



DECEMBER 2013

# ALL HANDS ON DECK

MOBILIZING NEW YORKERS FOR  
A LIVABLE AND RESILIENT CITY

The Municipal Art Society of New York  
**MASNYC**









December 2013

Dear Readers,

This document is a rollup of over a year's worth of listening and interpreting the voices of the many New Yorkers who woke up suddenly one late fall morning to a new normal: awareness of the imminent threats of climate change to our city and the northeastern seaboard of the United States, through rising seas and the increasing severity of weather patterns.

Why is an organization called the Municipal Art Society concerned with events seemingly tied to weather? In 1893, when MAS was created, its focus was ensuring the city possessed the capacity to preserve its core functions and its most positive attributes in the face of rapid industrialization. Would the beauty of the city, its dynamic streetscapes and public spaces, storied neighborhoods and remarkable culture, thriving manufacturing and business sectors, majestic buildings and celebratory public art survive the dawn of a new century? MAS took on that challenge, to advocate for public policies, leadership, and investment that would both nurture our city's unique civic assets and support new development to build upon them. Our city has not only survived but thrived throughout a remarkable century, becoming a global capital of innovation. By marrying together culture, technology, finance, and robust public and civic leadership, the arts and public space, NYC has become a global example of livable urbanism.

A new millennium brought a whole set of new challenges, with extraordinary tests to our physical, emotional, and financial capacity to function and succeed. We know from our history the critical role civil society plays in city building, ensuring the broadest public interests are reflected in public policies and development decisions that support a livable and resilient city for all New Yorkers.

Superstorm Sandy brought to the fore the vulnerability of our coastal communities, transit infrastructure, public housing, energy supply, utility grid, and food distribution systems. The immediate response to those cascading failures was swift and resourceful, from all sectors: public, private, institutional, community. But recovery is slow, and the challenge to plan forward, to "build back" more resilience at every level and in every system is an ambitious, demanding process, requiring both boldness and patience. We recognize that investing in approaches that favor the long term and make clear a "new normal" require tough decision making coupled with patient capital.

THE MUNICIPAL ART SOCIETY OF NEW YORK  
111 WEST 57TH STREET  
NEW YORK, NY 10019

T 212 935 3960  
F 212 753 1816

MAS.org

Marshalling a broad consensus—a culture of resilience—is no easy task, or else we would already have one. New York City has weathered a number of significant challenges. And we have an extraordinary network of community-based organizations, formed over decades of activism and community engagement, to advocate for their neighborhoods aspirations to be met, their aspirations realized. But now we must mobilize again, to strengthen our collective capacity to anticipate new shocks and challenges.

This document provides the reader with a brief review of what may prove to be one of the most significant years of reckoning for this city. Bolstering ourselves to plan for resilience means working within extraordinary complexity. The federal, state, and city governments have all contributed to the discourse of what should be prioritized. So also have a number of nonprofit groups and alliances. All of this work is referenced here. Our role as advocates for the livable and resilient city is to help distill the key recommendations coming from all sources, including the voices of those most directly affected by the events that followed Sandy, and to promote a way forward that will produce the best results for the city over the long term. Over the last year we have joined with hundreds of other organizations, as fellow stewards of the urban fabric that is New York, calling for the highest levels of public collaboration, community innovation, private investment, and shared commitment. With the Center for Urban Real Estate at Columbia, weeks after the storm we convened two federal cabinet secretaries and local experts to lay out the science and the practical challenges of coastal restoration and protection. A month later with almost a hundred community partners and our convening friends at the New School, we gathered several hundred people on a Saturday to set out principles to guide a range of redevelopment affecting public housing, neighborhood economies, building permitting and design, and cultural facilities. We began convening monthly Resilience Roundtables, to build a broad learning community to encompass engineering, public health, design, community activism and public policy development concerns. We supported the Mayor's Special Initiative on Resilience and Rebuilding, working with diverse community partners including Occupy Sandy and the local Community-based Recovery Organizations to recruit facilitators and participants to attend SIRR's public workshops to identify priorities. We participated in the planning and launch of the State's New York Rising program, and continue to liaise with their efforts to set up local planning processes to guide neighborhood rebuilding. And finally, we are working closely with our key partners the Region Plan Association, the Van Alen Institute, and the Institute for Public Knowledge at NYU, to support the President's Hurricane Sandy Task Force Initiative Rebuild by Design, an international resilience-building process with designers from around the world, to develop implementable solutions for the tristate communities affected by Sandy.

Concurrently, MAS programming over the past year included our renewed a commitment to rethink Penn Station, arguably the region's most critical piece of resilience infrastructure, ensuring access to the city for thousands across the region. We continued our planning support in Brownsville, Brooklyn, with a multi-stakeholder partnership there working to strengthen the livability of those neighborhoods through effective

THE MUNICIPAL ART SOCIETY OF NEW YORK

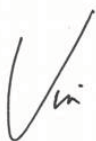


physical planning interventions and cultural investment strategies. We oriented thousands of New Yorkers to take their eyes to the street, build their urban literacy, and see the city through our walking tours and courses. And we highlighted the importance of the public realm and preserving a mix of building types to creating vibrant places, and their contribution to city livability, particularly in the overwhelmed and under-invested part of the city that surrounds our most prestigious business district: Grand Central/East Midtown. These initiatives reflect our commitment to investing in both the city's livability and resilience. It can never be either/or: trade-offs are not on the table. New York City needs to continue to show how both can be realized.

Sandy threatened one of the most populated and economically and culturally significant regions of North America. The challenges we face in this region, not defined by political jurisdiction but by ecology and landscape, are not unique. They are increasingly common to coastal cities and communities around the world, of which we are not the canary in the coal mine. Others have earned that lamentable distinction. But we are, potentially, a straw that may break the camel's back. The art—and science—of building a livable and resilient city is a collective one, the aggregated result of combining modest, hyper-local acts with broader investments in systems that make a productive, meaningful life in the city possible. Together with cities across the United States and around the world, we face a resilience imperative, matched closely with our ongoing challenges to make our cities livable for all.

This report is a call for radical cooperation, to mobilize New Yorkers across the five boroughs and every narrow interest and ideology, to rally together for a robust set of actions to secure our future. Sandy was our wake-up call. In 2014, as we welcome new leadership to City Hall, the commitment of civil society to the principles we stress here, and to the actions we and our diverse colleagues have urged we collectively undertake, is not only possible. It is necessary.

Please join us: we need *all hands on deck*.



**Vin Cipolla,**  
President, Municipal Art Society of New York



**Eugenie Birch,**  
Chair, Municipal Art Society of New York

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## MAS RESILIENCE AND COMMUNITY ENGAGEMENT

Brandie Lee Moreno

Chris Penalosa

Courtney Smith

Amy Parker

Mary Rowe

Alexis Taylor

## PHOTOGRAPHY

Cameron Blaylock

Giles Ashford

## REPORT DESIGN

Jerald Kohrs

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# INTRODUCTION

A FRAMEWORK FOR RESILIENCE: ALL HANDS ON DECK

WHY RESILIENCE MATTERS AND THE ROLE OF CIVIL SOCIETY IN BUILDING CONSENSUS

CREATING AN ECOSYSTEM OF INNOVATION AND RESILIENCE



## A FRAMEWORK FOR RESILIENCE: ALL HANDS ON DECK

A year into Superstorm Sandy recovery, New Yorkers are still experiencing the physical, social, and economic devastation caused by this severe weather event. Though technically only a tropical storm when it made landfall, Sandy generated a 14-foot storm surge, causing extensive damage along the coastal shores of New Jersey, New York, and Connecticut. The storm's floodwaters impaired New York City's physical landscape by inundating homes, parks, businesses, and infrastructure. It disproportionately affected vulnerable populations located near the coast.<sup>1</sup> Sandy also impacted inland communities and New York City neighborhoods by disabling the mechanical and electric systems that underpin the city's critical infrastructure.

Superstorm Sandy thrust into the spotlight tough questions about the future of our city. How do we handle the legacy of siting public and low-income housing on ecologically vulnerable sites? Where can funding for infrastructure improvements be found? And how can these improvements be made in an equitable and inclusive manner? Should we retreat from the waterfront? And if we do, how can we provide additional housing and community spaces that meet the needs for displaced populations? How do we assess the needs and foster meaningful engagement between afflicted communities and governmental rebuilding efforts? Sandy has presented New Yorkers with the unique opportunity to implement resiliency-driven initiatives throughout the city

This document proposes a framework for resilience that is grounded in principles that guide all MAS work, and establishes key priorities for making resilient communities, processes, and policies as the city recovers. It aggregates the efforts, recommendations, and ideas of multiple stakeholders and organizations, and in doing so emphasizes the need for cross-coordination and inclusive collaboration between different levels of government, disciplines, and recovering communities.

We need all hands on deck—city staff and agencies, cultural and academic institutions, neighborhood residents, experts, philanthropy, elected officials, and the private sector, including financiers and insurers, as well as the creative and entrepreneurial sectors—to generate innovation, increase the capacities of neighborhoods and communities, and place New York City on a path to becoming a global model for urban resilience.





Hurricane Sandy, the next morning in DUMBO  
Photo by Barry Yanowitz





## WHY RESILIENCE MATTERS AND THE ROLE OF CIVIL SOCIETY IN BUILDING CONSENSUS

Resilience is the ability of a system to sustain itself and quickly rebound from shocks and stresses. At The Municipal Art Society of New York (MAS), we believe that the resilience of urban systems—the interconnectedness between natural ecosystems, social networks, physical infrastructure, and neighborhoods—is deeply connected to the livability of our neighborhoods and the city as a whole. In order to create a more livable city that enables all residents to adapt to change and thrive in everyday life, we must develop a mix of large-scale initiatives and granular innovations to mitigate against the effects of unexpected challenges to the built environment. In other words, the quotidian benefits of resilience strategies have the potential to increase a city’s overall livability.

Sandy has made the effects of climate change a reality that necessitates immediate action as well as long-term planning. Considering the increased frequency and severity of storms, the predicted rise in sea levels and the risk of any other unanticipated shock, there is need for a comprehensive campaign to develop long-term rebuilding and resilience strategies.<sup>2</sup> Sandy exacerbated problems in many neighborhoods already socially and economically vulnerable. Floodwater inundated areas of New York City grappling with outdated infrastructure and strained already struggling local economies, accentuating the social constraints and geographical barriers that have permitted blatant inequalities to continue to exist in close proximity.

As government entities try to address the questions left by the storm, various organizations, experts, and community groups are taking steps toward developing strategies that build resilience and livability by releasing reports, conducting relevant research, and spearheading campaigns. Their efforts have produced recommendations, filled in knowledge gaps, highlighted omissions in the planning process, and provided much needed leadership for communities and the city as a whole. Civic organizations have shown themselves to be critical assets in identifying the key ingredients for a resilient recovery. By mediating diverse points of view and integrating ideas from multiple arenas, civil society has the unique ability to bring communities, the private sector, and government together.

Resilience requires a web of connections, strengthening all parts of the city to flexibly adapt and respond to challenges of all kinds.



The Municipal Art Society of New York has led New York City’s livability movement since 1893. MAS’s mission is to advocate for public policies, private sector practices, individual agency and community engagement for a resilient built environment that encourages our city’s economic vitality, cultural vibrancy, environmental sustainability, livability and social diversity.

For more information, visit [www.mas.org](http://www.mas.org)

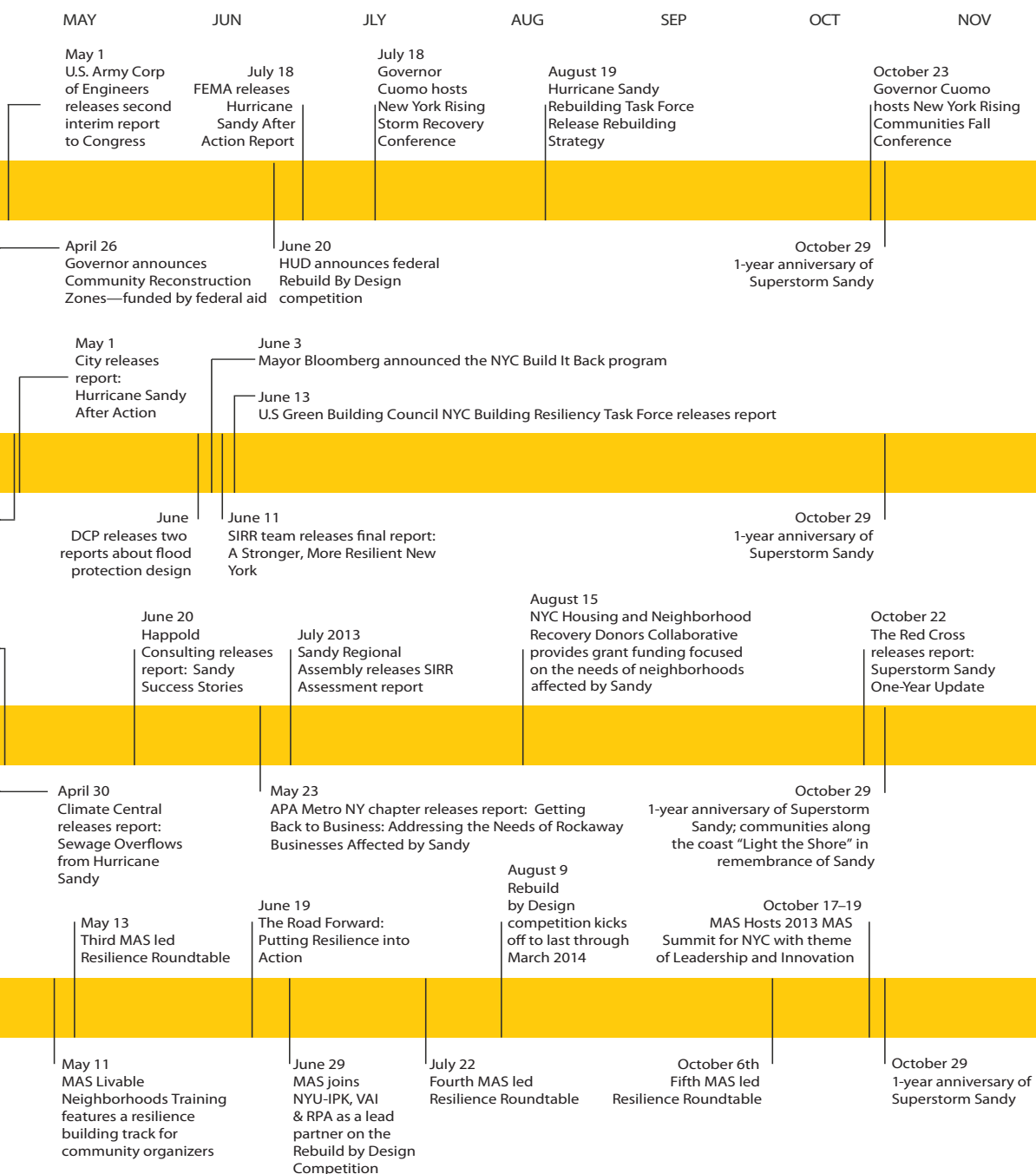
## INTRODUCTION CREATING AN ECOSYSTEM OF INNOVATION AND RESILIENCE

Much on-the-ground work has been done since Superstorm Sandy swept through New York City in October 2012. The first days and weeks after the storm, relief and recovery efforts were mobilized at the local, regional, and national level even before the arrival of national relief agencies, grassroots organizers provided immediate assistance to affected communities. Within days following the storms, independent and local volunteer relief organizations



“sprung up in droves, organized almost entirely through word of mouth and extensive social media campaigns.”<sup>3</sup>

Since these initial efforts, several public task forces have been devised, reports released, and immediate recovery programs funded. All the hands at work in this process may share symbiotic goals, but each operates with a different mandate, scope, and timeline guiding their work. The following timeline helps to visualize some of the many initiatives operating throughout the ongoing recovery from Sandy, sometimes in collaboration but often in silos. These efforts and others inform our framework for resilience:





This Framework for Resilience is representative of the diverse voices—academic, community groups, planning and design community, public agencies and officials, and private organizations—active in the recovery since Superstorm Sandy. It lays out four key priority areas—mobilizing existing resources, increasing local capacity, investing in adaptable infrastructure, and updating new policy to sustain resilience, and includes a series of recommendations to help achieve these “Priorities for Creating a Livable and Resilient New York City.”

## GUIDING PRINCIPLES

Through its work, MAS brings together local residents, planners, designers, experts, and activists to cultivate urban resilience and livability in neighborhoods throughout New York City. Through education, dialogue and advocacy for innovative design, planning and preservation, MAS promotes New York City’s economic vitality, cultural vibrancy, environmental

sustainability, and social diversity. As we think critically about how we continue to build resilience following Sandy, four key principles guide our priorities for creating a livable and resilient New York City:

**TRANSPARENCY.** As New York City faces the wide-ranging challenges exposed by Sandy, transparency is vital for rebuilding effectively and efficiently, for coordinating various recovery efforts and fostering a sense of trust and ownership between communities and governmental leaders. During MAS’s *Sink or Swim* convening in December 2013 (coproduced with the Center for Urban Real Estate at Columbia University), Secretary of Housing and Urban Development Shaun Donovan challenged New York directly, by saying “While the Federal government has a key leadership role to play in recovery. It is State and Local governments that must provide the vision for local communities. And most importantly, that vision must be owned by the community.” For communities to “own” a vision for resilience, the actions and processes of rebuilding must be

# FRAMEWORK FOR RESILIENCE



transparent and engaging. Our framework highlights examples of and opportunities for transparency within existing and proposed initiatives for rebuilding post-Sandy.

