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UNIVERSITY OF CONNECTICUT

Connecticut Institute for Resilience & Climate
Adaptation (CIRCA)



INTRODUCTION TO CIRCA'S MISSION AND GOALS

January 12th, 2024

James O'Donnell, Executive Director, CIRCA

CIRCA

Connecticut Institute for Resilience and Climate Adaptation (CIRCA)

Mission:

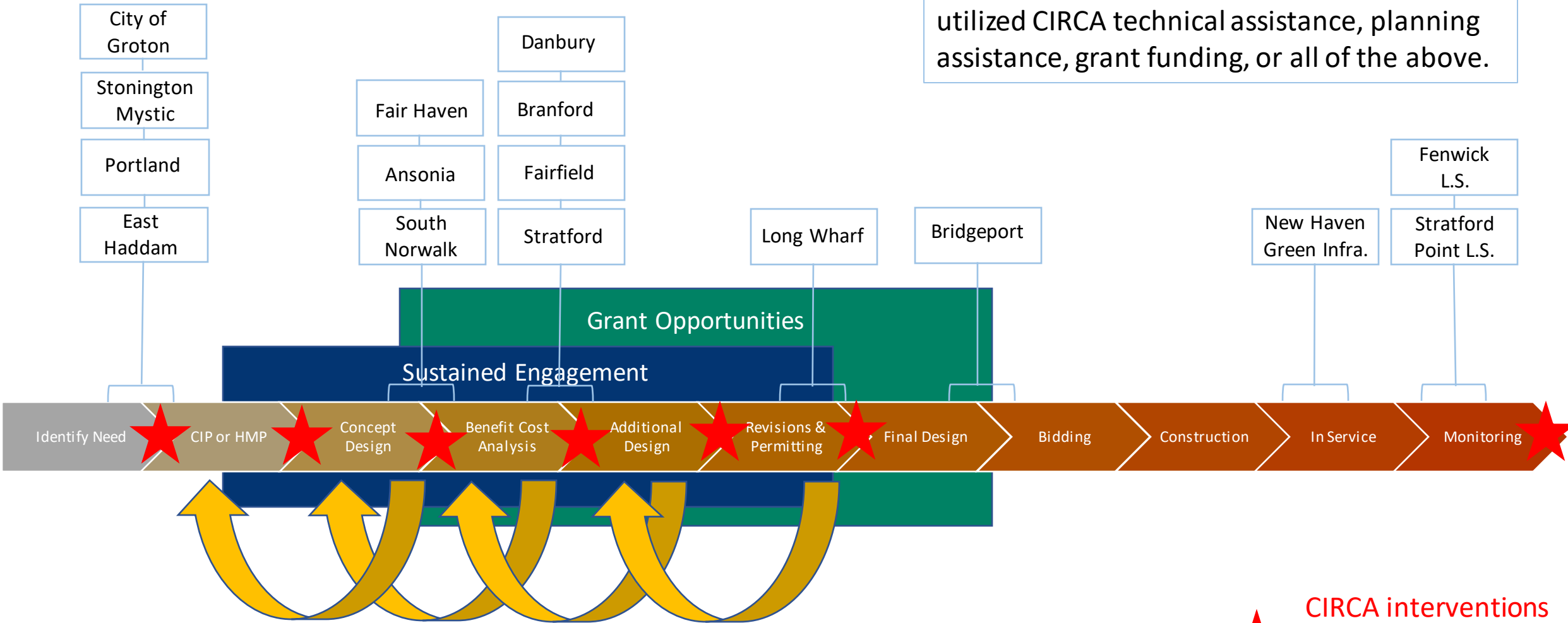
CIRCA's mission is to increase the resilience and sustainability of communities vulnerable to the growing impacts of climate change on the natural, built, and human environments. Our Institute is a multi-disciplinary, center of excellence that brings together experts in the natural sciences, engineering, economics, political science, finance, and law to provide practical solutions to problems arising as a result of a changing climate

Executive Director: James O'Donnell

CIRCA's climate research focus areas:

- Coastal and inland flooding
- Heat islands
- Resilience of critical infrastructure
- Innovative adaptation approaches (green infrastructure & living shorelines)
- Environmental Justice

The listed projects along the pipeline have utilized CIRCA technical assistance, planning assistance, grant funding, or all of the above.



Taking a step backward is possible and often will occur, in practice, along a project pipeline

★ CIRCA interventions and value added possible



CIRCA'S PROJECTS AND ITS IMPACT ON CONNECTICUT

January 12th, 2024

John Truscinski, CFM, Director of Resilience Planning, CIRCA

Planning Framework for Establishing Resilient Communities

- Focus community development around transit (resilient TOD)
- Create corridors resilient to climate change (resilient corridors)
- Create opportunities for affordable housing, preserving and enhancing the quality of life for existing affordable communities
- Develop energy, economic, and social resilience
- Increase transit connectivity
- Adapt structures and critical infrastructure in the flood zone to withstand occasional flooding
- Protect communities through healthy buffering ecosystems, where critical services, infrastructure, and transport hubs are located on safer, higher ground, and where strong connections exist between the two

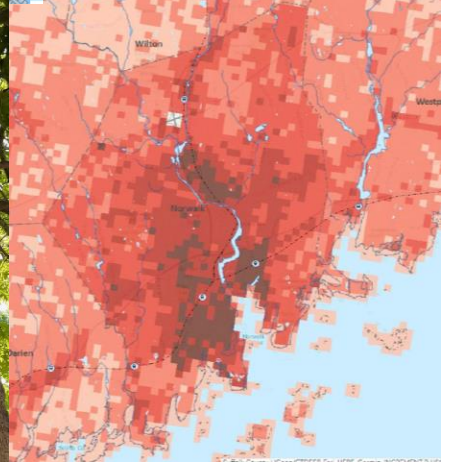
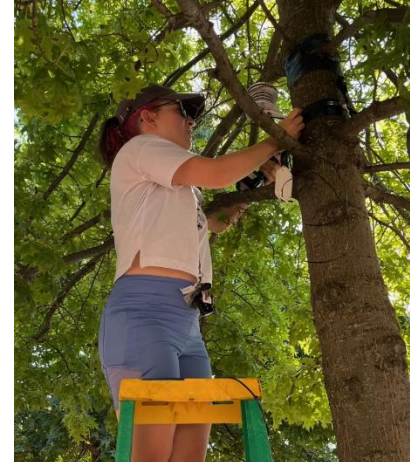
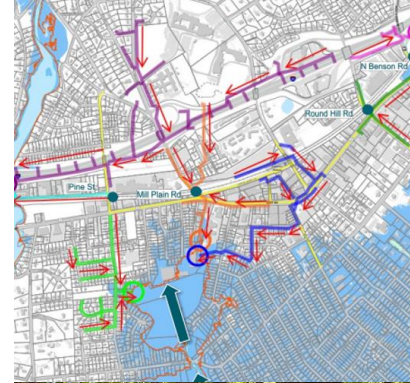
<https://resilientconnecticut.uconn.edu/wp-content/uploads/sites/2761/2020/04/Resilient-Connecticut-Planning-Framework-Final-1-30-20.pdf>

