

# RAINPROOFING NEW YORK CITY

RECOMMENDATIONS FROM THE  
WORKING GROUPS

JANUARY - JUNE 2024

The Rainproof NYC Working Groups was an initiative launched by Rebuild by Design, One Architecture & Urbanism, the Mayor’s Office of Climate & Environmental Justice, the NYC Mayor’s Office of Housing and Recovery Operations, and the NYC Department of Environmental Protection. The working groups, co-facilitated and composed of NYC agency staff and community leaders, worked together from January to June 2024 to identify and recommend strategies and policies to collectively determine recommendations for how NYC can adapt to increased heavy rainfall. Rebuild by Design compiled the information for the working groups to produce this report.

Contact us at [info@rebuildbydesign.org](mailto:info@rebuildbydesign.org).

**TO LEARN MORE ABOUT RAINPROOF NYC AND FOLLOW OUR JOURNEY, VISIT OUR WEBSITE: [RAINPROOF.NYC](http://RAINPROOF.NYC)**



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# RAINPROOF NYC WORKING GROUPS BACKGROUND

## WHY RAINPROOF NYC?

New York City is increasingly flooding from rain. Climate change is here, and storms that feel extreme now will only become more frequent and more intense, with devastating consequences. The New York City Panel on Climate Change (NPCC) anticipates that by the end of the century, the City could experience as much as 30% more annual rainfall than today. By the 2080s, days with 1 or more inches of precipitation could go from a baseline of 14 to 18 inches. Severe rainstorms like Hurricanes Henri, Ida, Ophelia, and the many unnamed events in-between have underscored our infrastructure's vulnerability and our systemic shortcomings in managing urban waterways. New Yorkers are confronting a new reality of intense rainfall and our century-old stormwater system cannot keep up with the increasing amount of rain.

To face this new reality, the City needs a systematic change to address heavy rainfall that leverages a multiple benefit approach, including nature-forward infrastructure, enhancing our communities, improving our health, saving dollars, and saving lives.

Rainproofing demands collective action—from government agencies to local businesses and individual citizens. Rainproofing New York means getting ready for big rainstorms before they happen to lessen their impacts during and after they happen. Everyone needs to help—governments, businesses, neighborhoods, schools, and people like you.

EVERY ACTION COUNTS, EVERY DROP COUNTS.



NEW YORKERS CAUGHT IN RAINSTORM | PHOTO BY NYC DEP.



CLOUDY NYC SKYLINE | PHOTO BY NYC DEP.



FLOODED SUBWAY TRAIN | PHOTO BY SUGAR POND VIA WIKICOMMONS.

"Can't commute to work because subways are flooded."

"Having lived in NYC since 2005, rainfall is notably heavier. I think we are not well tuned in to the dangers of heavy rainfall and underestimate its immediate danger."

"I want community wisdom about water in our neighborhoods to be part of planning processes."

"Homeowners have dealt with constant flooding for over 50 years, and they want out - they want their land returned back to nature."

"To learn more about how different agencies, organizations, and community groups are addressing the heavy rainfall problem in NYC."

"How do the hyperlocal needs integrate or dovetail with citywide and regional efforts?"

"Let's talk about how we can get various NYC agencies to link their pluvial flood mitigation projects, which would streamline funding/budgets and foster a more holistic approach to pluvial flood risk."

"As as a public servant who works in resiliency, this topic is extremely important to my waterfront projects."

## WE ASKED NEW YORKERS: WHY JOIN RAINPROOF NYC?

"I'm an educator who develops climate change and sustainability curriculum for k-12 schools."

"Lived through Sandy as a NYC employee and staffed the NYC Restore centers. Saw/supported families through the trauma of [losing] homes, schools and jobs."

"My street floods, [and] my basement floods in heavy rain."

"I am here to think about the intersection of this work with our parks and natural areas."

"Heavy rainfall affects my job, my commute, my home, and my neighborhood. Its effects have increased in the last few years."

"I want to take action to keep my home livable for a long time. I'm hoping to contribute to Rainproof NYC's efforts through my work."

"I'm a designer looking for innovative solutions to account for extreme rainfall."

# TOWARD A RAINPROOF NYC

In the face of New York City's evolving climate challenges, the Rainproof NYC working groups initiative emerged as a collaborative pioneering effort to tackle the increasing threat of heavy rainfall.

Building on the vision outlined in Rebuild by Design's and One Architecture & Urbanism's report "[Toward a Rainproof New York City: Turning the Concrete Jungle into a Sponge](#)" and New York City's efforts to improve flood resilience, including strategies outlined in "PlaNYC: Getting Sustainability Done," the Rainproof NYC working groups are a significant step toward systematically confronting our city's new climate change reality.

The New York City Mayor's Office of Climate & Environmental Justice and the NYC Department of Environmental Protection partnered with Rebuild by Design and One Architecture & Urbanism to launch the Rainproof NYC working groups to identify strategies and policies to address increasing rainfall in New York City. The working groups' efforts culminated in a full-day public symposium where they shared their proposed solutions, reflecting a collaborative process that engaged multiple perspectives and insights.

Convening individuals and organizations with various expertise, experience, or interest in addressing this challenge ensured that approaches were vetted and thereby supported through announcement and implementation. Final recommendations were informed, innovative, and implementable.

Together, we are confronting our city's new reality, aiming to create a city that can effectively manage heavy rainfall and mitigate its impacts on our communities.

## OUR GOALS FOR THE PROCESS:

### ADAPT TO LIVING WITH WATER:

Inform a collaborative process to design programs, policies, or projects into an actionable and implementable agenda to catalyze NYC's work going forward in addressing increasing heavy rainfall in NYC.

### UTILIZE STAKEHOLDER INPUT & EXPERT ADVICE:

Utilize the multidisciplinary aspect of the process to gain expert advice and best practices from other localities to inform programmatic components.

### CREATE A REPLICABLE MODEL:

We hope the Rainproof NYC working group process will build lasting relationships and serve as a precedent for future collaborations on policy design between communities, various stakeholders, and government.

### UNDERSTAND INTERSECTIONALITIES:

Create a deeper understanding of the intersection of increasing rainfall and climate justice, adaptation, housing, economic impacts, mental health, and social resilience, as well as local challenges and existing and new programmatic solutions.

# PROCESS DEVELOPMENT

The Rainproof NYC working groups process was established to address the impacts of heavy rainfall in New York City by fostering collaboration across different experiences and expertise. As climate change accelerates, our city faces new challenges that demand innovative, collaborative solutions, as well as shared ownership over the challenges. The time-bound process, running from January to June 2024, set out to develop actionable policies and programs that could transform NYC’s infrastructure and communities to better manage heavy rainfall.

The working groups were designed to be small, comprising 15 to 20 members each, with an equal mix of community members and city agency staff. Each group was co-facilitated by a NYC agency lead and a nonprofit leader, ensuring a balanced and inclusive approach to the challenges ahead.

Overall coordination was collaboratively led by the Rainproof NYC Steering Committee, consisting of Rebuild by Design, One Architecture & Urbanism, the Mayor’s Office of Climate and Environmental Justice (MOCEJ), NYC Department of Environmental Protection, and the co-facilitators of each working group (representing the Mayor’s Office of Housing Recovery Operations, the Center for NYC Neighborhoods, Regional Plan Association, and Green City Force).

## WORKING GROUP SELECTION & COMPOSITION

In November 2023, the Rainproof NYC steering committee put out an open call for New Yorkers with lived and professional expertise to work with city agencies in the 6-month collaborative process.

The response was inspiring, with over 300 applicants interested. Through a 2-week review process, the Steering Committee carefully selected 50 participants to ensure a diverse range of perspectives, representing all five boroughs, various community organizations, government agencies, and experts from academic and private sectors. City agency representatives were chosen through an internal city process. Overall, the working groups were composed of 97 members selected to represent a broad range of interests.

**“THERE IS NO TIME LIKE THE PRESENT TO COLLABORATE WITH DIVERSE COMMUNITIES AND CITY AGENCIES TO RAINPROOF NYC... TOGETHER, WE CAN EDUCATE AND BUILD THE CAPACITY OF OUR NEIGHBORS TO WITHSTAND THE INCREASING RAINFALL, ULTIMATELY PRESERVING LIVES AND COMMUNITIES.”**

**- RONA TAYLOR,  
EXECUTIVE DIRECTOR OF  
CENTRAL X SOUTH EAST BROOKLYN CDC.**

## PARTICIPANT BREAKDOWN:

NON-AGENCY PARTICIPANTS	
5	BOROUGHES
12	NEIGHBORHOOD ORGANIZATIONS ACROSS NYC
21	CITY, STATE, OR FEDERAL NONPROFITS
10+	ACADEMIC, PRIVATE OR PHILANTHROPY

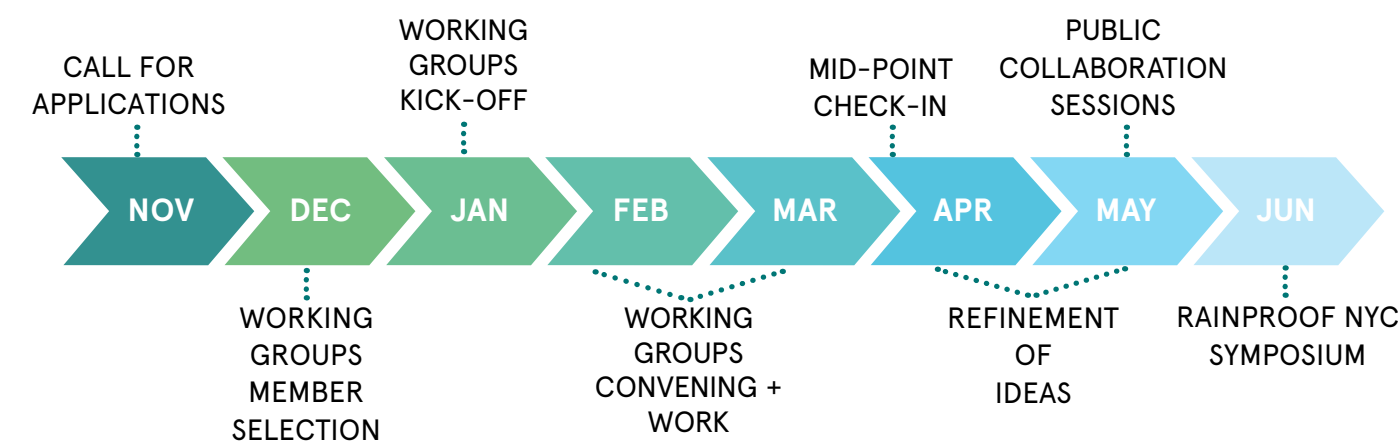
AGENCY PARTICIPANTS	
14	CITY AGENCIES
1	STATE AGENCY
1	FEDERAL AGENCY

## COLLABORATION & ENGAGEMENT

Throughout the six months, regular working group meetings were complemented by site tours, mixers, and inter-working group convenings, which were essential for fostering trust, understanding, and cross-group collaboration.

To ensure our process was transparent and proposed recommendations were vetted by New Yorkers, public engagement was an essential component. We launched a series of events to highlight innovative solutions, lessons learned from global cities, relevant research, new books, and more. Through these events and public input sessions, held virtually and in person, we gathered invaluable insights and ideas from over 1,000 participants. These events allowed us to see firsthand the challenges and opportunities in creating a rainproof city and to develop a deeper understanding of the disparities in how communities are impacted by heavy rain.

## WORKING GROUPS TIMELINE:



**“NOW IS THE TIME FOR US ALL TO COME TOGETHER AND TAKE ACTION FOR CLIMATE ADAPTATION. WE LIVE IN A CITY BUILT FOR THE CLIMATE OF 100 YEARS AGO. WE NEED TO MAKE IT WORK FOR EVERYONE FOR GENERATIONS TO COME.”**

**- THADDEUS PAWLOWSKI,  
MANAGING DIRECTOR OF  
COLUMBIA UNIVERSITY’S CENTER FOR  
RESILIENT CITIES AND LANDSCAPES.**

## PROGRESS AND RECOMMENDATIONS

Over the course of six months, the Rainproof NYC working groups made significant progress. They developed solutions that not only addressed immediate concerns but also aligned with the city’s broader climate resilience goals.

## FINAL SYMPOSIUM

The culmination of their work was a final symposium in June 2024, where nearly 300 attendees—including residents, community leaders, and experts—gathered to hear the working groups’ recommendations. The symposium not only showcased the innovative and implementable policies and programs developed by the groups but also inspired attendees to make individual commitments to rainproofing New York City.

## LOOKING FORWARD

Building on the foundations laid by these dedicated working groups, through continued collaboration and innovation, New York City is poised to lead by example, showing how communities can come together to address the environmental challenges of our time.

## OUR GOALS

The process officially began with a kick-off event in January 2024, wherein participants reviewed the challenge, existing NYC initiatives, and began their collaborative work. Participants committed to active collaboration, regular meetings, and participation in events, outreach, and a final presentation of recommendations. At the end of the process, the working groups were tasked with proposing final recommendations.

We set the following goals for the recommendations:

- Use the collaborative process of the working groups to design an actionable and implementable agenda to catalyze NYC's work in addressing increasingly heavy rainfall.
- Drive the City toward multi-benefit solutions to address the intersection of increasing rainfall and climate justice, adaptation, housing, economic impacts, mental health, and social resilience, as well as local challenges.
- Create shared ownership and accountability among government, nonprofit, public, and private sectors to address the challenge of heavy rainfall.
- To create a comprehensive recommendation, each working group was given guided questions. Overall, the questions were used to answer the overarching categories of the challenge, solution, recommendation design, and implementation.

The recommendations are the product of many different perspectives coming together through collaborative research and engagement with a shared mission.

## WORKING GROUP TOPIC AREAS:

### WORKING GROUP 1:

#### MANAGING INCREASINGLY HEAVY RAIN:

How can we shift NYC's policies and priorities to create a comprehensive plan to prepare for increasing rainfall?

Address gaps in infrastructure and risk management to protect from and prepare New Yorkers for more intense precipitation.

### WORKING GROUP 2:

#### HOUSING MOBILITY:

What does an equitable buyout program look like for NYC?

Inform the development of the City's Housing Mobility & Land Acquisition Program that was announced in "PlaNYC: Getting Sustainability Done."

### WORKING GROUP 3:

#### EVERYONE HAS A ROLE TO PLAY:

How can we build capacity among communities, the private sector, and Community-Based Organizations (CBOs) to share responsibility to address increasingly heavy rainfall?

# RAINPROOF NYC WORKING GROUPS RECOMMENDATIONS

# TOPIC AREA: MANAGING INCREASINGLY HEAVY RAIN

## ABOUT WORKING GROUP 1

### TOPIC

How can we shift NYC's policies and priorities to create a comprehensive plan to prepare for increasing rainfall?

Address gaps in infrastructure and risk management to protect from and prepare New Yorkers for more intense precipitation.

### RESEARCH QUESTION

How can we effectively utilize space in NYC to equitably reduce the risk from heavy rain and add value to communities?

### RESEARCH METHOD

#### THE WORKING GROUP DIVIDED INTO THREE SUBGROUPS:

- **SPACE:** How can we successfully re-imagine our spaces to manage rain-water?
- **RISK:** How can we effectively understand risk in ways that prioritize equity and vulnerability?
- **VALUE:** How can we achieve the greatest value and capture that value to make investments possible?

#### CO-FACILITATORS:

Alan Cohn, NYC Department of Environmental Protection (DEP)

Robert Freudenberg, Regional Plan Association

#### PARTICIPANTS:

Adam Berkowitz, NYC Department of Transportation (DOT)

Akemi Sato, Design Trust for Public Space

Amy Motzny, NYC Department of Environmental Protection (DEP)

Anastasia Yankopoulos, NYC Emergency Management (NYCEM)

Angela Licata, NYC Department of Environmental Protection (DEP)

Brendan Pillar, NYC Department of City Planning (DCP)

Brian Kempf, Federal Emergency Management Agency's (FEMA's) Region II (FEMA R2)

Caleb Richard Smith, WE ACT for Environmental Justice

Carolien Mossel

China Copperstone, We Stay/Nos Quedamos

Danny Pearlstein, Riders Alliance

Despo Thoma, SCAPE Landscape Architecture

Eric W. Sanderson, The New York Botanical Garden

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Kelly Vilar, Staten Island Urban Center

Lizzie Hodges McQuade, New York City Housing Authority (NYCHA)

Marit Larson, NYC Department of Parks & Recreation (NYC Parks)

Matthijs Bouw, One Architecture & Urbanism (ONE)

Melissa Enoch, NYC Department of Environmental Protection (DEP)

Olaitan Femi-Falade, Climate and Health Equity Foundation

Peter Mattingly, NYC Mayor's Office of Management and Budget (OMB)

Rifal Imam, Rebuild by Design

Robert Holub, NYC Department of Buildings (DOB)

Russ Dudley, Arcadis

Marit Larson, NYC PARKS

Sarah Charlop-Powers, Natural Areas Conservancy

Sherrise Palomino, New Yorkers for Parks

Shino Tanikawa, NYC Soil & Water Conservation District

Steve Carrea, NYC Department of Environmental Protection (DEP)

Sumiko Neary

Vincent Lee, Arup



WORKING GROUP 1 PRESENTING AT THE MIDPOINT CONVENING

# THE CHALLENGE

## WORKING GROUP MEMBERS IDENTIFIED A NUMBER OF CHALLENGES TO CONSIDER WHEN ADDRESSING HOW TO MANAGE INCREASED HEAVY RAINFALL:

- New York City’s existing stormwater management systems are not designed to manage all our water.
- In the future, significantly more stormwater will need to be managed.
- New York City’s unique geography makes pluvial flooding challenges intrinsically connected to other flood types.
- New York City’s systems are not easily adaptable to these changes.

# GUIDING PRINCIPLES

Heavy rain increases the existing risk to stormwater flooding and extends that risk to new areas. The risk is dangerous and can result in loss of life and destruction of livelihoods. To address these challenges, needs and expectations must be understood and discussed.

With these challenges in mind, Working Group 1 developed key principles to help inform and guide the group’s recommendations:

- The climate crisis is an opportunity to make the City better in an integrated way:
  - Make greenhouse gas emission reductions at the core of everything we do.
  - Do more/better with current funding streams.
  - Develop dedicated funding streams for stormwater management.
  - Recognize that risks in the future will be a function of how much we invest (or don’t) today and acknowledge that we can’t eliminate all risk.
  - Invest directly in communities (CBOs, etc.) to develop community flooding stewards and ambassadors to complement ongoing city work.
  - Identify and prioritize historically disinvested, vulnerable communities in ways that empower them.
- NYC needs to improve and expand the amount of water the city can process through better stormwater management, such as gray and green infrastructure, new investments and improving what we have, and better collaboration between agencies, the City, and the public.
- In addition to infrastructure, partnerships need to be developed to leverage external funds, have dedicated staff within city agencies who can seek and manage grants, and work with third parties who can receive funds and implement quickly. While much of the work of adapting to increasing heavy rain will be done in public spaces, there has been a good amount of discussion about how to more effectively engage the private sector.
- City government needs to communicate what living with water looks like, how it can be done equitably, and act proactively to avoid death, injury, disease, and major loss of property; it will also be important to tailor risk information for different audiences, since there will always be remaining or residual risk—this should be widely understood.
- There is a need for a holistic approach to promote the health and well-being of city residents during and after extreme flooding events, especially among at-risk groups. This approach must involve

collaboration between various city agencies and community groups to address health-related concerns and provide support for at-risk groups.

- In such an urbanized area, natural spaces are coveted. But when viewed through the lens of multiple uses, natural spaces in the city still seem undervalued and underfunded. There are already examples of great projects jointly performed by DEP and Parks—finding ways to further enhance and solidify that relationship could result in broader benefits, dedicated funding for public spaces, creative placemaking solutions, and more dedication to the protection and expansion of these resources.
- New York City needs a funded citywide maintenance and stewardship strategy developed for stormwater resiliency assets, especially those that have nature-based features. This would support the notion that networked and distributed stormwater infrastructure can be implemented with beneficial impacts that are measured and sustained.



WORKING GROUP 1 AT THE MIDPOINT CONVENING



WORKING GROUP 1 TOURING THE DOMINO WATER REUSE SYSTEMS



WORKING GROUP 1 AT THE RAINPROOF NYC SYMPOSIUM



WORKING GROUP 1 AT THE KICKOFF



# RECOMMENDATIONS

Working Group 1's recommendations reflect feedback captured by working group members throughout the Rainproof process and are organized within three overarching themes: Learning to Live With Water, Integrating Green & Gray Infrastructure, Improving and Expanding Natural Systems.

## THEME 1: LEARNING TO LIVE WITH WATER

Learning to “live with water” means that no lives are lost nor negatively altered as a result of increased heavy rainfall. It requires shifting to a paradigm in which stormwater can be absorbed within the dense urban landscape, understanding what we need to do to mitigate harmful impacts, learning from the natural environment that once existed and where it can be restored, and working toward a more harmonious relationship with water in the future. This includes clear communication about how to live with water safely, equitably, and in ways that prioritize the health and well-being of at-risk New Yorkers.

**PRIORITY LEVEL:** HIGH

**RECOMMENDED LEADS:** Mayor's Office, DEP; Development, Arts, & Education advocacy groups

**GOAL:** To prepare New Yorkers for a future with more water but less disruption from flooding, while also collectively setting new benchmarks for a more resilient and wetter future.

## RECOMMENDATION 1: ESTABLISH A CLEAR CITYWIDE COMMUNICATION STRATEGY FOR ALL NEW YORKERS

**PROPOSAL:** Establish a clear citywide communication strategy for all New Yorkers that:

- Acknowledges different types of flooding, the efforts underway to mitigate them, and educates on emergency preparedness, improved response, and other public health issues, along with the need to address all of these issues comprehensively and holistically.
- Incorporates science, lived experiences, policy, and art, and establishes a dialogue regarding tolerable standards for what future flooding looks like citywide.
- Conveys that we will not be able to solve all flooding issues, but can create integrated planning processes and design standards that mitigate severe flooding impacts in the most vulnerable areas.
- Advances a public awareness campaign—“We Live in a Wet Place”—that summarizes the strategy above and educates New Yorkers on what living with water means and what they can do about it.
- Promotes the potential development of Community Board or Borough-level “Living with Water Plans” that reflect the strategies above.

### IMPLEMENTATION:

- This recommendation should be implemented in coordination with Working Group 3 (Everyone has a Role to Play).
- Identify existing task forces, such as the Taskforce on Racial Inclusion & Equity and the Environmental Justice Advisory Board, that can support the City's implementation of this work, as well as resources such as the EJNYC Report and Mapping Tool, Stormwater Resiliency Maps, DEP's Stormwater Adaptation Plan, DEP's Green Infrastructure Map, and others that can play a role in leveraging city data and conducting targeted studies to gain a better understanding of these vulnerabilities.
- MOCEJ and the Environmental Justice Advisory Board should inform the development of the Environmental Justice Plan and incorporate components of the Environmental Justice Mapping Tool into the City's Stormwater Resiliency Map, as required under Local Law 172.

## RECOMMENDATION 2: INTEGRATE STORMWATER RESILIENCY STANDARDS AND PROGRAMS FOR WET (DESIGNED TO PERMIT FLOODING) AND DRY (DESIGNED TO BE WATER-TIGHT) FLOOD PROOFING.

**PRIORITY LEVEL:** HIGH

**PROPOSAL:** Integrate stormwater resiliency standards and programs for wet (designed to permit flooding) and dry (designed to be water-tight) flood proofing.

- Provide preparedness and recovery resources to property owners, managers, and renters in the most vulnerable communities during and after flooding.
- Improve policies for flood response and issue standards for basement units and other at-risk dwelling types.
- Consider providing or helping nonprofits to provide directories of companies with floodproofing services for people before or after rain events, e.g. a floodproofing directory.
- Evaluate stormwater resiliency standard for inland floodproofing in the Building Code.

### IMPLEMENTATION:

- Consider leveraging/expanding FloodHelpNY (MOCEJ, NYS, Governor's Office, Center for NYC Neighborhoods).
- Work with DOB and HPD to evaluate resiliency standards for inland floodproofing in the building code.

## RECOMMENDATION 3: PRIORITIZE THE FLOODPROOFING OF CRITICAL INFRASTRUCTURE STARTING IN THE MOST VULNERABLE NEIGHBORHOODS, INCLUDING MAJOR ROADWAYS, PUBLIC TRANSIT, POWER INFRASTRUCTURE, AND SCHOOLS, SO THAT CRITICAL FUNCTIONS ARE MAINTAINED AND PEOPLE CAN REASONABLY ACCESS WORK/SCHOOL/HOSPITALS.

**PRIORITY LEVEL:** HIGH

**PROPOSAL:** Prioritize the floodproofing of critical infrastructure, starting in the most vulnerable neighborhoods, including major roadways, public transit, power infrastructure, and schools, so that critical functions are maintained and people can reasonably access work/school/hospitals.

- Create a hierarchy for uses of public streets to prioritize the essential movement of people and goods over driving and parking cars to: 1. adapt to a wetter future in which buses must better complement and supplement vulnerable subway infrastructure.; and 2. mitigate climate impacts by encouraging people to use fast, reliable, affordable, efficient public transit rather than driving up vehicle emissions.

### IMPLEMENTATION:

Coordinate efforts to floodproof critical infrastructure and associated flood response among MOCEJ, DOT, MTA, DOE, DOHMH, and ConEd to ensure safe access during rainstorms.

## RECOMMENDATION 4: STRENGTHEN COMMUNITY RELATIONS TO IMPROVE COMMUNITY PREPAREDNESS, HAVE A CLEAR LINE OF COMMUNICATION FOR FEEDBACK TO INFORM THE DECISION-MAKING PROCESS, AND CREATE LOCAL MAINTENANCE RESOURCES.

**PROPOSAL:** Strengthen community relations to improve community preparedness, have a clear line of communication for feedback to inform the decision-making process, and create local maintenance resources. Coordinate with established local community organizations to create paid positions and training programs for community members in vulnerable areas.

**IMPLEMENTATION:** Identify potential philanthropic funding managed by a citywide or neighborhood nonprofit. This effort should also be developed in coordination with Working Group 3's recommendations.

### RECOMMENDATION 5: CONSIDER WAYS TO VIEW WATER AS A PUBLIC ASSET AND PROMOTE ECOLOGICAL VALUE FOR BIODIVERSITY.

#### PROPOSAL:

Consider ways to view water as a public asset and promote ecological value for biodiversity.

- Research legal/policy and design constraints and opportunities for scaling the building/site-level capture and re-use of stormwater.
- Enhance and increase uptake of existing incentive programs through a coordinated pilot program to promote innovative solutions, encourage public/private cooperation, and monitor and communicate metrics for assessing program success.
- Elevate the role of form, not just function, by incorporating placemaking into stormwater design to provide community amenities, educate youth and community members on function, improve livability, and maximize co-benefits.

#### IMPLEMENTATION:

- City agencies should work with academic institutions and nonprofit partners to research opportunities and constraints for scaling stormwater capture and re-use of stormwater.
- DEP can assess opportunities to enhance and increase uptake of existing incentive programs to promote innovative solutions to stormwater management.
- Agencies, such as DEP and DOT, should work with DCP and nonprofit partners to standardize placemaking into stormwater design.



## THEME 2: INTEGRATING GREEN & GRAY INFRASTRUCTURE

**CHALLENGE:** The city's stormwater infrastructure is not designed to manage heavy rain events, which are anticipated to only worsen. Addressing this problem will need investment in both gray and green infrastructure to manage as much stormwater as possible. However, space and funding are both limited, and trade-offs are inevitable.

**RECOMMENDED LEADS:** DEP, DPR, Mayor's Office; design professionals and researchers

**GOAL:** To work together across all dimensions, including gray and green infrastructure, among government agencies, and between government and the public to better manage heavy rain.

### RECOMMENDATION 6: CONSIDER WAYS TO VIEW WATER AS AN INTEGRAL PART OF THE BUILT ENVIRONMENT THROUGH MODIFIED DESIGN STANDARDS THAT PROMOTE INTEGRATED GREEN/GRAY SOLUTIONS ACROSS CITY AGENCIES TO IMPROVE AND EXPAND STORMWATER MANAGEMENT.

**PRIORITY LEVEL:**HIGH

**PROPOSAL:** Adjust criteria to encourage localized stormwater management and maximize co-benefits for mitigating heat and contributing to health and wellness in neighborhoods.

**IMPLEMENTATION:** Coordinated by MOCEJ through the existing Climate Resiliency Design Guidelines network. Examples of these established design standards that could be amended or leveraged for this work include, but are not limited to:

- Cloudburst Design Standards (DEP)
- Climate Resiliency Design Guidelines (MOCEJ)
- Principles of Good Urban Design (DCP)
- Streets and Open Space (DOT, DPR)
  - Street Design Manual
  - Open Streets
  - Resilient Street Ends
  - Parks Resiliency Guidelines
- Zoning and Buildings (DCP, DOB)
  - Waterfront access plans
    - Modified zoning requirements that promote nature-based solutions.
  - Enhance and expand existing Building Code requirements to adapt to a changing climate and incorporate inland flooding.

Agencies should coordinate updates to their respected design standards to adjust criteria to encourage localized stormwater management and maximize benefits.

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**RECOMMENDATION 7: IDENTIFY PARTIALLY FUNDED CAPITAL AND DEMONSTRATION PROJECTS AND PURSUE FUNDING THROUGH POOLING OF CITY AGENCY RESOURCES AND FEDERAL FUNDING OPPORTUNITIES. ENSURE AGENCIES HAVE THE RESOURCES NEEDED FOR GRANT IDENTIFICATION AND MANAGEMENT.**

**PROPOSAL:**

- Prioritize and strategize which projects fit into various federal funding opportunities.
- Leverage existing initiatives linked to federal funding opportunities, such as NYCEM’s Hazard Mitigation Planning, and task forces such as the Federal Infrastructure Funding Task Force, to prioritize eligible projects and coordinate funding opportunities across city agencies.

**IMPLEMENTATION:** Across all city agencies in coordination with OMB & MOCEJ.

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**RECOMMENDATION 8: TAILOR AND EXPAND INCENTIVE PROGRAMS TO PROMOTE GREATER OUTREACH, COORDINATION, AND ADOPTION AMONG UNDER-RESOURCED OR AT-RISK PRIVATE PROPERTIES (NEW-BUILD AND RETROFIT) SUCH AS LOW-DENSITY RESIDENTIAL COMMUNITIES, SINGLE-FAMILY HOMES, AFFORDABLE HOUSING, AND WATERFRONT DEVELOPMENT.**

**PROPOSAL:** Catalog existing city incentive programs.

- Develop an exploratory group to determine opportunities and advance implementation.

**IMPLEMENTATION:** DEP, HPD, DCP, DOB, and others should coordinate to assess existing incentive programs and explore opportunities to advance implementation.

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**RECOMMENDATION 9: ADOPT AN URBAN WATERSHED PLANNING APPROACH.**

**PROPOSAL:** Adopt an urban watershed planning approach that includes:

- Prioritized integrated planning (green/gray) to balance holistic citywide flood mitigation and water quality improvements.
- Multifaceted stakeholder engagement connecting stormwater management with affordable housing, neighborhood preservation, job creation, neighborhood safety, etc.
- Robust risk analyses for identifying the most vulnerable areas within the city with stakeholders and targeted localized solutions.
- Comprehensive analytical tools to find potential solutions that optimize the local drainage system through targeted investment.
- Establishing and communicating flood risk reduction standards including residual risk as new infrastructure projects are implemented.
- Research & development and opportunities to incorporate academic institutions.

**IMPLEMENTATION:** An urban watershed planning approach can be coordinated among DEP, MOCEJ, and NYCEM, and will help the City think more holistically and achieve the initiatives, which are outlined in the city’s “[PlaNYC: Getting Sustainability Done](#)” report:

**Flooding:** Implement a multilayered strategy for flood resilience.\*

*\*Includes developing a stormwater flooding adaptation plan by 2024 to establish a citywide flood protection target for stormwater infrastructure.*

**Waterways:**

- Reduce combined sewer overflows by more than 4 billion gallons per year by 2045 to improve water quality.
  - Develop a strategy to end the discharge of untreated sewage into the New York Harbor by 2060.
  - Improve the health and ecological function of wetlands.
- 

**RECOMMENDATION 10: FUND MAINTENANCE AND UPKEEP BUDGETS FOR GRAY AND GREEN STORMWATER SYSTEMS. MAINTENANCE NEEDS SHOULD BE CONSIDERED EARLY IN THE PROJECT PLANNING AND BUDGETING PHASE.**

**PROPOSAL:**

- OMB’s climate budgeting process provides an opportunity to assess maintenance needs and incorporate them into the budgeting process.
- Promote workforce development programs in partnership with NYCHA and NGOs.

**IMPLEMENTATION:** An effort across all city agencies in coordination with OMB & MOCEJ.

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## THEME 3: IMPROVE AND EXPAND NATURAL SYSTEMS

**CHALLENGE:** Natural systems—urban forests, streams, and wetlands—as well as natural spaces such as parks, street trees, and community gardens, provide a great deal of ecosystem and social benefits. Our natural areas and natural infrastructure are not self-sustaining, and their health and value decrease when they are not maintained but have either been damaged or lost to development, are limited in extent, or are not being effectively used to manage heavy rain. Restoring, maintaining, and, in some cases, redesigning such spaces could provide additional co-benefits such as heat mitigation, water management, active mobility, biodiversity benefits, and community-specific programming.

**RECOMMENDED LEADS:** DPR, DEP; natural areas advocacy groups

**GOAL:** To protect, expand, and maintain natural systems and their benefits on public and private properties to improve water management and reduce the negative impacts of flooding.

**RECOMMENDATION 11: PROTECT EXISTING ECOLOGICAL SYSTEMS, SUCH AS FORESTS AND WETLANDS LOCATED WITHIN PARKS, WATERFRONTS, AND OPEN SPACES, CONSIDERING ALREADY ESTABLISHED RECOMMENDATIONS INCLUDING THE WETLANDS MANAGEMENT FRAMEWORK AND POTENTIAL LEGAL PROTECTION STATUS, SUCH AS FOREVER WILD.**

**PRIORITY LEVEL:** HIGH

**PROPOSAL:**

- Expand restoration and maintenance funding for City and Community Based Organizations of high priority sites based on goals of maintaining existing stormwater capture and promoting community co-benefits.
- Develop infrastructure guidelines to restore and maintain the natural stormwater and groundwater flows that sustained historical ecological systems; engage ecologists and incorporate both hybrid green-gray systems and future conditions into planning.
- Develop accounting systems to properly evaluate potential loss of natural areas.

**IMPLEMENTATION:** DPR, DEP, and OMB should coordinate with nonprofits, such as NY-NJ HEP, to protect the City’s ecological systems.

**RECOMMENDATION 12: EXPAND NATURAL SYSTEMS, SUCH AS BLUEBELTS, DAYLIGHTED STREAMS, AND RESTORED WETLANDS, INTEGRATING THEM INTO THE WATERSHEDS OF FLOOD-PRONE COMMUNITIES THROUGH CURRENT AND FUTURE GOVERNMENT PROGRAMS SUCH AS THE CITY’S EMERGING HOUSING MOBILITY/BUYOUT APPROACH, AS WELL AS THROUGH PUBLIC/PRIVATE COOPERATION.**

**PROPOSAL:** Consider priority locations for adaptation to help manage stormwater.

**IMPLEMENTATION:** DPR, DEP, and HRO should coordinate programs focused on the expansion of natural systems with ongoing programs, such as the City’s emerging housing mobility/buyout approach.

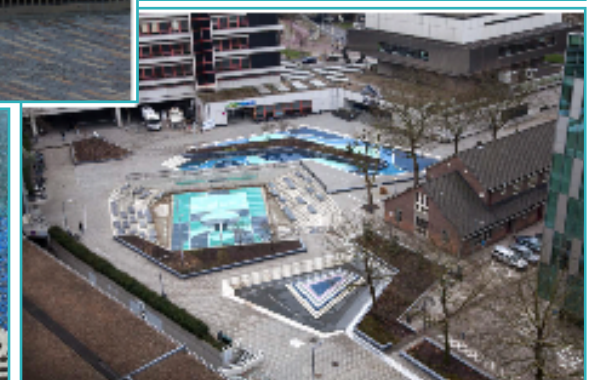
**RECOMMENDATION 13: DEVELOP CITYWIDE EDUCATION PROGRAMS TO CREATE AWARENESS OF THE ROLE NATURAL SYSTEMS CAN PLAY IN STORMWATER MANAGEMENT AND TO DEVELOP A FUTURE WORKFORCE.**

**PROPOSAL:** Consider developing an “Adopt an Underground Stream” program and similar placemaking approaches (e.g. high water marks) where neighborhoods can indicate the area where historic streams were located and/or where future flooding may occur; including cleanups and celebrations (closed street days with chalk art stream drawings, etc).

**IMPLEMENTATION:** Citywide education programs around creating awareness of the role natural systems play should be coordinated among DEP, DOE, DCLA, and other city agencies.



Bishan-Ang Mo Kio Park, Singapore  
Ramboll Studio Dreiseitl, 2012  
Images by Trevor Patt via Flickr



Images provided by DEP for Working Group 1

# TOPIC AREA: HOUSING MOBILITY

## ABOUT WORKING GROUP 2

### TOPIC

What does an equitable buyout program look like for NYC? Inform the development of the City's Housing Mobility & Land Acquisition Program announced in "PlaNYC: Getting Sustainability Done."

### RESEARCH QUESTION

How do we determine the parameters and best practices to inform the design of a voluntary, equitable buyout program for New York City?



WORKING GROUP 2 KICKOFF MEETING

**“A PROPERTY BUYOUT FOR FLOOD MITIGATION REFERS TO THE PROCESS IN WHICH A LOCAL GOVERNMENT BUYS PROPERTIES WHICH ARE VULNERABLE TO FLOODING FROM WILLING OWNERS. THIS PROCESS OFTEN OCCURS AFTER NATURAL DISASTERS, SUCH AS HURRICANES, WHEREIN FEDERAL AGENCIES LIKE FEMA ALLOCATE MONEY TO STATES WHO HAVE RECENTLY EXPERIENCED A NATURAL DISASTER.”**

- KELLY LEILANI MAIN, CO-FOUNDER & EXECUTIVE DIRECTOR OF BUY-IN COMMUNITY PLANNING

### CO-FACILITATORS:

Christie Peale, Center for NYC Neighborhoods (CNYCN)

Elizabeth Greenstein, Mayor's Office of Housing Recovery Operations (HRO)

### PARTICIPANTS:

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Amy Chan, New York State Division of Housing and Community Renewal (NYS HCR)

Amy Chester, Rebuild by Design

Annie Stefanski, Neighborhood Restore HDFC

Anthony Coker, Neighbors Helping Neighbors - FAC

Bo Chung, NYC Department of Health and Mental Hygiene (DOHMH)

Britney Dixon, Supermarvelous Society

Caroline Hays, Mayor's Office of Climate & Environmental Justice (MOCEJ)

Daira Raheem, Center for NYC Neighborhoods (CNYCN)

Debra Ack, East New York CLT

Desiree Thomas, TruFund Financial Services

Dmitri Johnson, The Nature Conservancy Climate Adaptation Team

Jacob Ahola, NYC Emergency Management (NYCEM)

Jessica Castro, Center for NYC Neighborhoods (CNYCN)

Joseph Tirone, Jr., Joe Tirone Team, Compass

Kate Boicourt, Environmental Defense Fund

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Michael Sandler, NYC Department of Housing Preservation and Development (HPD)

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Sangu Iyer, NYC Department of Environmental Protection (DEP)

Talley Burley, Mayor's Office of Climate & Environmental Justice (MOCEJ)

Thaddeus Pawlowski, Columbia Center for Resilient Cities and Landscapes

Tyler Taba, Waterfront Alliance  
Thaddeus Pawlowski, Columbia Center for Resilient Cities and Landscapes

Tyler Taba, Waterfront Alliance

# THE CHALLENGE

The City of New York has funding from US HUD’s CDBG-DR program to fund a consultant who will design the parameters of a future voluntary housing buyout program for 1-4 family homes in flood-prone areas. Working Group 2 of the Rainproof NYC project was tasked with determining the parameters and best practices to inform the design of an equitable buyout program for New York City.

The report “PlaNYC: Getting Sustainability Done,” released by MOCEJ in 2023, outlines the goal of establishing a voluntary buyout program for the city (referred to in the report as a “housing mobility” program). The work conducted by Working Group 2 supports this effort, though it should be noted that the goals laid out in PlaNYC are broader, in that they include land acquisition in addition to buyouts and are not restricted to the type of building or the type of flooding. Rainproof NYC’s work supports the efforts of an overall mobility program within these parameters by focusing on residential property owners facing intense rainfall and resultant stormwater flooding within the wider context of flooding in New York City.

## PLANYC INITIATIVE

Launch a voluntary housing mobility and land acquisition program to provide housing counseling and facilitate future land acquisition with Federal and State funds.

## PLANYC ACTION

Enable the City to engage with interested residents and acquire difficult-to-protect, flood-vulnerable properties that can support flood control, natural areas, or parklands.

## RESEARCH PROCESS

The working group broke into three parallel sub-teams to conduct initial research around:

### PRINCIPLES & VALUES:

Tasked to lay out considerations when defining an “equitable” buyout program, with a focus on physical, social, and economic considerations.

### PEOPLE & COMMUNITIES:

Tasked to conduct community outreach to obtain feedback on effective community engagement strategies and the most frequently asked questions from local residents.

### IMPACT & PLACE:

Tasked to compile research on how to plan for relocation during and after a buyout, including the financial and physical constraints for bought-out residents.



# RECOMMENDATIONS: HOUSING MOBILITY PROGRAM PRINCIPLES

Working Group 2 created shared principles that the City can use to develop an equitable buyout program.

## PROGRAM TENETS

*Whereas, NYC’s neighborhoods—coastal and inland—are regularly flooded as a result of disasters such as hurricanes and increased rainfall;*

*Whereas, there is a housing crisis in NYC with few vacant units and even fewer vacant affordable ones;*

*Whereas, buyouts are only one of many tools available to address flood risk and may be used to enhance or complement other resiliency strategies, and communities may advocate for resiliency measures that allow residents to move or remain in place;*

*Whereas, most buyout programs have been implemented with inequitable outcomes, further exacerbating already existing inequities in communities of color;*

*Whereas, the program being designed at this time will be limited to 1-4 family structures, and multifamily buildings and businesses will be addressed in future programs; and*

*Whereas, we recognize that everybody has to make trade-offs in a buyout program, including the City and homeowners*

*Now, Therefore, the following principles will guide a future housing mobility program for NYC.*

## ABOUT THE PRINCIPLES

The purpose (the “why”) of New York City’s proposal for a housing mobility program is to reduce flooding risk in New York City by acquiring property and moving residents from flood-prone or related (e.g., upstream) housing areas to safe and stable alternatives to affect the overall goal of reducing impacts from flooding. In support of that goal, Working Group 2 has developed a set of housing mobility program Principles that serve as general guideposts for how, with whom, when, and where the program may be implemented, before, during, and after disasters, but more importantly during “blue sky” (non-disaster) periods.

Working Group 2 worked collaboratively to collectively define what they think are the most important characteristics of a future housing mobility program. Inspired by the Louisiana SAFE program’s principles, Working Group 2 has strived to identify key themes that should be considered as the housing mobility program’s procedural details move forward. These principles should help guide key considerations, prioritization, engagement, and planning processes, but are not binding. The principles mirror well-established and recognized best practices for voluntary home buyout programs, but have been tailored and framed to the NYC context.

We hope that the principles will be shared publicly with the goal of inspiring and empowering New Yorkers to see the housing mobility program as an opportunity to reduce flood risk, restore ecosystems, and create more resilient and thriving communities across the five boroughs.

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# THE PRINCIPLES:

## PRINCIPLE 1: VOLUNTARY AND WELL-INFORMED

The program must be voluntary, and must prioritize the alleviation of substantial flooding risk in New York City neighborhoods where the following conditions exist:

1. Property owners have expressed an interest in participating, and
2. A community engagement plan has identified how the program will affect the neighborhood.

Eligible residents must be provided necessary and sufficient information in accessible languages of their choice to make informed decisions about their options, including why a buyout is being offered; what alternative options are available, appropriate, and feasible; and the trade-offs of different options for mitigating current and future risks. Participants must also be able to withdraw their participation from the program at any stage in the process.

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## PRINCIPLE 2: COMMUNITY-BASED AND NEIGHBORHOOD-SPECIFIC

While at the end of the day a buyout program serves individual homeowners, buyout programs can change the fabric of neighborhoods. Consequently, a community-driven process that is integrated into other long-term community planning initiatives is critical to ensuring that the buyout program will lead to improvements in the quality of life for all area residents as well as for owner-participants. Because every neighborhood is different, the program should be flexible enough to account for the diverse needs of participating communities, and have a clear process and procedure for doing so.

To accomplish this, the housing mobility program must be inclusive of, and enabled by, partnerships with the ecosystem of social service nonprofits, community groups, and social networks within participating neighborhoods in order to collaborate on outreach, intake, communication, and strategies for land reuse and stewardship when possible. This necessitates ensuring that outreach to such groups and residents is thorough and that materials are written accessibly, available in translated versions, and accompanied by counseling in multiple languages and culturally appropriate practices.

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## PRINCIPLE 3: HOUSING-CENTERED AND HOUSING-FOCUSED

The program must recognize the intersections between buyouts and the housing market: New York City is facing a significant housing crisis, with some of the lowest vacancy rates seen in years. While buying and demolishing a home takes it out of harm's way, it also adds to this housing crisis. For the housing mobility program to be effective, it must promote access to safe, affordable housing. This could be achieved through: 1) robust rehousing and case management services with mortgage resolution expertise; 2) by combining housing mobility program resources with other housing programs; 3) by providing sufficient financial resources for relocating owners and renters; and 4) by investing in affordable housing out of flood-prone areas for participants to access.

In historically overburdened and underserved neighborhoods, where histories of disinvestment have contributed to higher rates of vulnerability, the housing mobility program should recognize and account for these historic injustices when determining strategies for fair compensation, such as by using Fair Market Value adjustment factors. The program should strive to address other well-documented challenges, including finding permanent replacement housing and increased housing costs, to the extent possible.

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## PRINCIPLE 4: EQUITABLE AND RENTER-INCLUSIVE

The program should be human-centered and strive to prioritize assistance to New Yorkers who need the most help. The program should endeavor to provide access to holistic wrap-around services, including housing counseling, financial counseling, and mental health support services with a trauma-informed response. These resources should be included before, during, and after the buyout process and should be available to both homeowners and renters.

Recognizing that the majority of New Yorkers are renters—many with significantly less agency and resources in times of emergency than most homeowners—the program needs to provide sufficient resources to equitably support the relocation of renters above and beyond the requirements of the federal Uniform Relocation Act. Relocation opportunities should be in climate resilient communities and prioritize access to economic opportunities and social cohesion. The City should utilize all available tools to develop affordable rental housing and homeownership opportunities during blue sky disasters to enable renters to have this housing mobility option before disaster strikes.

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## PRINCIPLE 5: ENVIRONMENTALLY RESTORATIVE AND INTEGRATED

The program should require that any acquired properties be preserved as open space in perpetuity, with no further residential, commercial, or industrial development allowed. However, rather than end uses with few ecological benefits, such as mowed lawns that absorb little stormwater, the buyout program should strive to restore natural floodplain function, create vital flood protection infrastructure, and integrate the bought-out parcels into a broader watershed management strategy for flood risk reduction. Tailored for each community, these restored floodplain ecosystems should maximize climate co-benefits, such as reduced heat island effect, improved water quality, and restored habitat for improved biodiversity. Residents who engaged in previous buyout programs clearly stated that their participation was in part contingent on a clear understanding that the land will only be reused for ecological purposes.

To the extent possible, the City should integrate planning and funding for the stewardship and maintenance of buyout parcels before the program begins. The City should partner with community organizations and use neighborhood feedback as a way to create and get buy-in for adaptive reuse plans that maximize local benefit. As an example, buyout parcels could be used to expand access to bluebelts and greenbelts that increase access to nature and open space, especially in neighborhoods lacking such amenities.

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## PRINCIPLE 6: PERMANENT AND ADAPTABLE

In order to help build a more resilient New York City, the housing mobility program should be viewed as a multi-decade, multi-generational effort to build resilience to flooding and mitigate climate impacts. A permanent program should operate year-round and with the ability to be deployed rapidly in the event of a disaster or as funding is available. This kind of rolling program—rather than a more traditional pre-disaster or post-disaster one—can support more robust institutional learning and interagency collaboration. The housing mobility program touches on the work of many city agencies: By creating a permanent program, agencies will have the time to work collaboratively and test different methods for communication, outreach, engagement, and delivery, as well as invest in receiving feedback from community partners, city staff, and participants to identify strategies for program improvement, with the goal of building trust and accountability.

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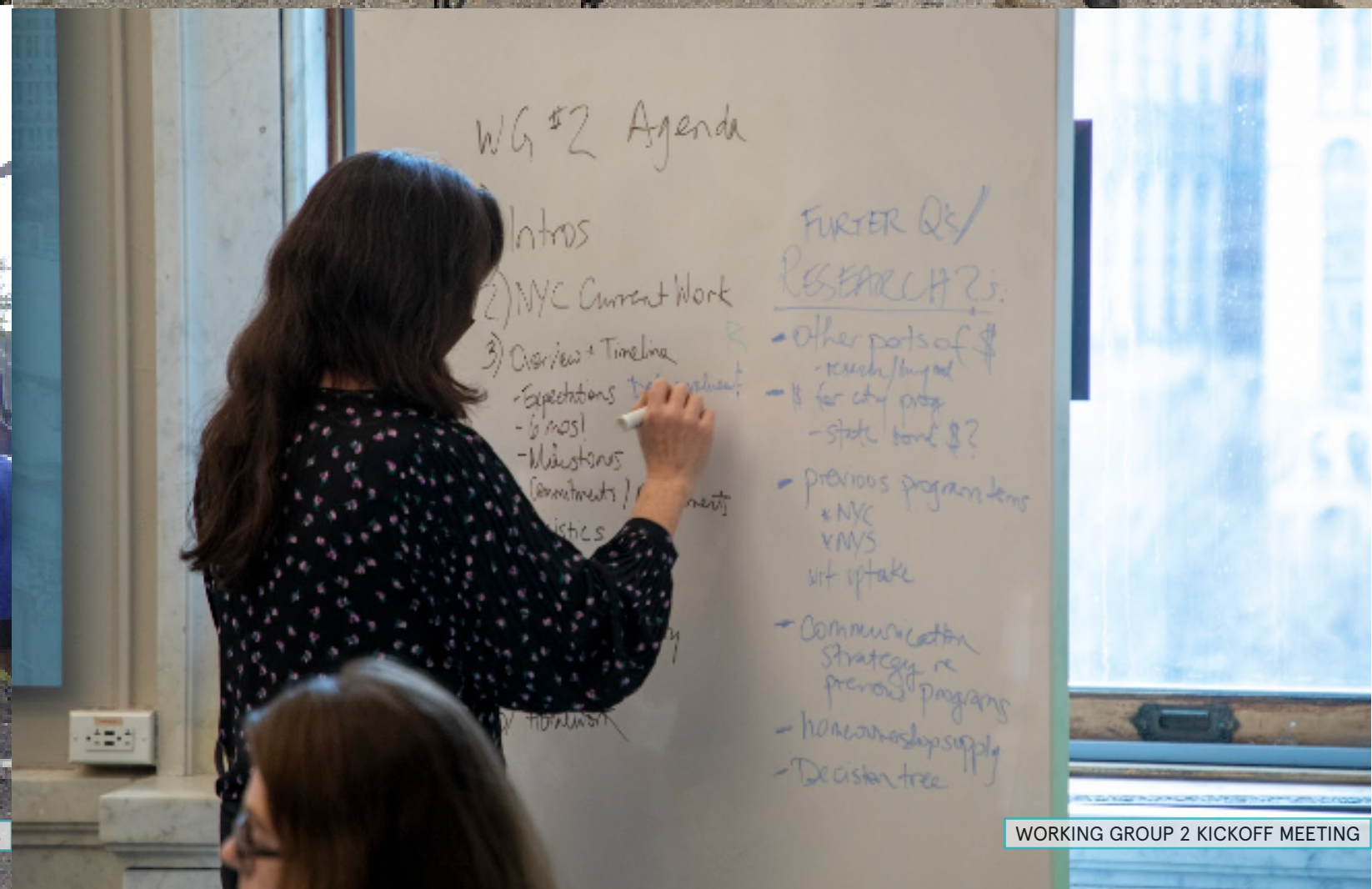
WORKING GROUP 2 AT THE RAINPROOF NYC SYMPOSIUM



WORKING GROUP 2 VISITING THE OAKWOOD BEACH BUYOUTS



WORKING GROUP 2 VISITING THE JEWEL STREETS



WORKING GROUP 2 KICKOFF MEETING



# TOPIC AREA: EVERYONE HAS A ROLE TO PLAY

## ABOUT WORKING GROUP 3

### TOPIC

How can we build capacity among communities, the private sector, and Community-Based Organizations (CBOs) to share responsibility to address increased heavy rainfall?

Every drop counts.

Build out an education, communication, and engagement strategy for communities, the private sector, CBOs, local nonprofits, and other agencies to do their part in managing increasing heavy rainfall.

### RESEARCH QUESTIONS

- What tools, resources, and knowledge do New Yorkers need to become rainproof?
- How do we activate existing resources to create, adopt, and own initiatives that will transform New York from a concrete jungle into a sponge?
- How do we encourage civic engagement and collaboration among nonprofit, private, and public sectors to address increasing rainfall?

### CO-FACILITATORS:

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Tonya Gayle, Green City Force (GCF)

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Frank Blancero

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Lot Locher, One Architecture & Urbanism (ONE)

Michael Roberson, Clean Energy Leadership Institute; The New School

Nikki Tourigny, The Hope Program; The 79 Decatur St HDFC Coop

Pamela Pettyjohn, Coney Island Beautification Project, Inc.

Rifal Imam, Rebuild by Design

Rona Taylor, Central x South East Brooklyn CDC

Sarah Nielson, NYC Department of Parks & Recreation (NYC Parks)

Saylor Pochan, Surfrider Foundation NYC

Shivali Gowda, Enterprise Community Partners

Tonya Gayle, Green City Force (GCF)



WORKING GROUP 3 AT THE RAINPROOF NYC SYMPOSIUM



WORKING GROUP 3 KICKOFF MEETING

## THE CHALLENGES

New York City is a diverse and global city by all standards: age, ability, race, religion, ethnicity, and even biodiversity. NYC residents speak over 200 languages, and across the five boroughs, reside anywhere from 0–401 feet above sea level. These variations impact NYC residents’ everyday experience and access to resources. This must be considered when designing equitable climate change resiliency strategies.

- Existing tools and resources for extreme rain mitigation, preparedness, response, and recovery are not widely accessible due to limited language, financial, digital literacy, or technology access.
- The existing design of New York’s cityscape makes it difficult for New Yorkers to imagine and advocate for public stormwater and/or green and blue infrastructure projects.
- Existing community engagement, greening, and public health education projects do not yet incorporate information and tools to address stormwater flooding.
- The decentralization of existing resources to learn about, mitigate, respond, and recover from stormwater flooding creates a critical accessibility barrier.

## METHOD/RESEARCH

Through 14 meetings as a Working Group as well as two public feedback sessions and multiple points of engagements with the community, the group sought to answer the following questions:

- What tools, resources, and knowledge do New Yorkers need to become rainproof?
- How do we activate existing resources to create, adopt, and own initiatives that will transform New York from a concrete jungle into a sponge?
- How do we encourage civic engagement and collaboration among nonprofit, private, and public sectors to address increasing rainfall?

Working Group 3’s recommendations reflect inputs from Working Group members as well as feedback captured during public engagement events throughout the Rainproof NYC process. Furthermore, these recommendations address the additional challenges that were identified during the rainproof process, surrounding the topics of the research questions.

These efforts led Working Group 3 to a set of four recommendations designed to bolster existing efforts and improve communications around extreme rain preparedness and safety. The existing and suggested resources required to implement each recommendation have been categorized by disaster **Phase and Scale**. Working Group 3 used these categories to assess the impact of, and suggest an implementation strategy for, each recommendation.

## RECOMMENDATIONS

**RECOMMENDATION 1: MAKE RAINPROOF A PART OF REGULAR COMMUNITY ENGAGEMENT TO INCREASE NEW YORKERS’ ABILITY AND SENSE OF URGENCY TO PREPARE FOR EXTREME RAIN.**

**PRIORITY LEVEL:** HIGH

**PHASE:** Before, During

**SCALE:** Health, Home

**PROPOSAL:** Incorporate Rainproof into existing programs, events, and resources, and meet communities where they are instead of creating new programs/events—i.e. “Do what you do, but do it Rainproof.”

**IMPLEMENTATION:**

1. Leverage existing public programs to promote Rainproof.
  - Programs that Working Group 3 identified that could be promoted further include: DEP’s hydra barrier distribution program with Borough Presidents; NYCEM’s Strengthening Communities Program; DOHMH’s “Be a Buddy” program; CERT Volunteer program; DOHMH Community Health Workers; SRIJB\* Community Flood Fellows; and NYC Days of Action.
2. Engage existing platforms for civic engagement, including town halls, community boards, civic associations, “friends of” parks groups, etc.
3. Partner with public and nonprofit agencies that have existing infrastructure to train and manage workforce for outreach, flier distribution, and volunteer coordination at events.
  - Organizations that our Working Group recommends coordination with include, but are not limited to: NYC Civic Corps Fellows; NYC Service Summer Employment; Rain Coalition; Green City Force; and The HOPE Program.

**RECOMMENDATION 2: CREATE A PUBLIC OUTREACH CAMPAIGN THAT PRIORITIZES INFORMATION AND RESOURCE ALLOCATION TO POPULATIONS AFFECTED BY EXTREME RAIN; DIVERSIFY MATERIALS TO ADDRESS ACCESSIBILITY GAPS.**

**PRIORITY LEVEL:** HIGH

**PHASE:** Before, During, After

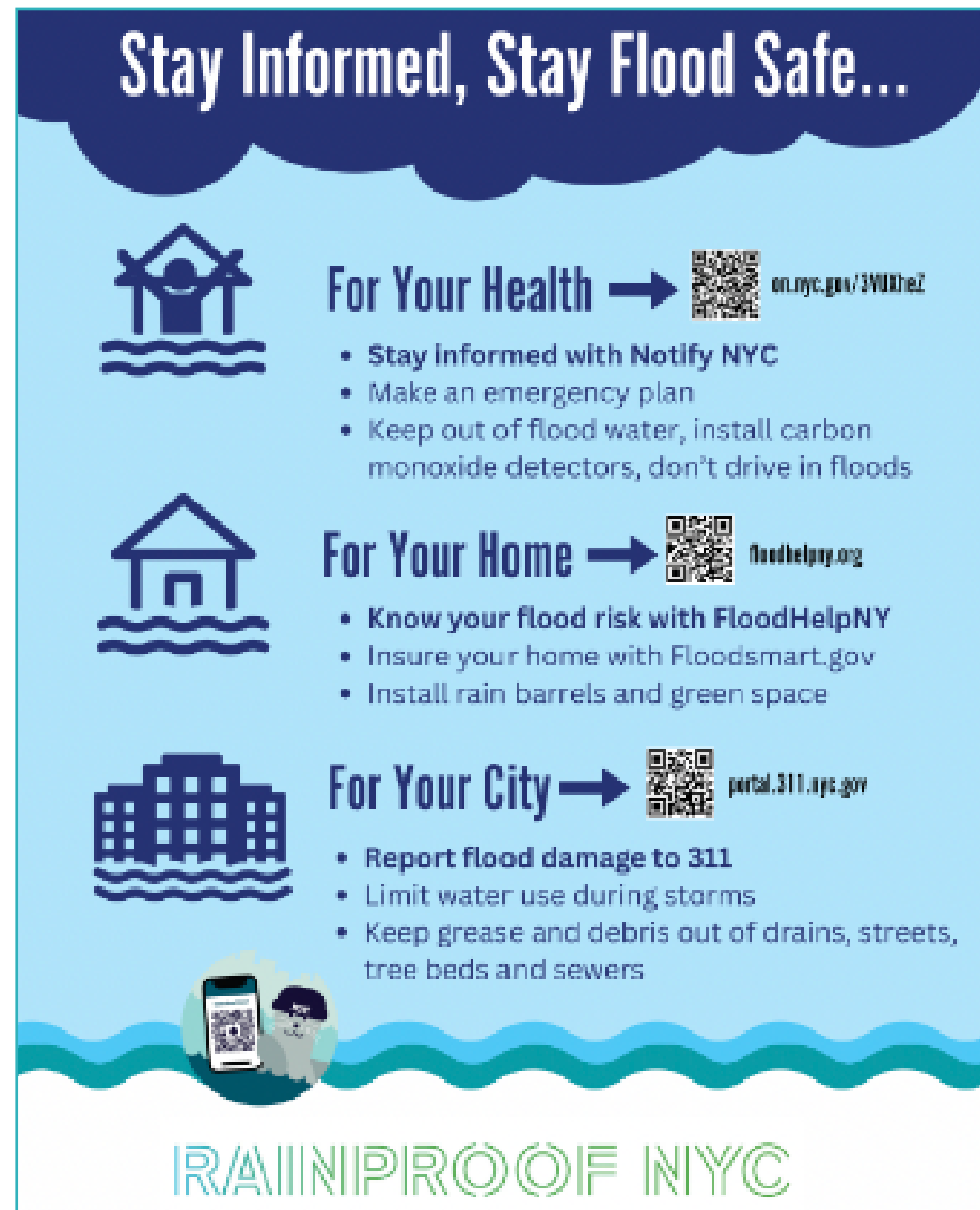
**SCALE:** Health, Home

**PROPOSAL:** Create a Rainproof toolkit for residents of New York that outlines risks, tools, and resources for all residents; is available digitally and in print; is inclusive of renters; and prioritizes communities who are most vulnerable to stormwater flooding.

**IMPLEMENTATION:**

1. Develop a digestible communication tool to connect New Yorkers with information and resources available for before, during, and after a storm for their health, home, and community/city.
2. Create opportunities for New Yorkers to physically engage with stormwater infrastructure, such as bluebelts, catch basins, or rain gardens through:
  - Employment opportunities
  - Volunteerism (i.e. Super Steward, Citizen Pruner, Master Composter)
  - Recreation

3. Expand access to existing resources through translation and print media (i.e. no internet or apps).
  - Examples of existing resources with accessibility barriers that our Working Group identified include: Rainfall Ready; Stormwater flood maps; FloodhelpNY.org; Notify NYC; and WAIT!
4. Develop a guide for multifamily property owners/managers to identify flood threat, incorporate flood-proofing measures, and inform tenants about stormwater flooding risks, resources, and emergency communication systems.
5. Develop a guide for renters to be prepared in the event of extreme rainfall. Although limited, renters can take actions such as enrolling in NotifyNYC, elevating important belongings before a storm, forming relationships with neighbors to have a safe space to be during an event, understanding the risk of their building and area, purchasing renters insurance, understanding community organizations/resources available in their neighborhood, cleaning catch basins near their apartment, and calling 311 to report extreme rainfall.



*Working Group 3 developed a Rainproof NYC outreach flyer to use as a digestible communication tool.*

*The flyer expands access to existing resources through print media by informing folks about stormwater flooding risks, resources, and emergency communication systems.*

**YOU CAN DOWNLOAD WORKING GROUP 3'S RAINPROOF NYC PUBLIC OUTREACH FLYER [HERE](#)>>**

### RECOMMENDATION 3: INVEST IN AND EQUIP COMMUNITY LEADERS WITH TOOLS TO INTERPRET RAIN FORECASTS, UNDERSTAND STORMWATER RISKS, AND COMMUNICATE RISKS AND RESOURCES TO THEIR CONSTITUENTS.

**PRIORITY LEVEL:** MEDIUM

**PHASE:** Before

**SCALE:** Health, Home

**PROPOSAL:** Launch a citywide team of paid community Risk Translators who will be trained to interpret rain forecasts, assess stormwater risks, engage constituents in the Rainproof Toolkit (see recommendation 2), and advocate for the unique Rainproofing needs of their community.

#### IMPLEMENTATION:

1. Leverage trusted community leaders to engage constituents in the Rainproof toolkit and Rainproof civic engagement events.
2. Collaborate with agencies, nonprofits, and community groups to identify potential risk translators and connect with underrepresented groups:
3. Potential organizations that could help include, but are not limited to: NYCEM; NYC Service; DOHMH; SRIJB; Sea Grant; and NY Disaster Interfaith Services (NYDIS). Look to existing community advocacy and public agencies' civic trainings to inform program design.
  - Existing programs that we could learn from include SRIJB Community Flood Fellows Program and The Sanitation Foundation's Trash Academy.
4. Explore corporate funding opportunities for Risk Translators programming.



**RECOMMENDATION 4: ENCOURAGE COLLABORATION AND SHARED OWNERSHIP OF DEALING WITH EXTREME RAIN ACROSS CITY AGENCIES, THE PRIVATE SECTOR, NONPROFITS, AND COMMUNITIES.**

**PRIORITY LEVEL:** HIGH

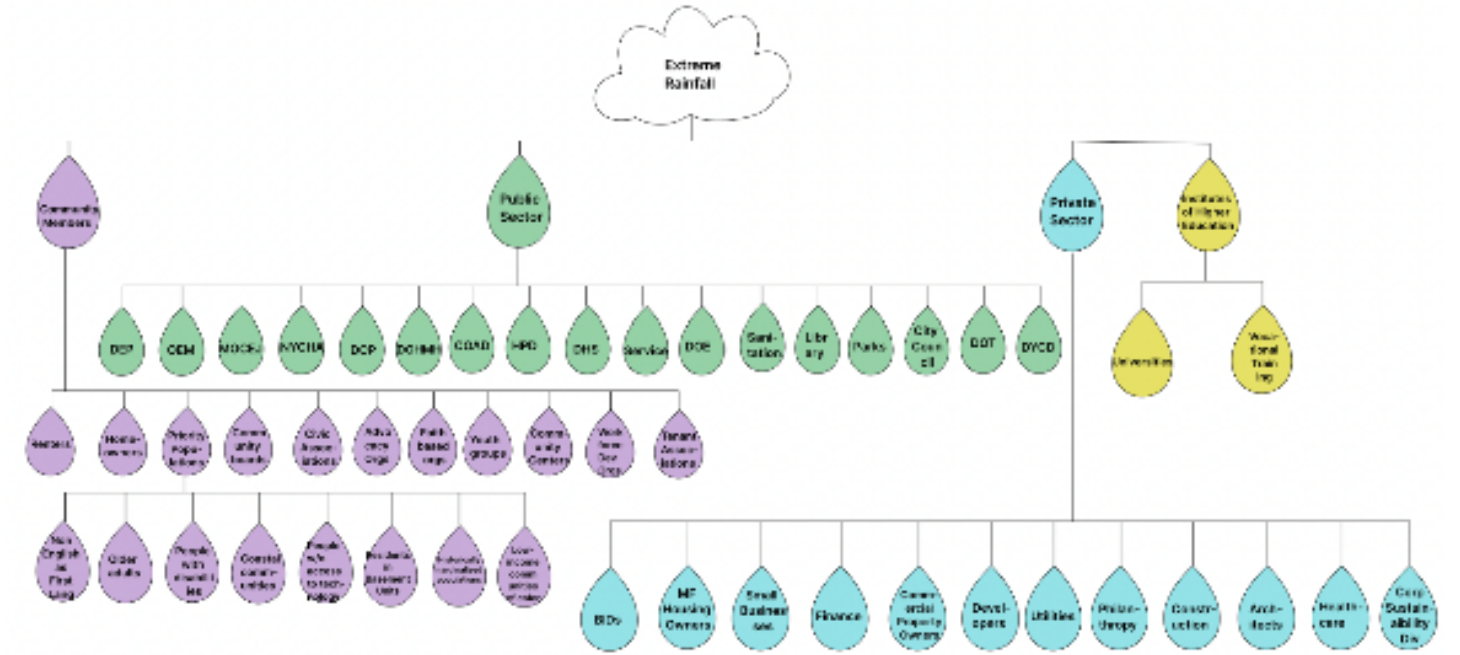
**PHASE:** Before, During, After

**SCALE:** Health, Home, Community/City

**PROPOSAL:** Launch a diverse, citywide team to centralize Rainproof project management, including policy design, project design, community engagement, and resource allocation. Roll out policies that incentivize rainproof design, civic engagement, and long-term solutions to stormwater flooding.

**IMPLEMENTATION:**

1. Require that city agencies include "Rainproof" planning information in any submissions to the Mayor's Management Report. Consider potential tie-ins with other existing reporting mechanisms as well as new initiatives like Climate Budgeting.
2. Incentivize all New Yorkers to take ownership of rainproofing their assets for the good of NYC:
  - Multi-family affordable housing owners develop business continuity plans, utilizing existing available templates and resources (i.e. <https://businesscontinuity.enterprisecommunity.org/>). Currently, the limitation to developing these plans is staff capacity, so providing funding for a staff member's time, hiring an intern, or onboarding a consultant to develop this would help these plans come to fruition.
  - Engagement process with mission-driven multi-family affordable housing owners and operators in areas heavily affected by extreme rainfall will help develop best practices and peer exchange for emergency communication with tenants, building protection during extreme rainfall, business continuity plan development, and more.
  - Private companies and financial institutions work through risks and values of stormwater flooding.
  - Academic institutions introduce Rainproof into their curricula, classroom, and capstone projects.
  - Community-based organizations educate and engage constituents in Rainproofing NYC.
  - City agencies and property owners can collaborate to develop resilience equipment libraries so resources can be shared in areas of high risk (for example back-up sump pumps, wet vacs, etc.).



Through out the process, the Everyone Has a Role to Play Working Group (Working Group 3) mapped out a comprehensive map of stakeholders through various exercises and workshops. This map is the final digestible version presented at the Rainproof NYC Symposium.



WORKING GROUP 3 PRESENTING THEIR RESEARCH PROCESS AT THE MIDPOINT CONVENING

# RAINPROOF NYC PRINCIPLES

## SETTING INTENTIONS: CENTERING EQUITY

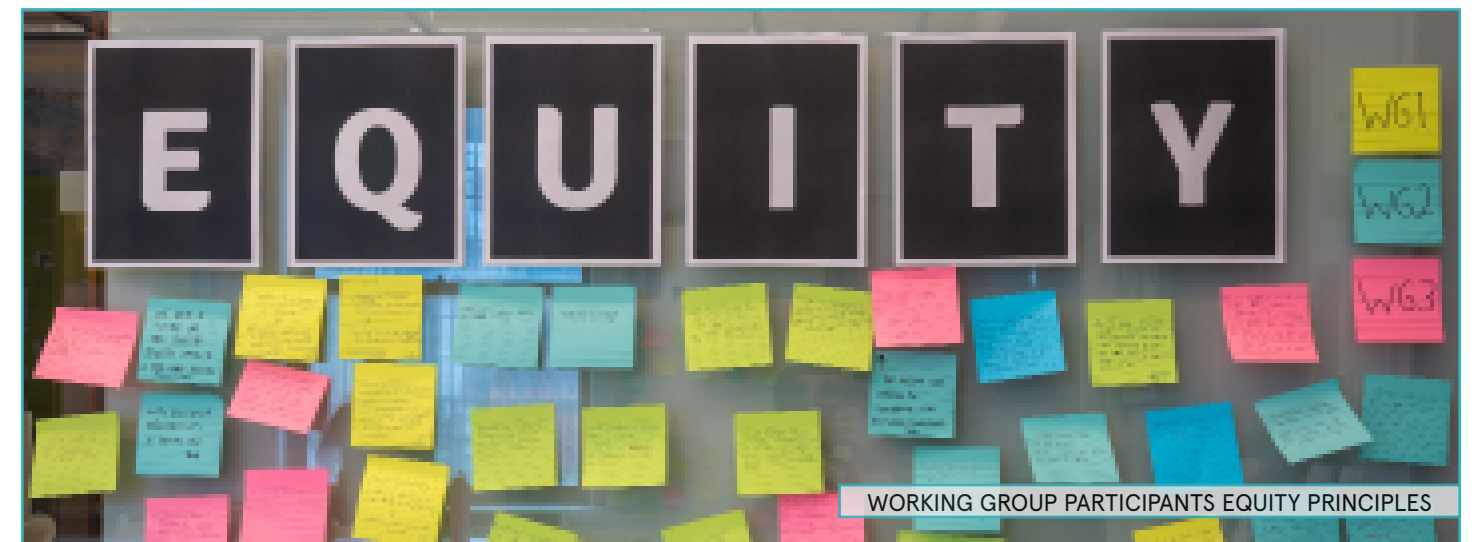
Understanding the experimental and interdisciplinary nature of this process, Rainproof NYC outlined equity and accessibility commitments for the process and for each participant. Below are the commitments the Rainproof NYC Working Groups made to one another at the beginning of the process.

### COMMITMENTS

Throughout our work, the Steering Committee was committed to diversity and inclusiveness as a core value and practice, and to lead by example, viewing and encouraging diversity as a fundamental tenet to the success of this process. The process aimed to support diversity across all lines of difference, including age, economic circumstance, ethnicity, sex, race, range of ability, religion, sexual orientation, citizenship status, and gender identity or expression.

Rainproof NYC understands that building and sustaining diversity requires an ongoing commitment to inclusion that must be embedded in our organizational culture, values, norms, and behaviors. To further achieve our goals, we believed it was crucial to ensure accessibility for all community members throughout this process. We committed to breaking down the barriers to accessibility for all our materials, events, and communications that any of our participants raised.

We viewed it as a work in progress, and we hope to continue learning from one another and our fellow community members.



## CO-DEVELOPING GUIDING PRINCIPLES:

From the beginning of the process, we committed to equitable and inclusive engagement. The Rainproof NYC working groups, with input from the public, developed shared guiding principles to address how New York City should work towards becoming rainproof.

To develop Rainproof NYC guiding principles, Working Group participants were asked to craft principles that reflected their ideas of the most important aspects of how NYC should become rainproof. The public was then asked to add their perspectives as New Yorkers.

Together, that feedback became a comprehensive list of guiding principles and proposed implementation practices to how the City should work towards becoming Rainproof NYC.

## EQUITY & ACCESSIBILITY

- Prioritize the needs, access, and voices of historically marginalized communities, ensuring they have decision-making power and ownership over rainproof policies and initiatives.
- Recognize & Understand Intersectional Challenges: Recognize and address systemic inequities, including historical injustices, systemic racism, and the legacy of colonialism. Develop solutions that recognize the decision-making processes and policy development of the intersecting factors that contribute to vulnerability and inequity by considering race, ethnicity, gender identity, socio-economic status, and age in decision-making processes and policy development.

## ENSURE ACCOUNTABILITY & TRANSPARENCY

- Establish clear accountability mechanisms (including metrics for success), transparent decision-making processes, and ongoing community feedback loops to ensure accountability and track progress effectively.
- Be honest and transparent about limitations and challenges.
- Build agency and ownership at all scales—from the individual resident or homeowner to leadership in City government—by identifying responsibilities, valuing work, and expanding decision-making processes.
- Prioritize transparency in planning and decision-making processes.

## NATURE-FORWARD

Prioritize sustainable and nature-based infrastructure solutions that prioritize green over gray infrastructure, promote co-benefits, and amplify natural ecosystems.

## PRIORITIZE & INSTITUTIONALIZE COLLABORATION

- Create avenues to foster collaborative partnerships across sectors, acknowledging the expertise, experiences, and contributions of each stakeholder group, including private, public, and community stakeholders.
- Create and uphold cross-sector collaboration among different stakeholders, including activists, community organizations, elected officials, government agencies, the private sector, educational institutions, and community organizations, as equal partners in developing and implementing rainproof initiatives.

## BUILD SUSTAINABLE STEWARDSHIP AND ASPIRATIONAL LARGE-SCALE TRANSFORMATION

Create avenues for active participation of different communities and stakeholders to foster a culture of environmental stewardship, including encouraging sustainable development practices that minimize environmental impact, reduce reliance on nonrenewable resources, and promote long-term ecological health.

# HOW TO IMPLEMENT THE GUIDING PRINCIPLES INTO PRACTICE:

## CREATING ACCOUNTABILITY MECHANISMS:

- **Build** agency and ownership at all scales—from the individual resident or homeowner to leadership in City government—by identifying responsibilities, valuing work, and expanding decision-making processes.
  - **Establish** dedicated teams or individuals at the mayoral level that are responsible for collaboration and coordination among stakeholders, setting targets, and guiding areas of focus for resilience efforts.
- **Establish** clear guidelines and regulations for Rainproofing initiatives, including clear timelines and deadlines for progress reports and milestones, to ensure accountability for implementation and compliance.
- **Prioritize** transparency in planning and decision-making processes by providing public data on initiative progress, initiative owners, the distribution of funds and buyouts, etc., and creating opportunities to provide public input and feedback, including difficult questions.
- **Manage** expectations by prioritizing honesty and transparency about limitations and challenges.
- **Develop** flexible and adaptive planning frameworks to address the nuance and uncertainty of changing environmental conditions.



## NATURE-FORWARD:

- **Promote** innovation in green infrastructure technologies and practices.
- **Prioritize** holistic, nature-forward strategies that mimic natural processes, considering the interconnectedness of infrastructure, environment, and community well-being, to manage stormwater effectively.
- **Prioritize** green space development in historically underserved areas to address environmental inequities.
- **Integrate** a multi-benefit and nature-forward framework into all aspects of housing policy and land use planning. Rezoning should prioritize green infrastructure alongside affordable housing developments to mitigate environmental impacts and ensure long-term sustainability.
- **Prioritize** the restoration of natural habitats and historic water pathways to improve biodiversity and ecological resilience.
- **Consider** soil health, groundwater dynamics, and other ecological factors in the planning and development processes of new infrastructure projects, and new infrastructure and land use decisions.

### INSTITUTIONALIZING COLLABORATION:

- **Create** mechanisms to gather input from the private sector and establish clear goals and timelines with key stakeholders.
- **Facilitate** knowledge exchange between stakeholders. Institutionalize interagency collaboration by establishing permanent interdisciplinary groups that meet regularly to address rainproof issues. Integrate communication and workflow by establishing shared communication platforms and workflow channels across relevant city agencies to facilitate collaboration and information sharing.
- **Coordinate** efforts regionally to leverage resources and expertise, particularly in areas with shared vulnerabilities.
- **Engage** the public through education and outreach efforts to promote the benefits of nature-based solutions.

### IMPLEMENTING EQUITY-CENTERED PRACTICES:

- **Address** intersectionalities by building a better understanding of the specific impacts of increasingly heavy rain on groups such as the disabled, children, pregnant women, the elderly, and others.
- **Create** policies and initiatives that aim to rectify these injustices and ensure fair distribution of resources and benefits.
- **Implement** solutions that adapt to the unique needs and characteristics of different communities, recognizing the diverse challenges posed by stormwater management in NYC.
- **Ensure** equitable access to information, resources, funding, and programs for all communities, including language-specific outreach and visual communication methods and considerations.
- **Prioritize** the most impacted communities in decision-making processes and balance placing unfair burdens or expectations on already marginalized communities.
  - **Recognize** community members for their expertise and provide support to community groups for project planning, implementation, and maintenance.
  - **Adapt** strategies, approaches, and solutions based on community feedback and evolving climate data.
  - **Ensure** equitable access to maintaining infrastructure and provide funding and support to community groups for maintenance, stewardship, and workforce development.
- **Integrate** accessibility considerations (i.e. language, physical and mental access, etc.) into infrastructure planning.
- **Ensure** that incentives for Rainproofing measures are accessible to all, prioritizing frontline communities.
- **Provide** transparent support and financial assistance programs, including grants, loans, and subsidies, for installing rainproof infrastructure, retrofitting housing, and integrating climate resilience into new projects.

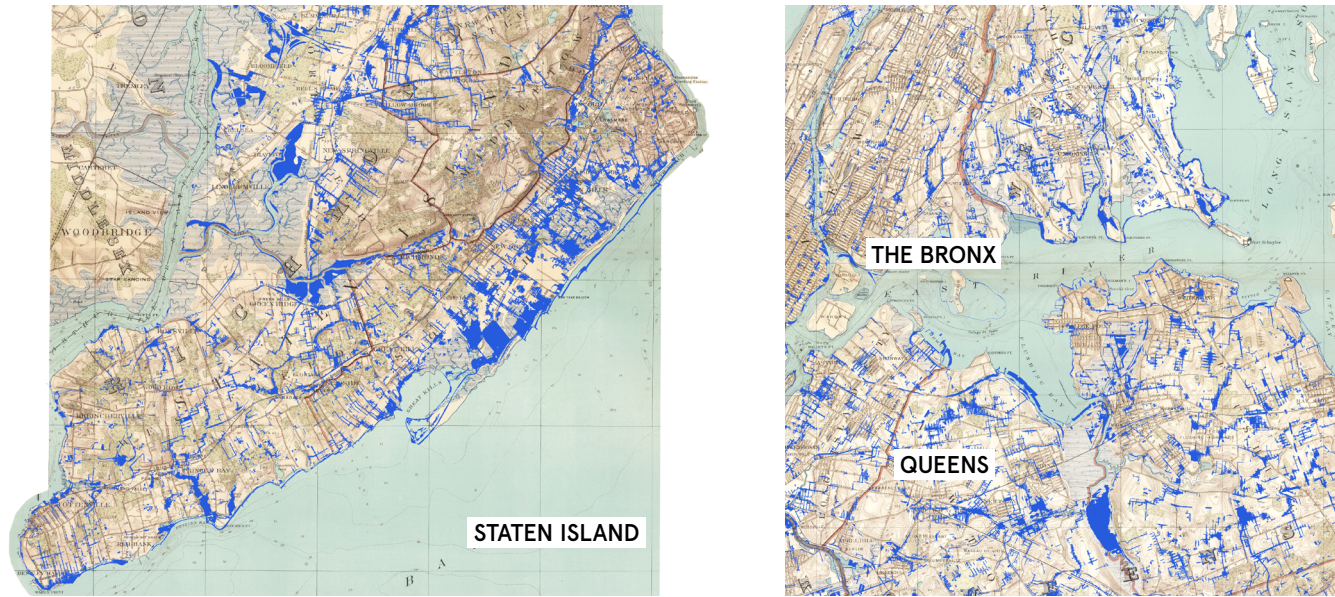
### BUILDING SUSTAINABLE STEWARDSHIP AND ASPIRATIONAL LARGE-SCALE TRANSFORMATION:

- **Create** avenues for active participation of different communities and stakeholders to foster a culture of environmental stewardship, including encouraging sustainable development practices that minimize environmental impact, reduce reliance on nonrenewable resources, and promote long-term ecological health.
- **Establish** sustainable funding mechanisms and long-term financial support systems to ensure the ongoing maintenance and effectiveness of rainproof infrastructure, prioritizing resilience and sustainability.
- **Build** on active efforts by incorporating existing best practices and lessons learned from within and outside NYC.
- **Commit** to long-term, sustainable strategies that address both immediate needs and future challenges, while continuously adapting to evolving circumstances and community feedback, including incentives for post-disaster recovery and short-term support for local needs.

# 10 THINGS EVERYONE SHOULD KNOW ABOUT HEAVY RAINFALL IN NEW YORK CITY

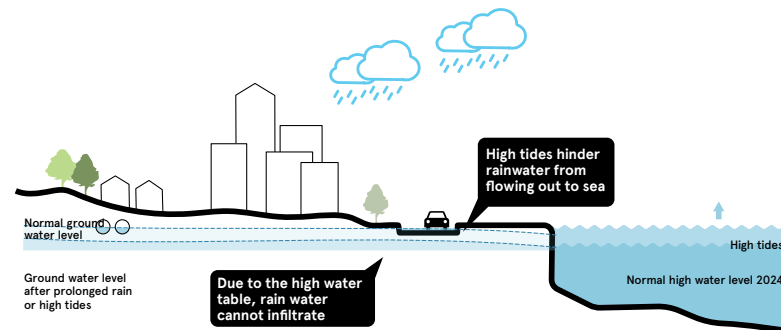
*These 10 points were developed through the Rainproof NYC working group process.*

11 New York City gets a lot of rain, and many areas are built in places that used to be wet, like wetlands and streams. These places often still flood when it rains a lot.



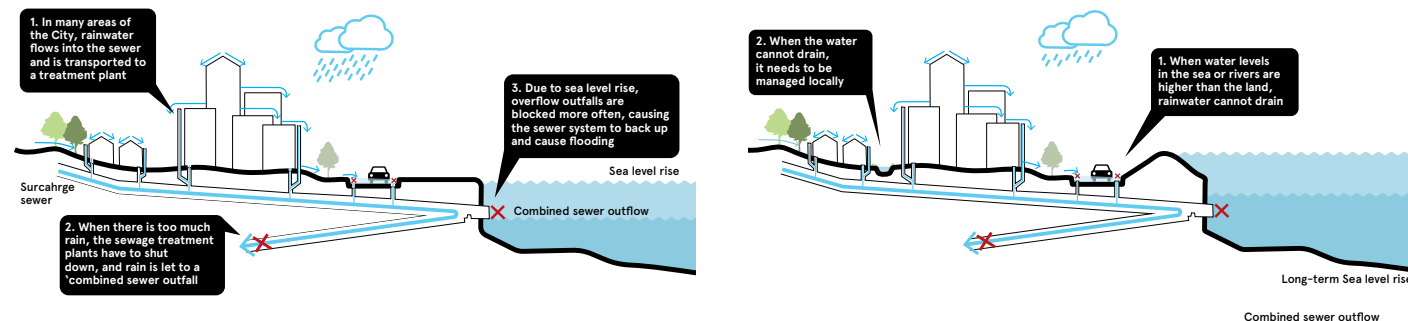
New York City stormwater flood maps overlaid on 1891 historic waterways. The historical maps of New York's boroughs show that there used to be several swamps and marshes. On top of the map, marked in blue, are the areas that currently flood, often at the same locations.

2 When it rains, water can't always soak into the ground or flow away easily because there's already a lot of water in the ground and rivers, and the rain is happening too fast to soak in. This makes flooding worse.



Rainwater has difficulty infiltrating after prolonged rainy days or during high tides.

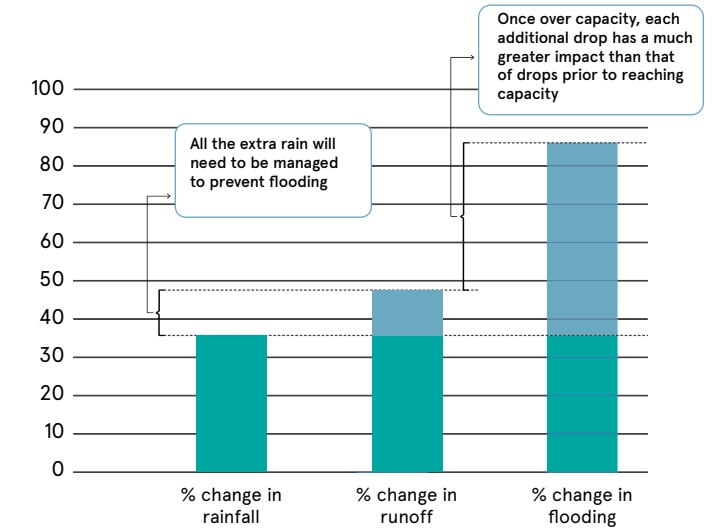
3 Rainstorms are getting stronger because of climate change. This makes it harder to manage the amount of rainwater and make sure rainwater and sewage does not pollute our waterways. As the sea level rises, it's even harder for water to drain away. Some parts of the city might end up below sea level in the future, especially during high tides, which means they'll have to hold water for longer.



Sea level rise will increase rainwater flooding.

Low-lying areas will have to store more water.

4 New York City's sewer system was made to handle rain, but only up to a certain amount per hour. Recent storms have been much stronger than expected, with rain falling as fast as over 3 inches per hour during storms like Hurricane Ida. The current sewers can't cope with this much rain.



Compounded risks with increasing rainfall.

5 The City's Department of Environmental Protection manages the sewer system. It's expensive to make the sewers bigger to handle more water because the pipes and treatment plants would need to be much larger. There's also not enough space underground to put bigger pipes, and the ones we have now can't easily be changed.

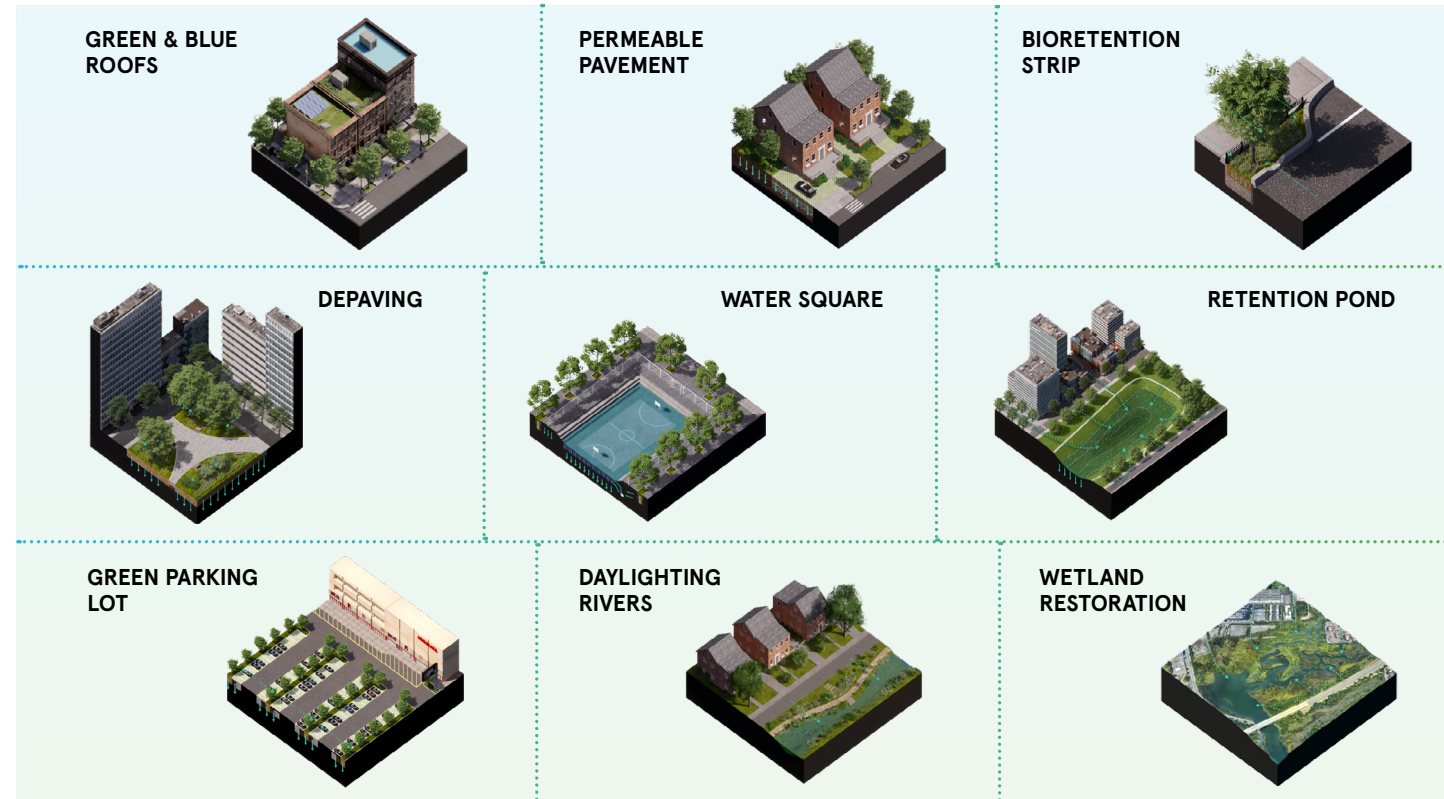
6 Most of the rain that falls in New York City lands on private property. If everyone who owns property could hold onto some of that water during a storm and release it slowly or reuse it afterward, flooding would be less of a problem.



7 Adding natural solutions (like green roofs, rain gardens, trees, and bluebelts) can reduce the amount of water going into the sewers and help filter some of the pollution in rain runoff. This can also cool the city, make people healthier, and support more kinds of plants and animals. But it needs space in streets, parks, and other places.



Green infrastructure interventions:



New York is crowded and funding must be distributed among many different priorities. Any plan to deal with heavy rain will need to make choices. We also need to accept that there will always be some risk of flooding.



Rainproofing New York means getting ready for big rainstorms before, during, and after they happen. Everyone needs to help—governments, businesses, neighborhoods, schools, and people like you.



Working group members share initial recommendations at the Rainproof NYC midpoint.



Rainproofing New York is a long process. For now, we have to adjust to living with water while making sure the most important things and the people who need help the most are prioritized.

# RAINPROOF NYC LEARNING TOGETHER

In addition to regular working group meetings, tours and events were developed to ensure cross-collaboration between working groups, check in on progress, and learn the different ways increased heavy rainfall affects different sectors.

## SITE VISITS

### FLOODNET COMMUNITY SESSIONS: A FLATBUSH OUTREACH EVENT & WORKSHOP

FloodNet offered Rainproof NYC a table at this community event. The Everyone Has A Role to Play working group (Working Group 3) hosted an informative table to test their public outreach fliers.

### OAKWOOD BEACH, STATEN ISLAND BEACH BUYOUTS

The Housing Mobility working group (Working Group 2) organized a visit to Oakwood Beach in Staten Island for a guided tour of the buyouts that were done there after Hurricane Sandy.

### WATER REUSE SYSTEM TOUR 1: THE HELENA, NEW SCHOOL & SOLAIRE

The Managing Increasing Heavy Rainfall working group (Working Group 1) organized a guided tour of water reuse systems in NYC. On Water Reuse Tour 1, the working groups visited water reuse systems at The Helena, The New School, and Solaire in Queens.

### WATER REUSE SYSTEM TOUR 2: DOMINO REFINERY & HALLETS POINT

Water Reuse Tour 2 offered working group participants an exciting guided opportunity to tour water reuse systems in NYC. The group visited water reuse systems at Domino in Brooklyn and Halletts Point in Queens.

### NYCDEP RESILIENT NYC PARTNERS SITE VISIT TO GREEN-WOOD CEMETERY

NYCDEP, Arcadis, and Green-Wood Cemetery organized a tour of one of the first projects completed under their Resilient NYC Partners green infrastructure program. Working groups learned more about Green-Wood's motivations for getting involved and some of the opportunities/challenges with the programs.

### THE JEWEL STREETS, BROOKLYN/QUEENS

The Housing Mobility working group (Working Group 2) visited the "Jewel Streets," a neighborhood that straddles Brooklyn and Queens, to learn about the complex and varied issues faced there and the solutions being proposed.

## PUBLIC OUTREACH

### IN-PERSON COLLABORATION SESSION AT THE AMERICAN MUSEUM OF NATURAL HISTORY

Rainproof NYC hosted an in-person, open-to-the-public collaboration session for attendees to provide feedback on draft recommendations.

### VIRTUAL COLLABORATION SESSION

Rainproof NYC hosted a virtual, open-to-the-public collaboration session for attendees to provide feedback on draft recommendations.

### RAINPROOF NYC SYMPOSIUM AT CUNY JOHN JAY COLLEGE

Full-day public symposium where the members of the Rainproof NYC Working Groups shared their collective recommendations to address this growing challenge for our city.



OAKWOOD BEACH



WATER REUSE TOUR 1



WATER REUSE TOUR 2



IN-PERSON COLLABORATION SESSION



THE JEWEL STREETS



GREEN-WOOD CEMETERY

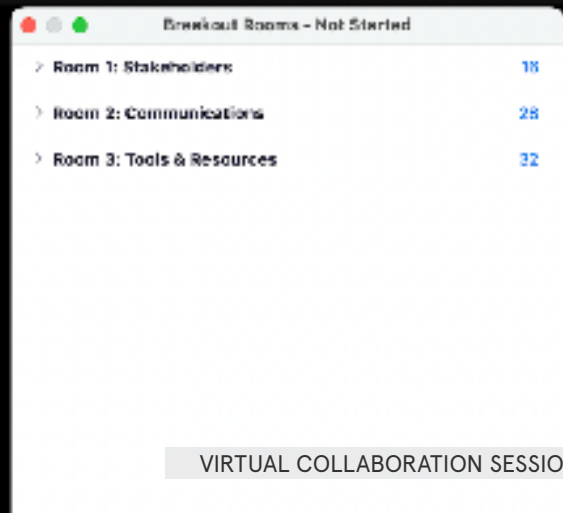
## BREAKOUT ROOMS

### Breakout Room #1 - Stakeholders

Facilitators: Shivali & Rona  
Notetaker: Inger

### Breakout Room #2 - Communications

Facilitators: Kat



VIRTUAL COLLABORATION SESSION



RAINPROOF NYC SYMPOSIUM

# THE RAINPROOF EVENT SERIES

Recognizing the increasing interest in the topic of heavy rainfall and that increasing heavy rainfall is an issue beyond NYC, Rebuild by Design and One Architecture & Urbanism led a simultaneous Rainproof event series aimed at highlighting innovative solutions, lessons learned from global cities, relevant research, new books, and more. Between January 2024 and June 2024, over 1,000 people attended our events.



AMSTERDAM RAINPROOF

## NYC MANAGING RAIN: INTERNATIONAL LESSONS FROM AMSTERDAM AND COPENHAGEN

Presentations by Lot Locher, Strategist and co-founder of Amsterdam Rainproof and current International Director for Climate at One Architecture & Urbanism, and Lykke Leonardsen, Programme Director of Resilient and Sustainable City Solutions at the City of Copenhagen. In conversation with Tonya Gayle, Executive Director at Green City Force.

## A RAINPROOF SUCCESS? WE THINK SO: HOBOKEN'S APPROACH

Presentation by Caleb Stratton, Assistant Business Administrator & Chief Resilience Officer for the City of Hoboken. In conversation with Doug McPherson, Interim Manager at ReAL Edgemere Community Land Trust.



HOBOKEN, NJ



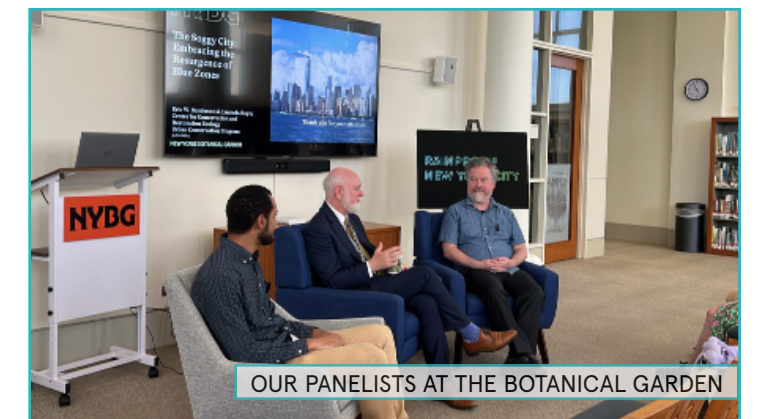
LANDSCAPES OF RETREAT BY ROSETTA S. ELKIN

## "LANDSCAPES OF RETREAT:" A CONVERSATION WITH ROSETTA S. ELKIN AND GUESTS

Presentation by author Rosetta S. Elkin. In conversation with Kelly Leilani Main, Executive Director of Buy-in Community Planning; Shameika Hanson, Community Protection Specialist at The Nature Conservancy; and Despo Thoma, Senior Associate at SCAPE Landscape Architecture.

## REIMAGINING THE CONCRETE JUNGLE: EMBRACING THE RESURGENCE OF BLUE ZONES

Presentation by Eric W. Sanderson, Vice President for Urban Conservation Strategy at the New York Botanical Garden and author of *Mannahatta: A Natural History of New York City*, and artist and journalist Nathan Kensinger, whose work explores New York's historic waterways and the building of flood protection around NYC. In conversation with Christian Murphy, Ecology Coordinator at the Bronx River Alliance.



OUR PANELISTS AT THE BOTANICAL GARDEN

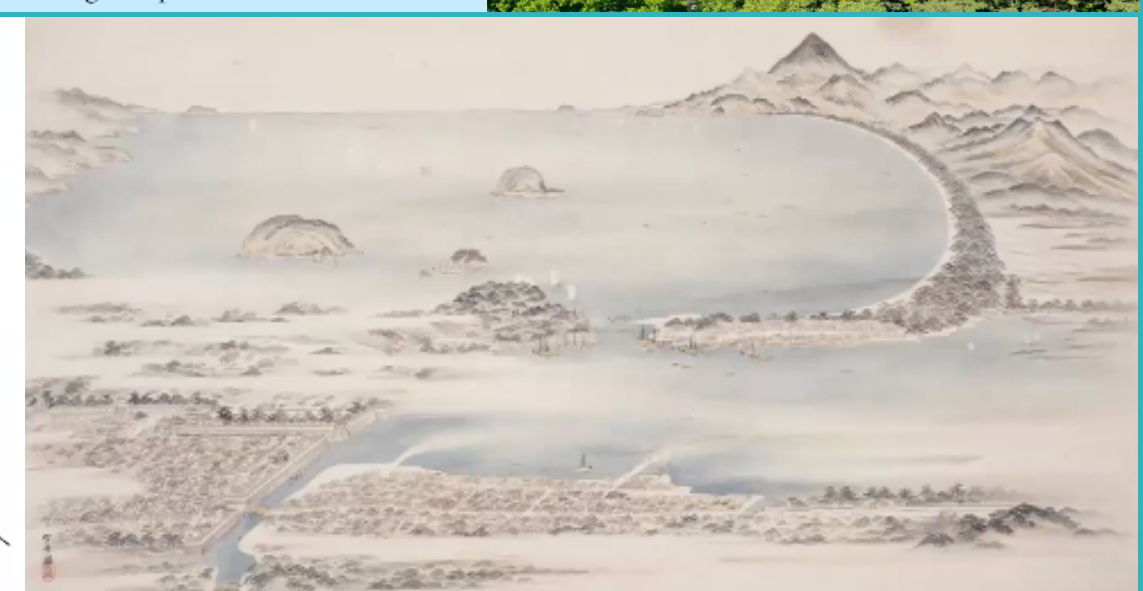
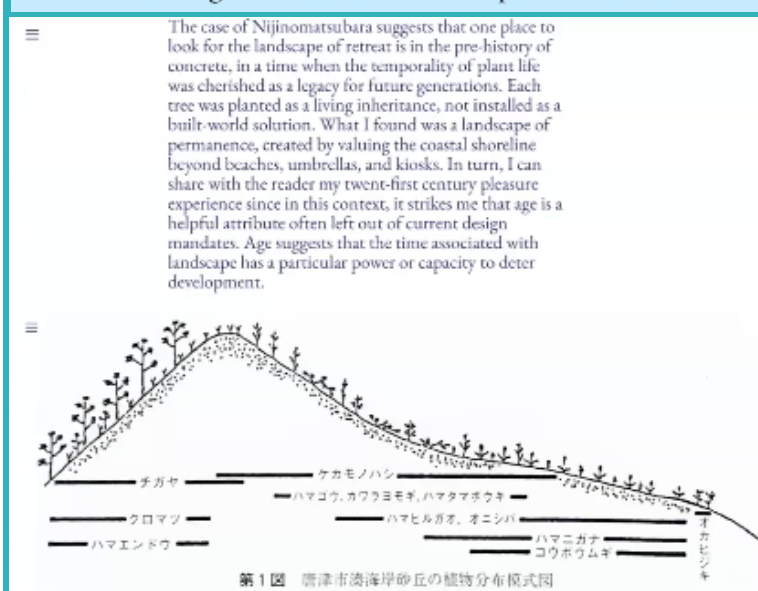
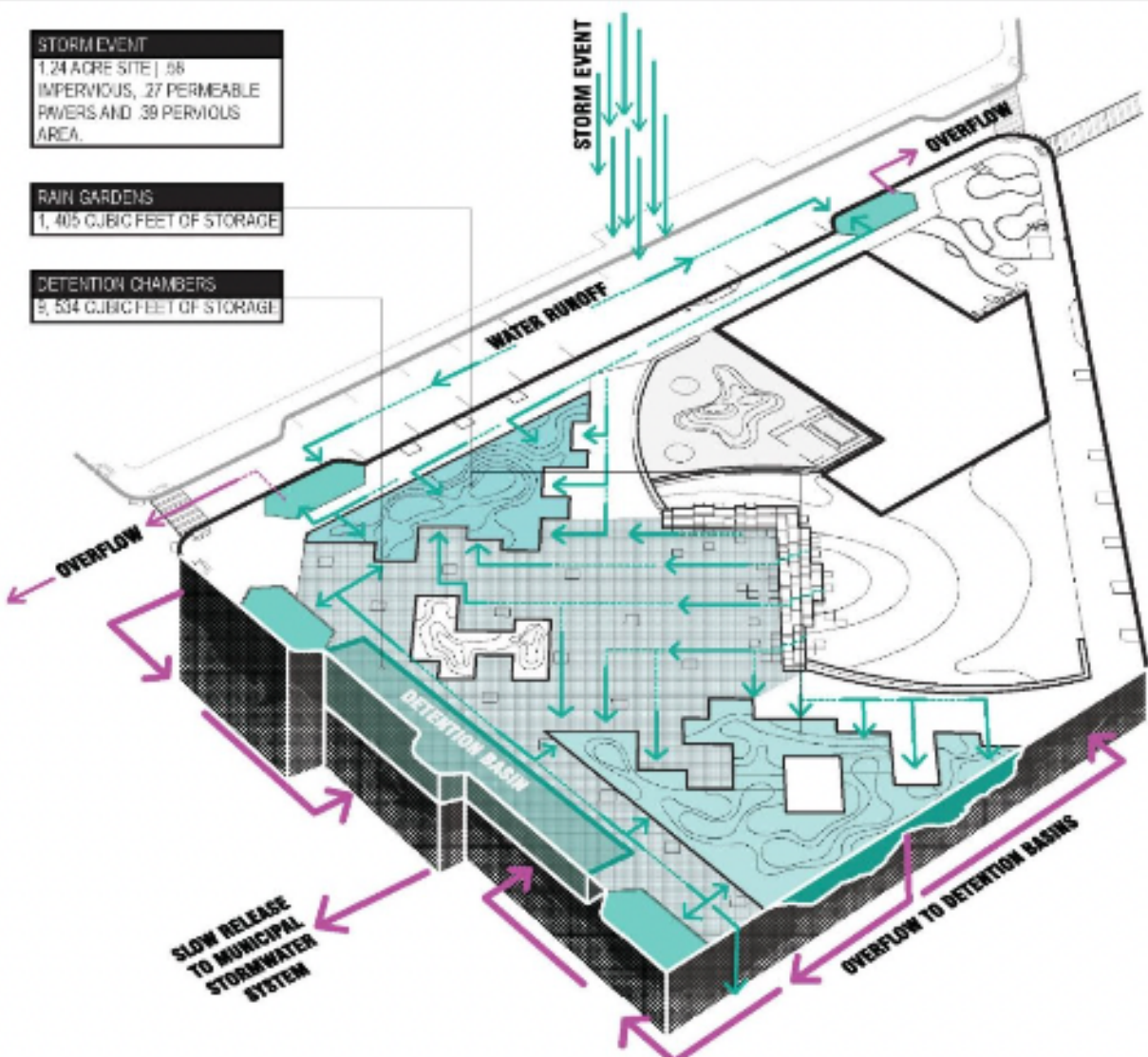
# Amsterdam Rainproof

Connecting and facilitating all stakeholders involved.



## BLUE ZONES: CITY-WIDE SUMMARY (DRAFT)

- **Blue Zone:** Groups of contiguous blocks (i.e. atomic polygons) that were wet, are wet, and predicted to be wet in the future (note caveats)
- Currently 369 Blue Zones, numbered and named for original features (e.g. Corson's Brook, Rock Hollow Pond, Rockaways)
- Cover 20% of blocks; 19% land area of the city
- ~ 985,000 New Yorkers and ~ 101,000 structures living in Blue Zones are vulnerable
- Government can't solve the problem only on government managed lands, but government lands (especially Parks) have an outsized role
- Giving water a place to go in Blue Zones will help protect 47% of the city where flooding is a risk and where deeper and more intense flooding is expected in the future



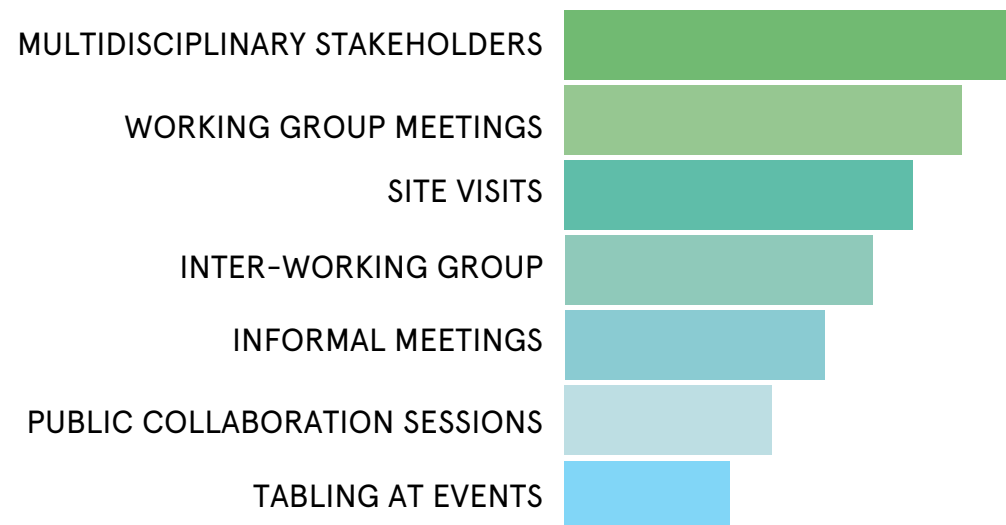
# LOOKING BACK: LEARNINGS FROM WORKING GROUP PARTICIPANTS

To reflect on the process, the Rainproof NYC Working Group participants were asked to respond to a survey to capture and understand their experiences. The following pages are summaries of what we heard from our participants.

## IMPACTFUL ASPECTS

Working group members were asked what aspects of the process they found most impactful to their work in the working group process.

Their responses are ordered by the frequency with which categories were chosen as the most impactful.



## WHAT WORKED WELL

### COLLABORATION & NETWORKING:

The working group process created an opportunity to collaborate with a diverse range of individuals, agencies, communities, and academics, fostering valuable connections and building relationships across different sectors. The diversity created space for learning new tools and methods, with significant support from Rebuild by Design staff to align principles across working groups and sectors.

### EXPERTISE & LEARNING:

The process provided valuable insights into the approaches of city agencies, mayor's offices, nonprofits, and the private sector on rain and flood management, highlighting the expertise and diverse perspectives present, the concepts of living with water and flood risk management, and the importance of engaging community members effectively in initiatives like Rainproof. It facilitated networking among professionals working on these critical issues across various sectors.

### SUPPORT & GUIDANCE:

The clear communication, support from the Rebuild by Design staff and network, and the overall welcoming environment encouraged active participation and facilitated alignment of principles and work across working groups.



WORKING GROUPS MID-POINT CHECK-IN CONVENING

“CHALLENGES WITH CONVENING SUCH A LARGE WORKING GROUP AND KEEPING EVERYONE ENGAGED. IT LEFT ME SOME REFLECTION POINTS ON WHAT MIGHT MAKE SENSE TO DO SIMILARLY OR DIFFERENTLY IF INVOLVED IN FUTURE SIMILAR WORKING GROUPS. CREATING ‘RISK TRANSLATORS’ AS A TERM IS SOMETHING THAT IS SO TRANSFERABLE AND PUTS A NAME TO SOMETHING THAT I TALK ABOUT A LOT.”

- HELEN WILEY,  
DISASTER PREPAREDNESS  
PROGRAM DIRECTOR AT SBP

“I LEARNED A LITTLE MORE ABOUT NYC-LED PROGRAMS AND PROJECTS-GREAT RECENT UPDATES FROM STAFF-AND FELT THAT, OVERALL, THE PLATFORM HELPED FOLKS CROSS-POLLINATE MUCH MORE THAN THEY WOULD NORMALLY ACROSS AGENCIES AND EXTERNALLY.”

- CHINA COPPERSTONE,  
RESEARCH ANALYST AT  
WE STAY/NOS QUEDAMOS



RAINPROOF NYC SYMPOSIUM

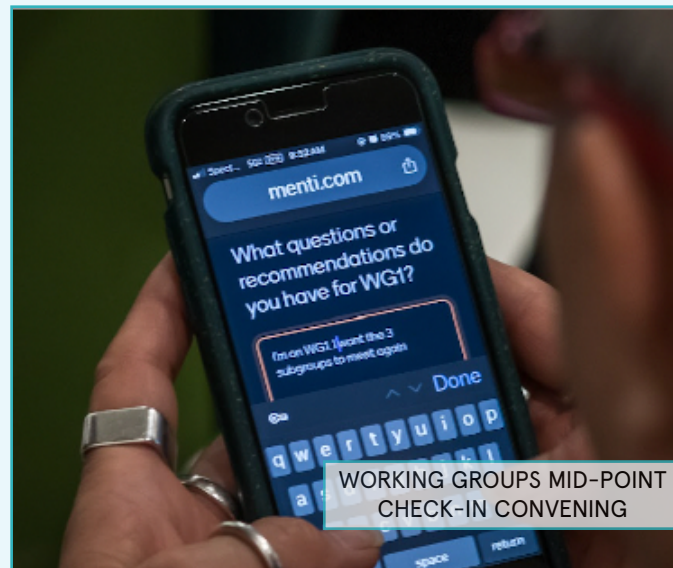
# LEARNINGS OF THE WORKING GROUPS

“THE PEER COLLABORATION AND CONNECTION TO A BROAD ARRAY OF COLLEAGUES WORKING IN THIS PLACE WAS FANTASTIC, AS WERE THE EVENTS AND FIELD TRIPS (THOUGH I WASN’T ABLE TO ATTEND MOST, I THINK THOSE THAT I SAW/HEARD OF WERE EXCELLENT CONTENT FOR PARTICIPANTS). MY TEAM AND I ALSO REALLY ENJOYED THE FACT THAT THERE WAS AN OPPORTUNITY FOR EXTERNAL STAKEHOLDERS/INTERESTED PUBLIC TO JOIN THE MIDWAY AND FINAL WORKSHOP.”

- KATE BOICOURT,  
DIRECTOR OF CLIMATE RESILIENT  
COASTS AND WATERSHEDS AT  
ENVIRONMENTAL DEFENSE FUND



WORKING GROUPS MID-POINT  
CHECK-IN CONVENING



WORKING GROUPS MID-POINT  
CHECK-IN CONVENING



WORKING GROUPS MID-POINT  
CHECK-IN CONVENING



WORKING GROUPS MID-POINT  
CHECK-IN CONVENING



WORKING GROUPS MIXER



RAINPROOF NYC SYMPOSIUM

“MAKING CONNECTIONS AND BUILDING RELATIONSHIPS WITH AGENCY, COMMUNITY, AND ACADEMIC LEADS ADDRESSING SIMILAR CHALLENGES, EVENTS AND FIELD TRIPS; INTRODUCTION TO NEW TOOLS/METHODS FOR COLLABORATION AND ENGAGEMENT ACROSS DIVERSE PARTNERS; SUPPORT FROM RBD STAFF TO ALIGN PRINCIPLES ACROSS WORKING GROUPS.”

- AMY MOTZNY,  
SECTION LEAD OF CLIMATE AND EQUITY  
AT NYC DEP

# SKILLS & KNOWLEDGE FOSTERED THROUGH THE PROCESS

The process fostered extensive cross-agency collaboration, promoting inclusive community engagement and enhancing project management skills. Participants appreciated the process' role in facilitating knowledge exchange across agencies and with external partners. The process fostered collaborative teamwork and active listening, highlighted the benefits of cross-agency idea sharing, and provided reflections on engaging large working groups effectively.

## COLLABORATIVE ENGAGEMENT



WORKING GROUPS MID-POINT CHECK-IN CONVENING

**“HOUSING MOBILITY IS A REALITY!!! AND, GRAY/BLACK WATER RECYCLING SYSTEMS ARE UP AND RUNNING AT MULTIPLE SITES, WITH MORE TO COME. ”**

**- SHINO TANIKAWA, EXECUTIVE DIRECTOR AT NYC SOIL & WATER CONSERVATION DISTRICT**

## COMMUNITY ENGAGEMENT AND COMMUNICATION

The process provided a deeper understanding of the need for inclusiveness and workforce development by community organizations, alongside the critical need for effective communication and outreach. Further, it facilitated networking among professionals working on these critical issues across various sectors.



WORKING GROUPS MID-POINT CHECK-IN CONVENING

Insights gained are poised to inform and enhance ongoing and future agency initiatives. Key focuses include integrating sustainable infrastructure solutions, leveraging communication strategies, and applying newly developed skills in project management and risk analysis.

## APPLICATION TO AGENCY INITIATIVES

## PRACTICAL APPLICATIONS AND RESOURCES

The compilation of resources and expert participation facilitated participants' application to specific projects, emphasizing the importance of risk and cost analysis, and recognizing the successful implementation of housing mobility and gray/black water recycling systems.

Participants gained a deeper understanding of Cloudburst solutions, buyout and resiliency programs, and NYC-led projects. Insights into city agency operations and ongoing projects were enriched through site visits and created a deepened understanding of climate science, hydrology, and gray/green infrastructure solutions.

## DEEPER UNDERSTANDING OF NYC AGENCY INITIATIVES

**“I HOPE TO BRING SOME OF THE PLAIN-LANGUAGE EXPLANATION OF THE PROBLEM AND STRATEGIES INTO DISCUSSIONS THAT CAN BE RELATED.**

**I THINK MUCH OF OUR WORK IS NOT EXPLICITLY RELATED TO STORMWATER, BUT THAT DOESN'T MEAN I CAN'T BRING THAT PERSPECTIVE UP.”**

**- ROBERT HOLUB, EXECUTIVE DIRECTOR OF CODE DEVELOPMENT AT NEW YORK CITY DEPARTMENT OF BUILDINGS**



WORKING GROUPS MID-POINT CHECK-IN CONVENING

# RAINPROOF NYC WORKING GROUPS SYMPOSIUM

On June 25, 2024, the Rainproof NYC Working Groups shared their collective recommendations for rainproofing NYC in a public symposium. The event dedicated time to reflecting on the process, highlighting some of the inspiring work already being done in the City, and looking forward to the future of Rainproof NYC.

## A LOOK AT THE DAY:

**WELCOME:  
REMARKS + ABOUT  
RAINPROOF NYC**

**KEYNOTE SPEAKER:  
RIT AGGARWALA,  
COMMISSIONER OF THE  
NYC DEP**

**OVERVIEW OF RAINPROOF  
NYC EQUITY INTENTIONS &  
PRINCIPLES**

**OVERVIEW OF  
RAINPROOF NYC  
RECOMMENDATIONS**

**KEYNOTE SPEAKER:  
RONA TAYLOR, EXECUTIVE  
DIRECTOR  
AT CENTRAL X SOUTH  
EAST BROOKLYN CDC**

**PANEL:**

**RAINFALL REALITIES:  
NAVIGATING AGENCY  
COLLABORATION IN A  
WETTER WORLD**

How will heavy rainfall interact with different NYC agencies' missions in the future? The panel featured how different NYC agencies are tackling rain and how rainfall will interact with their agency's mission in the future.

A conversation between Marit Larson from NYC Parks, Lizzie Hodges McQuade from the NYC Housing Authority, Bo Chung from the Department of Health & Mental Hygiene, Erin Morey from the Metropolitan Transportation Authority, and Paul Mercurio from the Department of Transportation.

Moderated by Arcadis' Russ Dudley.

**INTERACTIVE SESSION:**

**HOW CAN WE EACH  
LEAD A RAINPROOF NYC  
MOVEMENT?**

**CLOSING REMARKS:**

**ALISON LANDRY, CHIEF  
INFRASTRUCTURE  
OFFICER AT DMOPS**

**PANEL:**

**RAIN BOOTS ON THE  
GROUND: LEARNING  
FROM THE FRONTLINES**

What can we learn from the different actions NYC communities are taking to combat increasing heavy rainfall? The panel featured inspiring community organizations around NYC in a discussion of how they're addressing rainfall and how it can be scaled up throughout the City.

A conversation between Tonya Gayle from Green City Force, Rebecca Pryor from Guardians of Flushing Bay and representing the Rain Coalition, Lucy Cummings from the New York Disaster Inferfaith Services, and Pamela Pettyjohn from the Coney Island Beautification Project.

Moderated by Jill Cornell of NYC Emergency Management.



# COMMITMENTS FROM NEW YORKERS:

Though June 25th marked the conclusion of the Rainproof NYC working group process, it also marked the beginning of what's to come: the implementation of our recommendations.

At the end of the symposium, we asked attendees:

**"WHAT IS ONE ACTION YOU WILL TAKE TO RAINPROOF NYC?"**

Below are the inspiring actions New Yorkers have committed to to help Rainproof our city together:

"Implement the Rainproof NYC recommendations!"

"Talk about flooding issues with my teenage son to get him interested and motivated."

"Ensure that the people around me understand the extent of the climate problems ahead of us. But also give them hope by sharing my experiences of working with people already tackling these issues."

"Clean out my catch basin."

"Knowing my local hydrology—going out in the rain and seeing where water goes, [and] studying maps suggested by speakers and panelists."

"Email the people I met to build more community partnerships and research the things I learned about for the first time today."

"Talk to my team about how we can align our resources, capacity, and relationship[s] to support the recommendations we heard today."

"Follow up with the people I met and further research their websites. I will also integrate some of this knowledge into my curriculums."

"Take what I have learned back to my team and organization. Being [able] to mobilize our work for the city's work on Rainproof."

"Connect colleagues to Rainproof partners and resources to integrate into our projects!"

"I will ask my director if we can add extreme rainfall to our communication training module."

"Actually connect with the people I met today! Not in an icky networking way, but in a genuinely connecting brainstorming collective creativity way!"

# JOIN THE RAINPROOF NYC MOVEMENT

“Connect colleagues to Rainproof partners and resources to integrate into our projects!”



“I will ask my director if we can add extreme rainfall to our communication training module.”



“Follow up with the people I met and further research their websites. I will also integrate some of this knowledge into my curriculums.”



“Talk about flooding issues with my teenage son to get him interested and motivated.”

**TOGETHER, WE ARE TRANSFORMING NEW YORK CITY SO THAT WE CAN SAFELY ADAPT  
TO LIVING WITH MORE WATER.**

**THIS IS JUST THE BEGINNING OF OUR JOURNEY. WITH CONTINUED COLLABORATION AND  
INNOVATION, WE WILL BUILD A CITY THAT CAN WITHSTAND THE CHALLENGES OF THE  
FUTURE.**



# GLOSSARY

**BENEFIT-COST RATIO (BCR):** Benefits divided by costs equal the benefit-cost ratio. If the Benefit-Cost Ratio is equal to or greater than 1.0, then the project is cost-effective and applicable for funding through FEMA.

**BGI NETWORK:** A flexible and multi-functional system of Blue-Green Infrastructure (BGI). A network of natural and semi-natural spaces strategically designed within urban areas to provide multiple ecological, social, and economic benefits.

**BLUE-GREEN INFRASTRUCTURE (BGI):** Stormwater management practices that connect urban hydrological functions (blue) with vegetation systems (green) and community priorities (multi-functional). BGI offers valuable solutions for urban areas facing the challenges of climate change and reduces the need for traditional gray infrastructure.

**CLOUDBURST:** A 'cloudburst' is a sudden, heavy downpour where a lot of rain falls in a short amount of time. Cloudbursts can cause flooding, damage property, disrupt critical infrastructure, and pollute New York's rivers and Harbor (NYC DEP). Note: "cloudburst" is often used interchangeably with "rainbomb," "extreme rainstorm," "extreme rainfall," or "extreme precipitation."

**CLOUDBURST MASTER PLAN:** Another term for a BGI Network. It is a catchment-based strategic plan designed to manage and reduce the impacts of sudden, heavy rainfall (also known as cloudbursts) in urban areas.

**CO-BENEFITS:** Co-benefits describe the added benefits of BGI in addition to the primary purpose of flood risk reduction and/or pollution prevention. Co-benefits of BGI can include improved air quality, recreational value, physical activity, micro-climate, traffic safety, biodiversity, and noise reduction.

**CONVEYANCE SYSTEM:** A system such as drainage pipes, streets, and blue belts that directs water flow to be retained or detained by permeable surfaces, detention sites, or retention sites.

**DAYLIGHTING:** An approach that exposes some or all of a previously buried river, stream, or stormwater drainage (American Rivers).

**DETENTION SYSTEM:** An integrated approach to store water temporarily during a high precipitation event, such as green roofs, green-blue roofs, park space, bioswales, berms, sunken basketball courts, and sunken playgrounds.

**DESIGN STORM:** A design storm is a defined rain event including potential climate factors, whose Intensity, Duration, and Frequency (IDF) are selected as a desired level of protection (Return Period) and design criteria for resilience planning.

**GREEN INFRASTRUCTURE (GI):** The range of measures that use plant or soil systems, permeable pavement or other permeable surfaces or substrates, stormwater harvest and reuse, or landscaping to store, infiltrate, or evapotranspire stormwater and reduce flows to sewer systems or to surface waters (Water Infrastructure Improvement Act). Green infrastructure systems can reduce stormwater flooding.

**HOUSING MOBILITY:** The ability of residents to find and secure a home that improves their housing or neighborhood conditions.

**HOUSING STABILITY:** Secure access to a safe and healthy home and neighborhood that meets a resident's needs.

**NATURAL INFRASTRUCTURE:** Uses existing, restored, or enhanced ecosystems to generate infrastructure outcomes either on their own or in combination with built infrastructure. (International Institute for Sustainable Development)

**NATURE-BASED SOLUTIONS:** Sustainable planning, design, environmental management, and engineering practices that weave natural features or processes into the built environment to promote adaptation and resilience (FEMA).

**STORMWATER/PLUVIAL FLOOD:** Occurs when the amount of rainfall exceeds the capacity of urban stormwater drainage systems or the ground to absorb it. This excess water flows overland, causing water accumulation in natural or man-made hollows and low-lying areas or behind obstructions.

**RESIDENTIAL BUYOUT:** The acquisition of a flood-vulnerable property where the land is then converted to resilient and sustainable end uses.

**SMART INFRASTRUCTURE:** Infrastructure that uses real-time data to inform and deploy systems using sensors, cameras, and other monitoring devices.

**SERVICE LEVEL:** The stormwater service level describes the expected or designed capacity of the storm sewer system. Service Levels are often expressed using a Return Period (RP), such as a 5-year rain event. When the service level is exceeded, the stormwater drainage system may overflow and cause flooding and/or pollution.

**STORM SURGE:** The rise in seawater level caused solely by a storm. (NOAA)

# THANK YOU

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Con Edison

# HOW TO CREATE A RAINPROOF PROCESS IN YOUR CITY

**One goal of our work is to inspire more collective processes to address our most pressing challenges.**

**We began the Rainproof NYC Working Groups process as siloed sectors and individuals all with a passion to combat NYC's heavy rainfall but recognizing we cannot do it alone. Together, we spent an intensive few months getting to know one another's lived and professional experiences. We experimented with different formats, learned from home and abroad, exposed ourselves to other sectors, and held tough conversations to create a genuine network.**

**This report represents the tough but rewarding foundation of how we can come together. Together we are working to put the foundation we created into long-lasting implementation.**

**Join us by replicating a similar process of convening various lived and professional experiences into a guided building of shared thinking and acting to address our society's most complex challenges.**

**Let's work together.**

**RAINPROOFING DEMANDS COLLECTIVE ACTION—FROM GOVERNMENT AGENCIES TO LOCAL BUSINESSES AND INDIVIDUAL CITIZENS. RAINPROOFING NEW YORK MEANS GETTING READY FOR BIG RAINSTORMS BEFORE THEY HAPPEN TO LESSEN THEIR IMPACTS DURING AND AFTER THEY HAPPEN. EVERYONE NEEDS TO HELP—GOVERNMENTS, BUSINESSES, NEIGHBORHOODS, SCHOOLS, AND PEOPLE LIKE YOU.**

**EVERY ACTION COUNTS,  
EVERY DROP COUNTS.**