis for these regulations in a particular community, the community shall obtain, review and reasonably utilize data available from other Federal, State or other sources pending receipt of data from the Federal Insurance Administrator. However, when special flood hazard area designations and water surface elevations have been furnished by the Federal Insurance Administrator, they shall apply.” Currently, the procedure for production of the Flood Insurance Rate Maps (FIRM) does not account for climate change-flood impacts such as sea level rise, sea level rise-induced storm surge, or predicted increases in precipitation volumes. Some towns address this deficiency by requiring flood-proofing at distances above base flood elevation. There is not a federally designated method for assessing sea level rise.
- Starting in 2019, CGS Section 7-100I requires municipalities to submit their digital parcel and assessor databases, if they have it, to their regional council of governments, which then submits the information to the CT Office of Policy and Management. The provisioning of such data is dependent on the existence of such geospatial data. It does not provide mechanisms for the creation of such data.
- State agencies have data sets at different stages of completeness. Even similar data sets (e.g., roads) are different for reasons of source, use, and maintenance<sup>13</sup>.
- Councils of governments have data sets at different stages of completeness and update intervals.
- UConn CIRCA has developed a Climate Change Vulnerability Index (CCVI) for Fairfield and New Haven Counties and will be expanding it to the remaining Connecticut counties by Spring 2023. This is a multi-criteria decision-support tool for identifying patches and patterns of vulnerability. It is not intended to serve as a parcel-by-parcel analysis of climate risk or as the sole source for interpreting climate vulnerability across a municipality.

### III. Potential Remedies to the Planning Gaps

Tools for addressing these gaps in local climate resilience planning could include financial investments, changes to agency services, state legislation, and/or local and state program updates. Several remedies require action from the state legislature while some may be developed within the existing auspices of state agencies and local departments. Suggested

implementing actors are provided in bolded brackets after each recommendation. A table is provided below illustrating which remedies address which gaps.

1. **Mandate inclusion of climate change considerations in local plans.** This may require a more robust inclusion of climate change as elements in HMPs or POCDs; alternatively, it may be a mandate for the creation of local climate vulnerability and adaptation plans. Mandates should be combined with community-level context, incentives, and guidance on appropriate information<sup>14</sup>. At the very least, the role of sea level rise in the POCD should be clarified. Some options are provided below:

a. **Add requirements for HMPs that address climate change supra federal regulatory requirements**<sup>15</sup> [CT State Legislation]. Requiring the inclusion of climate change is not contrary to the intent of such plans but it is not yet included in the federal regulation. It is included in the latest FEMA’s Local Mitigation Planning Handbook<sup>16</sup> as described above and some consultants have incorporated climate change vulnerabilities, vulnerable populations, and, to a lesser extent, resilience strategies into their hazard mitigation templates. Standardizing the requirement may lead to other complementary actions such as standardized datasets, training, and programmatic support for common resilience-related mitigation strategies.

Legislation that adds additional requirement should be clear in the climate stressor, timeline, and/or resources or processes to conduct such analysis and identifying appropriate mitigation strategies. For example, one potential clear action could be modifying the required content of natural hazard plans to include: “In such plans, by 2030, municipalities shall include an inventory of community lifelines<sup>17</sup> and critical transitory and permanent infrastructure, that are of vital importance to immediate and longer-term recovery following an extreme event.” The legislation could also include a requirement to identify which infrastructure will be within the codified 2050 planning threshold for sea level rise.

b. **Require Plans of Conservation & Development to include climate change impacts in the planning decisions**<sup>18</sup> [CT State Legislation]. While the textual *and specific* addition of climate change to CGS Sec 8-23 would be a significant step, new legislation should be explicit in how climate change impacts are to be included in POCDs, such as mapping specific climate stressors, identifying at-risk critical infrastructure, developing mitigating land use strategies for at-risk areas of the municipality, and integrating across other local plans. Municipal land use planning and development are significant opportunities for adaption and are consistent with zoning commission authority to establish regulations “to secure safety from fire, panic, flood and other dangers [and] to promote health and the general welfare...” (CGS 8-2). The Rhode Island Division of Planning provides a Comprehensive Planning Standards Manual and Comprehensive Planning Guidance Handbook that describe how climate change should be incorporated into the local comprehensive plan<sup>19</sup>.

