

# 2016 NYC HAZARD MITIGATION PLAN ANNEX



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## SECTION 1: PLANNING PROCESS (HMP CHAPTER 2)

In order to enhance the Hazard Mitigation Plan so that it is a dynamic resource, the Hazard Mitigation Unit is developing a mitigation actions database to streamline agency updates and centralize citywide resiliency efforts (see Section 3). The update process will take place in a phased approach, starting with 14 of the 40 agencies on the Mitigation Planning Council (MPC).

The Hazard Mitigation Unit held a MPC meeting in November 2015 to discuss the launch of the database and to go over the process for collecting updates. Fourteen agencies on the MPC attended the event including Department of City Planning (DCP), Department of Environmental Protection (DEP), Department of Buildings (DOB), Department of Education (DOE), Department of Health and Mental Hygiene (DOHMH), Department of Parks and Recreation (DPR), Department of Sanitation of New York (DSNY), Fire Department of New York (FDNY), Health + Hospitals (H+H), Mayor's Office of Recovery and Resiliency (ORR), NYC Department of Transportation (NYCDOT), NYC Economic Development Corporation (NYCEDC), Office of Management and Budget (OMB), and Port Authority of New York and New Jersey (PANYNJ). Following the meeting, NYCEM held one-on-one meetings with each of these agencies to discuss mitigation actions updates.

Over the past year, the Hazard Mitigation Unit has served in an advisory role for several resiliency initiatives across the city. The resiliency initiatives include the following:

- Hunts Point Resiliency Advisory Working Group
  - HUD Community Development Block Grant Disaster Recovery (CDBG-DR) funds of \$45 million are available to the City to advance resiliency in Hunts Point. The Hunts Point Peninsula Resiliency and Evaluation Pilot Project will advance detailed feasibility studies for Resilient Energy and Flood Risk Reduction and select an implementable pilot project to increase resiliency in the peninsula. This originated through the HUD Rebuild by Design Competition in June 2013: Hunts Point Lifelines was one of the six winning proposals of \$20 million, and the City allocated an additional \$25 million in CDBG-DR funding to resiliency efforts in the peninsula.
  - During the summer of 2015, NYCEDC and ORR convened the Advisory Working Group that consisted of City agencies, community groups, elected officials, and Hunts Point businesses including the wholesale markets. The goal of the group was to develop resiliency priorities and recommendations for advancing resiliency in Hunts Point. NYCEM served as a subject matter expert in emergency planning and hazard mitigation.

- Sustainable City University of New York (CUNY) Resilient Solar Project
  - For the past two years, NYCEM has served on the Advisory Board of Sustainable CUNY’s Resilient Solar Project, supported by the United States Department of Energy, as well as the CUNY-led Policy and Legal Working Group and the Economics and Finance Working Group. Con Edison, Mayor’s Office of Sustainability, NYCEDC, DOB, FDNY, NYC Department of Citywide Administrative Services (DCAS), and ORR participate in this project as well.
  - This effort is creating a strategic pathway to a more resilient distributed energy system through the NYSolar Smart Distributed Generation Hub. The project emphasizes the value of resilient solar on critical facilities for emergency use, and NYCEM has helped designate a fire station, a school, and a NYC Housing Authority (NYCHA) development as sites for pilot studies. The studies will examine how resiliency benefits and electricity bill savings through peak-load reduction can make resilient solar a smart investment for critical infrastructure.

Since the 2015 HMP Update, Health and Hospitals Corporation (HHC) has changed its name to Health + Hospitals (H+H).

## SECTION 2: RISK ASSESSMENT (HMP CHAPTER 3)

This section includes new resources, studies, and tools to enhance the understanding of hazards as well as hazard events that have occurred since the 2015 HMP update.



Since the last HMP update, the city has experienced two nor'easter events and a close call with the forecasted Hurricane Joaquin. In the fall of 2015, the National Weather Service (NWS) closely monitored Tropical Storm Joaquin as it approached the Bahamas. Its track continued progressing northward and by October 1, Joaquin became a Category 4 hurricane, expected to make landfall north of North Carolina by October 6. In response to the forecast, NYCEM activated the Coastal Storm Plan and the Emergency Operations Center. Several days before Joaquin was expected to make landfall, NWS forecasted that Hurricane Joaquin would continue moving east and would head out to sea. Although the storm did not significantly impact the NYC area, it serves as a reminder that the city continues to be at risk to coastal storms.

