

What Happened During Sandy

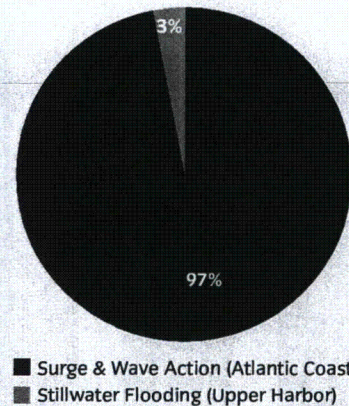
Building damage from storm surge and inundation during Sandy was widespread and in many cases severe. Sandy flooded an area that included approximately 88,700 buildings, or 9 percent of the city's building stock. These buildings encompassed 662 million square feet of space that included more than 300,000 housing units and 23,400 businesses. The storm completely destroyed or rendered structurally unsound hundreds of buildings and damaged thousands more. More than 100 of these impacted homes and businesses were destroyed by storm-related fires, which were predominantly electrical in nature and caused largely by the interaction of electricity and seawater.

Following Sandy, both the Federal government (through FEMA) and City government (through DOB) inspected the damage caused by the storm. At the Federal level, as of February 15, 2013, FEMA had completed inspections of nearly 70,000 housing units that registered with FEMA for disaster assistance. These inspections demonstrated that building damage varied widely, both in terms of the dollar value of losses and the level of flooding sustained. For example, of the approximately 47,000 owner-occupied housing units inspected by FEMA, 49 percent had sustained damage in excess of \$10,000, with 12 percent sustaining damage in excess of \$30,000. Of the approximately 22,000 rental housing units inspected, 26 percent sustained "substantial damage", the highest damage classification used by FEMA, indicating that damage was 50 percent or more of the pre-flood market value of the building.

The City's building-level damage assessments following Sandy were similarly comprehensive. These were led by DOB and represented the largest building inspection initiative in New York City history, teaming DOB inspectors and engineers with private-sector engineers who volunteered to serve the effort in Rapid Assessment Teams. The result of this initiative was a series of "tags" applied to buildings, ranging from "red" (indicating structural damage) to "yellow" (indicating that portions might be unsafe or might have significant non-structural damage) to "green" (indicating less serious damage or no damage at all).

The first set of these tags was issued by DOB Rapid Assessment Teams that were sent to the most impacted sections of the city immediately following Sandy (DOB Post-Storm Tags). Of the roughly 82,000 buildings receiving DOB Post-Storm Tags, approximately 73,000 of the buildings were tagged as green (or 89 percent of the total), 7,800 were tagged as yellow (or

Buildings Assigned Red or Destroyed Tags, Categorized by Flood Type



Source: DOB December Tags, DCP PLUTO

10 percent of the total), and 930 were tagged as red (or 1 percent of the total). Of the red-tagged buildings, 220 were further categorized as destroyed.

In December 2012, DOB conducted a follow-up assessment of the buildings that received DOB Post-Storm Tags, focusing on the roughly 8,700 buildings that had earlier been tagged yellow or red (including those tagged as destroyed). This assessment sought to standardize DOB's classification methodology across the boroughs. Generally, this assessment took a more conservative approach, for example, assigning yellow tags for damage to building systems only in larger buildings with elevators. As a result, a number of properties were reclassified (DOB December Tags). Of the roughly 8,700 buildings receiving DOB December Tags, approximately 1,300 were given yellow tags, and 780 were given red tags, of which 230 were further categorized as destroyed.

Though the figures diverge from one another, the story that they tell about the impact of Sandy on the city's building stock is relatively consistent. Namely that, with respect to the buildings that were seriously damaged by Sandy (those receiving either yellow or red tags, including those further classified as destroyed), the majority (between 63 percent and 91 percent) received yellow tags. This indicates that most Sandy-related damage was non-structural in nature, largely due to flooding of building systems and equipment (including electrical, sanitary, and life safety systems) located on ground floors or in basements—a conclusion that is buttressed by the fact that the aforementioned figures likely *understate* the number of buildings citywide that could have received yellow tags, given that DOB's

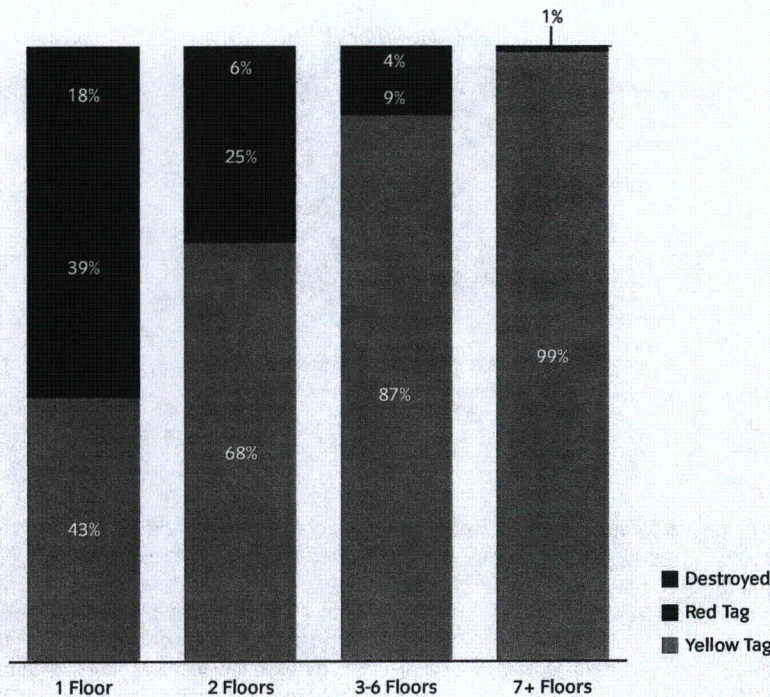
focus was generally on areas of the city where structural damage to buildings was greatest.

Though the damage indicated by yellow tags, in most cases, did not structurally compromise buildings, it did, in many cases, have profound impacts on building occupants, displacing residents and businesses likely also to be contending with extensive damage to building contents. Some yellow tagged buildings also required significant and costly repairs, including work on ground floors and basements.

Two sets of factors proved to be strong predictors of how Sandy affected buildings. First, flood characteristics such as surge force and depth of inundation correlated strongly with the degree of damage suffered by a building. Thus, shoreline areas that experienced the strong lateral forces of waves had many more damaged buildings than areas with stillwater flooding. In fact, wave action along the Atlantic Coast (including Southern Brooklyn, South Queens, and the East and South Shores of Staten Island) accounted for the majority of damaged buildings, and for nearly all buildings tagged red or destroyed citywide, whether those tags were DOB Pre-Storm Tags or DOB December Tags. (See chart: *Buildings Assigned Red or Destroyed Tags, Categorized by Flood Type*)

Other, perhaps less intuitive, predictors of Sandy's impact on any given building included building age and physical characteristics. For example, buildings predating the 1961 Zoning Resolution and the 1983 FIRM standards fared much worse than newer buildings, more frequently sustaining significant damage. Moreover, where more recently constructed buildings did suffer damage, such damage tended to be moderate rather than severe.

Buildings Assigned Destroyed, Red, and Yellow Tags, Categorized by Building Height



Source: DOB December Tags, DCP PLUTO

Building height was another key predictor of the degree of building damage from Sandy. One-story buildings proved particularly susceptible to severe damage. Although such buildings accounted for less than 25 percent of the buildings in the area inundated by Sandy, they represented roughly 75 percent of the buildings that sustained the most severe damage accord-

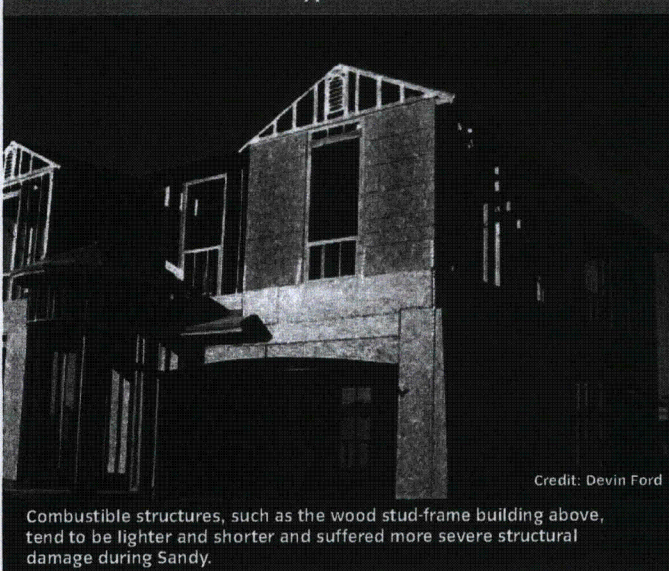
ing to the DOB December Tags (those receiving red tags, including those further tagged as destroyed). By contrast, high-rise buildings experiencing inundation generally did not sustain structural damage according to the DOB December Tags. They, however, often did experience damage to building systems that were housed in basements or otherwise

insufficiently elevated. (See chart: *Buildings Assigned Destroyed, Red, and Yellow Tags, Categorized by Building Height*)

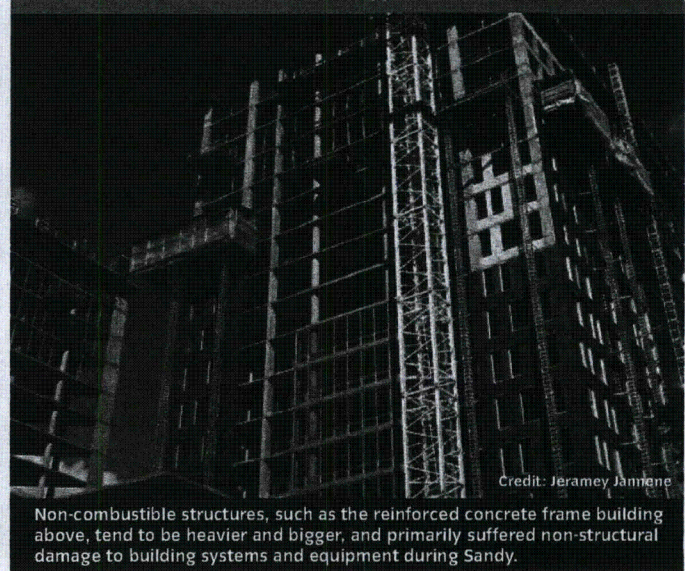
Construction type, which tends to correlate with building height, also served as a predictor of Sandy-related damage for buildings. As stated above, low-rise structures suffered the most severe damage. Though such structures are often of combustible construction, not all are. However, where low-rise structures were also of combustible construction, the damage tended to be even more severe. In fact, while 85 percent of the 1-story buildings in the area inundated by Sandy were combustible structures, 99 percent of 1-story buildings receiving red DOB December Tags (including those further tagged as destroyed) were of a combustible construction type. Conversely, high-rise structures, which often are of a non-combustible construction type, tended to experience less severe structural damage. (See photos: *Combustible Construction Type and Non-Combustible Construction Type*)

The building type most vulnerable to Sandy's effects turned out to be 1-story combustible buildings constructed before 1961—including bungalows found in many coastal areas of the city. Buildings matching these characteristics represented 18 percent of the buildings in the inundated areas of the city, but 73 percent of all structurally damaged or destroyed buildings in the city. Structures of this type were approximately four times more likely to sustain severe damage than their share in the inundation area would suggest. (See chart: *Share of Total Buildings in the Sandy Inundation Area Compared to Share of Building Damage, Categorized by Building Type*)

Combustible Construction Type



Non-Combustible Construction Type



Share of Total Buildings in the Sandy Inundation Area Compared to Share of Building Damage, Categorized by Building Type

Buildings in the Sandy Inundation Area

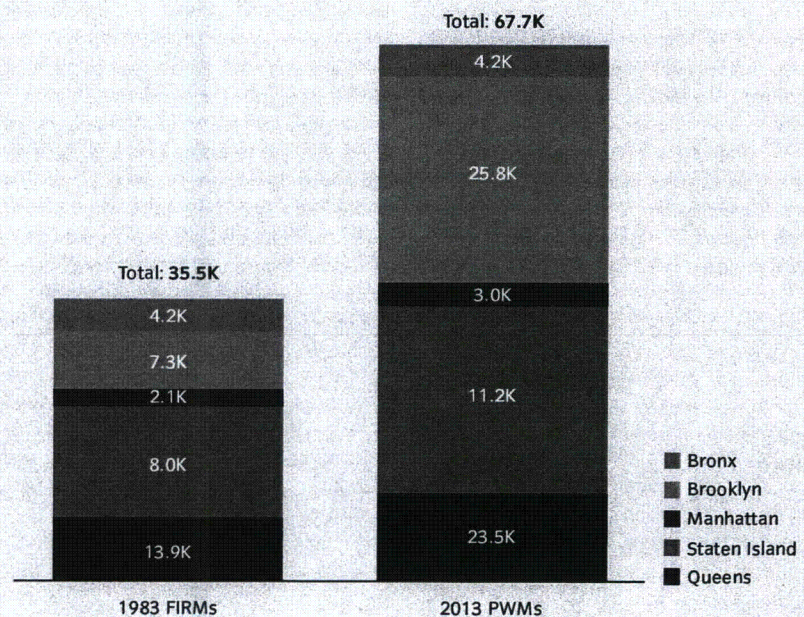
	Year of Construction	1 Floor		2 Floors		3 to 6 Floors		7 Floors or Higher		
		Combustible	Non-Combustible	Combustible	Non-Combustible	Combustible	Non-Combustible	Combustible	Non-Combustible	
Total Buildings	Pre-1961	18%	3%	37%	1%	11%	1%	0%	1%	100%
	Post-1961	2%	1%	16%	1%	6%	1%	0%	1%	
Buildings Assigned Red or Destroyed Tags	Pre-1961	73%	1%	16%	0%	5%	0%	0%	0%	100%
	Post-1961	1%	0%	3%	0%	1%	0%	0%	0%	

Percentages reflect the share of buildings in each category—either Total Buildings in the Sandy Inundation Area or Buildings with Red or Destroyed Tags—that have the characteristics defined in the chart. For example, 1-story buildings of a combustible construction type built pre-1961 represented 18 percent of the buildings in the Sandy Inundation Area, but 73 percent of the buildings tagged red or destroyed.

Source: DOB December Tags, DCP PLUTO

Although both size and construction type did play a role in the poor performance of many damaged and destroyed 1-story buildings, it is noteworthy that other 1-story structures and other combustible structures generally did not fare as poorly as 1-story combustible structures that also were built prior to the introduction of modern building codes. Thus the rules and regulations contained in these codes did appear to have played a particularly critical role in determining how well impacted structures fared.

Expansion of the Number of Buildings in the 100-Year Floodplain



Source: DCP, FEMA

What Could Happen in the Future

New York City's buildings face a variety of risks related to climate change.

Major Risks

Now and into the future, the risk of storm surge combined with sea level rise is likely to present the greatest threat to New York City's building stock. Flood risk is illustrated by the recent PWMs created by FEMA, which show more than 67,700 buildings now to be in New York City's 100-year floodplain, up from the approximately 35,500 indicated in the 1983 FIRMs—an increase of roughly 90 percent. These 67,700 buildings, in turn, encompass nearly 535 million square feet of space and house approximately 398,000

Risk Assessment: Impact of Climate Change on Buildings

Major Risk
 Moderate Risk
 Minor Risk

Hazard	Scale of Impact			Comments
	Today	2020s	2050s	
Gradual				
Sea level rise				Increasing numbers of buildings face weekly and daily flooding
Increased precipitation				Minimal impact
Higher average temperature				Minimal impact
Extreme Events				
Storm surge				Large and growing number of buildings likely would face significant flooding risk
Heavy downpour				Minimal impact
Heat wave				INDIRECT: impact primarily relating to increased risk of power outages
High winds				Building codes are calibrated to anticipated wind speeds though in-place stock and equipment may be vulnerable

residents and 271,000 jobs. Though these figures are significant in many ways, they tell only part of the story of the city's vulnerability. (See chart: *Expansion of the Number of Buildings in the 100-Year Floodplain*)

As vulnerable as New York's building stock may be today, it is very likely to become even more vulnerable in the future. According to climate projections from the New York City Panel on Climate Change (NPCC) described in Chapter 2 (*Climate Analysis*), sea levels are forecast to rise through the 2020s and 2050s. During this period, the floodplain will expand, with a corresponding increase in the number of buildings in the 100-year floodplain—rising to more than 88,000 by the 2020s and more than 114,000 by the 2050s based on recent high end projections of sea level rise. In addition to exposing more New Yorkers to greater risk, an expansion of this scale also would have significant financial impacts on hundreds of thousands of New Yorkers, ranging from new requirements relating to flood insurance, to more expensive flood insurance premiums, to new requirements for property owners to alter ground-level and underground spaces to comply with national flood-resistant construction standards (see Chapter 5).

Other Risks

Going forward, high winds are projected to pose a moderate risk to the building stock of New York.