Some specific potential prescriptions or remedies include:

- i. Amend CGS 8-23 (2)(d) to include a (13) that could say “impacts of climate change on the physical environment, infrastructure, and public health of the municipality and methods to address such impacts on the activities described in 8-23(e), with identification and special consideration of impacts to traditionally marginalized populations.”
  - ii. Highlighting or identifying source data to guide decision making<sup>20</sup>.
  - iii. Incorporating findings from Consolidated Plans (housing) or requiring towns that do not have Consolidated Plans to include increased climate risks to low- and moderate-income households<sup>21</sup>;
  - iv. Identify key land uses in risk areas and redirect out of the risk area, even if it requires a phased plan. For example, identify areas for increased housing density elsewhere in the community outside the floodplain. The goals should be to maintain social capital of residents by preserving social networks to the extent practicable. Accompanying efforts to that relocation are likely necessary from social services, religious institutions, social clubs, and recreational groups.
  - v. Identify areas, including developed and undeveloped areas that are likely to be inundated by 2050, then 2100, and prioritize those areas for acquisition, use change, or protection.
  - vi. Requiring municipalities of certain sizes or identified as environmental justice communities to include land use management strategies to reduce the heat island effect and to identify zoning regulations, town ordinances, and land use policies, that would reduce such impacts.
  - vii. Ch 444 Sec 22a-102 may provide an opportunity to include climate change in consideration of coastal programs by requiring discussion of risks to coastal resources with respect to climate change.
- c. Require Climate Change Vulnerability and Adaptation Plans [CT State Legislation].**  
This requirement may be considered in addition to the inclusion of climate change in POCDs or HMPs, or it may be considered as a separate plan with a requirement for consistency across the POCD, HMP, and Climate Change Vulnerability and Adaptation Plans. As described above, mandates for consideration of climate impacts can be set at certain intervals or for municipalities of certain sizes or geography. It may also be for municipalities of certain social risk or noted as a ‘distressed municipality.’ State programming should be established to support distressed or smaller municipalities with vulnerability analysis and adaptation planning. These plans should at least consider vulnerabilities related to flooding and heat with secondary impacts related to these. Legislation should set expectations such as requiring the geographic extent of the impacts, special risk populations within those areas, and potential methods to address those the vulnerabilities. The Infrastructure Investment and Jobs Act, enacted in November 2021 as Public Law 117-58, also known as the “Bipartisan Infrastructure

Law,” designated new funds for MPOs. Where that funding does not include climate resilience, or where there is not an MPO, financial support or technical assistance should be coordinated, perhaps through the councils of government with a climate-focused institute such as UConn CIRCA<sup>22</sup>.

Alternatively, the Office of Policy and Management could produce guidance on integrating land-use and climate-related plans such that each plan meets their respective requirements while coordinating their final actions to address the local vulnerabilities<sup>23</sup> similar to Rhode Island. In 23 CFR § 450.324(g), MPOs are already required to consult state and local agencies regarding conservation plans or maps and inventories of natural or historic resources. The new BIL also called for the development of regional goals for the integration of housing, transportation, economic development strategies.

