UCONN

Zoning for Municipal Resilience

Connecticut Institute for Resilience and Climate Adaptation
Zoning Fact Sheet Series

Municipal Land Use Commission Training

Offered by the Connecticut Institute for Resilience and Climate Adaptation (CIRCA)

CIRCA

CONNECTICUT Department of Housing

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Meet Your CIRCA Training Guides...

Kayla Vargas
Research Assistant
MS Energy & Environmental Management

Louanne Cooley
Legal Fellow
UConn Law
Adjunct Faculty

UConn CIRCA:

Using multidisciplinary teams to solve challenging problems

Science → Tools → Policy → Communication

PLANNING TOOLS

Innovative planning that incorporates technical knowledge & leads to policy development & project implementation.

TECHNICAL TOOLS

Developing map viewers, storymaps, datasets, & guidance documents to inform planning & decision-making.

FIELD RESEARCH

Deploying instruments, analyzing data, & developing models to better understand site conditions & demonstration projects.

ENGAGEMENT

Working with stakeholders to build capacity & partnerships through events, outreach, & tool development.

CIRCA

CONNECTICUT Department of Housing

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

About This Training

- Low Impact Development
  - Land management strategy emphasizing minimization of development on natural landscapes and hydrology.
  - Focus on design with nature, avoiding increased stormwater runoff.
- Climate Resilient Zoning
  - Expands concept of Low Impact Development to account for increasing vulnerabilities due to climate change by increased heat, precipitation, flooding, erosion, and storms.
  - Works within current zoning authority to maximize resilience to future climate change impacts.

Zoning for Climate Resilience

As climate change threatens people and the environment, municipalities can implement strategic land use planning and zoning regulations to improve local climate adaptation and resilience by directing development away from vulnerable areas.

Regulations can be targeted to:

- Protect natural buffering features and green infrastructure (Low Impact Development)
- Incentivize development density in specific areas, away from climate change vulnerable areas
- Specify resilient design to reduce impacts of storms, sea level rise, and increasing heat.

CIRCA

CONNECTICUT Department of Housing

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Zoning for Climate Resilience Continued

Overlap in municipal priorities…

Reduce Minimum Lot Size

Affordable housing options

Integrating Resilient Design and avoiding municipal climate risks

Resilient zoning can lead to affordable housing options while minimizing climate risks, then integrated into resilient design

CIRCA

CONNECTICUT Department of Housing

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Transfer of Development Rights and Resilience

CIRCA

CONNECTICUT Department of Housing

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Transfer of Development Rights and Resilience

Transferable Development Rights (TDR) are a regulatory technique allowing development rights to a property to be severed, transferred, and relocated to another parcel of land.

- Landowner retains the title and other rights to the property.
- Expressed as a conservation easement in land records.
- Directs development out of vulnerable areas, ***Sending Zones***, and allows the development rights to be utilized in ***Receiving Zones****;* permitting more density than authorized by typical zoning ordinance.

TDRs can preserve and protect:

- Natural resources.
- Ecological functions.
- Open space.
- Agricultural and Historical areas.

CIRCA

CONNECTICUT Department of Housing

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Transfer of Development Rights and Resilience

TDR programs can aid in protecting or establishing natural buffers to reduce flooding, protect water supply and infrastructure, or mitigate ground level heating.

TDRs can Promote Climate Resilience by:

- ✓ Limiting development in areas of higher climate risk and encouraging development in less sensitive areas
- ✓ Addressing climate-intensified hazards such as:
  - Sea Level Rise.
  - Flooding.
  - Poor Water Quality.
  - Erosion.

CIRCA

CONNECTICUT Department of Housing

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Transfer of Development Rights and Resilience

Connecticut TDR Statutes

C.G.S. Sec. 8-2 Regulations (c)(5) Provide for a municipal system for the creation of development rights and the permanent transfer of such development rights, which may include a system for the variance of density limits in connection with any such transfer;

C.G.S. Sec. 8-2e. Municipal agreements regarding development rights. Any two or more municipalities which have adopted the provisions of this chapter or chapter 125a or which are exercising zoning power pursuant to any special act may, with the approval of the legislative body of each municipality, execute an agreement providing for a system of development rights and the transfer of development rights across the boundaries of the municipalities which are parties to the agreement. Such system shall be implemented in a manner approved by the legislative body of each municipality and by the commission or other body which adopts zoning regulations of each municipality.

C.G.S. Sec. 8-2f. Joint applications necessary for transfer of development rights. Any zoning regulations adopted pursuant to section 8-2 concerning development rights shall authorize the transfer of the development rights to land only upon joint application of the transferor and transferee.

The Connecticut State Legislature may consider revisiting this policy to increase its utility.