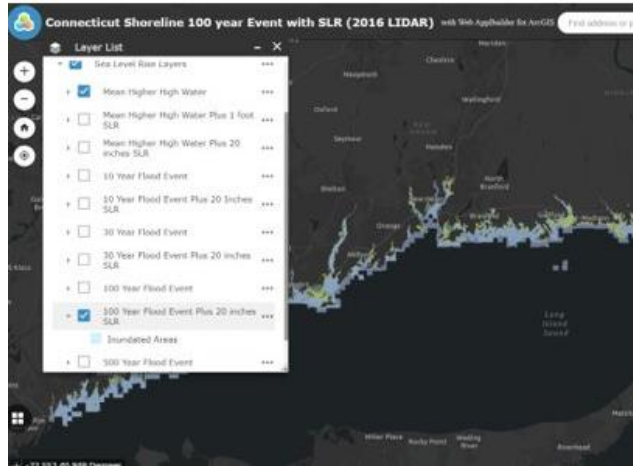
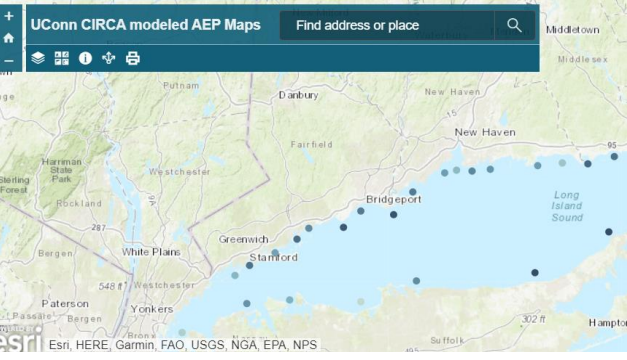
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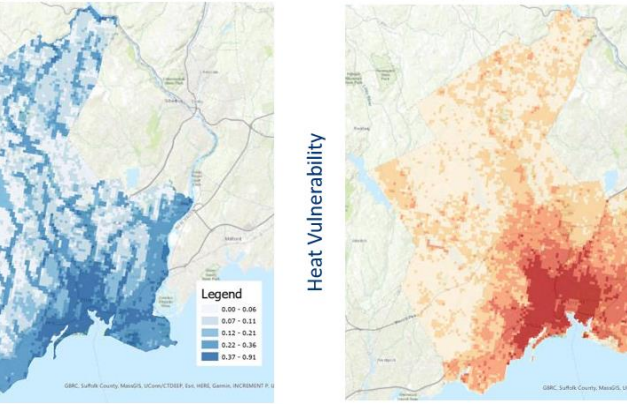
CIRCA – Resilient Connecticut

- 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.
- Field work deployment for water and wave levels and heat index to support model calibrations

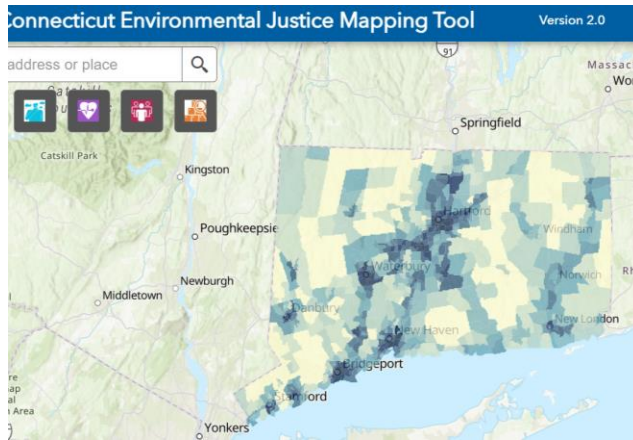
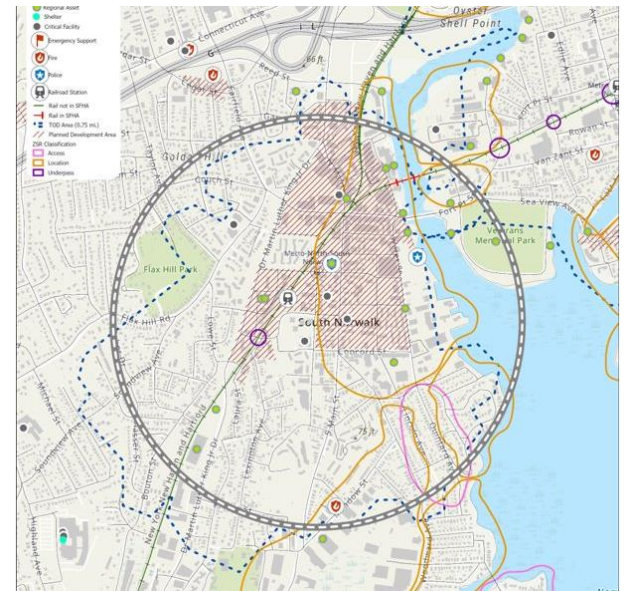