- d. **Amend other local plans to include climate change, which may be dependent on other supporting measures (data, training, etc.). These may be plans that address targeted goals such as Open Space or Comprehensive Economic Development Strategy (CEDS) [CT State Legislature or local departments with support from state agencies].** For example, Open Space Plans could consider repetitive loss properties for potential acquisition and alternative recreational access acquiring areas to be inundated or CEDS could review and support business continuity plans for recovery following disaster events or retrofitting commercial area infrastructure for expected risk. Notably, 24 CFR 91 Subpart D, which regulates Consolidated Plans for housing, does include climate change<sup>21</sup>.
- e. **Implement requirements for addressing short-term responses to the climate vulnerabilities at the local level [CT State Legislature or local departments with support from state agencies].** In addition to the climate vulnerability and adaptation plans and the natural hazard mitigation plan, Climate Vulnerability & Adaptation plans should illustrate how local agencies will address the short-term impacts from these growing vulnerabilities. For example, municipal heat response plans are a potential coordinating mechanism during these events. State legislation could require municipalities of certain sizes (higher urbanized areas may have increased risk) or distressed municipalities, which may have residents with less resources to escape the impacts, to prepare such plans at regular intervals and direct the Department of Public Health or Department of Emergency Management and Homeland Security to assist. The legislature might also consider requiring heat in the Local Emergency Operations Plan. Recent research by CIRCA and the CT Department of Public Health indicates that Heat Response Plans are not a common practice in Connecticut and where produced, are not always publicly available<sup>24</sup>. A heat audit of civic spaces that serve critical functions for heat relief (emergency shelters, cooling stations, schools, fire departments, town halls, recreation services, etc.) should also be considered. OPM or the Department of Administrative Services may assist with such an audit.

- 2. Create and maintain GIS infrastructure.** GIS data for decision-making should be consistent, compatible, reliable, and accessible across state agencies and different levels of government, especially for municipalities, COGs, and state agencies. Data should be comprehensively developed and regularly maintained at the state level. Standard data sources need to complete the above recommended planning activities can be identified and reviewed at regular intervals. The Geographic Information Systems Advisory Council and Geographic Information Officer position created in Public Act 21-2 should review existing state data and consider how such data should support state resiliency planning in its evaluation. While the work of the Advisory Council and Officer is underway, supporting activities may include:
- a.** Provide state support to municipalities in the preparation and/or maintenance of digital parcel maps joined with real estate information, planimetric data that illustrates climate vulnerabilities including but not limited to building outlines; complete datasets of locations of critical infrastructure like substations, shelters, and roadway elevations; and areas of planned investment. Perhaps through a state agency effort or planning funds to COGs, a GIS database of all hazard mitigation projects should be created. The state should also produce maps of areas of state investment of equipment or infrastructure that has a certain cost threshold and/or is located in the floodplain or within areas impacted by projected 2050 sea level rise.
  - b.** Provide state funding and a cadastral standard for municipalities to create spatial data layers that identifies community lifelines that mirror categorization established by FEMA<sup>25</sup>. This action is a way to formalize the priority locations municipalities communicate to electric utilities for restoration following outages, identify infrastructure at risk to flooding, and including their protection in hazard mitigation plans.
  - c.** Continue investment in downscaling of climatic data to achieve the following if not complete list of benefits: 1) articulating the threat multiplier effect on natural hazards for HMPs 2) directing land use away from risk areas or designing land use that mitigates vulnerabilities such as heat 3) informing investment that is expected to last beyond the lifetime of the incoming vulnerability and 4) providing a consistent source of data across CT municipalities. This downscaling could apply to heat or flooding/sea level rise exposure to municipalities. Special care should be taken to address uncertainty in long-term projections or climate impacts with less specific boundaries such as intense precipitation. The latest conditions/projections and assessment techniques should be incorporated on an ongoing basis. This down-scaled data could give more specific guidance to particular parcels or even identify patterns of risk across the state for a coordinated statewide response.
  - d.** Develop or refine maps that identify natural resources that are either at risk and/or of important resilience function to protect the landscape character, maintain or restore ecosystem services, and protect species unique to Connecticut. Engage conservation

biology and climatology expertise to identify areas of high vulnerability or high resiliency. Provide sufficient mapping and description that these areas may be considered in planning e.g., in areas of planned conservation, in Environmental Assessment/Environmental Impact Statements, or revising infrastructure design.