**COLLABORATION.** There must be cross-coordination between various streams of recovery efforts to instill resilience in New York City's urban fabric. Neither excellence nor efficiency happens in silos. We are calling for all hands on deck to ensure that the best, smartest, and most effective tools and pathways for resilience are identified and applied. Creating interdisciplinary and intercommunity networks stretches the impact of innovation, creativity, and limited funding. Integrated regional approaches allow comprehensive, systematic changes to take place. More broadly, decisions made here in the Northeast do not only affect our region, but also have implications along the seaboard and on state and federal policy leadership across the country. Moreover, our policy and planning decisions must be informed by the global challenges the world's largest cities increasingly share, including rapidly changing economics and the effects climate change. Our work locally should contribute to the international exchange of innovative, effective practices to benefit our planning efforts and those working on parallel challenges elsewhere in the United States and abroad.

**INCLUSIVITY.** A resilient approach to rebuilding includes economic, cultural, social, and environmental perspectives that create adaptable systems and vibrant communities. Overlapping initiatives from varying disciplines and perspectives prepares our city's communities and neighborhoods for unanticipated pressures by creating redundancies, strengthening social networks and focusing on the long-term livability and resilience

of our city. Considering the uncertainty of what the next crisis may be, it is important to develop a long-term vision of resilience that draws upon professional expertise but finds its root in community-based expertise. Our combined efforts and campaigns to build resilience cannot be confined to coastal and low-lying communities. In order to create a truly resilient city, all neighborhoods must develop the capacity to respond to economic, cultural, environmental, and social shocks. The priorities for creating a livable and resilient New York City that follow in the next pages, include a range of technical and social initiatives that work in tandem to increase the flexibility and adaptability of urban systems to cope with various challenges.

**SCALABILITY.** By approaching resilience at all levels, there is the opportunity to create multiple layers of defense and ensure opportunities for "all hands on deck" to tangibly participate in resilience. Providing options for resilience at varying levels of investment and duration, and at different scales, can make resilience building accessible to all, regardless of income, geography, or scope. The most innovative forms of resilience often begin at the ground level, so opportunities should be provided to scale up these granular approaches to be replicated, adapted and reused. The use of capacity-building toolkits and trainings, adaptable infrastructure, awareness and preparedness education, and critically-thought out zoning policies, can keep individuals safe and provide resilience as broadly as possible. Finding opportunities where approaches can be transferred requires careful site-specific analysis of *What happened, what worked, and why?* to identify where solutions may be applicable and or adapted for different neighborhoods, cities or regions.



**“While the Federal government has a key leadership role to play in recovery...It is State and Local governments that must provide the vision for local communities. And most importantly, that vision must be owned by the community.”**

—Shaun Donovan, U.S. Secretary of Housing and Urban Development, Sink or Swim (SoS): Principles and Priorities in a Post-Sandy Era, December 2012

## PRIORITIES FOR CREATING A LIVABLE AND RESILIENT NEW YORK CITY

Adhering to the principles above is critical to ensuring New York City is building a model for resilience that meets the needs of all New Yorkers. What follows is a series of priorities with recommendations that incorporate our guiding principles—transparency, collaboration, inclusivity, and scalability—into current and proposed initiatives. Under each of these priorities, we have outlined recommendations drawn from MAS’s work and the reports, research and suggestions of our partner organizations.<sup>4</sup> This framework aggregates “what we’ve heard,” and suggests actions for moving forward towards a resilient and livable city.

### 1. Mobilize Existing Resources and Diverse Expertise ..... 11

*Harness the availability of funding streams, local energy and expertise, and global best practices to develop effective local solutions.*

### 2. Strengthen Local Capacities ..... 17

*Strengthen the local capacity of our neighborhoods to respond and adapt to shocks of all kinds—economic, social, cultural, and environmental.*

### 3. Invest in Flexible and Adaptive Infrastructure.....28

*Strengthen urban systems with innovative design, strategic redundancies, and both soft and hard approaches.*

### 4. Lead with Policies That Sustain Resilience .....37

*Develop policy that informs future resilience planning and creates a culture of resilience throughout the region.*



## 1

## MOBILIZE EXISTING RESOURCES AND DIVERSE EXPERTISE

*Harness the availability of funding streams, local energy and expertise, and global best practices to develop effective local solutions.*

One of the greatest challenges following any disaster is matching individuals and communities with the resources they need for long-term recovery. In February 2013, both New York City and New York State received the first round of federal funding for Community Development Block Grants, a total of \$3.48 billion. At the same time, additional funding and resources have come in from foundations, private organizations, and individual donations, and vast numbers of New Yorkers, with relevant skills and knowledge, have donated their assistance to the rebuilding process. With the immense amount of resources and expertise available, it is critical to ask how we should channel these to meet community needs and maximize resiliency, to bridge large-scale resources and grassroots knowledge. With this priority, we want to address the processes by which resources are allocated and plans for rebuilding are made.

Building on the four key principles, recovery efforts must be moderated by an open and inclusive exchange between agencies, communities and practitioners. Transparency in funding opportunities and allocation is essential. As these funds are mobilized, true resilience also depends upon collaboration through activated social networks and public-private partnerships. Our recommendations call for comprehensive outreach to bring all New Yorkers into the rebuilding process. Furthermore, we must work together to create opportunities for meaningful participation and community led innovation. In order to support these inclusive and collaborative efforts, resource allocation must be as transparent as possible. Connecting the resources and expertise that is available allows us to build off of current best practices to create innovative, effective, local solutions. We need a robust network of resilience builders, with multiple mechanisms for coordination and communication across sectors, the formal and the informal, public efforts and private, institutionally-led and community-based, to create a meaningful exchange, better coordinated resource allocation, and process a platform that ensures we are taking advantage of effective practices *and* local expertise.

### RECOMMENDATION 1:

**Provide opportunities for meaningful engagement and comprehensive outreach to involve all community members in the resilience-building process.**

In order to channel external resources toward local needs, we must understand the diverse constituencies and dynamics of existing communities. There is no better way to find out this information than from local residents themselves. Indeed, as experts on their communities, residents have valuable information for creating sustainable resilience plans and should be at the center of this process. In our effort to become more resilient, we must strive to establish a meaningful engagement process as well as include the full range of community voices.

## FRAMEWORK FOR RESILIENCE

### PRIORITY 1

#### Mobilize Existing Resources and Diverse Expertise

*Harness the availability of funding streams, local energy and expertise, and global best practices to develop effective local solutions.*

To begin, a robust community outreach ensures that public engagement efforts reflect the reality and the diversity of our communities. With this in mind, projects that take advantage of the pre existing networks of community-based organizations have a head start in understanding and reaching out to the entire community. Resources about building resilience and development proposals can be provided online, in-print and offered in many languages. Outreach strategies must include individuals from a variety of income levels, racial groups, ethnicities, ages, and populations. In layering various methods of communication, we increase the inclusivity of building resilience.

Due to the scale of post-Sandy recovery, it is also important to identify and target outreach to the groups that are especially difficult to reach. The Sandy Regional Assembly and additional community organizations have recommended a strategic focus on connecting with low-income residents and communities of color, as they are “an integral part of the Sandy Recovery decision-making process and help hold recovery projects accountable after funds are allocated.”<sup>5</sup> Specifically, research by Make the Road New York has found that the City’s immigrant population is difficult to assist in federal and local relief efforts.<sup>6</sup> Besides the needs of residents, the City’s small businesses and manufacturers should also be seen as constituents and contributors to rebuilding and resiliency initiatives. Though the City’s ‘Hurricane Sandy After Action Report’ offers assistance for commercial office space and retail areas, assessing and allocating resources toward manufacturing and other industrial businesses is an important step toward resiliency.<sup>7</sup> Considering the links between physical, economic, and social recovery, this sector must be prioritized as manufacturers often provide high-wage jobs to members of low-income communities.<sup>8</sup>

Other initiatives emanating from the community or tech sectors are important contributors here. As an example, In Our Back Yard (IOBY), a place-based project-driven nonprofit organization, gathered ideas post-Sandy through crowdsourcing technology. By merging innovative technology with local voices, IOBY produced a list of place-based, community-driven ideas that span across all five boroughs. Their initiative had 380 participants who came up with 150 unique ideas for building resilience.<sup>9</sup> Partnering with invested organizations such as IOBY helps City agencies and other public proponents conduct community engagement in innovative ways.

Once the full spectrum of relevant voices is at the table, resilience and rebuilding efforts should emulate the equitable and collaborative practices of community-based planning. Whether projects are led by the city, the community or by the private sector, opportunities for “meaningful participation,” where the planning process “moves quickly without outrunning the capacity of affected communities to meaningfully participate” have to be provided in order for it to be effective.<sup>10</sup> Indeed, there are many ways to make these processes more inclusive and transparent—from hiring locally for rebuilding projects, to allowing ample time for public comment, to creating a “city-managed reporting website” to track the planning process for rebuilding and resilience initiatives.<sup>11</sup> No doubt New York City’s vibrant tech hacking community can come up with new ways for residents to track and engage in these processes. By shifting the mindset from “getting feedback” toward “proactive collaboration,” we gain local knowledge and empower residents, both of which help to effectively mobilize outside funding and resources.



Mindy Fullilove, Mailman SPH, Columbia University and  
Klaus Jacob, Lamont-Doherty Earth Observatory, Columbia  
Rebuild by Design, Staten Island Site Tour  
Photo by Cameron Blaylock



## FRAMEWORK FOR RESILIENCE

### PRIORITY 1

#### Mobilize Existing Resources and Diverse Expertise

*Harness the availability of funding streams, local energy and expertise, and global best practices to develop effective local solutions.*

### RECOMMENDATION 2:

**Establish transparent and coordinated communication for allocating disaster-relief and rebuilding resources to ensure an equitable and efficient process to building resilience.**

An equitable allocation of funds and effective coordination of resources can maximize the impact of Sandy funding, and more effectively meet local needs. Furthermore, clear and communicable funding opportunities can make the rebuilding and resilience processes much more efficient, as beneficiaries are better able to understand and access funds.

Even one year after Sandy residents still lack information about what long-term recovery of their neighborhoods looks like, whether and how to rebuild their homes, and how to finance the construction. The complexity of the rebuilding process is not unique to homeowners. For example, small businesses in Lower Manhattan require assistance to recover inventory and repair equipment damage. These impacted small businesses employ 5.7 million individuals in NYC, and at the same time, supply necessary supplies to surrounding residents, such as fresh, healthy food, cleanup and construction goods, and other personal items.<sup>12</sup> As these businesses struggle to recover, limited jobs and economic opportunity, as well as limited access to basic goods and services, restricts the ability of neighborhoods to get back on their feet. Programs that provide equal access to funding and distribute this information through multiple means can ensure an equitable and effective recovery process.



MAS's Livable Neighborhoods Program  
Photo by Giles Ashford

Knowing the challenge of accessing available resources, the *NYS 2100 Commission* report as well as the *Hurricane Sandy After Action Report* both advocate for the creation of an online resource that aggregates information about financial aid programs.<sup>13</sup> Aside from this digital resource, in order to really mobilize local residents to access the resources available to them, recovery agencies would be advised to partner with community-based organizations to implement “on the street” tactics. For example, canvassing and flyering in recovering areas helps share information about funding opportunities with populations and neighborhoods barred by the digital divide. Multiple modes of communication are necessary for making resources visible and accessible to diverse constituencies.

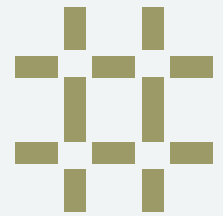
Recognizing the role of small businesses in neighborhood recovery, growth, and livability, in April Mayor Bloomberg established the Business Recovery Zones to prioritize small businesses in areas affected by the storm. As 70 percent of the more than 23,000 businesses and nonprofits that lie in these zones, the City is providing extra resources for these areas to increase the rate of physical and economic recovery.<sup>14</sup> Restoring and strengthening local businesses also helps to replenish jobs, goods and services for the neighborhood. Moving forward, we can maximize the effectiveness of recovery funding through strategic initiatives that target the triple bottom line, providing economic, social and environmental benefits.

#### RECOMMENDATION 3:

### Combine global “best practices,” with local innovation and expertise to make NYC a model for resilience.

In improving the resilience of our City, we must build upon local knowledge with resilience-driven solutions from other communities around the world. Experiences from New Orleans to Mexico City to Jakarta can inform how we prepare for and adapt to unexpected events. Reports by other partners in resilience, like members of the MAS-led CityBuilders Global Network, offer recommendations for physical and social improvements as well as ingenious design ideas. Civil society is in a unique position to bridge these global solutions with localized knowledge, and thereby lead innovative proposals for New York City’s neighborhoods and communities, as happens in city regions around the world.

Federal, State, and City agencies have created task forces with this very purpose in mind: to corral experts, both locally and globally, to address issues specific to Sandy. The Hurricane Sandy Rebuilding Task Force created the “Rebuild by Design” competition to spur new solutions that localities can use in the rebuilding process. In this initiative, the Task Force aims to develop innovative solutions for coastal areas, high-density urban environments, and ecological networks through collaborative ideas from landscape and urban designers, architects, infrastructure engineers and land-use planners who participate in the competition.<sup>15</sup> The Task Force identified local partners, NYU’s Institute for Public Knowledge, the Van Alen Institute, the Regional Plan Association, and the Municipal Art Society to lead the research and analysis of the region, and ensure comprehensive engagement with communities and local officials. Even the process of the competition is innovative in itself, using organizations with a long history of engagement and design to lead the community engagement and facilitate the development of community-driven design ideas, as well as encouraging a cross-collaboration of knowledge among design teams and project communities.



#### CITYBUILDERS GLOBAL NETWORK

The CityBuilders Global Network (CBGN) is an international network linking local urban innovators who make cities more livable and resilient, initiated by the Municipal Art Society in 2011 at a convening at the Bellagio global Conference Center operated by The Rockefeller Foundation. Subsequent follow-up meetings were held with network partners in Dhaka, Geneva, London, Montreal, New York City, Paris, Toronto, Vancouver and Washington DC. CBGN hosts an interactive digital platform and convenes regional resilience network events to share lessons and aggregate learnings that foster innovation and support strategies, projects and interventions that effectively build the resilience and livability of the world’s most dynamic and productive cities.

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## FRAMEWORK FOR RESILIENCE

### PRIORITY 1

#### Mobilize Existing Resources and Diverse Expertise

*Harness the availability of funding streams, local energy and expertise, and global best practices to develop effective local solutions.*

In addition to federally-led efforts, the City as well as private organizations are using competition to drive innovation. Examples include the Neighborhood Game-Changer Investment Competition and Infrastructure and Building Resiliency Technologies Competition initiated by the New York City Economic Development Corporation (NYCEDC) as well as the Far Roc Design Competition, the 3C Competition for Long Island, and the Terraform One competition, all of which are sponsored by private organizations.

These initiatives challenge the city-building disciplines (planning and design) to connect with technical experts in addressing local needs. They also spur innovation by demanding groundbreaking ideas and deliverables, helping to create opportunities for open thinking and integration, and a more holistic approach to resilience-making. But it is important to create pathways for these innovative solutions that best use the expertise and unique knowledge of local residents. Indeed, creating opportunities for public input early within any competition is vital for transferring new solutions to specific sites. In doing this, we can address the question of whether these competitions will alienate communities through a “race-to-the-top” environment or include them in the formation and evaluation of design proposals that are truly innovative locally.<sup>16</sup> In order to be truly resilient, any post-Sandy proposals that result from a competition process had best maximize pre existing social capital, which will not happen if communities are excluded from them.

The long-term goal of such initiatives must be to cultivate a network of thinkers, practitioners, and community leaders who understand both the physical and social dimensions of resilience. This type of collaboration, ideally ongoing, will make New York City a model for resilience as it increases the City’s ability to adapt, innovate and foster resilient development for years to come. Ultimately, it will supply the region with a web of reciprocally innovative relationships to foster innovation continuously: *an ecosystem of resilience*.

## REBUILD BY DESIGN

To learn more about the competition and the progress of design teams, as well as opportunities to get involved, follow us on social media or visit our webpage:

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Rebuild by Design, an initiative launched by the federal Hurricane Sandy Rebuilding Task force and with lead funding by the Rockefeller Foundation, seeks to inspire innovative and out-of-the-box solutions to protect communities against future climate-related events.

From August 2013 through February 2014, four lead partners—Municipal Art Society, NYU’s Institute for Public Knowledge, Regional Plan Association, and Van Alen Institute—will facilitate the research, design, and development of innovative and implementable design solutions for building resilience in the Sandy-impacted region.

Ten international design teams were chosen in August, including professionals from the architecture, planning, engineering, economics, ecology, and community fields. Managed by the lead partners, the design teams will undergo a

period of research and analysis of the region from August through November, to understand the impacts of Sandy in the region and to develop scalable and innovative design opportunities to build resilience.

From November through February, Design Teams will engage directly with communities and project partners where their design ideas could be implemented in order to develop schematic design solutions with community and sectoral stakeholders.

In April, completed proposals will be judged by a jury in order to determine their eligibility to be implemented with U.S. Department of Housing and Urban Development Community Development Block Grant—Disaster Recovery Funding and other sources of public and private-sector funding.



