



## Stamford Resilience Opportunity Assessment Project Grant Report for CIRCA's Municipal Resilience Grant – Award of: \$20,000



Photo by [John9474](#)



The Business Council of Fairfield County Foundation  
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Sponsored by a grant from the Connecticut Institute for Resilience and Climate Adaptation.

The mission of the Connecticut Institute for Resilience and Climate Adaptation (CIRCA) is to increase the resilience and sustainability of vulnerable communities along Connecticut’s coast and inland waterways to the growing impacts of climate change on the natural, built, and human environment.

More information about CIRCA can be found at [circa.uconn.edu](http://circa.uconn.edu).



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## Executive Summary

Stamford's "Resilience Opportunity Assessment" is a pilot project reviewing potential vulnerabilities to climate-related hazards at Stamford Government Center and Stamford High School. Stamford Government Center is where the majority of City operations are housed and the school serves as a public emergency shelter during blackouts and storms. These pilot assessments not only provided an opportunity to advance resiliency in specific municipal buildings, but continues to provide opportunities to improve how the entire City functions and recovers from possible disaster.

The City of Stamford partnered with New Ecology, Inc., a Hartford-based non-profit that has developed a resilience assessment process for identifying hazards (including flooding, extreme heat and cold, storms, etc.) and implementation priorities (including elevating mechanical and electrical equipment, flood proofing buildings, backflow preventers, portable water storage, etc.). Mitigation priorities were ranked in terms of cost, risk, and vulnerability for these two buildings.

A resilience opportunity assessment provides practical risk mitigation through scenario planning. Improving the resilience of two critical facilities in Stamford collectively would improve the City's ability to respond in an emergency. This project identified investment priorities as well as the type of measures that could be implemented to improve resiliency. Should the suggested improvements be made over time, the entire emergency response system would reap incremental benefits.

The assessment process included first identifying hazards, developing hazard scenarios and assessing their expected outcomes for each building. The assessed vulnerability of the building is used to prioritize hazards. Finally, a list of priority measures addressing each high priority hazard is developed for implementation.

The Stamford 2030 District assisted in development of case studies for the two buildings undergoing the resiliency assessment. In addition to case study reports, other materials were developed to highlight best practices, provide a resilience check-list for building owners, and educate owners using a set of videos describing ongoing hazards, the assessment process, and some of the project results.

The resilience assessment is a replicable process that can be implemented in other Stamford buildings and may be adjusted to examine low-income housing. Other municipalities across Connecticut's coast can also use this process to determine vulnerabilities in their built infrastructure and identify necessary improvements for implementation.

### Outreach:

- Hosted luncheon with key building owners to discuss the assessment process and ongoing resilience challenges.
- Organized keynote presentation by New Ecology, Inc. at the annual 2030 Districts Network Summit, hosted in Stamford.

- Developed material to be distributed through Stamford 2030’s local network and the North American 2030 District Network. The material was also shared with related state-wide organizations to repost and distribute through their membership.

#### Final Outputs:

- Resilience Opportunity Assessments
  - Stamford Government Center Resilience and Solar Opportunity Assessment
  - Stamford High School Resilience and Solar Opportunity Assessment
- Resilience Opportunity Assessment Case Studies
- Building Resilience Video Series
  - Topic 1 – Hazard Assessment
  - Topic 2 – Mapping Hazards
  - Topic 3 – Existing Buildings
  - Topic 4 – New Construction
  - Topic 5 – Financing
- Preliminary Resilience Checklist
- Resilience Best Practice Guide

## Background

Since the 1980s, the reliability and cost of energy have been of intense concern for the Stamford-area community. Major storms disrupted the power system in 1985 and 2010, and in 2011 Hurricane Irene and an October snowstorm caused outages that lasted for weeks. Super Storm Sandy followed in 2012. Underinvestment in transmission and distribution systems led to power shortages and spectacles such as fires erupting through manholes just yards away from the massive data centers of major US and European financial institutions. Stamford’s former mayor and Connecticut’s current governor, Dannel Malloy, championed state legislation to authorize local microgrids. In 2007, Stamford became the first city in the state to implement that legislation and establish an Energy Improvement District.

