Mayor's Office of Climate & Environmental Justice

Local Law 41 of 2021: Climate Resiliency Design Guidelines Pilot Program

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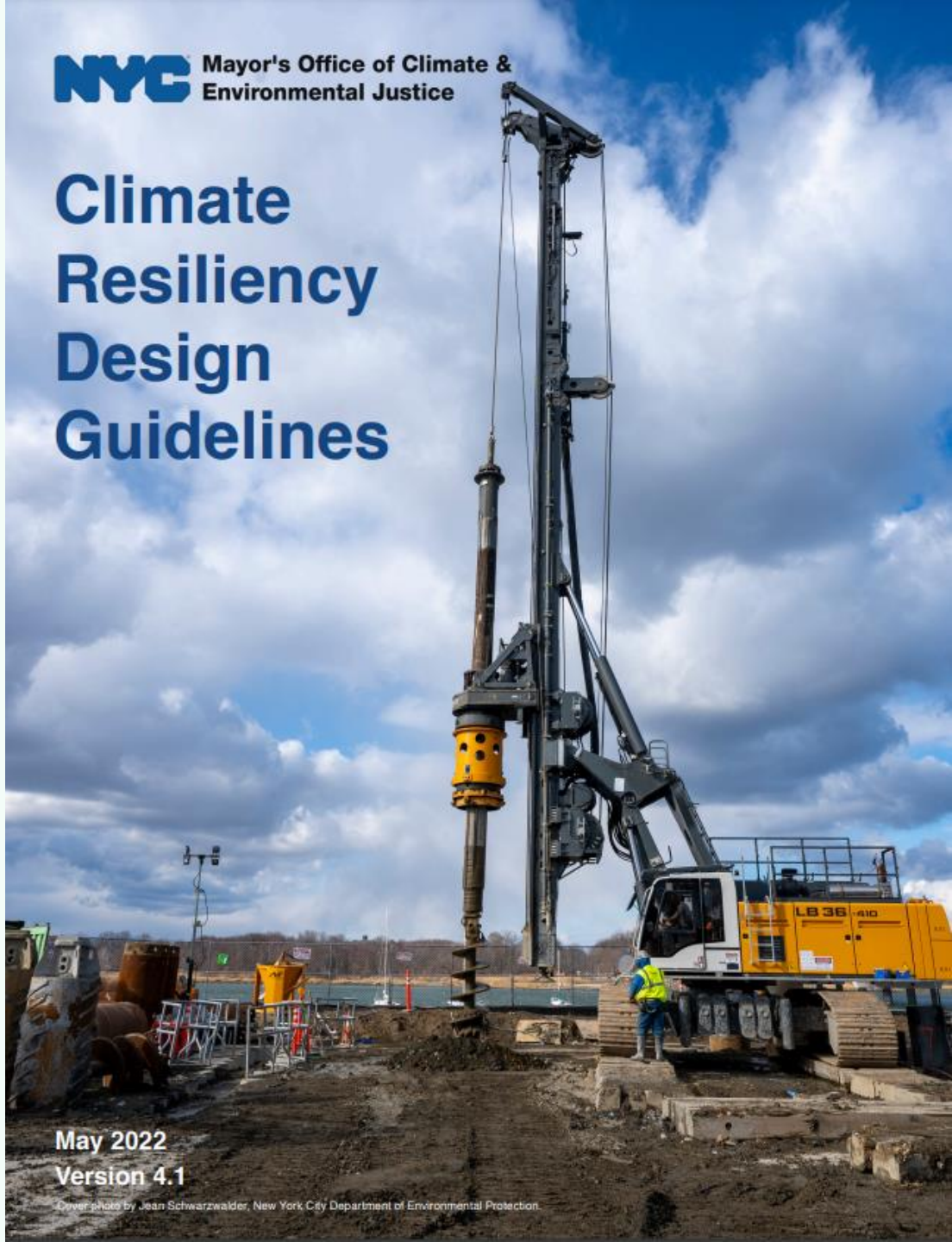
August 2023