## 2

## STRENGTHEN LOCAL CAPACITIES

*Strengthen the local capacity of our neighborhoods to respond and adapt to “shocks” of all kinds—economic, social, cultural, and environmental.*

Though Sandy produced immense physical destruction and infrastructure difficulties, it also revealed the inherent capacity of New Yorkers and neighborhoods. For example, during the storm, nurses, physicians and other volunteers helped to evacuate four hospitals and transfer 1,200 critical patients without losing a single life.<sup>17</sup> In the days after Sandy, volunteers with New York Communities for Change went door-to-door in the Rockaways, providing assistance and conducting 1,251 surveys that informed relief efforts.<sup>18</sup> Through Occupy Sandy—a well-networked alliance of community volunteers connected primarily through the internet and then on-the-ground in local communities—New Yorkers demonstrated both their individual commitment to this City and their collaborative capacities, turning out to help communities by the thousands in the weeks after the storm.<sup>19</sup> New technologies served to enhance local capacities, providing new avenues for volunteerism, collaboration, and cross-coordination. In March 2013, MAS recruited more than 150 volunteers from the design, planning, and grassroots organizing disciplines, eager to apply their skills in facilitation to the Mayor’s Special Initiative for Rebuilding and Resiliency (SIRR) public workshops. From community-based efforts to federally resourced public agencies, mobile and online technologies are now critical tools for communicating with response partners and the wider public.<sup>20</sup>

Many vulnerable communities were able to mobilize because of their inherent social cohesion, an often overlooked capacity. Red Hook, for example, has long been a vulnerable community with a population that is predominantly young, low-income and of “low-educational attainment.” Yet, the storm revealed a critical and perhaps unrecognized asset of Red Hook: high social capital from a tight-knit community, which ultimately served the area’s recovery in a variety of ways. Indeed, a strong social network is a specific capacity that helps communities to recover from unexpected events.

The demonstrated reflexes of those communities with strong social infrastructure, and the eagerness of volunteers throughout the city highlight the importance of building the capacity of neighborhoods. Since 2007, MAS has created opportunities to build neighborhood capacity, and allow residents to participate in the community planning process through the Livable Neighborhoods program. Providing day-long trainings in basic community planning and advocacy skills, Livable Neighborhoods seeks to empower residents to affect community change. Following Sandy, the spring 2013 program included courses on *Defining Resilience and Building Back Green*, *Funding the Resilience Process*, *Building Social Resilience and Cohesion*, and *Assessing Neighborhood Strengths and Addressing Vulnerabilities*. Recognizing that resilience is more than just protecting against coastal storms and flooding, MAS is piloting more customized programs to address local resilience challenges with its collaborator the Brownsville Partnership. MAS is working in those neighborhoods in Brooklyn and looking for ways in which better planning and design can enhance the economic and social resilience of their communities.

## FRAMEWORK FOR RESILIENCE

### PRIORITY 2

#### Strengthen Local Capacities

*Strengthen the local capacity of our neighborhoods to respond and adapt to “shocks” of all kinds—economic, social, cultural, and environmental.*

In anticipating disasters or other kinds of challenges in the future, we need to consider “how do we improve our systems to work from a bottom-up approach that listens and responds to what the community is capable and willing to do when it comes to extreme weather incidents?”<sup>21</sup> As we strive to answer this question, we recommend initiatives that increase local capacities by providing new resources and skills, creating communal spaces, and developing opportunities for collective creativity. Building upon our key principles, capacity building includes local residents in the rebuilding process, encourages transparency by integrating grassroots and top-down recovery efforts and establishes collaboration as the foundation for a more resilient and livable City.

#### RECOMMENDATION 1:

### Equip the general public with skills, tools, and technology that reinforce community-driven resiliency.

What will communities need in order to adapt, mobilize and rebuild after unexpected events? In order to put the recovery process into the hands of the impacted communities, they must be equipped with the skills, tools, and technology to carry out the rebuilding processes. Accessible mapping and data provides communities with the skills and tools to determine, “what happened?” and “why?,” and furthermore, “what worked?” and “what didn’t work.” The first step in any resilience-building process is assessing these questions. Adequate mapping and data must be widely available to diverse users (academia, industry, government, and the community) to assess and monitor the conditions of existing infrastructure and services, identify community needs, provide innovative solutions, and drive future planning and policy.

The use of open and accessible data allows for localized planning and community mobilization. Occupy Sandy utilized open data and hacked new technologies to make its relief efforts highly effective and efficient. Open-source tools like Sahana Eden served as a “dispatch hub for communications,” and tracked requests for assistance and supplies as well as printed waybills with inventories and their destinations.<sup>22</sup> Their centralized website site used open source data and Google Fusion Tables to map available resources, collect donations and operationalize volunteer efforts throughout New Jersey, Coney Island, Greenpoint, the Rockaways, and Staten Island.<sup>23</sup> Not everything needs to be “bespoke” or custom-made. Occupy Sandy found new uses for everyday technologies. Volunteers reimaged Amazon’s wedding registry to create a “wish list” of supplies for recovery efforts and necessities for storm victims.<sup>24</sup> Less than a week later, more than \$100,000 worth of requested items had been purchased to support local efforts. Through the use of accessible technology and tools, residents were able to take recovery into their own hands and allocate their time, resources, and money efficiently.

Data visualization can also be used to share important information across digital channels and to reach various audiences. To this end, OpenTripPlanner illustrated how Sandy altered the City’s accessibility via public transit. In Figure 1, the yellow indicates the most accessible areas for New Yorkers before the storm. Figure 2 shows accessible areas after Sandy.<sup>25</sup> By articulating critical vulnerabilities in the City’s transportation systems, data can help agencies prioritize system improvements, and citizens hold local government accountable to increase resiliency.

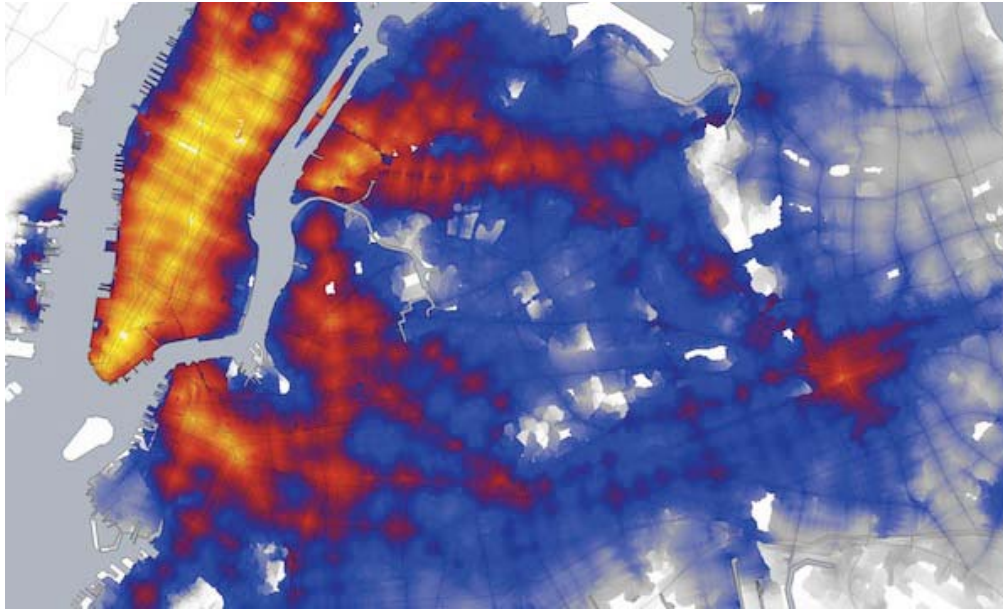


FIGURE 1:  
BEFORE THE STORM

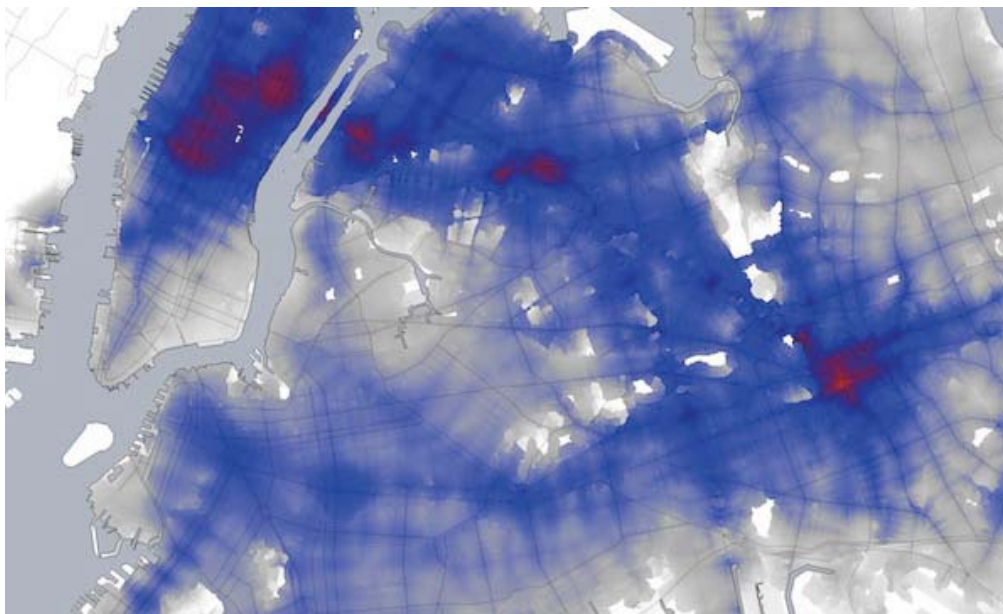


FIGURE 2:  
AFTER THE STORM

Source: OpenTripPlanner

Making data openly available is not an end in itself. It's the first step toward equipping communities with tools to participate directly in the planning and (re)development of their neighborhoods. The next step is making open data and its corresponding tools translatable to non-professionals and adaptive to the localized needs of specific neighborhoods. The NYCBigAPP exemplifies this next step through a competition that capitalized on the innovation while also creating practical tools for responders and communities post-Sandy. Through the competition process, developers created the app *Voluntarily* to assist in mobile canvassing by collecting, communicating, and visualizing information from disaster-affected areas in real-time. Another entry, MESA (The Massive Evacuation Simulation Application), was created as an emergency planning application that uses geospatial data to customize the best evacuation routes for different neighborhoods and populations.<sup>26</sup> These various applications of technology contribute to communities becoming involved directly in their



## FRAMEWORK FOR RESILIENCE

### PRIORITY 2

#### Strengthen Local Capacities

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own recovery and illustrate why Federal agencies have long advocated for using open data in the analysis and recovery of disasters, reflected in the federal government’s Open Government Initiative and Open Data Policy.<sup>27</sup>

Unfortunately, online tools and technology are not necessarily accessible after a disaster, to older residents not familiar with it or lower income communities with limited access. Therefore, the use of analog collection tools, such door-to-door canvassing and surveying, as mentioned above, can also provide a means to collect important information and data regarding a neighborhood. Shortly after the storm, the Alliance for Just Rebuilding (AJR) conducted a *Survey of Sandy Recovery Organizations* to determine information regarding the unmet needs of individuals’ weeks and months after the storm, and how rebuilding officials could bridge the gap between Community Based Organizations (CBOs) and those unmet needs. Through connecting with CBOs on the ground to identify these gaps in the recovery process, and sharing this information with government officials, AJR is able to affect future policy decisions and direct funding and resources to the holes in the recovery process.

In addition to having accessible tools and data, community members require skills and training in order to use these tools efficiently and carry out the recovery process. Recovering from Sandy presents a unique opportunity to develop long-term professional skills in communities that need them most—both in times of crisis and in the everyday. The *NYS 2100 Commission* report called for an expansion in “education and workforce development programs to ensure the availability of skilled professionals in critical recovery and resilience building activities, including restoring ecosystems, creating and maintaining green infrastructure, repairing damaged equipment and upgrading services.”<sup>28</sup> Indeed, updating the City’s various infrastructure systems will require specialized knowledge and training. In using local residents to fill gaps in rebuilding and resilience expertise, Sandy becomes an opportunity to expand local knowledge as well as economic opportunity for New Yorkers.

Rooted in this same idea, AJR proposed a training initiative that exemplifies this connection between resilience and livability. The initiative, called “Back Home, Back to Work,” aimed to address the widespread mold issues that have afflicted communities inundated during Sandy. Contractors and union workers would be trained and equipped to properly remove mold from homes and businesses. According to the AJR, the program would also produce economic stability by creating “family-sustaining jobs” and by introducing “hard-to-hire” populations to new skills and training.<sup>29</sup> The NYC Housing and Neighborhood Recovery Donors Collaborative has provided funding to community groups and technical assistance experts to deliver training and expertise on resource deployment for CBOs, institutional capacity building and fostering best practices in weather-related resiliency, and building social capital for high risk communities and vulnerable populations. Addressing a variety of targeted needs, the collaborative is supporting the exchange of human capital resources from experts in the field to local communities.

Together with educational institutions, civil society partnerships are often well equipped to provide training to community groups and residents, in order to build their capacity and equip them with them with the necessary knowledge and skills to carry out the recovery process. Programs, such as MAS’s Livable Neighborhoods or NYC Housing and Neighborhood Recovery Donors Collaborative’s grant programs are creating a transfer of knowledge from

city-wide subject matter experts to local community residents. These initiatives put forth tangible ways for disaster recovery efforts to activate community capacities and extend the impact of recovery spending to produce economic and social benefits.


## RECOMMENDATION 2:

### Allow communities be the drivers of their resilience plans.

Resilient communities are those with the capacity to respond and adapt, and thus residents themselves play an integral role in reacting and responding to unexpected events. In order to effectively strengthen their resilience capacity, local residents must be seen as central agents in the formation, actualization, and funding of the resilience plans.

As residents often understand the vulnerabilities and opportunities in their neighborhoods better than anyone else, local knowledge sharing has the potential to provide key insights for the City's recovery. For example, at our post-Sandy convenings, Gowanus residents repeatedly mentioned that their designated evacuation route relied on a bridge that flooded early on in the storm. Residents from Howard Beach pointed out that while the parts of their neighborhood were told not to evacuate, these same areas experienced heavy flooding.<sup>30</sup> These “on-the-ground” details fill in critical knowledge and operational gaps for disaster-planning. Knowing that this information is available is not enough—by what method can we intake this localized knowledge and use it to inform rebuilding efforts? The recently released Mayor's Special Initiative on Rebuilding and Resilience (SIRR) report: *A Stronger, More Resilient New York* offers community-building and resiliency plans for five generalized areas of the city—Southern Manhattan, the Brooklyn-Queens Waterfront, South Queens, Southern Brooklyn, and the South and East Shores of Staten Island. Integrating grassroots knowledge into these more general plans is an important next step. To this end, preexisting community-based plans offer a starting place for detailed and resident-driven recovery planning. For example, the 197-a plans of Sunset Park, Williamsburg, and Greenpoint contain a comprehensive evaluation of neighborhood assets and vulnerabilities.<sup>31</sup> These plans not only provide a model for inclusive planning, but could also operate as a framework from which to merge localized knowledge and broader, citywide initiatives.

Community members also have a role to play in deciding how outside funding is invested. Yet, bureaucracy can frustrate, if not obstruct, community leadership in rebuilding projects. In fact, the federal Hurricane Sandy Rebuilding Task Force report: *Hurricane Sandy Rebuilding Strategy* noted that there are approximately 40 different permit and review processes among the Federal agencies that can slow rebuilding processes from a few weeks to several years. As a result, a major aim of the Task Force was to compile recommendations that would cut red tape and get assistance “to families, businesses, and communities efficiently and effectively, with maximum accountability.”<sup>32</sup> New York Rising Community Reconstruction Program, a State-led initiative, is aiming to accomplish this by bringing communities into the planning process. By requiring the formation of a Planning Committee that includes, “among others, a representative from the County, Town or Village, elected legislative representatives, local residents, and leaders of other organizations and businesses in the community” and providing each committee with an expert consultant, the program bridges local knowledge and technical expertise, in order to allow communities to develop effectual rebuilding plans.<sup>33</sup> Recognizing the importance of community-driven planning, the State allocated \$25 million



“Those communities that were better organized  
on a civic level were able to respond better”

—Marilyn Gelber, former president,  
Brooklyn Community Foundation,  
Charting the Road to Resilience,  
January 2013



of its first CDBG-DR sum to support NYRCR's efforts in community-based planning.<sup>34</sup> Indeed, the New York Rising program exemplifies a cross-cutting and collaborative approach by integrating federal, state and local efforts into one initiative.

In retrospect, New Yorkers demonstrated a wide range of capacities, dedication, and collaboration in response to Sandy. There are countless examples of impromptu community-leadership actions as residents were transformed into first responders and thrust into the center of recovery efforts. As policies and initiatives evolve, resiliency will depend on how we prioritize the role of the community in the rebuilding process.

### RECOMMENDATION 3:

#### Create Community Hubs that provide resources and programs as well as strengthen the overall social infrastructure of neighborhoods.

Developing particular spaces as “community hubs” enables timely information sharing, and improves the efficiency of case management and the distribution of support. Perhaps more importantly, these central spaces which are civic assets, can provide services and programming when a disaster is not present, and therefore deliver ongoing benefits and further develop social capital within our communities.

This idea for centralized community centers has been suggested by multiple agencies, working groups and organizations. The Sandy Regional Assembly advocated for the creation of “Community Resilience Centers” in at-risk waterfront communities like Sunset Park, the South Bronx, the North Shore and Staten Island. The Assembly envisions these centers to accommodate community meetings, ongoing research, emergency supply distribution as well as any other efforts to reduce local vulnerabilities.<sup>35</sup> The Mayor's SIRR report includes an initiative to create Community Design Centers throughout the City to assist property owners in finding resilient design solutions and municipal resources for rebuilding.<sup>36</sup> Taken together, these initiatives offer a central space where communities plan for both the short-term and long-term challenges of disaster recovery and resilience building.