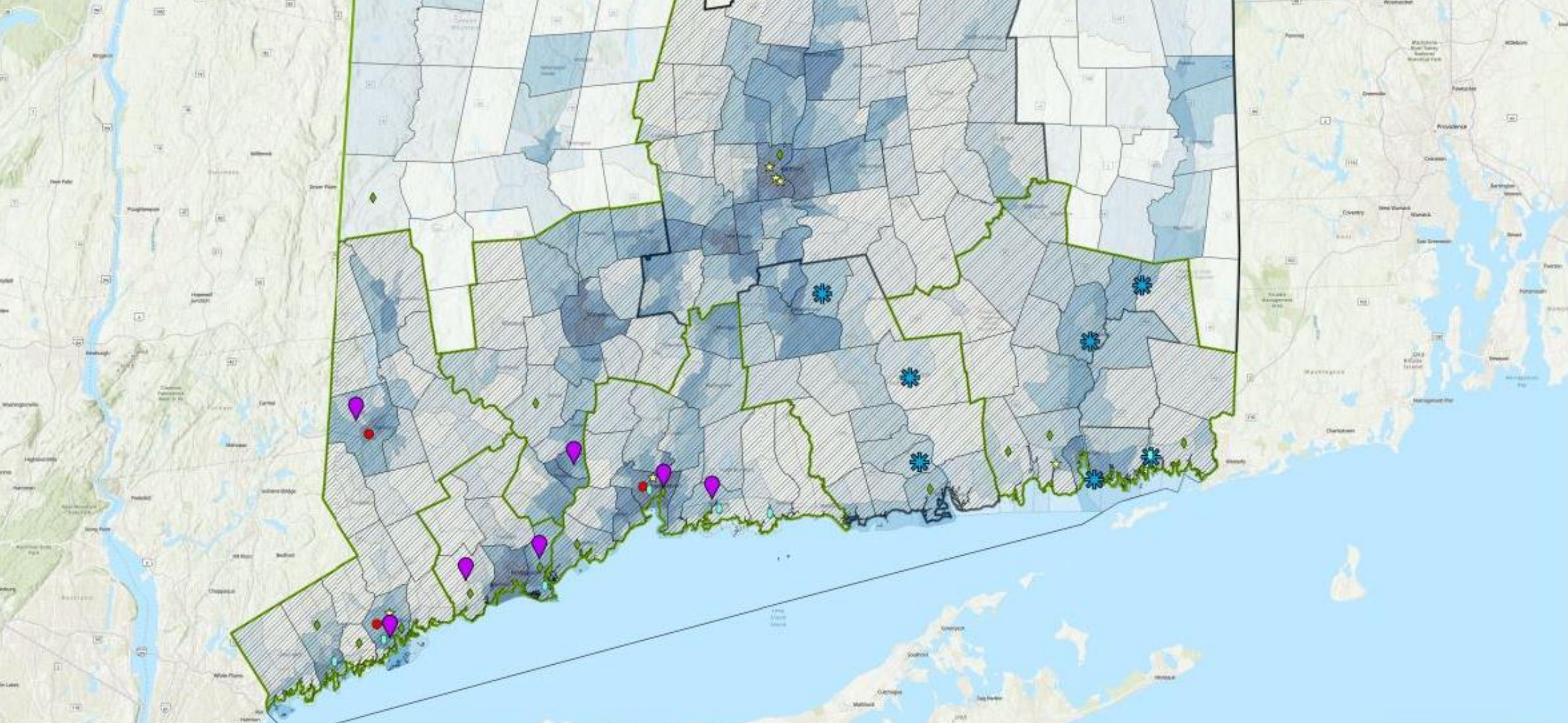


Mapping tools to support project development include



- Climate Change Vulnerability Index (CCVI) for flooding and heat,
- Zones of shared risk,
- Resilience opportunity areas.
- Sea level rise viewer
- Annual Exceedance Probability Viewer
- Environmental Justice Screening Tool





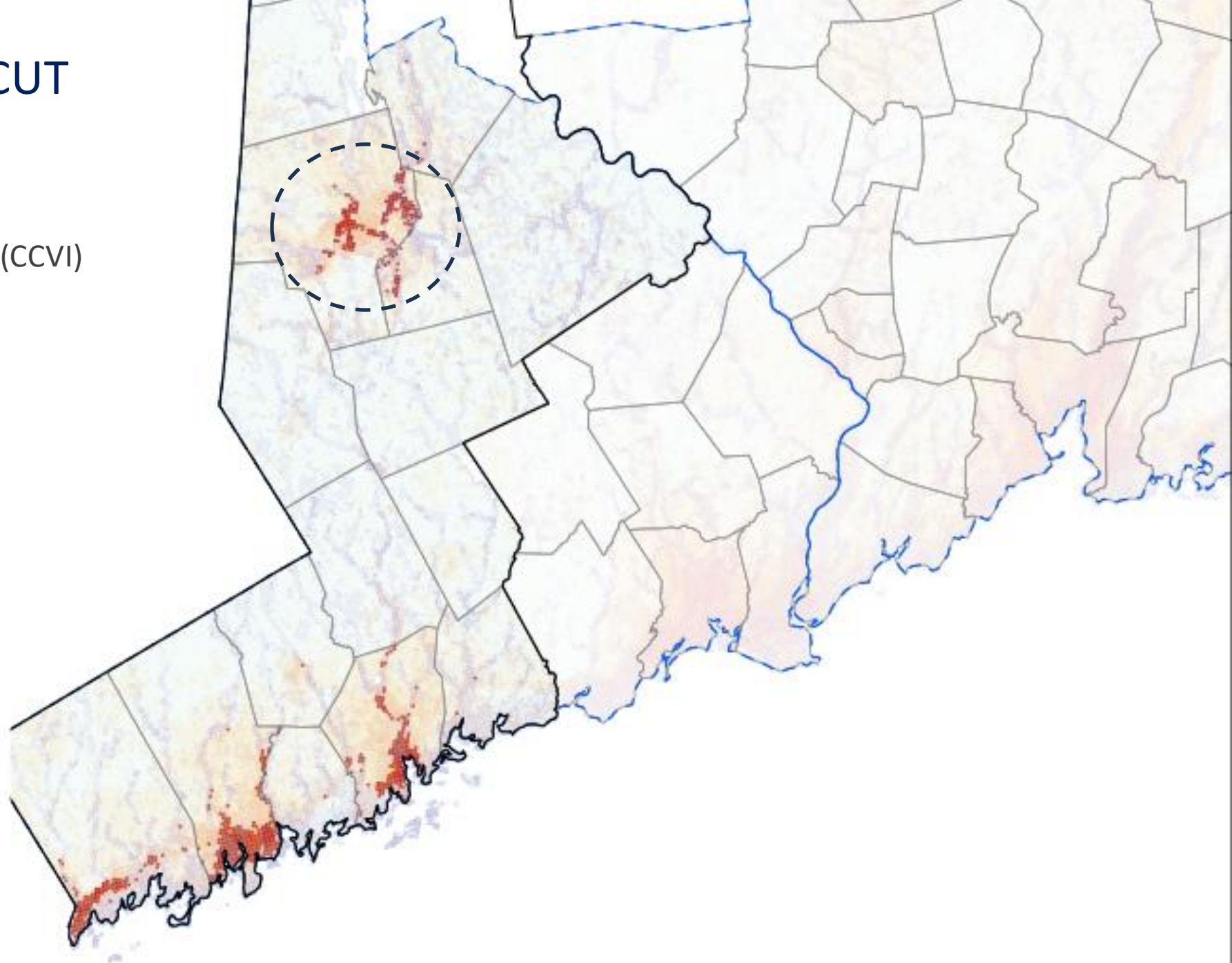
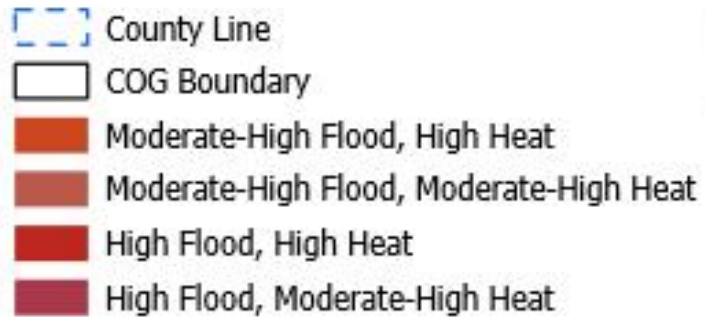
CIRCA Projects in CT

- | | | | | | |
|--|---|---|--|---|---|
|  Resilient CT 1.0 Phase III Projects Potential Resilient CT |  CIRCA Heat Sensors |  Towns Awarded Municipal Resilience Grants | Legend |  CT Towns CIRCA Has Engaged With |  CIRCA's Environmental Justice Mapping Tool Rank |
| |  CIRCA Water Sensors |  Municipal Resilience Grants |  CT Towns |  4 | |
| | | | |  5 | |
| | | | |  6 | |
| | | | |  7 | |
| | | | |  8 | |
| | | | |  9 | |
| | | | |  10 | |



