Resilient Connecticut
Phase II
Climate Change Vulnerability Index (CCVI) Methodology
Phase II Scope

**Task 1** Project Organization, Scheduling, and Integration
Project Administration

**Task 2** Organize and Run a Community and Stakeholder Engagement Process
Stakeholder Engagement

**Task 3** Refine Inventory or Resiliency Planning Projects and Data; and Develop and Inventory Database Tool

**Task 4** Develop Regional Risk and Vulnerability Assessment; and Identify Regional Zones of Shared Risk (ZSR)

**Task 5** Develop Regional Resilience and Adaptation Scenarios

**Task 6** Prepare Final Summary Report; Share Data

- Database & Maps
- Additional ZSR
- Opportunity Areas
- Report

Time
Area of Focus

- Fairfield and New Haven Counties
- Communities with Transit-Oriented Development (TOD) Potential
- Communities with Resilience Corridor Potential
What is the Path to Resilience?

Task 3
Refine the Inventory of Resiliency Planning Projects and Data, and Develop a Database Tool

Compile the Data to Set the Stage

Task 4
Develop a Regional Risk and Vulnerability Assessment and Identify Regional Zones of Shared Risk

Identify the Climate Challenges

Task 5
Develop Regional Resilience and Adaptation Scenarios

Identify the Opportunities
Resilient Connecticut Phase II Task 4

**Regional Risk and Vulnerability Assessment & Zones of Shared Risk**

1. Develop indicators to identify risk and vulnerabilities throughout the region

2. Develop SVI for the two counties

3. Develop methodology to identify Zones of Shared Risk

4. Develop a Climate Vulnerability Index using CIRCA’s CVI
CVI to CCVI

Climate Hazards

- Flooding
- Heat
- Wind
Key Terms

**Exposure**: the degree of the stress that the particular asset is going through with climate variability. Exposure includes the change, including magnitude and magnitude and frequency of extreme events.

**Sensitivity**: the degree to which a built, natural, or human system will be impacted by changes in climate conditions.

**Adaptive Capacity**: the ability of a system to adjust to changes, manage damages, take advantage of opportunities, or cope with consequences.

\[
\text{Vulnerability} = \text{Exposure} + \text{Sensitivity} - \text{Adaptive Capacity}
\]

- Before
- During
- After
CCVI Hierarchy

3 components to vulnerability:
• Exposure
• Sensitivity
• Adaptive Capacity

Components are broken down into indicators, each indicator is comprised of several factors.
Flooding

EXPOSURE

Climate Stressor
- FEMA Riverine Zones
- CIRCA Sea Level Rise
- Storm Surge
- Tidal Range
- Precipitation

Physical
- Impervious Surfaces
- Erosion
- Elevation (pooling)
- Soil Drainage
Flooding

- Built
  - Railways, Bus Yards, Rail Yards
  - Streets (isolation)
  - Septic Systems
  - Private Wells
  - Sanitary Sewer Infrastructure
  - Building Density
  - Critical Infrastructure
  - Flooded Facilities

- Ecological
  - Critical Habitat
  - Land Cover
  - Distance to Waterbodies

- Social
  - Median Income
  - Race and Ethnicity
  - % under 5
  - % over 65
  - % unemployed
  - Average no. per household
  - % below FPL
  - % over 25 without a HS Diploma
  - Older than 5 with Disability
  - Speaks English less than well
  - Population Density
# Flooding

## Built
- Coastal Structures
- Major Roadway Access
- Distance to Health Facility
- Distance to Shelters
- LID Structures
- Water and Sewer Service Areas
- Regulatory Standards
- Riverine Flood Protection Systems
- Resilient Landscapes

## Ecological
- Open Space in Flood Risk Areas
- Wetland Presence and Migration

## Social
- Walk, Bike, Transit Score
- Religious Organizations per 10,000
- Civic Organizations per 10,000
- High Owner-Occupied Housing
- Generator Availability
- Emergency Services per Capita
- % with Property Insurance
- Emergency Communication
- LID Policies
- Multiple Sources of Income

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**ADAPTIVE CAPACITY**
Heat

Climate Stressor
- Temperature Indicators
  - Air Quality
  - Number of Days Above Heat Wave

Physical
- Reflectivity

Exposure
Heat

**Built**
- Drinking Water Source
- Critical Infrastructure
- Zoning
- Building Density

**Ecological**
- Land Cover

**Social**
- Median Income
  - Race and Ethnicity
    - % Under 5
    - % Over 65
    - % Unemployed
  - Average per Household
  - % Below FPL
  - % over 25 without HS Diploma
  - Older than 5 with disability
  - Speaks English less than well
  - Lack of Vehicle
  - Transit Dependency
  - Outdoor Workers

SENSITIVITY
Wind

Climate Stressor
- Topographic Direction
- Average and/or Peak Wind Speeds
- Wind Direction

Physical
- Land Cover
Wind

Built
- Electric Grid (or streets)
- Zoning
- Average Structure Age
- % of Dead Ends in a Community
- Building Density

Ecological
- Tree Canopy Density to Building Ratio
- Open Space to Building Density

Social
- Median Income
- Race and Ethnicity
- % under 5
- % over 65
- % unemployed
- Average no. per household
- % below FPL
- % over 25 without a HS Diploma
- Older than 5 with Disability
- Speaks English less than well
- Population Density
- Lack of Vehicle
## Wind

### Built
- CT Building Code Design Wind Speed
- Eversource, UI, Wallingford, SNEW Staging Locations or Satellite Offices
- Air Conditioning
- Distance to Shelters

### Social
- Walk, Bike, Transit Score
- Religious Organizations per 10,000
- Civic Organizations per 10,000
- High Owner-Occupied Housing
- Generator Availability
- Emergency Services per Capita
- % with Property Insurance
- Emergency Communication

### Adaptive Capacity
- Social
- Built
What Will the CCVI Inform?

• ZSR efforts
• Phase II (and III) adaptation scenarios and project areas
• Collaborative future planning efforts outside of Resilient Connecticut
• Statewide CCVI
Next Steps...

- Collect stakeholder feedback
- Finalize methodology