Community-based social infrastructure also exists in digital forms. Red Hook Initiative WiFi is a collaboratively designed mesh network that was built prior to Sandy and provided critical communications during the immediate recovery period of the storm. As many as 300 people accessed the network daily in the weeks after the storm to communicate with loved ones, read Sandy-related news, and seek recovery assistance.<sup>37</sup> Red Hook Initiative not only meets a logistical need during weather-related crisis, but also serves a social need as it “fosters trust, interdependence, and reciprocity throughout the community, merges digital and physical community spaces, and sparks civic and community engagement by addressing local needs and culture.”<sup>38</sup>

Federal agencies have also turned to digital hubs as critical social infrastructure in times of crisis. After Sandy, FEMA prioritized the standardization and centralization of web content by consolidating all Sandy-related information from the U.S. government onto [USA.gov/sandy](http://USA.gov/sandy). Between October 22 and October 31, this page was viewed 71,000 times and

## FRAMEWORK FOR RESILIENCE

### PRIORITY 2

#### Strengthen Local Capacities

*Strengthen the local capacity of our neighborhoods to respond and adapt to “shocks” of all kinds—economic, social, cultural, and environmental.*

its corresponding widget viewed 2.8 million times. Information about relief and recovery was then consolidated onto FEMA.gov/sandy. Within the aforementioned timeframe, the FEMA page received 740,000 views. In planning to consolidate all Sandy-related material into two central hubs, FEMA helped visitors find information from an authoritative source.<sup>39</sup>

In MAS’s meetings with communities, residents overwhelmingly claimed that the strongest asset of their community was the people. Whether physical or digital, community hubs serve to aggregate residents both in times of crisis and throughout the year to identify shared needs and challenges, and resources to address them. Established hubs and physical spaces for interaction provide places for meaningful relationship building and network-formation that will continually help neighborhoods adapt to ongoing and unexpected pressures. City neighborhoods have traditionally created various kinds of places to act as anchors: local libraries, community centers, health clinics, parks, faith communities, community gardens, and increasingly coffee shops and internet cafes. Local differentiation is important, but the shared need is for a centrally located, well resourced place that can perform many different functions.

#### RECOMMENDATION 4:

### Preserve and reinforce community strengths by involving place-makers, preservationists, and the arts and cultural community into planning and policy decisions.

Further, vibrant neighborhoods are often united by important neighborhood markers such as libraries, fresh food markets, health centers, parks, and plazas. Creating social spaces and even more, using contextual arts and cultural programming to activate them and create a new or renewed sense of place, can strengthen social cohesion and stimulate economic activity. This comprehensive view of recovery underscores the relationship between resilience and livability. Place-making, historic preservation and cultural activities produce the social networking and pride of place that make communities not only resilient but livable as well.

As we rebuild the communities impacted by Sandy and consider the future growth of our city, it is beneficial to examine the interconnectivity of these spaces. As one Rockaways resident suggested, beaches are an important site for creative place-making that also connects local businesses with visitors from the entire City. Along these lines, the City’s SIRR report called for a revitalization strategy that would create retail and community spaces within Red Hook Houses and recreational areas and open space on public coastland in Staten Island.<sup>40</sup> These ideas aim to activate urban spaces with a mix of social, economic, and cultural initiatives. For decades, residents have been attracted to the culture and civic assets offered by these coastal communities. As we rebuild, reimagine even, how these communities can evolve, measures of adaptation and mitigation must be intertwined with methods to preserve and enhance these coastal cultures and civic assets.

As our city continues to grow, the importance of preserving cultural and civic assets in all neighborhoods is critical to our future resilience, because of their role in fostering diversity and creating a sense of attachment to place. MAS’s work in East Midtown and for a new Penn Station challenges New Yorkers to reconsider how we accommodate growth without losing

the places and spaces that make a neighborhood livable. With the accumulated negligence of the public realm in East Midtown and the congested dark corridors of Penn Station, Midtown has lost many of the assets that make a community appealing. To reclaim these values, MAS challenged the design community to envision a new plan for East Midtown and Penn Station that incorporated new designs for the public realm, while also allowing for economic development and growth. Whether rebuilding communities damaged by Sandy or attempting to restructure neighborhoods whose natural character has been lost, planning and design must consider the preservation of the places that attracted residents in the first place, and how to strengthen them with investments in the public realm, and incentives for supportive incremental development.

Another important question is how to approach the City's historic and landmarked buildings. These buildings are irreplaceable and contribute to both the social and physical fabric of communities. Research into the location of the City's historic buildings found that 394 landmarks were in the 100-year flood zone, with the most vulnerable landmarks having industrial, transit and recreational uses.<sup>41</sup> As City staff move forward in assessing and retrofitting these buildings, the cultural and social significance of these buildings is not only an important consideration but an opportunity for broader revitalization.

Using culture as a catalyst, the arts can be used to reinvigorate unused spaces, revitalize downtrodden infrastructure, and heal those suffering from trauma. In Brownsville, the neighborhood with the highest concentration of public housing in NYC, MAS with the Brownsville Partnership, is working to support the role of arts and culture in creating vibrancy and community cohesion. By collaborating with existing cultural institutions, new low-cost and free arts programming can provide neighborhoods with opportunities for collaboration and celebration, and contribute to an enhanced sense of community pride, cohesiveness, economic activity, and vibrancy that will strengthen the capacity and resilience of the neighborhood overtime.

“We must also empower individuals to build their own resilience and the resilience of their communities.”

—Judith Rodin, President, Rockefeller Foundation, MAS Summit for NYC 2013

The impact of trauma on people can also create mental and physical ills that hinder both the recovery of the individual and the process of rebuilding. Long-term rebuilding efforts can use the arts to address the trauma and affect recovery planning in the aftermath of Sandy. Sandy Storyline, a web platform that features firsthand accounts of Sandy through audio and visual mediums, reinforced communities by communicating shared experiences and amplifying local voices and perspectives on the storm. This platform functions as more than an outlet for community members. Indeed, it aims to bring “the human impact into the national conversation about economic inequality, climate change, infrastructure development and



## FRAMEWORK FOR RESILIENCE

### PRIORITY 2

#### Strengthen Local Capacities

*Strengthen the local capacity of our neighborhoods to respond and adapt to “shocks” of all kinds—economic, social, cultural, and environmental.*

the future of coastal cities in America.”<sup>42</sup> As we continue to rebuild post-Sandy, the arts and cultural expression are an essential part of processing storm-related events and also a platform for influencing the recovery process.

#### RECOMMENDATION 5:

### Prioritize action based on the preexisting and ongoing vulnerabilities of New York City’s neighborhoods

Damage and shocks exacerbate preexisting challenges; whether they are social, economic, or environmental. Therefore, recognizing the relationship between preexisting vulnerabilities and restricted capacities will help us plan rebuilding initiatives and investment.

The Metropolitan Waterfront Alliance, Environmental Defense Fund, AIA, and Furman Center have all recommended comprehensive needs assessments for communities so that sewage, building, and transportation vulnerabilities are specifically addressed in resilience planning process.<sup>43</sup> Extending this type of assessment to the social infrastructure of our communities allows us to address the needs and reinforce the capacities of the City’s most vulnerable populations. In other words, how will post-disaster spending meet the housing needs of residents with lower incomes? How will we account for and replace informal and unregistered housing units? And how will the City address the thousands of affordable homes lost in foreclosure?<sup>44</sup> Digging into these questions reveals multiple layers of need that extend beyond post-disaster relief. We have an opportunity to rebuild in a way that empowers the most vulnerable and at-risk communities. Indeed, building the capacities of these communities improves the resilience and livability of the City as a whole.

A strategic approach to restoring affordable housing is the foundation for local capacity-building and creating resilient communities. Secure affordable housing allows residents to put down roots and establish local networks, and ultimately, to form skill sets that fit into the ecosystem of their neighborhood. If the City’s affordable housing stock will not return to pre-storm levels, it follows that many residents may not be able to return to their pre-storm neighborhoods and communities, thereby disrupting the social infrastructure so necessary for their resilience.

Sandy revealed and exacerbated the preexisting vulnerabilities of the City’s public housing. According to the post-Sandy Furman report, 402 New York City Housing Authority (NYCHA), housing about 80,000 buildings owned by residents, were damaged by Sandy. FEMA calculated that 12.1 percent of all residents affected by the storm surge were seniors living alone, many unable to quickly evacuate or navigate stairs after power outages.<sup>45</sup> A stakeholder who attended MAS Road Forward Convening in June 2013 to review the SIRR recommendations stated that “The true measure of disaster management effectiveness is how the city handles vulnerable populations during an event.”<sup>46</sup> Retrofitting NYCHA’s most-at-risk buildings and creating evacuation plans for senior, disabled, and other populations will reduce the relief effort needed after a significant event. More broadly, opportunities to increase the capacity of these populations through social infrastructure and emergency preparedness will serve these vulnerable communities in times of crisis.

Meeting the short- and long-term needs of health-care facilities is another priority. Hospitals are critical resource centers after a storm, but are “only functional when access routes to the facility are open and when availability of water, power, and telecommunications allow continuity of operations and the ability to absorb the additional demand for medical care.”<sup>47</sup> Rebuilding efforts should especially concentrate on how the storm exacerbated poor health services in already disadvantaged communities. For example, patients waited for an average of 24 hours to be admitted into Kings County Hospital in Brooklyn after the storm.<sup>48</sup> When considering how to move forward, hospitals must identify the vulnerabilities they faced during the storm as well as how to ensure staff are cared for, and invest accordingly.

Beyond the systematic vulnerability, we must also consider those population groups that are more susceptible to the dangers a crisis may present. During the storm, more than half of the reported deaths in NYC were among older adults. Elderly and special needs populations are especially vulnerable due to the increased likelihood of chronic conditions, mobility limitations, and social isolation.<sup>49</sup> Multi-organization groups, such as The New York Academy of Medicine (NYAM)’s Older Adults & Disasters Policy Advisory Committee and the Task Force Emergency Planning and Response for Special Needs Populations, are looking at ways we can design and plan for resilience that incorporates the needs of these populations. The creation of neighborhood block captains or “buddy systems” to identify and check on vulnerable populations in the event of a storm can ensure unnecessary deaths and injuries are prevented. Additionally, more coordinated case management services, especially when it pertains to mental health or the distribution of prescription medications, such as to those individuals with diabetes or other critical illnesses, can safeguard that adequate medical treatment is provided to those in need.

In summation, creating resilient communities encompasses more than implanting external solutions or fixing environmental vulnerabilities. Residents in discussions with MAS viewed the rebuilding process as an opportunity to address the economic, social, environmental, and cultural concerns that have challenged our communities for years, maybe decades. Deficiencies such as limited transportation, food deserts, a lack of economic opportunity, and other vulnerabilities not only slow relief efforts but inhibit economic growth, public health and vibrant social spaces in communities. By first addressing these existing challenges, we can choose to rebuild in a way that reinvigorates our communities, while also building the economic, social, cultural, and environmental resilience over time.

## INVEST IN FLEXIBLE AND ADAPTIVE INFRASTRUCTURE

*Strengthen urban systems with innovative design, strategic redundancies, and both soft and hard approaches.*

Improving the social infrastructure in our neighborhoods is critical to resilience. However, the capacity of any neighborhood and its ability to serve its residents substantially depends upon the strength of its physical infrastructure systems. In the aftermath of hurricane Sandy, 800,000 residents were without power. 25,000 emergency-related vehicles were obtaining fuel from 3 gas stations. Thirty seven blocks of boardwalk suffered severe damage.<sup>50</sup> Eight subway tunnels were flooded. Water damage had affected 70,000-80,000 homes in New York City.<sup>51</sup> And 11 billion gallons of untreated or partially treated sewage had flowed into rivers, bays, canals and even city streets.<sup>52</sup> The effects of the storm ranged from disruptions to the City's large-scale systems (like transportation, electricity, and sewage) to those of individual neighborhoods or buildings. But beyond ravaging individual sites for repair, Sandy revealed the weaknesses and interdependencies of the City's infrastructure on various scales.

A resilient approach to rebuilding invests in physical preparedness and protection while also recognizing the limitations and the uncertainty of future events. As stated in the *NYS 2100 Commission* report, "Our capacity to deal with known risks, while establishing countermeasures to contend with unknowns, will be critical in the coming century."<sup>53</sup> Adaptable and flexible systems often seem at odds with the multibillion dollar, long-term infrastructure projects. So the question emerges: how do we strengthen the critical systems that sustain our livelihood while also preparing for the unknowable shocks to those very systems? The answer lies in initiatives that are multilayered and that re-imagine both the City's physical and social capacities.

To this end, we advocate for creating redundancies in various systems to lessen our dependence on a singular infrastructure. Also, it is critical to bring together communities, practitioners, and funding streams to mobilize innovative materials, rebuilding methods and soft infrastructure within all areas of the City. Indeed, truly resilient infrastructure is rooted in a social and eco-conscious perspective. In other words, a resilient strategy for physical preparedness is also integrated with the ongoing recovery efforts and long-term planning for the New Yorkers with the greatest need and with the natural environment. New or improved infrastructure that integrates green practices and new recreational and public spaces can reduce risk, and increase livability, while also mitigating climate change and providing additional public benefit. A multifaceted approach improves our resilience through creating opportunities for redundancy, while adding additional social and ecological benefits to our neighborhoods, boosting both livability and resilience.







## FRAMEWORK FOR RESILIENCE

### PRIORITY 3

Invest in Flexible and  
Adaptive Infrastructure

*Strengthen urban systems with  
innovative design, strategic  
redundancies and both soft and  
hard approaches.*

### RECOMMENDATION 1:

## Strengthen transportation network with various methods and routes of transportation.

In resilience terminology, this strategy is otherwise known as building in “system redundancies” that help ensure more flexibility for transit users in times of crisis. Creating “system redundancies” is a measure advocated by all levels of governmental authority. The Mayor’s SIRR report identified how expanding services was critical for creating a more flexible and resilient system.<sup>54</sup> The New York state’s *NYS 2100 Commission* report emphasized that providing multiple modes of travel would decrease the disruptions to the overall network in the event of individual systems fail.<sup>55</sup> In the AIA’s report, *Post-Sandy Initiative: Building Better, Building Smarter: Opportunities for Design and Development*, they extended the importance of redundancy to also include communications networks, such that “developing a robust communications network and plan will allow transportation agencies to alert the public about station closings and alternate transportation routes, prior to and immediately after severe storm events.”<sup>56</sup> Indeed, there is widespread agreement that making New York City’s transportation system more resilient involves a multilayered network with myriad types of transit. It is obvious how this strategy would also improve the daily quality of life for New Yorkers.

One opportunity for redundancy is to expand the city’s “Select Bus System.” Other cities have proven enhanced versions of this approach (more commonly known as “Bus Rapid Transit” or BRT) to be very successful outside the scope of disaster relief. In full capacity, BRT brings the speed, reliability and amenities of mass transit to the bus system. But unlike the installation of new subway tracks, BRT is lower in cost, provides more flexibility, and can be implemented in a shorter timeframe.<sup>57</sup> During the storm, the DOT actually mobilized an impromptu version of a BRT system by establishing bus-bridges between Brooklyn to Manhattan.<sup>58</sup>

“You had issues everywhere, you had no subways coming across from Brooklyn to Manhattan, so we needed to set up a new surface subway system. We worked with the MTA—we’d set up the bridges, so why not some bus bridges?—and the NYPD got their people out there to enforce that.”

—Janette Sadik-Khan, Commissioner of the New York City Department of Transportation, in the Rudin Center for Transportation.  
*Transportation During and After Hurricane Sandy*, NYU Wagner Graduate School of Public Service, November 2012. p. 17.

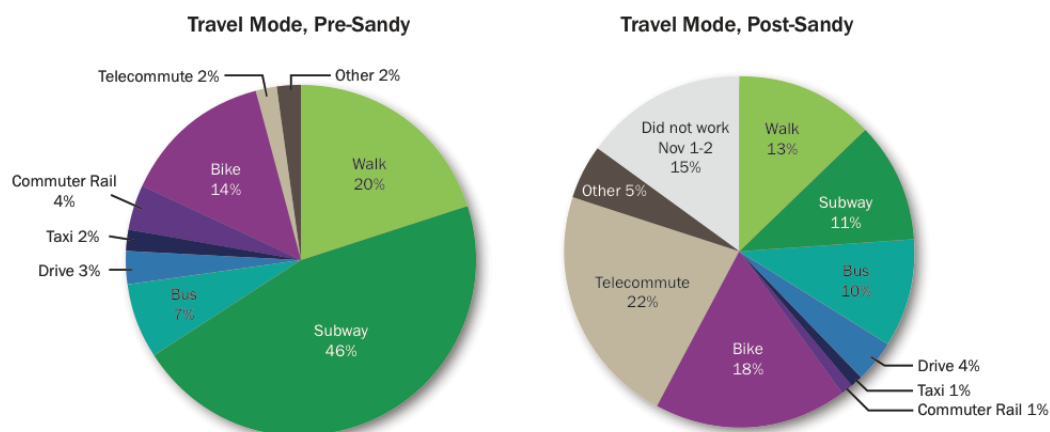
While the City responded quickly to the transportation disruptions following the storm, the immensity of issues that occurred highlighted the need for more redundant systems. As expressed by Janette Sadik-Khan in the Rudin Center’s report, *Transportation During and After Hurricane Sandy*, “You had issues everywhere, you had no subways coming across from Brooklyn to Manhattan, so we needed to set up a new surface subway system. We worked



FIGURE 3:  
TEMPORARY “BUS BRIDGES”  
(NONSTOP BUS SERVICE) AF-  
TER SANDY

with the MTA—we’d set up the bridges, so why not some bus bridges?—and the NYPD got their people out there to enforce that.” Regardless of the capacity of people and agencies to respond, without multiple layers and room for failure, physical disruptions will occur.