The City of Stamford Energy Improvement District (EID) awarded a contract in 2014 to an energy service company to recommend and implement cost-saving solutions for the City. The first phase of the project included energy conservation measures that would reduce energy costs and mitigate greenhouse gas emissions into the atmosphere. The focus of the first phase was on several City-owned buildings, including Government Center, where the majority of City operations are housed, and several schools, including those that serve as public emergency shelters during blackouts and storms.

Energy resiliency continues to be a concern for the safety and security of Stamford residents and business owners. The generation and distribution of energy must be reliable, not degrade air quality, help to reduce future effects of climate change, and must be affordable. Energy resiliency in a non-resilient society is only a partial accomplishment. Homes or businesses may still be washed away by storms and schools emptied by pandemic. Resiliency continues to require attention at the building, municipal and regional levels in order for communities to achieve continued safety and economic viability in the future.

## Project Goals

**Assess Hazards and Risks:** This project aimed to identify primary and secondary hazards and critical risks at the building-level for two pilot buildings.

**Identify Opportunities:** These two buildings would be evaluated further to identify appropriate opportunities to reduce risks based on current or anticipated hazards.

**Develop Resources:** Learning from the piloted assessments, useful resources would be identified to provide information about the assessment process and best practices in order to empower other building owners to identify and implement resilience measures.

**Communicate Methods and Findings:** Information about the assessment process, findings and resulting resources would be communicated to various stakeholders across the public and private sectors.

## Methods

**Building Walkthroughs** - Resilience and solar opportunity assessments were conducted for Stamford Government Center and Stamford High School. For these assessments New Ecology, Inc. (NEI) conducted onsite walkthroughs of the properties to visually identify critical risks; review the building's historical impact from extreme wind and hurricanes, flooding, ice and snow, and extreme heat and cold events and identify solar and storage potential. Walkthrough participants included representatives from the City of Stamford, NEI and the Stamford 2030 District.

**Resilience and Solar Assessments** - NEI developed the assessment report, which included a list of prioritized measures based on the identified hazards and onsite opportunities or limitations. Assessment reports were distributed to City of Stamford representatives from the Board of Education, City Parks Department, Department of Economic Development, Land Use Bureau, Office of the Mayor, Stamford Public Schools, Stormwater Management Department.

Meetings were held with some individual departments and as a collective to review the assessment results.

**Resource Development** - Follow up meetings with representatives of the Stamford 2030 District, the City of Stamford, and New Ecology, Inc. led to the identification of key resources to assist with Stamford's continued resiliency efforts.

**Outreach**- The Stamford 2030 District worked with local building owners, in addition to national and state-wide networks to identify key opportunities for continued outreach on the Resilience Opportunity Assessment process and results.

## CIRCA Mission Alignment

The Stamford Resilience Opportunity Assessment is a unique pilot project that advances several of CIRCA's implementation priorities. These include developing and deploying engineering and policy best practices for climate resilience; undertaking a pilot project designed to improve the resiliency and sustainability of the built environment along Connecticut's coast; fostering resilient actions and building sustainable communities that can adapt to the impacts and hazards of climate change; and reducing the loss of life and property and ecological damage from high-impact events. The project furthers CIRCA's mission, by providing the opportunity for improved resiliency and sustainability of the City of Stamford to the impacts of climate change on the natural, built, and human environment. Additionally, the resulting resources of this project, posted on the Stamford 2030 District website and distributed to CIRCA and other state and nation-wide organizations, provides additional resilience-related learning opportunities, assessment tools, and best practices for building owners to implement.

## Outcomes

**Products:** The final products of this projects included the Resilience Opportunity Assessments, case studies, a video series focused on building-level resilience, the Preliminary Resilience Checklist, and Resilience Best Practice Guide.

- Resilience Opportunity Assessments - Climate change resilience opportunity assessments were developed for each building including an overview of the building and its history, assessed hazards, and prioritized opportunities for implementation.

The primary hazards to the Stamford Government Center building were identified as coastal, riverine, and stormwater flooding and associated storm and sanitary sewer backups, extreme heat, and electric outage. Several low- to moderate-cost measures were identified to improve the building's resilience to flooding, heat and electrical outage. Additional measures may improve the building's resilience in a more extreme flood event.

The primary hazards to the Stamford High School building were identified as extreme heat, extreme cold, and electric outage. Several low- to moderate-cost measures were identified to improve the building's resilience to extreme temperatures and electric outage. Additional measures that may improve the building's resilience in the event of long term electric outages during extreme heat or cold would likely require substantial investments in upgrading the building envelope and providing additional sources of backup power.

- Preliminary Resilience Checklist- The checklist developed was intended to assist buildings owners as they begin to identify opportunities to improve their building's resilience to the most common hazards in the Connecticut region. This short self-assessment to review a building's history, resilience goals, emergency preparedness, insurance information, and information about backup systems.
- Resilience Best Practice Guide – This set of resilience best practices was developed to assist as owners begin evaluating options for building upgrades, new developments, and ongoing development standards. This basic guide list measures related to flood protection, extreme heat protection, backup needs, and emergency preparedness. There are additional resources listed that can provide further information about the listed measures from Enterprise Green Communities and the Federal Emergency Management Agency.
- Building Resilience Video Series – The Building Resilience Video Series is a five-part series of five to ten minute videos describing ongoing hazards, the resiliency assessment process, financing for resiliency, and some of the Stamford results.

**Replicability** - The resilience assessment is a replicable process that could be implemented in other Stamford buildings, and may be adjusted to examine low-income housing. Other municipalities across Connecticut's coast, including Bridgeport, New Haven, New London, and Norwalk, could also use this assessment to determine the vulnerabilities in their built infrastructure and identify necessary improvements for implementation. While New Ecology, Inc. has successfully utilized the tool in other cities and states, this project represents the first time this type of resilience assessment was conducted in the State of Connecticut. The resources developed as part of this project may also be used by public and private building owners across Connecticut.



## Lessons Learned

- Decision-making around long-term planning can be very difficult for resource-constrained communities and individual building owners.
- Financing resilience is a key unresolved question.
- Building owners are interested in understanding their roadmap to resiliency and how it helps them compete in the local market.
- Cities are interested in creative solutions to addressing and financing resilience.
- It is important that building owners are made aware of community resilience efforts to build confidence in their own local investments.

## Schedule & Budget Summary

The schedule and budget for the program was broken down into two areas with their associated costs:

1. **Resilience Opportunity Assessments:** The largest component of this project was completion of the Resilience Opportunity Assessments for the two buildings. Walkthroughs of Stamford Government Center and Stamford High School were completed in April 2018 with consultants from New Ecology, Inc. Over the summer the assessment reports for each building were completed and distributed to key City of Stamford staff in August 2018. (\$13,060)
2. **Outreach and Resource Development:** Outreach was ongoing from April through December 2018 and will continue beyond completion of the grant. A luncheon was held with a group of Stamford building owners to discuss the project and resiliency challenges in April 2018. A presentation on the assessment process was given at the annual 2030 Districts Network Summit, held in Stamford, with representatives from 15 cities across North America in October 2018. Resources were developed including Case Studies, Building Resilience Video Series, Resilience Best Practices Guide, and Preliminary Resilience Checklist. These were posted to the Stamford 2030 District website and will continue to be distributed to members. The resources have also been distributed to statewide organizations to repost and share with members, and will be provided to CIRCA. (\$6,940)

# Appendices

Copies of project products as separate Appendices (reports, presentations, resources, etc.)

1. Resilience Opportunity Assessments
  - a. Stamford Government Center
  - b. Stamford High School
  
2. Resources
  - a. Case Studies
  - b. Building Resilience Video Series (links to videos)
  - c. Building Resilience Video Series (slides)
    - i. Topic 1 – Hazard Assessment
    - ii. Topic 2 – Mapping Hazards
    - iii. Topic 3 – Existing Buildings
    - iv. Topic 4 – New Construction
    - v. Topic 5 – Financing
  - d. Preliminary Resilience Checklist
  - e. Resilience Best Practice Guide
  
3. 2030 Districts Network Summit Keynote Presentation