- e. Incorporate additional climate vulnerability maps into existing map usages (e.g. the State Locational Guide Map, Statewide Comprehensive Outdoor Recreation Plan, Connecticut Wildlife Action Plan, State Green Plan) to clearly delineate areas of regional resilience such as important landscape corridors for habitat migration, access to subsistence fishing, planned state investments, and areas to direct development. A special land use mapping assessment process should review potential priority funding areas in the context of projected flooding vulnerabilities to determine if limitations on development in those areas would be appropriate. Currently, conservation criteria that can alter the status of a priority funding area includes Hurricane inundation zones and 100-year flood zones. These could be expanded to include high heat or high flood vulnerabilities. CGS Sec. 16a-35d. *'Funding of growth-related projects'* can be amended to include exception for funding in a non-priority growth area if, with special mitigations for the local conservation factor, the project reduces harm to people, property, and ecosystem services. At the local level, current areas of planned development should be contrasted to areas of known or potential climate vulnerabilities and how development should respond appropriately.
3. **Develop clearly designated local authority for coordinating, evaluating, and implementing climate change assessment and planning [municipalities]**. Municipalities should consider a singular point of contact or a committee to manage climate change adaptation planning. While individual municipal departments will have authority to make certain purchases or conduct certain activities, a coordinating office or position could reduce inefficiencies, serve as a reference on best practices, apply for grants, support the executive offices, etc. Nationally, any significant urban areas or states have started employing Chief Resilience Officers or even Chief Heat Officers.
4. **Support municipal resilience planning activities at multiple scales**. Regional-scale planning, complex infrastructure construction or renovation, and widespread climate impacts such as sea level rise or heat islands require methodical, inclusive, and ongoing effort to limit the enormity of the vulnerability and to provide equitable adaptation. Larger scale planning is also a component to creating a resilient system such as creating redundancies in the applicable system (e.g., transportation or drinking water), distributing costs, and increasing capacity.
  - a. CGS 8-2e permits two or more towns to create a system of transfer of development rights across municipal boundaries. Legislation could enable COGs or another regional entity to coordinate such systems and for resilience purposes, such as purchasing development rights in anticipated sea level rise inundation areas or coastal properties purchasing rights in inland areas that could serve as water storage. Coastal overlay zones are a related tool to support development in appropriate areas.



- b. In coordination with the COGs, conduct inter-municipal and inter-state resilience planning especially in key transportation corridors and economic centers. Key interstate locations include the NY-MA-CT tri-state character and economic development area; the Danbury-Brewster Corridor and the Hartford-Springfield corridor. Inter-municipal coordination could include food system planning, heat relief, and evacuation. Additionally, communities inland from the coast will likely be receiving areas on a temporary or even permanent basis as coastal residents and/or businesses leave high-risk areas<sup>26</sup>. These areas will require continual evaluations for ecosystem services, lifelines maintenance, and transportation reliability.
  - c. Where the International Code Council, and therefore the state building code<sup>27</sup>, does not address risks to the built infrastructure for flooding, wind damage, heating/cooling, etc., municipalities should be incentivized to require additional resilience measures such as two feet or higher of freeboard above flood elevations, passive solar orientations, or wind-resistant roofing techniques.
  - d. Formally allow, either through regulatory action or via program implementation, municipalities to apply for adaptation projects under Urban Action Bonds or Small Town Economic Assistance Program (STEAP) bonds for projects listed in POCDs and/or Climate Adaptation Plans. Such projects should explicitly state the climate vulnerability the project would address and its consistency with local planning priorities.
  - e. Provide for ongoing training in climate adaptation and resilience to municipal and regional staff or volunteers.
  - f. Foster strategic planning for transportation. Both the MPOs and the state DOT should direct transportation dollars to reduce climate vulnerabilities or enhance protective actions. Standards should be set for new projects to evaluate if projects increase heat or flooding risks to customers or the surrounding community, similar to an Environmental Assessment or Environmental Impact Statement where alternatives are weighed and mitigating design elements are implemented. This may be addressed in the future as the BIL now requires the consideration of extreme weather and resilience in the risk management analysis in asset management plans.
- 5. Remove planning impediments or inconsistencies to local adaptation strategies or resilience measures.** Current legislation may impede, contradict, or restrict commonly implemented adaptation strategies. One successful example is Public Act 21-29, which enabled zoning boards to “provide for floating zones, overlay zones and planned development districts”. This corrected CGS 124 Sec 9-2m *Floating and overlay zones and flexible zoning districts* which limited which municipalities could deploy flexible zoning areas.
- a. Even though two or more municipalities under CGS 8-2e can enter into an agreement, which widens the pool of properties that can participate in a transfer of development rights (TDR) program, CGS Sec. 8-2f requires joint application of the transferor and transferee. A program, whether regional or state-wide, that can identify, hold, and/or