In the winter of 2016, there were two nor'easters (see table below) that caused minor to moderate coastal flooding in low-lying areas of New York City. Both events coincided with high tide, which with storm surge increased water levels in coastal areas of the city. The map on the following page shows areas most impacted by the February 8-10 Nor'easter.

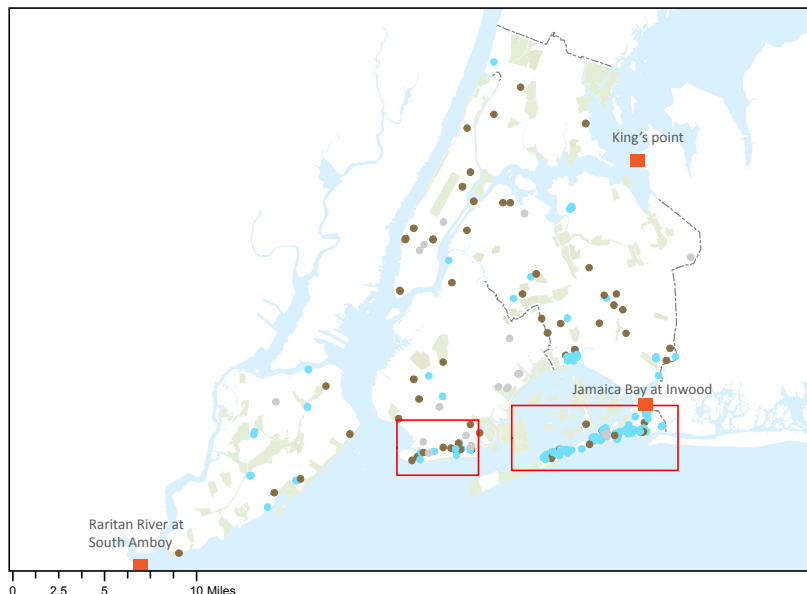
TABLE 1: COASTAL STORMS HISTORIC OCCURENCES APRIL 2015 - APRIL 2016

DATE	EVENT	LOCATION	WATER LEVEL (FEET)	TIDE STATION	DESCRIPTION
January 11-12, 2016	Nor'easter	Coastal Areas	3.21 above MHHW**	Raritan River at South Amboy	Minor flooding in coastal areas. 311 reports indicate flooded streets and clogged catch basins.
			2.75 above MHHW	King's Point	
February 8-10, 2016	Nor'easter	Rockaways and Coney Island	3.25 above MHHW	Raritan River at South Amboy	Coastal flooding in low-lying areas. 311 reports indicate street and highway flooding, excessive water in basement, and clogged catch basins. Tide gauges at several locations indicate moderate flooding.
			2.95 above MHHW	Jamaica Bay at Inwood	

**Source:** Stevens Institute Tide gauges (<http://hudson.dl.stevens-tech.edu/SFAS/>) and 311 call records. \*Event selection based on NYCEM activation. \*\*MHHW - Mean High High Water (highest tide).

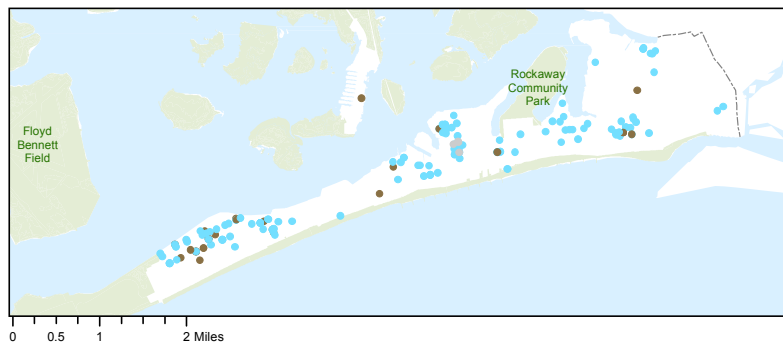
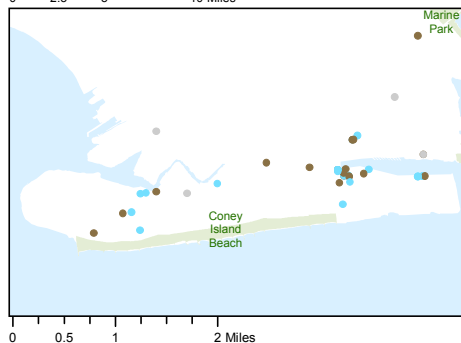
## 311 Flooding-related reports (Nor'easter, Feb 8-10 2016)