RESILIENT CONNECTICUT PHASE II

Climate Change Vulnerability Index (CCVI)



RESILIENT CONNECTICUT PHASE II

RESILIENT DANBURY

Resilient Connecticut Phase II

Regional Adaptation/Resilience Opportunity Areas

Name: Downtown Danbury

Location: Danbury

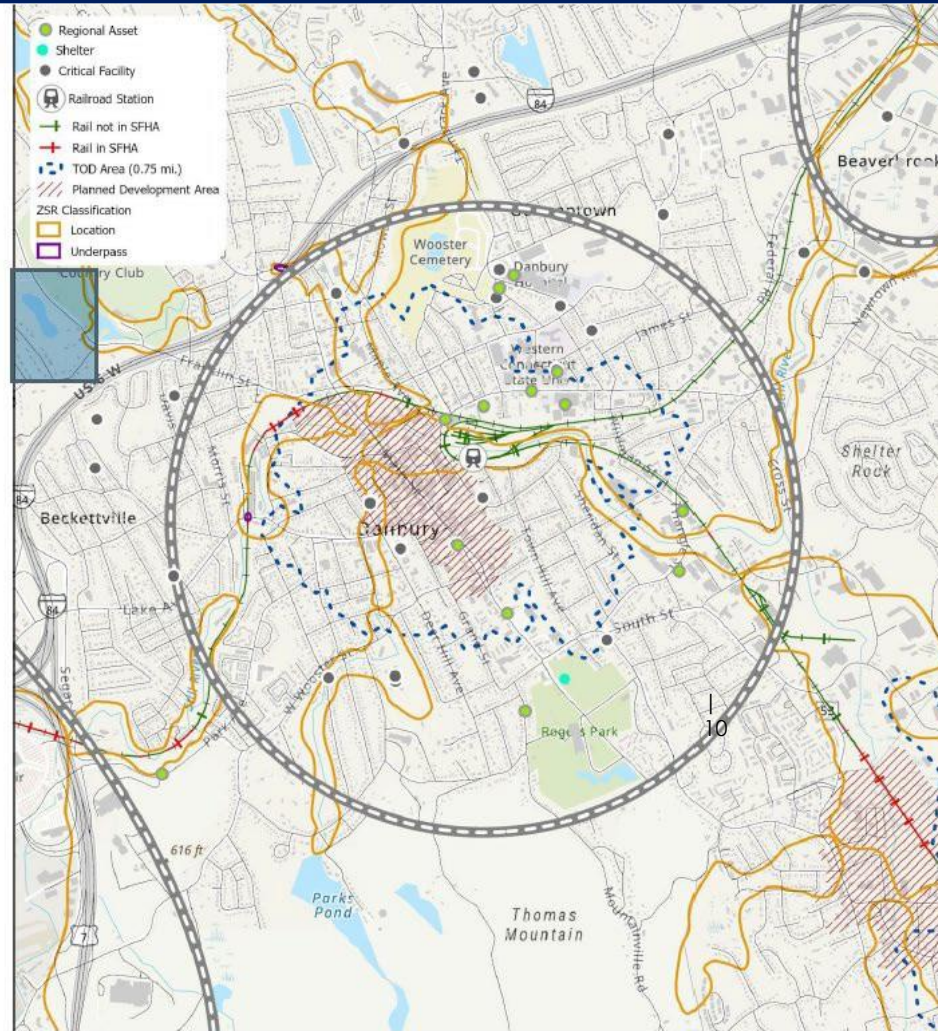
Considerations	Characteristics of Area
Flood Vulnerability	●●●●●
Heat Vulnerability	●●●●○
Social Vulnerability	●●●●●

The center of Danbury is characterized by zones of shared risk associated with the confluence of Padanarum Brook, Kohanza Brook, and the Still River. Despite many flood risk reduction projects undertaken over decades, TOD and planned development areas are located in close proximity to – or within – these zones of shared risk. Numerous critical facilities, historic resources, and the terminus of the MetroNorth Danbury line are also located in the area. Downtown Danbury is a regional center for northern WestCOG.

Almost all of the downtown area is moderately vulnerable to heat, with the highest vulnerable area concentrate along route 53 commercial properties. Presenting few opportunities for shade or street trees, the area has high heat emittance. In addition, there is high social sensitivity throughout the area.

City Hall
Fire headquarters
Hose Co. 5, 6, 7, and 9
Danbury Hospital
Danbury Health and Housing Dept.
Western CT State College Police