Agency-led initiatives can build upon and work in tandem with community-based efforts and local needs of New Yorkers. Of particular interest is the increased utilization of bike infrastructure post-Sandy. After the storm, about 20,000 New Yorkers, who normally relied on other forms of transportation, commuted to work via bike. At the same time, bike shop owners met bike-transit needs by opening bike stores (even without electricity) and providing safety information. Transportation Alternatives, a bicycle advocacy group, created commuter stations to pump tires and answer questions, and thus help New Yorkers become cyclists in a matter of minutes, providing another example of where civil society demonstrated its adaptability and rallied behind existing or experimental redundancies in times of crisis.<sup>59</sup> The Rudin Center’s data demonstrates this point:





## FRAMEWORK FOR RESILIENCE

### PRIORITY 3

Invest in Flexible and  
Adaptive Infrastructure

*Strengthen urban systems with  
innovative design, strategic  
redundancies and both soft and  
hard approaches.*

Residence Location	Pre-Sandy Commute Time (minutes)	Commute Time Nov. 1-2 (minutes)	Average Frustration Level
Brooklyn	42	86	3.93
Manhattan	29	52	2.97
Queens	45	47	3.00
Bronx	41	63	2.14
Staten Island	84	240	7.00
New Jersey	52	69	5.67
Northern Suburbs	73	61	2.40
Long Island	85	85	2.00

From this data, we can see how New Yorkers adapted to disruptions in their normal transit routines, with limited frustration.

This being said, the adaptability of New Yorkers extends only so far, especially for residents who already live in disconnected areas or experience socioeconomic disadvantages, as is the case in many of the coastal communities impacted by Sandy. In these neighborhoods, redundant systems can ensure a swift recovery after any catastrophic event, while also providing additional points of access and opportunities that can diminish the isolation of the neighborhood in the long term. Residents in our convenings provided detailed information about the transportation limitations in their neighborhoods. In particular, residents of Greenpoint, Gerritsen Beach, and the Far Rockaways claimed that limited transportation and isolation were primary concerns. More specifically, residents of the Far Rockaways emphasized that their neighborhood still lacks 24-hour transportation. In Gerritsen Beach, residents observed that the intense congestion during evacuation could be improved by expanding neighborhood access routes. Staten Island, South Brooklyn, and Rockaway residents all mentioned that transportation issues not only caused mobility and aid concerns post-Sandy but also limited the flow of economic activity into their neighborhoods.<sup>60</sup>

The disruptions in transport that occurred post-Sandy highlight many of the vulnerabilities these communities have faced on a day-to-day basis. Therefore, creating redundancies in New York City's transportation system has the potential not only to sustain the City in times of disaster, but also to contribute to economic growth and enhance the quality of life for New Yorkers in real time.

### RECOMMENDATION 2:

**Develop innovative and scalable solutions to how we rebuild, with special attention paid to public housing.**

Making New York City's buildings more resilient should happen, we argue, through a combination of approaches. Updating building codes and implementing new flood-proofing design are necessary, but solutions extend to more granular approaches and contingency plans. "Multiscale resilience is fundamental for understanding the interplay between persistence and change, adaptability and transformability."<sup>61</sup> Resilience requires flexible measures that can be utilized at different scales and varying levels of investment.

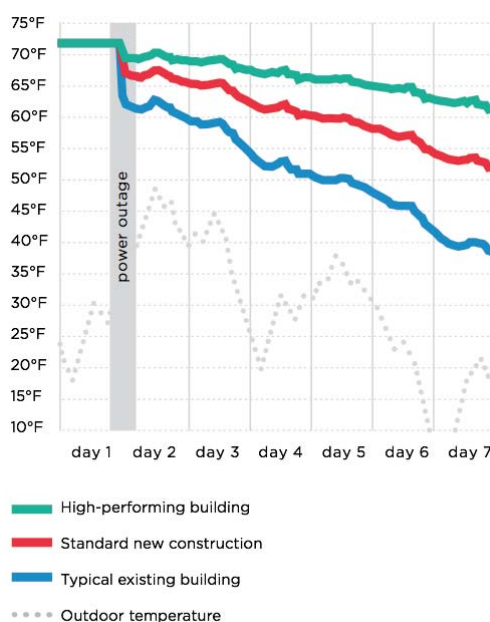
In order to understand what resilience measures are necessary, a comprehensive understanding of our buildings is required. It is important to note that the city’s most vulnerable buildings were one story, combustible, and constructed before the 1961 Zoning resolution and the 1983 FIRM standards. After the storm, 72 percent of buildings that met these criteria within the inundated area were completely destroyed.<sup>62</sup> This data underscores how retrofitting buildings to the latest standards will go a long way in making New Yorkers homes and businesses more resilient.

“We must also empower individuals to build their own resilience and the resilience of their communities.”

—Urban Green Council New York. *Building Resiliency Task Force*,  
The U.S. Green Building Council, June 2013.

Yet many buildings encountered difficulties apart from flooding. In particular, NYCHA’s housing projects experienced mechanical or engineering failures. As a result, many of the City’s most vulnerable residents were more or less “stuck” without power or food. Indeed, Sandy exposed risks that are particular to urban environments of high-density. As the Urban Green Council’s *Building Resiliency Task Force* noted, “While there is much to learn from other, storm-prone parts of the country, our high-density city—which contains 11 percent of the nation’s multifamily building residents—will need to find its own way.”<sup>63</sup> To this end, deploying multiple layers of initiatives is critical to making the City’s buildings more resilient. NYCHA is currently working to “flood-proof” its buildings, and the City has committed \$108 million in CDBG funding to enhance power resiliency in NYCHA’s most vulnerable buildings through emergency generators or alternative methods.<sup>64</sup> As noted by the Regional Assembly, making these housing buildings more resilient also involves better understanding of what contributed to mechanical failures through risk assessments and building-by-building audits.

But buildings should also have a plan for when the power goes out. How can residents get water without power? And how can windows, doors, and roofs be insulated to keep indoor temperatures bearable?<sup>65</sup> These questions illustrate how communities could provide useful knowledge for what small measures can be taken to increase the flexibility of our buildings in times of crisis.



INDOOR TEMPERATURES IN A MASONRY BUILDING AFTER A WINTER BLACKOUT

Source: Atelier Ten & Urban Green Council

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Through IOBY's crowdfunding platform, for example, participants proposed creating a "buddy program" to account for residents in large apartment buildings.<sup>66</sup> Similarly, the Regional Assembly recommended registering elderly and/or disabled residents public housing. If acted upon, these proposals would create a multilayered system to support New York City high-density urban fabric. Further, soliciting resident input concerning small retrofits that could improve the performance of individual units would generate a myriad of affordable prospects.

### RECOMMENDATION 3:

#### Continue to restore the City's natural infrastructure along the waterfront and beyond.

Constructing and maintaining waterfront parks, trees, wetlands, barrier dunes, and porous infrastructure will help to diminish the effects of storm and water damage. Strategically using this "soft" infrastructure encourages natural systems that mitigate climate change, while also creating opportunities for recreation and new public space. The City has been investing in "green" infrastructure since the 1990s with its Greenstreets project supported by the Department of Parks and Recreation (DPR) and the Department of Transportation (NYCDOT).<sup>67</sup> This project transforms asphalt areas into green landscapes, which serve to absorb storm water. During Sandy, the City tested a Greenstreet's site in Cambria Heights, Queens, that was specially designed to catch run-off from the adjacent streets. The site retained 100 percent of the total inflow water of an equivalent to 40,000 gallons, or 31 times its catchment area.<sup>68</sup> Additionally, the Greenstreets program benefits the environment by decreasing the urban heat island effect, increasing pedestrian and street traffic safety as well as beautifying the City's neighborhoods.

Restoring the City's wetlands also increases its physical resilience. PlaNYC, released in 2007 and updated in 2011, recognized the importance of wetlands with its goal to preserve and create 146 acres of wetlands in New York City. During the storm, these wetlands absorbed storm water and thus helped to protect upland communities from flooding. One example is the Little Neck Bay's Alley Creek, which acted as a container for the increasing tide and confined flooding to the wetland system.<sup>69</sup> Besides absorbing floodwaters, preserving wetlands also prevents these low-lying areas from being developed for more vulnerable uses like housing or critical infrastructure.

Lastly, restoring and maintaining the City's natural infrastructure is an investment that reaps economic returns. With 90 percent of New York State's population centered on the Atlantic Ocean, the waterfront sustains tourism, water-based commerce, fishing, and residential development.<sup>70</sup> Furthermore, the City's waterfront is a recreational asset for all New Yorkers. The City has established several initiatives to maintain its beaches, reinforce its coastal areas and modify shoreline parks for the protection of nearby communities.<sup>71</sup> We must act quickly to identify, and fortify the communities with the least coastal protection remaining after Sandy. Indeed, the strategic use of natural infrastructure will make the City more resilient while also creating a greener, more livable urban environment.





## FRAMEWORK FOR RESILIENCE

### PRIORITY 3

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### RECOMMENDATION 4:

#### Invest in strategic planning and improvements for telecommunication infrastructure.

These systems are critical to the safety of New Yorkers, especially in times of crisis, and serve as a vital link between residents-in-need and help-on-the-way. During Sandy, storm surges in lower Manhattan damaged Verizon's main telephone infrastructure, and high winds damaged overhead lines through the City. In addition, power outages shut down cellphone towers, which rely on commercial power. As a result, areas throughout all five boroughs were without landline or cell phone service for days.<sup>72</sup> In the aftermath of the storm, the City brought in "mobile cell platforms," "cell light trucks," and charging stations for first responders and communities in need.<sup>73</sup> Civil society also stepped up: Crisis Commons' Disaster Tech Lab responded to the disruptions in telecommunications by mapping available WiFi and power outages.<sup>74</sup>

In the future, the City plans to use its regulatory powers to enforce higher standards for service providers as well as to relocate telecommunication rooms to reduce the risk of flooding.<sup>75</sup> Just as redundancies create more adaptive transportation systems, redundancy in telecommunications infrastructure provides alternate paths for service during times of crisis. From this perspective, the City aims to build redundant conduit infrastructure while also encouraging multiple providers and back-up systems in buildings.<sup>76</sup> Complementing these digital systems with analog communications creates additional system redundancies and helps to reach those populations excluded by technical or income barriers in the digital divide. Though planning for sustained 3G and WiFi services is essential, the City has to consider populations that still rely on analog systems or POTS (plain old telephone service). Recognizing the "digital divide" will help to ensure that the most vulnerable populations, such as elderly or low-income residents, are able to communicate whatever the circumstance. Additionally, all of these options and redundancies must account for the multicultural composition of our city and our neighborhoods by offering these services in translation. Much like other infrastructure systems, a resilient telecommunication network will involve more than protecting facilities. It involves developing system redundancies, understanding a variety of local needs, and utilizing grassroots communication methods.

## 4

## LEAD WITH POLICIES THAT SUSTAIN RESILIENCE

*Develop policy that informs future resilience planning and creates a culture of resilience throughout the region.*

Superstorm Sandy revealed the detrimental impacts of our certain key historical planning decisions, like siting public housing in low-lying areas, and the challenges to the region's preparedness. Social and physical structures were threatened, and even damaged by the storm, due to inconsistencies between the policies that guide the City's development and the increasing risks of climate change. From physical planning constraints to the terms of their insurance policies, many residents and communities felt ill-equipped in preparing for the storm and knowing how to recover in the days, weeks and even months after. As mentioned earlier, 98 percent of the destroyed buildings were constructed before 1983, when New York City incorporated flood-proofing requirements into the Building Code. And the immensity of damage in the large concentration of "public housing projects along the water, in areas like the Rockaways, Coney Island, Red Hook and Alphabet City<sup>77</sup>" made quite clear the legacy of planning decisions that often placed vulnerable populations in harm's way.

A resilient approach to policy changes expands the strategy beyond relief efforts to creating a culture that is responsive and proactive, both in government and on-the-ground. In retrospect, the damage left by Sandy demonstrates the importance of governmental policies that guide and enhance the City's resiliency.<sup>78</sup>

Learning how to manage the risks of climate change is important -- from fostering public awareness of sustainable and resilient practices to providing guidance on specific issues, like insurance or FEMA's Advisory Base Flood Elevation (ABFE). Education empowers communities to be a part of rebuilding a resilient city by bridging top-down decisions with real-life application. Indeed, the government should support community leaders in making their neighborhoods, homes and workplaces safe. Policy can establish ongoing educational programs that build upon the skills of local leaders, provide tools and training for communities, and foster an awareness of resiliency. Furthermore, policy should also provide a foundation for how we rebuild by establishing regulatory frameworks, strategic planning for at-risk areas, and articulating interagency relationships and dependencies.

As new policies emerge after Sandy, local feedback based on personal experiences from Sandy can inform the conversation. In this way, policies can continue to evolve and endure while also serving the needs of its users. Procuring information from individual Sandy experiences and collaborating with on-the-ground stakeholders can create transparent decision-making processes. Additionally, developing policy that accounts for this multitude of voices will create future flexibility and accommodate diverse populations.



## FRAMEWORK FOR RESILIENCE

### PRIORITY 4

Lead with Policies That  
Sustain Resilience

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throughout the region.*

### RECOMMENDATION 1:

## Create a culture of readiness by educating the public and partnering with organizations to raise awareness about resilience.

At MAS's January convening, *Charting the Road to Resilience: From the Ground Up*, William Fritz, the president of Staten Island College, offered his five-point plan for resilience – The first four points focus on infrastructure improvements to protect our neighborhoods; however, none of these actions could be successful without his final point: “Educate the Public.” Before Sandy hit, New Yorkers did not understand the potential impact of the storm, nor did they understand the necessary preparations they needed to make in order to stay safe. “Despite extensive communications before the storm, many residents of Zone A chose not to evacuate.”<sup>79</sup> In fact, among those who did not leave, 50 percent believed the storm was not strong enough to pose any real threat. Months after the storm as residents have begun to rebuild, many are encountering misunderstandings of new kinds, as they struggle to understand FEMA's ABFEs, insurance, and how to prepare for the next storm. The importance of the general public understanding their risks and having knowledge about how to respond and recover is critical to public safety and effective implementation of resiliency plans. Broad or targeted education about resilience can be offered through various means and strategic partnerships. Design, social media, and tailored school curricula all provide opportunities to teach the general public about preparedness and resilience.

Government-led programs and funding can incorporate education to make the best use of its program and ensure effective implementation. New York State, for example, has stepped in to educate and assist residents with their insurance policies. The State's *NYS 2100 Commission*, report gives an overview of the key areas where people are uninformed or misled with regard to their insurance policies and coverage. In response, the report calls for the Department of Financial Services to “create a consumer education and disclosure initiative” that will ensure clarity and transparency for statewide customers. This education-based policy would build upon similar efforts that mandate clear disclosure in mortgages and other financial services. For example, the Dodd Frank Act requires “consumer-facing materials” to use plain and clear formatting and language that “succinctly explains the information that must be communicated to the consumer.”<sup>80</sup>

A combination of interdisciplinary collaboration and then public education communicating it and can help residents make the decisions and the necessary investments for rebuilding.

The use of social media is another key platform from which to educate the public about resilience. Before and after the storm, public agencies were already utilizing social media platforms such as Twitter, Facebook, and other websites to make announcements and educate the public about disaster preparedness. Twitter also served political leaders as a way to confirm information and interact with the public.<sup>81</sup> In line with Homeland Security's report on utilizing social media in times of crisis, *Lessons Learned: Social Media and Hurricane Sandy*, we see a need for cross coordinated information sharing between governmental entities and ad hoc or non-governmental groups and community “start-ups.” Moving forward, State and local agencies can create the guidelines for using these nontraditional platforms to educate the public in the event of weather-related disasters. Moreover, the widespread use of these platforms provides opportunities to explore how they could contribute to a culture of resiliency year-round.





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Innovative and integrated design is another avenue for public education. The Center for Urban Pedagogy (CUP) has developed a Public Access Program that uses accessible design to distill institutional processes and thereby empower members of the public to successfully engage and have not “get” their needs met. Pairing together graphic designers with community groups, CUP’s programs find ways to create educational and effective outreach to residents in need. Their brochure on “Rents, Rights and Repairs,” for example, educates NYCHA residents about housing court, navigating the repair process and avoiding eviction. In addition, the brochure is colorful and engaging, using plain language and simple visuals to break a complicated process down into manageable pieces. Partnerships between graphic designers, artists, and community groups or government agencies, can help translate complex issues into accessible information in order to help residents and neighborhoods navigate the processes required for resiliency. Furthermore, designers can be challenged to create tool kits and guides for building resilience and educating the public.

FIGURE 4:  
CENTER FOR URBAN  
PEDAGOGY (CUP).  
RENTS, RIGHTS  
AND REPAIRS PAMPHLET.



Design can also be woven into the urban fabric to create ongoing public awareness of resiliency. Residents in our convenings suggested that public signage be used to educate and inform. A Greenpoint resident suggested that the City should mark the 100-year flood plain on streets and lampposts in yellow paint. Another resident suggested highly stylized evacuation route signage near waterfront developments. Indeed, we should explore many methods of communicating critical information about storm relief to cultivate a culture of readiness and help mitigate complacency from residents living in potentially unaffected areas.

Finally, an integration of emergency preparedness, climate change, and resilience into youth and public school curriculum can create a cultural shift that begins with our younger generations. Shortly after the storm, The New York Times Learning Center offered a series of lesson plans to provide students with information about Sandy. Covering such topics as *Surviving Disasters as a School Community*, *Hurricane Science and Math*, *How Do We Plan for Next Time?*, and *Charting the Far-Reaching Effects of the Storm*, the lessons sought to comfort, prepare and inform students through education.<sup>82</sup> Moving forward, education can be a powerful tool to protect and prepare populations for potential threats of all kinds, as well as equip them to participate in the resiliency process.



