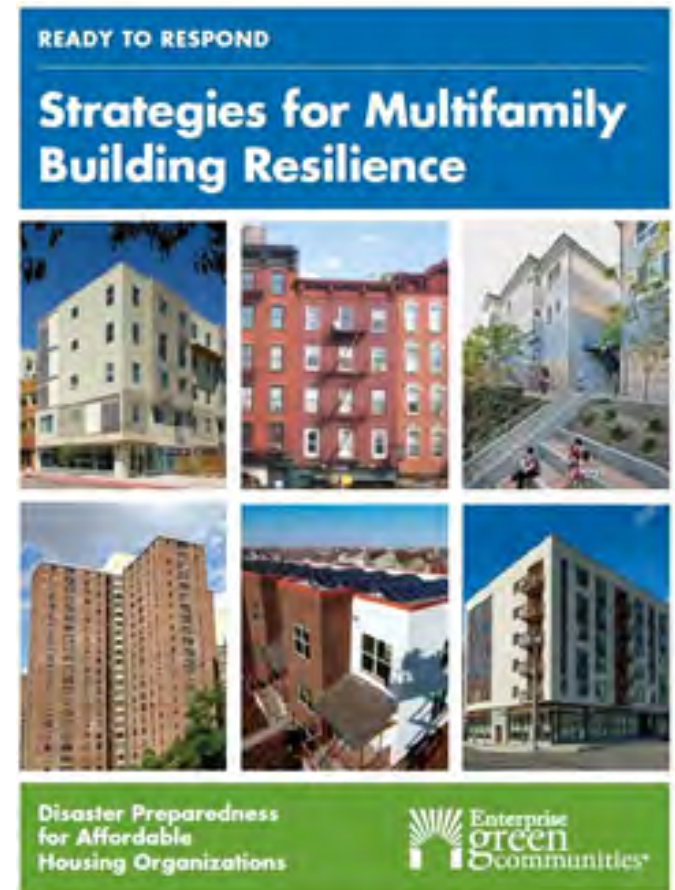


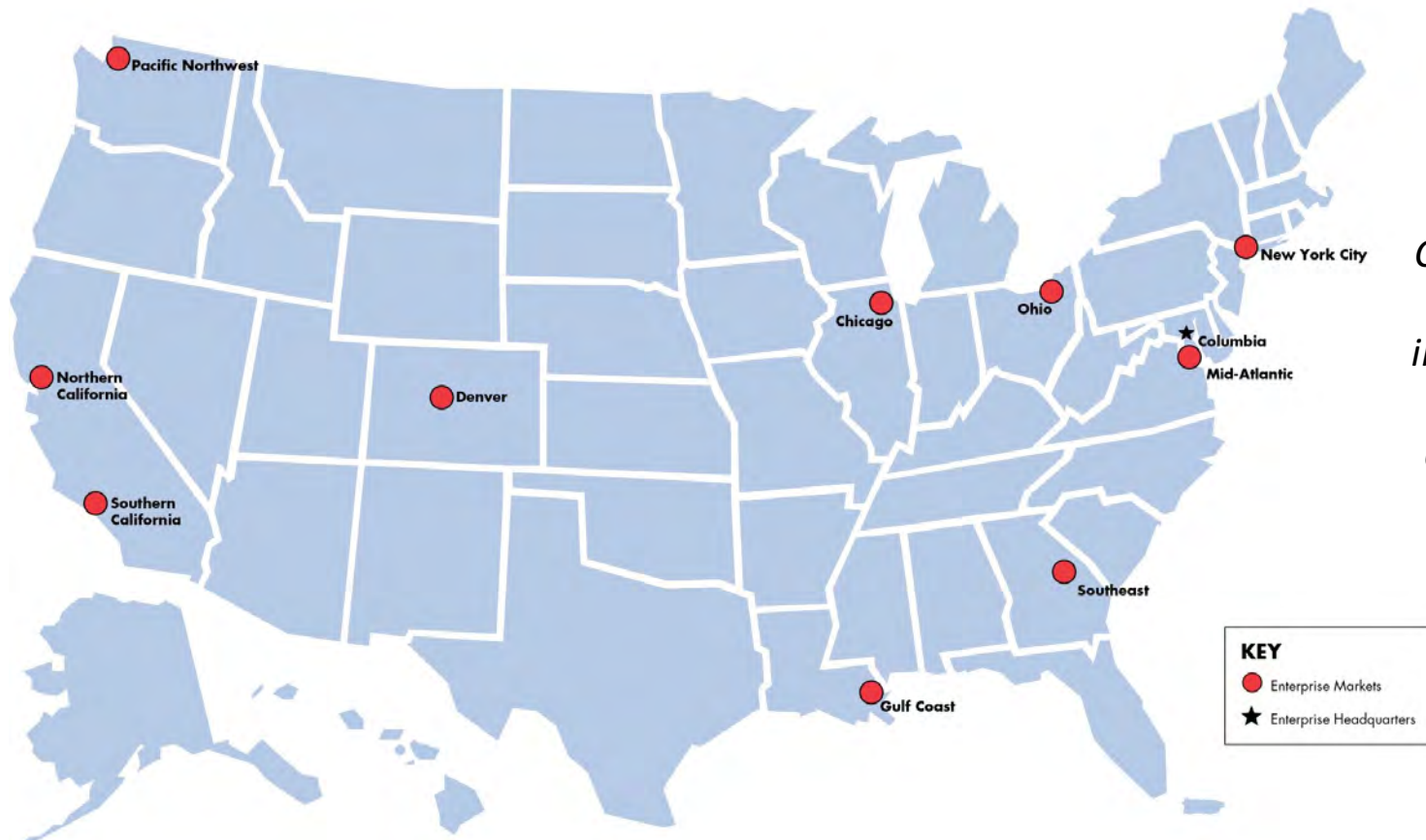
Enterprise Community Partners, Inc.

Ready to Respond: Strategies for Multifamily Building Resilience

December 1st, 2015



- Overview of efforts to support resilience in affordable housing
- Energy systems and community resilience & sustainability
- Questions - resilience & sustainability in low-income communities



Create opportunity for low- and moderate-income people through healthy, sustainable, affordable housing in diverse, thriving communities.

Enterprise Green Communities





Compendium to Enterprise Green Communities Criteria

Design for Resilience

Superstorms and Hurricanes



Multifamily Partnerships



Multifamily Housing

Social Services

Residential Units

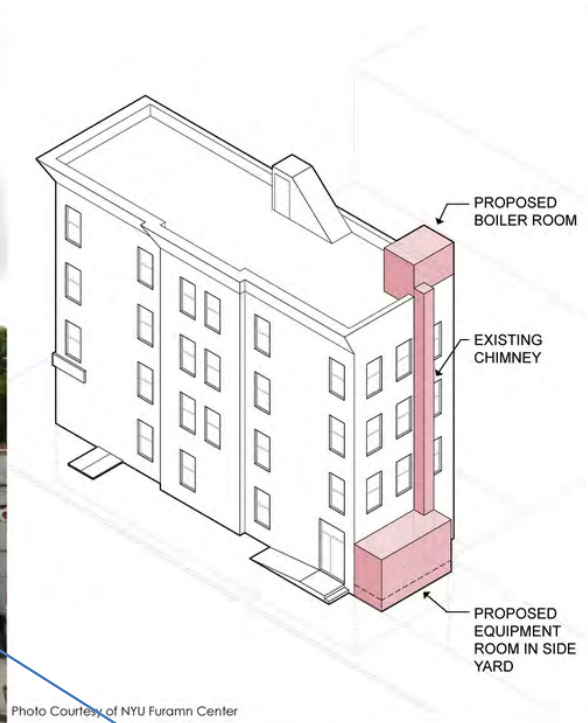


Photo Courtesy of NYU Furman Center

Critical Systems

Commercial Facility

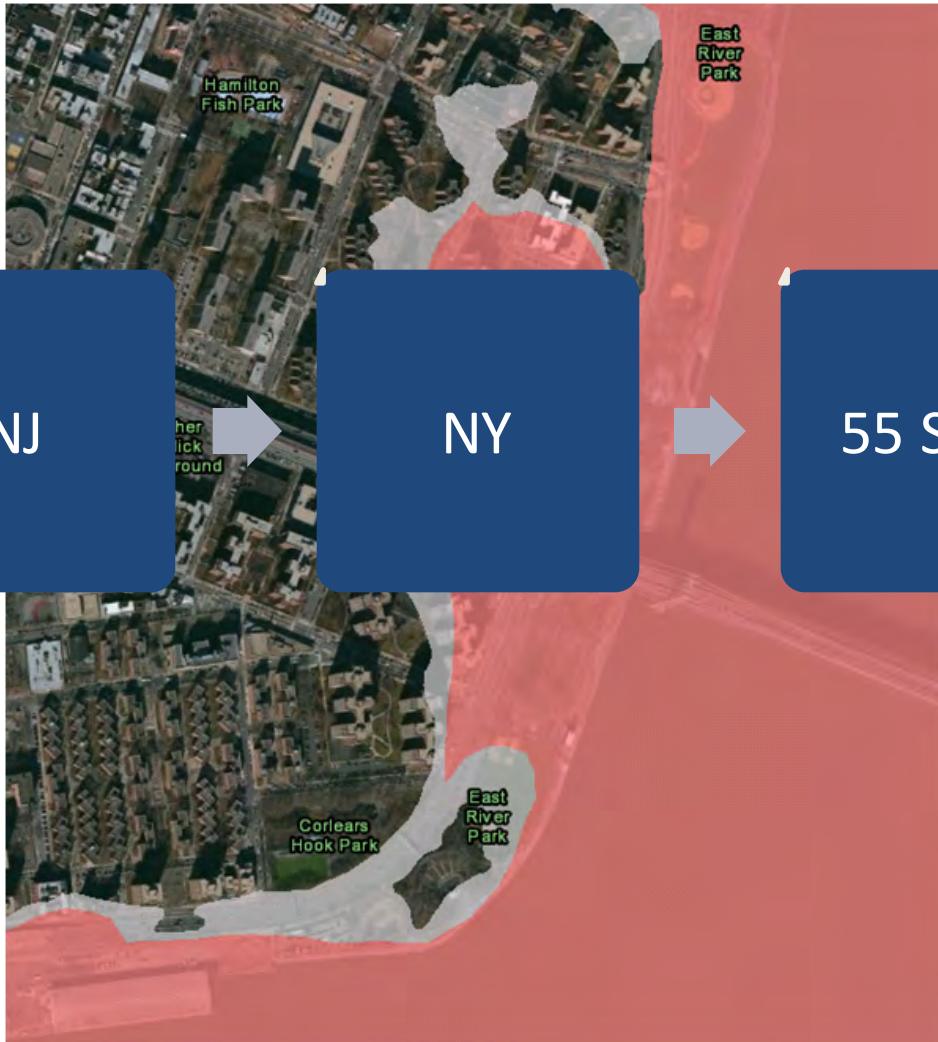
Community Room

Lessons from the Field

NJ

NY

55 Sites



Making an Investment in Resilience



Decision Making Process



Identify Hazard and Exposure

Climate Hazards Matrix

Potential Hazard

Determine your Hazard Exposure



Flooding (River and Coastal)

Although housing located in coastal areas or next to bodies of water is at the greatest risk of flooding, heavy rainfall can drastically damage buildings in any area. Conventional guidance can often be technically and financially impractical for multifamily properties. Elevating a building or its systems above the flood elevation can be unfeasible.

- » Locate your Flood Zone and Base Flood Elevation on the FEMA flood map center: <https://msc.fema.gov/portal/search> website
- » Hire a surveyor to provide you with an Elevation Certificate and your flood zone determination.
- » In urban areas connected to a combined sewer-stormwater system, many communities are at risk for flooding, even if not located within the Flood Zone.



Extreme Temperatures and Winter Storms/Blizzards

- » Power grids and HVAC systems become overtaxed and at risk of failure.
- » Buildings with little natural ventilation and poor envelope performance are at risk during heat waves from overheating.
- » The Urban Heat Island Effect (UHIE) can make heat waves worse.

- » FEMA and The National Oceanic and Atmosphere Administration (NOAA) provide tools to assess risks of long-range changes in weather and climate.
- » Third-party subscription services provide severe weather alerts by Email or SMS.



Severe High Wind Events

Winds above 86–110 can strip roofs, overturn objects, and damage windows and doors. In urban areas, broken glass and flying objects can harm pedestrians and building residents.

- » Determine your wind speed zone in accordance with FEMA guidelines.
- » ASCE 7 is the standard for building performance in high winds. Check if your local building codes require ASCE 7 compliance.



Fire

Fire spreads quickly and destroys entire blocks of housing. Multifamily buildings are at particular risk due to the high number of residents that live in buildings.

- The following buildings are at a higher risk for fire:
 - » Buildings that allow smoking in units.
 - » Residents with special needs who may be at risk of accidentally starting a fire or being unable to put one out.
 - » Buildings that consume highly flammable fuels



Explosion

Gas or fuel leak explosions can happen at any time and may not be detected until it's too late.

- » Work with your utility company to ensure that your fuel lines are secure and maintained
- » Check often for illegal fuel diversion

Assess your Risks

Risks to Community	Risks to Residents	Risks to Buildings	Risks to Business Continuity
 <ul style="list-style-type: none"> » Destruction of public infrastructure » Damage to property » Economic stress » Evacuation/Migration » Disruption of transportation » Loss of faith in public institutions » Blackouts » Water supply contamination » Security risk » Regulatory sanctions or fines » Migration out of community 	 <ul style="list-style-type: none"> » Injury or loss of life » Psychological trauma » Loss of property » Economic hardship » Exposure to pathogens and toxins 	 <p>Damage to:</p> <ul style="list-style-type: none"> » Envelope » Building systems » Frame » Communications infrastructure » Roof » Foundation 	 <ul style="list-style-type: none"> » Cost of repairs » Displacement of residents » Rising insurance rates » Reduction of property value » zLost rent during repairs » Risk of regulatory fines

Resilience Strategies Decision Matrix

					Estimated Cost	Related Strategies
Protection					Protection	
1 Wet Floodproofing	●	●	●	●	\$\$-\$\$\$	6, 8, 9, 10
2 Dry Floodproofing	○	○	○	○	\$\$-\$\$\$	3, 5, 6, 14
3 Site Perimeter Floodproofing	○	○	○	○	\$\$-\$\$\$	2, 6, 10
4 Resilient Elevators	○	○	●	●	\$\$-\$\$\$	2, 3, 6, 8, 13, 18
5 Backwater Valves	●	●	●	●	\$	2, 6, 10
6 Sump Pumps	●	●	●	●	\$	1, 2, 5, 8, 10, 13
Adaptation					Adaptation	
7 Envelope Efficiency	●	●	●	●	\$\$\$-\$\$\$\$	11, 12
8 Elevated Equipment	○	○	●	●	\$\$\$-\$\$\$\$	1, 7, 9, 12
9 Elevated Living Space	○	○	○	○	\$\$\$-\$\$\$\$	1, 2, 8
10 Surface Stormwater Management	○	○	●	●	\$\$-\$\$\$	2, 3, 5
11 Window Shading	●	●	●	●	\$	7
12 Distributed Heating and Cooling	●	●	○	○	\$\$	7, 8, 11
Backup					Backup	
13 Maintaining Backup Power to Critical Systems	●	●	●	●	\$\$-\$\$\$	4, 6, 8, 15, 18
14 Emergency Lighting	●	●	●	●	\$	13
15 Access to Potable Water	●	●	●	●	\$	13
Community					Community	
16 Building Community Ties	●	●	●	●	\$	17, 18, 19
17 Creating Community Resilience Spaces	○	○	●	●	\$-\$\$	13, 15, 16, 18, 19
18 Developing an Emergency Management Manual	●	●	●	●	\$	16, 17, 19
19 Organization for Community Resilience	●	●	●	●	\$	16, 17, 18

Legend

Building Types*

	Units	Floors	Year Built	Typical Building Construction	Elevator
 Low to Mid-Rise walk up's	8-50	3-6	pre-1929	Masonry structural walls, brick envelope, rubblestone or brick foundation, wood roof, and wood joist floors	Y / N
 Small-Rise contemporary	4-8	2-3	1920-Present	Wood frame, concrete block foundation, and shingled roof	N
 Mid-rise contemporary	10-250	4-12	1920-Present	Masonry bearing wall with wood joists or concrete, concrete foundation, brick- or wood-framed envelope, and tar roof membrane or shingled roof	Y
 High-Rise contemporary	50-400	12-40	1950-Current	Concrete masonry structure, CMU or slab on grade foundation, brick envelope, and tar roof membrane	Y

Applicability

○ Minimally applicable ○ Potentially applicable ● Applicable

Individual Strategy Components



Protection

Strategies that reduce a facility's vulnerability to extreme weather



Adaptation

Strategies that improve a facility's ability to adapt with changing climate conditions



Backup

Strategies that reduce a facility's vulnerability to extreme weather

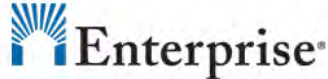


Community

Strategies that encourage changes in behavior to enhance resilience



Tools for Resilience Landing Page


Home. Community. Opportunity.

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Ready to Respond

Green Communities

- Tools & Services
 - Construction Templates
 - Retrofit Toolkit
 - Operations & Maintenance
 - Technical Assistance
 - Charrette Toolkit
 - Resident Engagement
 - Tools for Resilience
- Criteria & Certification
- Information Resources
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Ready to Respond Tools for Resilience




Complete this short, anonymous survey to evaluate your organization's preparedness efforts



The Ready to Respond: Disaster Staffing Toolkit Develop comprehensive disaster plans to protect buildings, residents and business operations.



Coming soon: 19 retrofit strategies to make buildings more resilient against extreme weather events.



Over 100 training videos on disaster preparedness, building infrastructure, resident engagement and more.

Our Ready to Respond Tools for Resilience were developed to help affordable housing organizations make their buildings resilient, prepare their staff to handle emergencies and ensure their residents remain safe.

These tools will help you:

- Communicate and coordinate with residents and external stakeholders during a variety of emergencies
- Ensure housing infrastructure can sustain shocks from a variety of emergency events
- Maintain business continuity during an emergency event



An Overview of the Disaster Staffing Toolkit



Funders



MAYOR'S FUND
TO ADVANCE
NEW YORK CITY

Energy systems - resilience & sustainability

- Current best practices - policies and programs
- Future imperatives - adaptive, renewable, low/no carbon
- Systems perspective
 - Infrastructure
 - Buildings
 - Distributed resources & technologies
- Assets, revenues and value creation
 - Business model disruptions
 - Delineation of benefits
 - New capital structures

CREATING WEALTH THROUGH GREEN, WELL-DESIGNED, CONNECTED PLACES



Neighborhood scale models grew out of central premise that **cities need innovation partners to foster systemic change**

Delivering **social equity** while driving system change in our built environment needs the right partners

Neighborhoods are where policy, scale and capital combine in support of community development and built environment transformation

- Community development leadership
- Design excellence & placemaking
- Financial innovation
- Policy advocacy
- Green performance across neighborhood
- Collaboration with partners & communities



BUILDINGS

DISTRICT

CITY

Resilience discussion - a resilient system/community will

- Why are disruptive events disruptive? decades of incremental dismantling of institutions and systems/subsystem
- What is a community or system? an abundant and diverse set of organizations/institutions, many of which have direct relationships/causality with the community's/system's resilience

Sustainability & Resilience

- What? [metrics] - built environment, social cohesion, economic equity/opportunity (multi-layered)
 - Sympathetic systems
- How to address resilience in communities that fundamentally are NOT sustainable?