SHOCKS

Hurricanes
Nor-easters
Cloudburst rain storms
Longer heat waves

Cosmos, Ave C and 7th Street, 2012

STRESSES

Tidal flooding
Higher average temperatures

Giles Ashford, **2018**. Edgemere

NYC must prepare for the full range of climate threats

COASTAL STORMS

+50% increase in intense hurricanes by 2100

MORE FREQUENT, MORE DESTRUCTIVE HURRICANES

SEA LEVEL RISE

Up to **30 in** SLR by 2050s

INCREASED TIDAL FLOODING + GROUNDWATER TABLE RISE

PRECIPITATION

Up to **1.5x** rain days > 1" by 2080s

FLOODING IN NON-COASTAL AREAS

TEMPERATURE

# of days above 90°F **TRIPLE** by 2050s

LONGER, MORE DANGEROUS HEAT WAVES

Climate Change and NYC

Projected climate changes from the NYC Panel on Climate Change

New York City Panel on Climate Change (NPCC)

- Made up of leading climate and social scientists
- Focus on climate risks: temperature, precipitation, changes in sea level, extreme events
- All projections subject to rigorous peer review

Forward-looking climate change data supplements historic data already used in building code

Historic climate data

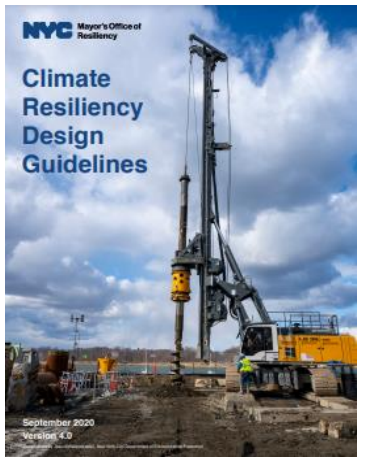
- NOAA Atlas 14
- NWS Climate Normals
- ASHRAE Climate Zones
- Etc.

Forward-looking climate data

New York City Panel on Climate Change (NPCC)

NYC Building Code & Engineering Standards

Mayor's Office: Climate Resiliency Design Guidelines



City Departments' Design Standards

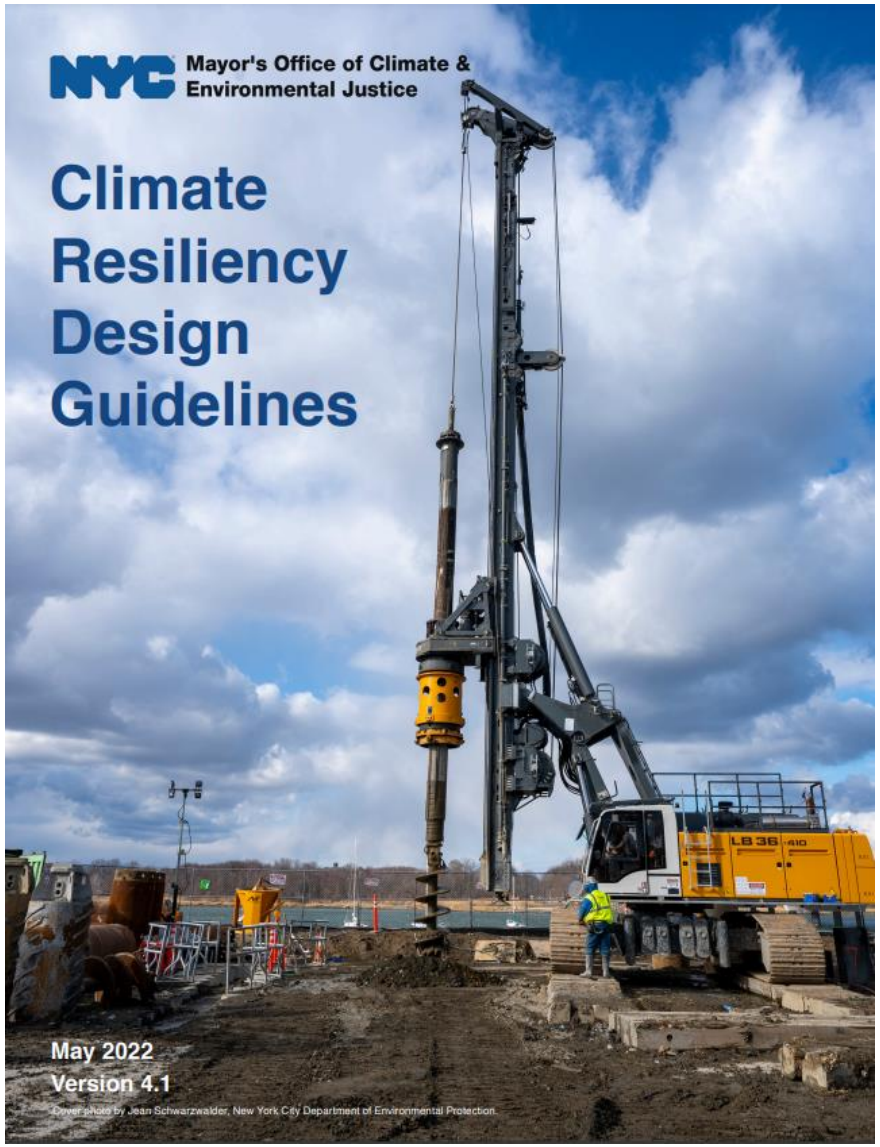
Design & Construction
Transportation
Environmental Protection
Housing Preservation & Development
Parks & Recreation
and others