CIRCA

CONNECTICUT Department of Housing

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Transfer of Development Rights and Resilience

City Spotlight…

Stamford, CT

- Adopted a modified TDR program to manage development densities and encourage historic preservation.

- Ordinance allows for redefining boundaries of adjacent lots for zoning purposes in a few of the city's densest zoning districts.

Tabernacle of Grace Church Stamford, CT., photographed May 25, 2021.Tyler Sizemore / Hearst Connecticut Media

This application could be applied to promoting **climate resilience** in areas where protection of micro-resources would be of value, like shade islands, greenspace, or creating stormwater retention swales.

CIRCA

CONNECTICUT Department of Housing

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

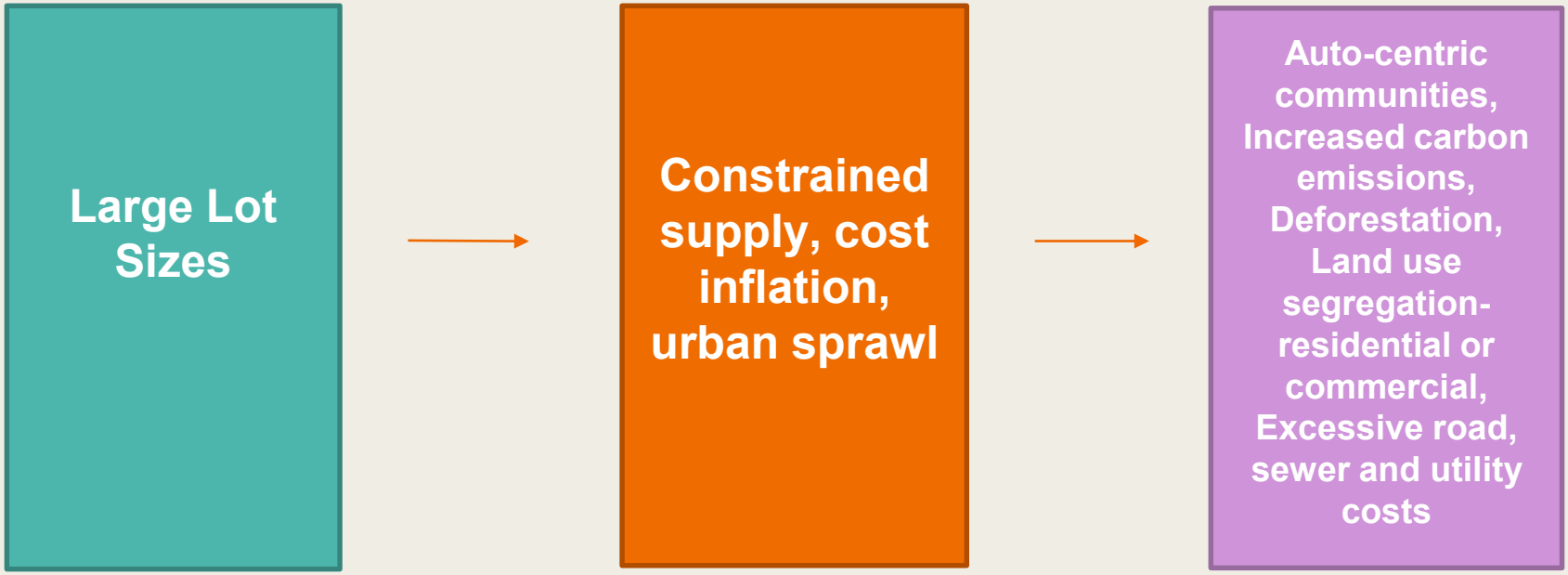
Minimum Lot Size Reduction and Resilience

"Connecticut's large lot sizes are larger than other states, which is one big reason Connecticut is one of the most expensive states to live in (Desegregate CT)."

Image courtesy Desegregate CT

Minimum Lot Size Reduction and Resilience

Minimum Lot size requirements are zoning codes that prerequisite developable land parcels to be a minimum size.



CIRCA

CONNECTICUT Department of Housing

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Minimum Lot Size Reduction and Resilience

Smaller lot sizes promote Climate Resilience by…

- ✓ Influencing cluster development.
- ✓ Limiting urban sprawl.
- ✓ Capitalizing open space.
- ✓ Lessen impervious surfaces.

Open space can be used to control flooding, preserve natural resources, enhance tree canopy, create community space, and increase wildlife habitat, biodiversity and ecological services.

Impervious surface removal Photo credit Department of Energy and Environment DC River Smart Homes Project

CIRCA

CONNECTICUT Department of Housing

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Minimum Lot Size Reduction and Resilience

Minimum Lot Size reduction can create diverse housing opportunities that appeal to various demographic populations, leading to more affordable and obtainable housing, and addresses historical racial and economic injustice.