While the NPCC does not provide specific projections for wind speeds, their projections do suggest an overall increase in the frequency of the most intense hurricanes, which are accompanied by high winds. Though the Building Code already requires new and substantially improved buildings to protect against top winds associated with a Category 3 hurricane, older buildings that predate modern standards and have improperly installed and maintained external elements may be vulnerable. This is especially true in areas with open exposures—for instance, along the coast—and with respect to older 1- and 2-family homes. And all structures, including high-rise buildings, will continue to face potential damage to façades from airborne debris during the sorts of extreme wind events that could occur in the future.

In addition, the city's future wind risk profile in the face of climate change is uncertain. While current Building Code requirements are based on data from area airports—John F. Kennedy

International Airport, LaGuardia Airport and Newark Liberty International Airport—a detailed mapping of the city's wind profile could provide a much more accurate assessment of the risks that buildings face with potentially increased storm activity.

Meanwhile, heavy downpours, increased precipitation, and higher temperatures in the future are expected to have a minimal impact on buildings. Though increased precipitation may raise the possibility of flooding, the levels of flooding currently projected are not believed to present anywhere near the same threat to life and property that storm surge poses now and in the future. Similarly, currently forecasted increases in average temperatures should not affect significantly the resiliency of building structural elements or in-house mechanical and electrical systems. However, without resiliency investments, the power outages that may come with heat waves certainly would affect the occupants of the city's buildings (see Chapter 6, *Utilities*).

This chapter contains a series of initiatives that are designed to mitigate the impacts of climate change on New York's buildings. In many cases, these initiatives are both ready to proceed and have identified funding sources assigned to cover their costs. With respect to these initiatives, the City intends to proceed with them as quickly as practicable, upon the receipt of identified funding.

Meanwhile, in the case of certain other initiatives described in this chapter, though these initiatives may be ready to proceed, they still do not have specific sources of funding assigned to them. In Chapter 19 (*Funding*), the City describes additional funding sources, which, if secured, would be sufficient to fund the full first phase of projects and programs described in this document over a 10-year period. The City will work aggressively on securing this funding and any necessary third-party approvals required in connection therewith (i.e., from the Federal or State governments). However, until such time as these sources are secured, the City will only proceed with those initiatives for which it has adequate funding.

Overview and Approach

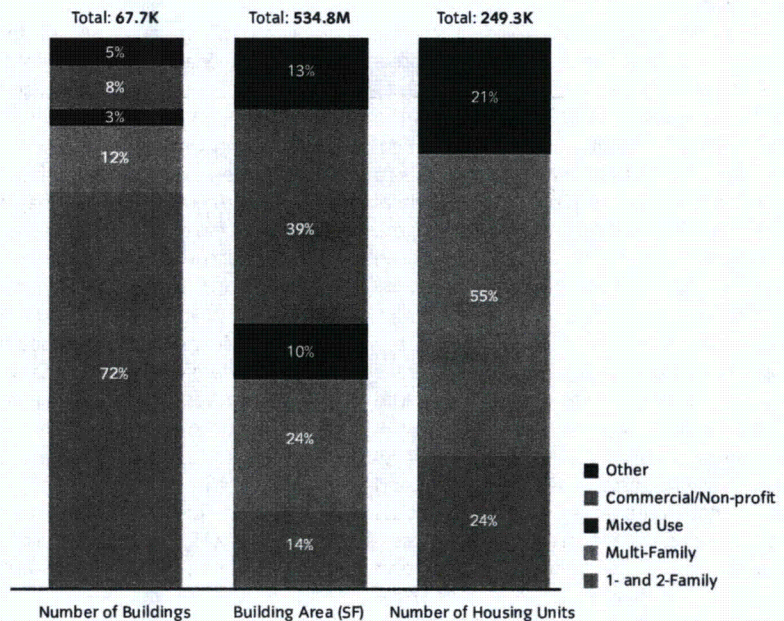
As the impact of Sandy demonstrated, buildings constructed in accordance with modern codes and standards tend to be better able to withstand extreme weather events—that is, they tend to be more resilient. Yet these codes and standards cannot remain static. They must evolve continually to incorporate the best available technologies and methodologies. The building initiatives to address climate risks, therefore, include a focus on enhancements to New York's building codes, with the goal of achieving two ends:

1. Strengthen new and substantially improved buildings to meet the highest possible standards;
2. Protect existing buildings—which remain the city's biggest challenge given their numbers—by encouraging targeted retrofits over time.

Strengthen new and rebuilt structures to meet the highest resiliency standards moving forward

For new and substantially improved buildings (that is, buildings for which the cost of alteration is greater than 50 percent of their previous value), the highest resiliency standards can be incorporated early in the design phase of construction in a manner that would effectively mitigate future losses. The City, through the Mayor's Office of Long-Term Planning and Sustainability (OLTPS), therefore will work with the City Council to enhance the

Buildings, Building Area, and Housing Units in the 2013 PWMs Broken Down by Land Use



Source: FEMA, DCP PLUTO

Construction Codes so that these buildings are designed to reflect the best available information on climate risk and resiliency.

Retrofit as many existing buildings as possible to improve resiliency

Meanwhile, the City also must deal with its substantial in-place inventory of existing buildings that are or will be vulnerable to climate risks. In many ways, existing buildings represent a bigger challenge than new buildings. Most of the buildings in the city's 100-year floodplain are older, constructed to codes and standards that did not incorporate flood resistance. In fact, approximately 72 percent of the structures in the city's 100-year floodplain were erected before 1961, when the current Zoning Resolution was passed, and 85 percent before 1983, when the City adopted FEMA's flood maps and incorporated flood-resistant construction standards for new and substantially improved buildings in the 100-year floodplain.

New York City's buildings also, in many cases, can be found amid urban site conditions that make retrofits challenging. The city's building stock differs dramatically from that of communities in other coastal flood-prone areas, such as the Gulf Coast and the Southern Atlantic Coast, which have sought to incorporate flood resistance even into their preexisting building stock. While construction in these coastal areas consists primarily of lower-density homes, buildings in New York City's 100-year floodplain include substantial numbers of higher density, and often

attached multi-family, and commercial/nonprofit buildings. Thus, while more than 70 percent of the 67,700 buildings in the 100-year floodplain of FEMA's PWMs are 1- and 2-family homes, a majority of the building area and housing units in the floodplain can be found in higher-density buildings. Specifically, approximately 34 percent of the 535 million square feet located in the 100-year floodplain can be found in multi-family buildings or mixed-use structures (which also tend to be multi-family), and roughly 39 percent can be found in commercial/nonprofit space. Similarly, while 1- and 2-family homes represent only 24 percent of the approximately 249,000 housing units in the 100-year floodplain, roughly 76 percent can be found in multi-family or mixed-use buildings. (See chart: *Buildings, Building Area, and Housing Units in the 2013 PWMs Broken Down by Land Use*)

The very nature of the city's structural inventory poses a challenge to using methodologies such as elevation to retrofit New York's building stock. For example, many property types common in New York City's neighborhoods have multiple stories and are constructed from materials such as masonry and concrete that make elevation difficult. Many also are attached or semi-attached, which means that elevation would require coordination with neighboring properties, and may be physically difficult and financially infeasible. Additionally, whereas in other jurisdictions, abandonment of ground floor and underground space may be a viable alternative to actual elevation, in many parts of New York, because of the high

value of usable real estate, doing so would result in significant financial loss to property owners.

Greater flood protection in developed areas also poses urban design challenges—both for retrofitting and new construction. Such protection can interfere with the visual connectivity between the first floor of a building and the public sidewalk, creating uninviting entranceways, and leading to architecture that fails to engage pedestrians. In New York, traditional flood-protection methods, therefore, have the potential to impact the neighborhood fabric in a negative way and could undermine the vitality of street life.

For example, if buildings in dense urban areas are elevated, spaces left unoccupied at the street level could pose security risks to area residents. Elevation also can make commercial corridors—which provide critical services and employment—untenable by inhibiting access to street-level retail. Visual and physical accessibility of retail from the sidewalk is more important in New York than elsewhere because New Yorkers walk to shopping and services more than anyone else in the United States. Elevating stores also can isolate them from the street environment. In addition, dry flood-proofing of retail or industrial structures can be technically difficult or costly. Meanwhile, even where elevation may be physically possible (as in the case of smaller, wood-framed structures), the narrow lots in New York City limit the space needed to stage construction and make post-elevation access challenging. *(See sidebar: Urban Site Conditions and Flood Protection Challenges)*

In short, these and other constraints make it prohibitively expensive, physically infeasible, or both, for owners of many properties in the floodplain to elevate their structures or to otherwise retrofit their buildings to meet national flood-resistant construction standards in full. In fact, as of the writing of this report, it is estimated that owners of approximately 39 percent of buildings in the 100-year floodplain of the PWMs (or roughly 26,300 buildings) would face significant challenges if they sought to retrofit in these ways due just to their challenging site conditions such as narrow lots or attached structures—without even taking into account issues such as cost and the ability to secure financing.

Given these obstacles, some policy advocates have suggested alternative approaches to improve the resiliency of New York's housing stock, such as government purchases of large numbers of vulnerable properties in the floodplain. Buyouts intended to turn exposed properties into natural or open spaces may make sense in limited circumstances in very high-risk areas where vulnerability is a function of the land itself,

and not of shortcomings in the buildings that exist there as of the writing of this report. However, such buyouts raise many issues. They would need to result in an open space or buffer area that serves a useful purpose, and to do so, would require near-unanimous participation of area residents to be effective—a challenge in many circumstances. Additionally, even if unanimity (or near-unanimity were achieved), the approach can be expensive—diverting limited resources from other investments that may be more cost-effective or have a more widespread impact. Given the scale of New York's building stock in the coastal area, the fact that buildings can be constructed to address the flood risks faced in the vast majority of coastal neighborhoods, and the limited alternative options for a growing population in New York City and the region, wholesale abandonment of or retreat from the city's waterfront is simply not a practical option.

The City, therefore, proposes an approach pursuant to which buyouts would be a tool in the City's tool kit, but one that would be used sparingly and, where used, would most commonly be used with the goal of redeveloping acquired properties in a more resilient fashion. In most cases, the City will prioritize the use of limited resources to retrofit the largest number of existing buildings to a significantly higher standard of resiliency. This strategy focuses on avoiding catastrophic loss in building types that proved most vulnerable during Sandy and otherwise seeks to allow inhabitants to reoccupy buildings quickly—after complying with all City evacuation orders and once reentry is deemed to be safe—by focusing efforts on elevating or otherwise protecting critical building systems. As with all retrofits, these building improvements would be completed in compliance with existing City construction rules, including the requirement that alterations greater than 50 percent of building value, prior to improvement, be considered “substantial improvements.” Substantially improved buildings must comply with the same flood-resistant construction standards as new buildings.

Strategy: Strengthen new and substantially rebuilt structures to meet the highest resiliency standards moving forward

Initiative 1 Improve regulations for flood resiliency of new and substantially improved buildings in the 100-year floodplain

As described above, the current rules for flood-resistant construction incorporate elevations from the most recently adopted FEMA FIRMs,

which have not been significantly updated since 1983. In 2010, FEMA began working with the City to update these maps to reflect better information on current flood risk. As part of this effort, FEMA released PWMs in June 2013. These maps provide an updated approximation of the final boundaries of the floodplain and BFEs that will be found in the final FIRMs that are expected to be issued by FEMA in 2015, with City adoption thereafter.

To enable new and substantially improved buildings, as well as existing buildings that retrofit voluntarily, to withstand appropriate flood risk, the City has proposed an amendment to the Zoning Resolution to allow these buildings to be elevated, without being penalized by zoning height limitations, to the higher of the BFE in the current effective FIRMs or the best available flood maps (currently the PWMs), in each case, plus 1 to 2 feet of freeboard. The proposed changes would also allow additional flexibility for other resiliency measures, including the elevation of mechanical equipment and relocation of existing underground parking.

When the new FIRMs are finalized, the City will further update the Building Code to reference the elevations contained therein and to require freeboard of 1 to 2 feet above these elevations.

Looking to a future where sea level rise could result in flood elevations even beyond the mandated freeboard, the City also will conduct a study of the implications of permitting zoning relief for up to 3 feet of freeboard. This analysis will serve as a necessary first step towards potential future adoption of corresponding zoning changes.

Towards a similar end, the City and the NPCC will establish a set of interim metrics to be measured in 2025 that will indicate whether sea levels around New York appear to be rising at expected rates. Every six years—in conjunction with every second Construction Codes review cycle—the NPCC and the City will review observed sea level rise. If, by 2025, sea level rise surpasses the metrics put forth by the City and the NPCC, the Building Code will be amended at that time, with corresponding zoning relief, to require 3 feet of freeboard above the BFE in FEMA's FIRMs (rather than the proposed 1 to 2 feet).

The Construction Codes (of which the Building Code is a part) will be amended in yet other ways, including additional changes that will help protect building systems and enable continued building operation in the event of utility failures during a flooding event. For example, new and substantially improved buildings in the 100-year floodplain will be required to install backflow preventers for sewer

connections, to seal points of entry further from floodwaters, and will be required to safeguard toxic materials.

The Construction Codes also will be amended to reduce restrictions on the length of cables that carry telecommunications service, allowing these cables to reach elevations above the DFE.

In addition, the City will revise existing provisions that restrict options for elevating critical equipment. For example, to encourage building owners to protect fuel tanks from flood damage, the current limits on the size of fuel tanks located above grade will be revised to allow for more flexibility. Also, DOB will issue a clarification on how mechanical equipment rooms contribute to floor area in a building.

In 2013, the City, through OLTPS, will seek to implement the foregoing changes to the Construction Codes. Also in 2013, DCP will continue to take the foregoing zoning changes through the public review process, with the goal of adoption before the end of the year. By 2015, DCP also will launch an analysis of the implications of allowing up to 3 feet of freeboard above the BFE, pending the scheduled release of the final FIRMs.

Initiative 2

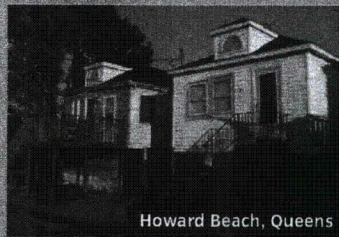
Rebuild and repair housing units destroyed and substantially damaged by Sandy

Roughly 23,000 private residential buildings encompassing nearly 70,000 housing units sustained some level of damage during Sandy. More than 2,000 of these buildings were significantly damaged and must be completely rebuilt or substantially improved, incorporating the highest resiliency standards. To address the damages sustained and to more effectively prepare these significantly damaged buildings for future storm events, the City either will assist owners or, in limited cases meeting City criteria, will facilitate the acquisition of properties by new owners whom it will assist, in rebuilding and substantially improving these properties based on the best floodplain data available over time. Additionally, the City will seek to incorporate resiliency measures into approximately 500 to 600 multi-family properties that sustained minor damage, including those developed under the City's Mitchell Lama Program and other affordable housing programs.

The Mayor's Office of Housing Recovery Operations (HRO) and HPD will lead these efforts. Federal Community Development Block Grant (CDBG) funding in the amount of approximately \$530 million has been allocated to the first phase of these programs. HRO and HPD plan to

Urban Site Conditions and Flood Protection Challenges

As described previously, site conditions in New York City make it both physically and financially difficult for the owners of many buildings in the 100-year floodplain to retrofit their buildings to current Federal flood-resistant construction standards. These challenges come into sharp focus when common building types in neighborhoods across New York City are examined.



Howard Beach, Queens

1- AND 2- FAMILY HOMES ON NARROW LOTS

Narrow lots lack space needed to stage construction when elevating a building.



Bayside, Queens

ATTACHED AND SEMI-ATTACHED HOMES

Reconfiguration of one building affects adjoining ones, and, with multi-story buildings, elevation requires removing floors and front and rear facades, in effect demolishing and rebuilding.



Sheepshead Bay, Brooklyn

MULTI-STORY BUILDINGS

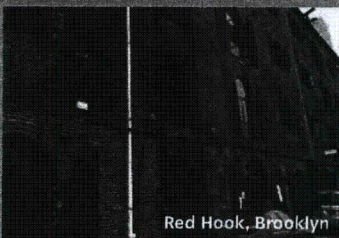
These buildings would, under current Federal flood-resistant construction standards, either have to eliminate all ground-floor and basement units, displacing families and forfeiting rental income, or elevate, which is highly impractical.



South Street Seaport, Manhattan

BUILDINGS WITH COMMERCIAL GROUND FLOORS

Commercial spaces thrive on ground-floor access. Raising the lowest floor to higher base flood elevations hampers commerce and complicates accessibility.



Red Hook, Brooklyn

INDUSTRIAL BUILDINGS

Though Federal flood-resistant construction standards allow dry flood-proofing of industrial spaces, this approach is costly and less reliable for flood levels higher than 3 feet.

Credit from top to bottom: Tim F via Flickr, Wikimedia, mercurialn via Flickr, Gryffindor via Wikimedia, Adam Elmquist via Panoramio

use a portion of these funds to repair and rebuild a subset of properties that were damaged significantly and, therefore, must be rebuilt or substantially improved.