Source: NYCEM GIS / GIS Track-It #2525  
Produced: 20 APR 2016 09:15



- Selected SFAS Tidal Stations
  - Large public park
- 311 Complaints**
- Catch Basin Clogged/Flooding
  - Excessive Water In Basement
  - Highway Flooding
  - Street Flooding

**NYC** Emergency Management



## DISEASE OUTBREAKS:

The Legionnaires' disease outbreak that occurred in the summer of 2015 is one of the most recent disease outbreaks to occur since the 2015 HMP update. Between July 2 and August 4, 2015, 138 people contracted Legionnaires' disease in the South Bronx, making this the largest outbreak of the disease in New York City's history.

TABLE 2: DISEASE OUTBREAKS HISTORIC OCCURRENCES APRIL 2015 - APRIL 2016

DATE	EVENT	DESCRIPTION
July 2, 2015 to August 4, 2015	Legionnaires' disease outbreak in the South Bronx	138 people contracted Legionnaires' disease and there were 16 fatalities. A single cooling tower in the South Bronx was determined to be the source of this outbreak.

Source: NYCEM Situation Reports. \*Events were selected by severity and the potential for high impact to New York City.

The City regularly monitors infectious diseases that are either present and/or emerging. Since 2015, the City has been monitoring the Zika virus outbreak in Central America, South America, the Caribbean, and Mexico. This virus usually spreads to people through mosquito bites from a specific type of mosquito that only lives in certain parts of the world. Most people (80%) who become infected with Zika do not get sick, and the impacts are typically mild for those who do get sick. However, Zika may cause birth defects. To avoid this risk, pregnant women and women who are trying to get pregnant are advised not to travel to areas affected by Zika.

Although there have been no locally transmitted cases of the Zika virus in NYC, there have been 35 reported cases of contracted Zika while visiting other countries as of April 14, 2016. All patients have since recovered. Currently, DOHMH is working closely with the U.S. Centers for Disease Control and Prevention and the State to monitor the situation as well as planning and preparing to mitigate the Zika virus should it move to the New York City region.



## EARTHQUAKES:

Several new developments at the federal level have occurred since April 2015 that will help mitigate the risk to earthquakes and include the following:

- President Obama signed a new [Executive Order](#) to set earthquake guidelines for federal facilities: Establishing a Federal Earthquake Management Standard. This will improve the capability of federal buildings to function after an earthquake, reducing risks to people, lowering post-quake recovery costs, and making it easier for communities to recover swiftly.
- United States Geological Survey (USGS), along with partners from state governments, universities, and private foundations have been working on an early alert system for the West Coast. This system detects the initial, fast-moving, typically non-damaging “P-Waves” of an earthquake and analyzes these to determine the size and trajectory of the slower-moving and more damaging “S-waves.” This allows for warnings to be sent ahead of time so that people can take immediate action.
  - Earthquake early warning system has been developed and is in an advanced testing phase in California, Oregon, and Washington.
- The Federal Communications Commission issued one set of proposed rules January 28, 2016, which is out for public comment, that pertain to earthquake early warning systems.





## EXTREME TEMPERATURES:

According to the National Oceanic and Atmospheric Administration (NOAA), 2015 was the hottest year on record. In New York City, there were 62 consecutive days above 80 degrees and the third warmest August on record. The New York Panel for Climate Change (NPCC) projects that by the 2050s the frequency of heat waves could increase to seven per year from the pre-2000 baseline of two per year. NYCEM activated its Heat Emergency Plan twice this past year to respond to high temperatures and resulting power outages. In addition to these heat events, there was one extreme cold event that occurred in February 2016 (see table below).