shepherd the transfers could increase the chances of successful transfers. A TDR bank could even purchase and hold the rights for purchase by receiving zones<sup>28</sup>.

- b.** Codify definitions and how they relate to climate change for terms such as vulnerability, resilience, hazard, and hazard mitigation to avoid confusion and encourage consistency across plans and regulations.

Statutes should be reviewed to identify stumbling blocks to local financing mechanisms (like the implemented stormwater authorities concept mentioned above) that could fund adaptation measures. Concepts such as developmental impact fees, municipal bonds, special assessment districts, or user fees could be considered. Improved data and planning will protect major capital investments by locating in lower risk areas or identifying risk-reductions solutions on-site before exposure to the particular climate impact.

Of the aforementioned solutions, incorporating climate change into ongoing planning processes and maintaining GIS data will be basic building blocks to implementing resilience across every municipality in Connecticut.

## IV. Conclusions

Without clear responsibilities, dedication of resources, and responsibilities for implementation, the diffuse nature of local resilience planning in Connecticut will continue to be piecemeal, inconsistent, opportunistic, and inequitable. Most states and localities are grappling now with the locus of responsibility for this type of planning. Wherever possible, for expediency, changes should be made to existing programs or responsibilities. While this white paper focuses on the factors related to local resilience where there is local control, additional thorough evaluation of regional concepts such as watershed management or transportation systems could provide similar observations in the gaps and opportunities for adaptation planning. Additionally, review of how greenhouse gas mitigation can be enhanced through these mechanisms would lead to co-benefits.

Creating a more Resilient Connecticut will depend not only on individual projects in a handful of towns but on a system that enables and enhances resilience for all communities across the state. That must begin with removing the limitations that already exist, enhancing existing processes, and creating new processes or policies that make adaptation a practice and resilience an inherent character of planning.

**Figure 1.** Relationship between identified gaps and suggested remedies.

Gap	Potential Remedy
Gap #1 Inclusion of Climate Change in Primary Local Planning Documents is Voluntary and Sporadic.	<ul style="list-style-type: none"> <li>• Mandate inclusion of climate change in local plans.</li> <li>• Support municipal resilience planning activities at multiple scales.</li> <li>• Create and Maintain GIS Infrastructure.</li> </ul>
Gap #2 Local Responsibility for Climate Resilience is Not Clear	<ul style="list-style-type: none"> <li>• Develop clear local authority for coordinating, evaluating, and implementing climate change assessment and planning.</li> <li>• Remove planning impediments or inconsistencies to local adaptation strategies or resilience measures.</li> </ul>
Gap #3 Primary Regional Planning Documents Do Not Require that Climate Change be Addressed	<ul style="list-style-type: none"> <li>• Support municipal resilience planning activities at multiple scales.</li> <li>• Remove planning impediments or inconsistencies to local adaptation strategies or resilience measures.</li> </ul>
Gap #4 Spatial Data across Connecticut is varied in availability, accessibility, adequacy, and accordance	<ul style="list-style-type: none"> <li>• Create and Maintain GIS Infrastructure.</li> </ul>

## Endnotes

Funding for this project was provided by the United States Department of Housing and Urban Development through the Community Development Block Grant National Disaster Recovery Program, as administered by the State of Connecticut, Department of Housing. This publication does not express the views of the Department of Housing or the State of Connecticut. The views and opinions expressed are those of the authors. Project support comes from the Connecticut Institute for Resilience and Climate Adaptation (CIRCA) and the University of Connecticut. CIRCA’s mission is to increase the resilience and sustainability of communities vulnerable to the growing impacts of climate change on the natural, built, and human environments.