Photo courtesy Desegregate CT

Minimum Lot Size Reduction and Resilience

Thinking ahead…

Scituate, MA – January 8: MBTA commuter rail train (Staff Photo By Stuart Cahill/Boston Herald)

Massachusetts has adopted smaller lot sizes in areas close to public transit (within 0.5 miles), to better influence Transit-Oriented Communities and create housing opportunities.

Prospect for CT?

- Carbon Emission Goals.
- Climate Initiatives.

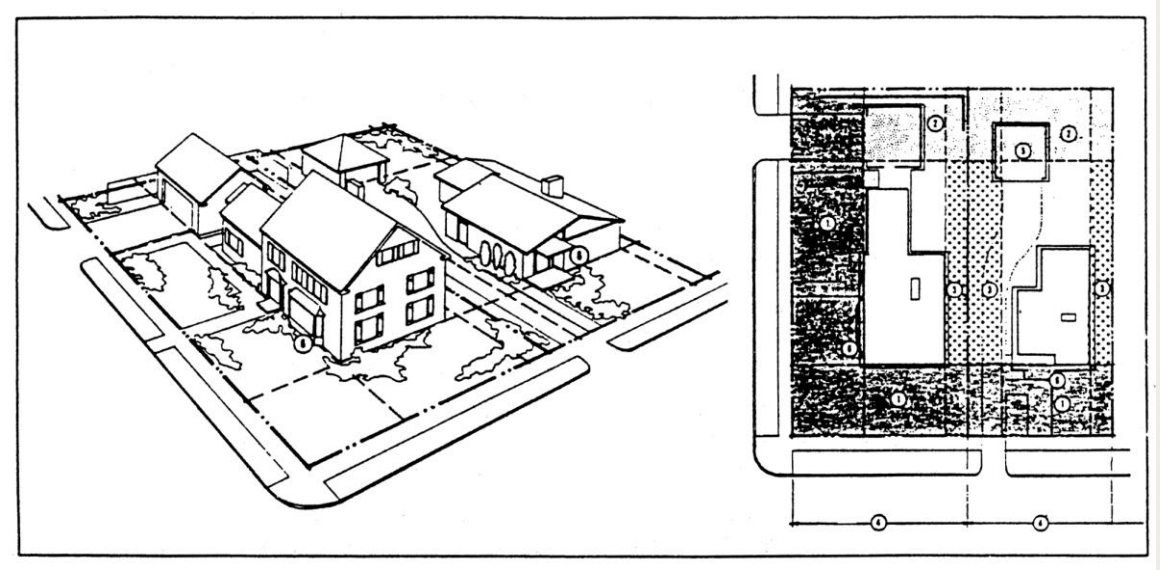
Learn more about the *2021 Massachusetts Housing Choice Act* by following:
https://www.mass.gov/info-details/multi-family-zoning-requirement-for-mbta-communities

CIRCA

CONNECTICUT Department of Housing

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Maximum Lot Coverage and Resilience



New Haven, CT RM-1 Low Middle Density Restrictions of size and placement of structure in specified district Photo Credit *Municode*

Maximum Lot Coverage and Resilience

Maximum Lot Coverage is defined as "the maximum area of a lot that is permitted to be covered by **impervious surfaces** in accordance with the applicable zoning district requirements, including but not limited to, building coverage, eaves, driveways, concrete patios, and similar features (Law Insider)."

Sq. ft of Impervious surface ÷ ***Size of developable parcel***

Maximum Lot Coverage and Resilience

Impervious Surfaces

- Buildings/Structures
- Asphalt driveways
- Patios
- Pools
- Sheds
- Roof overhangs
- Decks
- Parking Lots
- Concrete pavers

Approach

- Restrictive
- Moderate
- Inclusive

Any surface where water cannot effectively infiltrate to the underlying soil!

CIRCA

CONNECTICUT Department of Housing

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Maximum Lot Coverage and Resilience

Promote Climate Resilience by…

- Reducing flood risks
  - Stormwater management
- Preventing water quality threats
- Mitigating Urban Heat
- Open space opportunity
  - Flood control
  - Public recreation
  - Tree canopy growth

CIRCA

CONNECTICUT Department of Housing

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Maximum Lot Coverage and Resilience

Methods of Impervious Mitigation

Tree Planting

- Planting trees in highly impervious areas can reduce flooding as well as intercept heavy rainfall, thus retaining stormwater runoff. Tree canopy cover can also offer urban heat relief and reduce cooling costs.
- *NY Model Codes* suggest that property owners should plant one tree for every 200 sq ft of impervious surface created.