TABLE 3: EXTREME TEMPERATURE EVENTS APRIL 2015 - APRIL 2016

START	NOAA WEATHER STATIONS	TEMPERATURE**	EVENT	LOCATION	DESCRIPTION
July 19, 2015	JFK	96	Extreme Heat	Citywide	Power outages in Staten Island (18,000 + customers), 1 assisted living center. Three health care facilities used backup generation.
	LGA	100			
Central Park	101				
July 20, 2015	JFK	97			
July 20, 2015	LGA	97			
	Central Park	97			
July 28, 2015	JFK	94	Extreme Heat	Citywide	Multiple voltage reductions with some customer outages. Multiple developments experienced elevator outages due to voltage reductions.
	LGA	93			
Central Park	95				
July 30, 2015	JFK	96			
July 30, 2015	LGA	95			
	Central Park	95			
February 11, 2016	JFK	24	Extreme Cold	Citywide	311 call records indicate no heat/no hot water reports.
	LGA	24			
	Central Park	22			

**Source:** NWS weather stations, NYCEM Situation Reports, and 311 call records. *\*Event selection based on NYCEM Heat Emergency Plan activations and Cold Weather monitoring. \*\*Heat indices are reflected for Extreme Heat Events.*



## FLOODING:

Because flooding continues to be a hazard that occurs frequently in the NYC area, the City is focused on understanding all sources of flooding, including inland flooding. For example, DEP is developing an action plan to resolve long-standing flooding conditions that affect over 400,000 city residents in Southeast Queens. The area has more 311 flooding and confirmed sewer backup complaints than any other area of the city, and in certain neighborhoods, experiences recurring flooding conditions.

The plan will consist of intensive and accelerated long-term sewer build-out, complemented with innovative, site-specific solutions, such as Bluebelts and green infrastructure. It will serve as a model for other flood-prone neighborhoods of the city. Over the past year, the DEP and other agencies have also engaged with the City of Copenhagen to develop innovative solutions to prepare for more and heavier downpours (“cloudbursts”) brought about by climate change. Several workshops are being held to swap best practices in the areas of assessing risks, prioritizing response, and developing neighborhood-based solutions. At these sessions, City agencies and Danish groups have presented on approaches for water management, resiliency, and risk assessment.

TABLE 4: FLOODING HISTORIC OCCURRENCES APRIL 2015 - APRIL 2016

DATE	EVENT	TOTAL RAINFALL	HOURLY RATE	DURATION	LOCATION	DESCRIPTION
May 31, 2015 & June 1-2, 2015	Flash Flood	0.76 inches (LGA, May 31) 0.81 inches (JFK, June 1-2)	0.33 inches/hour (LGA, May 31) 0.22 inches/hour (JFK, June 1-2)	5 hours (May 31) 45 hours (June 1-2)	citywide	Flash flood event occurring on May 31, 2015. Followed by a long period of steady rain for two days. 311 reports indicate street and highway flooding, clogged catch basins, and excessive water in basements.
June 20, 2015	Flash Flood	0.32 inches (JFK)	0.26 inches/hour (JFK)	8 hours	citywide	311 reports indicate street flooding, numerous accounts of clogged catch basins, and excessive water in basements.
August 11, 2015	Flash Flood	0.6 inches (Central Park)	0.34 inches/hour (Central Park)	6 hours	citywide	311 reports indicate street flooding, numerous accounts of clogged catch basins, and excessive water in basements.

TABLE 4: FLOODING HISTORIC OCCURRENCES APRIL 2015 - APRIL 2016

DATE	EVENT	TOTAL RAINFALL	HOURLY RATE	DURATION	LOCATION	DESCRIPTION
August 19, 2015	Flash Flood	1.13 inches (JFK)	0.98 inches/hour (JFK)	6 hours	citywide	311 reports indicate numerous accounts of clogged catch basins.
September 29-30, 2015	Flash Flood	0.67 inches (Central Park)	0.28 inches/hour (Central Park)	8 hours	citywide	311 reports indicate street flooding, numerous accounts of clogged catch basins, and excessive water in basements.