Many thanks for the helpful comments and advice on the white paper provided by John Guskowski and CIRCA staff.

**DISCLAIMER:** This white paper addresses issues of general interest and does not give any specific legal advice pertaining to any specific circumstance. Parties should obtain advice from a lawyer or other qualified professional before acting on the information in this paper.

<sup>1</sup> *Global Warming Solutions Act* (Public Act 08-98) set mandatory GHG reduction targets of 10% below 1990 levels by 2020 and 80% below 2001 levels by 2050. Gov. Lamont’s Executive Order 1 established a 45% GHG emissions reduction below 2001 levels by 2030 by state government.

<sup>2</sup> Greenhouse gas mitigation and other carbon reduction methods are important to consider but not fully explored in this paper.

<sup>3</sup> As of 2017, 33 states require local (definition for local varies between borough, township, municipality, city, etc.) comprehensive plans. No state requires a discrete climate change element in a local comprehensive plan. Six have legislation enhancing resilience in the local comprehensive plan. Source: *A Survey of Climate Change Adaptation*

---

*Planning*. (2019). American Planning Association. <https://www.planning.org/publications/document/9189463/>  
<https://www.planning.org/nationalcenters/hazards/statesurvey/>

<sup>4</sup> Since the municipal coastal program is permissible but not required, review of statutes governing these additional plans were not reviewed.

<sup>5</sup> There are two additional elements, High Hazard Potential Dams and Fire Management assistance grants, but it was not counted here as it's very specific and not broadly applicable. Additional elements exist for an "enhanced" plan.

<sup>6</sup> There is a 7<sup>th</sup> element, Element G: High Hazard Potential Dams, but it was not counted here as it's very specific and not broadly applicable.

<sup>7</sup> This act also expanded work of the Connecticut Green Bank including a Clean Energy Fund and an Environmental Infrastructure Fund, which may receive funds required by law to be deposited and even federal funds.

<sup>8</sup> USDOT has a table with examples on how to incorporate resilience into transportation planning at <https://www.fhwa.dot.gov/environment/sustainability/resilience/publications/ratp/index.cfm>. USDOT also prepared a white paper that provides interesting reflections on how resilience is being incorporated into MPO and State DOT planning: Dix, Brenda; Zgoda, Beth; Vargo, Amanda; Heitsch, Samantha; Gestwick, Taylor. (2018) *Integrating Resilience into the Transportation Planning Process: White Paper on Literature Review Findings*. [White paper]. U.S. Department of Transportation, Federal Highway Administration, FHWAHEP-18-050.

[https://www.fhwa.dot.gov/environment/sustainability/resilience/ongoing\\_and\\_current\\_research/planning/integrating\\_resilience.pdf](https://www.fhwa.dot.gov/environment/sustainability/resilience/ongoing_and_current_research/planning/integrating_resilience.pdf)

<sup>9</sup> Climate change definitions were included in FHWA Order 5520, which was completed to comply with President Obama's Executive Order 13653. President Trump rescinded EO 13653 with EO13783.

<sup>10</sup> 23 CFR 450.324(f)(7)

<sup>11</sup> The Bipartisan Infrastructure Law (BIL) (§ 11105) had amendments, which took effect October 1, 2021, which require that States take into consideration extreme weather and resilience within their lifecycle cost and risk management analysis in their transit asset management plans (TAMPs).

<sup>12</sup> 23 CFR 450.306(d)(2)(i) and 23 CFR 450.206(c)(1), respectively

<sup>13</sup> The CT Office of Policy & Management recently established a Geographic Information Systems Office directed by a Geographic Information Officer (GIO) in 2022 following the 2021 June Special Session of the state legislature. This office will be responsible for coordinate GIS across agencies, COGs, municipalities, and other constituencies. A Geographic Information Systems Advisory Council will provide consultation to the GIO.