Permeable Pavement

- Alternative porous surface
  - Use in lower traffic areas to make an impact on water drainage.

Parking Minimum Reduction and Resilience

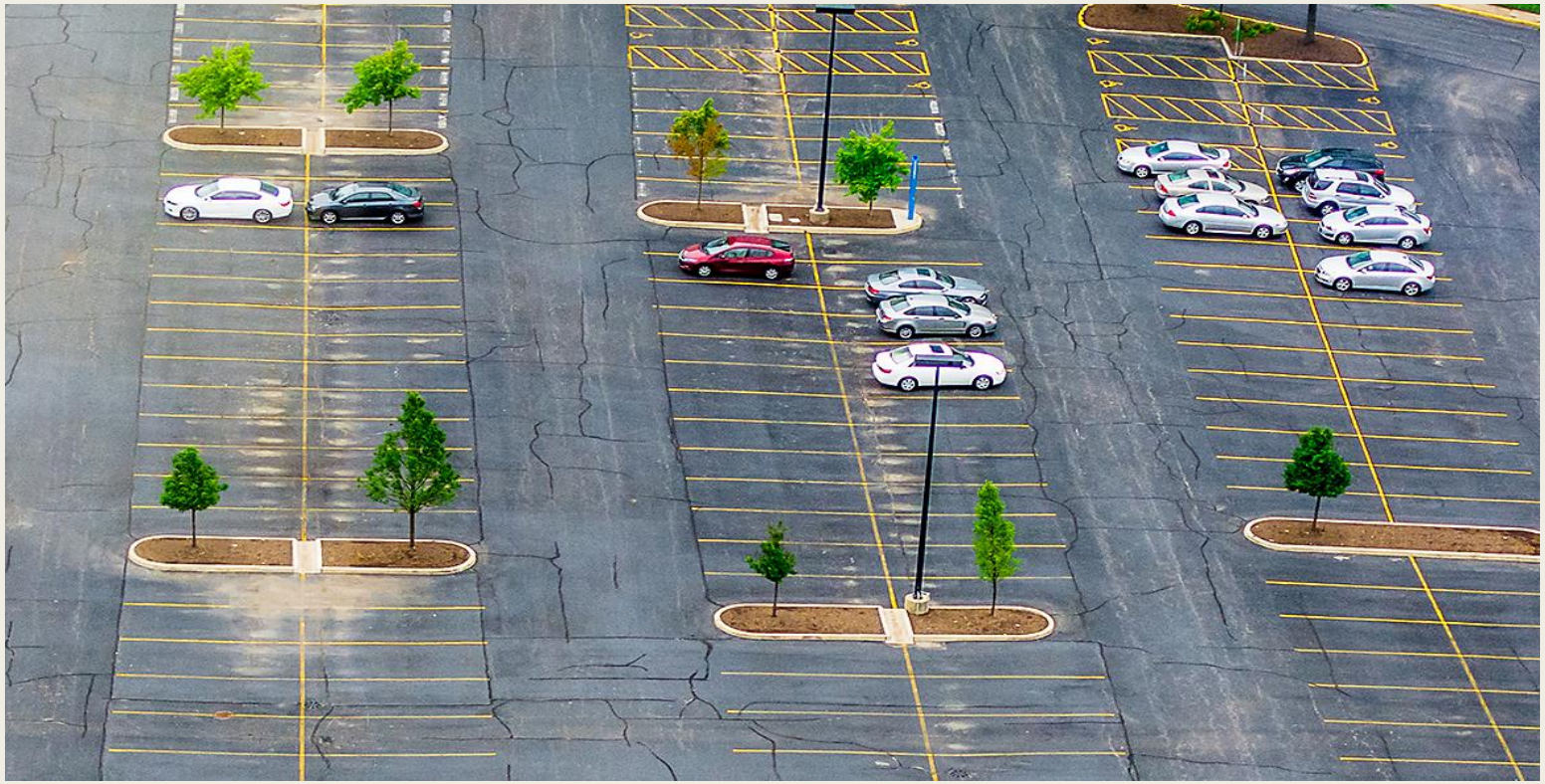


Photo by eyfoto/iStock/Getty Images Plus

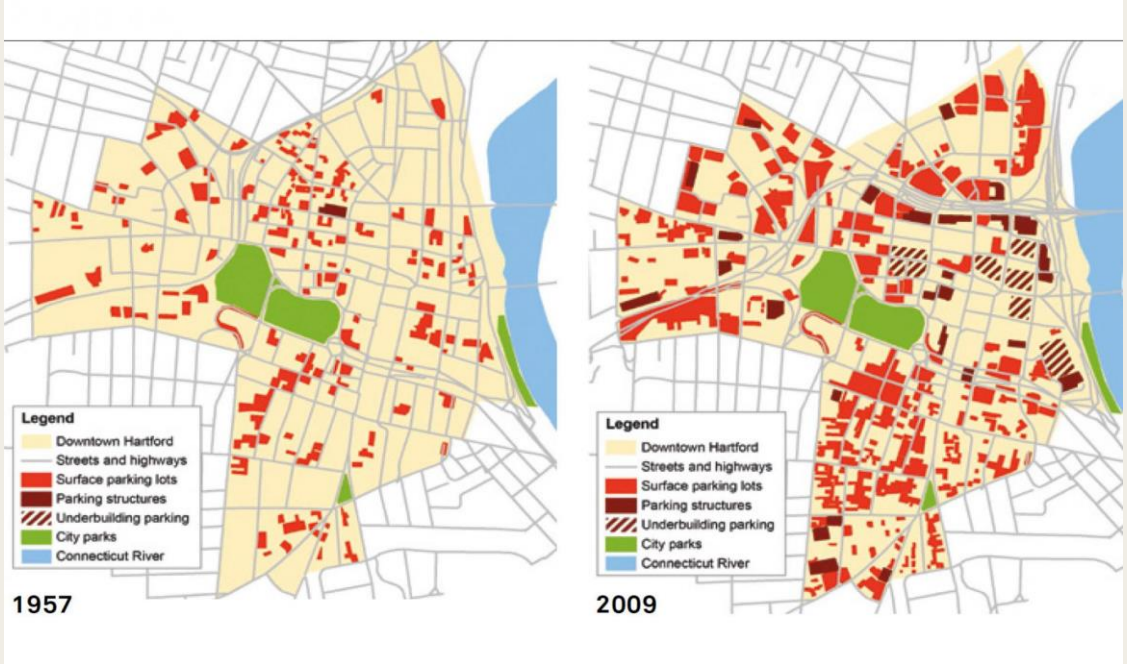
CIRCA

CONNECTICUT Department of Housing

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Parking Minimum Reduction and Resilience

Parking Minimums are municipal zoning ordinances that mandate a certain number of off-street parking spaces for private property owners to provide and maintain. They are usually determined by the square footage of a pertaining structure or number of residential units.



Researchers have determined that the land dedicated to surface parking lots in downtown Hartford, CT, tripled between 1960 and 2000.

Credit: Christopher McCahil and Norman Garrick.

CIRCA

CONNECTICUT Department of Housing

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Parking Minimum Reduction and Resilience

Why are Parking Minimums problematic?

Parking minimums can be damaging to the economy and resiliency of our communities by:

- Adding profitless value to urban businesses.
- Creating auto-centric communities and contributing to GHG emissions
- Cost inflation passed on to consumer and residents.
- Dramatically shaping the structure and function of urban spaces.

Hartford, CT Picture sourced from:
https://www.strongtowns.org/journal/2018/6/14/3-lessons-in-people-centered-transportation-from-the-first-us-city-to-completely-eliminate-parking-minimums

Parking Minimum Reduction and Resilience

Promote Climate Resilience by…

- ✓ Reducing impervious cover
  - Convert to Green Space
  - Mitigates Urban Heat Island Effect
  - Enhances Stormwater Management
- ✓ Decrease GHG emissions
  - Influence walk-able cities by decreasing large gaps between business

Other benefits of reduced Parking Minimums…

- ✓ Better land use
  - Increased housing
  - Recreational space
  - Better public transportation systems
  - Greenspace-Mitigation of climate impacts
- ✓ Businesses can utilize their spaces as a valuable resource

CIRCA

CONNECTICUT Department of Housing

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Parking Minimum Reduction and Resilience

2021 Connecticut Zoning Reform

Public Act 21-29

- *"may not require a minimum number of parking spaces for new housing units in excess of one space for studio and one-bedroom homes or two spaces for two-plus-bedroom homes."*

Municipalities can reduce Parking requirements in their cities further, abolish all together, or set parking maximums.

Context specific! What is appropriate for one town or zone, may not be appropriate for others. Requires data evaluation, nuance. This is why many communities chose to opt-out of the above provision in PA 21-29.