Initiative 3

Study and implement zoning changes to encourage retrofits of existing buildings and construction of new resilient buildings in the 100-year floodplain

The City, through DCP, will undertake a series of citywide and neighborhood-specific land use studies to address key planning issues in severely affected and vulnerable communities. As part of these studies, the City will identify ways to facilitate the voluntary construction of new, more resilient building stock and to encourage voluntary retrofits of existing vulnerable buildings over time. To be undertaken in close consultation with local residents, elected officials, and other community stakeholders, these land use studies will focus in particular on the challenges posed by the combination of flood exposure of the applicable neighborhoods, the vulnerability of the building types that are found in these neighborhoods (e.g., older, 1-story bungalows) and site conditions in these areas, such as the narrow lots in Midland Beach that can make replacement or retrofit of vulnerable buildings expensive or complicated.

Both citywide zoning changes and detailed neighborhood studies will promote the voluntary development of new, resilient buildings through strategies such as:

- allowing more flexibility in the measurement of height of elevated buildings and allowing parking to be placed underneath, provided steps such as landscaping are taken to address the quality of the streetscape; and
- enabling or even encouraging construction of new buildings that meet modern standards on existing small lots, either individually or in combination with other lots to be rebuilt.

Zoning changes to encourage the voluntary retrofit of existing buildings could include:

- permitting building owners to construct an additional floor above existing top floors to replace space below the DFE that is limited in use to meet flood protection standards;
- promoting best practices for the alternative use of ground floor space below the DFE, where Federal flood-resistant construction standards do not permit residential uses and may not permit commercial or other uses;
- increasing the building space allowed for mechanical systems, enabling property owners to more easily elevate building systems; and
- permitting greater flexibility in the design of stairs, ramps, and other accessibility features

where elevation is required for flood-protection purposes.

DCP's proposed Flood Resilience text amendment addresses some of these issues on a citywide basis. Subject to available funding, the goal is for DCP to commence additional studies in 2013. Thereafter, DCP would move to implement any changes deemed to be appropriate based on the results of its study.

To supplement these studies as well as post-Sandy housing recovery efforts more broadly, DCP also has worked with representatives of the local design community to develop a set of urban design principles to consider while designing flood-resilient buildings. These principles—included in DCP's *Designing for Flood Risk* study to be released in June 2013—can help mitigate the negative impacts of building elevation on streetscape, building access, ground floor activity, architectural quality, and neighborhood character. (See sidebar: *Designing for Flood Risk: Urban Design Principles*)

Initiative 4

Launch a competition to encourage development of new, cost-effective housing types to replace vulnerable stock

Many property owners are facing the reality that their homes are not only vulnerable to risks such as coastal flooding, but shortly they also may be facing substantial increases in their insurance premiums. In some cases, elevation of existing structures may be possible; in other cases, however, such elevation may be difficult or even impossible.

Subject to available funding, the City, through HPD, will launch an international competition called the Resilient Housing Design Competition. This competition will award prizes to private sector developers who design and develop new, high-quality housing prototypes that offer owners of vulnerable building types (e.g., older, 1-story bungalows) a cost-effective path that is consistent with City building and zoning requirements to replacing these structures. The winners of this competition will be given the opportunity to place these structures into service in connection with a City-sponsored development project. Prototypes will have applicability throughout the five boroughs. The goal is for HPD to launch this competition in 2013. Phase 1 of the competition will be an open international call for the creation of these prototypes, with a focus, in particular, on prototypes that address site conditions that are particularly challenging. Up to 10 winners will be selected for total cash prizes of up to \$2 million, awarded by a panel of judges, which, among other considerations,

will evaluate the likelihood that the prototypes actually will be deployed by New York City property owners.

Initiative 5

Work with New York State to identify eligible communities for the New York Smart Home Buyout Program

In February 2013, New York State announced a program pursuant to which the State would purchase highly vulnerable properties, tear down existing structures, and convert such properties into permanent open space. The City—through multiple agencies and departments including HRO, HPD, DCP, the Department of Environment Protection (DEP), and the Department of Parks & Recreation (DPR)—will evaluate opportunities for collaboration with the State in connection with this program based on an objective set of criteria developed by the City, including extreme vulnerability, consensus among a critical mass of contiguous local residents, and other relevant factors. It is anticipated that the eligibility criteria will be met in a relatively limited number of New York City areas. Funds allocated for this program statewide include \$171 million in CDBG funding from New York State, together with other State sources.

Initiative 6

Amend the Building Code and complete studies to improve wind resiliency for new and substantially improved buildings

In recent memory, New York City has not been struck by a regional wind event. However, though current Building Code requirements are calibrated to withstand a Category 3 hurricane, as the climate changes, the frequency of extreme wind events is likely to increase.

To address this uncertainty and improve the City's approach to protecting buildings from wind risks, the City will take the precautionary measure of amending the Building Code to clarify current wind-resistance specifications for façade elements and will restrict the use of pea gravel and small dimension stone as ballast on roofs. The City, through OLTPS, will implement these Building Code changes in 2013. Subject to available funding, DOB also will initiate a study to help the City more accurately map the wind profiles facing New York City's buildings across all five boroughs, identifying sites that face the greatest risk. The goal is to commence this study in 2013, with completion expected in 2015.

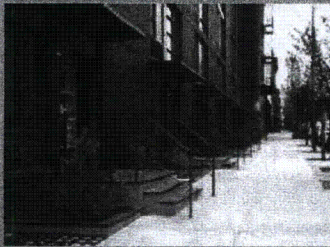
Designing for Flood Risk: Urban Design Principles

FEMA and Building Code standards for flood-resistant construction require new or substantially improved buildings in flood zones to be flood-proofed or elevated above projected flood levels. However, elevating buildings more than a few feet above the sidewalk can have negative effects on streetscape, building access, public safety, ground floor activity, architectural quality, and neighborhood character. DCP has worked with representatives of the local design community to develop a set of urban design principles to guide the design of flood-resilient buildings.



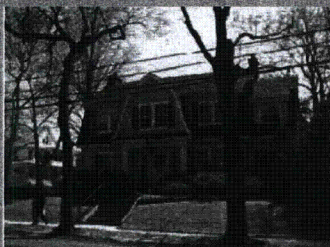
VISUAL CONNECTIVITY

Having the windows and front door of a building face the public street can create a sense of security and comfort for pedestrians. These architectural elements also provide visual interest, which in turn promotes a walkable neighborhood. Elevating the first floor of a building can limit this visual connectivity. In residential neighborhoods, porches, stoops, and generous access elements can be designed in order to help to mitigate this disconnection. On commercial streets, this visual connectivity is important to the viability of local retail. A common best practice would be to dry flood-proof the commercial space so that it can be closer to sidewalk level and therefore maximize visual and physical connectivity.



FACADE ARTICULATION

Buildings often contribute to the character of a place by offering human-scale architectural elements, particularly on first floors. Elevated buildings with crawl spaces, parking, or storage can create blank walls at grade. Setting a building back from the property line slightly and using landscaping and/or other creative design solutions could help to buffer these voids in an active streetscape. If ground-level parking is the only feasible option, then garage doors and curb cuts should be designed to minimize their impact on the pedestrian realm.



INVITING ACCESS

Elevated buildings pose challenges for accessibility. Ramps can be difficult to accommodate, particularly on smaller lots. Even smaller buildings that are not required to meet Americans with Disabilities Act (ADA) standards have the challenge of integrating longer runs of stairs into building or landscape design. Introducing a 90-degree turn or landing, and paying careful attention to overall stair design could make a long run of stairs easier to climb and appear more inviting for pedestrians.



NEIGHBORHOOD CHARACTER

Some neighborhoods exhibit a relative uniformity of building form. Elevating buildings will necessarily produce variations in building height and, in some cases, placement on the lot. Designers should respect a neighborhood's character by taking cues from existing context in building massing, fenestration, rooflines, and other architectural elements.

Adapting to higher standards of flood resistance is both a challenge and an opportunity for architects to achieve higher standards of design. The opportunity exists to innovate and produce buildings that contribute to the public realm and have a positive long-term effect on those neighborhoods recovering from Sandy.

Source: DCP

Strategy: Retrofit as many buildings as possible so that they will be significantly more resilient than they are today

Initiative 7

Encourage existing buildings in the 100-year floodplain to adopt flood resiliency measures through an incentive program and targeted requirements

The City will propose a program that will encourage and, in some limited cases, require property owners to adopt targeted flood protection measures that are tailored to New York's dense urban environment and that will offer meaningfully greater protection than the status quo.

This program consists of two elements:

- an incentive program, which will fund a portion of eligible flood-protection costs for existing building stock, subject to available funding; and
- a requirement for large buildings—those with 7 or more stories that are more than 300,000 square feet in size—to undertake flood-protection measures by 2030.

Incentive Program

With the goal of ensuring that the vast majority of the built square footage currently in the 100-year floodplain is significantly better protected from flood risk going forward than prior to Sandy, the City will create, subject to available funds, a \$1.2 billion program that will offer grants or, where appropriate, loans to building owners to help fund a percentage of the eligible costs of completing all or some of the Core Flood Resiliency Measures (as defined below).

The actual percentage of costs covered by this program will be based on a sliding scale, taking into account the uses of the applicable building (as defined by Department of Finance (DOF) tax class), the applicable building's size, and building value (using assessed value as a proxy). Prior to implementation of this program, the City will publish for public comment a proposed methodology for calculating the aforementioned sliding scale. Subject to the discretion of the City in cases of great need, the City will cap awards at \$2 million per building.

Core Flood Resiliency Measures: As Sandy demonstrated, during an inundation event, damage to systems and equipment is the most common type of damage experienced by buildings. In addition to imposing costly repairs,

damage to systems and equipment also delays recovery, preventing people from reoccupying their homes and getting their businesses up and running quickly after a storm.

The Core Flood Resiliency Measures will therefore include elevation or other flood protection of the following critical building equipment and utilities: fire protection equipment (including alarms and pumps); electrical equipment (including panels, switch gear, and transformers); heating, ventilation, and air conditioning (HVAC) equipment (including boilers, furnaces, and burners); plumbing equipment (including domestic water equipment and sump pump power feeds); telecommunications equipment; elevator equipment; and emergency generators and associated fuel tanks and pumps (subject to the approval of the Code amendments described above). (See graphic: *Flood Protection of Building Systems*)

Elevation or flood-proofing of this equipment will be required to meet the standard of the higher of the BFE, as set forth in the PWMs, or the FIRMs in effect as of the writing of this report, in each case, plus 1 to 2 feet of freeboard (as applicable). Upon adoption of the new FIRMs, elevation will be required to meet the standard of the BFE, as set forth in the new FIRMs, plus 1 to 2 feet of freeboard (as applicable).

For owners of 1- to 2-story buildings of a combustible type—those buildings most at risk of severe structural damage during a flood—Core Flood Resiliency Measures also will include structural reinforcement to prevent collapse in the event of inundation, including:

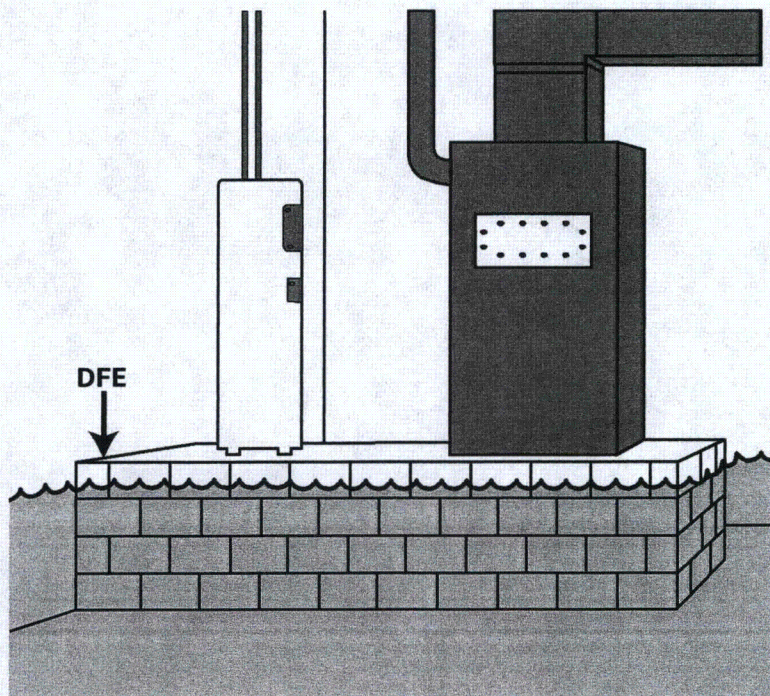
- upgrades to the foundation;
- reinforcement of exterior walls; and
- wet flood-proofing (see above).

These measures do not suggest that inhabitants should remain in their buildings during a flood or storm surge event. Regardless of the interventions completed, all residents and businesses should, of course, comply with any City evacuation orders to promote their safety. However, the goal is for the retrofits proposed above to allow residents and businesses to recover more quickly after a storm, once reentry is deemed to be safe.

Disbursement of Funds: For the first one to two years of the program, funds will be allocated to specific categories of uses to enable an equitable distribution of such funds across building types and geographies. Categories for which funds will be set aside during this one to two year period will be the following:

- \$100 million reserved for 1- to 3-family homes (DOF tax class 1);

Flood Protection of Building Systems



Example of a building hot water heater and furnace elevated above the minimum flood protection level via a platform.

- \$500 million to be divided among the boroughs based on their share of buildings in the 100-year floodplain; and
- \$100 million reserved for affordable housing projects (i.e., projects where at least 50 percent of units have income restrictions pursuant to a regulatory agreement, or projects otherwise designated as “affordable” by the HPD Commissioner).

At the end of the initial one to two year period of the program, any reserved funds that remain unused will be made available to all eligible applicants.

The Core Flood Resiliency Measures incorporate lessons learned from FEMA’s work in assessing the damage from Sandy, as well as guidance from FEMA’s extensive experience with building mitigation. Yet existing NFIP rules do not offer insurance rate reductions for buildings that become materially less vulnerable with these retrofits. To address this challenge, the City will continue to work with FEMA to develop a system of mitigation premium credits that reduce the cost of insurance for property owners who invest in these and other alternative approaches (see Chapter 5).

New York City Economic Development Corporation (NYCEDC) and HPD will administer this program beginning in 2013. The City will pursue CDBG funds as well as Federal Hazard Mitigation Grant Program (HMGP) funding, and other new sources, for the required funding for the program (see Chapter 19, *Funding*).

Mandate for Large Buildings

In addition to the incentive program outlined above, the City also will require buildings in the 100-year floodplain that are 7 stories or taller and greater than 300,000 square feet in size to complete Core Flood Resiliency Measures by 2030, so that the City’s largest buildings are not knocked out of service by future flood events.

Given the structural stability of buildings of this size, this mandate will apply to elevation or flood-protection of building equipment and utilities as described above, but will not require structural reinforcements. This mandate will be implemented via a change to the City’s Building Code and will be administered by DOB.

This mandate will not apply to public housing developments—which are pursuing a parallel resiliency program—or hospitals, nursing homes, and adult care facilities—which will be subject to a different mandate (see Initiative 9, below, and Chapter 8, *Healthcare*). The mandate will apply to affordable, housing projects. However, because of the sometimes precarious financial position of such projects,

they will be entitled to apply for a hardship waiver from the HPD Commissioner. Buildings subject to the mandate will be eligible to apply for funds through the incentive program described above.

With respect to buildings subject to this mandate, there will be two ways to achieve compliance. One will be a more traditional compliance track, pursuant to which building owners will complete one of the following approved flood-protection strategies:

- elevation of applicable equipment and utilities at or above the applicable DFE;
- dry flood-proofing of equipment and utilities below and up to the applicable DFE; and
- dry flood-proofing of the building itself below and up to the applicable DFE.

Buildings subject to the mandate also will be offered an alternative compliance track, pursuant to which building owners will be deemed to have satisfied the mandate, provided that they have taken one of the following steps:

- put in place alternative building-based measures (for example, temporary barriers coupled with an action plan; regular drills by trained staff; and renewal certificates) that provide an equivalent level of protection to the traditional path, as certified by a structural engineer and approved by DOB; or
- achieved protection via a coastal defense system that protects the applicable building up to the applicable DFE, as certified by a structural engineer and approved by DOB.

Notwithstanding the foregoing, the alternative compliance track will not be available for the following life safety systems: emergency generators and associated fuel tanks and pumps (subject to the approval of the Code amendments described above); fire alarm system components; fire pumps (to the extent that such components are not submersible); domestic water systems (to the extent that components are not submersible); and sump pump power feed equipment.

In addition, property owners may appeal to DOB for a variance from the mandate if site constraints or other engineering factors render compliance impossible. The BSA also will be authorized to grant such variances.

The City will seek City Council approval for this mandate—through a Building Code change—by the end of 2013. When first implemented, DFEs will be as set forth in the PWMs. Upon adoption of the new FIRMs in 2015, DFEs will be as set forth therein.