Assisted living facilities
War Memorial
Substation
Power plant
Museums



EAST DITCH FLOODING

RESILIENT DANBURY



June 2nd, 2022



June 2nd, 2022



June 2nd, 2022



September 16th, 2002



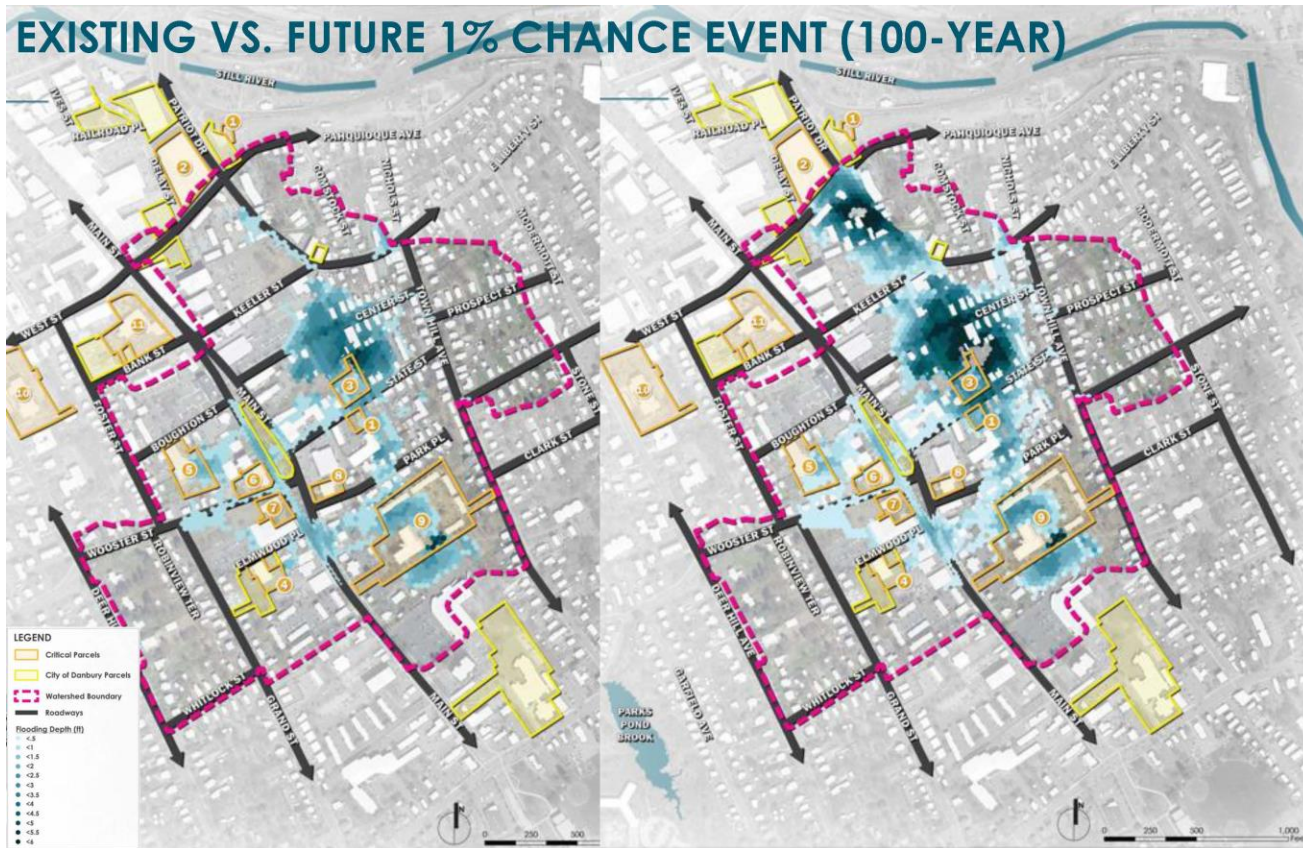
September 16th, 2002



August 13th, 2001

RESILIENT CONNECTICUT PHASE III

- Modeling and mapping existing and future conditions for flooding and heat



Walk and Shop

- Streetscape improvements
- Improve pedestrian experience
- Collect runoff



LEGEND

- 1. BIOSWALES
- 2. STREET TREES
- 3. RAIN GARDENS
- 4. REMOVED PARKING & ADDED LINEAR RAIN GARDEN



RESILIENT DANBURY SOUTH MAIN ST STREETScape IMPROVEMENTS



NOT TO SCALE

RESILIENT DANBURY



Lessons Learned

Resilient Danbury

- Extreme Heat: Opportunities to reduce heat exposure may be advanced using green infrastructure; respite from heat may be provided with cooling centers.
- Floods: Increased frequency of intense precipitation is already contributing to loss of service from critical facilities and flooding of socially vulnerable populations living in affordable housing where FEMA flood mapping is absent.
- Community: Sustained attention to climate risks can lead to simple acts (i.e., a memorandum of understanding) that formalize the use of new critical facilities.

Strategic Findings

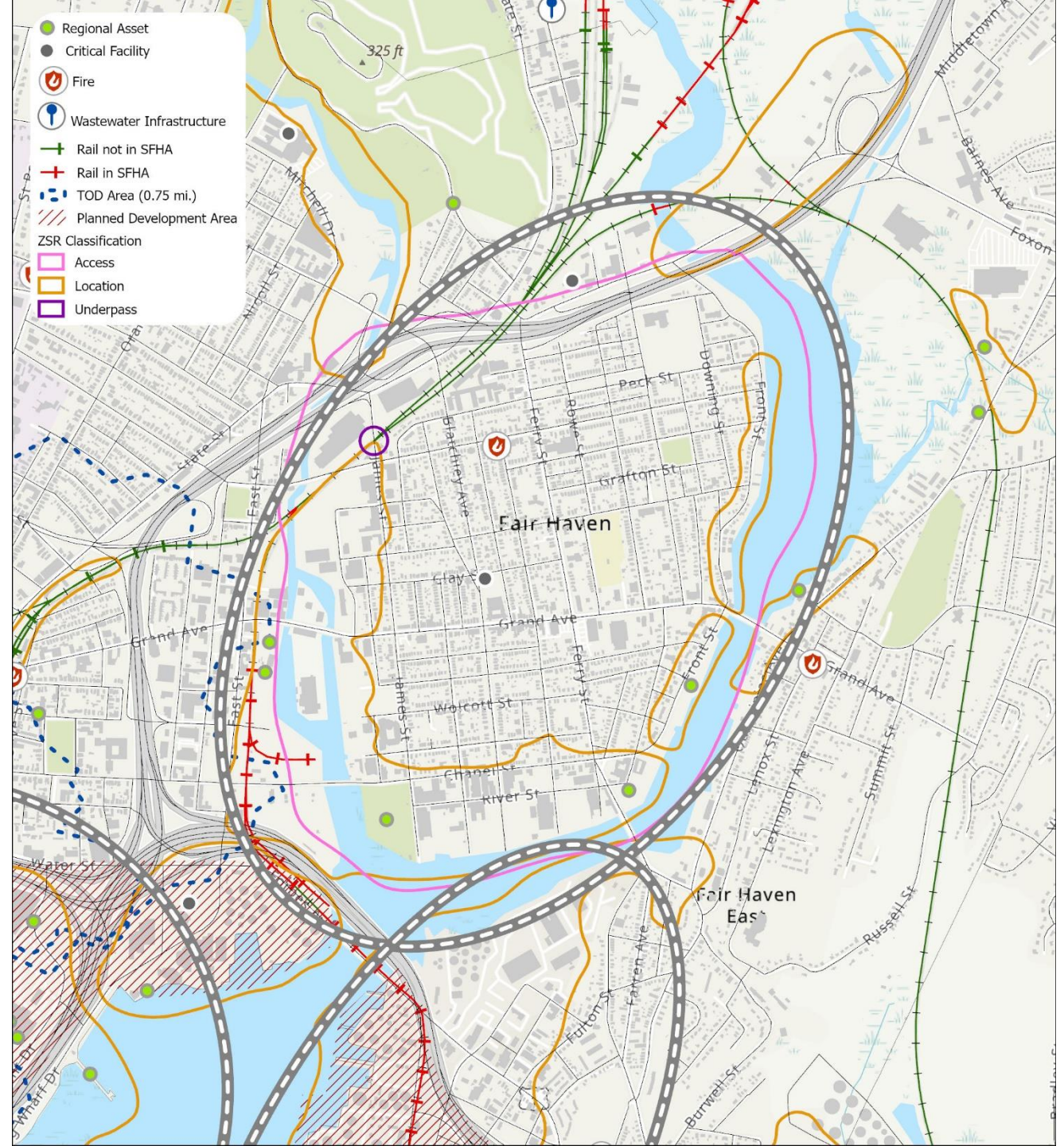
In developed city centers, green infrastructure alone cannot reduce flood losses; long-delayed infrastructure improvements must be advanced. Additional opportunities to incorporate elements of climate adaptation and resilience may appear when new affordable and market rate housing developments are proposed.