Source: NWS weather stations and 311 call records. \*Event selection was based on NYCEM Flash Flood Emergency Plan Activations.

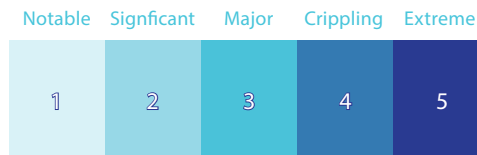


## WINTER STORMS:

This past winter season was a record setting El Niño event, which historically has brought warmer and milder weather to the northeast region of the United States. This could potentially explain why the 2015/2016 winter season did not bring in as many snow and extreme cold events as the previous season. Nevertheless, Winter Storm Jonas occurring in January 2016 broke the record for total snowfall accumulation in New York City. This storm occurred during high tide which also brought coastal flooding to low-lying areas of New York City (see chart below).

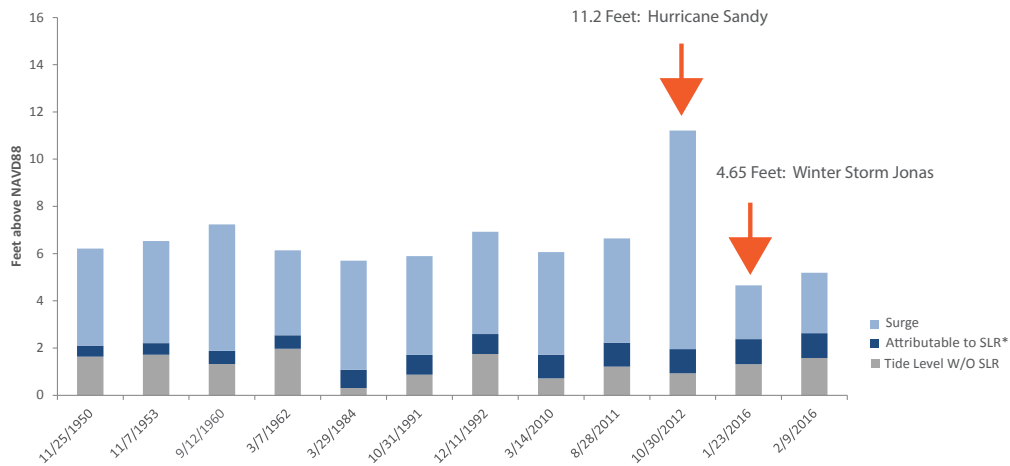
El Niño and La Niña are the warm and cool phases of a recurring climate pattern across the tropical Pacific. The pattern can shift back and forth irregularly every two to seven years, and each phase triggers predictable disruptions of temperature, precipitation, and winds.

The intensity of a winter storm can be classified by meteorological measurements and societal impacts. The Northeast Snowfall Impact Scale (NESIS) characterizes and ranks high impact Northeast snowstorms - those with large areas of snowfall accumulations of 10 inches and greater. The National Climatic Data Center developed this scale because the transportation and economic impacts of Northeast snowstorms can significantly affect the rest of the country. The index uses population data and meteorological measurements to gauge a storm's impacts on society.



Winter Storm Jonas reminded the city that winter storms can bring hazards beyond snow, such as coastal flooding. This event occurred during spring tide, resulting in moderate storm surge at areas throughout the region.

### High Water Events at the Battery Vs. Winter Storm Jonas 1900-Present



Source: NOAA; UCAR; Courtesy of ORR. \*SLR - Sea Level Rise

TABLE 5: WINTER STORM HISTORIC OCCURRENCES APRIL 2015 - APRIL 2016

DATE	EVENT	WEATHER STATION	TOTAL (INCHES)	NESIS	DESCRIPTION
January 23, 2016	Winter Storm Jonas	JFK	30.5	4	<ul style="list-style-type: none"> <li>Citywide travel ban was issued.</li> <li>Numerous towed vehicles.</li> <li>311 reports indicated an above average call volume for no heat/no hot water.</li> <li>Five winter related deaths (heart attacks while shoveling snow).</li> <li>Airports experienced widespread cancellations and delays.</li> <li>East River Ferry Service suspended, LIRR, Metro-North and outdoor subway lines suspended.</li> <li>Delays in plowing tertiary streets in Queens.</li> <li>Low lying coastal areas experienced moderate flooding.</li> <li>Battery Tide gauge indicated 4.65 Ft water height at NAVD88.</li> </ul>
		Central Park	26.8		