Enterprise green communities®

2020 NYC Overlay

Climate change data used in design improves the performance of capital projects

- **Goal of the Climate Resiliency Design Guidelines:** establish consistent approach for using forward-looking climate change data across the City capital plan
- **Addresses multiple hazards:** 1) extreme heat, 2) extreme rainfall, 3) tidal inundation with sea level rise, and 4) coastal storms.
- **For City of New York capital projects**, including new builds and substantial improvements
- **All types of capital projects:** buildings, infrastructure, and landscapes



The Guidelines address changes in heat, rainfall, and sea level

Climate Stressor	Example Design Strategy
Heat	Improve solar reflectance
	Add trees and shading canopies
	Maximize green space
	Upsize and improve HVAC redundancy
	Add energy recovery ventilation
Precipitation	Rain gardens
	Permeable pavements
	Infiltration trenches
	Green roofs
	Cloudburst design
Sea Level Rise	Elevate
	Wet floodproof
	Dry floodproof
	Protect critical equipment
	Deployable flood barriers

The Guidelines differentiate between short and long-lived facilities and components

Table 1 – Facilities and components and associated climate change projections

Climate change projections (time period covered)	**Examples of building, infrastructure, landscape, and components grouped by typical useful life**	
2020s (through to 2039)	*Temporary or rapidly replaced components and finishings*	• Interim and deployable flood protection measures • Asphalt pavement, pavers, and other ROW finishings • Green infrastructure • Street furniture • Temporary building structures • Storage facilities • Developing technology components (e.g., telecommunications equipment, batteries, solar photovoltatics, fuel cells)
2050s (2040-2069)	*Facility improvements, and components on a regular replacement cycle*	• Electrical, HVAC, and mechanical components • Most building retrofits (substantial improvements) • Concrete paving • Infrastructural mechanical components (e.g., compressors, lifts, pumps) • Outdoor recreational facilities • At-site energy equipment (e.g., fuel tanks, conduit, emergency generators) • Stormwater detention systems
2080s (2070-2099)	*Long-lived buildings and infrastructure*	• Most buildings (e.g., public, office, residential) • Piers, wharfs, and bulkheads • Plazas • Retaining walls • Culverts • On-site energy generation/co-generation plants
2100+	*Assets that cannot be relocated*	• Major infrastructure (e.g., tunnels, bridges, wastewater treatment plants) • Monumental buildings • Road reconstruction • Subgrade sewer infrastructure (e.g., sewers, catch basins, outfalls)

The City is iteratively testing and improving the Guidelines

Development Timeline

September 2016: formed Resilient Design Working Group composed of 15 City agencies

April 2017: released preliminary Climate Resiliency Design Guidelines

April 2018: version 2.0 of the Guidelines released, informed by desktop analyses

March 2019: version 3.0 of the Guidelines released

September 2020: version 4.0 of the Guidelines released

March 2021: LL41(2021) passed into law

Local Law 41 of 2021

LL41(2021) provides a ramp-up period in advance of a full resilient design mandate

- ✓Implement the Guidelines in real-world NYC capital projects
- ✓Quantify costs and benefits of resilient design specific to NYC capital projects
- ✓Build internal agency knowledge on resilient design to prepare for full mandate
- ✓Improve the Guidelines based on results
- ✓Institutionalize resilient design via scoring metric

Overview – LL41(2021)

Climate Resiliency Design Guidelines pilots

- 35+ pilots (e.g. 1-5 pilots per agency) informed by capital plan analysis
- 5 year program

Updated Guidelines (December 31, 2026)

Resiliency scoring metric development

- Establish points or metrics that consider the performance of resilient design features
- Projects meet minimum score

Resilient design mandate, via the resiliency scoring metric, begins for covered projects December 31, 2026

