

Mitigation minimizes the repeated cycle of disruption and damage. Every recovery phase following a hazard even becomes an opportunity for learning for the next.



It also means that our work is never done.

CHAPTER 5

BEHIND THE SCENES: OUR RISK MANAGEMENT PROCESS, AND WHAT LIES AHEAD

A ROBUST PLAN FOR A GLOBAL CITY

The *2014 Hazard Mitigation Plan* identifies hazards that can affect New York City and the risks associated with them, and it documents strategies for lowering those risks. It differs from other New York City plans that address risk in that it addresses a broader range of hazards.

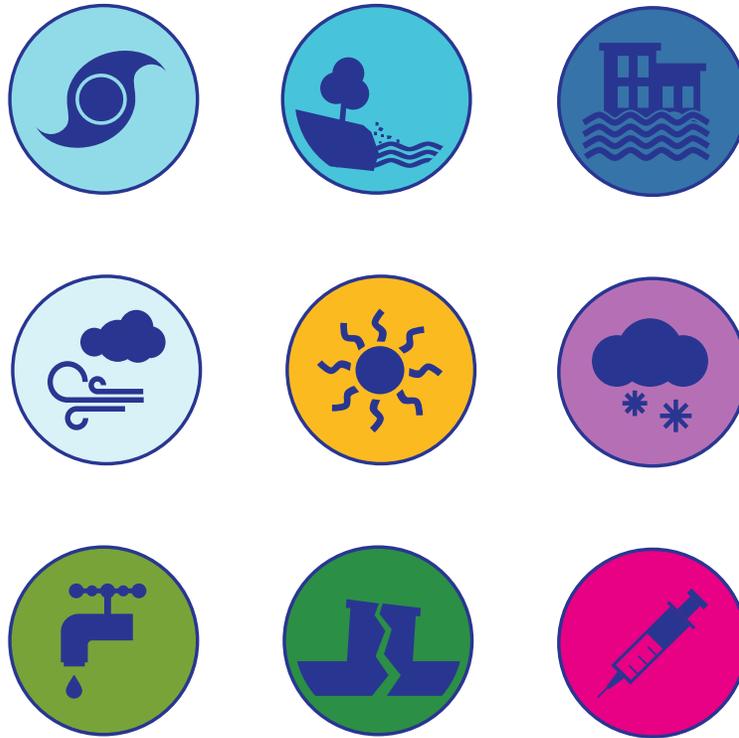
MOBILIZING OUR RESOURCES

Why did New York City produce a 551-page Hazard Mitigation Plan? Technically, it is a compliance document designed to satisfy FEMA requirements for hazard mitigation funding. FEMA requires that such plans be updated every 5 years.

But to say that our 2014 Plan “updates” the 2009 Plan understates the case. The 2014 Plan adds several non-natural disasters to the previous portfolio of solely natural hazards. It results from a planning process that converged with Hurricane Sandy and the City’s response to that catastrophic storm. It addresses climate change extensively. And while some of its content is necessarily similar to that of some other City plans, no other City plan addresses such a broad a range of hazards.

Producing the 2014 Plan took a year and required the expertise of stakeholders from City agencies, researchers, and community and industry partners. Taking the lead was a team from New York City Emergency Management, the Department of City Planning, and the Mayor’s Office of Recovery and Resiliency. The team convened and guided these bodies:

- A 13-member Steering Committee drawn from City agencies and regional organizations responsible for some of the city’s largest infrastructure systems with expertise in emergency management, land use planning, building codes, housing recovery, public health, public safety, transportation, infrastructure protection, climate change, regional planning, and natural resource protection.
- A 41-member Mitigation Planning Council drawn heavily from City agencies, with representation from State and federal agencies, various authorities, nongovernmental organizations, and the private sector, academic institutions, community organizations, and citizens



FEMA defined the contents of the Plan, which was designed to identify specific risk management measures –termed “mitigation actions” – that serve these goals:

- protect public health and safety, with a focus on our most vulnerable populations
- protect the built environment: property and infrastructure, including complex systems
- promote a sustainable economy
- protect the natural environment
- strengthen preparedness for disasters
- overall, promote resiliency and sustainability

The goals seem simple and straightforward. New York City’s risks are not. The planners elaborated the goals above into a set of 28 objectives and, with the 2009 Plan as their point of departure,

drew from their own extensive knowledge, the historical record, the latest scientific and technical information, consultation with hundreds of external parties, and many City plans and reports.

One important source was *PlaNYC 2030*, the City’s comprehensive plan – updated every four years – for achieving citywide sustainability goals. Another source was *A Stronger, More Resilient New York*, the City’s resiliency plan that guides and reports on recovery from Sandy and presents strategies and initiatives for managing risks associated with extreme weather and climate change.

PURSUING A RIGOROUS, INCLUSIVE APPROACH

The development of the hazard risk assessment for the 2014 Plan included a structured, rigorous approach to assessing the risks.