Compliance with the mandate will be monitored by the City in two ways. First, by the

end of 2020, subject buildings owners will be required to submit an interim report certifying that they have complied with the mandate, or to submit an affidavit describing a plan to achieve such compliance by 2030. Any buildings that become subject to this mandate in the future as flood maps are revised will have 15 years from the date that the applicable map is adopted to comply with the mandate.

Initiative 8

Establish Community Design Centers to assist property owners in developing design solutions for reconstruction and retrofitting, and connect them to available City programs

Property owners in neighborhoods affected by Sandy, or other potentially vulnerable areas in the 100-year floodplain, are working to understand how to rebuild or retrofit their buildings to be prepared for future extreme weather. The City, through HRO, will work with local partners and advocates to establish a physical presence in affected neighborhoods across the city in so-called Community Design Centers, in which a mix of professional and volunteer design staff would be on-call to help residents with reconstruction questions. The staff of each Community Design Center will also direct property owners to City programs that facilitate building repair and resiliency. The Centers could be managed by the City with support from local partners.

Initiative 9

Retrofit public housing units damaged by Sandy and increase future resiliency

New York City Housing Authority (NYCHA) developments across the city sustained significant damage during Sandy, including damage to electrical systems in approximately 250 NYCHA buildings. To address this issue, the City will implement targeted efforts to strengthen building resiliency against future extreme weather events by designing and constructing improvements to public housing directly impacted by Sandy.

Federal CDBG funding in the amount of \$108 million has been allocated to this initiative. The first phase of this program will include the installation of permanent emergency generators or alternate measures to enhance power resiliency at NYCHA’s most vulnerable impacted buildings. In addition, a combination of payments from NFIP policies, commercial insurance policies, and FEMA’s Public Assistance Program may be available to provide funds to cover the cost of repairing damaged structures and making resiliency improvements on these damaged buildings. Subject to available funding, NYCHA will begin this

work in 2013. By September 2013, NYCHA will also begin a planning process to identify targeted resiliency measures (for example, raised boilers and electrical switch gear) to address vulnerability throughout buildings in its portfolio in the 100-year floodplain. (See sidebar: *New York City Housing Authority Resiliency Planning*)

Initiative 10

Launch a sales tax abatement program for flood resiliency in industrial buildings

Industrial properties are particularly vulnerable to flood damage, because they tend to be concentrated in coastal areas of the city. This vulnerability is heightened since many industrial businesses are located in 1- to 2-story structures and ordinarily store expensive equipment and inventory at ground level. Industrial businesses also frequently operate on thin profit margins.

Given this, the City will launch a sales tax abatement program directed at industrial businesses to help subsidize the cost of making flood resiliency improvements. The program will prioritize 1- to 2-story buildings with more than 4 feet between their actual ground elevation and the applicable BFE.

The New York City Industrial Development Agency (NYCIDA) will implement this program beginning in 2013, with total benefits pursuant to the program to be capped at \$10 million.

Initiative 11

Launch a competition to increase flood resiliency in building systems

Approximately 88,700 buildings were located in areas impacted by Sandy. The number of properties at risk of coastal flooding, meanwhile, is likely to increase through the 2020s and 2050s, as sea levels rise and the floodplain expands.

To address this challenge, the City will launch a Resiliency Technologies Competition to allocate grants on a competitive basis to improve building resiliency. The competition will seek to fund demonstration projects that use innovative technologies to make building systems more resilient. NYCEDC will launch this competition in 2013 and expects to select winners in 2014. Approximately \$40 million in Federal CDBG funding has been allocated to the competition.

Initiative 12

Clarify regulations relating to the retrofit of landmarked structures in the 100-year floodplain

A number of vulnerable structures in the city's 100-year floodplain are designated as historic landmarks. Landmarks have restrictions applicable to them that may make it challenging for the owners of those structures to undertake resiliency retrofits. Consistent with its underlying mission and legislation, the Landmarks Preservation Commission (LPC), therefore, will clarify

its regulations, with the goal of assisting owners of landmarked buildings and properties in landmarked districts in the 100-year floodplain who are contemplating retrofit projects.

Initiative 13

Amend the Building Code to improve wind resiliency for existing buildings and complete studies of potential retrofits

As indicated above, while the NPCC does not provide specific projections for wind speeds, its projections do suggest an overall increase in the frequency of the most intense storm events that have wind effects. Older buildings that predate modern standards are particularly vulnerable, especially in coastal areas with open exposures. In addition, all structures, including high-rise buildings, will continue to face potential damage to façades from airborne debris during the sorts of extreme wind events that could occur in the future.

To address these risks, in 2013, the City—through OLTPS—will amend the Building Code to expand the existing DOB Façade Inspection Safety Program for high-rise buildings to include rooftop structures and equipment. Subject to available funding, DOB also will initiate a study of potential wind resiliency retrofits and their potential costs and benefits, consulting with a committee of industry experts. The goal is to complete the study by 2016.

New York City Housing Authority Resiliency Planning

The New York City Housing Authority (NYCHA) operates 2,596 buildings in 334 developments throughout New York City. These developments are home to over 400,000 residents—approximately the size of the entire population of Miami, Florida. Residents include working families, low-income households, seniors, and other vulnerable populations. While these developments are located in all five boroughs, there are significant concentrations of public housing on the waterfront far from the urban core, as in the Rockaways in Queens, or in locations with limited public transportation, such as in Red Hook in Brooklyn.

In preparation for Sandy's arrival, therefore, NYCHA was required to take important steps to protect its residents and assets—including implementing evacuation plans in the City's evacuation zones. Despite these orders to evacuate, many NYCHA residents, like others throughout the city, chose to shelter in place.

Due to the large size and heavy construction of NYCHA buildings, the developments suffered little structural damage. However, in

many cases, building mechanical and electrical equipment in basements was inundated. A total of 402 buildings housing 80,000 residents lost power as a result of the flooding of these building systems. Though NYCHA and community-based organizations worked to address the needs of these residents, the impact of the storm damage and the difficulty repairing it demonstrated the importance of making resiliency investments going forward.

As part of the recovery and rebuilding process, therefore, NYCHA is working to strengthen its buildings portfolio and incorporate measures such as the flood-proofing of critical building systems in areas impacted by Sandy. In addition, NYCHA is analyzing options for increasing the safety of buildings not impacted by Sandy but at risk of future flooding and other extreme weather damage. Over the next few months, NYCHA will begin a planning process to identify the best methods for increasing resiliency in vulnerable NYCHA buildings across the city, a process that will engage resiliency engineering experts and elicit input from NYCHA residents.



Example of large backup HVAC equipment on street

Credit: FEMA/Ashley Andujar

Initiative 14
Amend the Construction Codes and develop best practices to protect against utility service interruptions

Disruptions to building services—due either to the failure of in-building systems or of the utility networks on which they rely—can render a building unusable during a range of climate events, such as storms and heat waves. To begin to address these risks, the City—through OLTPS—will develop a list of relevant best practices and, in certain cases outlined below, will amend existing regulations.

The first step that the City will take will be to require, by 2014, common access to potable water in high-rise multi-family buildings during emergency situations. This will be done to help upper-floor residents who may lose access to such water in their units in the event of the failure of building electric pumps. The City also will develop requirements, beginning in 2013, to enable exit lighting to continue to function during an extended blackout.

Additionally, by 2013, the City will develop best practices relating to voluntary backup power generation and, will amend relevant codes to allow buildings to comply with these best practices. Proposed code changes will allow for reliable, safe, and resilient alternative fuel sources and cogeneration systems for emergency power, as well as building-mounted solar power. New guidelines for “quick-connect utility hook-ups” also will be promulgated, facilitating the rapid restoration of electricity and heat during utility outages.

The City will further develop, by 2014, best practices for emergency planning relating to longer-term survivability and will create model “building emergency plans” available to building owners. Among other provisions, the model plans will encourage large commercial buildings to pre-negotiate disaster recovery agreements with service providers and will encourage multi-family residential buildings to provide clear communication protocols for essential personnel.

The City also will study, by 2015, strategies to limit heating and cooling losses through building exterior walls, windows, and roofs. The purpose of this study will be to determine how to extend the length of time during which homes and businesses can continue to operate after the loss of electrical power.

Community and Economic Recovery



Business recovery efforts in Red Hook, Brooklyn

Credit: Michael Fleshman

Over 23,000 businesses and nonprofits employing 245,000 people were located in areas flooded by Sandy. Nearly 95 percent of these impacted enterprises were small- and medium-sized (employing 50 or fewer people), with many concentrated in the retail and service sectors. However, a number of very large enterprises also were impacted by Sandy's storm surge, including major corporations in Lower Manhattan; healthcare institutions on Hospital Row and spread throughout the Rockaways and Coney Island; and manufacturers across a wide swath of Brooklyn, Queens, and Staten Island. Meanwhile, outside of Sandy's inundation area,

tens of thousands of additional businesses and nonprofit institutions, employing many thousands more New Yorkers, were impacted indirectly by Sandy, losing heat and power for, in some cases days unable to access customers and employees due to transportation outages.

With local retailers, institutions, and service providers temporarily inaccessible or offline, the immediate aftermath of Sandy reinforced the importance of having community services and facilities in times of crisis. It also demonstrated the critical role that local commercial corridors play throughout the city as centers of employment and economic activity.

Overall, impacted businesses and nonprofits—whether large, small, or in-between—faced extensive damage to inventory and equipment, damage to the interiors of their spaces, and/or structural damage to their buildings. In fact, according to estimates released by the Mayor's Office, the direct private losses in New York City due to Sandy totaled approximately \$8.6 billion, of which up to \$4.8 billion were uninsured.

A significant percentage (70 percent) of the businesses and nonprofits that were most seriously impacted were concentrated in five distinct areas of the city. These areas were: the Brooklyn-Queens Waterfront, the East and South Shores of Staten Island, South Queens, Southern Brooklyn, and Southern Manhattan. In recognition of this disproportionate impact, on December 5, 2012, Mayor Bloomberg announced the creation of new Business Recovery Zones (BRZs) to align the City's recovery efforts to the specific needs of these most impacted areas. Each BRZ was assigned a point person to identify and begin to develop solutions to the issues facing these areas. BRZ leaders conducted outreach events, worked with more than 1,000 businesses to connect them to government resources, and ensured that basic services—such as grocery stores—were restored quickly.

In addition to forming and staffing the BRZs, the City also quickly undertook a number of other activities to assist businesses in the immediate aftermath of Sandy, including:

- Coordinating efforts between the Department of Small Business Services' (SBS) Business Outreach Emergency Response Unit and the Office of Emergency Management to help address time-sensitive business and nonprofit issues, including power restoration and large debris removal;
- Launching nine NYC Restoration Centers;
- Tasking NYC Business Solution Centers to provide local services to businesses, nonprofits, and residents;
- Launching a loan and matching grant fund for impacted businesses and nonprofits, capitalized with over \$25 million, in partnership with Goldman Sachs, the New York Bankers Association, the Mayor's

Fund to Advance New York City, and the Partnership for New York City;

- Structuring, through the New York City Industrial Development Agency, a sales tax waiver program to reduce the cost of reconstruction with \$25 million in total capacity;
- Working with New York State to administer National Emergency Grant funds, which the City used to hire more than 1,100 individuals to help with recovery and cleanup in parks and public housing;
- Launching a \$1 million Small Business Assistance Grant in partnership with Barclays, Citi, and UBS for businesses that had reopened but needed help with repairs;
- Establishing the NYC Restoration Business Acceleration Team to coordinate City services, such as permitting and inspections, in order to expedite business and nonprofit reopenings; and
- Launching the Support NYC Small Business campaign to spotlight open businesses and their recovery stories through radio, subway, bus shelter, and print advertisements, as well as an interactive website that, as of the writing of this report, has been viewed more than 20,000 times.

In total, these programs—launched almost entirely with City resources while Congress debated the scale of Sandy-related supplemental appropriations—are believed, as of the date of this report, to have assisted more than 2,500 companies, employing over 6,800 New Yorkers in all five boroughs.

Building on the positive momentum generated by the aforementioned programs, the City's Partial Action Plan, which outlines the uses of the City's initial \$1.8 billion allocation of Federal disaster recovery funding under the Community Development Block Grant (CDBG) program, proposed the dedication of \$300 million of this funding, including planning and administrative costs, to targeted business, nonprofit, and community recovery programs. The plan was approved on May 10, 2013 by the US Department of Housing and Urban Development.

Using these and other resources in order to support recovery in the impacted areas, the City will pursue a five-borough community and economic recovery plan to help build grassroots capacity and foster community leadership; to help businesses and nonprofits impacted by Sandy to recover; to help businesses and nonprofits in vulnerable locations to make resiliency investments that will prepare them better for future extreme weather; and to bring new economic activity to neighborhoods recovering from the impacts of Sandy to enable these neighborhoods to come back even stronger than they were before.

HireNYC

There is the opportunity to use Sandy rebuilding efforts to put people in devastated communities back to work. This is especially important in hard-hit areas that had high rates of unemployment prior to the storm. The City is dedicated to taking advantage of this opportunity and will use its HireNYC and Workforce One Career Centers to do so. Immediately after Sandy, the City's Workforce One Career Centers helped to locate more than 1,000 workers to help with cleanup efforts in impacted communities.

HireNYC is a free program that connects low-income individuals to economic development projects sponsored by the City, taking advantage of the City's workforce development services. Among other things, the program provides free applicant screening services to project developers. This program, along with the City's Workforce One Centers (including a new center to be opened in Far Rockaway), will help to ensure that vulnerable populations in impacted communities are positioned to take advantage of post-Sandy rebuilding efforts.

We're Back.
Sweets are now repaired.

DUMBO was hit hard by Superstorm Sandy. At the height of the storm surge, there was 4 feet of water in One Girl Cookies. Flood waters carried away containers of cakes and cupcakes. The walls and all of their equipment needed either replacement or repair. With the help of others in the neighborhood and local donations, One Girl Cookies is up and running again for the holidays.

One Girl Cookies, DUMBO

Support NYC Small Business

Show your support for businesses that have reopened after Superstorm Sandy by patronizing their establishments. Find them by visiting nyc.gov and searching "Support NYC Small Business."

NYC
Michael R. Bloomberg
Mayor
Small Business Services

Proud supporter of NYC Small Business

MasterCard

Like us on Facebook

Log into Facebook and search: Support NYC Small Business

Local advertising supporting businesses recovering from Sandy

Launch Business Recovery and Resiliency Programs

During Sandy, over 23,000 businesses citywide were inundated by the storm. For many, recovery has been challenging. To assist with this recovery, immediately after the storm, the City launched the series of programs previously described, including a \$25 million loan and grant program and a \$25 million sales tax waiver program designed to help businesses get back on their feet. Building on the momentum of these programs, which have assisted more than 2,500 businesses as of the writing of this report, the City, through New York City Economic Development Corporation (NYCEDC), will launch the CDBG-funded Business Resiliency Investment Program of up to \$100 million, including planning and administrative costs, to help vulnerable businesses throughout the city make resiliency investments in their buildings and equipment and the Business Loan and Grant Program of up to \$80 million, to assist businesses with recovery and rebuilding efforts.

Launch the Neighborhood Game Changer Competition

In many of the communities impacted by Sandy, lack of opportunities for economic advancement among significant impacted populations has hampered recovery. In many cases, this situation existed even before Sandy but has been exacerbated by the impacts of the storm. To address this, the City, through NYCEDC, will launch the CDBG-funded Neighborhood Game Changer program to invest up to \$20 million in public money,

including planning and administrative costs, in each of the five communities on which this report focuses. This funding will be available on a competitive basis to help finance transformational projects. Such projects could include those that:

- Bring transformative uses to an area's waterfront and beaches;
- Establish new anchor institutions, businesses, and critical services on commercial corridors;
- Improve transportation access and tourism infrastructure; and
- Attract new uses to and result in improved resiliency of public facilities.

To win the competition, projects will have to spur incremental economic activity and match public funding with significant private funding. This program will be administered by NYCEDC through a competitive Request for Proposals (RFP) process in 2013.

Launch Neighborhood Retail Recovery Program

The cores of many Sandy-impacted neighborhoods are the local commercial corridors that provide employment opportunities and services to those who live and work around them. They include local retailers, institutions, and service providers—including food markets, pharmacies, social service organizations, laundromats, and others. In many cases, though, these corridors were devastated by the storm. To address this, the City will call on the Public Service Commission (PSC) and Con Edison to amend the preferential Business Incentive Rate (BIR) program, which offers a

discount on Con Edison's electric delivery charges, and will call on the Long Island Power Authority (LIPA) to create such a program in the Rockaways, to allow it to be extended to impacted small businesses in the five communities on which this report focuses. Businesses and nonprofits with 10 or fewer employees that have received support from City-sponsored loan and grant programs will be eligible for the discount for five years up to a maximum discount of \$50,000 per business or nonprofit. The maximum aggregate benefit available for each impacted community area will be \$1 million, for a total benefit of \$5 million. The program will focus on key priority corridors to enable resilient recovery in the most critical portions of each neighborhood.