## RECOMMENDATION 2:

### Develop a long-term planning process for coastal properties.

Climate change will continue to affect weather patterns and potentially alter the landscape of our city. From this perspective, a resilient approach requires careful research and comprehensive planning for the City's most vulnerable and flood-prone areas. Agencies at various levels of governance are working together to create a strategy for growth that is cognizant of the risks of future storms. By incorporating grassroots ideas and input, we can seek to reframe the too often constricted debate of relocation versus rebuilding. Integrating education and policy to provide a multitude of options and considerations for rebuilding can put informed decision making processes into the hands of communities.

It is well understood that any “decision to engage in managed retreat would face significant legal, political, and practical challenges.”<sup>83</sup> In addition to policy requirements, social challenges, and decade's worth of personal attachment to place make it an even more difficult decision for residents to leave behind their homes and communities. When considering how we rebuild, it is critical to understand the long-term impacts these communities may be facing. Furthermore, residents must be aware of choices they have when considering whether to rebuild or relocate, and how.

Federal agencies want to provide state and local governments and organizations with resources to help communities better understand the long-term effects of climate change. To this end, the first recommendation laid out in the President's Hurricane Sandy Rebuilding Task Force was to develop and equip recovery planners with a “climate resilience tool kit” that would help to inform where and how to rebuild.<sup>84</sup> This tool would equip the community with the tools and resources to be the drivers of the planning decisions. The second recommendation of the report was to establish a “minimum flood risk reduction standard.” This would require rebuilding projects funded by Federal dollars to meet FEMA's flood-proofing standards.<sup>85</sup> These overarching implementation standards help to ensure the consistency and longevity of rebuilding efforts. Yet, these wide-ranging policies must be accompanied by instruction and flexibility to accommodate special circumstances within certain communities. A sound combination of community-used decision-making tools and stringent government-led policy can help to protect communities in the long term.

While governmental agencies must plan for and establish policies concerning the reconstruction of coastal properties, they must also understand public resistance to relocation and the obstacles communities face in various rebuilding scenarios. According to an AP survey, residents in New York State showed much greater support for rebuilding (80 percent) as opposed to relocating (61 percent). Even those affected by Sandy supported rebuilding over relocation.<sup>86</sup>

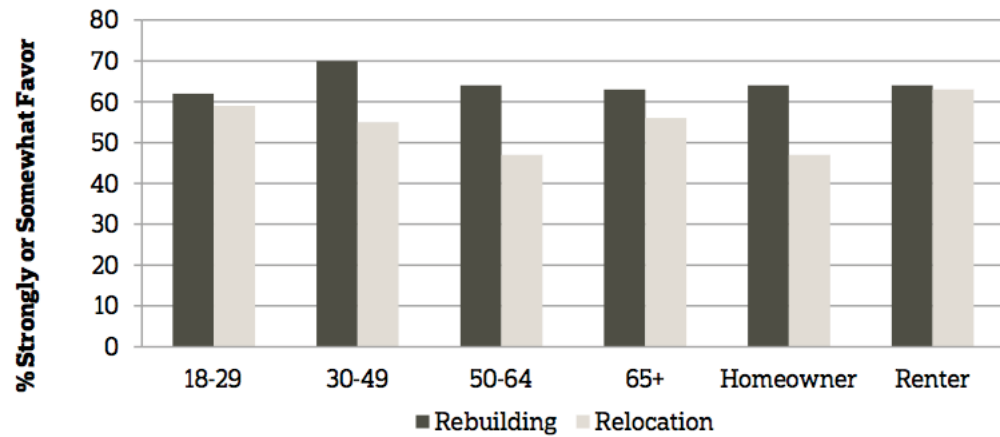
New York State has offered a voluntary buyout program for residents who choose to leave their homes in flood-prone areas. While most residents have opted to rebuild, rather than relocate,<sup>87</sup> one group of residents in Oakwood Beach, Staten Island have created a committee to inform neighbors about the program, educate them about their options, and create an opportunity for collective decision making. The Oakwood Beach Buyout Committee is made up primarily of residents living in the “natural area referred to as the blue belt that

## FRAMEWORK FOR RESILIENCE

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Source: The Associated Press and NORC. *After a Disaster Strikes: Public Opinion on Rebuilding and Relocation Policies*. The Associated Press-NORC Center for Public Affairs Research, July 2013. pp. 1-2

serves Staten Island as a storm water retention area,” and is prone to flooding even during less-severe rain water events.<sup>88</sup> The committee directs “its efforts by first educating local public officials as to the many reasons the target areas qualifies for the Program, and then helping officials facilitate the Program application process by communicating with residents and collecting information.” Through community-driven education, outreach, and decision making the group is hoping to recruit all 165 homes in the target area into the program. In this circumstance, government policy has provided options for communities living in vulnerable areas. However, it is the community that has taken the decision-making process into their own hands.

It is critical that communities are given options based on informed policy making when choosing whether to rebuild or relocate. Yet more important, these programs must include education and full disclosure about the options and their long-term implications. Included in this education must be information about how to build resiliently if they choose to stay, how to prepare for the next event, what the potential impacts of future events may be, and any additional financial implications associated with these concerns. With retreat, residents should understand the true value of their property, their options for relocation, and how the land they are giving up will be used in the future. Agencies at all levels are considering these concerns when planning for future development and growth. However, when making these difficult decision around how and where we rebuild, those communities who will be impacted must be at the center of the decision-making process.

### RECOMMENDATION 3:

## Reform zoning and building codes to incorporate resilience and promote livability.

Modifying current zoning and building codes is an opportunity to encourage the best practices in resilient building and ensure future development meets revised minimum resiliency standards. At the same time, zoning and building codes also provide an opportunity to reinforce the livability of our neighborhoods, by preserving and promoting active street life, historical character and architecture, green building techniques, and an accessible public realm. Following Sandy, there is a need to reconsider and revise our zoning ordinances and building codes to incorporate resiliency measures to protect our communities and infrastructure. Furthermore, zoning law that incorporates resiliency standards will help address the difficult questions of where to build, expand, demolish, or preserve. These measures cannot happen at the cost of livability. Instead, inventive revisions that integrate resilience and livability must be realized. Learning from the experience of Sandy, and incorporating best practices in green building, resilience protection, public space planning, and historic preservation into new and revised zoning laws, and building codes can help protect future generations, save multitudes of dollars in infrastructure repairs, and stimulate the ongoing vitality of our communities.

In the “Zoning and Regulatory Issues” breakout session at MAS’ January convening, zoning experts from the Citizens Housing and Planning Council, Pratt Institute, Community Board 1, and Rutgers University, discussed the need for zoning that “allows, incentivizes, and mandates.” This means that zoning policy must be revised to be more flexible and provide different services in different areas. Depending on the area this may be “protection:” zoning to promote or mandate specific building types or infrastructure that mitigates surge or flood damage; “accommodation:” zoning to allow adaptive reuse for retail spaces and ground floors in flood-prone areas; or ‘retreat and restoration:’ zoning to promote relocation and allow land to be replaced by natural infrastructure.<sup>89</sup> Revised zoning ordinances can certainly affect future development, however, we also need to envision new ways for how we protect and accommodate older development. For example the Department of City Planning’s recently adopted Flood Resilience Zoning Text Amendment enables new and existing buildings throughout designated flood zones to meet the latest standards for flood-resistant construction.”<sup>90</sup> At the same time, the amendment “removes additional impediments to flood-resistant construction,” and modifies regulations to mitigate potential negative effects on the streetscape and public realm.<sup>91</sup> Zoning can be a powerful tool for improving the resilience of our buildings and future development. For instance, as recommended by AIA’s report, zoning could allow for more flexibility in storing and locating mechanical and electric equipment away from flood-prone areas.<sup>92</sup> However, it is crucial that any reforms for resilience promote, rather than stifle, contributors to livability.

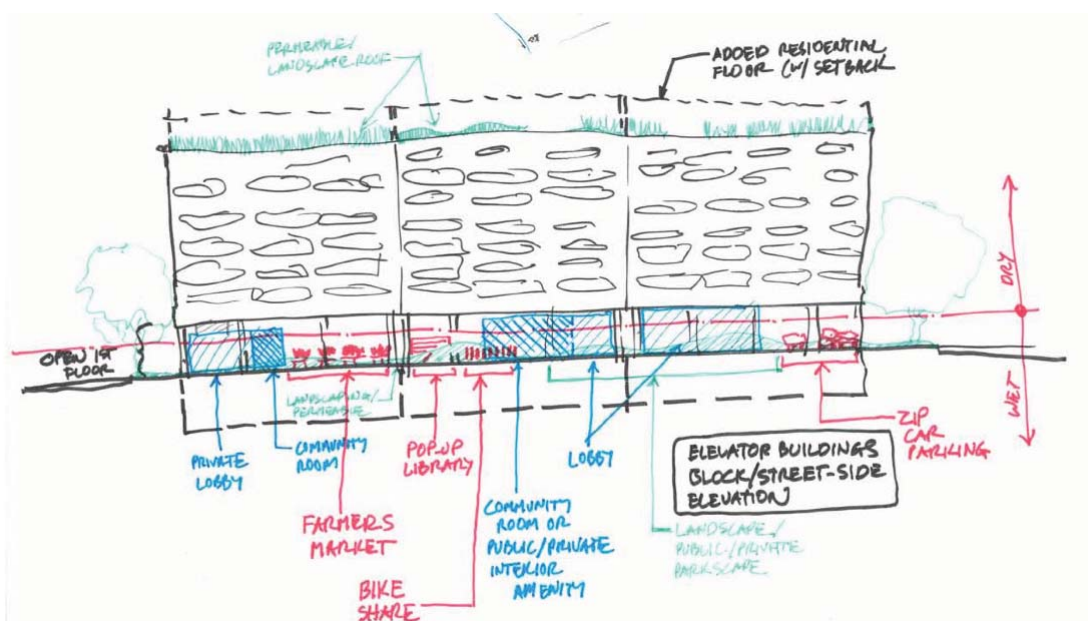
Formalizing flood resilience into standard building codes and creating more stringent codes in vulnerable areas will produce stronger buildings that are less susceptible to damage from severe events and reduce future costs. The Governor’s *NYS 2100 Commission* report stressed the need to use formalized ordinances to ensure weatherization of existing building stock and more resilient building design in new construction.<sup>93</sup> The Hurricane Sandy Rebuilding Task Force specifically advocates for at-risk areas to adopt and enforce the most current





version of the International Building Code (IBC) and International Residential Code (IRC) so that “the most resilient structures are built and that communities are better protected from all types of hazards and disasters.” Indeed, by mitigating homes and building from the future effects of climate change, homeowners and proprietors save in the long run: “Research has shown that every dollar spent on mitigation saves three dollars in potential loss.”<sup>94</sup> Additionally, the private sector can reduce risk, insurance rates, and maintenance costs by proactively adopting the IBC and IRC codes.<sup>95</sup> As policies encourage a proactive and standardized approach to building and zoning codes, these resilience-driven measures also result in more affordable choices for our homes and office space, creating a more livable city.

Creating opportunities to implement building codes at different scales can allow building owners and community members to initiate decisions around the resilience and livability of their neighborhoods. The AIA recommends increasing the scale of flood-proofing measures from the building to permit “block-wide proofing.” This collective solution would bring together individual resources and resiliency-planning to increase protection for the community as a whole. For instance, the Urban Green Council’s *Building Resiliency Task Force* report offered a number of mandatory proposals, from relocating and protecting building systems, to planting wind and flood resistant trees, to providing safety lighting in residential stairwells and hallways that would improve the safety, resiliency, and overall energy use of new and renovated buildings. Additional recommended code reforms, including making the capture and retention of storm water, cogeneration, and the use of solar energy and temporary generators, would further increase the building’s ability to bounce back, while also mitigating climate change and advancing the building’s livability. When creating revisions to building codes and ordinances, reforms that can provide multiple benefits, such as improved public spaces, energy use reductions, and green building standards, can help to build resilience, reduce cost, and improve the livability of our communities over time.



Source: American Institute of Architects New York (AIANY). Post-Sandy Initiative: Building Better, Building Smarter: Opportunities for Design and Development, May 2013.

## FRAMEWORK FOR RESILIENCE

### PRIORITY 4

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### RECOMMENDATION 4:

## Take a Regional Approach to Resilience Planning.

The response to Sandy underscored the vast array of agencies and interdependencies that must be involved in disaster planning and response. The report from the Hurricane Sandy Rebuilding Task Force pointed out the interconnections between fuel terminals in New Jersey and fuel availability in New York City, between local and statewide infrastructure and between natural infrastructure and various coastal communities of different cities and states<sup>96</sup>: “Natural disasters do not respect State or local boundaries, thus rebuilding plans cannot be bound by jurisdictional lines.”<sup>97</sup> Policies that recognize these interdependencies will lead to more adaptive and ultimately functional systems. An “All hands on deck” approach to building the resilience of our region cannot be limited to city or state boundaries—regional partnerships and strategies must be created to exchange scalable solutions across boundaries and implement resilience across regional systems. Opportunities for regional convening—and approaches to “governance” rather than government—can spark discussion about the critical overlaps in resiliency planning, and begin to create the necessary partnerships and collaborative solutions that are required to implement regional system changes.

The Federal Hurricane Sandy Rebuilding Task Force had the unique opportunity of looking at the region as a whole to determine how Sandy’s funding should be spent and prioritized. One of their primary goals was in “coordinating the efforts of the federal, state and local governments and ensuring a region-wide approach to rebuilding.”<sup>98</sup> This includes recommendations for “providing a forum to coordinate and discuss large-scale, regional infrastructure projects and map the connections and interdependencies between them, saving money and getting better results for all levels of government.”<sup>99</sup> As mentioned, the Task Force created the Rebuild by Design Competition to experiment with an innovative trans-boundary approach to develop regionally scalable solutions to increase resilience. The RBD approach of encouraging cross-collaboration between New York, New Jersey, Connecticut, Rhode Island, and Maryland as well as between architects, planners, designers, ecologists, economists from around the globe, and communities from around the region may prove an effective intervention to stimulate more effective, cross-jurisdictional solutions: time will tell.

Some community groups and organizations are also experimenting with ways to work together regionally. Coalitions such as the Sandy Regional Assembly, or organizations such as NY-NJ Baykeepers, include diverse constituencies of New York and New Jersey community groups seeking to improve the region’s resilience and ensure the health of the Hudson-Raritan Estuary. Considering the shared resources of our waterways, ecosystems, and large-scale infrastructure, it is critical for neighboring towns, states, and regions to collaborate in building resilience. Additionally, the development of strategic partnerships facilitates the exchange of best practices and scalable solutions from one town to the next. Creating truly resilient cities and communities requires a full-systems, coordinated, and integrated approach, irrespective of political boundaries, which are ecologically meaningless.



“Natural disasters do not respect  
State or local boundaries, thus  
rebuilding plans cannot be bound  
by jurisdictional lines.”

—Hurricane Sandy Rebuilding Task Force. *Hurricane Sandy Rebuilding  
Strategy: Stronger Communities, A Resilient Region.*  
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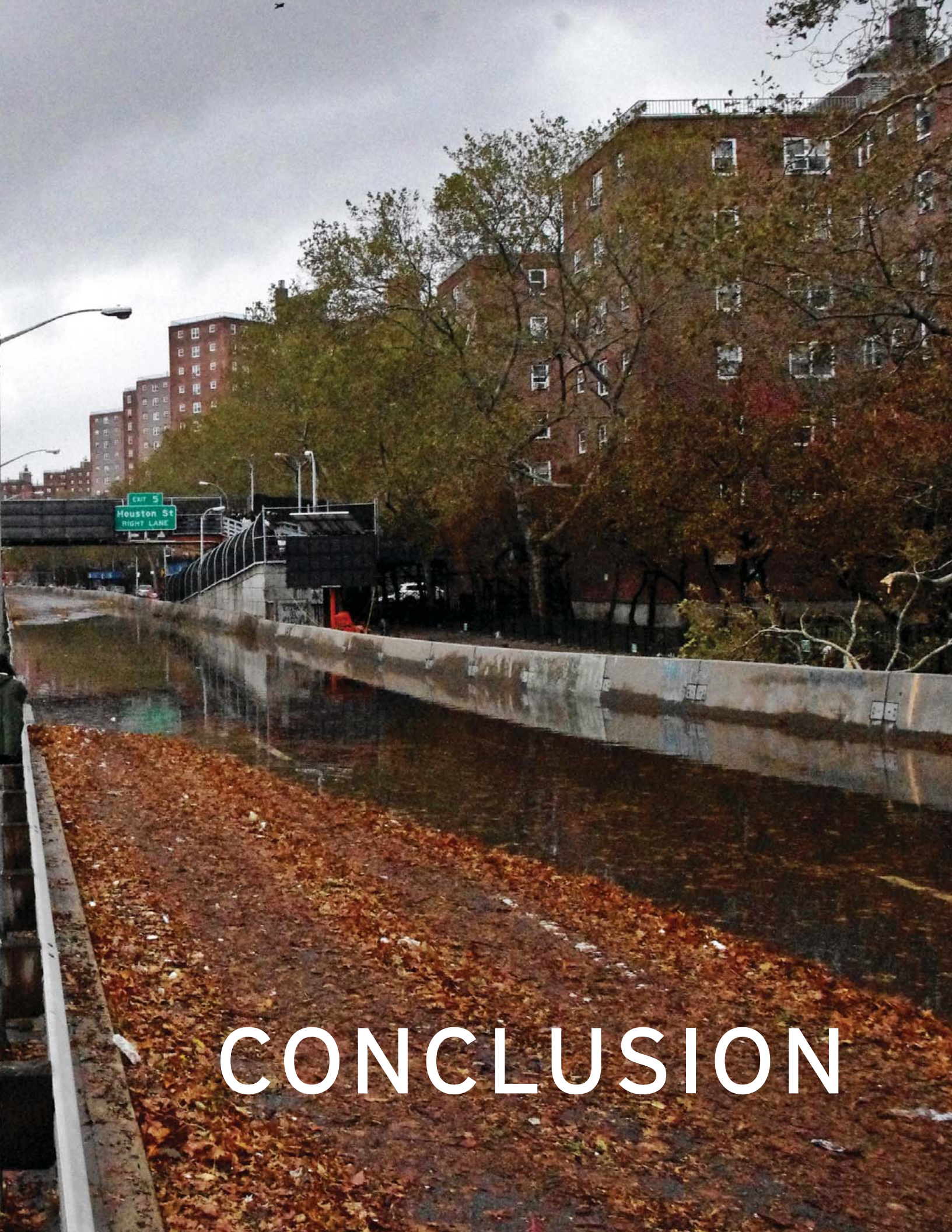
One of many houses in Staten Island, N.Y. destroyed by Hurricane Sandy  
Photo by Cpl. Bryan Nygaard





The FDR Drive flooded after Hurricane Sandy on Tuesday, October 30th  
Photo by David Shankbone





CONCLUSION



Resilience is the ability of a system to withstand shocks and stresses while still maintaining its essential functions and capacity to thrive. Systems that are more vulnerable, at stretched capacity, or lacking in diversity are more likely to experience catastrophic consequences when the next shock event happens.<sup>100</sup> Though Sandy revealed vulnerabilities within New York City's infrastructure, coastal areas, and response tactics, it also demonstrated the strength of local capacities and the efficacy of collective action. Indeed, New York City is first and foremost a dynamic and ambitious place where ideas and innovation are animated by New Yorkers themselves. We are capable of developing a multilayered and adaptive system that prepares for the future effects of climate change, one which puts people and communities at the heart of our resilience. We must remember "that resilience during an emergency is closely intertwined with the longer-term strength of communities."<sup>101</sup> To that end, we view our key principles—transparency, collaboration, inclusivity, and scalability—as the foundation. These principles open up the process and make space for the community leadership and local initiatives that are so critical to resiliency. It is specifically important that these principles inform the day-to-day policies and practices that have in the past widened inequalities, isolated communities, and strained the economic opportunities of average New Yorkers. Government should take the lead in creating transparent, collaborative, and inclusive processes, where all hands are truly on deck to reimagine and rebuild a more resilient and livable City.