Resilient Connecticut Phase II

Regional Adaptation/Resilience Opportunity Areas

Name: Fair Haven/Mill River
 Location: New Haven

Considerations	Characteristics of Area
Flood Vulnerability	○ ● ● ● ●
Heat Vulnerability	○ ● ● ● ●
Social Vulnerability	○ ● ● ● ●
<p>Zones of shared risk along the Mill River and Quinnipiac River merge with a zone of shared risk drawn around Fair Haven (for isolation risks) to highlight an opportunity area centered on Fair Haven. While TOD does not overlap with Fair Haven, it is present just west of the Mill River. Numerous resilience opportunities may be available as the City promotes and supports redevelopment in the Mill River and Fair Haven areas. Care should be taken to enhance livability in Fair Haven and connectivity to surrounding areas.</p> <p>Fair Haven is entirely high heat vulnerable. This is attributed primarily to the high social sensitivity present here, combined with dense housing, high amounts of pavement, and disconnected green space for shade.</p>	
Fire station Public works School	Substation Coastal access



RESILIENT FAIR HAVEN PROJECTED FUTURE FLOODING

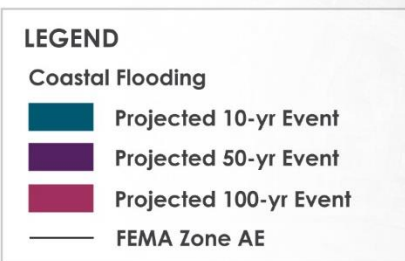
WITH A WARMER AND WETTER CLIMATE, RAINFALL INTENSITY WILL INCREASE, AND SEA LEVELS WILL RISE, EXACERBATING COASTAL AND INLAND FLOODING.

WHAT IS ACCOUNTED FOR IN COASTAL FLOOD RISK MODELING?

- Maximum floodwater elevation, depth, and extent considering:
- Topography
- Storm surge
- Waves
- Tidal action
- Projected sea level rise (20 inches by the year 2050)

PROJECTED DRAINAGE RELATED FLOODING:

Storm drainage system modeling was not included in the project scope. Therefore, current and future drainage-related flooding depths and extents cannot be calculated for the Fair Haven neighborhood at this time.



RESILIENT FAIR HAVEN

CRITICAL COMMUNITY ASSETS

CRITICAL COMMUNITY ASSETS ARE PARTICULARLY IMPORTANT TO THE SOCIAL RESILIENCE OF THIS COMMUNITY PROVIDING COMMUNITY COHESION, CHARACTER, AND QUALITY OF LIFE.

SEVERAL NATIONAL AND LOCAL HISTORIC DISTRICTS ARE LOCATED WITHIN FAIR HAVEN, REFLECTING THE AREA'S MARITIME AND INDUSTRIAL PAST AND EMPHASIS ON HISTORIC PRESERVATION.

Library / Post Office

- 01 FAIR HAVEN BRANCH LIBRARY
- 02 UNITED STATES POSTAL SERVICE

Emergency Response

- 04 NEW HAVEN POLICE DEPARTMENT
- 02 NEW HAVEN FIRE DEPARTMENT ENGINE 17
- 03 NEW HAVEN FIRE DEPARTMENT ENGINE 10/TRUCK 3
- 06 YALE NEW HAVEN HOSPITAL CENTER FOR EMS

Senior Center

- 01 ATWATER SENIOR CENTER
- 02 MARY WADE HOME

Healthcare Facility

- 01 COCENTRA URGENT CARE + DEPT. OF SOCIAL SERVICES CT
- 02 NEW HAVEN PHARMACY
- 03 PIONEER REHAB DBA + PHYSICAL THERAPY
- 04 FAIR HAVEN COMMUNITY HEALTHCARE
- 05 NEW HAVEN MEDICAL CENTER

School

- 01 FARNAM NEIGHBORHOOD HOUSE + NURSERY SCHOOL
- 02 ELM CITY COLLEGE PREPARATORY ELEMENTARY SCHOOL
- 03 FAMILY ACADEMY
- 04 LITTLE ESTRELLITAS LICENSED FAMILY HOME DAYCARE
- 05 JOHN S. MARTINEZ SCHOOL
- 06 COLD SPRING SCHOOL
- 07 FAIR HAVEN SCHOOL
- 08 TITI TANIA'S DAYCARE
- 09 AUNTIE ROSE CHILDCARE DEVELOPMENT CENTER
- 10 ALL SAINTS CATHOLIC ACADEMY
- 11 LITTLE SKY FAMILY CHILDCARE
- 12 TIA HILDA'S DAYCARE LLC
- 13 CLINTON AVENUE SCHOOL
- 14 BOSS BABY LEARNING + DAY CARE

Religious Center

- 01 STRAIGHTWAY CHURCH
- 02 GLESA SALVACION Y VIDA ETERNA
- 03 IGLESIA CRISTIANA ESTRELLA RESPALDECIENTE DE JACOB
- 04 APOSTLE IMMIGRANT SERVICES
- 05 THE REDEEMED CHRISTIAN CHURCH OF GOD
- 06 IGLESIA DE DIOS PENTECOSTAL MI
- 07 IGLESIA BAUTISTA EL CALVARIO
- 08 CHURCH OF GOD OF PROPHECY
- 09 INSPIRATIONAL EVANGELISTIC
- 10 OUR LADY OF GUADALUPE PARISH
- 11 IGLESIA CRISTIANA DIOS DE PACTOS
- 12 IGLESIA CRISTIANA BETANIA AD
- 13 IGLESIA DE DIOS LA NUEVA JERUSALEN INC