Source: Situation Reports issued during EOC activation, Stevens Institute, NWS Weather Stations, and 311 call records. \*Event selection based on minimum height of snow more than 10 inches.

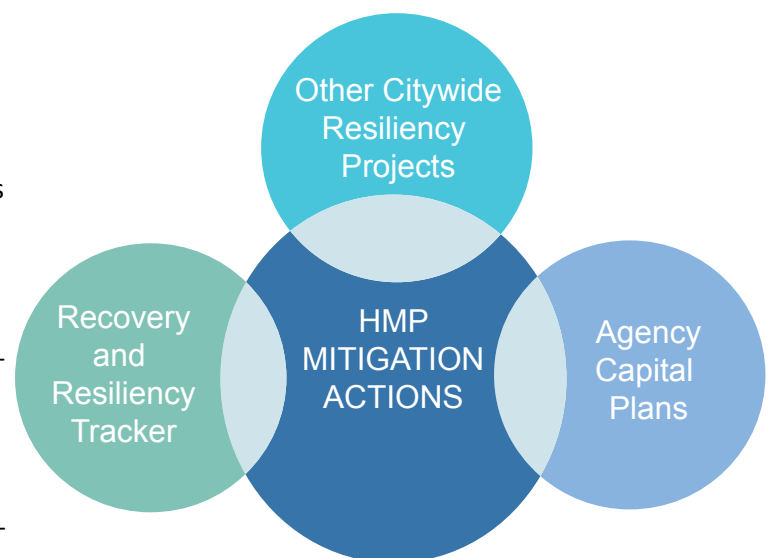
## SECTION 3: MITIGATION STRATEGY (HMP CHAPTER 4)

The NYC 2014 HMP identifies over 600 existing and potential projects (mitigation actions) across 40 agencies. Many of these projects overlap with other citywide resiliency and capital initiatives. To build upon the 2014 HMP and make this section a dynamic tool, NYCEM has launched the Mitigation Action Database. This initiative will transform the current static list structure of the mitigation actions into an interagency online repository.

The Mitigation Actions (MA) Database will streamline mitigation action updates by leveraging information from citywide initiatives, identify new mitigation actions for future annual review cycles, and will eventually include a public-facing, online interactive mapping platform that identifies the location of select mitigation actions. This includes close coordination between NYCEM and Mayor's Office of Recovery and Resiliency to bridge overlapping resiliency projects identified within *OneNYC*.

In June 2013, the City released its comprehensive climate resiliency plan, *PlaNYC A Stronger, More Resilient New York* that outlines a 10-year, over \$20 billion program with 257 initiatives for adapting the city's infrastructure systems and its hardest-hit neighborhoods after Hurricane Sandy. The plan includes a detailed analysis of damage and sets forth a risk assessment that informs the City's program to prepare for a future with climate change. In April 2014, the City committed to enhancing and expanding resiliency and housing recovery programs with the release of *OneNYC*. With *OneNYC*, the City expands and accelerates its climate adaptation roadmap with several new concepts and focus areas, including: community strengthening, new climate projections from the 2015 NPCC *Building the Knowledge Base for Climate Resiliency*, urban heat, land use policy as a tool for resiliency, and an updated federal agenda.

Over the course of 2015, NYCEM has cross referenced overlaps between other citywide initiatives related to capital planning, resiliency, and Sandy recovery with the 2014 HMP mitigation actions. NYCEM Hazard Mitigation selected 14 agencies to pilot the MA Database (Phase 1). NYCEM met with these agencies to discuss updates to the mitigation actions they submitted to the 2014 HMP and asked them to verify the cross-referenced projects. The summary table below identifies the changes to mitigation actions for Phase I of the database. Phase 1 of the Mitigation Actions Database, showed that 93 projects have moved from potential to existing, 58 projects have been completed, and 83 projects have been added. Two of the agencies for Phase 1 mitigation strategies are featured on the following pages.