The priorities listed in this framework serve to guide New York City on a path toward a more resilient and livable future, but it is still only the beginning of an ambitious, fundamentally hopeful journey. Creating an adaptive urban environment is an ongoing process, a journey rather than a final destination. Our planning and rebuilding efforts must not only prepare for the next superstorm, but also contribute to the ongoing process of creating livable and resilient neighborhoods for ALL New Yorkers. All hands on deck is about fostering our collective fortitude, to motivate us to look beyond any immediate far and settle for short-term solutions.

Becoming a model for global resilience requires a culture shift in the way we as a society think about the shocks to our systems—we need proaction to outweigh reaction, to look for innovative ways to adapt in tandem with smarter ways to prevent, and we need to perpetually aspire to become a more and more livable and resilient city in order to triumph over the status quo.



“In cities around the world, organizations like MAS must advocate for initiatives and investments that build the resilience and livability of our cities simultaneously. These can no longer be traded off, and civil society has a crucial leadership role in forging these linkages.”

— Vin Cipolla, President  
Municipal Art Society  
MAS Summit for NYC 2013



People gather on the boardwalk in Seaside Heights, Tuesday Oct. 29, 2013 to recognize the one year anniversary of Hurricane Sandy.  
Photo by The Star-Ledger, Newark N.J.



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*The Municipal Art Society is grateful for its many partners and resource people. This diverse list represents the organizations, academic institutions, government agencies, and community groups that have attended MAS's resilience convenings and roundtables, participated in Rebuild by Design programming, and made a significant contribution to the resilience landscape within the region. Through continued effort and coordination—with “all hands on deck”—we can continue to progress the resilience and livability of New York and the region.*

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# APPENDIX

The appendix includes summaries of our notes from our convenings, and facilitation in the Mayor's Special Initiative for Rebuilding and Resiliency workshop that are referenced throughout this document.

APPENDIX ONE: Charting the Road To Resilience: From the Ground Up  
*January 11 - 12, 2013.*

APPENDIX TWO: Neighborhood Summaries - Mayor's Special Initiative for Rebuilding and Resiliency (SIRR) Facilitator Notes

APPENDIX THREE: The Road Forward: Putting Resilience into Action - June 19, 2013

APPENDIX FOUR: Framework for Resilience





CHARTING THE ROAD TO RESILIENCE: FROM THE  
GROUND UP. *JANUARY 11–2, 2013.***SITE VISITS: FRIDAY, JANUARY 11, 2013**

- VISIT 1 Staten Island, hosted by Council on the Arts and Humanities for Staten Island (COAHSI)
- VISIT 2 The Rockaway Peninsula, hosted by Rockaway Waterfront Alliance & Walter Meyer, Local Office Landscape
- VISIT 3 Red Hook, hosted by Red Hook Initiative
- VISIT 4 Adapting to Change: Lower East Side Walking Tour, hosted by Green Map
- VISIT 5 Hudson River Park, hosted by the Forum for Urban Design
- VISIT 6 East River Esplanade & South Street Seaport, hosted by the Forum for Urban Design
- VISIT 7 Brooklyn Bridge Park, hosted by the Forum for Urban Design
- VISIT 8 NYCHA Coney Island Properties, hosted by Marguerite Mann, Brooklyn Property Management Director



## CHARTING THE ROAD TO RESILIENCE, CONVENING: SATURDAY JANUARY 12, 2013

- 8:30 AM CHECK-IN
- 8:55 AM OPENING REMARKS  
Vin Cipolla, *The Municipal Art Society*
- WELCOME  
David Van Zandt, *The New School*
- 9:05 AM THE REAL PICTURE—DATA BRIEFING  
Max Weselcouch, *NYU Furman Center*  
Abby Suckle, *CultureNOW*  
Illya Azaroff, *Design+LAB*
- 9:35 AM WHAT'S AT STAKE?  
Klaus Jacob, *Lamont-Doherty Earth Observatory, Columbia University*  
William Fritz, *College of Staten Island*  
Nancy Kete, *The Rockefeller Foundation*  
Jamie Rubin, *Federal Hurricane Sandy Task Force*
- 10:30 AM COMMUNITY RESPONSES AND ONGOING CHALLENGES  
Marilyn Gelber, *Brooklyn Community Foundation*  
Andy Smith, *Occupy Sandy/Respond & Rebuild*  
Kathryn Mallon, *NYC Rapid Repairs & Department of Environmental Protection*
- 11:15 AM WORKING GROUPS A (Concurrent working sessions: what worked, what didn't, principles for going forward)
- 12:30 PM LUNCH
- 1:00 PM WORKING GROUPS B  
A repeat of the 11:15 AM working groups
- 2:15 PM ADDRESSING THE HARD QUESTIONS: WHAT'S AT STAKE  
James Russell, *Bloomberg News*  
Eddie Bautista, *NYC Environmental Justice Alliance*  
Ron Shiffman, *Pratt Institute Center for Community and Environmental Development*  
Mindy Fullilove, *Columbia University, Mailman School of Public Health*  
Joel Towers, *Parsons The New School for Design*  
Pat Simon, *Ocean Bay Community Development Corporation*
- 3:15 PM PRINCIPLES FOR MOVING FORWARD, WORKING GROUPS REPORT, THE SANDY PRINCIPLES  
Mary Rowe, *Municipal Art Society*  
Andrew Zolli, *POPtech*
- 3:45 PM CONCLUSION

## APPENDIX ONE

## BREAK-OUTS: SATURDAY JANUARY 12, 2013

Charting the Road To Resilience:  
From the Ground Up.  
January 11–12, 2013.

TOPIC	RESOURCE PEOPLE
Economy, Small Business Recovery & Entrepreneurship	Jonathan Gouveia, NYCEDC; Micah Kotch, Incubator Initiatives NYU-Poly; Robin Barnes, Greater New Orleans, Inc.; Noah Bernamoff, Mile End Deli
Environment and Infrastructure Design	Andrew Faust, Center for Bioregional Living; David Waggonner, Waggonner & Ball Architects; Ellen Baer, Hudson Square BID; Jeanne Dupont, Rockaway Waterfront Alliance (RWA); Marc Matsil, The Trust for Public Land; Walter Meyer and Jennifer Bolstad, Local Office Landscape
Resilience Planning Process	Catherine Hughes, Manhattan Community Board 1; Christine Gasper, Center for Urban Pedagogy (CUP); Eddie Bautista, New York City Environmental Justice Alliance (NYCEJA); Raju Mann, Municipal Art Society; Ron Shiffman, Pratt Institute Center for Community and Environmental Development
Zoning & Regulatory Implications	Deborah Gans, Gans Studio; Ethel Sheffer, Insight Associates; John Shapiro, Center for Planning and the Environment, Pratt Institute; Judd Schechtman, Graduate Fellow, National Oceanic and Atmospheric Administration, Rutgers Bloustein School of Planning; Mark Ginsberg, Curtis + Ginsberg Architects LLP; Michael Levine, Manhattan Community Board 1
Neighborhood Preservation	Diane Kaese, Kaese & Lynch Architecture and Engineering LLP; Jessica F. Vasquez, Neighborhood Preservation Coalition of NYS, Inc.; Jonathan Marvel, Rogers Marvel Architects; Ned Kaufman, Ned Kaufman Ph. D.; Peg Breen, The New York Landmarks Conservancy; Ronda Wist, Municipal Art Society
The Most Vulnerable: Public Housing, Aging, & Displaced Populations	Ana Garcia, NY Academy of Medicine; Jeanette Toomer, Good Old Lower East Side; Mindy Fullilove, Columbia University, Mailman School of Public Health; Rosanne Haggerty, Community Solutions; Wally Bazemore, Red Hook Houses resident
Communications, Social Media & Data	Alley Lyles, Untapped Cities & Mayor Bloomberg's NYC Digital office; Laine Kaplan-Levenson, Land Of Opportunity; Michelle Young, Untapped Cities; Rachel Falcone, Sandy Storyline Project; Paula Segal, 596 Acres
Parks, Playgrounds & Public Spaces	Chris Vanterpool, NY Restoration Project; tKaja Kühl & Lee Altman, The Design Trust; Jordan Smith, NYC Department of Parks & Recreation; Nette Compton, ASLA-NY
Long-Term Sustainability & Green Design	Denisha Williams, ASLA-NY; Joel Towers, Parsons The New School for Design; Ken Levenson, NY Passive House; Max Joel & Sara Jayanthi, Solar One; Nancy Aber Goshaw, GoshawArchitects; Winnie Wong & Sarah Ashley Baxendell, Occupy Sandy/Sustainable Sandy
Building Cultural Resilience	Carol Bebel, Ashé NOLA; Caron Atlas, Arts & Democracy Project; Melanie Franklin Cohn, Council on the Arts and Humanities for Staten Island (COAHSI); Melissa Levin, Lower Manhattan Cultural Council; Michael Premo, Occupy Sandy; Tamara Greenfield, Fourth Arts Block
Community Mapping & Importance of Data & Information	Abby Suckle, CultureNow; Emily Sprague, Architecture for Humanity; Jessie Braden, GIS Lab for Community Access, Pratt; Juan Camilo Osorio, NYC-EIA Policy Analyst & Pratt Center for Planning
On the Ground Troubleshooting: Homeowner & Resident Recovery Programs	Andy Smith, Respond and Rebuild/Occupy Sandy; Denise Thornton & Tina Marquardt, Beacon of Hope; James McCullar, James McCullar Architecture, PC; Pat Simon, Ocean Bay Community Development Corporation; TBD, Board Member from Red Hook Tenant Association
Unlocking the Potential of Community Capacity	Cassie Flynn, ioby; Damien Crisp, Occupy Sandy; Keegan Stephen, Anna Larson & Madison Sheffield, Times Up; Molly Turner, AirBNB; Wendy Brawer, Green Map System
Beyond Recovery: Take-Aways for the Long Term	Carl Skelton, Gotham Innovation Greenhouse; David Maddox, The Nature of Cities & Sound Science LLC; Jee Won Kim, Jee Won Kim Architects; Klaus Jacob, Lamont-Doherty Earth Observatory, Columbia University; Maria Aiolo, Lamont-Doherty Earth Observatory, Columbia University; Norman Jacknis, Cisco System Internet Business Solutions Group; Susannah Drake, dlandstudio
The Response of Churches, Schools & Libraries	Bridget Quinn-Carey, Queens Library; Justin Wedes, Occupy Sandy; Naila Caicedo-Rosado, Brooklyn Public Library; Rev. Cheryl Anthony, JUDAH International Christian Center, Inc. (JUDAH);
Waterproofing New York	Anne Guiney, Institute for Urban Design; Catherine Seavitt Nordenson, The City College of New York & Catherine Seavitt Studio; Denise Hoffman, The City College of New York & Hoffman Brandt Projects LLC

## KEY THEMES FROM THE REPORT BACK SESSION:

Below is a summary of the key themes distilled within the break-out groups during *“Charting the Road to Resilience: From the Ground Up.”*

**COMMUNITY MAPPING:** Need for data collection & mapping to know what community services are available, where they are, how they can help.

- Matching needs with resources – Supply/Demand
- Needs assessment
- Data collection
- Mapping infrastructure, community resources, cultural services, etc.
- Heritage Survey – considering the role of preservation in disaster planning

**SOCIAL INFRASTRUCTURE:** Develop new methods and ways to build neighborhood relationships and strong social networks.

- Resilience works best in an organized community.
- Neighbors are the first and last responders. Need to develop ways to build neighbor relations prior to storms.
- Community based planning should be integrated into longer term government resiliency planning.
- Improved networking, organizing & community building amongst classes, races, & generations
- Training for residents on “how to care for one another”
- Develop spaces for strong communities to be built
- Capitalize on relationships with faith communities
- Use Libraries, Schools, Gardens, Parks & Art space as community meeting spaces and recovery staging areas
- Need for civic culture that can pro-actively drive policy & planning
- More resilient communities are those that are socially engaged
- Learn from the use of Ad hoc community gathering spaces

**CROSS-COORDINATION:** Ensure coordination and knowledge exchange between varying government agencies and departments, with CBOs, community residents, and interdisciplinary professionals from the arts, sciences, social policy, design, academia, etc.

- Need for cross coordination and communication amongst CBOs, private business, government & volunteers
- Collaboration/partnerships can be developed between private organizations, CBOs, government.
- More integration amongst local, state & federal government – with input from local community based organizations
- Strengthening the communication between government at all levels & other organizations
- Regional Resilience Authority/Commission and/or Resilience Czar – that would include a diverse group from various backgrounds & across different disciplines
- Connecting on the ground effort and knowledge for government decision making, funding & policy.
- Regional approaches
- Partnerships with elected officials
- Information exchange amongst boundaries/barriers – cutting the Red tape
- Planning across agencies & geographic jurisdiction
- Solutions designed interdisciplinary & inter-sectoral
- Incorporate sciences & research into plans & development

**VULNERABLE POPULATIONS:** Make vulnerable populations a priority to ensure their safety and their participation in the recovery process.

- Making the invisible, visible
- Accessibility vs. isolation of these populations
- Consider environmental justice issues in zoning implications
- Recognize need to improve overall public health
- Providing assistance/resources for elderly & disabled before the storm hits



## APPENDIX ONE

Charting the Road To Resilience:  
From the Ground Up.  
January 11–12, 2013.

- Prioritizing this communities needs
- Including them in the decision making/conversation, etc – making sure they have a voice
- Ensuring their safety

**IMPROVING COMMUNICATIONS:** Create resilient communications that provide multiple choices to enable local connection.

- Need for Communication infrastructure and options that are accessible to all/withstand electricity outages (are resilient).
- Need for more non-digital communication
- Resilient, redundant & decentralized communications infrastructure
- Intergenerational training/support for various communication methods (on/off-line)

**ADAPTABLE RESILIENCE:** Resilience plans should be flexible and adaptable, incorporating strategies that take into account intermediate scales of time, space, typologies and situations.

- Develop plans that are flexible and adaptable: what we do now may be obsolete in 100 years
- Resilience must include an approach to investment & planning for a city-region that will continue to evolve
- FEMA maps outdated – current ones should not be used as a planning tool – need to incorporate unpredictability of what the future will bring
- Strategies must be mindful of intermediate scales of time, space, typologies & situations

**ARTS & CULTURE:** Recognize culture as a community resource involving the arts community in planning and policy decisions, recognizing the role of arts and culture expression in resilience-building and the recovery process.

- Community identity
- Act of translation & Symbols – language gap
- Living story of the event & experience – Power of story
- Interdisciplinary & collaborate use of artists/designers to design/develop solutions
- Consider ways to preserve the culture/place of the neighborhoods while planning for a disaster

**IMPROVED INFRASTRUCTURE:** Integrate the best technologies and strategies in order to use and restore natural infrastructure and create flexible and adaptive systems.

- Bikes as resources
- Accessibility for vulnerable populations
- Dunes as barriers
- Maintenance of street trees
- Waterfront parks designed to protect built environment
- Incorporate the natural environment into development plans for built environment
- Use waterfront land as barriers – creating parks, wetlands, etc.
- In low-risk areas incorporate sustainability measures: trees, walkability, agriculture, high-density, low-rise neighborhoods of diverse use;
- energy efficient & durable buildings with strengthened performance based codes
- Porous infrastructure/sidewalks/streets
- More redundant & flexible power grid – decentralized power grid
- Rethinking waterfront as a luxury amenity & instead as a hazard zone
- Nature as sponge/mitigation
- Rethinking where & how we build

**ZONING:** Reform zoning to allow, incentivize, mandate and protect, addressing the difficult questions of land use when deciding where to build, expand, demolish, or protect.