Support local merchants in improving and promoting local commercial corridors

As mentioned above, Sandy highlighted the important role played by local commercial corridors in many of the impacted communities. The City, through the SBS, will continue to provide financial and/or technical assistance to area business improvement districts (BIDs), merchant associations, and other groups that work to improve, market, maintain, and otherwise promote primary commercial corridors. Subject to review of applications received, SBS will prioritize allocating its resources, including its CDBG funding, to impacted commercial corridors. SBS programs, which, in addition to being funded by CDBG, also will be funded by private partners and the Mayor's Fund to Advance New York City, will seek to jump-start business activity in hard-hit areas by providing both capital and technical assistance for:

- Capacity building for existing and new BIDs, merchant associations, and chambers of commerce. Many of the key commercial corridors in the impacted areas lack organized efforts in retail corridors, and SBS will help to form these entities and give them the tools to market local businesses, hold promotional events and programming, and coordinate cleanliness and safety efforts. In addition to using upcoming allocations of CDBG funds, SBS has committed to providing seed money to create new merchant organizations for hard-hit areas in the Rockaways, and in and around the South Street Seaport.
- Retail façade and streetscape improvements that enliven the character and vibrancy of commercial corridors. Storefront improvements such as neighborhood-sensitive signage and façades, mesh security gates, and engaging awnings help to create a sense



Businesses affected by Sandy in the Rockaways

Credit: NYC Department of Small Business Services

of place and attract residents and visitors. Those areas most impacted by Sandy have the opportunity to recreate their commercial centers to reflect their neighborhood's character positively. By making these and other streetscape improvements—such as upgrading light poles, benches, and tree and flower beds—the City will work with local businesses and nonprofits to make these commercial corridors destinations again.

- Marketing and business attraction activities to advertise commercial districts and the neighborhoods they serve. Local events that attract people to commercial districts help enliven these districts, which can be critical after a disaster. Marketing materials such as brochures or promotional maps, meanwhile, can complement these efforts, serving as a way for retail businesses to advertise that they remain open for business. The City, therefore, will support efforts such as these in Sandy-impacted commercial districts.

Initiative 5

Continue to support the FRESH program to increase the number of full-line grocers in underserved neighborhoods

Even before Sandy, the residents of many communities impacted by Sandy lacked adequate access to fresh fruits and vegetables and other healthy food options. Noting this challenge, especially in underprivileged areas of the city, in 2009, the City launched the FRESH (Food Retail Expansion to Support Health) program, a series of zoning and financial incentives available to supermarkets that fill this gap in neighborhoods underserved by grocery retail. To promote the recovery of commercial corridors in these areas, the City will continue to support the FRESH program, with a particular focus on Sandy-impacted neighborhoods.

Initiative 6

Reassess commercial properties citywide to reflect post-Sandy market values

After Sandy, many commercial properties were worth less than before the storm. To reflect this fact and to help with recovery from the storm, the City has reassessed more than 88,000 properties impacted by the storm citywide. Overall, these reassessments have lowered the tax burden on Sandy-impacted properties—including both commercial and residential properties—by over \$90 million, with commercial properties in neighborhoods impacted by Sandy receiving a reduction, on average, of approximately 10 percent of their pre-storm assessed values. The City, through the Department of Finance, will continue making these reassessments.

Minority and Women-owned Business Enterprises



Sandy was a challenging event for businesses throughout New York City. As recovery continues across the five boroughs, the City likely will tap private sector expertise, ranging from professional services firms to construction contractors and sub-contractors. Where it does so, the City has the opportunity not just to rebuild devastated communities, but to do so in a way that helps traditionally disadvantaged businesses, including Minority and Women-owned Business Enterprises (MWBEs).

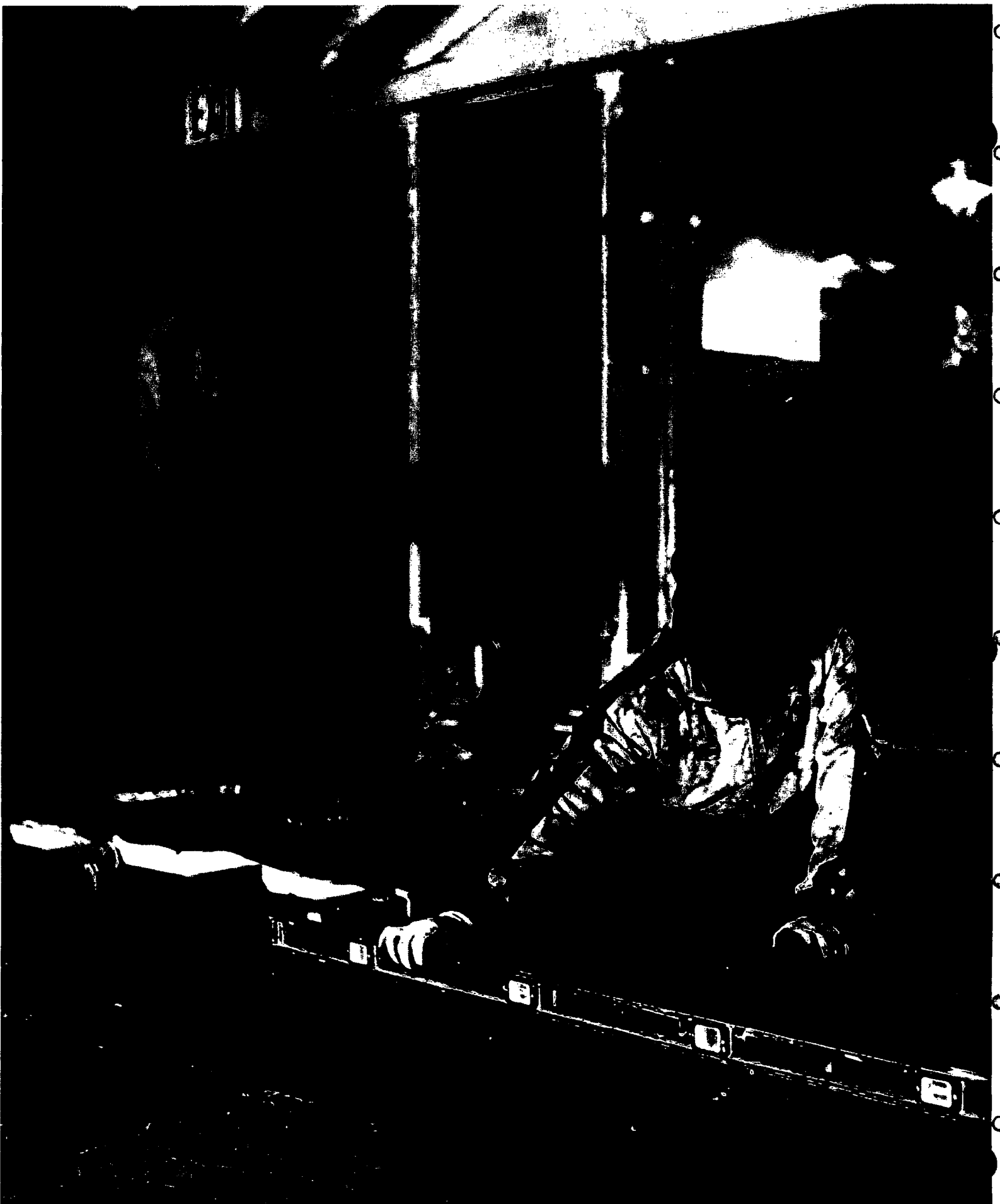
The City's passage of Local Law 129 in 2005 sought to connect certified MWBEs with opportunities to sell their products and services to agencies on contracts under \$1 million. Certified businesses obtained greater access to, and information about, contracting opportunities through classes, networking events, and targeted solicitations. They also received technical assistance to compete for those contracts more effectively and benefited from inclusion in the City's Online Directory of Certified Businesses. Local Law 129, set goals for City agencies to meet for MWBE participation on program-eligible contracts.

In the years since the passage of Local Law 129, the number of MWBEs certified to do business with the City has grown from 700 to more than 3,500, with firms receiving more than \$3 billion in City contracts. In fiscal year 2012 alone, MWBEs won almost \$530 million worth of City prime contracts and sub-contracts.

Building on this success, in February 2012, the City launched Compete to Win, five initiatives to help facilitate teaming opportunities, provide technical assistance, match MWBE owners with mentors, and secure loans and surety bonds for MWBEs. These initiatives will be of particular value to MWBEs in the construction industry as they pursue Sandy-related work.

In January of 2013, building further on the City's MWBE successes, the Mayor signed into law Local Law 1, which, among other things, eliminates the \$1 million cap on contracts targeted to MWBEs, thereby increasing the overall value of program-eligible contracts from \$400 million to \$2.2 billion. Local Law 1 also increases accountability for City agencies relative to their contracting participation goals.

Since Sandy, many MWBEs have found new opportunities in connection with the recovery effort. For example, the City's Rapid Repairs program employed 10 prime contractors and approximately 185 subcontractors, including 37 MWBEs. The City will continue to use opportunities such as this throughout the post-Sandy recovery effort to promote the growth of MWBEs.



Rebuilding the Rockaways restaurant Thai Rock, Queens

Credit: Trista Sordillo

We are all moved by natural disasters. We sympathize with those who fall victim to these dreaded events, we reach out with help and donations—and we hope that such catastrophes will not touch us directly. When they do, as New Yorkers recently learned with Sandy, these events can be devastating. Insurance can help provide people and businesses with financial protection against such catastrophes. Insurance also can benefit the city as a whole, reducing the need for government disaster assistance and minimizing the impact of shocks

that otherwise could undermine the stability of communities and the local economy.

Beyond the hardships that these catastrophes inflict, there are very real economic costs. Nationally, these costs have risen dramatically in recent years. In fact, 10 of the 12 most costly hurricanes in US insurance history occurred during the past decade—with uninsured losses even greater than insured losses for many of these disasters. Several factors have contributed to these rising costs. One is the

increase in the frequency and severity of extreme weather. Another is the growth of metropolitan centers; with more Americans living close together, when a disaster strikes, it affects more people. The increased costs of natural disasters are also due to the rise in the sheer number and value of properties in vulnerable areas.

Sandy likely will become the third most expensive hurricane in United States history in terms of losses covered by insurance (after Katrina in 2005 and Andrew in 1992). The storm is estimated to have caused a total of approximately \$19 billion in insured losses covered by private insurers and between \$12 and \$15 billion in insured losses covered by the National Flood Insurance Program (NFIP), a program managed by the Federal Emergency Management Agency (FEMA). (See chart: *Hurricanes With Highest Insured Losses in US History*)

Notwithstanding the high insured losses incurred during Sandy, in fact, thousands of New Yorkers whose homes and businesses were inundated by the storm did not have adequate flood coverage—or any coverage at all. In part, this was because many New Yorkers did not know they needed a separate policy for flood insurance, or simply chose not to insure against flood risks. For other owners, the problem was that they did not know that their properties were at risk. This was attributable to the fact that the Flood Insurance Rate Maps (FIRMs) in effect when Sandy struck (i.e., the maps created by FEMA to delineate areas at risk of flooding) were outdated. They not only had not been meaningfully revised since 1983, but they also significantly understated the flood risks in New York. In fact, more than half of all buildings in areas inundated by Sandy were outside of the 100-year floodplain—the area that has 1 percent or greater chance of flooding in any given year—indicated on these maps.

In addition to highlighting the importance of flood insurance, Sandy also brought to the forefront the impact that recent reforms to the NFIP will have on New Yorkers. These reforms, enacted by the Biggert-Waters Flood Insurance Reform Act of 2012 (Biggert-Waters), require changes to the NFIP that will strengthen the financial solvency of the program, which had been \$18 billion in debt to the US Treasury prior to Sandy. These changes will phase out the program's policyholder subsidies, which, in many cases, had kept premiums well below actuarial rates. As a result, rates will be rising for many policyholders throughout New York—something that would have occurred even without Sandy.

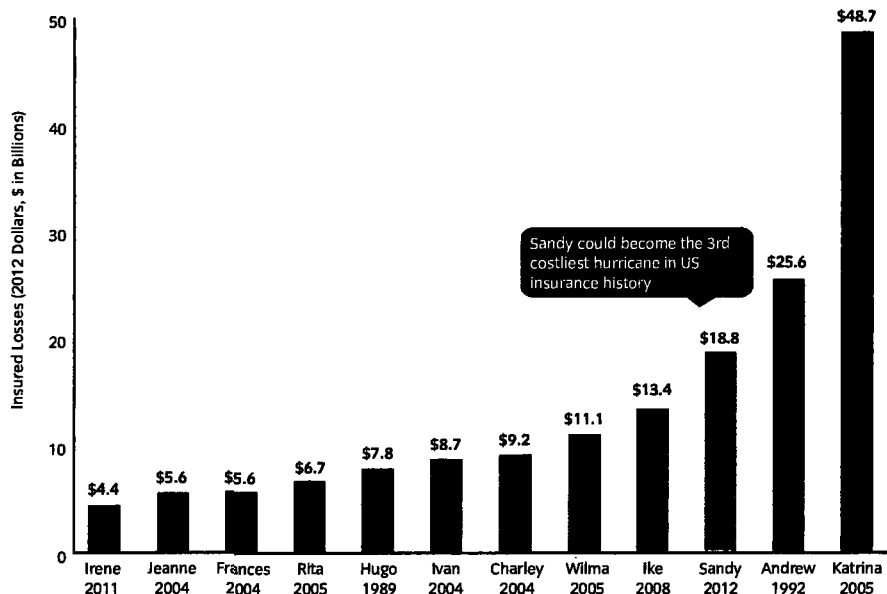
Compounding this is the fact that, after Sandy, FEMA released Preliminary Work Maps (PWMs)



Blackout in Manhattan

Credit: Dan Nguyen

Hurricanes With Highest Insured Losses in US History



Source: Insurance Information Institute

to provide more updated information on flood risk in New York City. The new maps show a significantly expanded 100-year floodplain compared with the 1983 maps, with approximately 32,000 more buildings in the floodplain (an increase of 91 percent). As these PWMs are turned into regulatory maps, it is likely that many more New Yorkers will be deemed to be exposed to flood risk, and, if they have Federally backed mortgages, they will be required to buy flood insurance—just as rates are increasing dramatically.

In keeping with the overarching goals of this report—which are to minimize loss and disruption from climate hazards and enable the city to bounce back quickly if damage is sustained—the City will propose several ways to address the insurance challenges described above. In doing so, the City will avoid falling into a common post-disaster trap: namely, calling for subsidized coverage, which may provide short-term benefits to the insured, but contributes to other adverse long-term consequences, including encouraging high-risk behavior. Instead, the City will propose a series of reforms to the NFIP that will encourage flood mitigation by, and offer commensurately lower premiums to, those who obtain flood insurance; create lower-cost flood insurance products for those who are vulnerable to flooding but are not required to obtain insurance; and advocate for the creation of premium assistance measures to help low-income New Yorkers afford flood insurance.

How the Insurance System Works

Insurance transfers risk from an individual policyholder to a larger risk-sharing pool. The insurance system is based on the principle of risk-based premiums: those with greater risk (i.e., those more likely to suffer damage and require a claims payment from an insurance provider) should pay higher premiums than those with less risk. Thus, an owner of a property in an area prone to floods and hurricanes should pay more for insurance than the owner of a property in an area with less risk. The reason insurance providers must charge risk-based rates is that these rates are necessary for providers to remain financially solvent and have sufficient resources to pay policyholder claims in the event of losses.

Because of the delicate balance that providers must strike, regulators oversee the licensing of insurance companies, monitor insurers' financial health and reporting, and review their market conduct. State governments are the primary regulators of insurance companies. In New York State, the Department of Financial Services is the primary regulatory body that oversees the

Sandy's Impacts Outside of the NFIP

Sandy is likely to have impacts on insurance coverage in New York beyond the National Flood Insurance Program (NFIP). However, those impacts are not expected to be nearly as dramatic as impacts to those who have, or soon will be required to have, policies through the NFIP. Accordingly, this chapter focuses primarily on the NFIP. The private insurance market is generally expected to remain stable for two reasons. First, while homeowners insurance rates may rise post-Sandy, rate increases in this market generally must be approved by State government insurance regulators, who work to ensure fair and reasonable pricing.

Second, in the commercial property insurance market, early analysis indicates that Sandy's impact is likely to be modest overall. A May 2013 report by the insurance brokerage firm Marsh found that rates in this market have remained relatively stable and competitive through the first quarter of 2013—even if providers were tightening some policy terms and conditions. According to early indications from Marsh, this stability generally continued through the second quarter of 2013. These observations are largely backed up by a recent study by Advisen, a global insurance data and analytics provider, which found that even though insured losses from Sandy were high, they were unlikely to lead to sharply higher premiums for a sustained period of time. According to Advisen, though it was possible that premiums would increase in the short term—especially for properties in flood-prone regions—the property-casualty insurance market remained abundantly capitalized, which likely would soften the future financial impact of Sandy over time.