The mapping portion of the project started in the winter of 2015 and will continue through the summer of 2016. This tool will help MPC members better localize planning efforts, cross reference their actions with the Risk Assessment Section, work with communities, and leverage grant opportunities.

TABLE 6: SUMMARY OF MITIGATION ACTION CHANGES FROM APRIL 2014 - APRIL 2016 (PHASE 1 AGENCIES: DOES NOT REPRESENT ENTIRE MPC)			
AGENCY	NO. OF ACTIONS MOVED FROM POTENTIAL TO EXISTING	NO. OF COMPLETED ACTIONS	NEW ACTIONS
Con Edison	4	1	0
DCP	6	10	1
DEP	8	2	0
DPR	1	1	0
DOB	3	11	12
DOE	4	0	14
DOHMH	3	1	2
DSNY	2	3	13
FDNY	8	6	0
H+H	13	8	29
MTA	9	3	10
NYCDOT	5	4	0
NYCEDC	7	3	0
NYCEM	20	5	2
Total	93	58	83

**Source:** Phase I Agency mitigation actions update submissions.

**MITIGATION ACTIONS SPOTLIGHT (MTA):** The MTA currently has a \$6.9 billion post-Sandy recovery and resiliency program. To date, the MTA has committed \$2.4 billion of these funds to 187 plus individual projects. Measures, such as restoring subway service to the Rockaways, were implemented soon after Hurricane Sandy; others, like refurbishing the Montague tube with resilient systems and flood-protected electrical rooms, are in final construction; and still others—such as protecting the portals to the Hugh L. Carey and Queens Midtown Tunnels, hardening the power and signal system along Metro-North’s Hudson Line, and building walls and improving drainage to protect subway and rail yards—are in advanced stages of planning, design, and procurement.

**MITIGATION ACTION SPOTLIGHT (DOHMH):** The Ebola outbreak began in 2014 and extended throughout 2015. This prompted the city, including DOHMH and other agencies and organizations involved in healthcare system preparedness, to increase emphasis on preparing the healthcare system to respond safely and effectively to outbreaks of emerging infectious diseases. Activities in 2015 to minimize the effects of Ebola in the city include:

#### **Establish Protocols:**

- Establishment of New York City Health + Hospitals / Bellevue as the HHS Region 2 Ebola and Special Pathogens Treatment Center along with support for two other NYS Ebola Designated Treatment Centers in NYC (Mount Sinai Hospital and Montefiore – Moses Campus)
- Continued support for healthcare networks to develop comprehensive plans for infectious disease preparedness and train staff on plans.

#### **Workplace Controls:**

- Assessment of infection control practices in ambulance companies to inform development of training for EMTs and paramedics.
- Development of program to assess infection control practices in certain healthcare settings (nursing homes and some ambulatory care sites).

## **CAPABILITY ASSESSMENT**

Over the past year, there have been several reports, tools, and working groups that enhance the ability of the MPC to implement mitigation strategies. Below is a summary of recently released tools.

#### *Planning and Regulatory (City Plans):*

- **Resilient Neighborhoods:** This DCP led initiative, aims to identify and address vulnerabilities specific to communities in flood zones and those neighborhoods severely affected by Hurricane Sandy. DCP is in the process of developing and finalizing strategies with community groups and other agencies for the resilient neighborhoods planning studies.

DCP released its Resilient Neighborhoods initiative report for the [Edgewater Park](#) neighborhood of the Bronx. The report recommends a number of ways to address the hazards facing this waterfront residential neighborhood. The report will be shared with community members to help raise awareness of flood risk and provide information on retrofitting buildings to create a more resilient Edgewater Park.