CIRCA

CONNECTICUT Department of Housing

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Parking Minimum Reduction and Resilience

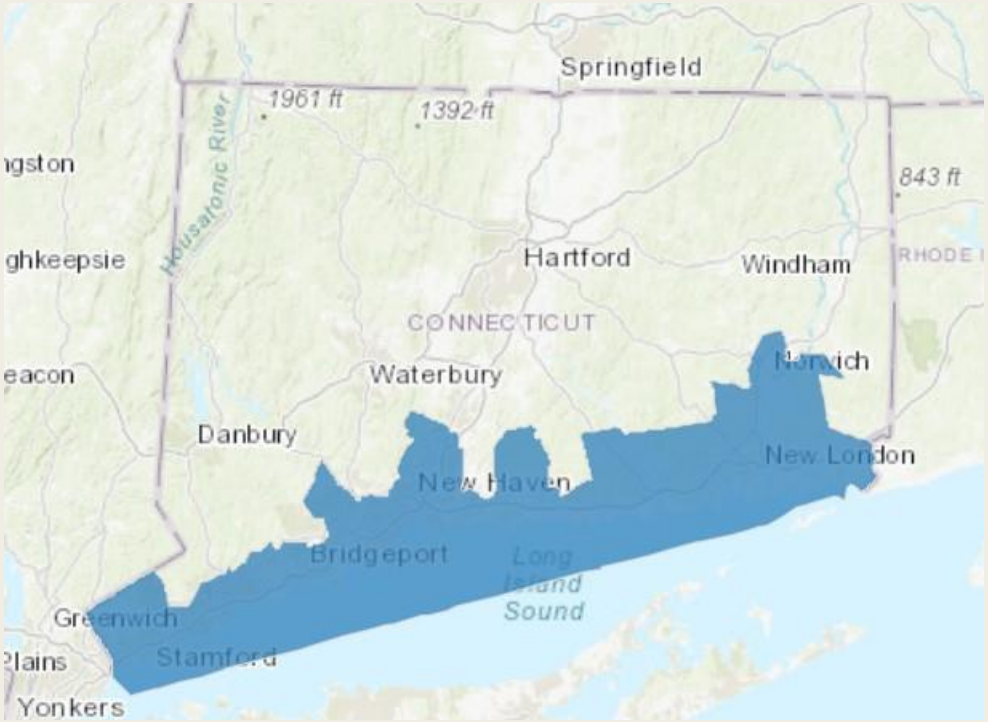
City Spotlight…

- Hartford CT eliminated parking minimums citywide.
- Enacted use specific parking maximums.
- Has *cycle* parking minimums!

This building was converted to apartments in downtown Hartford after parking mandates were eliminated.

Photo: Google Maps https://usa.streetsblog.org/2017/12/13/hartford-eliminates-parking-minimums-citywide/

Overlay Zones and Resilience



Connecticut Coastal Area and Boundary Polygon Map photo courtesy of CT DEEP GIS

Overlay Districts and Resilience

Overlay Districts are additional layers of regulation for site-specific concerns. Commonly used for:

- Historic preservation
- Flood protection zones and waterfronts
- Riparian corridors
- Pedestrian friendly zoning
- Transportation oriented development

CIRCA

CONNECTICUT Department of Housing

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Overlay Districts and Resilience

- In 2021, **Connecticut Public Act 21-29** revised the zoning enabling act to specifically authorize municipalities to adopt zoning regulations to allow overlay zones, floating zones, planned development districts, and cluster zones.

- Overlay zones can now be used for a wider range of purposes, like fostering **climate resilience**, without concern of legal challenge.

- Overlay zone standards can be implemented by right or permit to provide a targeted layer of protection for vulnerable areas.

Overlay Districts and Resilience

Promote Climate Resilience by…

- Regulating adaptive strategies
  - Breakaway walls
  - Setbacks
  - Elevation standards
  - Impervious surface requirements
  - Development densities
    - Coastal sprawl management
    - Limit sensitive area development
- Flexibility in standards
  - Elevation of buildings in flood zones

Some municipalities have further expanded community resilience by increasing minimum flood protection requirements above state and federal standards with the use of Overlay Districts.

CIRCA

CONNECTICUT Department of Housing

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Overlay Districts and Resilience

In Connecticut…

Connecticut Coastal Management Act (P.A. 79-535) authorized creation of Coastal Overlay Zones to regulate coastal development and limit the impact of flooding and erosion. While the Act does not specifically refer to climate resilience, the purpose and criteria are consistent with fostering a **climate resilient coastal area**.

- Greenwich Connecticut Coastal Overlay Zone has:
  - strict criteria for project approvals, requires site plan review and prioritizes protection of the natural environment and coastal resources.
  - Address climate resilience more directly by adding resilient design requirements.

CIRCA

CONNECTICUT Department of Housing

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Overlay Districts and Resilience

- Using best evidence sea level rise modeling to discern a Flood Overlay Zone boundary (inclusive of FEMA 100-year flood zones) would be best practice for a municipality to provide appropriate flood protection zoning regulations in coastal areas.

- Coastal overlay zones could be adapted to address climate resilience more directly by adding resilient design requirements.

Section of New Haven, CT CIRCA SLR/Storm Surge Viewer Tool

For Data Description and Usage, see *CIRCA's SLR and Storm Surge Viewer Tool*.