- Identify hazards that pose a serious risk, and for each one of them considered

- likely severity
- probability
- geographic areas likely to be impacted
- historic data
- Determine which features of our city are vulnerable to each hazard; primarily,
 - people (particularly the most vulnerable groups)
 - the built environment, including infrastructure and complex systems
 - the natural environment
 - our economy
 - future conditions to the extent they can be reasonably foreseen
- Estimate potential losses using loss estimate software for hurricane winds, flooding, and earthquakes.

Defining a citywide suite of mitigation actions

Mitigation actions considered for inclusion in the plan were those undertaken or planned by City, State, and federal agencies; utilities; and other players. The actions can generally be characterized as:

- statutory and regulatory measures, including zoning law and construction codes
- policies, programs, projects, and special initiatives
- physical property protections such as seismic retrofitting and flood-proofing
- natural resource protections such as projects that protect wetlands
- major infrastructure projects like construction of City Water Tunnel Number 3

- in-depth, well-coordinated emergency-response capabilities
- communication tools and programs that promote preparedness and recovery

To assemble an inventory of candidate actions, planners next

- identified existing strategies – those already being implemented, or for which funding was already secure
- determined potential strategies – programs, plans, projects, and policies for which funding had not yet been secured

The result was over 200 pages of detailed tables that identify a set of 330 existing actions and 332 potential actions. The tables capture the scope, variety, and dynamism of the city’s risk management efforts. Their feasibility was evaluated against social, technical, administrative, political, legal, economic, and environmental considerations. (A proposed action’s inclusion in the Plan did not constitute an official commitment to implementing it.)

After a public comment period, the draft Plan was revised, submitted to FEMA, and approved. By Executive Order, on April 15, 2014, the Mayor adopted it as the City’s official Hazard Mitigation Plan.

LOOKING AHEAD

A PLAN THAT IS MORE THAN A DOCUMENT

Besides satisfying FEMA requirements for mitigation funding eligibility, the 2014 Plan equips us to take advantage of funding opportunities as they arise – we are fully prepared to make the case.

But the Plan’s value extends far beyond funding goals. The planning process itself strengthened collaboration among participants, with benefits that continue to this day. And while the process described above may sound mechanistic, it entailed considerable learning

DISTRIBUTED RESPONSIBILITIES AND KEY PLAYERS IN OUR CITY'S MANAGEMENT OF RISK

Beyond the large cast of parties who produced the *2014 Hazard Mitigation Plan* is an even larger cast who contribute to the daily work of managing risks. Responsibility is distributed widely: City, State, and federal agencies, various authorities, nongovernmental organizations, and the private sector all play important roles.

Characteristically, for any one hazard, multiple parties exercise responsibilities. Conversely, a single party's responsibilities may span multiple hazards. This makes for a complex network of relationships that are purposely decentralized across many organizations.

Emerging as a central player is the **Mayor's Office of Recovery and Resiliency (ORR)**, created in March 2014 to work with City agencies to implement strategies of long-term climate resiliency efforts as laid out in *A Stronger, More Resilient New York*, while also incorporating resiliency into ongoing City operations. on the City's resiliency priorities are strengthening coastal defenses, upgrading buildings, protecting infrastructure and critical services, and making Neighborhoods safer and more economically resilient. ORR is also engaging with State and Federal rebuilding programs to ensure complementary recovery approaches.

Billions of dollars in federal funding are contributing to Sandy recovery and long-term hazard mitigation efforts across the city. Augmenting this are investments by the City and its partners.

and the continual application of expert judgment. The planners' expanded knowledge base and seasoned judgment inform their ongoing management of risk.

Importantly, the Plan is more than a compliance document that sits on a shelf. This makes it an extremely useful tool. For each mitigation action, it identifies the responsible party, the timetable, costs, and funding sources. It is frequently consulted as a resource, and it directly supports the monitoring and evaluation that contribute to results.

The responsibility for implementing strategies is distributed among many parties. The Mitigation Unit at the City's Emergency Management Department serves as lead coordinator for tracking implementation – working through the Mitigation Planning Council – and for updating the 2014 Plan. It convenes meetings, conducts research relevant to the Plan, shares information about funding opportunities, and widely promotes awareness of risk management.

Annually, New York City Emergency Management will obtain status reports from City agencies and private partners and update the Plan to reflect them. As the Plan is updated, it will remain online. Comments on it are welcome at any time.

It is truly not only our City government's plan but our entire city's plan.



WORK SESSION FOR NYC'S RISK LANDSCAPE

A PROCESS THAT STEADILY GAINS IN POWER

For our Hazard Mitigation Plan's fullest value to be realized, this set of conditions must be satisfied:

- Risk management strategies must be seamlessly integrated into the agendas, plans, and operating and capital budgets of all parties responsible for them.
- The effectiveness of strategies must be assessed.
- Changing conditions must be assessed – for example, fluctuations in available funding; new laws, regulations, and policies; significant new study findings; impacts of major hazard events.
- Strategies must be modified as needed.

Driving the hazard mitigation process is a proactive approach informed by continuous learning. In the past, hazard mitigation was usually reactive – undertaken in response to a disaster that had just occurred, as illustrated by the regulatory timeline in Chapter 4 that chronicles incremental improvements in the City’s building codes. Today we aim to prospectively fashion strategies that can minimize or break cycles of repeated destruction. This means that every recovery phase following a hazard event becomes an opportunity for learning. It also means that our work is never done, because the nature of some risks evolves, as do some measures for managing them.