Notwithstanding the foregoing, changes in the insurance market bear continued monitoring by the City. If, in the future, Sandy's impacts on this market appear to be more substantial than projected, the City should develop initiatives to address these impacts for the benefit of policyholders in the five boroughs.

insurance market, reviewing and approving rates for homeowners policies, for example. Under State law, New York City does not have the authority to regulate insurance companies.

Property insurance can provide protection for individuals and businesses against losses due to climate risks and other types of risks. Coverage generally is provided through package policies such as standard homeowners and commercial property policies, which include coverage for a variety of perils, or causes of loss, such as hailstorms, fire, and theft. However, coverage for flooding, like most other natural catastrophes, is generally excluded and must be purchased through a separate policy.

This is because catastrophic risk is different from other insured risks. First, catastrophic risk is low probability, or infrequent in occurrence. As a result, individuals and businesses generally choose not to purchase insurance for these risks. One of the reasons for this is that individuals tend to underestimate their vulnerability to catastrophic risks. In fact, while greater numbers of homeowners tend to buy catastrophic coverage such as flood insurance after a natural disaster—because of their heightened awareness of risk—many of these same homeowners later let their policies lapse if they have not made a claim. This is even true for those who are required by law to have coverage, such as those with Federally backed mortgages. Whereas lenders rigorously enforce purchase requirements for homeowners insurance, many

have been less vigilant about enforcing requirements for catastrophic risks like floods. (See sidebar: *Risk Perception and Demand for Catastrophic Insurance*)

Risk Perception and Demand for Catastrophic Insurance

Recent studies by the Wharton Risk Management and Decision Processes Center at the University of Pennsylvania find that many residents in hazard-prone areas perceive the likelihood of suffering losses from natural hazards in a given year to be so low that they do not purchase insurance or take measures to protect their homes. After experiencing severe damage—at the point when they have a heightened awareness of the consequences of a disaster—they often purchase insurance. However, many let their policies lapse a few years later if they have not made a claim on their policy.

Rather than viewing insurance as a form of protection, there is a tendency to regard it as an investment. If one pays premiums for a few years and does not make a claim, the money spent on premiums is viewed as being a bad investment. In fact, not suffering a loss should be viewed as the most desirable outcome. The best return on an insurance policy is no return at all.

Catastrophic risk is different from other risks in yet another way: its impact is correlated with a geographic area. That is, when one policyholder is affected, it usually means others are too, since natural disasters tend to affect a large number of people in close proximity. Due to the extraordinarily high losses that can occur when disasters strike, insurers require high premiums for catastrophe insurance, further dissuading potential policyholders. Consequently, premiums for a flood insurance policy can, in some cases, cost more than a homeowners policy that covers a whole range of perils.

Government-Provided Catastrophe Insurance

To promote broader catastrophe coverage at lower rates, the government often steps in to provide insurance directly. Several states that face hurricane risks, for example, have established their own catastrophe insurance programs. In most cases, these programs are designed to be “insurers of last resort”—to offer coverage to those unable to obtain policies in the private market. Many of these state-run pools are established after a disaster, as demand for coverage grows and as private coverage becomes less available or more expensive.

This was true in Florida in 1992 after Hurricane Andrew led to an unprecedented volume of claims. In response, many insurance companies raised rates sharply, canceled, or declined to renew policies, or simply withdrew from the Florida market altogether. A state-run insurer of last resort, which evolved to become Citizens Property Insurance Corporation, eventually was established to provide affordable coverage to homeowners and businesses. After years of offering subsidized rates, Citizens is now the largest property insurer in Florida, with reserves that many experts believe to be insufficient to pay claims in the event of another disaster.

The Texas Windstorm Insurance Underwriting Association, created in the 1970s, is another state program that did not collect adequate premiums to cover the actual risk of damage. After two hurricanes in 2008, it has liabilities that exceed assets by nearly \$200 million, as of the writing of this report—and its board recently considered placing the program into receivership.

As demonstrated above, government insurance programs are frequently under intense pressure to offer subsidized premiums, which often leads to financial insolvency. These subsidized programs also have created other undesirable consequences. For example, government-sponsored insurers with inadequate capital resources must, when disaster strikes, seek state backing, which diverts funds from other priorities such as education and public safety. This need to tap public coffers is common among state-run programs, which often insure properties that cannot get coverage elsewhere—since they generally are forbidden to deny coverage to high-risk properties. As a result, their overall insurance pools are comprised of policyholders with both higher risk and higher probability of loss.

These programs also have had another unfortunate consequence. Namely, by subsidizing the cost of insurance, they have, in effect, encouraged people—who do not have to bear the true costs of the risks they choose to take—to build and live in areas susceptible to natural catastrophes.

National Flood Insurance Program

Prior to the creation of the NFIP in 1968, the Federal government’s involvement in flood protection focused on making investments in structural flood-control projects, such as dams

and levees, and providing post-disaster assistance to flood victims. Eventually, in recognition of increasing flood losses and Federal disaster-relief costs, and because private insurers were unwilling to offer coverage, Congress created the NFIP.

In establishing the NFIP, Congress reasoned that the Federal government was a suitable insurance provider because it could pool risk broadly across the entire country. At the same time, Congress believed that the NFIP could be used to reduce future flood damages through state and community floodplain-management regulations, thus eventually reducing Federal spending on disaster assistance.

Today, FEMA, through its administration of the NFIP, sets insurance premiums and establishes minimum building standards on the basis of the Flood Insurance Rate Maps (FIRMs) that it produces. These maps delineate the geographic boundary of the floodplain in different regions, including the 100-year floodplain (the area with a 1 percent or greater chance of flooding in any given year) and the 500-year floodplain (the area with a 0.2 percent or greater chance of flooding each year). The FIRMs also show the height to which the floodwaters from a 100-year storm could rise, which is known as the Base Flood Elevation (BFE).

NFIP policies are available to property owners in participating communities. As a condition of participation, these communities must adopt FEMA’s flood-resistant construction requirements or more stringent local standards as part of their local building codes (see Chapter 4, *Buildings*). As a participating community, New York City incorporated FEMA’s required construction standards into its building code in 1983. Pursuant to this, new buildings in the 100-year floodplain must be built at or above the BFE in the five boroughs.

Residential policyholders can obtain coverage through the NFIP for up to \$250,000 for their homes, with separate policies for contents available for up to \$100,000. Policies for non-residential policyholders cover up to \$500,000 for buildings and up to \$500,000 for contents. In both cases, although policies cover basic electrical and mechanical equipment, such as central air conditioners, furnaces, and hot water heaters located in basements, NFIP policies generally do not cover personal property that is located in basements. (See chart: *National Flood Insurance Program Coverage Limits*)

Because of the limited coverage the NFIP provides, the program primarily attracts homeowners and some small businesses. Larger businesses, by contrast, tend to buy insurance



Flood damage in New Dorp Beach, Staten Island

Credit: John De Guzman

National Flood Insurance Program Coverage Limits

Policy Type	Maximum Coverage
Building Coverage	
Single-family dwelling	\$250,000
Two- to four-family dwelling	\$250,000
Multi-family ("Other Residential")	\$250,000
Commercial ("Non-Residential")	\$500,000
Contents Coverage	
Residential	\$100,000
Commercial	\$500,000

Source: FEMA

through the private market. These companies typically have comprehensive insurance policies that bundle together property, business interruption, liability, and other coverage into a single policy, which, in areas at risk of flooding, typically includes flood coverage.

Historically, the NFIP has offered subsidized premiums to many policyholders. For example, for properties built before the issuance of FIRMs, a subsidized "pre-FIRM" rate was originally created to encourage broader

participation in the NFIP. The program also allowed "grandfathering" provisions so that properties that were mapped into higher risk areas on subsequent flood maps were able to keep their former, subsidized rates. FEMA estimates that roughly 20 percent of all policyholders in the program pay subsidized rates today. For some properties, these rates may be only half of the actuarial rates.

Reform of the National Flood Insurance Program

While serving the important policy goals of providing flood insurance and encouraging safer construction in floodplains, the NFIP faces some of the same challenges that many other government-sponsored catastrophe insurance programs face. For example, originally intended to be self-supporting, the NFIP has required multiple infusions of tax dollars to stay afloat, in part due to the program's subsidized premiums. It also, though, has suffered from the significant cost of paying claims time and again on properties with repetitive flooding. These properties represent only 1 percent of NFIP policies but account for 25 to 30 percent of claims historically paid by the program. Unlike private insurers, however, by law, the NFIP generally has not been allowed to deny insurance to these high-risk properties, despite the significant drain on resources that they represent.

In 2012, because of the financial difficulties of the NFIP, Congress passed the Biggert-Waters Flood Insurance Reform Act, renewing the program through 2017 but requiring significant changes to it. These changes include an elimination of subsidies on new or lapsed policies and a phase-out for subsidies on other

policies. The biggest rate increases may occur in areas affected by changes in FEMA flood maps. In areas where FIRMs are not changed, rates on existing policies for second homes, businesses, and properties suffering repetitive losses will increase by 25 percent per year until they reach their full actuarial rates. For all other properties, the rate of increase will be capped at 20 percent per year. Meanwhile, in areas where new FIRMs are put in place by FEMA, subsidies will be phased out over five years. Under Biggert-Waters, penalties on banks also will be raised to increase the likelihood that they will enforce mandatory purchase requirements associated with Federally backed mortgages. (See chart: *Summary of Changes to NFIP Premiums Required by Biggert-Waters*)

Looking to the future, the impact of Biggert-Waters will be particularly severe for policyholders in New York who live in buildings constructed before the City first adopted FEMA's FIRMs in 1983 and who, therefore, were entitled to heavily subsidized premiums. Approximately 75 percent of the nearly 26,000 NFIP policies in effect during Sandy were eligible for these lower rates. Subsidies will phase out for these policyholders over five years after FEMA's new FIRMs become effective, likely in 2015. Starting in 2015, new policyholders likely will have to pay full-risk rates immediately.

What Happened During Sandy

Sandy highlighted New York City's vulnerability to flooding. However, the storm also served as a reminder of the importance of flood insurance for homeowners and businesses alike.

Summary of Changes to NFIP Premiums Required by Biggert-Waters

Date of Implementation	What Will Happen	Who is Affected
January 1, 2013	<ul style="list-style-type: none"> 25% premium increase per year until premiums reflect full-risk rates 	<ul style="list-style-type: none"> Homeowners with subsidized insurance rates on second homes or other non-primary residences
October 1, 2013	<ul style="list-style-type: none"> 25% premium increase per year until premiums reflect full-risk rates 	<ul style="list-style-type: none"> Owners of business properties with subsidized premiums Owners of properties with severe repetitive loss (cumulative NFIP claims payments exceeding the fair market value of the property)
October 1, 2013	<ul style="list-style-type: none"> Up to 20% premium increase per year 	<ul style="list-style-type: none"> All policyholders not subject to other phase-outs
Late 2014	<ul style="list-style-type: none"> 5 year phase-out of subsidies on existing policies Immediate requirement to pay full-risk rate for new or lapsed policies 	<ul style="list-style-type: none"> All policyholders affected by map changes (FEMA's revised Flood Insurance Rate Maps are expected for New York City in 2015)

Source: FEMA

While approximately 95 percent of New York City homeowners have homeowners insurance, the majority did not have separate flood policies when Sandy struck. Thousands of insured property owners thus were faced with the sobering fact that they had no coverage for the flood damage their properties sustained. In fact, the City estimates that less than 20 percent of residential buildings in areas inundated by Sandy had coverage through the NFIP. The numbers are believed to have been even lower for businesses; approximately 26,400 businesses with fewer than 50 employees were in the Sandy inundation zone in New York, but only 1,400 commercial NFIP policies were in effect when Sandy hit.

Even for property owners with NFIP policies, in many cases, those policies covered only a portion of what homeowners needed to pay for repairs. For example, for many property owners, most of their damage occurred in basements, for which NFIP policies provide only minimal coverage.

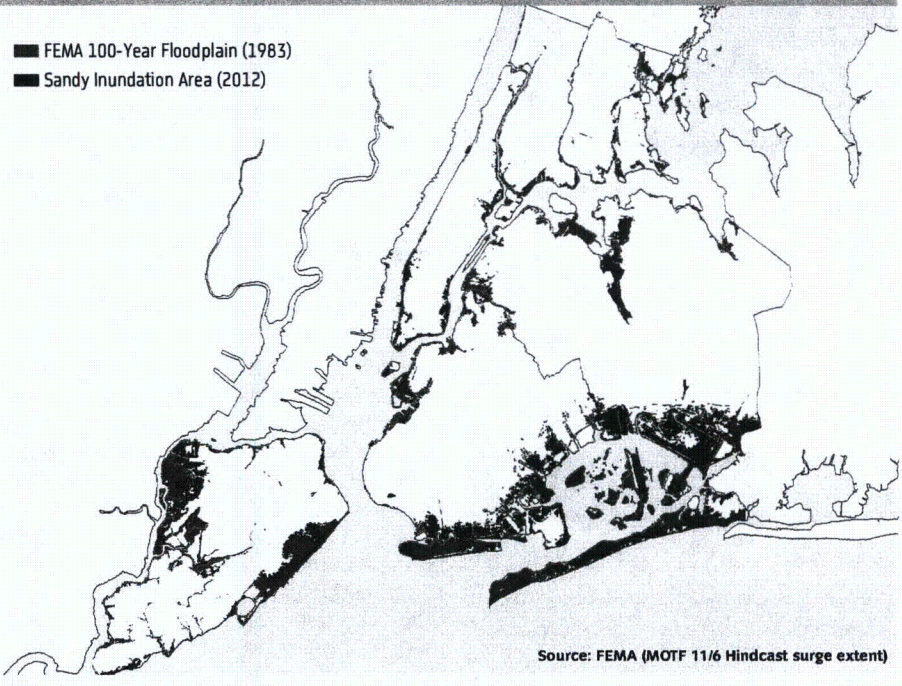
Another insurance complication for many New Yorkers post-Sandy was that they were required to hold multiple policies covering multiple risks, including general property and casualty policies, along with their NFIP policies. After the storm, claims adjusters had to determine the cause of—and thus the policy that would pay for—each policyholder's losses, a process that was frequently time-consuming.

Additionally, once claims were adjusted, policyholders did not always receive immediate payment, primarily because many policies had standard clauses directing insurers to issue payments to mortgage lenders, rather than to policyholders directly. Banks then needed to endorse checks before funds could be released to policyholders, often requiring proof that repairs had been made before doing so. Following Sandy, State regulators intervened in many cases to expedite the release of claims payments by banks to policyholders.

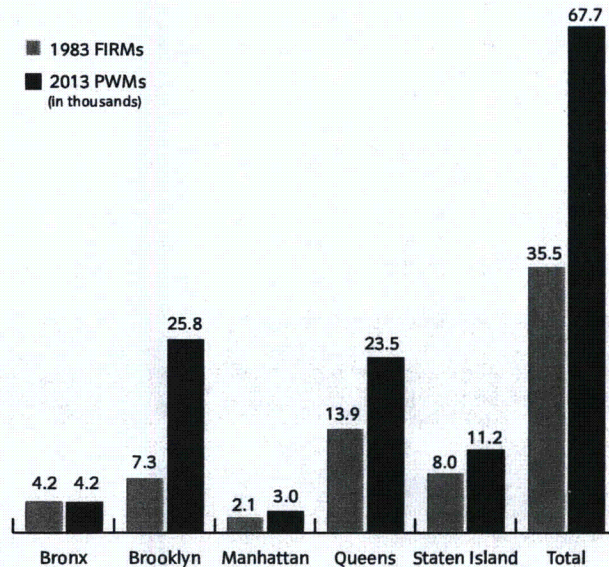
Sandy exposed other insurance-related issues in New York. For example, many businesses experienced losses from business interruption relating to power and transit outages. However, in most cases, even if they had business interruption policies, they were not covered unless they had flood insurance policies as well.

Yet another issue was that many of those who experienced flood-related losses were required to have flood insurance, but did not actually have policies. In fact, the City estimates that approximately one-third of homeowners in the 1983 floodplain who had Federally backed mortgages, and thus were supposed to have flood insurance, did not have policies in force

Comparison of 100-Year Floodplain in 1983 FIRMs and Sandy Inundation Area



Number of Buildings in the 100-Year Floodplain by Borough



when Sandy hit, reflecting a combination of lax compliance by homeowners and lax enforcement by many banks.

These figures, while daunting, may somewhat misstate the problem in New York. This is because the mandatory purchase requirement can apply differently to multifamily buildings. Generally, for condominiums and cooperatives, individual unit or apartment owners may not be required to hold a separate flood insurance policy if the building association has purchased

a policy with sufficient coverage. The required level of coverage for a building depends upon factors including the outstanding balance of the building's mortgage, the replacement value of the building, and the number of units. If the building has met the required coverage levels, individual unit owners are, in most cases, considered in compliance with the purchase requirement. Accordingly, some of the low flood insurance penetration in New York may be attributable to this aspect of the NFIP.

There are multiple reasons for the low penetration of flood insurance in New York. In some cases, New Yorkers simply chose not to buy flood insurance because, as noted earlier, people tend to underestimate the risk of low-probability events. They also typically misjudge the economic impact of suffering flood damage. When faced with a bill of approximately \$1,000 per year for a flood policy—the average NFIP premium paid on 1- to 4-family residential policies in New York City pre-Sandy—many New Yorkers ended up choosing to spend their money elsewhere.

Other policyholders, meanwhile, previously had coverage, but then allowed their insurance policies to lapse. This can happen easily, since NFIP policies, like homeowners policies, are one-year contracts. A recent study found that new NFIP policies are typically held for just two to four years, with 20 to 30 percent of policies dropped after only one year. This, again, is at least in part attributable to lax mortgage enforcement by banks, which seem to have enforced mandatory flood insurance purchase requirements at the time mortgages were issued, but then did not monitor compliance thereafter.

The final reason for New York's low penetration rate is that many impacted New Yorkers were neither aware of their risks nor required to buy flood insurance because they lived in areas outside the boundaries of the floodplain on FEMA's 1983 maps. This was true for half of all buildings and half of all residential units in areas inundated by Sandy. (See map: Comparison of 100-Year Floodplain in 1983 FIRMs and Sandy Inundation Area)

What Could Happen in the Future

After Sandy, FEMA released advisory maps to portray current flood risks more accurately. Those maps have been replaced by the recently released PWMs. These new maps do not have an immediate impact on flood insurance requirements. However, the final Flood Insurance Rate Maps, likely to go into effect in 2015, are expected to be consistent with the PWMs and will trigger insurance purchase requirements for many New Yorkers.

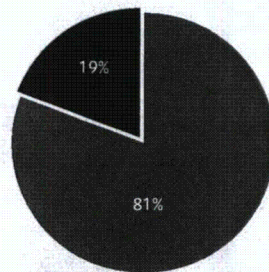
According to the PWMs, the number of buildings in New York City's 100-year floodplain is nearly double the number in the 1983 FIRMs. An estimated 85 percent of these buildings are "pre-FIRM"—i.e., constructed before November

1983—and thus pre-date the building code requirements that mandate construction at or above the Base Flood Elevation. In comparison, only 19 percent of the 5.5 million properties insured by the NFIP policies nationwide are "pre-FIRM." This contrast highlights one of the ways in which the urban character and older building stock of New York City differs dramatically from most other regions that participate in the NFIP—to the detriment of New York policyholders (see Chapter 4). (See chart: Number of Buildings in the 100-Year Floodplain by Borough; See chart: National Flood Insurance Program Coverage by Age of Buildings)

Though owners of these properties are, as of the writing of this report, still eligible to buy subsidized NFIP policies, as a result of Biggert-Waters, their rates will begin to increase. Once

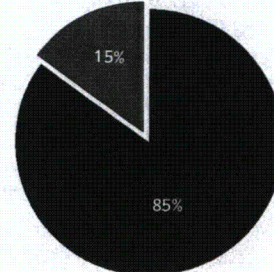
National Flood Insurance Program Coverage by Age of Buildings

United States



Total: 5.5M NFIP Policies Nationwide

New York City



Total: 67.7K Buildings in the 2013 PWMs 100-Year Floodplain

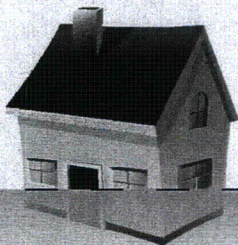
■ Built November 1983 or after ■ Built before November 1983

Source: FEMA

Insurance Premiums Under the National Flood Insurance Program

PREMIUM AT 4 FEET BELOW
BASE FLOOD ELEVATION

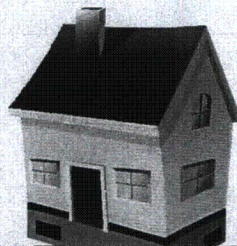
\$9,500/year



BFE

PREMIUM AT
BASE FLOOD ELEVATION

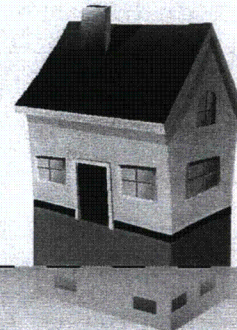
\$1,410/year



BFE

PREMIUM AT 3 FEET ABOVE
BASE FLOOD ELEVATION

\$427/year



BFE

Rates per FEMA flood insurance manual, October 1, 2012, for a \$250,000 building coverage policy (does not include contents) on a single-family structure located in a high to moderate risk zone.

Source: FEMA

the final FIRMs are in effect, all policies will be charged risk-based rates, either immediately or through a phasing-out of subsidies, which could result in a steep rise in insurance premiums on these properties.

Under the NFIP, FEMA traditionally has set risk-based rates by evaluating the distance between a property's lowest floor and the BFE. This is because a building below expected flood levels is generally assumed to be at greater risk. Rates rise steeply for buildings the farther the lowest occupied floor is below the BFE. (See graphic: *Insurance Premiums Under the National Flood Insurance Program*)

The PWMs show Base Flood Elevations throughout the five boroughs to be increasing by one to four feet in most areas, with variation from neighborhood to neighborhood. Accordingly, even many properties that comply with today's BFE will soon be one to four feet below the revised BFE. An illustration of how these changes will impact different areas can be seen in the estimated changes in the five communities on which this report focuses. (See table: *Estimated Range of Base Flood Elevation Increases: SIRR Communities*)

Looking at an individual case highlights the full impact of all of the changes relating to NFIP that New Yorkers soon will be facing. Consider the owner of a single-family home in Tottenville in Staten Island that has its lowest floor at the same level as the current Base Flood Elevation. As of the writing of this report, this homeowner would pay about \$1,400 per year for the maximum \$250,000 coverage. However, if the information in the Preliminary Work Maps, showing the BFE increasing by almost four feet for this area, carries through to the final Flood Insurance Rate Maps, then the premium on that property likely will jump to \$9,500 once the new FIRMs are in effect. The same would be true for an owner of a similar property in Breezy Point in Queens, for which the PWMs also show a four foot increase in the BFE. To put this in perspective, if the owner of the home in the Tottenville example were earning the median annual household income in this area—which, at \$80,000 is significantly higher than the median household income for New York City as a whole—once the new rates go into effect, the owner would be required to spend a staggering 12 percent of his or her household income on flood insurance.

Overall, the projected added costs in flood insurance likely will decrease the value of properties in the floodplain citywide, since prospective buyers presumably will factor future insurance costs into the price they are willing to pay for these properties. In addition, as a result of these added insurance costs,

property owners who are not required by law to carry flood insurance likely will opt out of coverage altogether.

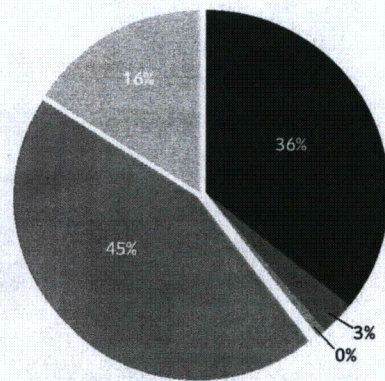
In theory, it should be possible to construct or retrofit buildings in ways that reduce the risk of damage and, in turn, to reduce the cost of insurance under the NFIP. However, in practice, the NFIP provides few incentives for property owners to protect their buildings from flood damage and reduce their premiums, other than by elevating their buildings—actually lifting

structures above the BFE. While that option may be possible for some structures—such as small wood-frame structures common in other parts of the country—it simply is not feasible in many areas of New York City, especially where much of the building stock consists of attached and semi-attached buildings and multi-story structures. Other features such as narrow lots and the use of construction materials such as masonry and concrete can also make elevation of buildings difficult (see Chapter 4). In New York, approximately 26,300 buildings in the

Estimated Range of Base Flood Elevation Increases: SIRR Communities

Community	Range of BFE Increase (in feet)
Brooklyn-Queens Waterfront	1.0-3.0
East and South Shore, Staten Island	2.0-4.0
South Queens	1.0-4.0
Southern Manhattan	1.0-3.0
Southern Brooklyn	2.0-3.0

Physical Constraints to Elevating New York City Buildings



Difficult to Elevate

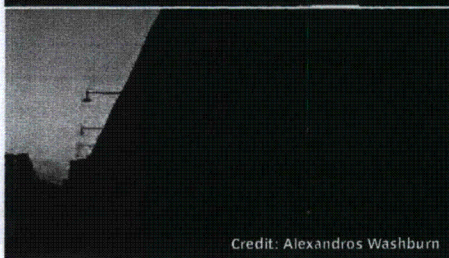
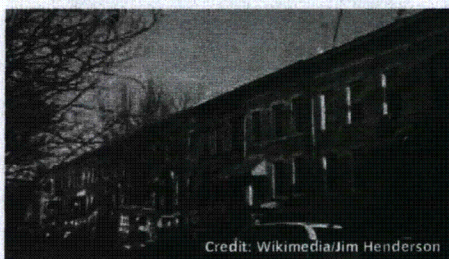
- Attached and Semi-Attached Buildings
- Detached Residential (includes Mixed-Use) Buildings on Narrow Lots (< 25 ft. wide)
- Detached Commercial/Nonprofit Buildings on Narrow Lots (< 50 ft. wide)

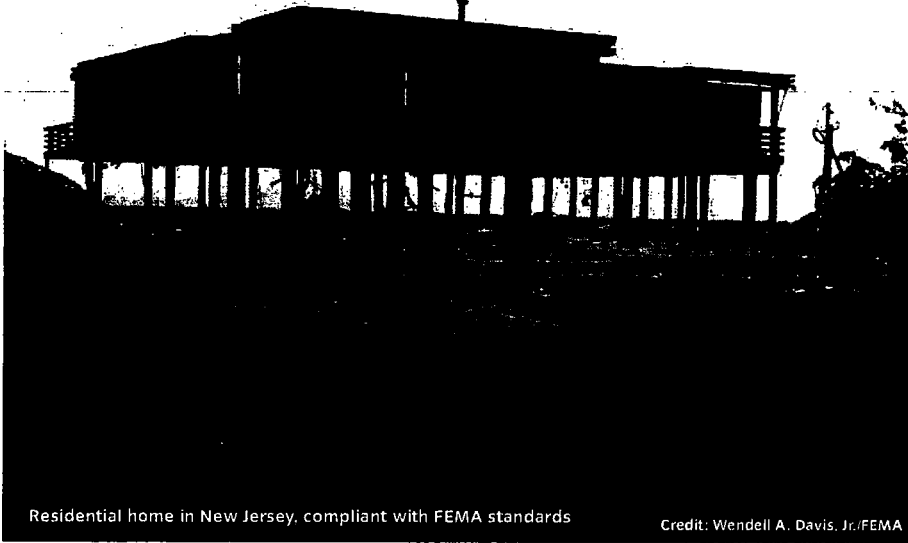
Possible to Elevate

- Buildings Without Physical Constraints

Unknown

- Data N/A





Residential home in New Jersey, compliant with FEMA standards

Credit: Wendell A. Davis, Jr./FEMA

Policy Options to Address Insurance Affordability

With premiums in some areas likely to increase significantly as a result of the Biggert-Waters Act, low-income residents may not be able to afford insurance. Two approaches to addressing this issue are described below.

One approach would be a national voucher program. This would be consistent with Biggert-Waters, which specifically authorizes a FEMA-National Academy of Sciences study of affordability that is to explore, among other approaches, a means-tested flood insurance voucher program for low-income residents currently residing in flood-prone areas. A voucher program could work as follows: A low-income homeowner would receive a voucher worth, for example, \$200. That homeowner then would be required to use this voucher to purchase flood insurance. If the homeowner's risk-based premium were \$1,000, the homeowner could use his or her voucher to pay for \$200 of this premium, resulting in out-of-pocket expenses of \$800 (\$1,000 minus \$200).

A second, complementary tool for reducing the cost of insurance is mitigation. If a homeowner invests in a mitigation measure that reduces annual expected losses by, for example, \$300, then his or her premium should, in theory, decrease by this amount, whether or not the homeowner received a voucher. The decrease in premium would be based on the expected lower claim payments from future flood damage as a result of the mitigation measure implemented. In the homeowner in the first example receives a \$200 voucher and invests in mitigation, that individual would pay a premium of \$500 (\$800 minus \$300). If the applicable house were sold, the property should command a higher price as a result of this improvement, and the new owner would benefit from a more resilient structure.

A challenge to the latter strategy of premium reduction (i.e., mitigation) is how to finance the required upfront cost of this mitigation. This could be addressed by a home-improvement loan to cover the costs of mitigation investments. In many cases, the reduction in premium resulting from mitigation investments should be greater than the costs of home improvement loans that would help pay for them. For example, returning to the aforementioned homeowner, if he or she were to obtain a home-improvement loan to cover the cost of a mitigation investment and debt service on that loan were to cost \$100, then the homeowner's net cost would be \$800 (i.e., the \$1,000 base premium, minus \$300 in premium reduction due to the mitigation investment, plus \$100 to cover the cost of the home-improvement loan).

Source: Wharton Risk Management and Decision Processes Center

newly expanded floodplain have characteristics or site conditions that would make elevation enormously challenging, or even impossible. (See chart: *Physical Constraints to Elevating New York City Buildings*)

On top of this, elevation as a mitigation strategy creates another set of problems in an urban environment such as New York that it does not present elsewhere. By eliminating ground flood uses such as retail stores, elevation disrupts the fabric of neighborhoods, impedes important economic activity, makes services less accessible to residents, and potentially takes "eyes off the streets," posing possible public safety challenges as well.

New York City faces a range of climate risks as of the writing of this report and over the next several decades. These risks are expected to have impacts on buildings, and thus have implications for insurance coverage.

According to projections from the New York City Panel on Climate Change (NPCC), described in Chapter 2 (*Climate Analysis*), sea levels are forecast to rise through the 2020s and 2050s. During this period, the 100-year floodplain will expand and BFEs could increase. The number of buildings in the 100-year floodplain is forecast to rise to 88,700 by the 2020s and 114,000 buildings by the 2050s. If property owners in the new floodplain buy flood insurance in the same proportion as property owners in the current floodplain do, nearly 45,000 buildings would be uninsured in the 2020s and 60,000 would be uninsured in the 2050s.

While other types of climate risks could affect various types of insurance coverage in New York, the impact of sea level rise and greater frequency of the most intense coastal storms are expected to have the greatest impact on NFIP rates.

This chapter contains a series of initiatives that are designed to address important issues related to insurance. In many cases, these initiatives are both ready to proceed and have identified funding sources assigned to cover their costs. With respect to these initiatives, the City intends to proceed with them as quickly as practicable, upon the receipt of identified funding.

Meanwhile, in the case of certain other initiatives described in this chapter, though these initiatives may be ready to proceed, they still do not have specific sources of funding assigned to them. In Chapter 19 (*Funding*), the City describes additional funding sources, which, if secured, would be sufficient to fund the full first phase of projects and programs described in this document over a 10-year period. The City will work aggressively on securing this funding and any necessary third-party approvals required in connection therewith (i.e., from the Federal or State governments). However, until such time as these sources are secured, the City will only proceed with those initiatives for which it has adequate funding.

Strategy: Target affordability solutions to low-income policyholders

The combined impact of Biggert-Waters and the remapping of New York City's floodplain will result in significant increases in flood insurance premiums, which many New Yorkers, especially the city's most vulnerable populations—including those with low, or on fixed, incomes—will not be able to afford. These increases will pose serious challenges to the economic stability not only of neighborhoods in New York City but also of neighborhoods nationwide.

Initiative 1

Support Federal efforts to address affordability issues related to reform of the NFIP

Biggert-Waters requires FEMA and the National Academy of Sciences (NAS) to conduct a study of methods to help individuals to be able to afford risk-based premiums under the NFIP. According to the law, FEMA and NAS are to focus this study on targeted assistance, including means-tested vouchers, rather than generally subsidized rates.

The City will support these goals actively and will urge its Federal government partners to take swift action to comply with these Biggert-Waters

provisions. The study was slated for completion within 270 days of the enactment of Biggert-Waters, but that deadline has passed. FEMA and the NAS should, therefore, initiate the study immediately for completion no later than the first half of 2014, enacting the recommendations as quickly as possible thereafter.

The City will especially support Federal action aimed at addressing affordability for the city's (and country's) most vulnerable populations, such as low-income, owner-occupied households.

If no progress is made on addressing insurance affordability for vulnerable households by the time the new FIRMs are in effect, the City will consider taking its own actions to support these households. These actions might include establishing a fund to cost-share insurance premiums or policyholders' deductibles in the event of a loss. However, the City, unlike the Federal government, does not have the capacity to take broad action on this issue, and therefore strongly urges FEMA and NAS to take the necessary steps immediately.

Strategy: Define resiliency standards for existing buildings

Sandy highlighted the limited information currently available on risk-reduction techniques short of elevation, which is impractical, financially infeasible or physically impossible for building types common in New York City and other dense urban areas. This dearth of information complicates efforts by property owners seeking to invest in mitigation.

Initiative 2

Develop FEMA-endorsed flood protection standards and certifications for existing urban buildings

The City has developed a retrofit standard, referred to as the "Core Flood Resiliency Measures" (see Chapter 4). The City proposes that these measures be rolled out citywide. These measures incorporate building mitigation options that are physically and financially feasible for a wide range of urban building types. This standard focuses on resiliency measures that protect building systems and structural integrity and was developed, in part, based on post-Sandy damage assessments by FEMA.

The City will work with FEMA to develop a national flood-protection standard for urban buildings, to complement and augment the Core Flood Resiliency Measures and to supplement FEMA's preferred elevation approach. Because

many of New York City's building types and urban site conditions can be found in other dense, urban areas throughout the country, especially in the Northeast, this work will be widely applicable across the country. To this end, the Office of Long-Term Planning and Sustainability (OLTPS) will continue discussions that are already underway with FEMA, with the goal of achieving agreement on new standards by 2014.

Initiative 3

Call on FEMA to recognize mixed-use buildings as a distinct building category

Mixed-use buildings do not, as of the writing of this report, exist as a separate building class under the NFIP; if occupancy in a given building is more than 75 percent residential, it is considered a residential building. At less than 75 percent residential occupancy, the building is considered non-residential.

Under current FEMA regulations for the NFIP, non-residential buildings located in the 100-year floodplain are permitted to certify qualifying flood-proofing designs as an alternative to elevation to, or above, the BFE. Properties with approved flood-proofing certifications pay considerably lower insurance premiums than properties below the BFE. Because of FEMA's categorization, a building with ground floor retail and no residential units below the BFE that has more than 75 percent of its floor area above the ground floor would be classified as a residential building and, therefore, would not be eligible for a flood-proofing certification.

The City will work with FEMA to create a separate mixed-use building category, allowing these structures to be eligible for flood-proofing certifications, provided they do not have residential occupancy below the applicable BFE. OLTPS will continue discussions already underway with FEMA, with the goal of achieving agreement by 2014. In the PWMs, there are approximately 2,300 mixed-use buildings in New York City that would benefit from this change.

Strategy: Incorporate resiliency standards in insurance underwriting

Consistent with the principle of risk-based premiums, measures that reduce a property's risk of damage should be reflected in a commensurate reduction in the cost of insurance; this is because investments in mitigation have many long-term benefits, including protecting lives and reducing the risk of property losses. Insurers and lenders also benefit when policyholders

invest in mitigation by reducing their potential exposure to loss. However, based on the current NFIP rating system, insurance costs can be reduced significantly when a building is elevated above the BFE, but not if other mitigation measures are taken. Alternative mitigation methods that demonstrably reduce the risk of flood damage should also be integrated into the NFIP's insurance rating system.

Initiative 4

Call on FEMA to develop mitigation credits for resiliency measures

Mitigation is critical to strengthening the resiliency of the existing built environment. As previously discussed, for many building types in New York City and urban areas nationally, structural characteristics, site conditions, and cost pose a challenge to elevation. Fortunately, other mitigation options are available. The NFIP should encourage property owners to take effective and realistic actions to reduce risks. The City, therefore, will call on FEMA to develop a system of insurance premium credits under the NFIP, to offer risk-based incentives for investing in a range of mitigation measures.

OLTPS will work with FEMA to commission a study of mitigation measures to be considered for this program. The study, to include measures developed through Initiative 2, will analyze these measures and their impact on risk, assessing these impacts for a range of building types.

Working in partnership with FEMA, OLTPS will initiate the study in 2013 and oversee this effort; the study is expected to be completed by 2014. The City will call on FEMA to review and incorporate the study's findings into the underwriting of flood insurance as soon thereafter as possible.

Initiative 5

Study approaches for New York City to join FEMA's Community Rating System program

The National Flood Insurance Program's Community Rating System (CRS) is a voluntary incentive program that encourages community floodplain management activities that exceed the minimum NFIP requirements. For communities that are admitted into the CRS program, flood insurance premiums are discounted for all policyholders in these communities by at least 5 percent to reflect the overall reduced flood risk profile.

The City will evaluate New York's ability to gain admission to the CRS program, and the costs and benefits of doing so. While the opportunity

for discounted premiums for New Yorkers is compelling, joining the program may require the City to take legal or other remedial actions against property owners found to be in violation of building codes in the floodplain. A measured approach to understanding the City's potential obligations, and practical solutions to meeting those obligations, is therefore required. OLTPS and the Department of Buildings will complete this evaluation by the first half of 2014.

Strategy: Expand pricing options for policyholders

Flexible pricing options can encourage more people, especially those not required to carry insurance, to purchase coverage that suits their needs. A higher-deductible option is a commonly used tool in insurance pricing for reducing premium costs to policyholders while protecting against catastrophic losses. Higher deductibles are consistent with the principle of risk-based pricing and provide significant cost savings to policyholders who choose them. This approach is a common feature of catastrophe insurance policies, with, for example, most homeowners insurance policies in New York State including mandatory hurricane deductibles, often up to 5 percent of the insured value of a home.

Initiative 6

Call on FEMA to allow residential policyholders to select higher deductibles

Currently under the NFIP, deductibles up to \$50,000 are allowed for commercial policies, but residential policies are limited to a maximum deductible of \$5,000. Initial analyses indicate that if a \$10,000 deductible were available on residential policies, flood insurance premiums could be reduced by more than 30 percent, while a \$25,000 deductible could cut premiums in half. This option likely would be available only to property owners who do not have Federally backed mortgages, as these individuals are not subject to the regulatory regime applicable to such mortgages and thus have more flexibility. Even so, there is a potentially significant market for this product.

The City will work with FEMA to evaluate the higher-deductible option in order to understand precisely how deductibles would translate into premium reductions for various property types and to determine which property owners would be best served by higher deductibles.

In connection with the introduction of higher-deductible policies, the City will call for FEMA

to initiate a comprehensive policyholder education initiative that helps consumers choose a deductible level that they can afford while avoiding the potential for underinsurance in the event of a loss. OLTPS will continue discussions already underway with FEMA, with the goal of reaching agreement on new policy options with by 2014.

Strategy: Improve awareness and education about insurance

For insurance to play the appropriate role in providing individuals and businesses with financial protection from climate risks, consumers must be aware of both their risks and the coverage their insurance policies include or exclude. Issues of consumer awareness and education should be addressed at the points of sale and renewal, and throughout the life of an insurance contract. Insurers also should be aware of the extensive efforts the City is taking to minimize loss and disruption from climate hazards through the initiatives in this report. Doing so will foster a more robust insurance market for the benefit of all participants.

Initiative 7

Support the goals of the NYS 2100 Commission to protect New York State, consumers, and businesses

The NYS 2100 Commission was convened by Governor Cuomo in response to recent severe weather events experienced by New York State, including Sandy. The Commission's Insurance committee outlined a series of goals and strategies protecting consumers and businesses. The City will support the State in pursuing the Commission's goals, which include:

- promoting investments in mitigation;
- improving consumer awareness and education;
- preventing underinsurance for flood risk and covered perils;
- expanding coverage for business interruption;
- promoting a comprehensive insurance emergency measures act; and
- providing catastrophe response services.

Initiative 8

Call on New York State to improve policyholder awareness at the point of sale or renewal

Sandy demonstrated the importance of policyholder awareness, particularly relating to flood insurance, as well as the importance of easily understood insurance contracts. These issues should be addressed by New York State as the primary regulator of the insurance industry in

New York. The City, working through OLTPS, will collaborate with the New York State Department of Financial Services to evaluate opportunities to improve policyholder awareness, including through more meaningful disclosure at the points of sale and renewal. Among other things, the City and State should review the role that a variety of actors—including policyholders, insurers, brokers, and agents—can play in achieving this goal.

Initiative 9

Launch a consumer education campaign on flood insurance

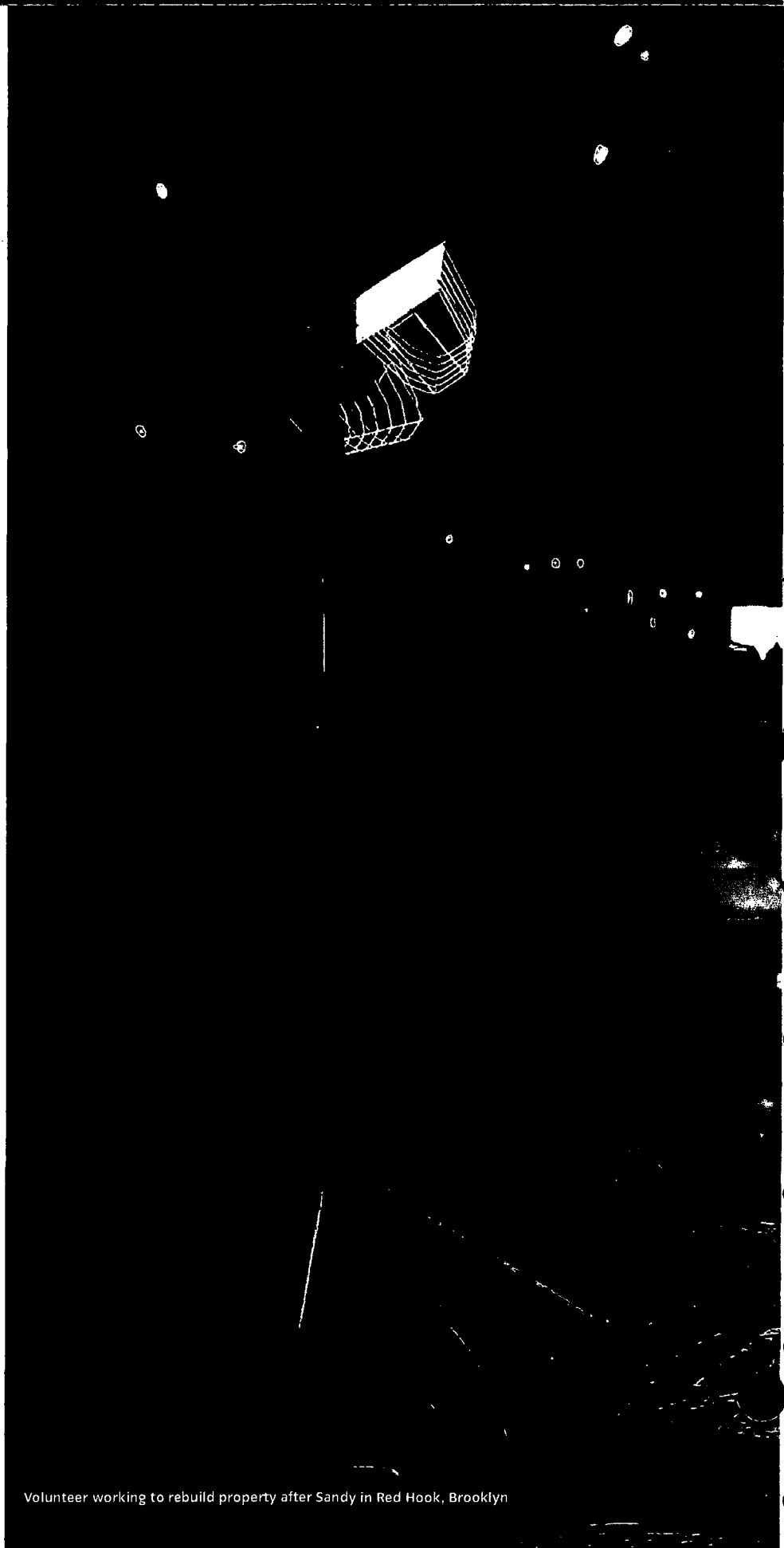
The Preliminary Work Maps show an increase of approximately 32,000 buildings in the 100-year floodplain. Therefore, it is critically important that owners of these properties in particular understand their obligations and be aware that their standard homeowners policies do not generally provide flood coverage. The City will launch a consumer education campaign to achieve these ends. Communication channels may include subway advertisements, radio spots, and social media. The Department of Consumer Affairs will develop and launch this citywide campaign in 2014.

Initiative 10

Launch an engagement campaign targeting insurers

Insurers' perceptions of climate risks in New York City and their confidence in the City's adaptation strategies can influence the availability and pricing of insurance. The City will, therefore, launch an insurer engagement campaign to inform insurance providers about the comprehensive measures the City is taking both pursuant to this report and more generally to minimize loss and disruption from climate risks.

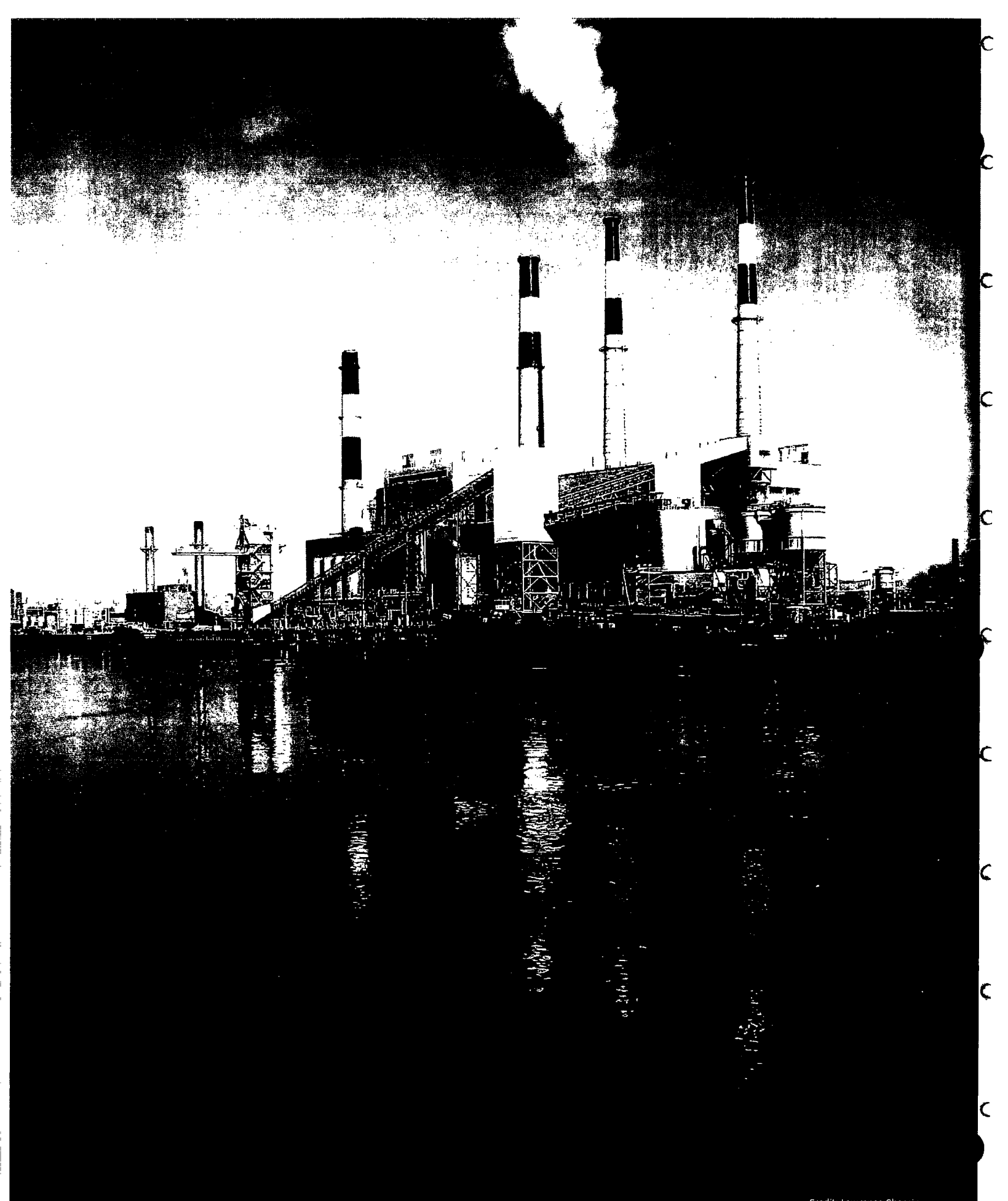
This campaign, which will be launched by OLTPS, will include information on coastal protection investments, building code changes, and initiatives that impact business continuity like infrastructure hardening and transportation resiliency. The target audience will include insurance company executives and underwriters, catastrophe modeling experts, and other stakeholders from leading commercial and homeowner insurance providers in New York. The objective of this campaign will be to convince these individuals and their companies to consider the City's strategies as they set rates in New York. OLTPS will hold the first forum with insurers in 2013 and continue industry engagement on an annual basis.



Volunteer working to rebuild property after Sandy in Red Hook, Brooklyn



Credit: Damon Winter/The New York Times



Ravenswood Generating Station, on the East River waterfront, is the largest power plant in New York City.

Credit: Lawrence Chernin