Overlay Districts and Resilience

A **Tiered Overlay Zoning Structure** can accommodate site-specific climate risks.

- **Protection Zone:** areas with critical infrastructure and dense development; reliance on hard armored flood protection infrastructure, but green infrastructure could be encouraged.

- **Accommodation Zone:** non-critical areas, future sea level rise is considered in future development i.e., setback, elevation, stronger building codes; downzoning appropriate for hazard reduction.

- **Conservation Zone**: areas with natural flood protection (marshes) or only non-critical structures at risk; downzoning to discourage development; rebuilding restrictions; overall goal of removing development and replacement with natural protection or open space.

CIRCA

CONNECTICUT Department of Housing

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Overlay Districts and Resilience

City Spotlight…

South Kingston, Rhode Island – Coastal Resilience Overlay District

- Specifically addresses the effects of climate change by "promoting awareness of future projections of sea level rise and the associated impacts from flooding and storm surge to current and future property owners."

- Susceptible to a one-hundred-year storm surge, in combination with a five-foot sea level rise that lies outside of FEMA Special Flood Hazard Area.

Influences property owners to make decisions that are responsive to a changing climate and weather patterns.

CIRCA

CONNECTICUT Department of Housing

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Design Standards

Building and Landscape

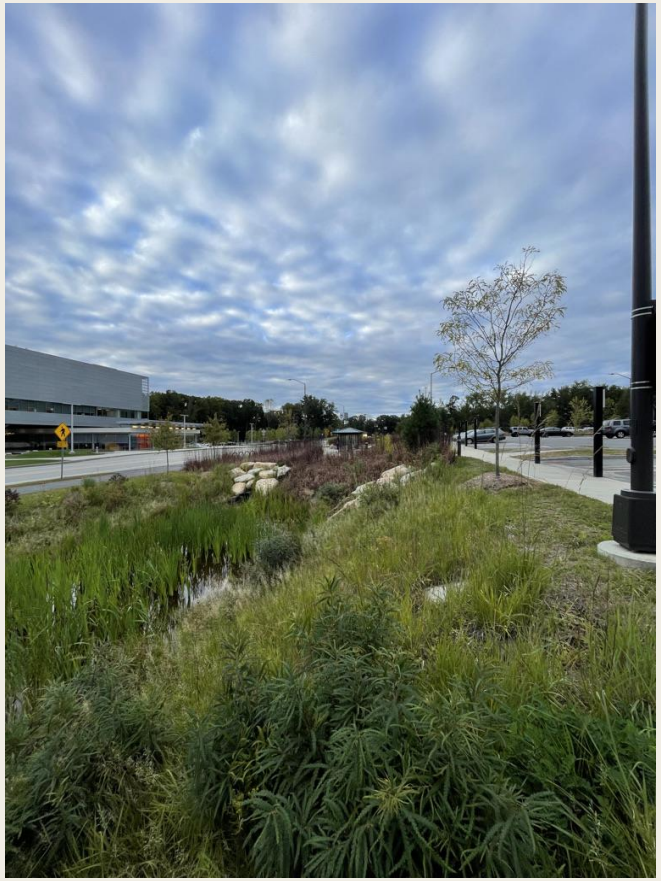
CIRCA

CONNECTICUT Department of Housing

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Resilient Design Standards
Increased Precipitation

Precipitation in Connecticut is predicted to increase by 4 to 5 inches annually by midcentury; over the winter and spring seasons. Adopting design strategies that pertain to increased rainfall can enhance **climate resilience** for current and future infrastructure with the co-benefits of public health and safety.



Connecticut Physical Climate Science Assessment Report (PSCAR)
or
https://circa.uconn.edu/wp-content/uploads/sites/1618/2019/11/CTPCSAR-Aug2019.pdf

CIRCA

CONNECTICUT Department of Housing

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Resilient Design Standards
Increased Precipitation/Flooding

Building Strategies

Dry Floodproofing Techniques

- Demountable flood barrier

Rainscreen

- Air space allows for effective moisture management
- Increases structural longevity
- Benefit all geographical locations

Green Roofing

- Vegetation absorbs and slows stormwater flow
- Mandate on new construction

Landscape Strategies

Blue Belts

- Engineered wetlands
- Require large amount of space

Onsite Stormwater Infiltration

- Diminish impervious surfaces
- Include Stormwater Infiltration Plans for new development

Green Infrastructure

- Bioswales, Raingardens, Permeable surfaces
- Use parks to collect

CIRCA

CONNECTICUT Department of Housing

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Resilient Design Standards
Increased Heat

The Northeast is the fastest warming region in the contiguous U.S….