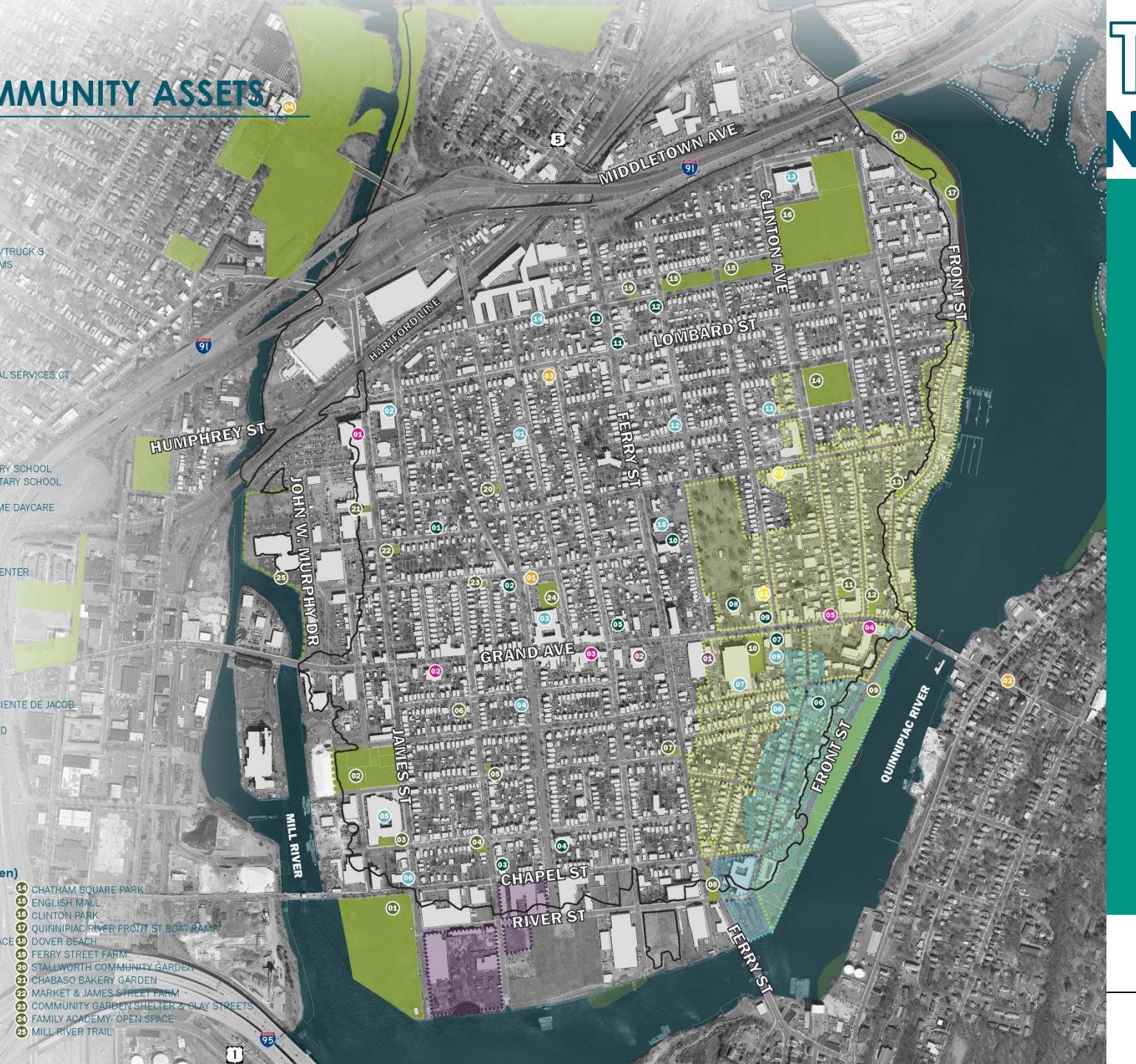
Public Open Space

(Park, Urban Farm, Community Garden)

- 01 CRISCUOLO PARK
- 02 MILL RIVER TRAIL OPEN SPACE
- 03 JOHN S. MARTINEZ SCHOOL OPEN SPACE
- 04 ESMERALDA PARK
- 05 WOLCOTT & LLOYD COMMUNITY GREENSPACE
- 06 WOOLSEY ST COMMUNITY GARDEN
- 07 WOLCOTT & FERRY STREET FARM
- 08 FERRY STREET TRIANGLE
- 09 QUINNIPIAC RIVER PARK
- 10 FAIR HAVEN SCHOOL OPEN SPACE
- 11 CLINTON AVE. OPEN SPACE
- 12 GRAND ACRES COMMUNITY GARDEN
- 13 LEWIS STREET PARK
- 14 CHATHAM SQUARE PARK
- 15 ENGLISH MALL
- 16 CLINTON PARK
- 17 QUINNIPIAC RIVER FRONT ST BOAT RAMP
- 18 DOVER BEACH
- 19 FERRY STREET FARM
- 20 STALLWORTH COMMUNITY GARDEN
- 21 CHABASO BAKERY GARDEN
- 22 MARKET & JAMES STREET FARM
- 23 COMMUNITY GARDEN SHELTER & CLAY STREETS
- 24 FAMILY ACADEMY OPEN SPACE
- 25 MILL RIVER TRAIL

LEGEND

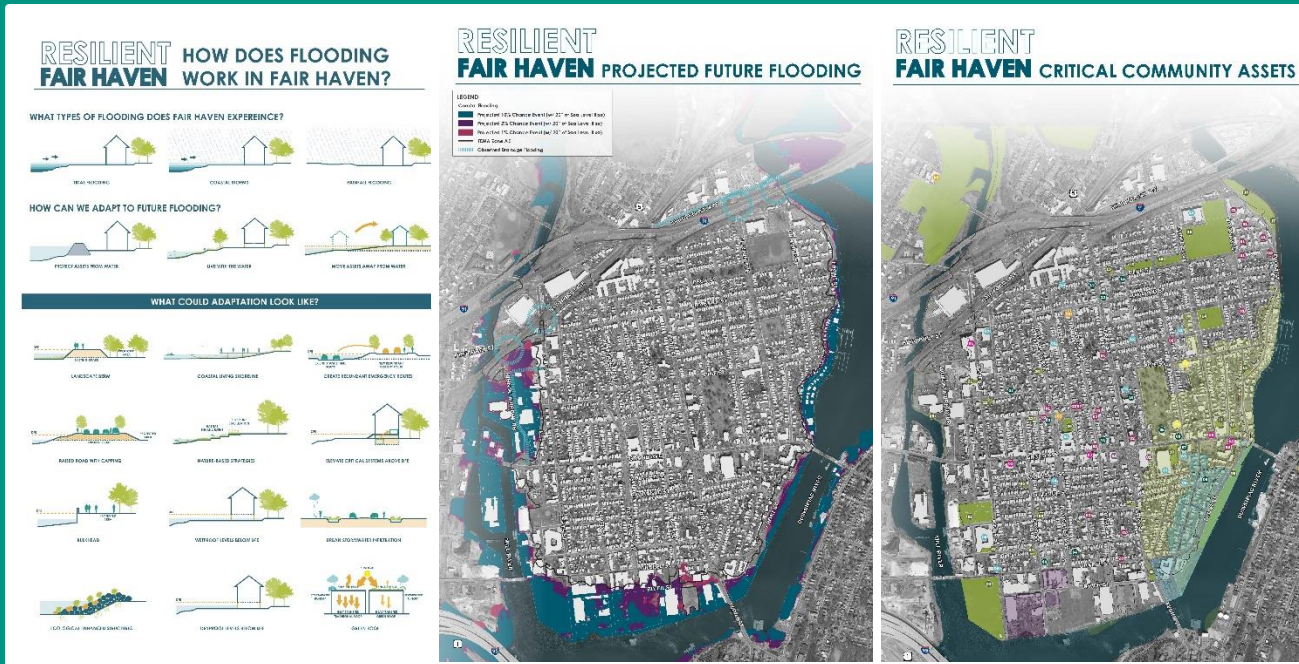
- River Street Historic District
- Quinniac River Historic District
- Quinniac Avenue Historic District
- Public Open Space
- FEMA Zone AE



STAKEHOLDER + COMMUNITY OUTREACH

RESILIENT FAIR HAVEN

- Recent Efforts (CMT, Fair Haven Day, Survey, RiverFest, Flyer Distribution, Meetings with Economic Development, Emergency Management)
- Next Steps (Upcoming meeting with GNHWPCA, Family Fun Day – FAME School and/or Junta Back to School event – Both in AUG)