- Should allow, incentivize & mandate

- Zoning codes should be flexible to incorporate NY's diverse populations, communities, uses, etc
- Zoning codes can be used for "protection," "accommodation" or "retreat & restoration"

**EDUCATION:** Educate the public to be 'resilience ready.'

- Disaster Preparedness
- Where to go for help, how to evacuate
- Train housing counselors/CBOs to provide info on insurance, banks, FEMA, etc.
- Consistent/best practice training and coordination of volunteers & disaster workers
- Use schools as training, info & gathering spaces for communities
- Public signage: distances to resources in need; location of resources; where to evacuate, water levels, maps, etc.
- Learn from other locations: Japan, NOLA, etc.
- Educating community on rebuilding and how to help neighbors in disaster response
- Providing education on social media/communications to older populations
- Train next generation about offline communication
- General Science
- Teaching new Yorkers about nature & risks associated with hurricanes and additional climate weather patterns and storms
- Standardized topography, ecology & disaster training responses in schools
- Need for a population that understands the general implications of climate change, resource depletion, & social disruption – this thinking needs to go into decisions made at community level and beyond

#### **COMMON IDEAS/QUOTES:**

- "One Size doesn't fit all in recovery planning."
- Klaus Jacob: "We are in risk denial."
- "In rebuilding this is a chance to rebuild with the future in mind and to better mitigate and promote resiliency for the future."
- "Resiliency ≠ Adaptation."
- "All it takes it two people who start talking."
- "How should the city use data more effectively to provide disaster response and more importantly preparedness?"
- How do we reach the folks that are often forgotten (homeless, mentally ill, incarcerated, elderly, etc) and not leave them behind?
- "Neighbors are first and last responders."
- Adhocracy.
- Adaptation, managed retreat, accommodation.
- "Reintroducing the notion of NATURE to the City."
- What can we learn from other places?
- Learn how to be prepared.

# LOWER MANHATTAN



*"everyone checked on at least one other family"*

*"the City must do something about public housing"*

*"the Conrad Hotel wanted to give rooms to elderly people in buildings with no power, but didn't know how to reach or find them"*

68 ALL HANDS ON DECK: MOBILIZING NEW YORKERS FOR A LIVABLE AND RESILIENT CITY



## NEIGHBORHOOD-SPECIFIC RECOMMENDATIONS

# THE ROCKAWAYS



### In Your Words

*"if you build the beach back the community follows"*

*"community = communicate + unity"*

*"invest in education and create jobs for the knowledge-based economy"*

*"jobs should be the priority for Rockaway residents"*

PROJECT	LOCATION	DETAILS
Reinvent vacant buildings and spaces as community centers	Movie theater on Mott Avenue for Town Hall, underutilized historic sites, and vacant lots	Create a central communication hub where the community can gather and participate in decision making
Shore up deteriorating beaches and boardwalk	Rockaway Boardwalk	Elevate the boardwalk and add a sea wall and commercial opportunities. Contain toxic runoff from Edgemere Landfill and mitigate beach and natural dune erosion
Improve accessibility and transportation options	General	Create a 24-hour transportation network that includes an improved shuttle bus route and ferry service, and complete necessary road repairs
Emphasize education and employment opportunities	South Rockaway	Invest in youth education and skill development with a vocational school, employment center, recreational opportunities, and reopening of closed schools to alleviate overcrowding
Expand health care infrastructure to meet community's needs	General	Open a second hospital, community health centers, or clinics to provide health care services to all, including the elderly and mentally and physically disabled and those suffering from post-traumatic stress
Give economic development a boost	116th Street and along boardwalk	More supermarkets, big-box, and small businesses are needed to meet communities' needs and to provide much-needed job opportunities
Improve access to health care services after storms	General	Provide treatment for psychological trauma associated with disasters and make hospitals and clinics more accessible

## NEIGHBORHOOD-SPECIFIC RECOMMENDATIONS

# BROOKLYN WATERFRONT & LONG ISLAND CITY



### In Your Words

*"[We need] something that can do many things at once, is smarter than hard infrastructure... but instead integrates community needs and is flexible and adaptable."*

*"Design ideas that are developed in a transparent process and with an open mind for a change of regulatory frameworks across scales to enable solutions."*

*"Zoning codes... [to] require individual buildings to be safer and able to withstand flooding."*

PROJECT	LOCATION	DETAILS
Build soft infrastructure	Red Hook Terminal	Unused land at the Red Hook terminal could be used for porous or sponge surfaces to absorb storm surges
Emergency Playbook	Community Centers	Develop an emergency handbook that develops neighborhood level solutions during disasters
Disaster-related education program	Community Centers	Develop education materials informing about flood plain areas, environmental risks, and climate change impacts
Ferry Transportation	Hallet's Point	Increase ferry transportation services around the waterfront to provide transportation alternatives.
Mark 100-year flood plain	Streets and lampposts	Provide a visual marker for the 100-year flood plain or include signage that designates areas
Emergency Response Coordinator	Neighborhood Level Coverage	Assign an emergency response coordinator that has specialized knowledge of the neighborhood that would be responsible for disaster relief
Improve access to health care services after storms	General	Provide treatment for psychological trauma associated with disasters and make hospitals and clinics more accessible

## NEIGHBORHOOD-SPECIFIC RECOMMENDATIONS

# SOUTHERN BROOKLYN



### In Your Words

*"social value of neighbors and neighborhoods"*

*"local identity—people say they're from Brighton Beach, not NYC"*

*"there are people in the community who are willing to respond and to be accountable for the neighborhood"*

*"the boardwalk as it is now has to go!"*

PROJECT	LOCATION	DETAILS
Centralized community hubs	Coney Island, Brighton Beach, Manhattan Beach, Sea Gate, Gerritsen Beach, Canarsie, Sheepshead Bay	Provide space for small community-based, nonprofit, and faith-based organizations to join forces, with access to stockpiled supplies, electricity, and emergency aid
One-stop information source for before, during, and after the storm	Online and accessible everywhere	Aggregate information from different sites, make sure it is correct and understandable, and includes information on both preparation and recovery
Reimagine the Southern Brooklyn waterfront	Coney Island Boardwalk	Raise the boardwalk and add a recreation area with storm-absorbing vegetation
Use existing infrastructure as storm surge protection	The Belt Parkway	Reinforce and add flood gates to the Belt Parkway at inlets—including Gerritsen Inlet—and major streets in tandem with reconstruction of Belt Parkway bridges
Keep waterways clean and accessible	Coney Island Creek	Address water and soil contamination caused by sewage system overflows, test for toxicity, and consider introducing wetlands to keep popular recreation areas clean, safe, and protected
Protect and shore up hospitals and medical facilities	Coney Island Hospital	Move emergency generators off the ground floor to preclude evacuation and ensure access to medical aid and medicine during emergencies
Improve access to health care services after storms	General	Provide treatment for psychological trauma associated with disasters and make hospitals and clinics more accessible



## APPENDIX TWO

## NEIGHBORHOOD-SPECIFIC RECOMMENDATIONS

# STATEN ISLAND (EAST AND SOUTH SHORE)



### In Your Words

*"Whether or not people had faith that the city would follow through and spend the money necessary to fix some of these problems, the feeling at the end was positive. People got to participate, be heard. I even think some appreciated the chance to think about something besides the daily problems they face right now, which can be so horrific and depressing after a while."*

*"People are helping each other providing support. People of Staten Island are awesome. They helped each other."*

*"We should have a good sense of who is living in each neighborhood and what their needs are."*

PROJECT	LOCATION	DETAILS
Rebuild trees and sand dunes	New Dorp Beach	Raise sand levels, replant trees, and replenish the beach's sand dunes
Coastal road retrofitting	Father Capodanno Boulevard	Raise the grade of the roads so that it's above surrounding areas
Boardwalk rebuilding	Midland Beach	Repair the boardwalk at Midland Beach, fill-in with material underneath and add an economic component that could relocate quickly during a storm threat
Emergency Network Hub	Half-mile radius of every neighborhood	Create an emergency network hub that focuses on emergency services such as backup generators, heat, hot water, and internet access
Adaptive reuse of buildings for emergency refuge	Churches, schools, and vacant buildings	Designate community assets as areas of temporary shelter for people to stay in while they rebuild their homes
Neighborhood block captains	Every block on Staten Island	Assign a neighborhood block captain to create a needs assessment checklist for their respective block

THE ROAD FORWARD: PUTTING RESILIENCE INTO ACTION.  
WEDNESDAY JUNE 19, 2013.  
THE NEW SCHOOL, 66 W 12<sup>TH</sup> STREET, NEW YORK, NY

APPENDIX THREE

8:30 AM CHECK-IN

9:00 AM OPENING REMARKS

Vin Cipolla, *President, the Municipal Art Society*

9:05 AM PRESENTATION: REPORT FROM THE SPECIAL INITIATIVE FOR  
REBUILDING AND RESILIENCY (SIRR)

Jamie Springer, *Deputy Director, Communities, SIRR*

Tokumbo Shobowale, *Director, Infrastructure and Built Environment, SIRR*

9:45 AM CONCURRENT BREAKOUT SESSIONS

- Built Environment (Housing, Commercial Buildings, & Insurance)
- Community Rebuilding and Resiliency Plans:
  - » Atlantic Coastline Communities (Staten Island, Southern Queens, Southern Brooklyn,
  - » East River Communities (Southern Manhattan, Brooklyn-Queens waterfront)
- Coastal Protection
- Hospitals, Health Care, and Medicine
- Utilities (Energy, Water, Wastewater, Communications)
- Transportation
- Implementation Roles and Strategies

11:00 AM BREAKOUT SESSION REPORT BACK AND QUESTIONS TO SIRR

Jamie Springer, *Deputy Director, Communities, SIRR*

Tokumbo Shobowale, *Director, Infrastructure and Built Environment, SIRR*

Moderator: Mary Rowe, *Vice President & Managing Director, MAS*

11:45 AM PRIORITIZING OPPORTUNITY AND ADDRESSING THE TOUGH  
QUESTIONS: THE ROAD FORWARD TOWARD A RESILIENT NEW YORK

Seth Pinsky, *Director, Mayor's Special Initiative for Rebuilding & Resiliency*

Laurel Blatchford, *Executive Director, Hurricane Sandy Rebuilding Task Force*

Jeremy Creelan, *Special Counsel to the Governor, NYS*

12:30 PM CLOSING

## APPENDIX THREE

## REPORT BACK: SUMMARIES FROM THE BREAK-OUT SESSIONS:

The Road Forward: Putting  
Resilience Into Action  
June 19, 2013.

### BUILT ENVIRONMENT

- Consider the effect of rebuilding and resilience measures on affordability
- Elevating buildings reduces the number of units
  - » Need to balance affordability and resiliency
- Use rebuilding as an opportunity to reduce energy usage and be more climate friendly. Create a major cultural shift
- Need for coordinated, holistic decision making
- Review impact processes
  - » Where does water go versus where do we keep it out?
  - » More attention to be paid to vulnerable populations, landmarks, NYCHA housing stock
- Enforcement of new codes, regulations
- Financing: What are new and innovative models of financing?

### COMMUNITY REBUILDING: ATLANTIC COASTLINE

- Community Capacity
  - » How do communities respond?
  - » How does the city support capacity?
  - » Community groups should mobilize to make the SIRR recommendations happen

### COMMUNITY REBUILDING: EAST RIVER COMMUNITIES

- Gaps:
  - » Need a clearer understanding at the community board level about policy changes.
  - » Where in planning will on-the-ground technical assistance be communicated to residents and companies?
- Section 3 (HUD): creation of jobs and new kinds of economic activities is one example of many programs that can work together

### COASTAL PROTECTION

- How do we include community participation in coastal protection? How do we implement coastal protection at community level?
- Conflicting efforts between army corps and the Parks Dept. (build up versus flatten)—A need to coordinate the efforts between different agencies and departments
- How is deployment coordinated?
- Communities have technical questions about designs of storm infrastructure that need answers
- There are many questioning the impact of new coastal infrastructure to existing structures, systems, etc.
- Coastal protection must be adaptable and flexible, i.e., consider changes in topography, ecology, weather patterns, social patterns

### HOSPITALS, HEALTH CARE, AND MEDICINE

- Needs of vulnerable communities are sometimes beyond the capabilities of responders
- Need to enhance relationships between organizations (e.g., multiple organizations working on similar issues and serving different clientele).
- The storm was not the only challenge, it is one of many stresses communities are already facing
- Involve hospitals in Long Term Recovery Groups
- “Hardening” health care infrastructure: Need to expand codes for back-up generators, and consider



community providers such as outpatient clinics home health care networks, etc. that could respond in the case of a disaster

- There is a need to create better linkages between disaster case management and pre-existing case management
- Hospitals as place making institutions: economic drivers and employers in communities
- Consider alternate public health regulations that kick in during emergencies to give health organizations permission to refill prescriptions. Need to coordinate between city, state, federal regulations

## UTILITIES

- City is partnering with major utilities: How does the city make ConEd more accountable?
- How we can leverage alternative fuel sources?
- Creation of micro grids and moving large plants out of vulnerable geographies
- SIRR needed to describe their mission and where funding was coming from

## TRANSPORTATION & PARKS

- Develop culture of collective action—transportation is a critical component
- Raise the profile of transportation improvements—keep public alert to trigger creative responses
- Build up everyday livability- SBS across bridges, ferries to build transportation
  - » How do we mainstream ferry service? (Example: Rockaways)
- Need inter-agency coordination at every level of government
- Management of transportation that promotes walking, biking

## IMPLEMENTATION ROLES & STRATEGIES

- Integration—Where is NY State?
- Scope—Preexisting conditions
- Communications
- Financial scenarios
- On the ground action—granular mobilization

## MOBILIZE EXISTING RESOURCES AND DIVERSE EXPERTISE

*Harness the availability of funding streams, local energy and expertise, and global best practices to develop effective local solutions.*

### RECOMMENDATIONS

- 1** Provide opportunities for meaningful engagement and comprehensive outreach to involve all community member in the resilience building process.
- 2** Establish transparent and coordinated communication for allocating disaster-relief and rebuilding resources to ensure an equitable and efficient process to building resilience.
- 3** Combine global “best practices,” with local innovation and expertise to make New York City a model for resilience.

PRIORITIES FOR CREATING A  
LIVABLE AND RESILIENT NEW YORK CITY

## STRENGTHEN LOCAL CAPABILITIES

*Strengthen the local capacity of our neighborhoods to respond and adapt to shocks of all kinds – economic, social, cultural, and environmental.*

### RECOMMENDATIONS

- 1** Equip the general public with skills, tools, and technology that reinforce community-driven resiliency.
- 2** Allow communities to be the drivers of their resilience plans.
- 3** Create Community Hubs that provide resources and programs as well as strengthen the overall social infrastructure of neighborhoods.
- 4** Preserve and reinforce community strengths by involving place-makers, preservationists, and the arts and cultural community into planning and policy decisions.
- 5** Prioritize action based on the preexisting and ongoing vulnerabilities of New York City’s neighborhoods.

# FRAMEWORK FOR RESILIENCE

This Framework for Resilience is representative of the diverse voices – academic, community groups, planning and design community, public agencies and officials, and private organizations – active in the recovery since Superstorm Sandy. It lays out four key priority areas – mobilizing existing resources, increasing local capacity, investing in adaptable infrastructure, and updating new policy to sustain resilience, – and includes a series of recommendations to help achieve these ‘Priorities for Creating a Livable and Resilient New York City.’

## GUIDING PRINCIPLES

**TRANSPARENCY:** As New York City faces the wide-ranging challenges exposed by Sandy, transparency is vital for rebuilding effectively and efficiently, for coordinating various recovery efforts and fostering a sense of trust and ownership between communities and governmental leaders.

**COLLABORATION:** There must be cross-coordination between various streams of recovery efforts to instill resilience in the New York City’s urban fabric. Neither excellence nor efficiency happens in silos. We are calling for all hands on deck to ensure that the best, smartest, and most effective tools and pathways for resilience are identified and applied.

**INCLUSIVITY:** A resilient approach to rebuilding includes economic, cultural, social, and environmental perspectives that create adaptable systems and vibrant communities. Overlapping initiatives from varying disciplines and perspectives prepares our city’s communities and neighborhoods for unanticipated pressures by creating redundancies, strengthening social networks and focusing on the long-term livability and resilience of our city.

**SCALABILITY:** By approaching resilience at all levels, there is the opportunity to create multiple layers of defense and ensure opportunities for ‘a;; hands on deck’ to tangibly participate in resilience. Providing options for resilience at varying levels of investment and duration, and at different scales, can make resilience building accessible to all, regardless of income, geography, or scope of time.

## INVEST IN FLEXIBLE AND ADAPTIVE INFRASTRUCTURE

*Strengthen urban systems with innovative design, strategic redundancies and both soft and hard approaches.*

### RECOMMENDATIONS

- 1** Strengthen transportation network with various methods and routes of transportation.
- 2** Develop innovative and scalable solutions to how we rebuild, with special attention paid to public housing.
- 3** Continue to restore the City’s natural infrastructure along the waterfront and beyond.
- 4** Invest in strategic planning and improvements for telecommunication infrastructure.

PRIORITIES FOR CREATING A  
LIVABLE AND RESILIENT NEW YORK CITY

## LEAD WITH POLICIES THAT SUSTAIN RESILIENCE

*Develop policy that informs future resilience planning and creates a culture of resilience throughout the region.*

### RECOMMENDATIONS

- 1** Create a culture of readiness by educating the public and partnering with organizations to raise awareness about resilience.
- 2** Develop a long-term planning process for coastal properties.
- 3** Reform zoning and building codes to incorporate resilience and promote livability.
- 4** Take a regional approach to resilience planning.

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