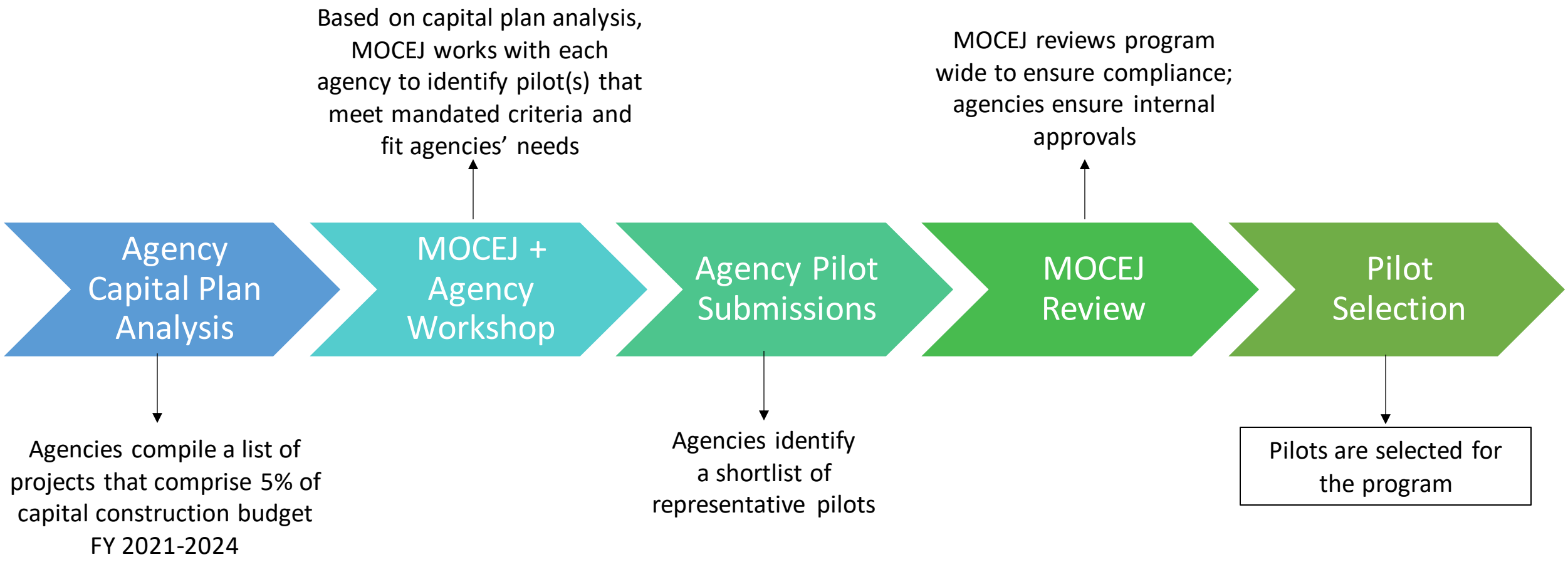
Resiliency Scoring Metric

- All covered projects will be required to meet or exceed a minimum resiliency score starting December 31, 2026
- Developed with agencies and subject matter experts
- Informed by the Guidelines and pilot program
- Minimum scores can differ for:
  - New construction
  - Substantial improvements
  - Infrastructure

Agencies will contribute pilots early in scoping that collectively must meet certain criteria:

- ✓At least 35 capital projects total
- ✓At least 35% located in environmental justice areas
- ✓At least 4 projects per borough
- ✓Most common capital projects
- ✓New construction and substantial improvements
- ✓Projects with a range of useful lives
- ✓Projects with a range of capital costs
- ✓Critical and non-critical facilities
- ✓Exposed to a variety of climate stressors

Pilot Selection Process



May 2021 → **August 2021**

Current Pilot Cohort

- 40 initial pilot projects selected
- Over 40% in environmental justice areas
- 5 boroughs
- Budget range from $3 million to $1 billion
- Including libraries, museums, roads, community centers, housing, administrative buildings, piers, schools, and more

Process

(1) Project Scope Development

(2) Climate Change Exposure Screening

(3) Risk Assessment (major projects and those that scored medium or high on exposure)

(4) Integrate Resilient Design Strategies

(5) Qualitative or Quantitative BCA (depending on project cost and complexity)

(6) Finalize Resilient Design Strategies

Thank you

Contact:

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Download NYC's Climate Resiliency Design Guidelines at nyc.gov/resiliency