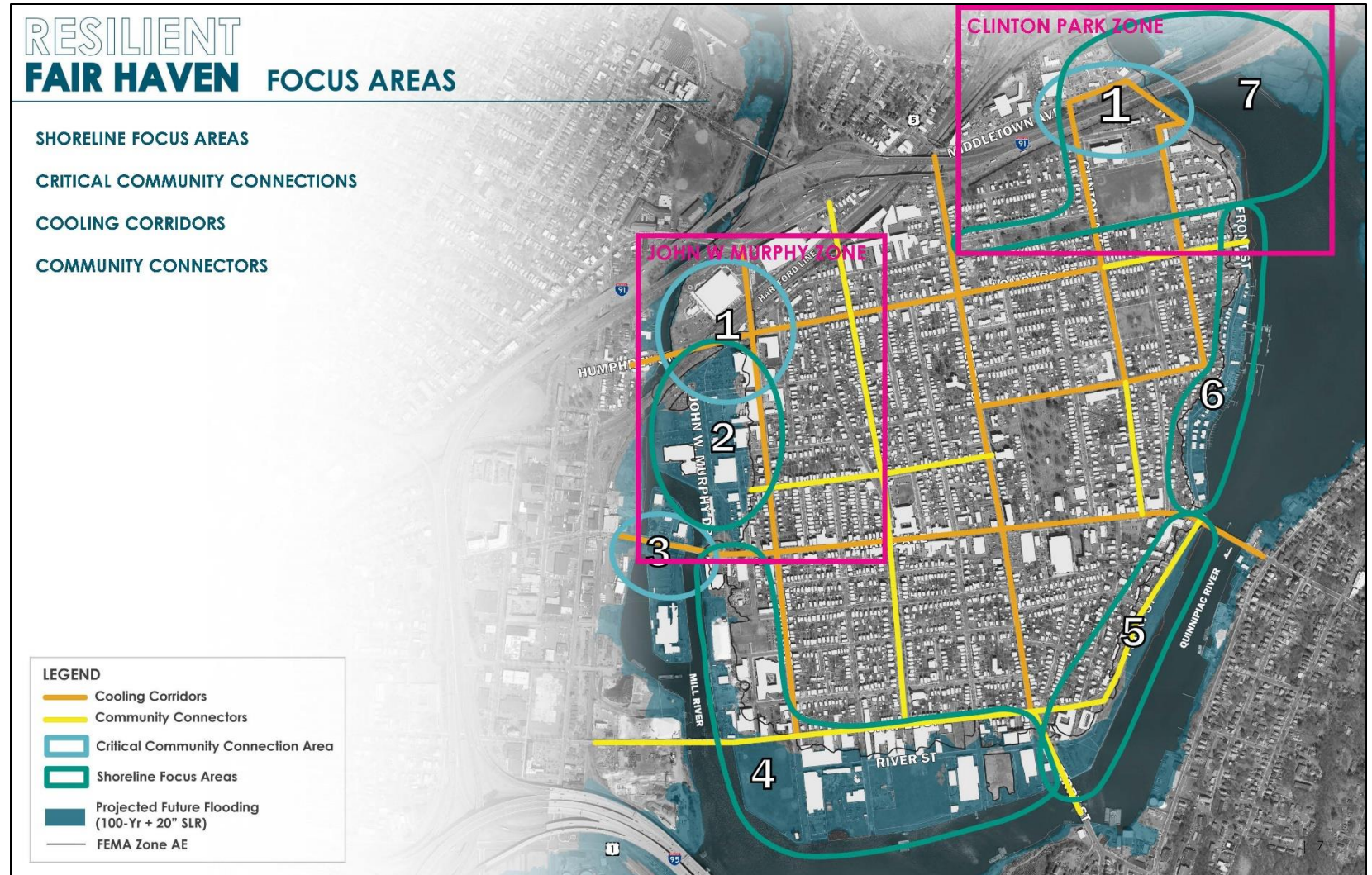
RESILIENT FAIR HAVEN

Flood Risk Reduction

- Close coordination with City Plan, Engineering, Economic Development, and stakeholders such as Save the Sound revealed that two broad areas were receiving less attention and may have unmet needs:

John Murphy Zone

Clinton Park Zone



GOALS

- Reduce flood risk along Mill River and address extreme heat risk
- Reduce impervious surfaces and soften shoreline
- Enhance access to Mill River
- Create cooling/resilience corridors
- Provide shading of school parking lot and outdoor classroom space as pilot project



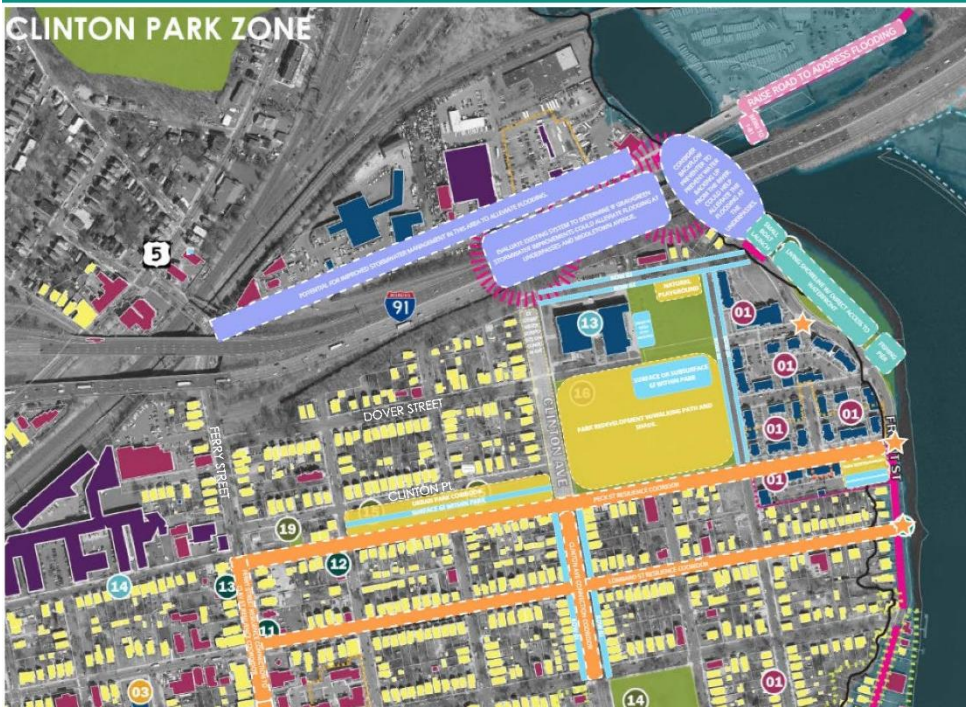
RECOMMENDED ACTIONS



RESILIENT FAIR HAVEN

Lessons Learned

FOCUS AREA SELECTION



Resilient Fair Haven

- Extreme Heat: Opportunities to reduce heat exposure may be advanced using green infrastructure; respite from heat may be provided with cooling centers and water access.
- Floods: Coastal floods and intense precipitation will increasingly hinder access from Fair Haven to adjacent parts of New Haven using the many bridges and underpasses.
- Community: Residents have pressing needs related to housing, safety, health, economic insecurity which may be higher current priorities than climate resilience.

Strategic Findings

Communities with significant health, socioeconomic, and recreational needs may not have time to dedicate to climate resilience needs. To foster interest, opportunities to advance climate adaptation may need to be linked to improvements in transit, walkability, recreation, public and critical facilities, community spaces, and water access.