<sup>14</sup> Butler, W., Holmes, T., & Lange, Z. (2021). Mandated Planning for Climate Change: Responding to the Peril of Flood Act for Sea Level Rise Adaptation in Florida. *Journal of the American Planning Association*, 87(3), 370–382. <https://doi.org/10.1080/01944363.2020.1865188>

<sup>15</sup> Examples see: Cal. Gov. Code § 65302 requires climate change in the safety element of their local hazard mitigation plan; R.I. Gen. Laws § 42-6.2-3 (State agencies shall support the climate change coordinating council as they "(11) Encourages [stet] municipalities to incorporate climate change adaptation into local hazard mitigation plans and, when feasible, into hazard mitigation projects"). Vermont's emergency management agency must review local plans with respect to climate change biennially. An [ICLEI report](#), "Integrating Hazard Mitigation and Climate Adaptation Planning: Case Studies and Lessons Learned" discusses this relationship further.

<sup>16</sup> FEMA also released a "Guide to Expanding Mitigation: Making the Connection to the Coast" in May 2022.

<sup>17</sup> Community Lifelines is a framework established by FEMA to prioritize restoration of different functions (e.g., Safety & Security, Communications, Energy, etc.) following disasters.

<sup>18</sup> New Jersey master plan has comprehensive obligations for the inclusion of climate change in the land use element including consistency with the hazard mitigation and other plans (N.J. Stat. § 40:55D-28).

<sup>19</sup> <https://planning.ri.gov/planning-areas/local-comprehensive-planning>

<sup>20</sup> As an example, Colorado's comprehensive planning statutes state applicable sources - CO Rev Stat § 31-23-206 (2016).

<sup>21</sup> Local and state Consolidated Plans for housing have to consider climate change. 24 CFR 91.310(2)(3) Commencing with consolidated plans submitted on or after January 1, 2018, the State must also describe the

---

vulnerability of housing occupied by low- and moderate-income households to increased natural hazard risks due to climate change based on an analysis of data, findings, and methods identified by the State in its consolidated plan. 24 CFR 91.210(a)(5) Commencing with consolidated plans submitted on or after January 1, 2018, the jurisdiction must also describe the vulnerability of housing occupied by low- and moderate-income households to increased natural hazard risks associated with climate change based on an analysis of data, findings, and methods identified by the jurisdiction in its consolidated plan.

<sup>22</sup> The Bipartisan Infrastructure Law also created the Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation (PROTECT) Formula Program which encourage multimodal and multiscale resilient transportation planning.

<sup>23</sup> Integration of land use and transportation planning was also suggested in Peckett, H., & Duffy, C. (2012). *Best planning practices: Metropolitan transportation plans*. U.S. Department of Transportation.  
[https://www.planning.dot.gov/documents/BestPlanningPractices\\_MTP.pdf](https://www.planning.dot.gov/documents/BestPlanningPractices_MTP.pdf)

<sup>24</sup> Elton, N., Hayes, L.E., & Wozniak-Brown, J. *Preliminary Results: Emergency Shelter and Cooling Center Practices in Connecticut*. Connecticut Department of Public Health and UConn Connecticut Institute for Resilience and Climate Adaptation. 2022.

<sup>25</sup> <https://www.fema.gov/emergency-managers/practitioners/lifelines>

<sup>26</sup> Internal, regional, and national migration is difficult to predict except general acceptance of movement away from risk to areas with less risk. An example story is: Ropeik, A. (2021, January 22). *Americans Are Moving to Escape Climate Impacts. Towns Expect More to Come*. NPR.

<sup>27</sup> In 2022, the State Building Inspector, State Fire Marshal and the Codes and Standards Committee intend to adopt the 2022 State Building and Fire Safety codes based on the 2021 editions of the International Code Council (ICC) documents.

<sup>28</sup> Please see CIRCA's Legal and Policy products on additional TDR considerations.