THE LONGER-TERM OUTLOOK

Not only is our approach to risk proactive. As Chapter 2 explains, the field of risk management has gained power and sophistication, the concept of risk has expanded, and sustainability and resiliency have become paramount twin goals. The long-term, strategic approach to risk management is gaining traction at all levels of government, and within the private and nonprofit sectors.

A few examples illustrate this reality. The White House has incorporated climate change into many of the Sandy recovery policies and programs. New York City has pioneered urban sustainability and resiliency efforts, its goals are becoming increasingly ambitious, and more and more of its partners and stakeholders are stepping up to the challenge. Con Edison puts its climate change principles online and has dedicated \$1 billion to fortify critical infrastructure and equipment across its system. The Port Authority of New York and New Jersey’s environmental initiatives encompass climate change. The MTA devotes many web pages to sustainability, including a page on climate adaptation. Many major corporations have Sustainability Officers. Many colleges and universities offer degrees in sustainability and disaster management. The Rockefeller Foundation is pushing the resiliency agenda globally, starting with New York City’s selection for the 100 Resilient Cities Network.

These examples illustrate that sustainability and resiliency initiatives have been growing in the City. Deservedly, climate change is now

Climate change deservedly commands growing attention. But it must not obscure the very real threat of other hazards.

dominant in risk management discussions, and it will become only more so. But it must not obscure the very real threat of other hazards.

Ahead, we foresee, along with climate change, greater levels of risk due to population growth and the strain it puts on aging infrastructure. We see the potential for budget shortfalls as repair and recovery costs for hazard impacts erode public and private sector budgets. Investing in mitigation measures is fiscally prudent. But will those investments be made? Other urgent needs are competing for scarce funds.

But while the future is uncertain, post-Sandy New York City is “coming back stronger.” We foresee our management of risk growing ever stronger as mitigation measures are steadily implemented and strengthened, as we continue to learn, and as new technologies improve and fall in cost and we determine how best to capitalize on them.

We also foresee more parties in the private and nonprofit sectors and the general public gaining a clearer understanding of the hazards New Yorkers face and greater insight into the nature of risk itself, thereby becoming better prepared to withstand, respond to, and recover from hazard events.

Toward this end, if you found this Guide helpful, please share it!

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PHOTO CREDITS

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Acronyms in *NYC's Risk Landscape...*

ACS American Community Survey **ASCE** American Society Civil Engineers **AQI** Air Quality Index
BFE Base Flood Elevation **CD** Community Districts **CDC** Centers for Disease Control **CEHA** Coastal Erosion Hazard Area
CEQR City Environmental Quality Review **CERT** Community Emergency Response Team
CSO Combined Sewer Overflow **CUNY** City University of New York **DCP** New York City Department of City Planning
DEP New York City Department of Environmental Protection **DHS** New York City Department of Homeless Services
DOB New York City Department of Buildings **DOF** Department of Finance
DOHMH New York City Department of Health and Mental Hygiene **DOITT** New York City Department of Information Technology and Telecommunications
EF-Scale Enhanced Fujita Scale **EPA** United States Environmental Protection Agency
FDNY New York City Fire Department **FEMA** United States Federal Emergency Management Agency
FIRM Flood Insurance Rate Map **F-Scale** Fujita Scale **ft** Feet **FHWA** Federal Highway Administration
GIS Geographic Information Systems **HAZUS-MH** Hazards U.S. Multi-Hazard
ICC International Code Council **JFK** John Fitzgerald Kennedy Airport **LGA** LaGuardia Airport
MapPLUTO Property Land Use Tax Lot Output **MERS-CoV** Middle Eastern Respiratory Syndrome Coronavirus
MOM Maximum of MEOWs **mph** Miles Per Hour **MTA** Metropolitan Transportation Authority
NEHRP National Earthquake Hazards Reduction Program **NESIS** Northeast Snowfall Impact Scale
NFIP National Flood Insurance Program **NHC** National Hurricane Center **NOAA** United States National Oceanic and Atmospheric Administration
NPCC New York City Panel on Climate Change **NWS** National Weather Service **NYC** New York City
NYCEM NYC Area Consortium for Earthquake Loss Mitigation
NYCHA New York City Housing Authority **NYS** New York State
NYSDEC New York State Department of Environmental Conservation **NYS DHSES** New York State Division of Homeland Security and Emergency Services
NYSGS New York State Geological Survey **OLTPS** New York City Office of Long-Term Planning and Sustainability
ORR Office of Recovery and Resiliency **PATH** Port Authority Trans-Hudson
PlaNYC PlaNYC: A Greener, Greater New York **PSEG** Public Service Electric and Gas Company
SFHA Special Flood Hazard Area **SLOSH** Sea, Lake, and Overland Surges from Hurricanes Model
USACE United States Army Corps of Engineers **USGS** United States Geological Survey

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NYC Hazard Mitigation