**Resilient Art Spaces:** DCP released a guide for operators and owners of arts and cultural spaces on measures they can take before, during, and after a storm to protect from storm damage and recover more quickly. The report is part of the agency's work in West Chelsea under the Resilient Neighborhoods initiative and was developed in collaboration with ORR, NYCEM, NYC Small Business Services (SBS), and the NYC Department of Cultural Affairs (DCLA).

- **Resilient Retail Study:** The DCP Resilient Retail study addresses existing physical and regulatory challenges to maintaining active commercial corridors that serve neighborhood retail needs within the city's floodplain. It outlines short and long-term adaptation and retrofit strategies for businesses, and proposes federal regulatory reforms and local land

use actions that aim to provide business and property owners with more flexibility in flood mitigation. A report summarizing recommendations is expected later this year.

- [\*Resilient Industry Study\*](#): Organized by DCP, the Resilient Industry initiative will assess vulnerability to flooding in industrial areas of New York City and propose strategies that individual businesses and the City can pursue to make industrial areas and surrounding communities more resilient. The Technical Advisory Committee consists of city and state [agencies](#), [private industrial businesses](#), and private not for profit organizations. The study will consider both physical changes to protect industrial facilities and operational strategies to prepare for future storms.
- [\*Resilient Edgemere Community Planning Initiative\*](#): The Housing Preservation & Development (HPD) is leading this initiative along with several NYC agencies to align New York City's Sandy recovery and rebuilding investments in Edgemere (Eastern Rockaways) with a long-term and comprehensive community vision. The initiative's goals are to improve quality of life and long-term resiliency in the neighborhood through: coordinated post-Sandy recovery investments, flood risk mitigation, infill housing development, land use changes, streetscape and mobility improvements, and waterfront access and open space development.
- [\*OneNYC 2016 update and on-line mapping platform\*](#): Annual update on the initiatives identified in *OneNYC* and *A Stronger More Resilient New York*. Projects identified in these initiatives will be mapped and publically available. Over the summer, select mitigation actions will be added to this platform as part of the Mitigation Actions Database project.

#### *Education and Outreach*

- [\*Urban Heat Island \(UHI\) Working Group\*](#): Organized by ORR, this group consists of City agencies, academics, and non-governmental organizations (NGOs). The group will inform the City's efforts to mitigate and adapt to the impacts of extreme heat and understanding of the impact of UHI. The past year, the working group has been developing a strategic framework to inform and guide future capital investments and operational strategies, identify and advise on near-term tactics for the city's most heat-vulnerable communities based on the best available science, and recommend needed monitoring and research initiatives to adapt our city to the increasing impacts of urban heat.
- With support from the CDC, the City's Department of Health and Mental Hygiene (DOHMH) has conducted surveillance and analysis of climate-related health effects, including heat impacts, and published with academic partners an analysis to identify



## Ready New York: Reduce Your Risk Presentation



indicators of vulnerability to extreme heat event-related mortality in NYC. A resulting heat vulnerability index (HVI) has been shared with and is informing work of the Urban Heat Island Working Group.

- *Climate Change Adaptation Taskforce (CCATF)*: Based on the 2012 Local Law (LL) 42, which is to identify critical infrastructure in New York City that could be at risk from the effects of climate change, the CCATF facilitates knowledge sharing and develops strategies to reduce the impacts of climate change on these assets. In July 2015, telecommunications was added to the LL 42 as a sector of interest. A final report that will describe system-wide asset vulnerabilities and adaptation strategies will be released in fall of 2016.

- There are five working groups that are in the process of developing an updated inventory of at-risk infrastructure, a design standards framework, and a repository of resilience guidelines. The working groups consist of the following sectors: energy, social infrastructure, telecommunication, transportation, and water, sewer, and waste.
- *Built Environment Working Group*: Organized by ORR to discuss programs, policies, projects and issues that relate to built environment resiliency.
- *Reduce Your Risk Ready New York Presentation*: In October 2014, NYCEM developed a Ready New York guide geared towards the homeowner, which includes strategies that homeowners can employ to reduce the impacts of coastal storms, flooding, earthquakes, brush fires, strong windstorms, extreme heat, and winter weather. In 2015, NYCEM created a specialized Ready New York Presentation for the Reduce Your Risk Guide and has presented to several building owners associations.