Temperatures expected to increase by 4.0-5.1°F by mid-century and 5.3-9.1°F by late century (PCSAR).

What this means for Connecticut…

- Significant negative health impacts
- Negative impacts on infrastructure and natural landscapes
- Economic impact

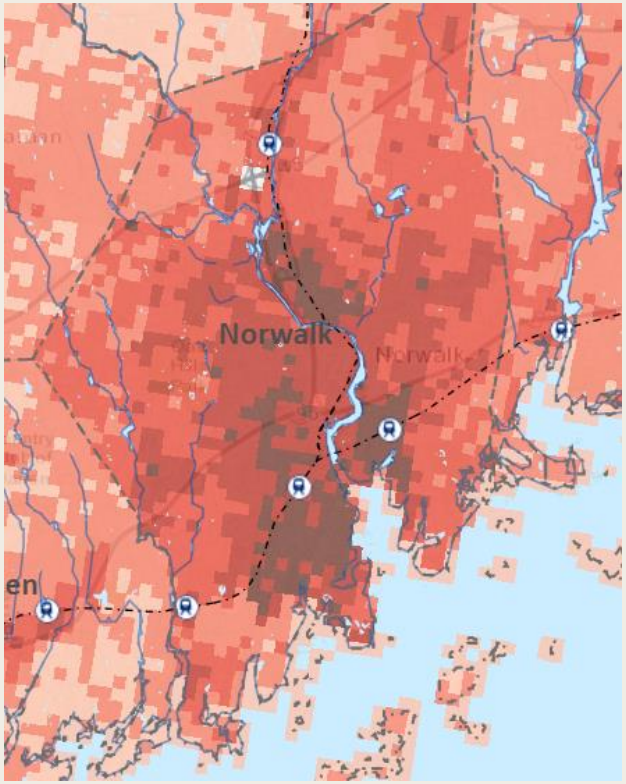


Photo credit CIRCA

CIRCA

CONNECTICUT Department of Housing

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Resilient Design Standards
Increased Heat

Building Strategies

Form/Envelope for future
- Incorporate adaptations to climate change in initial building design

Continuous Air Barrier
- Air/Moisture control

Mechanical Systems for Future
- Design to embrace predicted weather patterns in new/renovation builds

Reflective Roofs
- Enforce in new/replacement construction

Increased Termite/Pest Activity
- Termite-proof barriers

Landscape Strategies

Vegetative Shading/Tree Canopy
- Strategic placement

Drought Tolerant Vegetation
- Minimize irrigation/enhance tree survivability

Shaded Public Areas
- Provide shelter during power outages
- Solar opportunity

Reflective Materials
- Use permeable pavers or crushed stone on applicable sidewalks and small parking lots

CIRCA

CONNECTICUT Department of Housing

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Energy Standards for Resilience

Energy Standards for Resilience

Public Act 21-29 changed language about Renewable Energy.

New language now appears in CGS 8-2 (c) regulations may:

(3) Require or promote

(A) energy-efficient patterns of development;
(B) the use of distributed generation or freestanding solar, wind and other renewable forms of energy;
(C) combined heat and power; and
(D) energy conservation;

(4) Provide for incentives for developers who use

(A) solar and other renewable forms of energy;
(B) combined heat and power;
(C) water conservation, including demand offsets; and
(D) energy conservation techniques, including, but not limited to, cluster development, higher density development and performance standards for roads, sidewalks and underground facilities in the subdivision;

CIRCA

CONNECTICUT Department of Housing

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Energy Efficiency Standards

Sec. 8-2 (c)(3) *"Require or promote (A)* ***energy-efficient*** *patterns of development; (B) the use of distributed generation or freestanding solar, wind and other renewable forms of energy; (C) combined heat and power; and (D) energy conservation;"*

Promotes resilience by…

- ✓ Reducing electric grid demands
- ✓ Decreasing GHG emissions
- ✓ When energy costs are low, residents can contribute to local economies!

Photo courtesy https://www.energystar.gov/

CIRCA

CONNECTICUT Department of Housing

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Solar by Right

- Regulation designed to increase renewable energy by permitting solar energy systems by-right in appropriate zones.
- Use specific regulations (height, set back, landscaping and others) still apply.
- Example: Hartford permits roof top solar in all zones as an accessory structure by right, subject to specific regulatory requirements.

NOTE:

- P.A. 22-25 prohibits home-owners associations from banning rooftop solar.
- Connecticut Siting Council has jurisdiction on solar siting for projects generating over one MW.

CIRCA

CONNECTICUT Department of Housing

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Thank you!

UCONN
UNIVERSITY OF CONNECTICUT

CIRCA
Connecticut Institute for Resilience and Climate Adaptation

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

CIRCA

CONNECTICUT
Department of Housing

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT