

RESIST DELAY STORE DISCHARGE

A COMPREHENSIVE URBAN WATER STRATEGY

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1. Executive Summary

A comprehensive urban water strategy

1. Based on a flood risk approach
2. A focus on communities with:
 - a) demonstrated risk
 - b) a concentration of value
 - c) and, vulnerabilities with regional impact
3. Addresses two forms of flood risk:
 - a) storm surge
 - b) rain-based flash flood
4. Urban environments are complex dense, and highly connected
= require an integrate, comprehensive approach
5. Four components to strategy:
 - a) resist
 - b) delay
 - c) store
 - d) discharge
6. Objectives include:
 - a) manage water
 - b) mitigate flood insurance
 - c) deliver co-benefits
7. Proposed safety levels: a new standard
 - a) storm surge— against 500 year level storm events
 - b) flash flood—to cope with 1 in 10 year rain fall events
8. Net benefits:
 - a) preserve
 - b) reduce
 - c) enhance
 - d) sustain
9. Innovative and replicable:
 - a) comprehensive strategy
 - b) stakeholder coalition and funding framework
 - c) communication and education
 - d) integrated design
10. Implementation includes:
 - a) master plan
 - b) catalytic capital projects
 - coastal defense at Hoboken Station
 - coastal defense at Weehawken Cove
 - c) guidelines and studies
 - d) programs
 - e) pilot projects

2. Approach

The Sandy-affected region is a long coastline with many assets, and as we now know, at risk. A fully comprehensive solution is beyond our means, so we will need to prioritize, build smart, and recognize where best to focus our resources. Integrated into our built environments our investments in risk reduction should also empower our communities and our economy, allowing us to grow resiliently.

Our approach is framed by a desire to understand and quantify flood risk. In doing so, we are better positioned to identify those opportunities that present the greatest impact, the best value, and the highest potential—our areas of focus.

Within the Sandy-affected region, New Jersey's communities of Jersey City, Hoboken, and Weehawken are susceptible to both flash flood and storm surge. As integrated urban environments, discreet one-house-at-a-time solutions do not make sense. What is required is a comprehensive approach that acknowledges the density and complexity of the context, galvanizes a diverse community of beneficiaries, and defends the entire city, its assets and citizens.

Two-thirds of Hoboken lies within the FEMA 100-year flood zone—Sandy clearly demonstrated the consequence of such vulnerabilities to flood *risk*; Hoboken is the 4th densest city in the country, and represents a sizeable concentration of *value*; The NJT / PANYNJ transit complex at Hoboken station, and NHSA sewage works, are examples of exposed infrastructure with significant regional *impact*. It is the combination of these factors, and others, that warrant such significant investment in flood defense. Engaged citizenry, and leadership with the capacity to move quickly, provides the conditions for a swift political process.

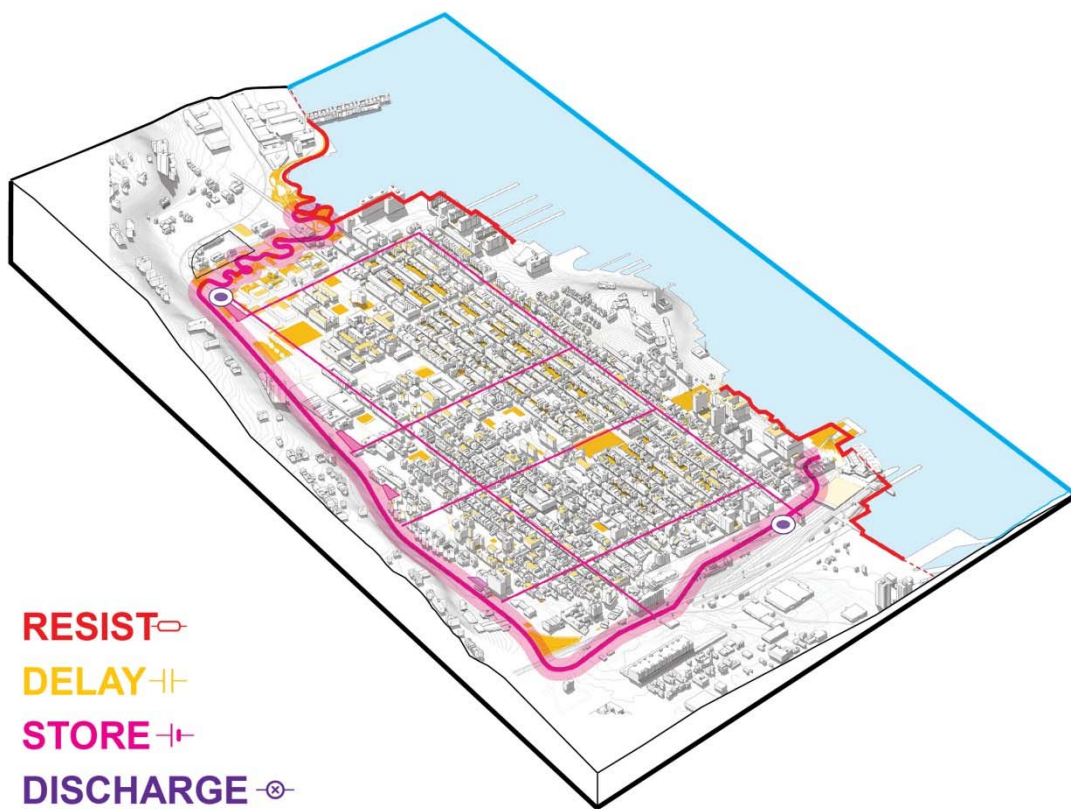
Our comprehensive urban water strategy deploys programmed hard infrastructure and soft landscape for coastal defense (resist); policy recommendations, guidelines, and urban infrastructure to slow rainwater runoff (delay); a circuit of interconnected green infrastructure to store and direct excess rainwater (store); and water pumps and alternative routes to support drainage (discharge).

The objectives of this manifold strategy are to manage water, for both disaster and for long-term growth; to mitigate the financial pressures of flood insurance—enabling reasonable premiums, or exemption from the Federal flood insurance program, through the redrawing of the FEMA flood maps; and the delivery of co-benefits—including: civic, cultural, recreational, and commercial amenities—that enhance the quality of the built environment.

The net benefits are considerable. A robust flood defense will avert losses to assets and disruption of activities (preserve); in turn, this will lead to considerable savings on the ongoing cost of defensive measures and emergency response (reduce); the defensive infrastructure will serve as the catalyst for community amenities (enhance); while the certainty afforded by these measures will provide a sound basis for growth (sustain).

Our strategy is predicated on a series of innovations: a comprehensive approach to flood risk; a coalition of stakeholders and collaborative funding framework; an umbrella of communication and education; and integrated multi-faceted design solutions. Inherent to each innovation is the opportunity for replication across the region—insuring positive impact from both the built solution and the propagation of its underlying ideas.

Implementation of our strategy will be carried out over a number of years and leverage a broad program of funds across government, philanthropy, business, and community sources—the keystone investment will be HUD CDBG-DR funding.



3. Flood Risk Assessment

The city of Hoboken lies on the west bank of the Hudson River in the New York metropolitan, directly across Manhattan, and includes Hoboken Terminal, a major transportation hub for the region. Large parts of the City of Hoboken used to be marshes along the Hudson River surrounding an island, which currently is the higher part of Hoboken. Due to this geometry, its high-density urban environment and low elevation, Hoboken is susceptible to both flash flood and storm surge.

In October 2012 when Hurricane Sandy made landfall on the East coast of the United States of America large parts of the city were flooded. To cope with these flood challenges both flood risks – storm surge and extreme rainfall events – need to be addressed comprehensively and an improved level of protection is required. Hoboken's single water shed, single jurisdiction, and combination of high impact factors (high density, value, influence, and potential) lend themselves to creating a multi-faceted solution that both defends the entirety of the city, and enables commercial, civic, and recreational amenities to take shape.

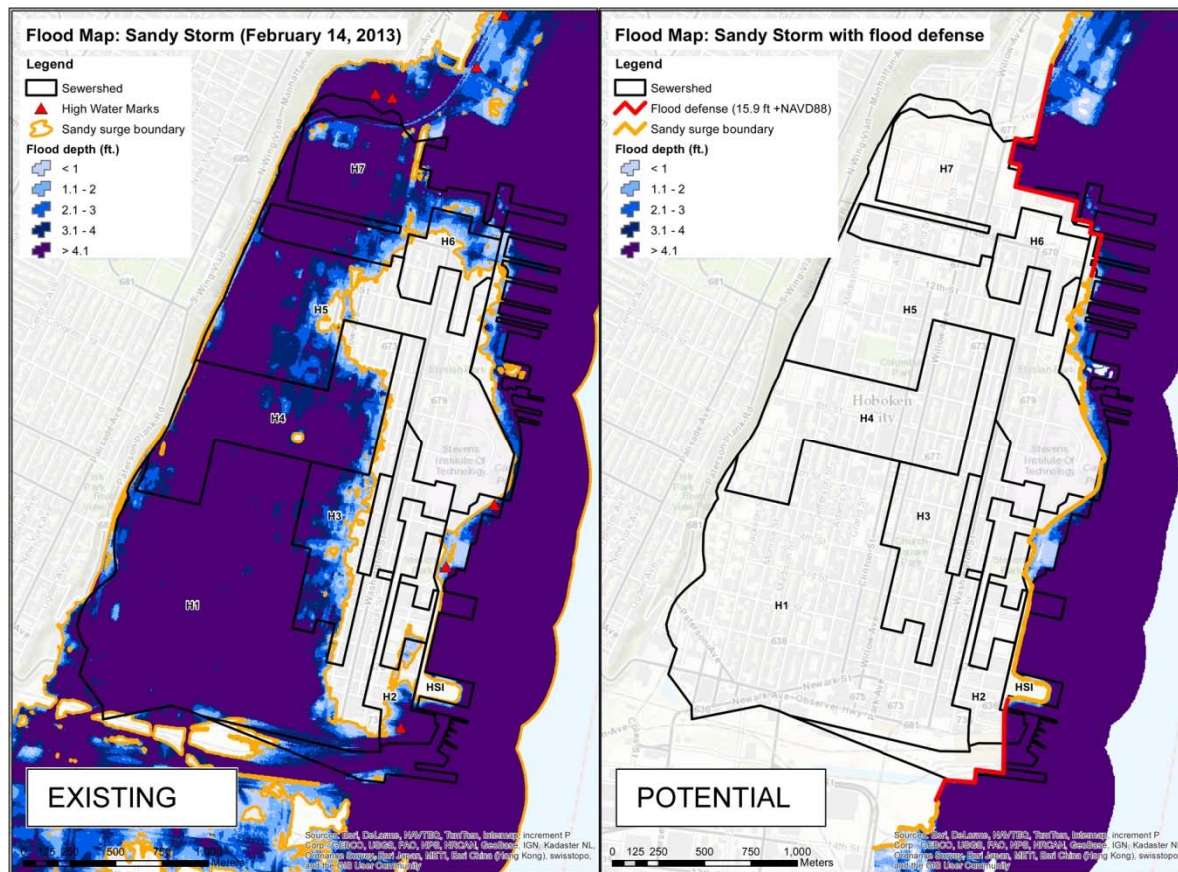
Safety level for storm surge flood risk reduction

The impact of hurricane Sandy (2012) on the high-density built environment in New York and New Jersey illustrated the region's vulnerability to storm surges. For the City of Hoboken a flood risk assessment is conducted, illustrating an approach to determine an appropriate safety level and highlighting the importance of increased flood protection. The study provides an example for comparable communities in the region and a motivation for flood risk assessments for flood-prone areas world-wide.

Determining a safety level for flood protection is ultimately a political choice. It is the question how much safety (a) society desires at which costs. By monetizing the investments in flood protection and determining the corresponding present value of risk reduction, an economic optimum level of protection can be determined (Jonkman et al., 2009; Kind, 2013). To conduct this analysis, the Hydraulic Boundary Conditions for Hoboken are obtained from different sources (Lin et al., 2012 and NOAA, 2013), potential investments in flood protection measures are derived based on expert judgment and coastal defense cost estimates (Hillen et al., 2010; Jonkman et al., 2013) and a damage assessment is conducted, based on private damage and a mark-up to include public damage, business interruption and the concept of risk-aversion. These parameters determine a safety level with the most value for money.

Following this analysis the 500-year level of protection for the flood defenses to address storm surges is concerned to be an economic optimum. With this level of protection the risk reduction significantly outweighs the investment in flood defenses. Hereby a new standard for Hoboken is proposed, protecting the city against Sandy-like surge events and which can still be funded with the ongoing grant programs. This level of protection is considered appropriate in the US setting and is a case for improved flood risk reduction measures.

In Appendix 3 this approach is detailed and the analysis and its results shown.



Urban water management strategy

Due to its high-density urban environment and low elevation, several portions of Hoboken, particularly in the southwest area of the city, are prone to (flash) flooding when rain events occur during high tide. The existing urban water system in Hoboken is mainly based on discharge, both sewage (dry weather flow) and storm water (wet weather flow). The system consists of a collection of interconnected pipes, mainly closed canals. Runoff takes place by gravity flow and by pumping stations to the waste water treatment plant in Hoboken north.

Large sections of Hoboken are either below the normal high tide elevation or the normal storm high tide elevation, and many of the associated outfalls are also either below normal high tide levels or the normal storm high tide levels. This means that these outfalls are not able to release this excess flow into the Hudson River when storm events occur during high tide. Instead, all of this water stays in the sewer system, and the sewage levels throughout the sewer system keep rising until either the sewage level is higher than the tide level or street flooding begins.

Already in 2002 the need for additional wet weather or “ejector” pumps was obvious. Originally, 4 wet weather pumps were designed to create low tide conditions along Hoboken’s interceptor line were going to be used to alleviate the flooding problem when wet weather conditions coincided with high tides levels at the Hudson River. In 2011 the H1 sewer shed was equipped with an additional wet weather pump with a capacity of 50 million gallon per day (83 cfs).

Fitting our design procedure in the Comprehensive Water Strategy we decided to start calculating the water assignment as the required storage capacity that is causing nuisance and flash flooding. Besides increasing discharge and creating more storage capacity, the runoff intensity and volume can be reduced. The runoff intensity depends on the design and construction of the buildings, streets, green and so on.

The water assignment isn't normative, but has to be appropriate by balancing the cost/ effectiveness. From daily practice in Hoboken excessive water in streets occurs once or twice a year. Also the drainage system has a fixed capacity depending on good maintenance. Storm events are however very dynamic. We need more storage capacity. Corresponding with the preferred drainage T10 capacity (5.2 inch in 24 h) we require a T10 storage capacity as well.

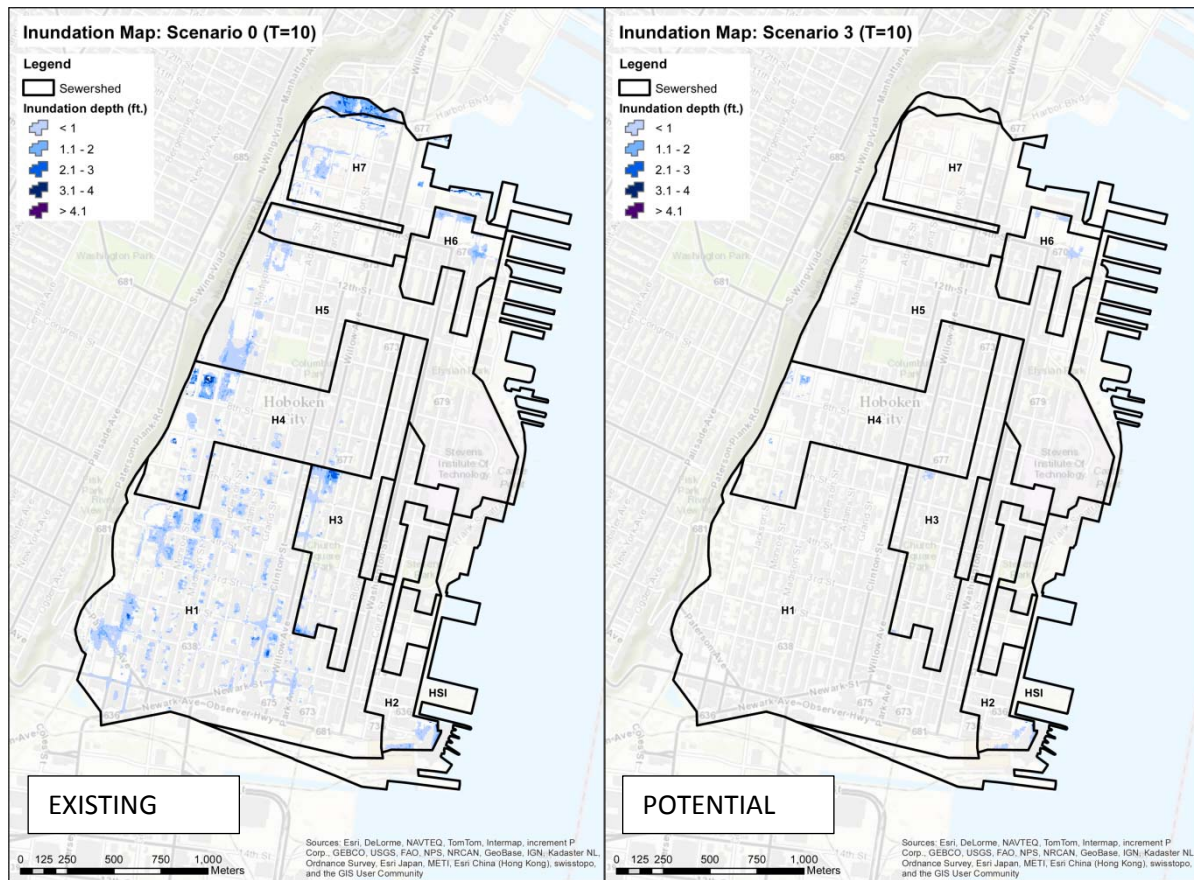
In the Hoboken Green Infrastructure Strategic Plan (October 2013) the volume of potential storm water storage using storm water BMP's is calculated. This is for a future water management of Hoboken. This says nothing about any performance or assignment. Fitting our design strategy we developed a conceptual, sewer shed and outfall based, water balance model and calculated the Hoboken water assignment as the required (delay &) storage capacity in the existing situation. The water balance results are represented by calculated surplus volume of water in the streets or urban flash floods for a T1, T10 and T100 rainfall event:

Return period T storm event	Rain depth [inch/ 24h]	Volume assignment [acre*feet]	Volume assignment [cu.ft]
1/100	8.57	144.13	6,278,303
1/10	5.22	60.87	2,651,497
1/1	2.86	18.85	821,106

Already some practical measures and optional alternatives are mentioned in the Hoboken Green Infrastructure Strategic Plan (October 2013), both on system scale (green belt) and local scale (city wide BMP's). Green roofs and vegetated infiltration swales are a few examples to retain water and delay the runoff process. Plenty of facilities exist to reduce runoff. These Sustainable Drainage systems (SuDS) – also called Green Infrastructure (GI) or Best Management Practices (BMPs) for Low Impact Development (LID) - create numerous alternative options for solving our storage design problem. We will have to address these optional alternatives during the design process by at least considering separately a fast surface and piped runoff component and a slow runoff component through the soil/subsurface drainage system. It should be considered to incorporate these best practice guidelines or BMP's in a manual.

The water volumes per sewer shed are compared with the elevation. For this we used a special developed spatial analyst tool in ArcGIS for mapping water depths and flooding in the streets. The Figure below illustrates the urban inundation for a T10 rainfall event from the existing situation to a potential future situation. Clearly the delay, store and discharge measures have effect on limiting the reoccurrence of flash floods in Hoboken. Also the green infrastructure solutions and storm water BMP's have the opportunity to separate the storm water drainage from sewage discharge. This also limits the combined sewer overflows. The proposed green belt has the potential to facilitate wetlands and natural treatment of storm water runoff.

In Appendix 4 the detailed storm water analysis is provided.



4. Stakeholder process

A comprehensive strategy towards a resilient Hoboken requires an understanding of flood risk and an alignment of values and priorities. Our team has actively engaged a range of stakeholders through presentations, workshops and meetings. Our goal was to educate the community and ourselves on the costs and benefits of protecting Hoboken and living with water. The team spent long days and nights presenting, listening and even teaching resilience through the lens of politics 101. We mediated differences between groups through the shared objective of resilience.

The notes and feedback from public showcases and web based feedback surveys have shaped our proposals and are the first phase of a rigorous stakeholder process that has impressive and broad based support from the federal through the individual level. The letters of support for Resist, Delay, Store and Discharge (Appendix 2) illustrates the success and efficacy of the stakeholder process and provides a basis for the successful implementation of the proposed solutions for resilience.

Stakeholders	
Public meeting	<ul style="list-style-type: none"> • (Multi-service center: community) <ul style="list-style-type: none"> ◦ Presentation ◦ Q&A • (Hoboken Station main waiting room: commuter) <ul style="list-style-type: none"> ◦ Q&A ◦ Design charrette ◦ Web based survey
Outreach and stakeholder interaction	<ul style="list-style-type: none"> • Education pamphlet <ul style="list-style-type: none"> ◦ Flood Risk 101 • Education simulation <ul style="list-style-type: none"> ◦ Which flood protection measures • Road Show <ul style="list-style-type: none"> ◦ Breakfast reception: Chamber of Commerce ◦ Work session: Hoboken Boathouse ◦ Meeting: School community ◦ Seminar: Stevens Institute (social science elective) ◦ Drinks reception: Hoboken developer community ◦ Meeting: CERT ◦ Meeting: Charitable organizations • Survey <ul style="list-style-type: none"> ◦ Online ◦ CERT canvassing • Seminar <ul style="list-style-type: none"> ◦ 2014 NJAPA Conference

Stakeholders	
Communities	<ul style="list-style-type: none"> • Hoboken Chamber of Commerce <ul style="list-style-type: none"> ◦ Presented proposal and fielded questions from members at breakfast reception as part of outreach roadshow. Issues raised included how members could help take action now—resiliency toolkit?; how members can be part of the ongoing design; and how development can be part of the solution. • Hoboken Historical Museum <ul style="list-style-type: none"> ◦ Visited exhibition on “Hoboken: One year after Sandy” and discussed with Museum curator and staff. Sourced city data. • Community Emergency Response Team <ul style="list-style-type: none"> ◦ RBD community funds to support CERT outreach activities—CERT carried out door-to-door canvassing to generate awareness for team OMA’s RBD proposal, to conduct team OMA’s project survey, and to sign-up volunteers for the City of Hoboken’s “Floor Captain” resiliency initiative. • Mile Mesh <ul style="list-style-type: none"> ◦ Co-presented at NJAPA 2014 Conference. Discussed how other resiliency initiatives can be integrated into Hoboken’s flood resiliency

	<p>framework.</p> <ul style="list-style-type: none"> • Stevens Institute of Technology <ul style="list-style-type: none"> ◦ Alan Blumberg, Davidson Laboratory: proofread team OMA's flood risk analysis; shared animated model of Sandy storm surge in Hoboken. Ongoing dialogue. ◦ Seminar on policy and resiliency together with Mayor Zimmer for Social Science elective as part of outreach roadshow. • Hoboken Catholic Academy <ul style="list-style-type: none"> ◦ Presentation and work session with other Hoboken education stakeholders as part of outreach roadshow. Discussed Sandy damage to schools, resiliency measures, and how potential recreational amenities associated with the flood protection infrastructure could benefit local schools. • Hoboken Dual Language Charter School (HOLA) <ul style="list-style-type: none"> ◦ Presentation and work session with other Hoboken education stakeholders as part of outreach roadshow. • Hoboken Day Care <ul style="list-style-type: none"> ◦ Presentation and work session with other Hoboken education stakeholders as part of outreach roadshow. • Hoboken Cove Community Boathouse <ul style="list-style-type: none"> ◦ Work session with Marvel Architects, selected designer for Boathouse to coordinate integration of boathouse into future flood defense structures. • Bike Hoboken <ul style="list-style-type: none"> ◦ Discussed integration of bike paths, and bike share, into flood defense infrastructure with community members at public meeting. • Hoboken Developers <ul style="list-style-type: none"> ◦ Presented proposal and fielded questions from the community at an evening drinks reception as part of outreach roadshow. • Hoboken Resident Community <ul style="list-style-type: none"> ◦ Presented proposal and fielded questions from the community at a public meeting hosted by Hoboken multi-service center. • Hoboken Commuter Community <ul style="list-style-type: none"> ◦ Round table work sessions, general Q& A, an online survey, and circulation of information pamphlets at an evening event at Hoboken Station's main waiting room. The exhibition remained open for the week. • Hoboken Jubilee Center <ul style="list-style-type: none"> ◦ Presented proposal and fielded questions from the community at an evening drinks reception as part of outreach roadshow. • Hoboken Boys and Girls Club <ul style="list-style-type: none"> ◦ Presented proposal and fielded questions from the community at an evening drinks reception as part of outreach roadshow. • Hopes <ul style="list-style-type: none"> ◦ Presented proposal and fielded questions from the community at an evening drinks reception as part of outreach roadshow.
Hoboken	<ul style="list-style-type: none"> • Mayor Zimmer <ul style="list-style-type: none"> ◦ Ongoing dialogue. An initial presentation towards the end of stage 2 to Mayor Zimmer and her team set the stage for a defining collaboration. Team OMA's proposal not only shared common thinking and complimented the City's own initiatives, but addressed two outstanding elements: a coastal defense strategy, and an overarching vision (the comprehensive system). The Mayor's office has provided strong support throughout the design phase, including outreach and data gathering. Ongoing discussion have helped shape our strategy and advanced the city's own thinking on resiliency. ◦ Team OMA and RBD has demonstrated supported Hoboken's NFWF application. ◦ Demonstrated benefits of the comprehensive strategy to Hoboken include the protection of the entire Hoboken Station complex, the protection of the train yards and LCOR development site, and the

	<p>leveraging of defensive infrastructure to catalyze redevelopment of the station complex.</p> <ul style="list-style-type: none"> • City Council <ul style="list-style-type: none"> ◦ Presentation and Q&A with the City Council at scheduled council meeting. A number of council members followed up with questions during subsequent public outreach events that primarily focused on scale and timing of the proposal. • Hoboken Housing Authority <ul style="list-style-type: none"> ◦ Presented proposal and fielded questions from the community at an evening drinks reception as part of outreach roadshow.
Jersey City	<ul style="list-style-type: none"> • Mayor Fulop <ul style="list-style-type: none"> ◦ Presentation and discussion with Mayor Fulop at Jersey City Hall. Confirmed compatibility of proposal with Jersey City's own plans and demonstrated benefits accrued to Jersey City of Team OMA's proposal: Protection of North Jersey City from storm surge at Hoboken Station breach point; defense of NJT/PATH transit infrastructure; adoption of piloted Delay and Store green infrastructure programs for water management; Civic, economic and recreational amenities around Hoboken Station complex; a sound basis for ongoing development in Newport. • Jersey City, Division of City Planning <ul style="list-style-type: none"> ◦ Discussed project in context of Jersey City's flood resiliency strategy.
Weehawken	<ul style="list-style-type: none"> • Mayor Turner <ul style="list-style-type: none"> ◦ Presentation and discussion with Mayor Turner at Hoboken City Hall and at Weehawken City Hall. Confirmed integration of South Weehawken into proposal and demonstration of benefits accrued to Weehawken of Team OMA's proposal: Defense of south Weehawken from storm surge at Weehawken Cove breach point; defense of NHSA sewage infrastructure and PSE&G electrical substations; adoption of piloted Delay and Store green infrastructure programs for water management (Weehawken resident has volunteered her property as the site of a potential pilot 'rain' garden); New parkland offering enhanced recreational amenities for Weehawken Cove; a sound basis for ongoing development in south Weehawken. • City Council <ul style="list-style-type: none"> ◦ Presentation and Q&A with the City Council at scheduled council meeting to be confirmed.
Hudson County	<ul style="list-style-type: none"> • County of Hudson, Division of Planning <ul style="list-style-type: none"> ◦ Discussion at public meeting at Hoboken Station's main waiting room. • North Hudson Sewage Authority <ul style="list-style-type: none"> ◦ Ongoing dialogue. Integration of pump into strategy. Coordination of proposed 'natural filtering system' as part of Store strategy. Sharing of base data on sewage system, Sandy damage, and future plans for resiliency and mitigating CSO events. • PSE&G <ul style="list-style-type: none"> ◦ Discussion at public meeting at Hoboken multi-service center, and ongoing liaison via Mayor's office.
PANYNJ	<ul style="list-style-type: none"> • PANYNJ / PATH <ul style="list-style-type: none"> ◦ Ongoing dialogue. Presentation and discussion with Deborah Gramiccioni (Deputy Director Port Authority), and Mike Marino (Deputy Director PATH) at Hoboken City Hall, with Mayor Zimmer. Confirmed compatibility of proposal with PANYNJ's own plans and agreed the opportunity and benefit of multiple layers of defense to transit assets. Exchanged data on PANYNJ damages sustained during Sandy, and confirmed assets at risk including micro: assets at Hoboken station, and macro: the integrity of the whole PATH system. ◦ Demonstrated benefits of the comprehensive strategy to PANYNJ include the protection of Hoboken PATH station (and by extension the entire PATH network). Potential protection of tunnel entrances and ventilation assets to the north and south of Hoboken.

State of New Jersey	<ul style="list-style-type: none"> • Governor's Office of Recovery and Rebuilding <ul style="list-style-type: none"> ◦ Ongoing dialogue with Governor's office. Coordination and access to state agencies, personnel, and data. • New Jersey Transit <ul style="list-style-type: none"> ◦ Ongoing dialogue. Presentation and discussion with NJT, and developer partner for Hoboken Station yards site, LCOR. Subsequent collaboration focused on multiple fronts: Adoption of the comprehensive strategy as a basis for design coordination; Integration and support of resiliency strategies (NJT's FTA application to fill-in Longslip canal and team OMA's HUD CDBG-DR submission); Use of NJT's Hoboken Station complex and Hoboken Light Rail sites as host to city-wide resiliency measures; a common basis to assess flood risk and quantify assets at risk; sharing of data on the transit system, Sandy damage, and future plans for resiliency. ◦ Demonstrated benefits of the comprehensive strategy to NJT include the protection of the entire Hoboken Station complex, the protection of the train yards and LCOR development site, and the leveraging of defensive infrastructure to catalyze redevelopment of the station complex. ◦ Coordination with NJT on their FTA funding application addressed Resist and Discharge—agreeing the height of the bulkhead at the end of Longslip Canal is consistent with the rest of the Resist defense standard, and ensuring the culverts incorporated into the canal for run-off from the palisades had adequate capacity to provide drainage for the Discharge termination of the green circuit. • NJ EDA <ul style="list-style-type: none"> ◦ Discussion on sidelines of RBD organized 'funding' workshop. • NJ DEP <ul style="list-style-type: none"> ◦ Discussion on sidelines of RBD organized 'funding' workshop. • Other applicable departments • Senator Cory Booker <ul style="list-style-type: none"> ◦ Presentation and discussion with Senator Booker at his offices in Newark. Demonstrated benefits accrued to Hoboken and wider New Jersey region of Team OMA's proposal. Senator stated the need for an 'urban' solution to flood resiliency. • Senator Bob Menendez <ul style="list-style-type: none"> ◦ Mayor Zimmer presented OMA's proposal to Senator Menendez at end of stage 2.
NGO	<ul style="list-style-type: none"> • Re.Invest Initiative (Rockefeller Foundation) <ul style="list-style-type: none"> ◦ Co-presented at GSD studio. Dialogue as one of Mayor's office ongoing projects. Discussed coordination of initiatives, and integration under team OMA's umbrella comprehensive strategy. • Hoboken Green Infrastructure Strategic Plan / Louis Berger (Together North Jersey) <ul style="list-style-type: none"> ◦ Co-presented at NJAPA 2014 Conference, and other events. Dialogue as one of Mayor's office ongoing projects. Discussed coordination of initiatives and integration under team OMA's umbrella comprehensive strategy.
Private sector	<ul style="list-style-type: none"> • (see community stakeholders)
Federal	<ul style="list-style-type: none"> • HUD • Army Corp of Engineers • DOI • FEMA • DOT

5. Implementation Plan

The comprehensive strategy addresses two direct flood challenges that need to be directly addressed in the coming years. These include catalytic coastal defense schemes, reducing the risk of storm surge flooding and the already scheduled first steps of Hoboken's green infrastructure plan. For swift implementation the conceptual design needs to be studied in more detail leading to a master plan that builds upon a flood risk analysis and an overarching strategy to address all water related challenges.

This leads to the following projects and actions to be implemented in the next 5 years (Phase 1):

- Master plan that details the components of the strategy
- Studies that provide analysis and expertise on various aspects of the strategy, and pilot-projects that test and develop the proposals
 - Flood Risk Analysis
 - Comprehensive Funding and Implementation Strategy for all aspects of the master plan
 - Marsh introduction study
 - Storm water management guidelines
 - Incentives, mandates, and zoning recommendations related to short-term resilience and green infrastructure
- Catalytic projects
 - Coastal defense at Hoboken Station complex and surroundings
 - Coastal defense at Weehawken Cove
 - Pump station
 - Greenbelt CSO wetland pilot

At 20 years the major pieces of the coastal defense are implemented and the co-benefits on and around these flood defense measures can be realized. Different from the construction of the flood defense structures, the green infrastructure measures can be realized flexible and fitting the phasing. The elements can be phased in over time, first focusing on obtaining sufficient storage capacity in the city.

The following projects are expected to be ready for implementation in 20 years (Phase 2):

- Programs
 - Roll-out of private and civic “delay” and “store” solutions
- Projects
 - Coastal defense – non-priority interventions
 - Realization of the Green Belt/ Blue Corridor/ Green Circuit
- Studies
 - Flood insurance exemption

Over the long term (Phase 3, 50 years), the strategy will contribute towards a continuous, maintained, and defended New Jersey shoreline. It will be a model for adapting urban centers to the complex challenges of climate change. It will define a parallel urban green infrastructure—separating rainwater management from the existing combined sewage system—and put the community on a sustainable path to living with water.

Green infrastructure

Specifically for the green infrastructure measures, the following elements can be considered to be implemented – in line with existing plans – in Phase 1 (0-5 years):

- Hoboken Green Infrastructure – Design Guidelines – Managing Urban Runoff Manual (incl. city wide policy stormwater BMP's).
- More comprehensive design of the Green Belt/ Blue Corridor/ Green Circuit.
- Green infrastructure pilot and demonstration projects.
- A Green infrastructure incentive plan.
- Green Street Steward Program (maintenance of green infrastructure facilities on “small and medium scale”).

- Realization of the twin Wet Weather Pump station (“Discharge”) will help limit flash floods on the short term.

During Phase 2 (5-20 years) of implementing our comprehensive strategy we suggest to consider scaling up green infrastructure measures and storm water BMP’s (small and medium scale).

Phase 3 (20-50 years) of implementing our comprehensive strategy we propose:

- Continuing of scaling up green infrastructure measures and storm water BMP’s (small and medium scale) as we expect some of today’s extreme events have become “the new normal”.
- Transitioning towards a blue-green city of Hoboken.

6. Benefit-Cost Analysis

The Comprehensive Strategy presents an opportunity to defend a dense concentration of value at risk in the City of Hoboken and to provide new amenities stacked with infrastructure investment that serve the community and region. This will provide significant net economic benefits -- approximately \$100m in net benefits from flood risk reduction alone -- and advance an innovative model for flood infrastructure that can be replicated throughout the region. These improvements can support Hoboken's self-identification as an innovative and resilient city. Specific benefits include:

- **Preserve** | Mitigating the risk of flood damage to Hoboken's sizeable and diverse assets and activities.
- **Reduce** | Minimizing ongoing expenditures associated with the base case, including emergency response costs and flood insurance premiums.
- **Enhance** | Providing new economic activities and public amenities that add value to Hoboken.

Methodology

At this point in the design exercise, the OMA team has quantified and monetized expected economic benefits of reduced flood risk for the first phase of investment at a conceptual, order-of-magnitude level and compared them to expected costs of flood infrastructure. Additional costs associated with layered program elements including retail spaces, new parks and open space, transit improvements, and site-specific green infrastructure investment will be calculated during the Master Plan in the first phase of implementation. Similarly, the value associated with these program elements is expected to be significant and transformative for Hoboken; at this stage, it is described quantitatively pending additional design refinement. As part of the design refinement, the team will conduct detailed engineering and planning studies to ensure any adverse effects of this plan are minimized; as such, no adverse effects of plan implementation are described in this report.

The comprehensive strategy was prepared using an adjusted economic optimum approach, which selects the "safety level" with the minimum total societal costs, where total cost equals infrastructure investment costs plus expected costs of flood damages over the next century (The monetized Net Present Value of the flood risk is calculated using an infinite time horizon). Safety level is a measure of the (annual) probability of exceedence of a storm surge level (1/10 years, 1/50 years, 1/100 years, 1/500 years, etc.) against which the contemplated defense infrastructure would be effective. The team recommends a 500-year level defense for Hoboken based on:

- Hudson Estuary available water level data combined with sea level rise used to estimate probability of future water levels associated with extreme events
- Estimates of benefits for different levels of flood defense, based on the potential economic losses associated with different flood levels
- Comparison of the costs of different levels of flood defense based on international best practices and Royal HaskoningDHV firm knowledge.

In addition to informing the design, this analysis is the foundation of the cost benefit analysis described below.

All costs and benefits are compared to a "reference case" -- the expected state of Hoboken without investment in the comprehensive strategy. For this reference case, we have assumed that flooding events will continue to regularly occur, with storm water flooding on an approximately yearly basis and flooding due to storm surge approximately every decade. Frequency of flood events will increase over time as a result of climate change.

In response to this risk, public and private actors are expected to invest in non-coordinated defense, including:

- The City would build two or more additional flood pumps at approximate cost of \$10m per pump.
- Individual development sites of high scale would undertake significant defense measures specific to their sites. This could include site-specific flood walls, site elevation, green infrastructure, and/or wetproofing. Such measures are expected to cost tens of millions of dollars for each of the two major redevelopment areas.
- As mandated by the city in new zoning and/or as required, property owners may be compelled to undertake resiliency investments including elevation of utilities and selective waterproofing at potentially significant cost.
- The North Hudson Sewerage Authority (NHSA) would be required to make significant investments in its infrastructure to comply with federal regulations.

Because ad hoc investments are not expected to offer the same flood protections as the comprehensive strategy, the reference case includes significant damages to Hoboken. Existing property owners, residents, businesses, and institutions would be saddled with increased flood insurance premia as the Biggert-Waters act takes full effect and as repeated damages disqualify existing policy holders from their subsidies. Moreover, residents, workers, and the public sector would continue to bear the cost of disruption and damage during increasingly frequent and severe storm events.

Project Costs

The cost of the first phase of this program is expected to equal approximately \$470m (See table 1), including a variety of partner projects undertaken by New Jersey Transit (“NJ Transit”), NHSA, and the City of Hoboken. Projects undertaken by partners represent \$145m of this estimated \$470m project cost. Cost estimates are based on expert judgment of Royal HaskoningDHV’s experts with significant experience in flood control engineering works and programs. Estimates are in line with leading studies on coastal defense cost estimates (e.g. Hillen et al. 2010, Jonkman et al. 2013). Note that the Phase I cost excludes approximately \$60m in green infrastructure program interventions and the bulk of “layered program” costs, which will be refined in Phase I and move forward in subsequent phases.

Sources/Notes: Coastal defense cost estimates for hard costs only provided by Royal HaskoningDHV. Long Slip Canal costs based on estimated NJ Transit program. Pumping station, block 12 storage park, and land acquisition costs provided by City of Hoboken. Program and soft costs are rough estimates provided by OMA Team based on their professional experience. Operations and maintenance costs are based on standard multipliers (1.5% annually for flood infrastructure; 10% annually for open space).

Table 1: Summary of First Phase Cost Estimates

Phase 1 Project Components	Costs (Millions)
Capital (0)	\$ 470
Hard Costs Related to CDBR-DR Request (1) (2)	\$ 220
Hoboken Terminal	\$ 90
Weehawken Cove	\$ 120
Other Coastal Defenses	\$ 10
Soft Costs Related to CDBG-DR Request	\$ 53
Master Plan and Technical Studies	\$ 20
Coastal Defense Soft Costs (3)	\$ 33
Contingency Related to CDBG-DR Request (4)	\$ 51
Hard & Soft Costs of Partner Projects (5)	\$ 149
Long Slip Canal & NJ Transit Resiliency	\$ 100
PATH Train Resiliency	\$ 10
New Pumping Station	\$ 12
Block 12 Storage Park	\$ 3
Green Infrastructure Land Acquisition	\$ 20
"Program Layer" Demonstration Projects	\$ 2
Green Infrastructure Demonstration Projects	\$ 2
Operations & Maintenance	\$ 7.8
Annual Programming Costs (6)	\$ 0.5
Annual Maintenance Costs (7)	\$ 7.3

Value PropositionPreserve

The concentration of people, activity, and value in Hoboken creates the imperative for defense. Hoboken is the 4th densest city in the US, with over 50,000 residents and 17,000 employees. According to the Hudson County Assessor's Office, existing assets represent approximately \$11b in value in addition to the value of transit and other infrastructure. Institutions including the Stevens Institute and Hoboken University Medical Center have a significant and valuable presence in the City.

Additionally, Hoboken Terminal is located in the southeast corner of the city. Hoboken Terminal is both an historic asset and a vibrant multimodal transit hub of critical import to Northern NJ and the metropolitan region. Hoboken Terminal serves six modes of transit with some 50,000 daily passengers, and countless more from throughout New York and New Jersey pass through on regional rail.

Hoboken suffered significant damage during Hurricane Sandy roughly estimated by this team at over \$250m, including an estimated \$125m damage to NJ Transit's station, infrastructure, and trains; \$48m in reported national flood insurance claims; nearly \$10m in reported City damages; an estimated \$25m in automobile damages; and significant damage to other major public and institutional assets. Low income

and minority populations were especially hard hit as the Hoboken Housing Authority's properties were among the most damaged.

The value of activity taking place in Hoboken is as significant as its asset base. Residents earn \$3.5 billion in wages each year, and businesses earn \$2.1 billion in income. Flood events disrupt their economic activities; during Hurricane Sandy, all but one of the businesses on Washington Street, this City's primary retail corridor, were without power. Residents and workers were immobilized by the flooding for up to one week, reducing economic activity. The PATH train, which provides commuter service to Manhattan and nearby destinations in New Jersey, was closed for three months, causing commuter delays. This disruption also reduced foot traffic to local businesses that depend on commuter patronage, resulting in reduced sales. Flood defense can preserve day to day business function, worker productivity; resident productivity; and commuter productivity over the base case by preserving. Increased stability of operations increases transit ridership and local retail sales over the base case.

To calculate the impact of reducing flood risk, Royal HaskoningDHV drew on its safety level analysis to compare expected flood risk in present value terms without intervention to expected flood risk with the recommended 500-year level of protection. Royal HaskoningDHV found that while current flood risk is equal to \$750m, investment in the comprehensive strategy is expected to reduce this risk to \$118m, for net benefit from flood risk reduction equal to \$632m. Note that this calculation is specific to storm surge protection along the Hudson River; storm water management provides additional flood reduction benefits not calculated in this report.

Reduce

All properties in the flood zone will soon be required to carry flood insurance. In Hoboken, there is reason to believe that property owners will be hit especially hard. A large and growing share of the City is in Special Flood Hazard Area. Additionally, the historic building stock and long-term residency suggest some affected residents may not currently have flood insurance and would therefore be mandated to purchase full-price insurance by 2019. Repeated storm events resulting in repeated claims suggest those currently eligible for subsidized insurance may lose that eligibility shortly. Preliminary estimates suggest annual flood insurance premiums could increase by \$40m annually over time, assuming full subsidy lapse for 9,144 existing policy holders resulting in a 400% increase in premiums over existing rates, as well as an increase in the number of policies by 50% to reflect the expansion of the flood zone and new requirements.

The comprehensive strategy would recast the entire city as a "shaded X" zone exempt from the insurance mandate by ensuring 100-year flood protection or greater (500-year protection proposed).

Flood protection would also reduce the cost of providing emergency services during flood events. The National Guard was deployed in Hoboken during Hurricane Sandy, and countless other State, City, and private individuals provided assistance. The cost of these efforts is significant: FEMA provided \$1.3b in disaster assistance throughout the Sandy-affected region.

Additionally, investment in the comprehensive strategy can streamline costs of defense compared to the reference case, in which private actors are compelled to undertake costly retrofits and major site-specific defenses, and public actors pursue costly and disjointed investments in pumping systems and public site defenses.

Enhance

Central to the comprehensive strategy, new amenities layered with flood infrastructure can provide benefits to the community and region. This includes:

- **Regional transit:** In tandem with station defense, there is an opportunity to improve and enhance public spaces within and connecting to Hoboken Station to improve and support its function as a multimodal hub of regional importance.
- **Neighborhood Fabric:** The comprehensive strategy includes significant improvement in pedestrian and public space conditions throughout the city as part of storm surge defense and green infrastructure investment.
- **Parks:** New open spaces planned at Weehawken Cove, Pier A (near Hoboken Terminal), and along the water storage belt including Block 12 will provide new places for outdoor recreation in a dense urban environment with limited access to parks. This will provide recreational benefits and property value premiums throughout the City.
- **Retail:** New retail amenities included within resiliency-supported development and resiliency infrastructure itself provide activation and services to the community.

Green infrastructure investment also offers a host of environmental benefits, including:

- **Water quality:** Green infrastructure for rainwater management can reduce combined sewer overflow and improve water quality.
- **Water efficiency:** Opportunity to use green infrastructure and water collection as an asset – a means for heat, cooling, potentially utilities.
- **Energy efficiency:** Landscape and green infrastructure interventions can reduce the heat island effect and reduce cooling needs in the summer.
- **Air quality:** Additionally, use of green infrastructure (especially trees) can capture greenhouse gasses; Vegetation provides air filtration benefits, especially small particulate matter.

Flood defense will support development of new real estate assets in the City's redevelopment areas, which are significantly at risk of flooding. The two primary development sites – Hoboken Yards and the Weehawken Cove area – are likely to include 5.2-6.2m SF of new residential, commercial, and retail development. The expected value of this development \$2.3 to \$2.8b based on a 2012 economic impact analysis prepared by HR&A for the Hoboken Yards; zoning potential analysis conducted by OMA of the Weehawken Cove area, which is 3.2 M SF underbuilt; and the range of anticipated development at the Yards site proposed by the City and NJ Transit (which owns the Yards parcel) of approximately 2M to 3M SF. Planning for redevelopment at the Yards has been in progress since 2008; the area has been designated in need of redevelopment by the City, and a successful redevelopment plan would need to be market-supportable and generate sufficient value to fund the relocation of certain NJ Transit functions to create appropriate development parcels. According to NJ Transit's designated developer LCOR, with City approvals of a market-supportable development plan as part of the comprehensive strategy, construction could begin on the site in approximately two years.

While development could take place without the comprehensive strategy, it is anticipated that the comprehensive strategy will support swifter implementation of more valuable development by:

- Reducing the need for on-site defense infrastructure and associated costs.
- Reducing asset risk and strengthening the rationale for investment and business attraction.
- Providing a process for facilitating design and approvals coordination between the City of Hoboken and NJ Transit.

These factors combine to generate significant net new economic activity in Hoboken, including:

- Direct and multiplier impacts of construction activity for new infrastructure and real estate development.
- Support for new commercial development opportunities, primarily at the two major redevelopment sites, creating new transit-oriented office destinations within the City that could host tens of thousands of employees.

- New retail amenities within the “layered program” and proposed developments that could generate jobs and retail sales within Hoboken.
- Indirect and induced impacts of this new employment and spending activity.
- Significant new local and state tax revenues that could fund essential community services and a portion of the costs of the Comprehensive Strategy.

7. Funding

The OMA team proposes to implement the comprehensive strategy over a period of 20 years, leading with high impact projects, projects with additional implementation support, and deeper study where needed to create momentum for full implementation. For the first phase, which will take place within five years of CDBG-DR award, the team will focus on:

- Detailed design, engineering, and construction of large-scale storm surge defenses that provide the majority of the expected flood risk reduction benefits over time and support the development of new real estate assets and commercial activities on nearby underdeveloped parcels.
- The first step towards this implementation will include master planning and technical studies to inform the detailed program, hydraulic engineering constraints, and funding strategy for the full build out of the comprehensive strategy including a green infrastructure incentive plan.
- Catalytic early wins carried out by partner organizations, including NJ Transit's plans to fill Long Slip Canal, defending its transit assets and providing auxiliary flood defense benefits to the City; NHSA's planned pump investment to improve discharge functions in North Hoboken; and the City's plans to develop new storage parks on Block 12 and elsewhere.
- Demonstration projects to educate the public, solicit feedback, and generate momentum for implementation of the green infrastructure strategy and "stacked program."

Successful implementation at all phases of the comprehensive strategy will require a broad funding partnership among multiple public and private entities. The comprehensive strategy offers significant benefits to diverse stakeholders that can be monetized to support project funding.

To launch this project and unlock additional funding opportunities, we propose a significant CDBG-DR investment in the first phase in tandem with other supportive investments carried out by other public entities. We request a CDBG-DR allocation of \$325m to support storm surge infrastructure construction and detailed technical study required to advance an effective and innovative flood defense program. Some of this need could potentially be met with additional sources of federal funding for which the project is eligible, including:

- EPA state revolving fund contributions for green infrastructure that provides resilience to support wastewater and drinking water system improvements.
- FEMA 406 public assistance for to restore damage to public facilities.
- FEMA 404 public assistance to provide resiliency investments for protection of undamaged, vulnerable public facilities.
- Future iterations of FEMA or DOI programs similar to recently closed grant opportunities.

Operating funds will be supplied by private partners from their operating budgets. The City will meet its operating funding needs by drawing on value capture opportunities related to new infrastructure-supported development at Hoboken Yards, which is expected to generate between \$5m and \$10m of incremental net City taxes at full buildout. City funds will fill any O&M funding gap prior to revenue stabilization.

Table 2: Phase I Funding Approach

Phase I Funding Sources	Funding (Millions)	Amount
Capital (0)	\$	470
CDBG-DR (1)	\$	324
FTA (2)	\$	110
City of Hoboken (3)	\$	36
Additional City/Philanthropic Support (4)	\$	3
Operating Sources	\$	7.8
Net New City Taxes from Development (5)	\$	6.1
NJ Transit & PANYNJ (6)	\$	1.7

In later phases, local project partners and property owners will spearhead implementation of stacked program elements and green infrastructure by drawing on additional public, private, and earned revenues. Capital sources are expected to include:

- Additional federal sources, potentially including funding support from DOI, FEMA, HUD, or other agencies depending on funding availability at the time, to support green infrastructure investment.
- State of New Jersey grant funding, including DEP, EDA, or other agencies to support green infrastructure investment and local economic development.
- City Bond investments in layered program costs and some green infrastructure costs that benefit residents.
- Planned developments can be compelled to contribute to infrastructure and/or layered program on major sites benefitted by flood infrastructure.
- NJ Transit and PANYNJ can contribute capital investment for layered programs that benefit transit functions.
- Private Investments can support green infrastructure on private sites.
- Philanthropy can be pursued for layered programs that benefit the community and/or green infrastructure.

As in Phase I, incremental net City taxes from new development can support O&M of infrastructure and new program amenities. This source may be augmented by operating agreements with private developers, earned income from programs or private concessions, and/or potential philanthropic grants. Additionally, investments on private parcels will be operated in perpetuity by private landowners.

8. Appendices

Appendix 1 – Design Approach (presentation)

Appendix 2 – Letters of Support for OMA proposal


Appendix 3 – Hoboken Resiliency Measures

Appendix 4 – Flood Risk 101 Pamphlet

Appendix 5 – Team

Appendix 1 – Design Approach (presentation)





| REBUILD BY DESIGN



RESIST
DELAY
STORE
DISCHARGE

TEAM

OMA



BUILDING AND CITY

AMO



INTERACTION



WATER MANAGEMENT

BAL
MOR
I



ECOLOGY

HR&A



ECONOMICS

EXECUTIVE SUMMARY

A COMPREHENSIVE URBAN WATER STRATEGY

FOCUS ON COMMUNITIES WITH DEMONSTRATED RISK, A CONCENTRATED RISK, A CONCENTRATION OF VALUE, AND VULNERABILITIES WITH REGIONAL IMPACT.

TWO FORMS OF FLOOD RISK: STORM SURGE AND RAIN-BASED FLASH FLOOD

COMPLEXITY, DENSITY, AND CONNECTIVITY OF URBAN ENVIRONMENTS REQUIRE AN INTEGRATED, COMPREHENSIVE SOLUTION

FOUR COMPONENTS TO PROPOSAL: RESIST / DELAY / STORE / DISCHARGE

OBJECTIVE: TO MANAGE WATER, MITIGATE FLOOD INSURANCE, AND DELIVER CO-BENEFITS

PROPOSED SAFETY LEVEL (ACHIEVABLE AND VALUE-FOR MONEY):

STORM SURGE - 1 IN 500 YEAR

FLASH FLOOD - 1 IN 10 YEAR

STATEMENT SUMMARY

OUR COMPREHENSIVE URBAN WATER STRATEGY DEPLOYS PROGRAMMED HARD INFRASTRUCTURE AND SOFT LANDSCAPE FOR COASTAL DEFENSE (RESIST);

POLICY RECOMMENDATIONS, GUIDELINES, AND URBAN INFRASTRUCTURE TO SLOW RAINWATER RUNOFF (DELAY);

A CIRCUIT OF INTERCONNECTED GREEN INFRASTRUCTURE TO STORE AND DIRECT EXCESS RAINWATER (STORE);

AND WATER PUMPS AND ALTERNATIVE ROUTES TO SUPPORT DRAINAGE (DISCHARGE).

The word 'APPROACH' is rendered in a bold, sans-serif typeface. It features a color gradient that starts with bright yellow on the left and transitions through orange to a vibrant magenta on the right. The letters are set against a white background with soft, grey, painterly clouds scattered around them.

APPROACH

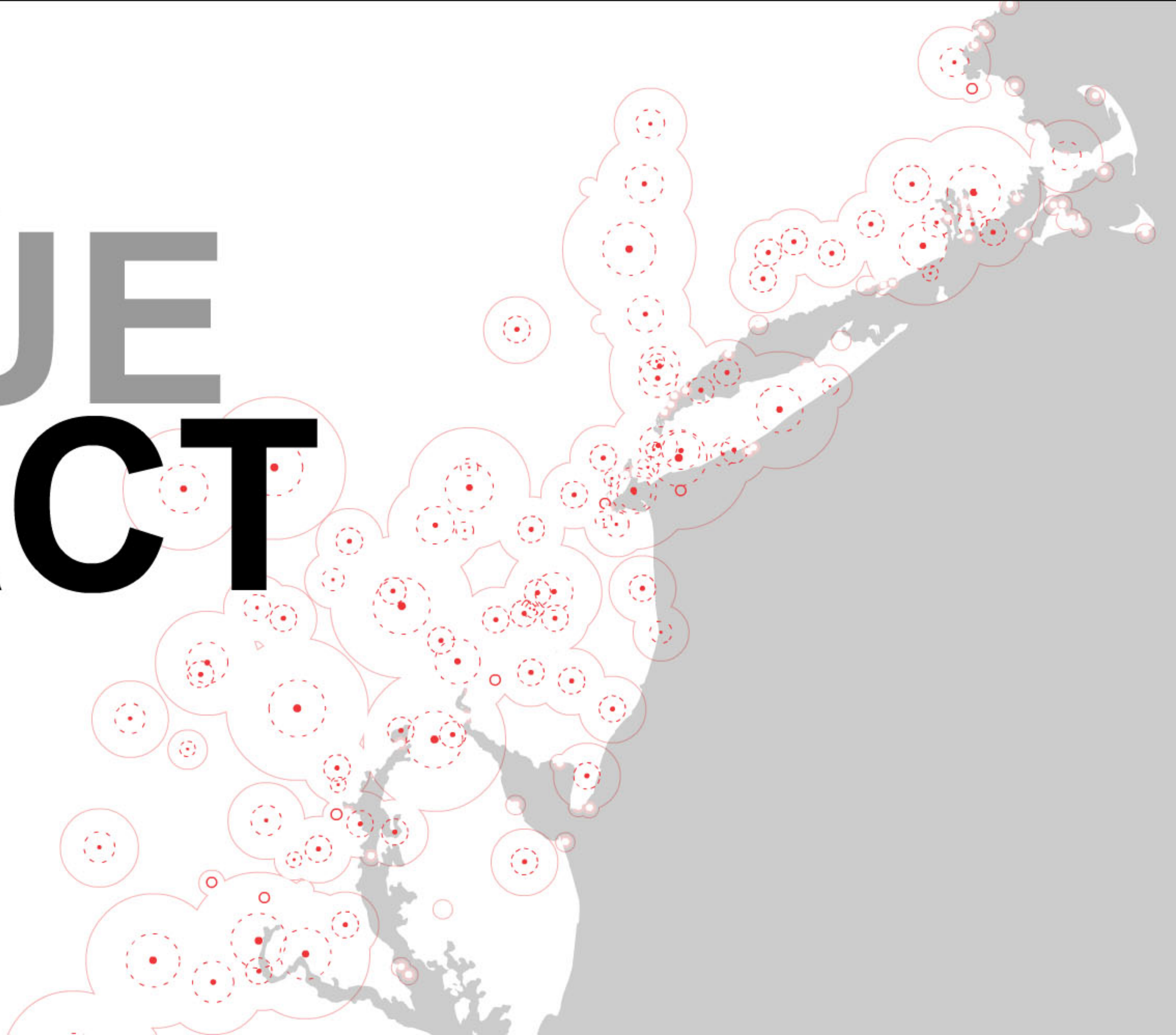
RISK



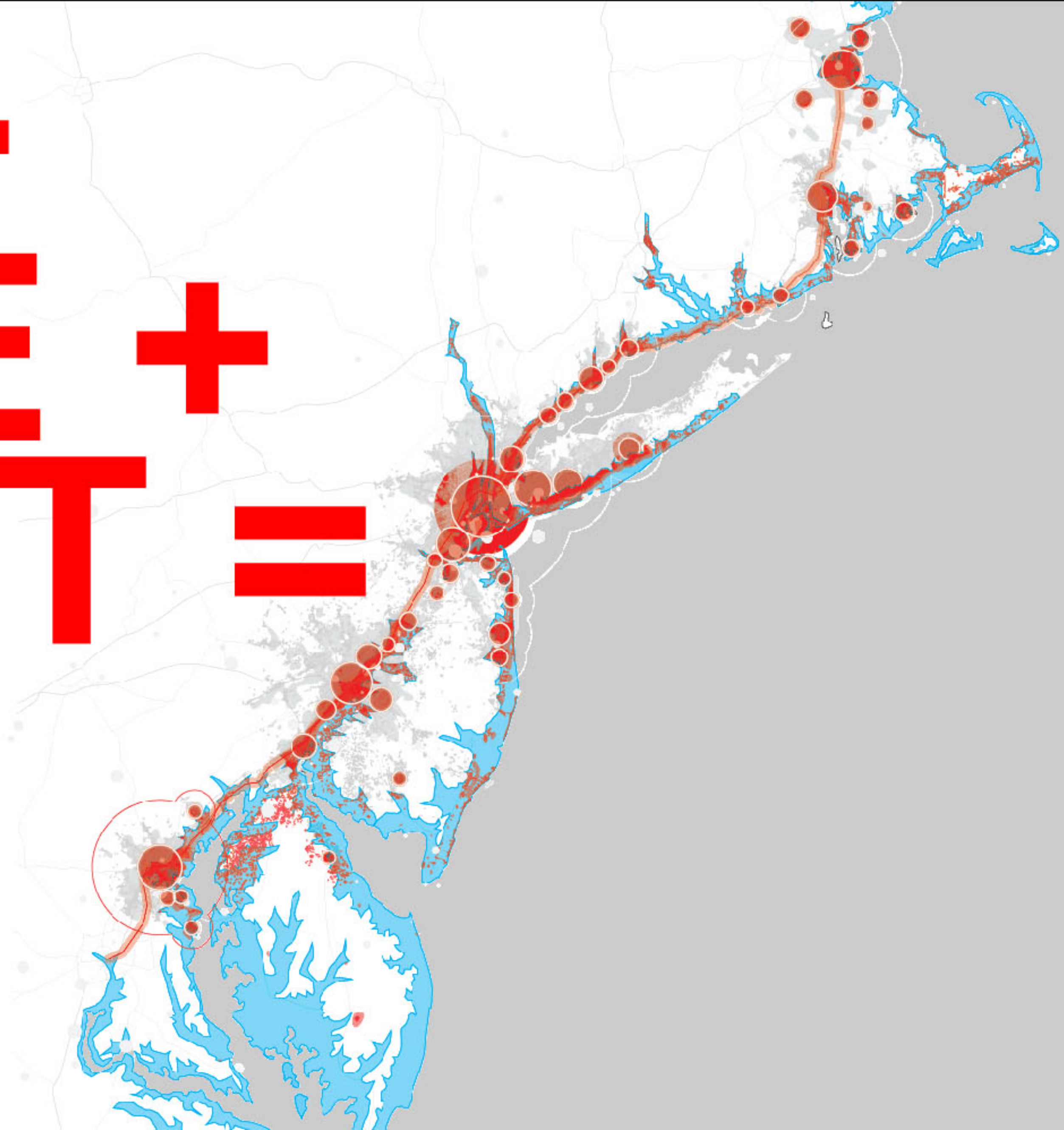
RISK VALUE



RISK VALUE IMPACT



**RISK +
VALUE +
IMPACT =**



RISK VALUE IMPACT

**"YOU MEAN THE 'BIGGEST
BANG FOR OUR BUCK"
-MAYOR TURNER**



this is a test

HOW DO WE PROTECT A CITY?

**THERE IS NO POINT IN FORTIFYING
OUR FIRE STATION IF THE WHOLE CITY
IS FLOODED...**

**...WE NEED A SOLUTION THAT
PROTECTS THE WHOLE
COMMUNITY"**

-MAYOR ZIMMER



ASSETS PEOPLE CONNECTION

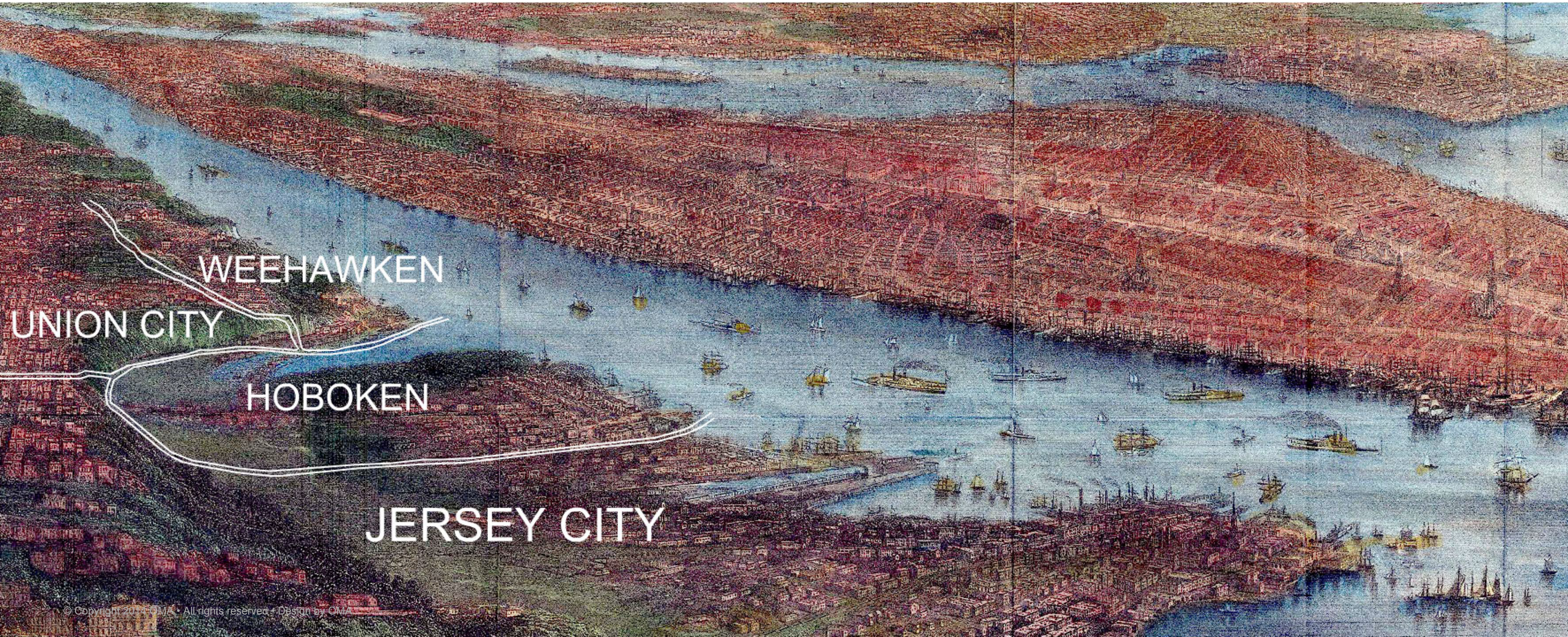
WE CAN'T LIFT IT
UP ON STILTS



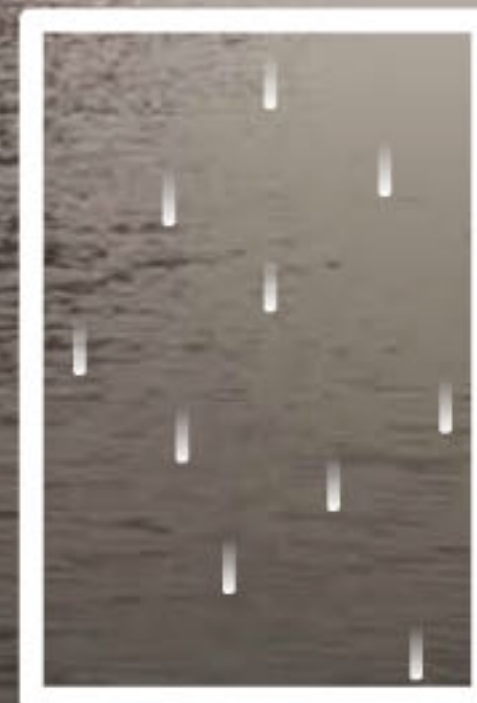
SITE

(A CHALLENGE OF
LOCATION)

PRIOR TO INDUSTRIALIZATION, THE HUDSON RIVER EDGE WAS A MARSH, WITH HOBOKEN IN PARTICULAR BEGINNING ITS TRANSFORMATION AS JUST AN ELEVATED HILL SURROUNDED BY WETLANDS



FLASH FLOOD



GLOBAL WARMING IS REAL

TIDAL SURGE





RISK

HOBOKEN HAS HAD 4 FLOOD EVENTS IN THE YEAR SINCE HURRICANE SANDY



RISK

2/3 OF HOBOKEN LIES IN
THE FEMA FLOOD ZONE



RISK VALUE DENSITY



VALUE

GROWTH POTENTIAL



RISK VALUE IMPACT

COMMUTER NODE
(NJ, PATH)



RISK VALUE IMPACT

COMMON UTILITIES (NHSA, PSE&G)

RISK VALUE IMPACT

**JUSTIFIES SIGNIFICANT INVESTMENT
IN FLOOD DEFENSE FOR THE NORTH
HUDSON COMMUNITY**



SOLUTION

PROPOSAL

A COMPREHENSIVE WATER STRATEGY THAT
CONSISTS OF 4 MAJOR COMPONENTS



RESIST

PROGRAMMED HARD
INFRASTRUCTURE
AND SOFT
LANDSCAPE FOR
COASTAL DEFENSE



DELAY

POLICY
RECOMENDATIONS,
GUIDELINES, AND
URBAN
INFRASTRUCTURE
TO SLOW
RAINWATER RUNOFF



STORE

A CIRCUIT OF
INTERCONNECTED
GREEN
INFRASTRUCTURE
TO STORE AND
DIRECT EXCESS
RAINWATER



DISCHARGE

WATER PUMPS &
ALTERNATIVE
ROUTES TO
SUPPORT DRAINAGE

OBJECTIVES:

A COMPREHENSIVE SOLUTION

MANAGES WATER
(FOR DISASTER AND FOR GROWTH)

MITIGATES FLOOD INSURANCE
(REASONABLE PREMIUMS THROUGH REDRAWING FLOOD MAP
AND/OR "ZONE X" FEDERAL FLOOD INSURANCE EXEMPTION)

DELIVERS CO-BENEFITS
(CIVIC, CULTURAL, RECREATIONAL, AND
COMMERCIAL AMENITIES)

NET BENEFITS

PRESERVE:

ASSETS AND ACTIVITIES

REDUCE:

**COSTS OF DEFENSE AND
EMERGENCY RESPONSE**

ENHANCE:

AMENITIES FOR COMMUNITY

SUSTAIN:

A BASIS FOR GROWTH

INNOVATION

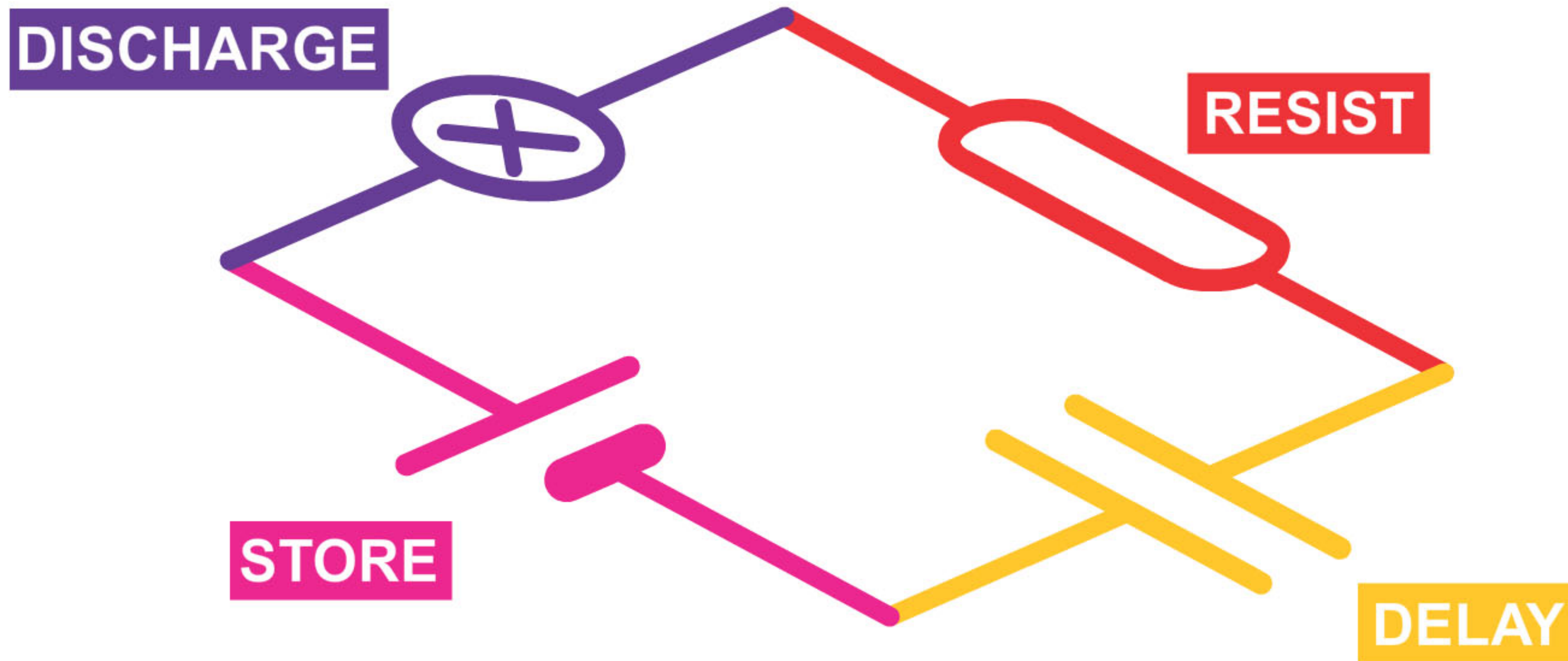
COMPREHENSIVE STRATEGY

COALITION / FUNDING FRAMEWORK

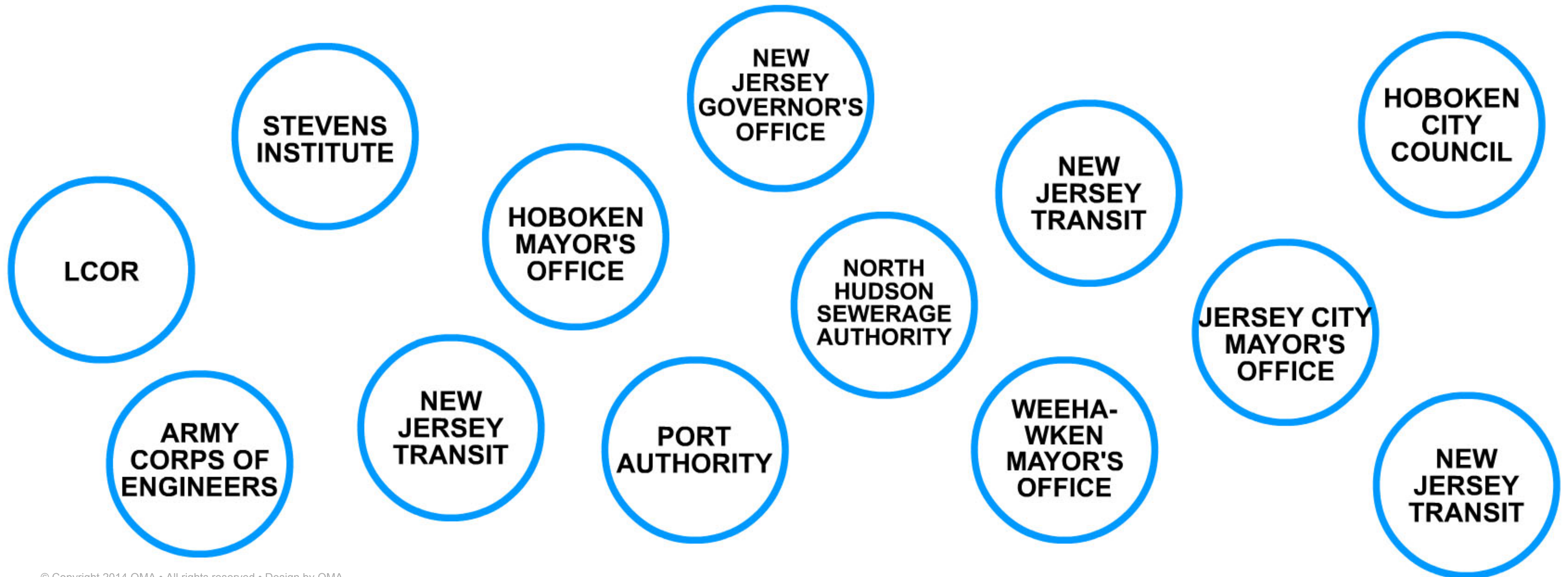
COMMUNICATIONS

INTEGRATED DESIGN SOLUTIONS

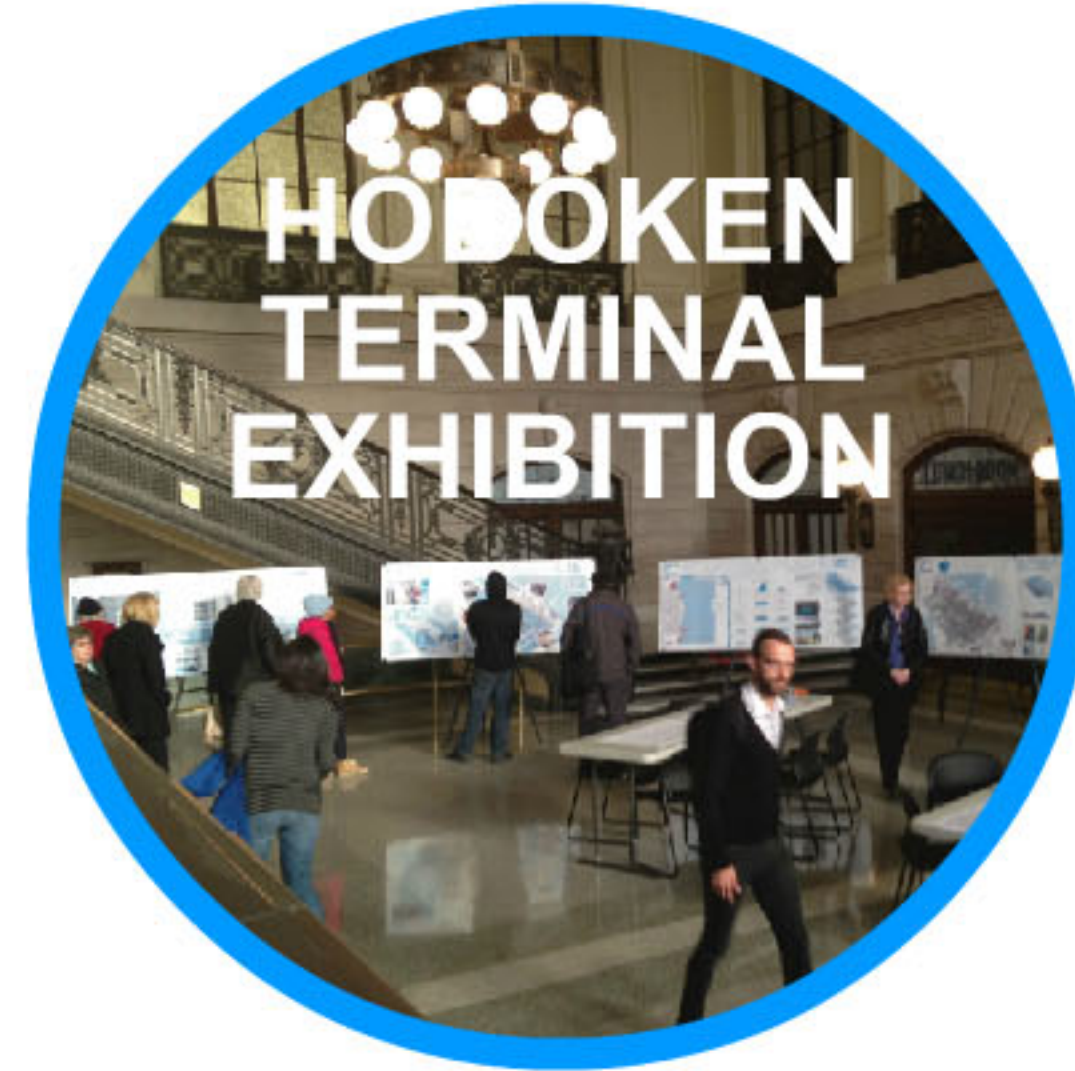
A COMPREHENSIVE SOLUTION



A COALITION OF STAKEHOLDERS

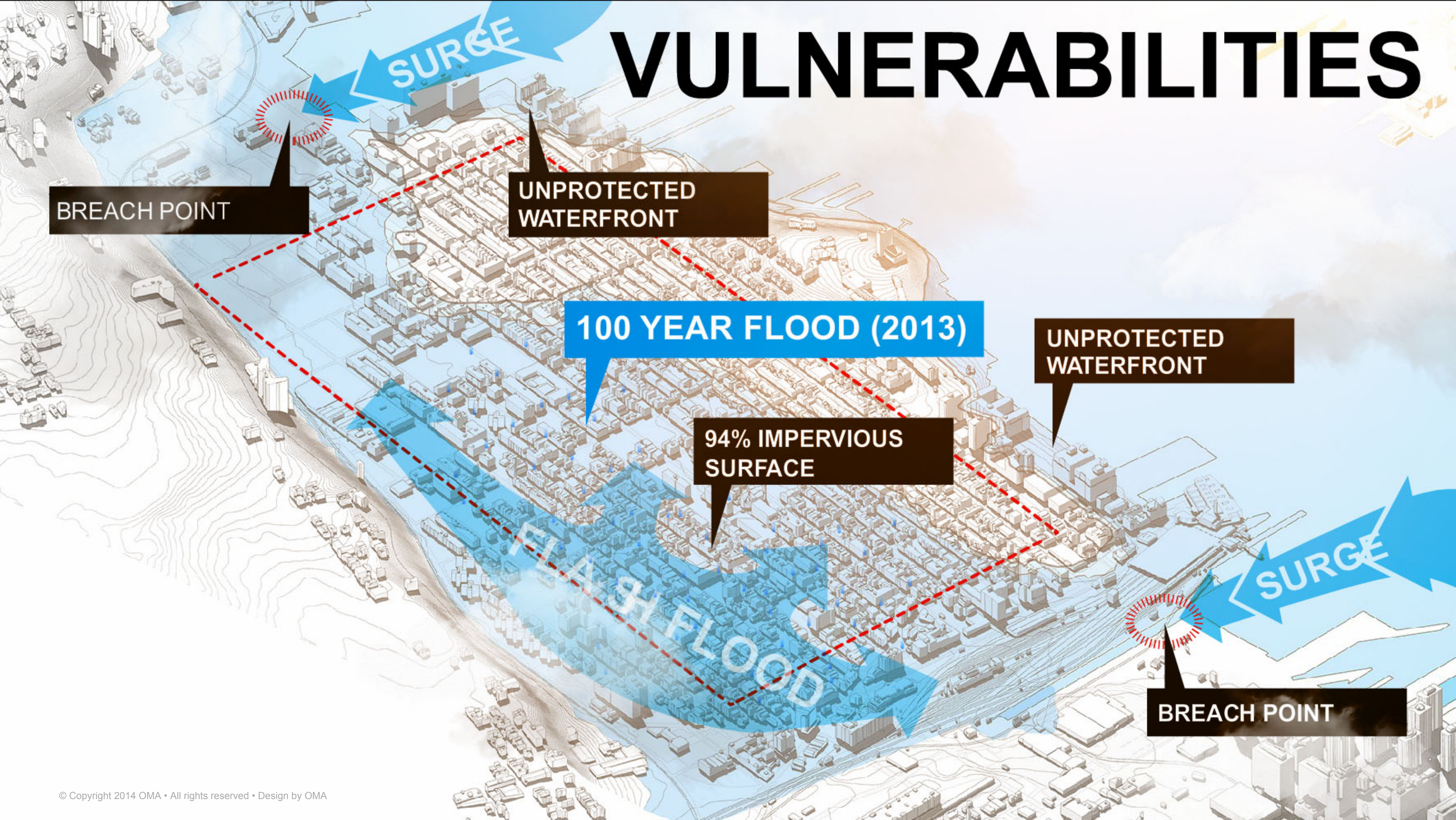


A COMMUNICATIONS PLATFORM



THE PLAN

VULNERABILITIES



BREACH POINT

UNPROTECTED
WATERFRONT

100 YEAR FLOOD (2013)

UNPROTECTED
WATERFRONT

94% IMPERVIOUS
SURFACE

FLASH FLOOD

SURGE

BREACH POINT

RESIST

COMPREHENSIVE WATER STRATEGY

DISCHARGE

DELAY

DISCHARGE

STORE

RESIST

RESIST

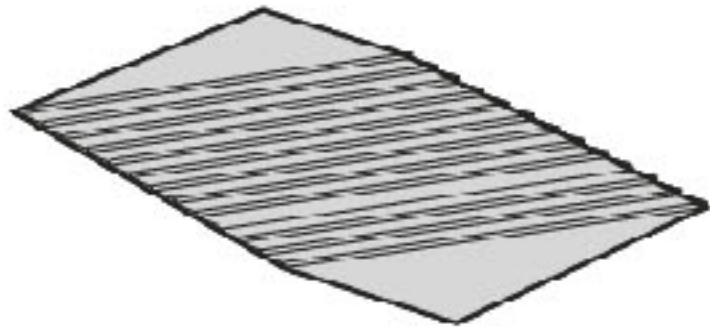


RESIST

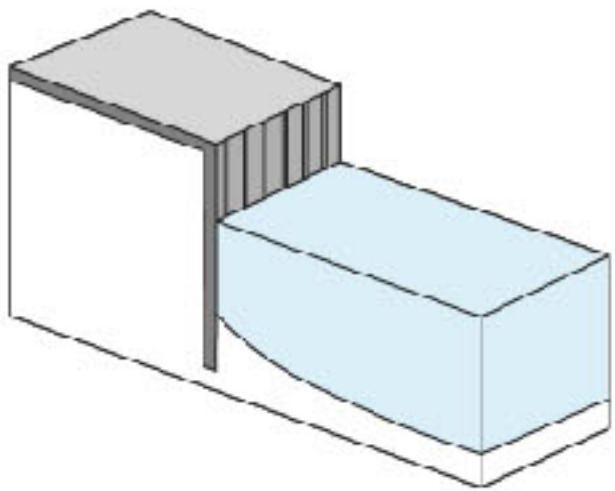


RESIST

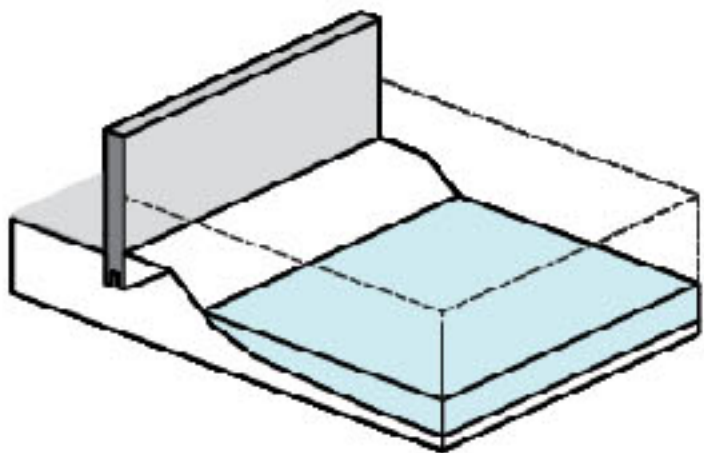
TERRACED EDGE



BULKHEAD



DEPLOYABLE FLOOD WALL













DELAY 44

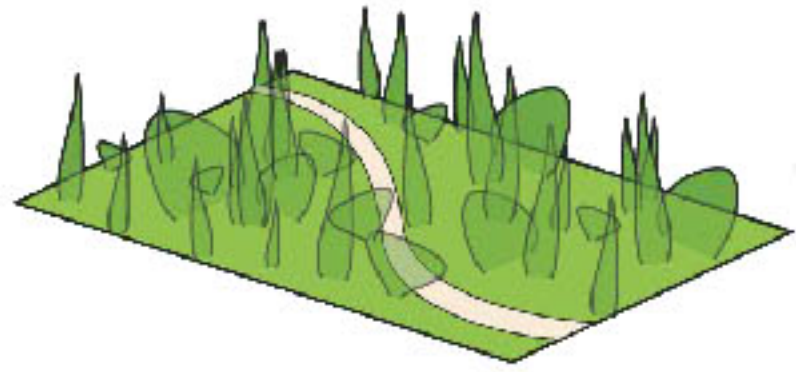


DELAY

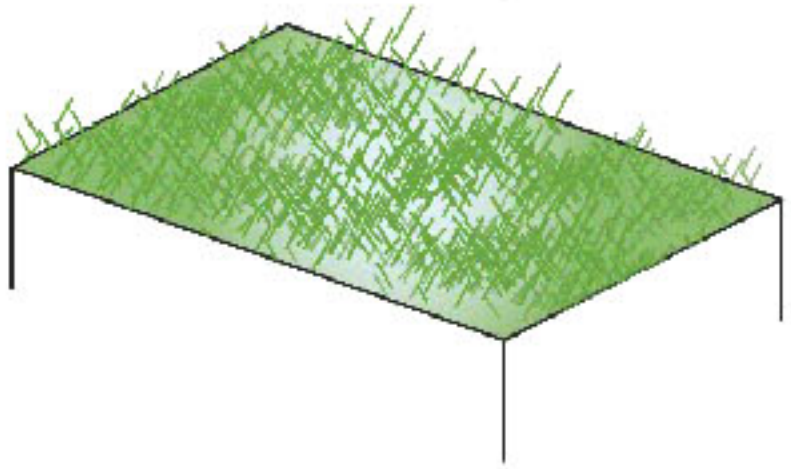


DELAY

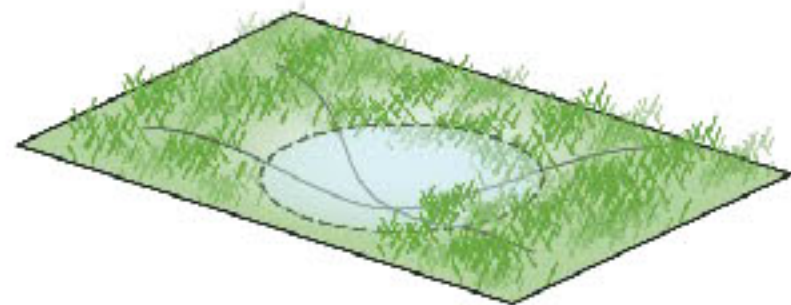
PARKLAND / TERRACED EDGE



GREEN ROOF



BIOSWALE



PROGRAM INITIATIVE: CIVIC INSTITUTIONS

ALLOCATIONS



GUIDELINES



RECLAIM EMPTY LOT



PARKS / BIOSWALES



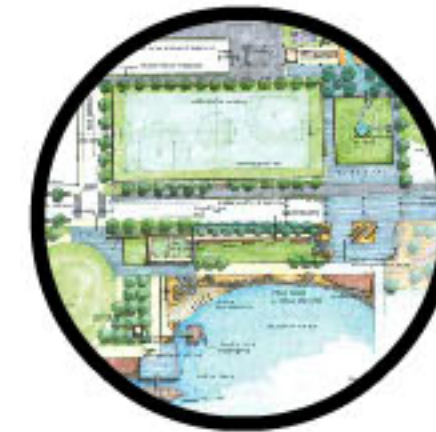
PERMEABLE PAVING



7 ACRES OF HOBOKEN PLANNED FOR RECLAMATION



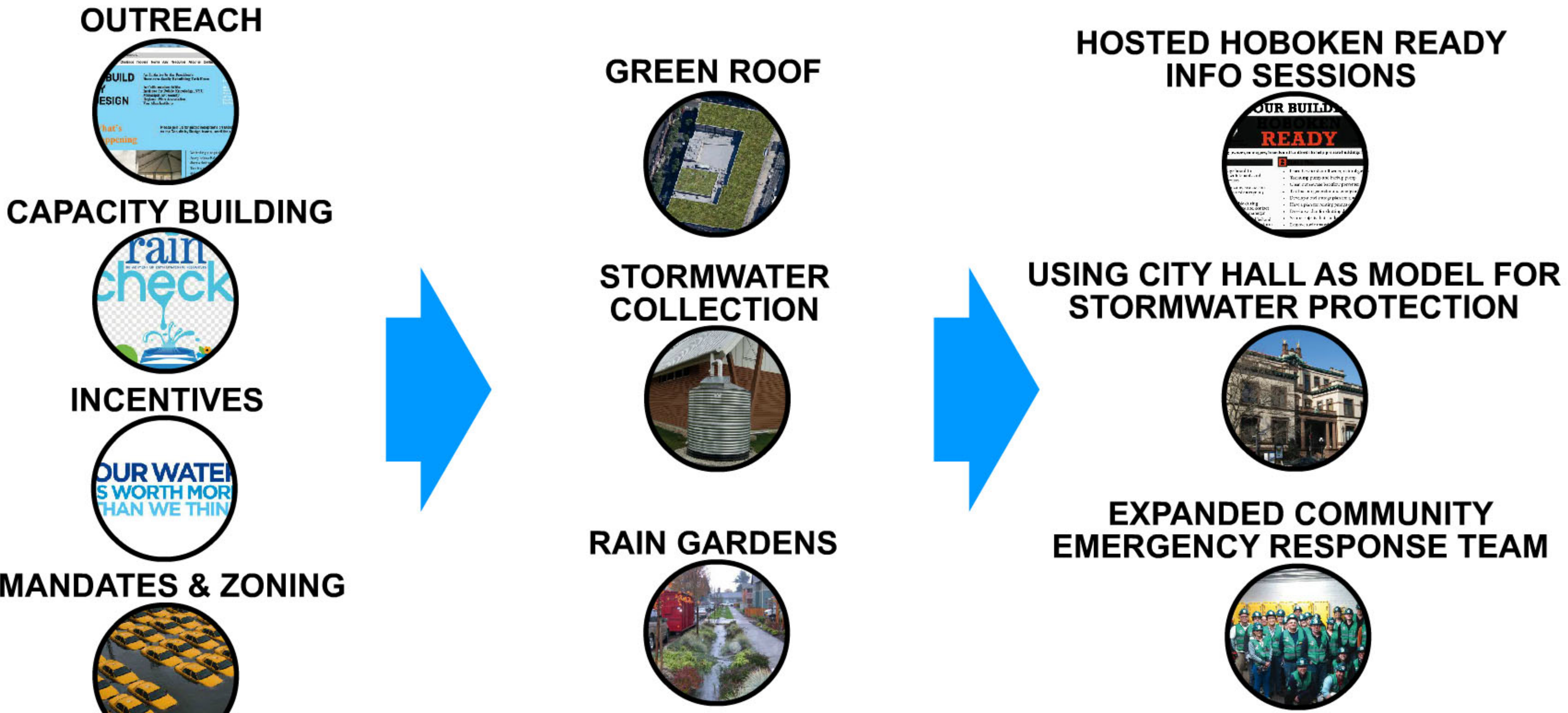
1600 PARK / HOBOKEN COVE



EXTENSIONS



PROGRAM INITIATIVE: CIVIC INSTITUTIONS



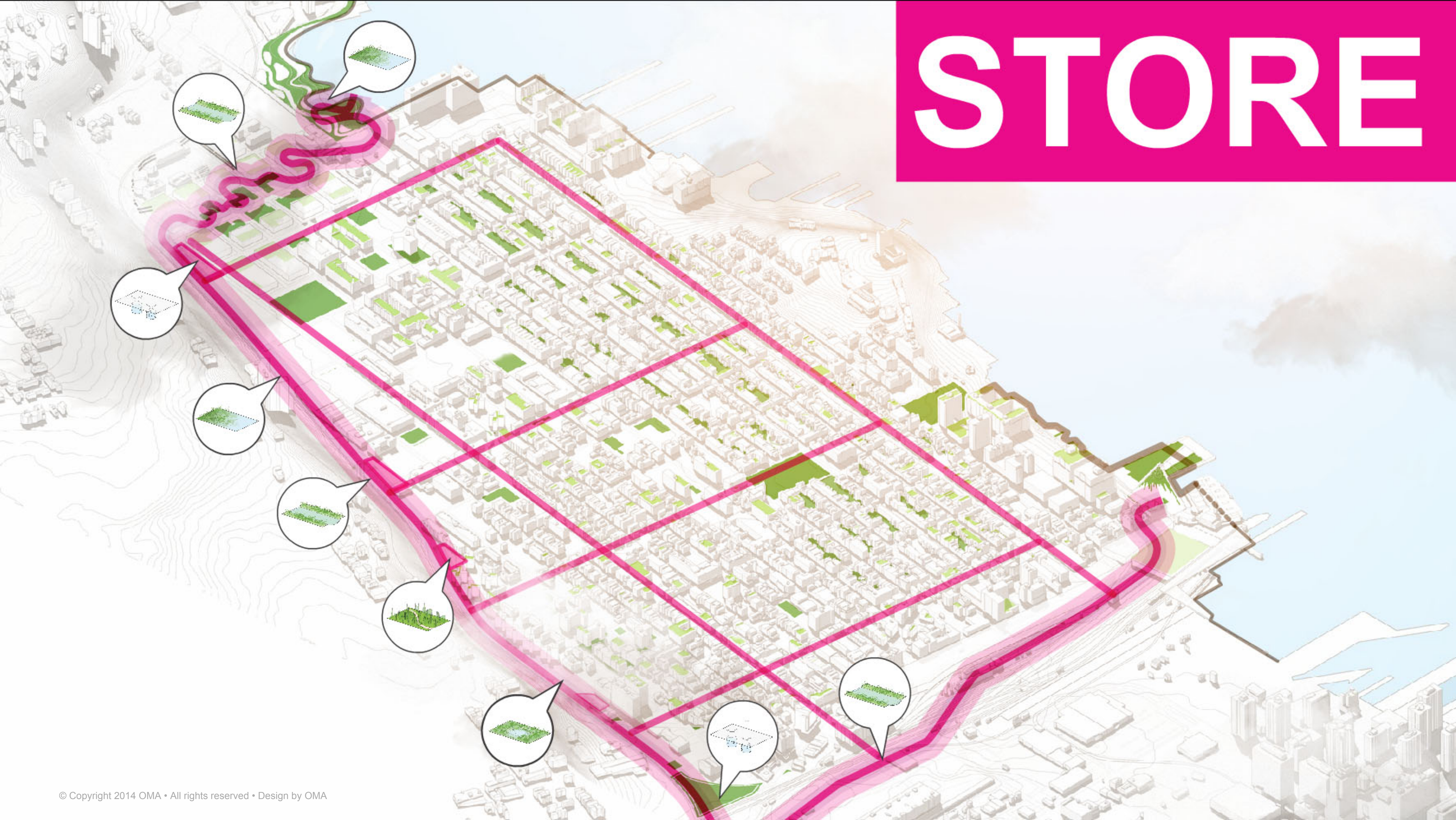
DELAY



STORE +

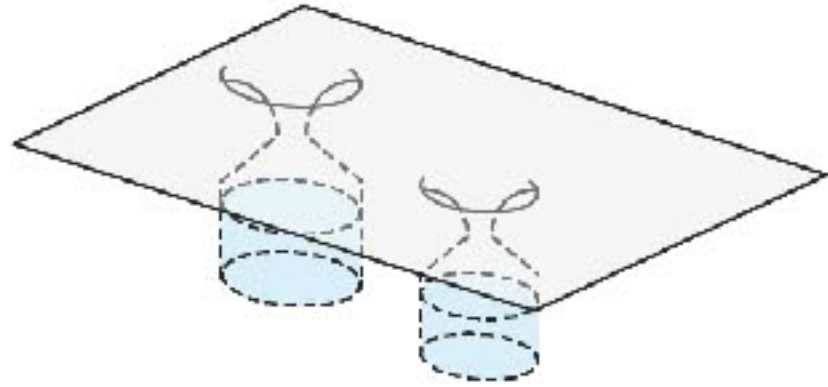


STORE

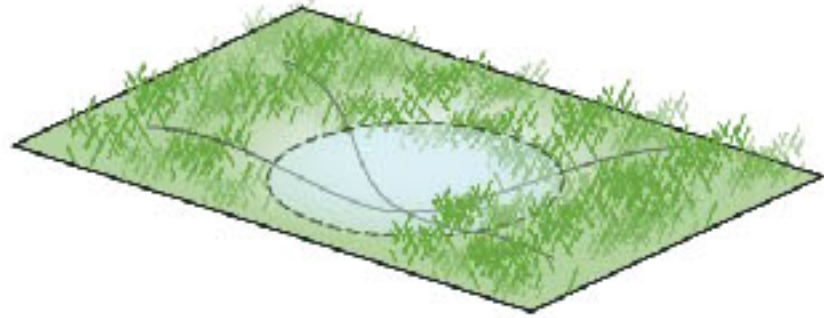


STORE

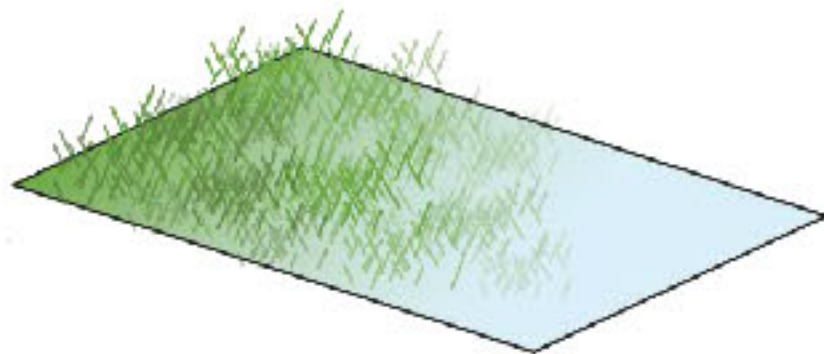
CISTERN



BIORETENTION BASIN



CONSTRUCTED WETLANDS



STORE 





DISCHARGE —⊗—



DISCHARGE

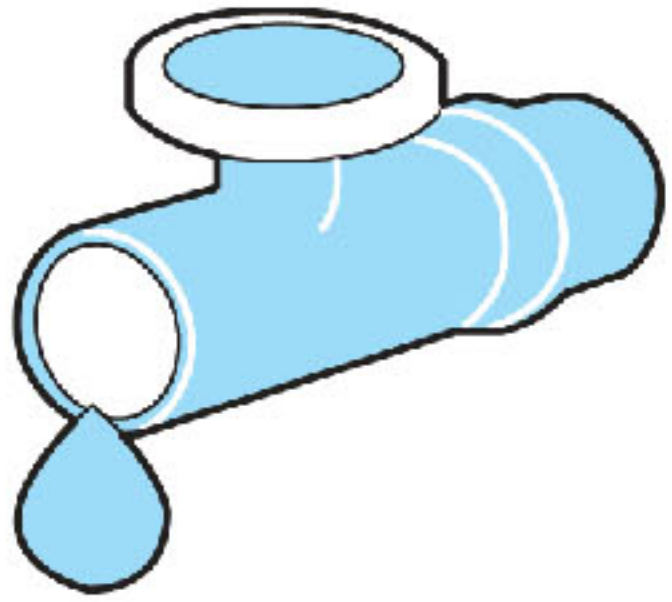
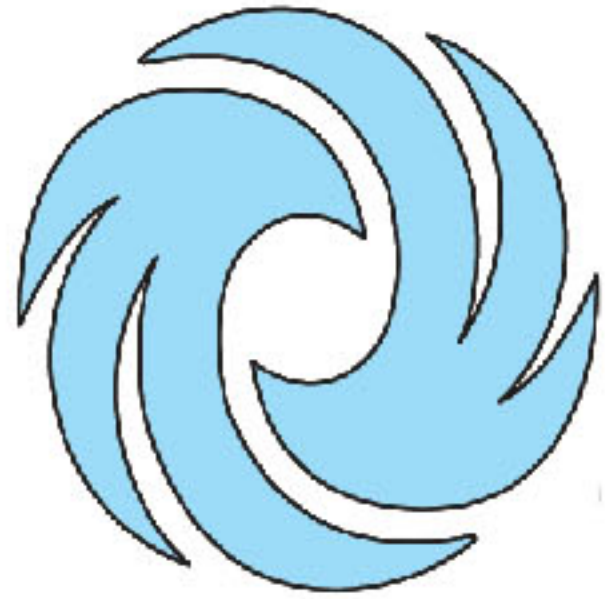


DISCHARGE

STORMWATER PUMP



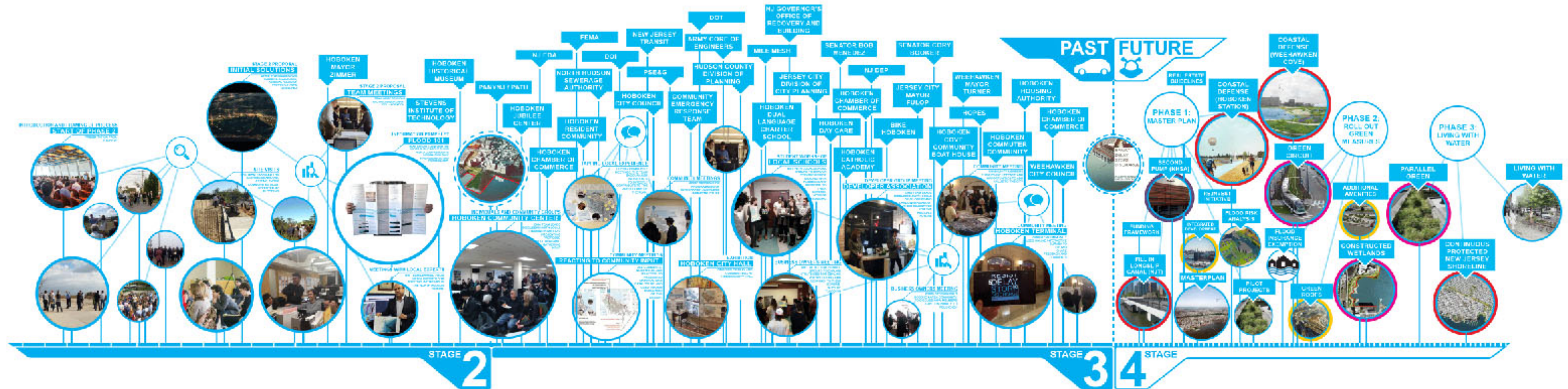
STORM DRAIN

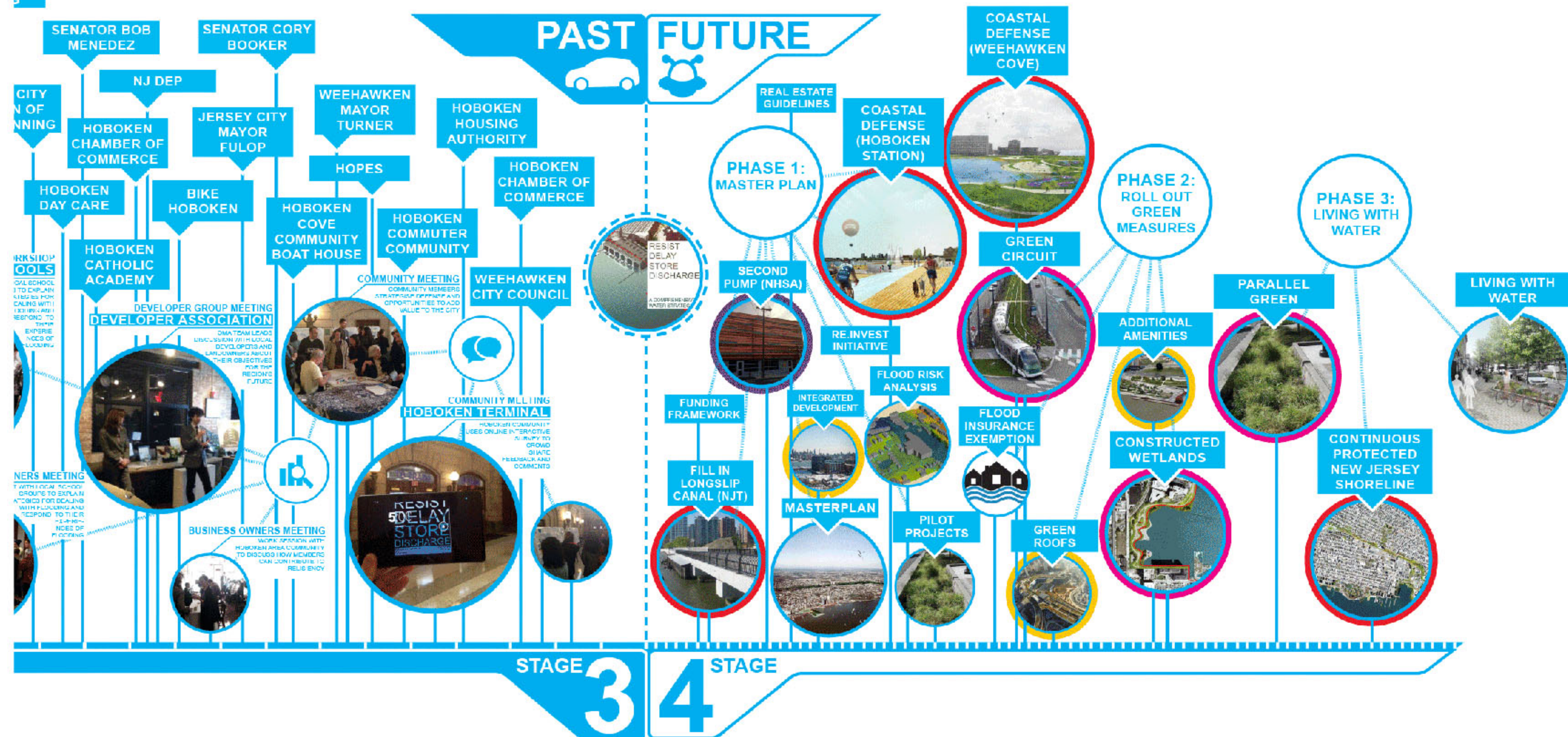


TIMELINE

CLICK ANYWHERE
TO ZOOM IN AND OUT

PROCESS
STAKEHOLDERS
INTERACTION
ACTION PLAN







DEFENDED COASTLINE

Appendix 2 - Letters of Support for OMA proposal

Federal/National

- U.S. Senator Robert Menendez
- U.S. Senator Cory Booker
- U.S. Representative Albio Sires
- re:focus partners/RE.invest Initiative – RE.invest is an initiative funded by Rockefeller Foundation working with several cities including Hoboken on resilient infrastructure solutions. In Hoboken, the focus is on designing and financing a park at the BASF site with underground parking that can double as underground stormwater storage.
- SUEZ Environment North America – the parent company of United Water, which provides water services to the City of Hoboken

State

- NJ TRANSIT – Owns Hoboken Terminal and a substantial amount of property in Hoboken. Their facilities were severely flooded by Superstorm Sandy.
- New Jersey Association for Floodplain Management – a statewide organization of over 250 members and chapter of the national Association of State Floodplain Managers (ASFPM), a respected voice in floodplain management practice and policy in the United States.
- American Planning Association – New Jersey Chapter
- United Water – provides water service to the City of Hoboken

Regional

- East Coast Greenway Alliance (x2) – a consortium working to create a 3,000 mile East coast Greenway through 15 states and Washington, D.C.
- Hudson River Waterfront Conservancy - non-profit organization that monitors the construction and maintenance of the Hudson River Waterfront Walkway and advocates for public access to the waterfront
- Metropolitan Waterfront Alliance - an alliance of over 700 organizations working to transform the waters of New York and New Jersey Harbor into clean and accessible places to learn, work and play
- NY/NJ Baykeeper – a non-profit whose mission is to protect, preserve, and restore the ecological integrity and productivity of the Hudson-Raritan Estuary
- North Hudson Sewerage Authority – the sewage authority serving Hoboken, Weehawken, Union City and West New York. NHSA currently operates a wet weather pump located at Observer Highway.
- North Jersey Transportation Planning Authority - the federally authorized Metropolitan Planning Organization for the 13-county northern New Jersey region which oversees over \$2 billion in transportation improvement projects yearly
- Rutgers Center for Urban Environmental Sustainability - a unique academic center with a mission to bring the scientific, design, and engineering expertise available through Rutgers into the communities of New Jersey to solve urban environmental problems. They have worked with Hoboken to redesign the City Hall block to incorporate green stormwater runoff mitigation measures including bioswales and cisterns.
- Together North Jersey – a planning initiative through which a team of professionals has developed a Green Infrastructure Strategic Plan for Hoboken.

County

- Hudson County Executive Thomas A. DeGise
- Hudson County Freeholder Anthony Romano
- Hudson County Economic Development Corp. – established to foster business growth and community development through job creation and improving the quality of life in Hudson County.
- Hudson County Comprehensive Economic Development Strategy Committee

City/Community

- Hoboken Mayor Dawn Zimmer
- Weehawken Mayor Richard F. Turner
- Hoboken City Council President Jennifer Giattino (6th Ward)

- Hoboken Councilman James Doyle (At-Large)
- Hoboken Councilman Ravi Bhalla (At-Large)
- Hoboken Councilman Peter Cunningham (5th Ward)
- Hoboken Housing Authority Commissioner Dana Wefer
- Ann Holtzman, Hoboken Zoning Officer & Flood Plain Administrator
- Sustainable Jersey City – a network of green community groups and individuals within Jersey City working to advance efforts to move the city toward a more sustainable future.
- American Legion Post 107 – serves veterans in Hoboken and the surrounding area. It was destroyed by Superstorm Sandy and still has not been repaired.
- CarePoint Health/Hoboken University Medical Center – Hoboken's only hospital, which suffered millions of dollars in damage during Superstorm Sandy and Hurricane Irene.
- Community Church of Hoboken – a Hoboken church dating to 1856.
- Fund for a Better Waterfront – a nonprofit organization advocating since 1990 for a public waterfront park along the Hudson River
- Hoboken Chamber of Commerce – advocating for the interests of Hoboken's business community
- Hoboken Community Emergency Response Team – a pivotal group of volunteers during Superstorm Sandy, the group has grown to 100 members and received recognition from the White House and FEMA
- Hoboken Cove Community Boathouse – a non-profit boathouse for the community. The group is working with the City to create a second boathouse at Hoboken Cove.
- Hoboken Family Alliance – a volunteer driven organization that promotes the interests of Hoboken families.
- Hoboken Historical Museum (x2) – open since 1986. Their current exhibit is titled “Hoboken: One Year After Sandy – Lessons Learned about Preparedness, Resiliency, and Community”
- Hoboken Historic Preservation Commission – charged with preserving the historic fabric of Hoboken
- Hoboken Little League Baseball
- Hoboken Quality of Life Coalition –a nonprofit community group working towards improving Hoboken's environment, historical architecture, and quality of life.
- Hoboken Volunteer Ambulance Corps – Hoboken's emergency services provider since 1971. HVAC had to evacuate their headquarters and lost several vehicles during Superstorm Sandy.
- Hudson Tea Building – a residential building, formerly the Lipton Tea Factory headquarters, located on the waterfront along the south of Hoboken Cove. The building flooded during Superstorm Sandy.
- MileMesh – a community-driven effort to create a resilient wifi mesh communications network in Hoboken in the wake of Superstorm Sandy.
- Mile Square Theatre – a leading North Jersey regional theater located in Hoboken
- Urban Arts at Monroe – a business located in western Hoboken, which was impacted by the flooding from Superstorm Sandy
- Accordia Realty Ventures – a new developer in Hoboken
- Jamie Baker & Brandon Miller - residents
- Thomas Chartier - resident & business owner

ROBERT MENENDEZ
NEW JERSEY

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United States Senate

WASHINGTON, DC 20510-3005

October 31, 2013

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ONE GATEWAY CENTER
11TH FLOOR
NEWARK, NJ 07102
(973) 646-3030

208 WHITE HORSE PIKE
SUITE 18-19
BARRINGTON, NJ 08007
(856) 757-5353

The Honorable Shaun Donovan
Secretary
Department of Housing and Urban Development
451 7th Street, S.W.
Washington, D.C. 20410

Re: Rebuild by Design Competition

Dear Secretary Donovan:

I am writing this letter in support of the OMA team's application for Rebuild by Design funding for its Comprehensive Strategy for Hoboken, New Jersey. The City of Hoboken, a densely populated urban area on the Hudson River in northern New Jersey, suffered greatly during Super Storm Sandy. Because of its location and because a large part of the City is developed, Hoboken is susceptible to both flash flood and storm surge. Unfortunately, unlike the shore or suburban areas of the state, Hoboken cannot mitigate from flood disasters by elevating structures or by individual efforts. As we all know, with the impacts from climate change, Hoboken will continue to face flooding from rising sea level unless they can become more resilient.

Accordingly, Hoboken is an ideal candidate to receive Rebuild by Design Funding. The OMA Comprehensive Strategy would maximize the defense of the city in its entirety, taking into consideration the residential areas as well as the priorities of commercial, civic and recreational facilities. This is important in terms of safeguarding critical infrastructure that enables the City to respond to emergencies, maintain economic growth, and secure quality of life.

The Dutch firm OMA, which has taken the lead along with its local partners NYU's Institute for Public Knowledge, Municipal Art Society, Regional Plan Association and the Van Alen Institute, have studied the urban landscape adjacent to the Hudson River for months. From its great wealth of experience in the Netherlands, OMA draws important lessons in safeguarding communities. It is coming to the table with the acknowledgement from its work in Amsterdam that no system is perfect to protect all assets, and that one needs to work with, rather than against, the natural flow – prioritizing assets and working towards the greatest resiliency. Among the mitigation features of its plan are green belts, water storage facilities, pumping stations and landscaping features that deflect water away from critical areas.

It is for the above-stated reasons that I respectfully request your consideration of the OMA team's important project for Rebuild by Design funding for the City of Hoboken. If you should have any questions, please do not hesitate to contact me.

Sincerely,



ROBERT MENENDEZ
United States Senator

United States Senate

March 24, 2014

The Honorable Shaun Donovan
Secretary
U.S. Department of Housing and Urban Development
451 7th Street S.W.
Washington, DC 20410

Dear Secretary Donovan:

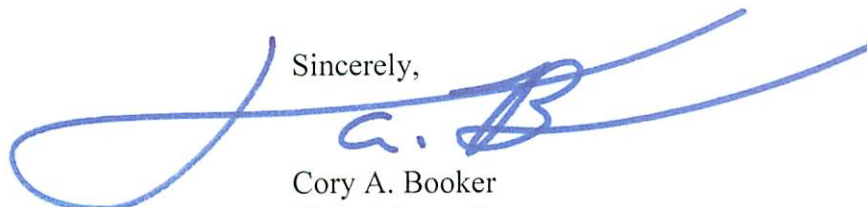
I write today in support of the OMA team's proposal for the Department of Housing and Urban Development's (HUD) Rebuild by Design program, which would provide a comprehensive solution to address Hoboken's vulnerability to flash flooding and tidal surge. As you know, Hoboken is the fourth-densest city in the United States with two-thirds of the City in the Federal Emergency Management Agency's (FEMA) flood zone. While many suburban communities are raising their homes and businesses to protect themselves from future flooding events, Hoboken's urban infrastructure requires an innovative strategy to mitigate flooding and adapt to rising sea levels.

The project is comprised of four major components that aim to enhance water management, mitigate flooding, and deliver additional cultural, recreational, and commercial benefits to the City. In order to resist tidal surge, the design places structures such as dikes, levees, and bulkhead in strategic locations throughout the city. In addition, the proposal adds critical green space to city roofs and parks as well as retention basins and wetlands that will help delay and store flood and rainwater. Finally, the design calls for an update of infrastructure by improving storm drains and stormwater pumps to discharge water more effectively.

After Superstorm Sandy, almost three-quarters of Hoboken was submerged after experiencing an 11-foot surge. Three to four-foot floodwaters in some neighborhoods, and standing water in town for as long as five days, put at risk the City's utilities, infrastructure, and access to emergency services for thousands of residents.

I respectfully request your consideration of the OMA team's Rebuild by Design proposal. The City of Hoboken is committed to working with OMA and HUD to ensure the future safety and quality of life for Hoboken and its residents. Thank you for your consideration, and please do not hesitate to contact me or a member of my staff at (973) 639-8700.

Sincerely,

A handwritten signature in blue ink, appearing to read 'C. A. B.', is written over a horizontal line. The signature is stylized with a large loop on the left and a long, sweeping underline.

Cory A. Booker
United States Senator

ALBIO SIRES
8TH DISTRICT, NEW JERSEY



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800 ANNA STREET
ELIZABETH, NJ 07201
(908) 820-0692

BAYONNE CITY HALL
630 AVENUE C, ROOM 9
BAYONNE, NJ 07002
(201) 823-2900

Congress of the United States
House of Representatives
Washington, DC 20515-3013

March 21, 2014

The Honorable Shaun Donovan
Secretary
Department of Housing and Urban Development
451 7th Street, S.W.
Washington, DC 20410

Re: Rebuild by Design Competition

Dear Secretary Donovan:

I am writing to offer my strong support for the OMA proposal titled "Resist, Delay, Store, Discharge" that would protect the City of Hoboken and parts of the Township of Weehawken and the City of Jersey City as part of the Rebuild by Design competition.

Hoboken, Jersey City and Weehawken are dense, urban communities along the Hudson River that are increasingly vulnerable to coastal flooding as well as flash flooding. It is so important that we protect this area, which is a major economic driver for the state and includes critical infrastructure such as Hoboken Terminal, a regional multi-modal transportation hub.

Traditional strategies for mitigating flooding such as elevating homes do not work in these communities. Instead, the OMA team's proposal represents a comprehensive urban water management strategy for addressing flooding that could be replicated in other urban areas. This approach recognizes that flood waters don't stop at municipal boundaries and presents a regional solution to address the threat from storm surges in a way that also protects neighboring cities. It employs green infrastructure to cost-effectively address flash flooding and improve the health of our neighborhoods and waterways.

The Rebuild by Design competition is an opportunity to develop creative solutions to improve our region's resiliency. I am proud to support the OMA team's proposal to make Hoboken, Weehawken, and Jersey City more resilient and to serve as an urban model for resiliency, and I request your consideration for funding as part of the Rebuild by Design competition.

If you should have any questions, please do not hesitate to contact me.

Sincerely,


Albio Sires
Member of Congress



Hon. Dawn Zimmer, Mayor
City of Hoboken
94 Washington Street
Hoboken, New Jersey 07030

March 11, 2014

Dear Mayor Zimmer:

On behalf of re:focus partners and the RE.invest Initiative, I am pleased to submit this letter of support for the Rebuild by Design team's Comprehensive Strategy for Hoboken.

The RE.invest team has had the pleasure of working with your staff over the past year, since Superstorm Sandy devastated Hoboken. Simply put, we have been very impressed with your team's creativity in bringing together resources to re-envision the city. This creativity is evident in the proposals developed through the Rebuild by Design process. Rather than reconstructing your traditional water, energy, telecommunication, and other coastal systems that were damaged in the storm, you committed to finding new green and resilient infrastructure strategies to make Hoboken more robust in future.

re:focus and the RE.invest team are so pleased to be working with you, and alongside the Rebuild by Design team, to realize that vision. Over the last year, our RE.invest team of engineers, lawyers, and finance experts has worked closely with Hoboken to identify innovative infrastructure design and investment options for the city. We were pleased to see that the strategy presented by the Rebuild by Design team is consistent with the principles and approaches we've identified for increasing urban resilience in your city:

- First, resilience is about systems, not just projects – which means that careful integration, coordination, and sequencing is essential to make sure that when one structure fails it doesn't take down a whole system. The Rebuild by Design strategy presents a well-formed set of concepts to ensure system integrity.
- Second, finding new ways to align public and private interests to help cities plan large systems of small projects is necessary. Costs and benefits associated with resilient infrastructure systems are often spread across sectors – therefore coordination among sectors is critical. The Rebuild by Design strategy presents a



practical plan for coordination by identifying policy tools to help Hoboken motivate private activity and use public authorities to the greatest extent.

- Third, when it comes to green and resilient systems, success is often something that doesn't happen. The city didn't flood, the power didn't turn off, even though the storm hit. Capturing those benefits and savings over time requires integrated planning. The Rebuild by Design strategy provides that long-term vision with a focus on capturing valuable co-benefits created by reducing multiple risks.

In addition to developing a set of working principals for resilient infrastructure investment, our team has been collaborating with the city to support the development of a parcel in northwest Hoboken. Our proposal would provide much needed subsurface parking that can double as stormwater detention space in the case of a sudden flood or severe storm event, while maintaining green space for public use. By the end of 2014, the RE.invest team will provide the city with a design concept, cost and revenue projections and a legal implementation strategy for this particular project. Our work is directly in line with the goals of the Rebuild by Design strategy to resist, delay, store and discharge, and will serve as an early model for how particular resilient infrastructure projects from the strategy can be implemented and financed in Hoboken.

Based on our experiences working with your team and members of the Rebuild by Design team over the past year, we are confident that support for the Rebuild by Design Comprehensive Strategy would be well used in Hoboken to protect vulnerable communities from the impacts of future storms and strategically leverage additional private investment in your city. This letter reflects our strong support for the Rebuild by Design plan's funding and implementation.

Sincerely,

Shalini Vajjhala
Founder & CEO
re:focus partners

SUEZ ENVIRONNEMENT NORTH AMERICA

BERTRAND CAMUS
CEO
200 OLD HOOK ROAD
HARRINGTON PARK, NJ 07640
TEL 201-767-9300
FAX 201-767-2082
BERTRAND.CAMUS@UNITEDWATER.COM



March 24, 2014

The Honorable Shaun Donovan, Secretary
U.S. Department of Housing and Urban Development
451 7th Street, S.W.
Washington, DC 20410

Dear Mr. Secretary,

SUEZ ENVIRONNEMENT NORTH AMERICA supports Mayor Dawn Zimmer, the City of Hoboken, NJ and the team from OMA (a leading international partnership practicing architecture, urbanism, and cultural analysis) for their groundbreaking entry into the Rebuild by Design Competition sponsored by the Hurricane Sandy Rebuilding Task Force and The U.S. Department of Housing and Urban Development.

Hurricane Sandy is the most recent event to expose the vulnerability of our region to extreme weather. Few problems are as complex as flood mitigation for densely populated, low-lying waterfront communities. As a water services leader, SUEZ ENVIRONNEMENT NORTH AMERICA champions innovative technical solutions which provide essential services to communities with respect for the environment. Complex problems often require hybrid approaches and forward-thinking ideas, both of which are present in OMA's plan for the City of Hoboken.

Guided by four main tenets, "resist, delay, store, discharge," OMA's plan calls for using parks, buildings, and greenways as barriers against flooding waters. The plan also includes a redevelopment of the Hoboken Terminal, as well as a greenway around the city that would double as a park and rainwater storage. Their comprehensive strategy deploys both hard infrastructure and soft landscape for coastal defense (resist); recommends policies to enable the urban fabric to slow down water (delay); a green circuit to trap water (store) and water pumps to support drainage (discharge).

Through inventive approaches and strategic partnerships, Hoboken is already taking proactive measures when it comes to modernization and dealing with aging infrastructure. It is well positioned to serve as a model for the next great advancements in flood mitigation. We believe the plan submitted by OMA can serve as this model, and encourage you to consider the submittal worthy of funding.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'B. Camus', with a horizontal line underneath.

Bertrand Camus

cc: Mayor Dawn Zimmer, City of Hoboken, NJ

Chris Christie, Governor
Kim Guadagno, Lieutenant Governor
James S. Simpson, Board Chairman
Veronique Hakim, Executive Director

NJ TRANSIT
One Penn Plaza East
Newark, NJ 07105-2246
973-491-7000

March 24, 2014

Secretary Shaun Donovan
U.S. Department of Housing and Urban Development
451 7th Street S.W.
Washington, DC 20410

Re: Support for a Community-Based Flood Protection Strategy

Dear Secretary Donovan:

As New Jersey's statewide public transportation corporation, we have significant rail, light rail, bus and passenger terminal assets in the City of Hoboken. During Superstorm Sandy, these assets were severely impacted. In addition to the millions of dollars in damaged equipment, electric substations, track, signals and passenger facilities, our operations were suspended and thousands of commuters were denied access to cross-Hudson transportation.

Our experience was only a portion of the wider damage the City of Hoboken and surrounding areas suffered as streets flooded and power failed. Clearly, the most important lesson learned from Superstorm Sandy is that flood protection requires a regional approach. And, that is why we are encouraged by initiatives that address the larger issues of how an entire community can achieve resilience.

NJ TRANSIT staff has held a series of meetings with the OMA team, providing OMA with technical data, drawings and other support as OMA has worked through the Rebuild by Design Process. NJ TRANSIT will be submitting a grant application to the Federal Transit Administration for a transit resiliency effort that includes the filling of Long Slip Canal at our Hoboken Terminal and Yard, which is consistent with and could be integrated into OMA's design. This Long Slip project will contribute to a more resilient NJ TRANSIT facility, and will also serve to mitigate local area flooding, as well.

We recognize that the community-based flood protection concepts now in discussion are in the earliest stages of development. NJ TRANSIT continues to engage with communities and stakeholders to find regional solutions to the flooding, storm surge and energy challenges highlighted by Superstorm Sandy.

While much more will need to be known about how they will interface with the Hoboken Terminal and other NJ TRANSIT assets, we look forward to continuing our efforts toward the larger goal of regional flood protection and resiliency.

Sincerely,

A handwritten signature in blue ink that reads "John C. Leon". The signature is fluid and cursive, with the first name "John" being the most prominent part.

John C. Leon
Senior Director
Office of Government and Community Relations

cc: Daniel Pittman, OMA/Rebuild by Design

Chris Christie, Governor
Kim Guadagno, Lieutenant Governor
James S. Simpson, Board Chairman
Veronique Hakim, Executive Director

NJ TRANSIT
One Penn Plaza East
Newark, NJ 07105-2246
973-491-7000

March 24, 2014

Mr. Stephen D. Marks, PP, AICP, CFM, LEED GA
Assistant Business Administrator
City of Hoboken
94 Washington Street
Hoboken, New Jersey 07030

Re: Support for a Community-Based Flood Protection Strategy

Dear Mr. Marks:

As New Jersey's statewide public transportation corporation, we have significant rail, light rail, bus and passenger terminal assets in the City of Hoboken. During Superstorm Sandy, these assets were severely impacted. In addition to the millions of dollars in damaged equipment, electric substations, track, signals and passenger facilities, our operations were suspended and thousands of commuters were denied access to cross-Hudson transportation.

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We recognize that the community-based flood protection concepts now in discussion are in the earliest stages of development. NJ TRANSIT continues to engage with communities and stakeholders to find regional solutions to the flooding, storm surge and energy challenges highlighted by Superstorm Sandy.

We look forward to continuing our efforts toward the larger goal of regional flood protection and resiliency.

Sincerely,

A handwritten signature in blue ink that reads "John C. Leon". The signature is written in a cursive, flowing style.

John C. Leon
Senior Director
Office of Government and Community Relations

cc: Daniel Pittman, OMA/Rebuild by Design



March 19, 2014

Secretary Shaun Donovan
U.S. Department of Housing and Urban Development
451 7th Street S.W.
Washington, DC 20410

RE: Rebuild By Design
Hoboken, NJ

I am writing in support of the City of Hoboken's Rebuild By Design (RBD) proposal.

As you may know, the New Jersey Association for Floodplain Management (NJAFM) is a non-profit volunteer organization dedicated to reducing loss of life and property damage resulting from floods and promoting sound floodplain management at all levels of government. Our membership consists of public officials, first responders, local, state and federal agency employees, public and private engineers, planners, floodplain managers and others responsible for various aspects of floodplain management. NJAFM is a state chapter of the national Association of State Floodplain Managers (ASFPM).

We have reviewed available information regarding Hoboken's RBD proposal, which identifies 4 resiliency strategies for Hoboken:

1. "Resist" for coastline protection; DIKES AND LEVEES
2. "Delay" for stormwater detention (i.e. green infrastructure);
3. "Store" for stormwater retention (i.e. more green infrastructure); and
4. "Discharge" to pump floodwaters out of the city when flooding occurs.

While specific details of the proposed plan have not been provided, the plan does incorporate a number of concepts that NJAFM recognizes as important mitigation strategies to address flood hazards, particularly in New Jersey's urban environment. Specifically, the use of green infrastructure to manage stormwater and the restoration of natural systems to enhance coastal protection are important initiatives that have the potential to provide positive flood mitigation benefits to the City.



Their proposal to incorporate these elements into an overall plan for the City represents an opportunity to make Hoboken more sustainable and resilient far into the future. We would recommend that the final plan incorporate non-structural solutions as part of the coastline protection component, and avoid/minimize fill and other impacts to shallow water habitats of the Hudson River.

Based on the overall project concepts, NJAFM is happy to support their proposal as part of a comprehensive plan to address flood hazards in the City of Hoboken.

Best of luck!

Sincerely,

Craig Wenger, Chair
NJAFM

c: Stephen Marks, City of Hoboken
NJAFM Board



American Planning Association
New Jersey Chapter

March 20, 2014

The Honorable Shaun Donovan, Secretary
U.S. Department of Housing and Urban Development
451 7th Street, S.W.
Washington, DC 20410

RE: *Rebuild by Design: City of Hoboken*

Dear Mr. Secretary,

The purpose of this letter is to express the American Planning Association New Jersey Chapter's strong support for the **City of Hoboken's** entry into the **Rebuild by Design** competition for the ***"Resist, Delay, Store, Discharge: a Comprehensive Strategy for Hoboken"*** proposal.

As you are likely aware, the City of Hoboken is extremely vulnerable to flooding. As such, the City, under Mayor Zimmer's leadership, has been extremely proactive in developing sensible approaches toward making the City more livable and resilient. The recent development of a Green Infrastructure Strategic Plan, as well as its demonstrated commitment to redevelopment and comprehensive community planning reveals Hoboken as a model for communities across the Nation.

The concepts presented in ***Resist, Delay, Store and Discharge Strategy for Hoboken*** present the next step in making Hoboken a model for resiliency. The concepts and approaches embodied in the strategy are central to good planning and sustainable communities. They are thoughtful and innovative yet practical and achievable. The RBD plan utilizes 4 resiliency strategies for Hoboken:

1. "Resist" for coastline protection;
2. "Delay" for stormwater detention (i.e. green infrastructure);
3. "Store" for stormwater retention (i.e. more green infrastructure); and
4. "Discharge" to pump floodwaters out of the city should flooding occur.

Hoboken is an important transportation asset in the region that needs to be protected. This is an opportunity to fund projects which will make Hoboken more sustainable and resilient far into the future. We hope that you will agree that the City of Hoboken proposal is worthy of funding and that a significant portion of Sandy recovery funds can be awarded to support implementation.

Sincerely,

A handwritten signature in black ink, reading 'Charles W. Latini J.', written in a cursive style.

Charles Latini
President

UNITED WATER

NADINE LESLIE
PRESIDENT-ENVIRONMENTAL SERVICES
200 OLD HOOK ROAD
HARRINGTON PARK, NJ 07640
TEL 201-750-3400
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NADINE.LESLIE@UNITEDWATER.COM
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March 24, 2014

The Honorable Shaun Donovan, Secretary
U.S. Department of Housing and Urban Development
451 7th Street, S.W.
Washington, DC 20410

Dear Mr. Secretary,

United Water Environmental Services proudly supports OMA (a leading international partnership practicing architecture, urbanism, and cultural analysis) and their Hoboken, NJ entry into the Rebuild by Design Competition sponsored by the Hurricane Sandy Rebuilding Task Force and The U.S. Department of Housing and Urban Development. We applaud OMA and Mayor Dawn Zimmer for championing an innovative, comprehensive and multi-faceted solution to a serious problem.

Hoboken is now, and always has been, vulnerable to flood water. The City was originally an island, surrounded by the Hudson River on the east and tidal lands at the foot of the New Jersey Palisades on the west. Much of the City and surrounding area lies at or below sea level and is densely populated with older buildings and antiquated infrastructure.

Solving Hoboken's historic flooding problem will not be an easy task. The OMA Team presents a comprehensive approach addressing political, ecological and economic factors. Most importantly, the plan relies on sustainable and resilient solutions geared towards thoroughly understanding and minimizing the City's risks.

At United Water, we strive to provide innovative water and waste management solutions that improve the quality of life in the communities we serve. Our focus is more than just clean water. For people, businesses and communities across the country, we provide sustainable solutions for essential environmental services. We see this same focus within OMA's approach to creating a stronger Hoboken, and we look forward to seeing this vision become reality.

Yours sincerely,

A handwritten signature in dark ink that reads 'Nadine Leslie'.

Nadine Leslie

cc: Mayor Dawn Zimmer, City of Hoboken, NJ



To: The U.S. Department of Housing and Urban Development
From: The East Coast Greenway Alliance
Date: March 12, 2014
Re: Rebuild by Design letter of support for Hoboken New Jersey

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Chuck Sloan, Chairman, Trust for the Appalachian Trail Lands
Pablo Torres, Environmental Advocate
Karen Votava, ECGA Co-Founder

Executive Director

Dennis Markatos-Soriano

The East Coast Greenway Alliance is a consortium of trail developers, planners, advocates, municipal, and county, that together work at the local, state and national levels to implement the East coast Greenway, a system of trails connected together with interim routes on roadways connecting trails together. It is a National Millennium Trail, that connects communities from the Canadian border to Key West Florida, going through the 25 major cities, 15 states and the District of Columbia.

Many of the cities that we go through have waterfronts that they are in the process of developing. Hoboken is an excellent example of a community developing their community strategically for environmental quality and resilience and for livability. The system of linear parks, the resiliency strategies for the development/redevelopment of Hoboken together show that the goals for Hoboken are long term, thoughtful and create accessibility for people to experience all that the environment has to offer. The sound principles of stormwater management to manage/control the storm surge, flow, and metered discharge will also provide for a cleaner water being discharged.

We are proud to support the City of Hoboken's efforts to build/rebuild based on sound ecological principles and their submission to the Rebuild by Design competition.

Sincerely,

Andy Hamilton
Mid-Atlantic Coordinator, East Coast Greenway Alliance





March 20, 2014

To: The U.S. Department of Housing and Urban Development

From: The East Coast Greenway Alliance

Re: Rebuild by Design letter of support for Hoboken, New Jersey

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Executive Director

Dennis Markatos-Soriano

The East Coast Greenway Alliance works with a consortium of trail developers, planners, advocates, and government agencies at the local, state and national levels to implement the East Coast Greenway (ECG). The ECG is a 2,900-mile system of trails connected by interim routes on roadways. This National Millennium Trail connects communities from the Canadian border to Key West, Florida, going through 25 major cities and 15 states along the Eastern Seaboard.

Many of the cities along the ECG have waterfronts that are undergoing development, including the city of Hoboken, New Jersey. This is an excellent example of a community developing strategically for environmental quality, resilience, and livability. Hoboken's system of linear parks and their strategies for redevelopment show that their development plans are long-term and thoughtful, and will create opportunities for citizens to experience all that the environment has to offer. The sound principles of stormwater management they are proposing to control storm surges, flow, and metered discharge will also improve water quality.

We are proud to support the City of Hoboken's efforts to build/rebuild based on sound ecological principles, and we thank you for considering their submission to the Rebuild by Design competition.

Sincerely,

Dennis Markatos-Soriano,
Executive Director
East Coast Greenway Alliance





P.O. Box 6217
Hoboken, NJ 07030

March 20, 2014

U.S. Department of Housing and Urban Development

Re. Rebuild by Design Competition

To Whom It May Concern:

With this letter the Hudson River Waterfront Conservancy of NJ, Inc. offers its enthusiastic support for the City of Hoboken's plan in the Rebuild by Design competition. We understand that the plan involves four resiliency strategies identified as *Resist, Delay, Store and Discharge* brought together by the Dutch engineering firm OMA. This is a multi faceted plan which provides corrective and protective management of the flooding that affects nine of the towns along the New Jersey side of the lower Hudson River. This is not just a plan for Hoboken for it will provide a guide for these other municipalities as well. It deserves to be chosen for a Build by Design Award.

The primary area of concern for the Hudson River Waterfront Conservancy of NJ, Inc. is the riverfront stability of the communities of Bayonne, Jersey City, Hoboken, Weehawken, West New York, Guttenberg, North Bergen and Edgewater. These cities - built down to the river – exist within the most densely populated area of New Jersey. The waterfront is a critical resource for each of these locations. It sustains the economy and the general well being of all residents and businesses. The resilience and sustainability of the shoreline and the reaction to flooding in these towns on the river depends upon new ways to live with water. Hoboken has taken the step to meet that challenge by bringing in OMA and applying for this award. The receipt of this grant will serve not just Hoboken but these many other communities as well.

The Conservancy urges acceptance for the Build by Design Award for the City of Hoboken.

Sincerely,

Helen Manogue
President

Donald Stitzenberg, Esq., Vice President
Peggy Wong, Secretary
Edward H. Rogaski, Jr., Treasurer
Carol Hoernlein, P.E.; May Hogan; Howard Singer, PhD; William Neyenhouse PP; Dorcey Winant



Metropolitan Waterfront Alliance

March 11, 2014

Re: Rebuild By Design Letter of Support

To whom it may concern:

On behalf of the Metropolitan Waterfront Alliance (MWA), please accept this letter of support for OMA's comprehensive strategy for Hoboken prepared for the Rebuild By Design competition.

MWA is a network of over 770 businesses, community and recreational groups, educational institutions, and other stakeholders committed to transforming the region's harbor and waterways to make them cleaner and more accessible, a vibrant place to play, learn, and work, with great parks, great jobs and great transportation for all. Using a wide range of programs and organizing tools, MWA influences local and regional waterfront policy through MWA's Task Forces and other means. We have reviewed OMA's presentation entitled "Resist, Delay, Store, Discharge" and find it to be worthy of support and funding by the federal government and U.S. Department of Housing and Urban Development.

The City of Hoboken is both a vibrant neighborhood at the heart of the New York metropolitan area and an extremely important regional transit hub for commuters and the local economy. The Rebuild By Design/OMA strategy relies on coastline protection to protect the community from future storm surges and sea level rise while presenting opportunities for additional recreational and open space. The strategy would use green infrastructure to detain and retain stormwater runoff to reduce flooding and the urban heat island effect, while improving both air quality and water quality. Finally, the strategy would use mechanisms for discharging flood waters as a last resort, should flooding occur.

We urge you to support this project.

Sincerely,

Roland Lewis
President and CEO

BOARD OF TRUSTEES

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Kate Sinding
Steve Wilson
John H. Watts, *Chair Emeritus*
Roland Lewis, *President & CEO*



March 19, 2014

To Whom It May Concern:

Please accept this letter of support from NY/NJ Baykeeper for the OMA-led Rebuild by Design proposal for the Hoboken area. The project is titled *Resist, Delay, Store, Discharge: A Comprehensive Strategy for Hoboken*. NY/NJ Baykeeper has worked since 1989 to protect, preserve and restore the NY-NJ Harbor Estuary, including the northern New Jersey coastline. Baykeeper knows all too well the Hoboken area was devastated by Hurricane Sandy and supports the idea of not just rebuilding, but rebuilding smarter.

The OMA design is a good starting point to address the flooding and resiliency issues faced by Hoboken. Specifically, we support the “Store” and “Delay” concepts as described by the proposal and look forward to hearing more details on the “Resist” and “Discharge” concepts as the design moves forward. Baykeeper supports the multiplier effect that will occur with this design that not only addresses resiliency and flooding, but also stormwater and combined sewer overflow pollution. This design will result in long-term water quality improvements for the Estuary.

It is important the proposal be an asset not only to Hoboken, but also surrounding communities in a way that does not simply push the flooding problem elsewhere or have an impact on the local ecosystem. We look forward to working with Hoboken and the federal and state agencies in fleshing out of the details of the proposal, but believe it represents a good step forward and support the concept.

Please do not hesitate to contact me if I can be of any further assistance at Debbie@nynjbaykeeper.org or 732-888-9870 x2. Thank you.

Regards,

Deborah A. Mans
Baykeeper & Executive Director



1600 Adams St.
Hoboken, NJ 07030
201/963-6043
Fax 201/963-3907
www.nhudsonsa.com

Commissioners:

Frank Raia
Chairman

Brian Assadourian
Brian H. Kappock
Libero D. Marotta
Harold Schroeder
Anthony J. Soares
Alejandro Velazquez
Count J. Wiley
Erika Zucconi

Dr. Richard J. Wolff
Executive Director

Fredric J. Pucci, P.E.
Authority Engineer

March 10, 2014

The Hon. Dawn Zimmer
Mayor
The City of Hoboken
Hoboken, N.J. 07030

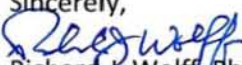
Dear Mayor Zimmer:

The North Hudson Sewerage Authority is pleased to inform you that we are in full support of the OMA Plan, *Rebuild By Design*, which outlines a comprehensive water management strategy for Hoboken.

Many of the initiatives in the Plan are those which the Authority's engineers have been examining and pursuing over the last several years, including additional wet weather pumping stations, green infrastructure solutions, and storm water detention systems. In fact, we have shared our data and research with the authors of the OMA Plan and have met several times with them in very useful exchanges of information.

Specifically, the Authority is supportive of the overall strategic approach to water management, which is set forth in the Plan: "Resist, Delay, Store and Discharge." We have already advanced the planning for a number of the initiatives proposed in the Plan, including the preliminary design of a wet weather pump station at the eastern foot of 11th Street, as well as a number of major green infrastructure projects. We share, for example, the Plan's intent to examine the feasibility of restoring wetlands in the Hoboken/Weehawken Cove and of constructing underground wet weather storage facilities. Further, our engineers have had numerous discussions over the last 18 months about deployable sea walls which appear to us both desirable and feasible.

We would very much like to continue to work with the City, as it pursues the solutions and approaches outlined in the OMA Plan.

Sincerely,

Richard J. Wolff, Ph.D.



Thomas DeGise, Chair
Mary K. Murphy, Executive Director

March 21, 2014

To Whom It May Concern:

I am writing this letter in support of the City of Hoboken's application to the Rebuild by Design competition.

The North Jersey Transportation Planning Authority (NJTPA) is the metropolitan planning organization for a 13-county region in northern and central New Jersey that includes Hudson County and the City of Hoboken. The NJTPA is responsible for regional transportation planning and oversees all federal transportation investment in the region. In addition, the NJTPA is a leading member of Together North Jersey, the consortium headed by Rutgers University that is creating a Regional Plan for Sustainable Development through a HUD Sustainable Communities Regional Planning Grant.

The City of Hoboken's proposal for flood protection through a strategy of "Resist, Delay, Store, Discharge" would provide important benefits to the regional transportation system. In particular, it would help protect Hoboken Terminal, a regionally significant, multimodal transportation hub where rail, light rail and ferry transportation connect. In addition, some of the potential improvements to the Hoboken waterfront would help promote bicycle and pedestrian travel.

These proposed improvements are consistent with the overall goals and strategies of the NJTPA's *Plan 2040*, the 2013 update of the federally required long-range transportation plan. In addition to calling for making infrastructure more resilient to extreme weather, *Plan 2040* focuses on the importance of multimodal transportation and calls for improvements to bicycle/pedestrian transportation. The City's approach to flood protection is consistent with all these goals.

Very truly yours,

Mary K. Murphy
Executive Director, NJTPA

3/14/2014

Secretary Shaun Donovan
U.S. Department of Housing and Urban Development
451 7th Street S.W.,
Washington, DC 20410

**Rebuild by Design, A comprehensive Strategy for Hoboken
Letter of Support**

Dear Secretary Donovan,

The Rutgers Center for Urban Environmental Sustainability (CUES) enthusiastically supports the resiliency adaptations proposed for the **City of Hoboken**, developed by the Rebuild by Design team.

Prior to Superstorm Sandy CUES had the opportunity to support the City in developing options for managing storm water including a re-design proposal for the City Hall open spaces. As part of the project CUES lead a community workshop. The amount of resident participation and enthusiasm was indicative of strong local support for measures that can be taken by residents to store and slowly release storm water.

In addition a Rutgers graduate student investigated storm water management in Hoboken for his Master Thesis, and Hoboken made the thesis available to the team. The student identified vacant land and other open spaces that could be integrated to reduce flooding. We were very excited to see that the Rebuild by Design Team was able to utilize this research in considering options to store, absorb, and slowly release floodwaters.

Based on our knowledge of conditions in Hoboken we strongly support the multi-faceted concept proposed by the Rebuild by Design Team. We are convinced that such a comprehensive approach can become a model for highly urbanized flood prone coastal communities, even beyond the New York/New Jersey region.

Yours sincerely,


Dr. Wolfram Hoefer


Dr. Beth Ravit



Edward J. Bloustein School of Planning and Public Policy
Rutgers, The State University of New Jersey
33 Livingston Avenue
New Brunswick, New Jersey 08901

www.togethernorthjersey.com

PH: (848) 932-2840 direct dial
FAX: (732) 932-3714

March 20, 2014

The Honorable Shaun Donovan, Secretary
U.S. Department of Housing and Urban Development
451 7th Street, S.W.
Washington, DC 20410

Dear Mr. Secretary,

I am writing to you on behalf of **Together North Jersey**, a partnership of nearly 100 jurisdictions, organizations, educational institutions and businesses in northern New Jersey that have joined together to create a long-term action plan to promote sustainable community development in a 13-county planning region. Together North Jersey is an FY 2011 Sustainable Communities Regional Planning Grantee. As you know, our planning region was severely impacted by Hurricane Sandy. The purpose of this letter is to express Together North Jersey's strong support for the **City of Hoboken's** entry into the **Rebuild by Design** competition for the **"Resist, Delay, Store, Discharge: a Comprehensive Strategy for Hoboken"** proposal prepared by the OMA design team.

Hoboken is extremely vulnerable to flooding from regular rain events and storm surge from coastal storms. Over the past two years, Together North Jersey and the City have collaborated on multiple occasions to develop "nature-based" solutions to chronic flooding problems and areas at risk for storm surge inundation and sea-level rise. Our collaborations have included the deployment of rain gardens in the city, envisioning green infrastructure for City Hall and most recently development of a **Green Infrastructure Strategic Plan** for the entire city. This plan, which was funded through Together North Jersey's Sustainable Communities grant from HUD, is a model for communities throughout our region, the State of New Jersey and the country.

The Green Infrastructure Strategic Plan includes specific, implementable actions and recommendations that will make the leading-edge concepts presented in **Resist, Delay, Store and Discharge Strategy for Hoboken** a reality. Selecting the OMA team proposal as a winning design will leverage the significant investment of HUD Sustainable Communities planning funds made in our region and provide much needed implementation funding that will help make the City of Hoboken a model for resiliency in the Together North Jersey region and beyond. The concepts and approaches embodied in the strategy are central to the goals and objectives of the Together North Jersey planning initiative. I hope that you will agree that the proposal is worthy of funding and that a significant portion of Sandy recovery funds can be awarded to the City of Hoboken to support implementation.

Sincerely,

A handwritten signature in black ink that reads "Jon A. Carnegie". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

Jon A. Carnegie, AICP/PP
Project Director
Together North Jersey

COUNTY OF HUDSON



OFFICE OF
THE COUNTY EXECUTIVE

BRENNAN COURT HOUSE
583 NEWARK AVENUE
JERSEY CITY, NEW JERSEY 07306
PHONE: 201-795-6200
FAX: 201-714-4825

THOMAS A. DE GISE
COUNTY EXECUTIVE

Secretary Shaun Donovan
U.S. Department of Housing and Urban Development
451 7th Street S.W., Washington, DC 20410

Re: Rebuild By Design
Letter of Support

Dear Secretary Donovan:

On behalf of the County of Hudson, I am pleased to provide this letter of support for OMA's comprehensive strategy for Hoboken prepared for the Rebuild By Design competition.

As County Executive of a peninsula county sandwiched between the Hackensack River, Hudson River, Passaic River, Newark Bay and Upper New York Bay, I can personally attest to the devastation and destruction that Superstorm Sandy brought through its storm surge and tidal flooding, especially to our low-lying coastal communities like Hoboken, and the rest of our communities, through gale force winds and the accompanying damage to electrical lines and the loss of power. In fact, the county government alone suffered over \$9,514,110.77 in damage to our county parks, roads and facilities, including the county's own emergency operations center and correctional center.

My administration has been diligently working to harden our assets and assist our constituent communities do the same. I applaud the City of Hoboken for creating its own resiliency plan and pursuing an ambitious agenda. I have reviewed OMA's presentation entitled "Resist, Delay, Store, Discharge" and have determined that it is consistent with Hudson County's All Hazards Mitigation Plan which was approved by FEMA and the State of New Jersey in 2009. OMA's proposal is well thought out and is worthy of support and funding by the federal government and U.S. Department of Housing and Urban Development. The City of Hoboken is an extremely important community within Hudson County.

An equal opportunity employer

Hoboken is a vibrant city with more than 50,000 residents and a vital part of Hudson County's regional economy. If funded, the Rebuild By Design proposal will make Hoboken more resilient, help protect the community from future flooding and storm events and help preserve and enhance the County's regional economy.

If you have any questions please feel free to call. Thank you for your attention to this matter.

Sincerely,

A handwritten signature in dark ink, reading "Thomas A. DeGise". The signature is fluid and cursive, with the first name "Thomas" being the most prominent.

Thomas A. DeGise
County Executive



County of Hudson
BOARD OF CHOSEN FREEHOLDERS

Administration Annex 567 Pavonia Avenue
Jersey City, New Jersey 07306
Phone: (201) 795-6001
Fax: (201) 217-0404

ANTHONY L. ROMANO, JR.
FREEHOLDER

March 10, 2014

To Whom It May Concern:

As the Freeholder representing the City of Hoboken, I would like to express my support for the OMA proposal which would assist Hoboken with its current flooding problems. Hoboken suffered tremendously with Hurricane Sandy and has had four flash floods since. With two-thirds of Hoboken in a FEMA flood zone, many of the city's utilities are at risk during times of flooding. The City of Hoboken is also vulnerable to storm surges since its waterfront is currently unprotected.

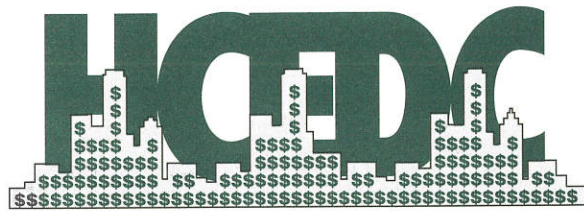
The OMA proposal focuses on four resilient and sustainable strategies to protect the City of Hoboken from extreme storm events in the future. "Resist" for coastline protection during storm surges at the water's edge; "Delay" to slow down storm water run-off through green infrastructure; "Store" to hold storm water until storm events pass; and "Discharge" to pump flood waters should flooding occur. This proposal is quite feasible and is gaining broad community support.

Making the OMA proposal a reality will greatly increase the quality of life in Hoboken for both residents, visitors and the over 50,000 commuters that pass through Hoboken terminal daily.

Sincerely,

A handwritten signature in dark ink, reading "Anthony L. Romano, Jr.", is written over a horizontal line.

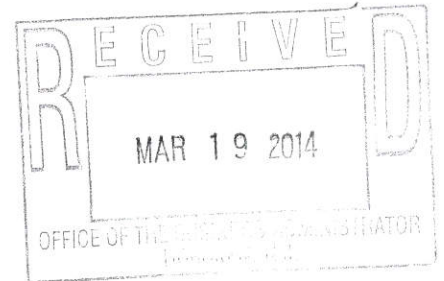
Captain Anthony L. Romano, Jr.
Hudson County Freeholder, District 5



Hudson County Economic Development Corp.

March 114, 2014

Mr. Stephen Marks
Assistant Business Manager
City of Hoboken
94 Washington Street
Hoboken, NJ 07030

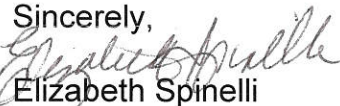


Dear Mr. Marks:

I am writing to offer my support for the Hoboken "Rebuild by Design" planning application. The City of Hoboken has endured flash floods from storms and was devastated by Hurricane Sandy. The approach offered in the HUD Rebuild by Design Plan promotes an innovative method within the (4) strategies that will protect the city from future events.

This application offers a feasible solution to the flooding problem and strengthens the region by developing this innovative approach.

I am proud to support your application and offer my assistance as you move forward.

Sincerely,

Elizabeth Spinelli
Executive Director

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Trustee Emeritus

Executive Director
Elizabeth J. Spinelli

Counsel
Timothy Hawkes, Esq.



**COUNTY OF HUDSON
COMPREHENSIVE ECONOMIC DEVELOPMENT STRATEGY COMMITTEE
DEPARTMENT OF PARKS & COMMUNITY SERVICES
DIVISION OF PLANNING
MEADOWVIEW CAMPUS BLDG. 1, FL. 2
595 COUNTY AVENUE
SECAUCUS, NEW JERSEY 07094
WWW.HUDSONCOUNTYNJ.ORG/PLANNING**

Thomas A. DeGise, County Executive
Michelle Richardson, Director of Parks & Community Services

Paul Silverman, Chair
Maria Nieves, Vice-Chair
Massiel Medina Ferrara, PP, AICP, Secretary

Resolution: 2014-001

***Resolution endorsing OMA's comprehensive strategy for
the City of Hoboken prepared for the Rebuild By Design competition***

WHEREAS, a Comprehensive Economic Development Strategy (CEDS) is the result of the local planning process designed to guide the economic growth of an area. The purpose of a CEDS is to establish a process that will help create jobs, foster more stable and diversified economies, and improve living conditions. It provides a mechanism for coordinating the efforts of individuals, organizations, local governments, and private industry concerned with economic development. A CEDS is identified as a requirement to apply for assistance under the federal Economic Development Administration's (EDA) public works and economic adjustment programs; and,

WHEREAS, the County of Hudson is an eligible economic development district organization as determined by guidelines established by the U.S. Economic Development Administration. The County of Hudson adopted a Comprehensive Economic Development Strategy in 2010. The Hudson County CEDS committee was duly constituted by appointments made by the Hudson County Executive and consented to by the Hudson County Board of Chosen Freeholders; and,

WHEREAS, this Committee has prepared and endorsed a regional Comprehensive Economic Development Strategy for Hudson County that was approved by the United States Economic Development Administration on March 23, 2012; and,

WHEREAS, the primary goals of the Hudson County CEDS include: investing in infrastructure systems and technology to continue economic growth, stimulate new development and redevelopment, and enhance the quality of life; identifying, evaluating and implementing alternate strategies and tools that promote economic development and economic growth; supporting the development of cultural, recreational and historic amenities that not only benefit County residents, but foster the development of the travel and tourism industry; assisting in the development of Quality of Life factors that make Hudson County a more attractive place for businesses and people to live and work; and promoting sustainable, smart growth development;

WHEREAS, the CEDS representative for the City of Hoboken, Stephen D. Marks, introduced OMA's presentation for the Rebuild By Design competition entitled "Resist, Delay, Store, Discharge" to the Committee;

WHEREAS, the Committee supports that the proposal will make Hoboken more resilient, help protect the community from future flooding and storm events and help preserve and enhance the County's regional economy;

Now, therefore, be it resolved, by the Hudson County Comprehensive Economic Development Strategy Committee that the CEDS Committee endorses OMA's comprehensive strategy for Hoboken prepared for the Rebuild By Design competition.

Certified to be a true and correct copy of the Resolution of the Joint Comprehensive Economic Development Strategy & Strategic Revitalization Committee adopted at a meeting on 3/12/14.


_____, Vice-Chair
Maria Nieves


_____, Secretary
Massiel M. Ferrara



March 24, 2014

The Honorable Shaun Donovan
Secretary
Department of Housing and Urban Development
451 7th Street, S.W.
Washington, D.C. 20410

Re: Rebuild by Design competition

Dear Secretary Donovan:

I am writing to offer my enthusiastic support for the OMA team's comprehensive urban water management strategy to address flooding in Hoboken, Weehawken, and the northern waterfront of Jersey City.

The City of Hoboken was once an island outcrop surrounded by tidal marshes, and it has suffered from flooding for more than 100 years. We regularly face flash flooding, and Superstorm Sandy highlighted our vulnerability to coastal flooding from storm surges and how exposed we are to the increasing threats from climate change and sea level rise. Just since Sandy, we have had three major flood events. In many cases our residents and businesses must pay out of pocket for repetitive losses because the flood insurance they purchased does not actually provide meaningful coverage.

The current situation is not sustainable, and the traditional solutions have so far failed us. There are incentives for raising homes on pilings, funds for protecting individual municipal assets to create "islands of protection," and funds for property buyouts, but these solutions do not work in densely built urban areas.

We need a better way, and the Rebuild by Design competition is a unique opportunity to implement the kinds of creative solutions to improve resiliency in urban areas. The OMA team's "Resist, Delay, Store, Discharge" urban water management strategy has the potential to be a national model for urban coastal resiliency.

This comprehensive approach would protect all of our assets. As the fourth most densely populated city in the country, the plan would protect a tremendous number of Hoboken residences and businesses in addition to critical infrastructure including electrical substations, our regional medical center, fire houses, and flood pumps. It would also protect our most flood-prone areas in western Hoboken including some of our most vulnerable residents in the Hoboken Housing Authority, who have suffered from flooding for decades. With 56 percent of our residents

OFFICE OF THE MAYOR

commuting by public transportation every day (the highest rate in the country), Hoboken is extremely reliant on our public transit system. OMA's proposal would provide a layer of protection to Hoboken Terminal, a major regional multi-modal transit hub with PATH, ferry, and NJ Transit rail and bus service that is used by our neighbors in Jersey City and those throughout the region. At the north end, it would provide protection for Weehawken and the North Hudson Sewerage Authority's assets which serve both of our communities. In short, the proposal would comprehensively protect all of Hoboken as well as Weehawken and part of Jersey City.

My Administration is committed to addressing our flooding challenges in a comprehensive and sustainable way, and there is broad public support to pursue the approach proposed by the OMA team. I believe OMA's comprehensive water management strategy can serve as a national model for urban resiliency, and I respectfully request your consideration and support for this proposal.

Thank you for your continued support during Superstorm Sandy and the year and half since. I greatly appreciated being a part of the Hurricane Sandy Rebuilding Task Force. The ideas that came out of the Task Force have guided the Rebuild by Design competition as it seeks to improve on federal policies that work and reform those policies that do not make sense.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Zimmer', with a stylized flourish extending from the end.

Mayor Zimmer



TOWNSHIP OF WEEHAWKEN
NEW JERSEY

MUNICIPAL BUILDING
400 PARK AVENUE
WEEHAWKEN, NEW JERSEY 07086

March 21, 2014

Dear Secretary Donovan,

As Mayor of the Township of Weehawken, I am writing to lend my strong support for OMA's "Resist, Delay, Store, Discharge" proposal for the Rebuild by Design competition which would comprehensively protect Weehawken, Hoboken and part of Jersey City.

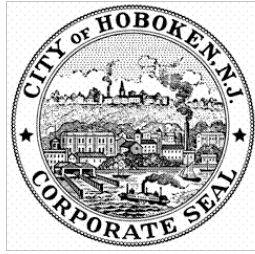
During Superstorm Sandy, the Shades area in southern Weehawken was severely flooded due to the storm surge which entered near our border with Hoboken. The "Resist, Delay, Store, Discharge" strategy is a thoughtful urban approach for addressing flooding. It would fully protect the residents of Weehawken from the kind of coastal flooding we experienced during Sandy. The plan will also fully protect shared critical infrastructure, such as the North Hudson Sewerage Authority treatment plant and pump facilities.

I appreciate the opportunity to have discussed the proposal with Mayor Zimmer, her staff, and members of the OMA and Rebuild by Design teams. I believe that OMA's proposal will serve as a national model for regional urban resiliency.

Sincerely,

A handwritten signature in black ink, appearing to read "Richard F. Turner", is written over a horizontal line.

Richard F. Turner
Mayor



March 22, 2014

To Whom it May Concern,

Hoboken is approximately one square mile with close to seventy percent of the residents living in flood prone areas. The program “Resist, Delay, Store, Discharge: a comprehensive strategy for Hoboken”, created by OMA for the Rebuild by Design program allows for a solution to the storm surge issues in Hoboken and the small footprint of Hoboken makes it an ideal testing ground.

During and after Superstorm Sandy I personally experienced three and a half feet of water in my ground floor destroying my families kitchen and living room. I witnessed cars floating and crashing into peoples homes. The loss of personal property was unfathomable. The PATH train was out of service for over a month. Families were displaced. Rebuild by Design can change this.

The City of Hoboken is committed to finding flooding solutions and I am in full support of OMA proposal.

Please contact me if I can further assist JenGiattino6@gmail.com , 201.780.6779,

Jen Giattino

Sixthward Council President

March 24, 2014

The Honorable Shaun Donovan, Secretary
U.S. Department of Housing and Urban Development
451 7th Street, SW
Washington, DC 20410

Re: Rebuild By Design Contest

Dear Secretary Donovan:

As a member of the Hoboken City Council, I am writing to offer my support for the comprehensive strategy devised by the Dutch design firm, OMA, to rebuild Hoboken as part of the Department of Housing and Urban Development's (HUD) Rebuild by Design competition. The strategy proposed, which comes in the wake of the devastation wrought by Hurricane Sandy, is essential to our community because of the urban nature of our City's architecture and historical development, coupled with the reality of our topography – up to 80% of the City is in the flood zone and is susceptible to future flooding events. We are particularly vulnerable, but we are resilient and plan to do what it takes to maintain our community in the face of this challenge.

The OMA four-pronged concepts of *Resist, Delay, Store, Discharge*, focuses on establishing resiliency through the integration of key infrastructural elements that not only protect coastal neighborhoods, they protect the entire City of Hoboken. The ongoing public process has effectively educated Hoboken's citizenry about what steps can and need to be taken by both individuals and the government alike, sharing the chore, and we are hoping to work at the municipal, county, state, and federal levels of government so as implement our plan to protect our City going forward, especially as we face climate change and its turmoil.

Please look favorably upon Hoboken's Initiative when evaluating the various submissions in the Rebuild By Design completion. While I am naturally biased in favor of our great City, it is indisputable that we have a gem of a city which is more at risk than most others, and we've designed an impressive plan to tackle the challenges on many fronts. Thank you for your consideration.

Respectfully,

A handwritten signature in black ink, appearing to read 'James Doyle', with a long horizontal flourish extending to the right.

James Doyle
Councilman at Large
Hoboken City Council



COUNCIL OF THE CITY OF HOBOKEN

CITY HALL
94 Washington Street
Hoboken, New Jersey 07030
www.hobokennj.org

RAVINDER S. BHALLA
Councilman-At-Large
City Council Vice-President

Phone: 201-647-6090
RBhalla@HobokenNJ.org

March 25, 2014

To Whom It May Concern:

As a Councilman of the City of Hoboken, I write to express my strong support for the Rebuild by Design proposal prepared by OMA to provide our City with a multi-faceted and innovative approach to mitigating the impact of future severe weather events.

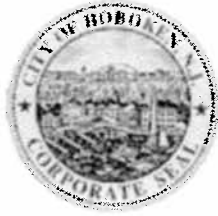
As you may know, Superstorm Sandy completely devastated much of Hoboken, leaving more than 70 percent of our City under water during this storm. OMA's proposal, and its approach to "Resist, Delay, Store and Discharge" is a meaningful and rare opportunity for our City to minimize the effects of flooding conditions and future flooding. Sandy caused catastrophic flooding, isolated emergency services, and caused our local hospital to evacuate, only to name a few emergent concerns. Hoboken is severely impacted by coastal waters and severe storms during high tide which have routinely flooded our City. The OMA plan will both help minimize the effects of any flooding problems and prevent many future ones as storms continue to worsen over the years. The OMA proposal also focuses on key infrastructural elements that will protect our coastal neighborhoods and the entire City of Hoboken.

For these reasons, I respectfully submit that implementation of the OMA proposal is critical to protecting our City, its residents, as well as the many visitors who enjoy Hoboken every day. I highly support this proposal and greatly appreciate your consideration.

If you have any questions, please do not hesitate to contact me.

Very truly yours,

Ravi S. Bhalla
Councilman-at-Large
City of Hoboken



PETER H. CUNNINGHAM
FIFTH WARD COUNCILMAN

March 24, 2014

To Whom It May Concern,

As Hoboken's Fifth Ward Councilman, I write this letter in support of Mayor Dawn Zimmer and the City of Hoboken's partnership with the firm OMA to develop a strategy to protect Hoboken from future flooding.

As the representative of over 10,000 residents of Hoboken's northwest section of Hoboken, I have seen the devastating effects our residents have endured from flooding, especially from "super storm" Sandy. The team's design "Resist, Delay, Store, Discharge: a Comprehensive Strategy for Hoboken" is a plan that approaches the solution to Hoboken's storm surge problem in a multi-faceted way which creates a multiple of opportunities for Hoboken from job creation to preservation.

More than two thirds of Hoboken is in the FEMA flood zone. I believe this plan coalesces the brightest minds with a comprehensive plan addressing Hoboken's flooding issues long term in an effort to protect our infrastructure, our economy and especially our residents.

Thank you in advance for your consideration.

Sincerely,

Peter H. Cunningham
Fifth Ward Councilman
City of Hoboken
94 Washington Street
Hoboken, NJ 07030

Dana Wefer
201-420-4046
danawefer@gmail.com

March 25, 2014

The Honorable Shaun Donovan, Secretary
U.S. Department of Housing and Urban Development
451 7th Street, S.W.
Washington, DC 20410

Dear Secretary Donovan,

I write as a Commissioner of the Hoboken Housing Authority and resident of the southwest part of Hoboken to express my strong support for Hoboken's Rebuild by Design entry, "Resist, Delay, Store, Discharge: a Comprehensive Strategy for Hoboken."

All of Hoboken was battered by Superstorm Sandy, and the southwest part of Hoboken, where most of our most vulnerable residents reside, was particularly hard hit. The public housing facilities were under water for days. Boiler rooms, generators, electrical panels, plumbing, the administration building, and countless other facilities were destroyed as they lingered under salt water and sewage. The water lines high on the walls of the underground boiler rooms serve as a stark reminder of our continued vulnerability. In many ways, the housing authority still has not recovered from the damage Sandy wrought.

I have attended the Rebuild by Design community meetings and sincerely believe, both as a Commissioner of the Hoboken Housing Authority, and as a southwest Hoboken resident myself, that the implementation of OMA's Rebuild by Design proposal would go far in allowing Hoboken to mitigate the damage future hurricanes and superstorms may bring to Hoboken. It addresses, as the title suggests, every step essential to getting Hoboken through such a storm: Resist, Delay, Store and Discharge. Its comprehensive approach is smart, efficient, and exactly what Hoboken needs.

Sincerely,



Dana Wefer
Hoboken Housing Authority Commissioner

City of Hoboken

94 Washington Street
Hoboken, NJ 07030

Dawn Zimmer
Mayor



Ann Holtzman, CFM
Zoning Officer &
Flood Plain Administrator

Ph. 201.420.2063
aholtzman@hobokennj.gov

March 24, 2014

To Whom It May Concern:

I wish to take this opportunity to express my enthusiastic support for the Rebuild by Design competition submission by OMA for the City of Hoboken. The OMA team has put together a comprehensive design plan that addresses not only storm surge coastal flooding like the city experienced with Hurricane Sandy, but also takes into consideration flooding from severe rain events which inundate significant portions of the city an average of 2.6 times a year.

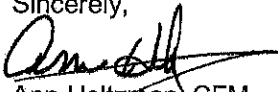
OMA's cohesive plan of "Resist, Delay, Store and Discharge" is an environmentally conscious strategy to arrest the effects of flooding without disrupting the natural hydrologic cycle. The plan builds upon the existing geographic and built environment to aid in resisting storm surge. It employs green design and building strategies to delay and store run off, reducing ponding and inundation of the city's combined sewer system. Stormwater can then be discharged, over time, as groundwater recharge or by mechanical means once filtered for contaminants.

Hoboken has already taken progressive steps to protect its residents and buildings from future effects of flooding. We adopted a Flood Damage Prevention Ordinance that calls for elevation of new structures and building requirements far more restrictive than those required by the National Flood Insurance Program. The city is also actively working on developing new zoning and building code requirements for resiliency and flood hazard mitigation. We will also be adopting progressive new stormwater regulations uniquely suited to the urban environment. These efforts alone however, will not protect the City of Hoboken.

The coastal flood controls proposed by OMA tie everything together and are critical to the future of this historic city. 80% of the City of Hoboken is in the Special Flood Hazard Area. 175 properties have been identified by the NFIP as repetitive or severe repetitive loss. However, standard solutions to flood mitigation, like raising or relocating structures cannot be done in Hoboken because of the urban context of attached row houses. Under the umbrella of the OMA plan, Hoboken retains its charm, residents and businesses are protected, property values are retained, and hazard risk and the costs associated will be significantly reduced.

Mayor Zimmer has been a champion of Rebuild by Design from the beginning. She is truly dedicated to the health and safety of residents, the growth and economic stability of local business, and the overall sustainability of the City of Hoboken. Her unwavering commitment to resiliency will assure the implementation and success of this project and its components.

Sincerely,



Ann Holtzman, CFM
Flood Plain Manager

March 21, 2014

To: The Honorable Shaun Donovan, Secretary
U.S. Department of Housing and Urban Development
451 7th Street, S.W.
Washington, DC 20410

Re: Letter of Support for City of Hoboken, 'Rebuild By Design' Funding Opportunity
Stephen D. Marks, Assistant Business Administrator

Sustainable Jersey City is a collaborative network of green community groups and individuals within Jersey City who have come together to move the city toward a more sustainable future. By focusing on community partnerships and neighborhood actions, Sustainable Jersey City has built relationships with many neighborhood, governmental and private organizations to further their reach and objectives, for both Jersey City and the Region.

Green Infrastructure solutions are a very strong focus of ours, given the US EPA Consent Decree we are operating under, and we are very pleased that our neighbor City of Hoboken has worked hard to develop comprehensive planning and strategic design solutions, which now have the opportunity to be implemented through CDBG funding for Disaster Recovery. Along with member of our advisory team, Ramapo College of NJ, we strongly support their efforts to become a model for cities seeking to become more sustainable and resilient. Certainly the City of Jersey City stands to benefit from the implementation of their 'Resist, Delay, Store, Discharge' proposal as proximate case to use similar approaches.

We are especially aligned with the following attributes of their design plans –

- The green infrastructure components of the proposal will reduce the number of combined sewer overflow (CSO) events on an annual basis which will improve overall water quality in the Hudson River as well as local streams and tributaries;
- The green infrastructure will add valuable green space to a dense urban community which will improve overall air quality, reduce the urban heat island effect and improve public health;
- The green infrastructure will also provide additional parkspace and recreational opportunities for residents which will in turn help to reduce obesity and modern diseases associated with a more sedentary lifestyle;

Jersey City shares Hoboken's historically flood-prone geography and with their OMA Proposal having high potential to reduce stormwater runoff and eliminate the hazards associated with these increased flooding events, we are a stakeholder in their success in implementing a best practices model. Working together to develop resiliency strategies that mitigate the negative impact of these occurrences is a priority interest and we strongly support!

Sincerely,

Debra A. Italiano
Founder & Chair, Sustainable Jersey City

Ashwani Vasishth
Associate Professor, Environmental Planning
Director, Master of Arts in Sustainability Studies



American Legion Post 107

308 Second Street

Hoboken, NJ 07030

Americanlegion107nj@aol.com

March 7th, 2014

To Whom it May Concern:

I am writing as Commander of the Hoboken American Legion Post 107 in support of OMA's proposed flood protection strategy for our Mile Square City as part of the Rebuild by Design competition.

Hoboken, New Jersey might be better known as the birthplace of Frank Sinatra or the home of the Cake Boss. But it also **WAS** the home of the American Legion Post 107 until it was destroyed by Hurricane Sandy.

The Post was established nearly 100 years ago, just after World War I and it has continuously served all Veterans from its opening to the present day. The memorabilia that we lost in Hurricane Sandy was PRICELESS. Still today, after nearly two years we are one of three American Legion Posts in the state that is not up and running.

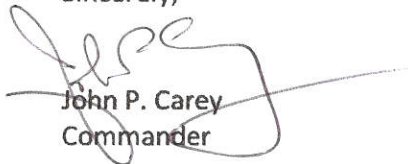
The process in raising funds for rebuilding has been difficult at best.

Call it "Global Warming or Climate Change" but CHANGE has to come before the town drowns.

The proposed strategy by OMA to protect our City from flooding and make the town safer appears to be the answer.

On behalf of all the members of our Post, I offer our strong support for this initiative.

Sincerely,



John P. Carey
Commander



March 18, 2014

Re: Rebuild By Design
Letter of Support

To whom it may concern:

On behalf of the CPH-Hoboken University Medical Center (HUMC), I am pleased to provide this letter of support for OMA's comprehensive strategy for Hoboken prepared for the Rebuild By Design competition.

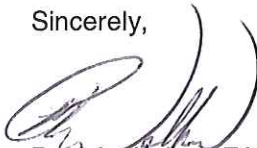
As President of HUMC, I can personally attest to the devastation and destruction that Superstorm Sandy brought through its storm surge, tidal flooding, gale force winds, and accompanying damage to electrical system. The HUMC suffered millions of dollars in damage from Superstorm Sandy, as well as Hurricane Irene.

HUMC has been diligently strategizing to harden our assets and assist our constituent communities. I applaud the City of Hoboken for creating its own resiliency plan. OMA's proposal is well thought out and is worthy of support and funding by the federal government and U.S. Department of Housing and Urban Development.

If funded, the Rebuild By Design proposal will make Hoboken more resilient, help protect the community from future flooding and storm events and help preserve and enhance HUMC operational capacity.

If you have any questions please feel free to call. Thank you for your attention to this matter.

Sincerely,



Paul A. Walker, FACHE
Chief Executive Officer

■ **Bayonne Medical Center**
29th Street at Avenue E
Bayonne, NJ 07002
T: 201.858.5000

■ **Christ Hospital**
176 Palisade Avenue
Jersey City, NJ 07306
T: 201.795.8200

■ **Hoboken University Medical Center**
308 Willow Avenue
Hoboken, NJ 07030
T: 201.418.1000



The Community Church of Hoboken

600 Garden Street
Hoboken, New Jersey 07030-3904
Telephone: 201-659-8119
Pastor: The Rev. Marvin W. Krieger

March 24, 2014

Mayor Dawn Zimmer
City of Hoboken
94 Washington Street
Hoboken, NJ 07030

Dear Mayor Zimmer,

We are writing in support of the City's plan to protect Hoboken from future storms.

Today's Community Church of Hoboken has roots here dating from 1856, when our building at the corner of 6th and Garden opened. Our congregation is home to a wide variety of people from all over the city and from areas as far away as Carlstadt and New Brunswick. Superstorm Sandy touched us all.

After the storm we were more fortunate than most to have suffered no major water damage. We did suffer wind damage and we are still in the process of making repairs. Among Hoboken buildings we got our electricity back earlier than most, and were blessed to be able to produce hot water and serve coffee, tea, snacks to our neighbors, as well as provide them the energy needed to communicate to their loved ones all over the U.S. and the world.

This is characteristic of the type of community service we like to provide as often as we can. Each year we host free concerts open to the community, workshops for local school kids on gardening and composting, receive collections for food and clothing banks, and serve as a venue for the City's annual Open Studio Tour for Artists. We are proud of this record of service and strive to do more.

If there are other ways we can help educate the public about the importance of the City's resiliency plans and the ever-present risks from storms and other hazards please let us know.

Thank you for the opportunity to work together to make Hoboken a place that is a safer and healthier place to live.

Sincerely,

Reverend Marvin W. Krieger



March 6, 2014

To whom it may concern:

Since Superstorm Sandy struck the New Jersey coast in October of 2012, the Fund for a Better Waterfront (FBW) has focused much of its attention on measures that would protect against future storms and flooding. The OMA-led team selected by HUD for the Rebuild by Design program has developed an especially credible program for the Hoboken area, including portions of Jersey City and Weehawken. It is entitled *Resist, Delay, Store, Discharge: a comprehensive strategy for Hoboken*. We are in full support of this program.

FBW has carefully reviewed this plan and believe that its implementation would serve as an invaluable prototype. This model would be be replicable for other densely populated urban, waterfront communities. Being roughly one square mile makes the Hoboken area an especially manageable laboratory to develop and test such comprehensive remedies. Hoboken's Mayor and her administration have been actively engaged in this program and clearly have the political will to carry it out. The area residents and business community, most of whom were directly impacted by Sandy, and many of whom are subjected to flash flooding that occurs each year in Hoboken, are committed to finding solutions.

After Superstorm Sandy, more than 70 percent of Hoboken was under water. Not in anyone's lifetime has the City witnessed such a powerful storm and such catastrophic flooding as occurred on October 30th, 2012. Some neighborhoods experienced 3 to 4 feet of floodwaters, isolating thousands of people from any emergency services. The local hospital had to be evacuated. Cell phone service went out. The power grid was down for nearly a week for most Hoboken residents. The Hoboken PATH train — the choice of transit for 25,000 daily commuters — was out of service for a month. The impact on people's lives, on businesses, local government and community institutions was profound.

Please feel free to contact me if I can be of any further assistance at ron@betterwaterfront.org or 201-659-8965.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Ron Hine", written over a horizontal line.

Ron Hine
Executive Director

March 24, 2014

Re: Rebuild By Design

Dear Secretary Donovan:

The Hoboken Chamber of Commerce is very supportive of the OMA team's efforts to provide solutions to prevent future flooding and wish them the best of luck in their submission to HUD. As the final submission package to HUD was not ready to be shared at the time of our open house viewing, we are interested to obtain a copy of it when it is available to be shared. We understand this to be the first round of funding which, if obtained, will fund the conceptual design phase.

Our membership reflects the rich diversity of businesses who reside in Hoboken. These include but are not limited to retail, professional services, education, hospitality, transportation and real estate leasing, sales and development. Our core goals include representing our members in the promotion of our business environment and policies that foster a healthy, diverse and ever-growing business community.

The Chamber was pleased to hear during the OMA presentation that one of the major selection criteria being considered by HUD is the future economic growth potential as well as the existing economic importance of the target areas. As a definitive mitigation plan has yet to be fully defined, we assume that in supporting the creation of a comprehensive plan that the City of Hoboken is, and will continue to be, committed to working collaboratively with the Chamber and its individual members to promote the continued economic growth of The Chamber has established two committees in particular that focus on sustainability and growth, the Economic Development Council and the Urban Sustainability Council. One of the goals of both committees is to directly interface with the City, on behalf of the Chamber membership, on issues related to their focus areas. In supporting the OMA team's efforts, the Chamber makes the assumption that the City and OMA will be sensitive to incorporate the location of existing businesses as well as any known future business and pending development plans into their storm mitigation planning process.

In the polling of our membership subsequent to the OMA meeting, we received the following comments:

1. We support The City in its efforts to help protect The City from future flooding and surge events.
2. The program "Resist, Delay, Store, Discharge" is in its early stages, therefore, it is difficult to comment on any specifics or the technical aspects of it. It seems like an integrated approach using a multitude of practical, cost effective solutions.
3. Property owners and developers can be part of the solution by integrating elements of flood mitigation strategies into future development plans.
4. What financial obligations will the business owners and/or property owners have if this plan wins to be?
5. The chamber committees and the chamber members are ready with ideas and information to tweak the action plans to work at the local level.
6. The program entitled "Resist, Delay, Store, Discharge" is a smart, integrated approach using a multitude of practical, cost effective solutions to a complicated and far reaching problem posed by rising sea levels and the economic burden it will place on Hoboken as evidenced during recent storm events.

The Hoboken Chamber of Commerce lends its support to OMA's "Resist, Delay, Store, Discharge" concept master plan and hopes The City will receive the necessary funding to safeguard its residents, businesses and infrastructure from the challenges posed by a changing climate and continue Hoboken's history of more than 200 years as a place to live, work and play.

Thank you again and we look forward to our continued participation in the process.

Sincerely,

Gregory Dell'Aquila President

Gregory Dell'Aquila
President, Hoboken Chamber of Commerce

Community Emergency Response Team City of Hoboken



March 10, 2014

To Whom It May Concern:

I am writing as the Operations and Training officer with the Hoboken OEM and the CERT Coordinator of the City Of Hoboken's Community Emergency Response Team (CERT) in support of OMA's proposed flood protection strategy for the City of Hoboken as part of the Rebuild by Design competition.

CERT has been the primary volunteer emergency response organization that supports the Hoboken OEM, Fire, Police and EMS since 2010. CERT is also the lead coordinating body to recruit, educate and train volunteers within our community.

We have been instrumental in responding to many incidents natural as well as man-made; this includes the multiple hurricanes that struck our community, as well as countless fires, snow storms, floods and water main breaks.

During Superstorm Sandy, I was the CERT Incident Commander. The Hoboken CERT team was responsible for (i) identifying and training key volunteer leaders to help manage the influx of 5,000 volunteers; (ii) identifying and recruiting doctors, pharmacists and nurse practitioners; (iii) opening Hoboken High School to accept and distribute more than 23,000 Meals Ready to Eat, and tens of thousands of donations from around the country; (iv) managing and supplying six Points of Distribution throughout the City; and (v) manning the Emergency Operations Center throughout the entire 14-day tour.

The Hoboken Community Emergency Response Team has grown to over 100 members since Superstorm Sandy and we are making great strides to improve our response. This initiative will further protect the community by helping our response times, and saving lives. Specifically, this initiative will give us the tools to properly avoid, respond and recover from a massive disaster of which we suffered great loss.

In our after-action review, one of the key objectives we found was to find a way to keep the City of Hoboken from future flooding. The proposed strategy would protect all of Hoboken from flooding and make the community safer. We offer our strong support for this initiative.

Very truly yours,

A handwritten signature in black ink that reads "Lou Casciano". The signature is written in a cursive, flowing style.

Lou Casciano
Operations and Training Officer/CERT Coordinator
City of Hoboken Office of Emergency Management

Hoboken Cove Community Boathouse



March 23, 2014

Mayor Dawn Zimmer
City of Hoboken
94 Washington Street
Hoboken, NJ 07030

Dear Mayor Zimmer,

We are writing in support of the City of Hoboken/ Office of Modern Architecture plan to make Hoboken more resilient and protected from future storms.

Hoboken Cove Community Boathouse, Inc is a 501(c)(3) non-profit volunteer organization dedicated to creating free public access to the Hudson River. Over the last eight years we have enabled more than 5,500 people to go kayaking on the Hudson River at Frank Sinatra Park, Maxwell Place Park and on numerous trips up and down the river – all free of charge.

Our current site was inches from being flooded during Sandy. Our future site was not so fortunate. Looking ahead, we are optimistic that the \$237,000 in grants we have secured for this new building will be better spent knowing the City has a thoughtful plan in place to help protect the city. Hopefully these monies, from Hudson County and the State of New Jersey, can help to leverage others from HUD and other agencies to help advance the plans for protecting Hoboken and adjoining areas of Weehawken and Jersey City.

Thank you for the opportunity to work together to make Hoboken a place that is more fun and more safe. Please do not hesitate to reach out if we can be of any further assistance.

Sincerely,

The Hoboken Cove Community Boathouse Board:

Malky Adelman
Eileen McCarran

Carter Craft
Jon Miller

Dylan Mader
John Trinkwalder

Hoboken Cove Community Boathouse Inc. c/o 1115 Willow Ave, Apt 302
Hoboken NJ 07030 www.hobokencoveboathouse.org



Hoboken Family Alliance | PO Box 1194 | Hoboken NJ 07030

20 March 2014

To Whom It May Concern:

Super Storm Sandy affected almost all of Hoboken's 50,000 residents in some way. Many schools were closed for several days, homes were flooded and pedestrian safety was at risk due to blackouts on most city streets and debris strewn everywhere. Since then there have been several initiatives to try and prevent this amount of damage occurring in the future. The Hoboken Family Alliance supports the City of Hoboken's partnership with OMA to develop a strategy to protect Hoboken from future flooding. The "Resist, Delay, Store, Discharge" program is a comprehensive strategy that addresses the many challenges that come with living in a low-lying area.

The Hoboken Family Alliance is a non-profit, volunteer-driven organization dedicated to Hoboken 10,000+ families. The organization focuses on educational and parenting issues, philanthropy, open and public space concerns, children's resources and events.

This plan would provide the City a way to mitigate future threats while also improving overall quality of life for families and all residents of Hoboken. We wholeheartedly support this endeavor.

Sincerely,

Francoise Vielot
Community Affairs Director, HFA

HOBOKEN HISTORICAL MUSEUM

March 6, 2014

To Whom it May Concern:

The Hoboken Historical Museum was recently honored with a visit from the engineers from OMA, who came to see our current exhibit, *Hoboken: One Year After Sandy, Lessons Learned about Preparedness, Resiliency, and Community*. I was impressed with their knowledge and understanding of the difficulties Hoboken has faced from over 100 years of flooding.

What is impressive about OMA's very comprehensive plan is how minimally invasive and environmentally sensitive it is. Rather than a barrier-type solution, or demanding that all buildings be raised, this plan appears to not only protect our city for generations to come, but provides more green space, and more open space. In addition, OMA's responsiveness to community input, as well as their willingness to work with major stakeholders such as New Jersey Transit and the North Hudson Sewerage Authority, make them a considerate partner in this extremely important project.

Hoboken's flooding issues are long-standing and we applaud Mayor Zimmer for taking the lead and persevering on finding real solutions to a problem that will get worse if not dealt with in a systematic way. The Mayor understands that Hoboken is a unique, 19th century-built environment which many proposals do not respect and would not be realistic in implementing. For OMA's plan to succeed, it will take a strong commitment that our Mayor has shown, and the endorsement of community groups such as the Hoboken Historical Museum. We certainly support this plan.

Thanks for giving us the opportunity to write on this issue.

Sincerely,



Robert Foster
Executive Director

HOBOKEN HISTORICAL MUSEUM

March 13, 2014

To Whom It May Concern:

Two nights ago, I visited the OMA/Rebuild by Design display to see the conceptual underpinnings of Hoboken's plans to make the city more resilient to future mega-storms and flooding. By reading the material and speaking with the experts, I learned a lot both as a citizen and as an educator. I am very excited about the city's efforts, spearheaded by Mayor Zimmer, to gain funding and to deal with the complex, related issues.

As Education Curator at the Hoboken Historical Museum, I was especially happy to hear from Mayor Zimmer that educating the public about the need for this work, about the progress the city is making, and about the staff's desire for input from the community is an important priority for the team. At the museum, I have created nine new education programs on Sandy-related themes, such as preparedness, resiliency, community, and policy, for students in Grades K to 12. Mayor Zimmer said that she welcomes collaboration between the city and the museum. I am hopeful that we can work together to create new programs and to transform our exhibit-related educational programs into ongoing ones and take them into the schools.

Since the museum has a long-standing commitment to storm resiliency, I look forward to accomplishing our mutual goals of promoting the public's better understanding of, and participation in, the long-term process of making our community safer.

Sincerely,

Razel Solow

Razel Solow, Ph.D.
Education Curator

1301 Hudson Street | Hoboken, NJ 07030
www.hobokenmuseum.org | 201.656.2240

CITY OF HOBOKEN

HOBOKEN HISTORIC PRESERVATION COMMISSION

DAWN M. ZIMMER
Mayor



Nancy Cricco, Chairperson
Dennis English, Vice Chairman
Joan Abel, Commissioner
Elaine Gold, Commissioner
Susan Pregibon, Commissioner
Ana Sanchez, Commissioner
Paul Somerville, Commissioner
Andrea Rizvi, Commissioner

6 March 2014

To Whom It May Concern:

As mandated by the state of New Jersey and the City of Hoboken, the members of the Hoboken Historic Preservation Commission are charged with preserving the historic fabric of the City of Hoboken. We are grateful for the pro-active approach Mayor Dawn Zimmer's administration is undertaking to ensure that the best procedures and designs for protecting our City from events such as "Super-storm Sandy" are implemented. OMA's cohesive strategy itself, if put into effect, will become an act of preservation for the entirety of our City.

Because the Hudson River near Hoboken and New York Harbor is an estuary, it is tidal as far north as West Point and beyond. In the "perfect storm" alignment of conditions that were present during Sandy, our greatest asset, the Hudson River, became our greatest threat. Therefore, we appreciate OMA's strategy which includes the utilization of not only naturally occurring geographical features such as Weehawken Cove to our north, but also the built environment such as Pier A Park to our south.

Where preservation efforts and the work of OMA intersect, the Hoboken Historic Preservation Commission remains supportive, committed and eager to engage with OMA and Mayor Zimmer's administration. In time, the initiatives laid out in OMA's "Resist, Delay, Store, Discharge: a Comprehensive Strategy for Hoboken", will be considered a historic chapter in our City's rich history.

Sincerely,

Nancy Cricco, Chairman



Hoboken Little League Baseball

Monday, March 24, 2014

Re: Rebuild By Design competition

Letter of support

To whom it may concern,

On behalf of the Hoboken Little League I am pleased to write this letter of support for the Rebuild By Design completion proposal for the City of Hoboken.

As a lifelong Hoboken resident, I can offer firsthand testimony of the severe and repetitive flooding which has historically affected our city. However, it seems that the frequency and intensity of storms is becoming greater and more devastating. In 2011, Hurricane Irene flooded the western and southwest parts of town. In 2012, Hurricane Sandy flooded more than three-quarters of the city which knocked out power to the entire community and displaced thousands of residents, businesses and other organizations, including schools, the Boys and Girls Club and the American Legion hall.

I recently met members of the Office for Metropolitan Architecture team and watched their presentation to make Hoboken more resilient and resistant to flooding. The OMA proposal seems like a common sense solution to reduce flooding in our community. If implemented, the OMA plan would create additional parks and open spaces to absorb rainwater during storms. Hoboken has very little parkspace and these parks and open spaces could also be used for recreation, playgrounds and ball fields during fair weather.

I fully support the Office for Metropolitan Architecture proposal for the Rebuild By Design competition and hope that it gets funded.

Sincerely,

A handwritten signature in black ink, appearing to read 'James Farina'.

James Farina

President of Hoboken Little League

cc: Mayor Dawn Zimmer



Quality of Life Coalition
Hoboken, NJ
www.QLChoboken.org

March 6, 2014

To Whom It May Concern:

Hoboken is one of the most densely populated municipalities in New Jersey, the most densely populated state in the nation. Seventy percent of residents live within flood prone sections of the city's 1.3 square miles. Since Hurricane Sandy the city has searched for ways to reduce the severity of the pervasive flooding by seeking the expertise of experts in flood control.

The firm OMA has been brought on board to help prepare an integrated flood management program. The result is an approach that assembles a variety of approaches that include coastline installations to ways that will detain and even retain the waters as they rise. This multi-faceted approach is essential in meeting the challenge in an area where the needs of one section differs from other parts of the city. OMA calls the program "Resist, Delay, Store, Discharge" and it lives up to its title.

In addition there is another program which complements OMA. It is Together North Jersey's Green Infrastructure Strategic Plan. This effort adds recommendations for pervious materials to replace traditional impervious surfaces, such as roads and sidewalks and the installation of public space rain gardens among other ideas. It also includes simple cost effective strategies such as revisions to the current zoning ordinance and incentives and requirements for private property development. Even the sewerage authority is playing a role by seeking funds that will enable installation of a pump at 11th Street. When combined, Hoboken can be a city that knows how to live well with water.

All of these efforts that come together also do something else as well. They give the city an opportunity to show FEMA that Hoboken is doing everything we can to reduce flooding which in turn, can lead to a reduction in the ever-rising flood insurance rates.

To use an old Hoboken phrase, "what's not to like?" From the Quality of Life Coalition's perspective it is almost obligatory that our group energetically support these efforts. They will affect each of our 50,000 plus residents and provide an example of how to live in a congested urban area as we survive the waters, and enjoy life in a flourishing city.

Sincerely,

Helen Manogue
Coordinator

Melissa Abernathy, Asst. Coordinator/Secretary Eduardo Gonzalez, Treasurer
Tom Chartier P.E.; Ines Garcia Keim

Hoboken Volunteer Ambulance Corps

Member; Third District-NEW JERSEY STATE FIRST AID COUNCIL, INC.

P.O. BOX M-1368
707 CLINTON STREET
HOBOKEN, NEW JERSEY 07030
201-420-2135

March 5, 2014

To Whom It May Concern:

I am writing as President of the Hoboken Volunteer Ambulance Corps in support of OMA's proposed flood protection strategy for the City of Hoboken as part of the Rebuild by Design competition.

The Hoboken Volunteer Ambulance Corps has been the Emergency Medical Services provider for the City of Hoboken since 1971. Our organization has responded to over 250,000 calls for assistance in that time. We are the last all volunteer ambulance service in Hudson County NJ.

We have been part of many disasters, both natural and manmade; this includes the tragic events of September 11, 2001, as well as countless fires, train incidents, hazardous materials events, and many mass casualty situations.

During Superstorm Sandy I was the EMS Incident Commander. We not only assisted those who needed help, but we were victims of the storm and needed assistance ourselves.

We lost two (2) Ambulances, a Supervisors vehicle, a Mass Casualty Response Truck, and our Communications Unit to the massive flooding in the City of Hoboken. Besides that we had tens of thousands of dollars' worth of damage in our headquarters building, which we were forced to evacuate due to the flooding.

Superstorm Sandy's surge brought over five (5) feet of water into our headquarters. Also some areas of Hoboken had water over ten (10) feet deep making access to patients and to those needing assistance close to impossible at some points.

We responded during the storm and for two (2) weeks after from a makeshift headquarters, and with the assistance of ambulances from the Pennsylvania EMS Task Force answered over 800 requests for help.

In our after action review one of the key objectives we found was to find a way to keep the City of Hoboken from future flooding. The proposed strategy would protect all of Hoboken from flooding and make the community safer. We offer our strong support for this initiative.

Sincerely,



Thomas F. Molta, President
Hoboken Volunteer Ambulance Corps.



The Hudson Tea Buildings
Condominium Association, Inc.
Management Office
1500 Hudson Street
Hoboken, NJ 07030
P 201.795.1935
F 201.795.3780

Mr. Shaun Donovan
HUD Secretary
Washington, D.C.

March 21, 2014

RE: Rebuild By Design

Dear Secretary Donovan,

Positioned on the banks of the Hudson River in the northeast corner of the City of Hoboken, New Jersey, the Hudson Tea Buildings Condominium Association, Inc. is one of Hoboken's largest residential condominium associations. Our two historic 100 year-old buildings, formerly the headquarters for the Lipton Tea Company, now provide housing for over thousand residents, all of whom were affected by the floodwaters of Hurricane Sandy. As such, we thought it was essential to relay our support for Hoboken's important Rebuild by Design entry being championed by Mayor Dawn Zimmer's administration and the team from OMA.

When Hurricane Sandy utilized our property as a gateway to flood northern and western Hoboken, we experienced firsthand the power of Mother Nature, the safety concerns and stresses of our families and first responders, the fears over potential losses to our personal housing investments and the shortfalls and vulnerabilities of our city's existing infrastructure. We also lived the time consuming and costly repairs and cleanup, the resulting FEMA/NFIP flood insurance claims and of course witnessed the test of our collective resolves.

The multi-faceted OMA proposal incorporates strategic ideas to help protect not only our citizens, our homes and businesses, but also one of the major metropolitan transportation hubs in the New Jersey/New York area. Hoboken's NJ Transit Train and Port Authority Trans-Hudson (PATH) stations are a vital transportation artery delivering employees to their workplaces throughout Manhattan, Hoboken, Jersey City, Newark and the suburbs. These stations and commuter routes deliver the lifeblood of the economic engines that drive our regional success. So protecting them is paramount.

We are certain your application review team will conduct a comprehensive examination of all of the important plans being submitted. When your work is completed we hope that you will find as we have, that Hoboken's proposal warrants significant capital consideration. The Hoboken leadership has never wavered in the face of challenging floodwaters and we know that if so entrusted, they will utilize the important funding to strengthen Hoboken, which in turn will also help reduce the challenging demands our region currently places on FEMA's National Flood Insurance Program.

Very sincerely,

A handwritten signature in cursive script that reads "Mike Henderson".

Mike Henderson, Property Manager

On behalf of the Board of Directors of the Hudson Tea Buildings

March 10, 2014

To Whom It May Concern:

I am writing to express my strong support for the Rebuild By Design proposal for Hoboken, New Jersey developed in partnership with OMA.

In the aftermath of Superstorm Sandy, Hoboken experienced extensive flooding. The resulting power loss also severely disrupted telecommunications, including cable, fiber optic and cellular networks. The result - the communications serving Hoboken's historic 19th century architecture was effectively returned to 19th-century capability.

As we recovered from the storm, a group of local technologists organized to ensure this never happens again. MileMesh is a community-based effort that seeks to build a resilient wireless telecommunications infrastructure for residents, businesses and government in Hoboken using inexpensive Wi-Fi hardware and free open source networking software.

While we are confident our efforts will eventually provide a backup crisis communications capability for Hoboken, even in the best of circumstances we are many years from achieving our goal and may never be able to serve all who will need bandwidth in the event of another extended crisis and telecommunications outage.

That's why we would prefer to not have to build our wireless network at all. The City of Hoboken and OMA's proposal, if funded by the federal government, would virtually eliminate flooding in our extremely vulnerable community of 50,000 residents, and provide a model for protecting coastal urban areas throughout the country from the impacts of climate change, severe weather and sea level rise.

I do hope that the selection committee will see the sense in making substantial investments in basic anti-flooding infrastructure, so that we don't have to deploy our digital Band-Aids instead.

Sincerely,



Dr. Anthony Townsend
Senior Research Scientist, Rudin Center for Transportation Policy, New York University
co-founder, MileMesh

MILE SQUARE THEATRE

Chris O'Connor
Artistic Director

Matthew Lawler
Associate Artistic Director

Laura Cornish
Company Manager

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Principal, Castle Point Publishing

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CFO, Bijou Properties

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Co-Founder of Project Play

David Tornabene
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Bijou Properties

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Playwright

Geri Fallo
Hoboken Cultural Affairs

Marc Masterson
South Coast Repertory

Paula Ohaus
Former Director of Theater Arts,
Hoboken High School

Frank Raia
Commissioner, North Hudson
Sewage Authority

Amy Saltz
Rutgers University

March 7, 2014

To Whom It May Concern,

I write this letter in support of Mayor Dawn Zimmer and the City of Hoboken's partnership with the firm OMA to develop a strategy to protect Hoboken from future flooding. The team's design "Resist, Delay, Store, Discharge: a Comprehensive Strategy for Hoboken" is a plan that approaches the solution to Hoboken's storm surge problem in a multi-faceted way that also creates much needed open space.

Mile Square Theatre's goal is to enhance and improve the quality of life through the performing arts. We live in a world-class city that deserves world-class art. OMA's plan addresses a critical problem in a world-class manner, in partnership with top-notch organizations and institutions. The plan not only remediates a dire threat, but improves our quality of life.

I believe this plan mobilizes the best and brightest and I'm excited by the City of Hoboken's partnership in it.

Sincerely,



Chris O'Connor
Artistic Director

urban arts

at Monroe



come



create



enjoy



March 11, 2014

Mayor Dawn Zimmer
Hoboken City Hall
94 Washington Street
Hoboken, NJ 07030

Dear Mayor Zimmer,

As business owners in Hoboken, we at Urban Arts support the Rebuild by Design initiative of the Hurricane Sandy Rebuilding task force. We believe our city's infrastructure can greatly benefit by a team of professionals developing innovative ideas to help make it safe from future storms.

Our business, as so many others, was greatly affected by Hurricane Sandy. The entire first floor of our building was flooded with over four feet of water. The cleanup of mold and debris was extensive. As a result we were unable to teach classes for more than two weeks after the storm, causing financial repercussions. The devastation in our location and throughout the town was extreme.

The storm impacted the community not only physically but emotionally and psychologically as well. Our students were greatly affected by the aftermath. Many of them were not only displaced from their homes but from their schools as well. As teachers we witnessed the negative affect this had on the children. We feel it is commendable that our local government is being proactive in seeking ways to insure this does not happen again.

We fully support any partnership between Hoboken and OMA.

With our sincere regards,

Justine Uva

Patricia Morale



JOSEPH R. ROMANO
PRINCIPAL

March 24, 2014

Honorable Dawn Zimmer
Mayor
City of Hoboken
City Hall
Hoboken, NJ 07030-4585

RE: Hoboken Flood Protection
Rebuild by Design

Dear Mayor Zimmer:

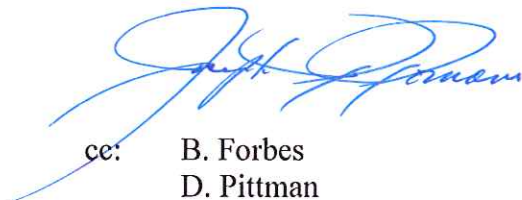
My partner, Jason Bogart, and I would both like to express our appreciation for your inviting us to the recent presentation by OMA on their proposals for the Rebuild by Design competition.

We thought the presentation was thoughtful and comprehensive in its understanding of the issues and its approach to a realistic phased solution. This is a critical issue that faces all of New Jersey but is particularly relevant to Hoboken in light of not only the recent events experienced with Hurricane Sandy but with regard to long standing flood issues that affect all of Hoboken's citizens.

Accordia is a newcomer to Hoboken but we are keenly aware of the need deal with these issues.

OMA's proposals represent a well thought out and necessary first step in solving this problem. We applaud and support the City's initiatives and look forward to working with the city on this going forward.

Very truly yours,



cc: B. Forbes
D. Pittman

March 23, 2014

Dear Secretary Donovan;

Our apartment building flooded in the basement and we lost power for 6 days. I (Jamie) was also unable to get to work and lost income. We support the OMA plan. It covers the bases well and will help Hoboken avoid a big disastrous flood like the one from Hurricane Sandy.

Thanks for your consideration.

Sincerely,
Jamie Baker and Brandon Miller
841 Willow Avenue #2L
Hoboken, NJ 07030

CC: Brandon Miller

March 18, 2014

To Whom It May Concern:

I, along with many members of the Hoboken business community, recently had the pleasure of attending a presentation by Mayor Dawn Zimmer and the firm OMA on their proposal to implement a comprehensive flood prevention and management program. The program, entitled “Resist, Delay, Store, Discharge” is a smart, integrated approach using a multitude of practical, cost effective solutions to a complicated and far reaching problem posed by rising sea levels and the economic burden it will place on Hoboken and our neighboring communities, as well as the state of New Jersey and the federal government, as evidenced during the recent events of “Hurricane Sandy”.

In the short time since Hurricane Sandy, the City of Hoboken has suffered four (4) flash floods, affecting the approximately 70% of Hoboken located within a designated flood zone. Hoboken is the 4th most densely populated municipality in the most densely populated state. Our city is located directly across the Hudson River from New York City, and is a crucial transportation hub, incorporating subway, heavy rail, light rail, bus and ferry transportation into the regional mass transportation network connecting the contiguous United States with New York City and Newark International Airport. The storm surge caused during Hurricane Sandy flooded the subway tunnels and effectively shut down mass transportation for months. In addition to costing tens of billions of dollars in assessed damage, this impact was fatal for many business in Hoboken and the adjacent communities.

The “Resist, Delay, Store, Discharge” plan provides measures to avoid future catastrophes and to drastically lessen the damage when the next storm surge arrives. The OMA plan accomplishes this using Hoboken’s natural topography and a series of existing and new man-made barriers to **Resist** and **Delay**; the implementation of pervious materials to replace traditional impervious surfaces, such as roads & sidewalks, and public space rain gardens & detention features to **Store**; and a series of pumping stations to **Discharge**. The plan also creates a partnership with private property owners and developers by revising the current zoning ordinance to include both mandatory prescriptive measures and various incentives.

As a Hoboken resident and owner of two small businesses in Hoboken, I support OMA’s “Resist, Delay, Store, Discharge” plan and hope the city will receive the necessary funding to safeguard it’s residents, businesses and infrastructure from the challenges posed by a changing climate and continue Hoboken’s rich history of spanning more than 200 years as a place to live, work and play.

Sincerely,



Thomas Chartier
Hoboken resident and local business owner

Appendix 3 – Hoboken Resiliency Measures

CITY OF HOBOKEN

Office of the Business Administrator



DAWN ZIMMER
Mayor

QUENTIN WIEST
Business Administrator

STEPHEN D. MARKS, PP, AICP
Assistant Business Administrator

MEMORANDUM

TO: HON. DAWN ZIMMER, MAYOR
FROM: STEPHEN MARKS, ASSISTANT BUSINESS ADMINISTRATOR
DATE: MARCH 21, 2014
RE: MUNICIPAL RESILIENCY MEASURES

Please accept this memo documenting all of the activities your administration has engaged in to make the City of Hoboken more resilient to flooding and natural disasters. The measures generally fall into two broad categories: structural and non-structural. The structural items are those “brick and mortar” projects which can be constructed. The non-structural items are those policies and programs which need to be implemented and administered.

I. NON-STRUCTURAL

- A. It should be stated upfront, that you have been an active and vocal voice on disaster recovery and preparedness having testified before the U.S. Senate on December 13, 2012. You were appointed by HUD Secretary Shaun Donovan to the Hurricane Sandy Rebuilding Task Force. The Findings and Recommendations of the Task Force were published on August 19, 2013 and have helped guide the nation’s recovery efforts. On November 1, 2013 you were appointed by President Obama to the Climate Preparedness and Resilience Task Force. The Task Force’s recommendations to improve national preparedness and align federal policy and regulations to promote resiliency will be completed in the summer of 2014. The city has been working with the U.S. Army Corps of Engineers on its \$20 million North Atlantic Coast Comprehensive Study to protect the eastern seaboard from future disaster events. Finally, the city has actively engaged and petitioned numerous agencies and stakeholders to work on resiliency efforts, including the Governor’s Office of Recovery and Rebuilding, the Port Authority of New York and New Jersey and New Jersey Transit to name a few.
- B. The City of Hoboken was the first municipality in the State of New Jersey to submit and receive approval of its “Strategic Recovery Planning Report” which outlined the city’s 9 point resiliency plan. Approval of the report entitled the city to receive Community Development Block Grant funds for Disaster Recovery (CDBG/DR). The city received a \$200,000.00 federal CDBG/DR program grant for Post Sandy Planning Assistance which is administered by the New Jersey Department of Community Affairs (NJDCA). The city hired Princeton Hydro, Inc. of Ringoes, NJ through a competitive RFP process. There are five separate components of the plan including: preparation of a municipal Hazard Mitigation Plan; preparation of resilient Design Standards to reconcile federal, state and local

- regulations and guidelines for builders and real estate developers into one document; preparation of a municipal Stormwater Management plan which will look at the city holistically to reduce flooding; preparation of a 5 year Capital Improvement Plan to make municipal buildings and facilities more resilient; and preparation of a municipal Open Space, Recreation and Historic Preservation Plan to turn the city's parks and playgrounds into green infrastructure to reduce stormwater run-off and flooding in surrounding neighborhoods. The consultants will complete their work by January 31, 2015.
- C. On December 18, 2013 the city council approved ordinance Z-263 which amended chapter 104 of the city's code for Flood Damage Prevention to reflect updates recommended by the New Jersey Department of Environmental Protection's latest revised model ordinance. The city already participates in the National Flood Insurance Program (NFIP). The city has submitted an application to the Federal Emergency Management Administration to participate in the Community Rating System (CRS) program. Communities participating in the CRS program may lower their residents' flood insurance premiums by as much as forty five percent.
 - D. The city has partnered with and supported the Hoboken Community Emergency Response Team (CERT). The CERT program is an all-volunteer organization of community members educated about disaster preparedness for hazards that may impact their area. The Hoboken team is trained in basic disaster response and has been active for three years. The team has opened and operated emergency shelters, both cooling and heating centers and has participated in civic events. The CERT team volunteered during Hurricane Irene and played a major role during Hurricane Sandy running a pharmacy program, facilitating food and water deliveries to thousands of seniors and disabled residents who were unable to get out of their homes, oversaw and ran the various food distribution locations throughout the city, staffed and ran three shelters, and staffed the operation of the 24/7 Emergency Operations Center in City Hall. During the hurricane season of 2013, the CERT team conducted "Hoboken Ready" public information campaign with community meetings to inform the general public about safety and promote the purchase of emergency supplies and "Go Bags".
 - E. Finally, Hurricane Sandy had a huge impact on Hoboken's transportation system, disrupting and dislocating all modes of transport. It was estimated that nearly 2,000 automobiles in Hoboken alone were damaged or destroyed. The Port Authority sustained over \$1 billion in damages and its PATH system was flooded and took several months to fully repair. NJ Transit's Hoboken terminal and rail yard were flooded and the agency sustained over \$125 million in damages, mostly to its heavy rail fleet and lines. According to the 2010 decennial census more than thirty four percent of Hoboken's households do not own an automobile. Therefore, it is necessary and incumbent to help create a more resilient and sustainable transportation system. Given the dearth of federal, state and local government funding, this resilient transportation system must be efficient, economical and cost effective. With this in mind, the City of Hoboken partnered with the City of Jersey City and Township of Weehawken to create a regional bicycle sharing system. On February 19, 2014 the city council authorized a contract with Bike and Roll for a system that will feature 800 bicycles, 25 stations and 2 full service pavilions. The bike share program will be privately funded and will not cost the cities any money.

II. STRUCTURAL

- A. The municipal government of the City of Hoboken sustained major damage (\$8,349,533.53) to city owned assets and facilities during Hurricane Sandy. The city has been working with

the Federal Emergency Management Agency (FEMA) to recover federal reimbursement costs for eligible expense (\$3,965,359.13). In addition, the city has applied for additional federal funding (\$465,260.00) to floodproof damaged municipal facilities.

- B. On August 7, 2013 the city council approved a \$75,400 professional service contract with EI Associates of Cedar Knolls, NJ to plan and design the installation of emergency back-up generators at municipal facilities. On September 3, 2013, the city council approved an ordinance (Z-248) authorizing the acquisition of emergency back-up electrical generators and a high-water vehicle and appropriated \$965,000 for the same. Since that time, the city's consulting electrical engineers have drafted a preliminary design plan, appeared before the municipal planning board and historic preservation commission and are now finalizing the plans, specifications and estimates for installation and construction to be bid in the near future.
- C. The city submitted seven Hazard Mitigation Grant Program (HMGP) Letters of Intent (LOI) to the New Jersey Office of Emergency Management for a variety of projects and programs totaling over one hundred million dollars. To date, the city received one HMGP grant from the State of New Jersey totaling \$142,080. This funding will be applied toward the purchase and installation of an emergency back-up generator at the Fire HQ. In addition, the city received a portion of Hudson County's HMGP grant totaling \$132,853.69 which will be applied toward the purchase and installation of an emergency back-up generator at the Police HQ.
- D. On June 13, 2013 the city executed a five party Memorandum of Understanding (MOU) with the U.S. Department of Energy, Sandia National Laboratory, the N.J. Board of Public Utilities and Public Service Electric and Gas company (PSE&G) to agree to work together on the design of a "Micro-grid". A Micro-grid is an emergency back-up energy system which delivers electricity to facilities during black-outs, brown-outs and disaster events. The power engineers from Sandia examined the utility infrastructure in Hoboken and measured the power needs of over 50 critical community facilities, including the Police HQ, Fire HQ, Fire Stations, the Ambulance Corps, the Hoboken University Medical Center (HUMC), the North Hudson Sewerage Authority's (NHSA) sewerage treatment plant, the Hoboken shelter, local public schools, the Hoboken Housing Authority, senior buildings, grocery stores, pharmacies and gasoline stations. Sandia National Laboratory recently completed their study and concept plan which will be the basis of an application for funding to the U.S. Department of Energy. The value of the engineering analysis and preliminary design plan by Sandia National Laboratory was approximately \$500,000.
- E. RESIST
It was reported by emergency personnel and eye witnesses that Hurricane Sandy's storm surge from the Hudson River breached Hoboken's shoreline at two locations: the Hoboken Cove to the north and the Long Slip Canal in NJ Transit's rail yard to the south. Subject matter experts have estimated that approximately 500 million gallons of brackish water from the Hudson River entered the city from these two locations and met in the middle of the city. The City of Hoboken has collaborated with NJ Transit on an application for federal FTA funding to floodproof the Hoboken terminal and rail yard to prevent future flooding. To the north, the city owns the upland property immediately along Hoboken Cove and had prepared concept plans for the future park, having been awarded \$1,000,000 by the New Jersey Green Acres program. However, after Hurricane Sandy the city is re-thinking its approach and will be redesigning the park area to consider incorporating: armored levees, bulkhead, riprap revetment, or seawalls to prevent future storm surges from entering the city.

F. DELAY/STORE

The city received a technical assistance grant worth \$90,000 from “Together North Jersey”, a federally funded consortium of public, non-profit and academic agencies working to make communities in northern New Jersey more sustainable. The consultant team from EE&K and the Louis Berger Group, Inc. worked with municipal officials and representatives from the North Hudson Sewerage Authority to examine Hoboken’s topography, hydrology and sewer system to identify effective strategies to reduce flooding and stormwater run-off. The report entitled “Hoboken Green Infrastructure Strategic Plan” recommends a combination of green roofs, subsurface storage, stormwater infiltration planters, rain gardens, detention ponds, rainwater harvesting and reuse, vegetated swales, tree pits, permeable pavement and constructed wetlands. The strategic plan was presented to the Hoboken city council on March 2, 2014.

G. DELAY/STORE

The city received a \$20,000 grant from Sustainable Jersey to design and construct a rain garden to capture stormwater run-off. Municipal officials have been working with engineers and landscape architects from Rutgers University to find a suitable location. Because of the topography and hydrology of the site, the team selected the intersection of Fourth Street and Garden Street. Since Garden Street is a county road, the city needed the approval of the County Engineer and Freeholder Board. After the county’s respective approval, the city has been finalizing plans, specifications and estimates to bid out for construction. When completed, the rain garden will not only capture stormwater run-off and reduce flooding, it will be used as a prototype and example for other property owners and interested parties around to the city to model and emulate.

H. DELAY/STORE

In 2012, the city began working with the Rutgers University Center for Urban Environmental Sustainability and School of Biological and Environmental Science to examine the city hall block. Landscape architects and engineers from Rutgers conducted a community charette in October 2012 to apply green infrastructure to city hall to reduce stormwater run-off and downstream flooding. The conceptual design plans were presented to the Historic Preservation Commission and the administration received city council approval to apply for funding to make said improvements. Finally, the plans were submitted to the N.J. Environmental Infrastructure Trust Fund with the H5 Wet Weather Pump Station for a low interest loan. The plans include vegetated bioswales, a cistern, community gardens, porous pavers and shade tree pits. The project will prevent 47% of city hall’s stormwater run-off from entering the combined sewer system and collect an average of 13,122 gallons of rainfall per month. The project is estimated to cost approximately \$250,000.

I. STORE

On September 3, 2013 the city council approved a professional service contract for \$115,400 with Starr Whitehouse Landscape Architects, New York, NY to prepare the preliminary concept plans for the new park planned for Block 12 in the southwest corner of the city. On September 4, 2013 the city filed a declaration of taking with the Superior Court of the State of New Jersey to acquire Block 12, lots 1-7 and 11-15. The city deposited \$2,937,000 with the court and the deed was recorded by the Hudson County Register on October 8, 2013. Since that time, the city’s landscape architects have been preparing a preliminary design and concept plan for Block 12 which will reduce stormwater run-off and flooding in the vicinity of the park. The one acre parking lot which has nearly 100% impervious coverage currently contributes to localized flooding. However, as currently designed, the site will soon replace

impervious blacktop with raingardens, treepits, vegetated bioswales and porous pavers. The site will accommodate a 5" rainfall or 10 year storm event without any run-off effecting neighboring properties or flooding the surrounding community. The average rainfall in Hoboken per month is 4.3".

J. STORE

The City has authorized a \$20,000,000 bond for the purposes of acquiring additional land for open space. Properties targeted are in the western part of town, which is most flood prone.

K. STORE

For the past ten months, the city has been working with the Rockefeller Foundation's "Re.Invest Initiative" to examine the city's antiquated and failing infrastructure to come up with innovative design and funding solutions to make the city more resilient and sustainable. Hoboken was chosen by the Rockefeller Foundation to be one of eight cities across the country to receive over \$350,000 worth of in-kind engineering, finance and legal expertise. The city put forth the 6.5 acre former Cognis-Henkle chemical factory (now owned by BASF) as a candidate site for a multi-disciplinary and multi-functional project. The Re.Invest team is examining the feasibility of completely remediating the site, removing all of the contaminated soil and replacing the void with an underground parking garage with enclosed stormwater chambers below the garage to capture flood waters during rain events. Above the underground garage at street level will be a new 6.5 acre park. The Re.Invest team expects to complete the feasibility study/concept plan by December 31, 2014.

L. STORE

The City is in negotiations with the current owner of a parcel nearly one acre in size at the corner of 7th Street and Jackson Street for the purposes of creating new parkland. This parcel can be used in a similar fashion as the Block 12 site, changing an impervious surface to raingardens, treepits, vegetated bioswales and porous pavers to better manage and reduce stormwater runoff.

M. DISCHARGE

The city has been working closely with the North Hudson Sewerage Authority (NHSA) on the design and installation of the H5 Wet Weather Pump Station. The station is to be located on 11th Street between Washington Street and Hudson Street. The pump station will consist of two 20 million gallon per day pumps with an emergency back-up generator. The pump station will reduce flooding in the "H5" catchment area which is located in the neighborhood where ShopRite is located. The NHSA provided over \$500,000 of in-kind engineering services for this project. On March 3, 2014 the city submitted an \$11 million low interest loan application for this project to the New Jersey Environmental Infrastructure Trust Fund. If approved, the city and NHSA may receive a notice to proceed in November 2014 and start construction in the spring of 2015. The duration of construction is expected to be 18 months. The pump station should be operation by mid to late 2016.

If you need additional information or assistance, please let me know.

Appendix 4 – Flood Risk 101 Pamphlet

101

Flood Risk

with 2 x 4

Royal HaskoningDHV

HRA

BRLMORT

OMA

REBUILD
BY
DESIGN

What is Flood Risk?



Source: Federal Emergency Management Agency

Glossary of Useful Terms

100-Year Flood: A flood with a 1% chance of occurring in any given year.

500-Year Flood: A storm with a .2% chance of occurring in any given year.

Combined Sewer Overflow (CSO): A type of sewer system that collects sanitary sewage and stormwater runoff in a single pipe system.

Flash Flood: A sudden local flood, typically due to heavy rain.

Flood Plain: Any land area susceptible to being inundated by floodwaters from any source.

Flood Risk: The measure of vulnerability to flood with consideration to the likelihood of flooding and the total value of the assets at risk.

Flood Zones: Areas identified by the Federal Emergency Management Agency (FEMA) as special flood hazard areas or risk premium zones for flood insurance. These zones are indicated in Federal Emergency Management Agency Flood Insurance Rate Maps (FEMA FIRM).

Impervious Surface: Also known as impermeable surfaces, impervious surfaces refer to materials that do not absorb rainwater and cause water runoff.

Rain Garden: Used to manage rainwater runoff by allowing runoff from impervious areas to be absorbed into the ground. In addition to alleviating loads on the municipal storm drain system, rain gardens clean storm water through biofiltration.

Resilience: The positive ability of a system or company to adapt itself to the consequences of a catastrophic failure.

Retention Basin: An excavated area used to manage stormwater runoff to prevent flooding and downstream erosion.

Return Period: With regard to flood, it is an estimate of the likelihood of a storm event. It is also known as a recurrence interval.

Sea Level Rise (SLR): Sea level rise is the mean rise in sea level over time attributed to climate change as global temperatures increase, seawater warms and expands, mountain glaciers melt, and ice sheets from Greenland and Antarctica melt and flow into the ocean.

Storm Surge: A rise in coastal water level associated with a hurricane or other strong coastal storm.

Surface Runoff: Surface or water runoff is the water flow that occurs due to the impermeability of the ground.

For More Information Visit any of the following sites:

Federal Emergency Management Agency (FEMA)
<http://www.fema.gov/>

HUD: Rebuild by Design
<http://www.rebuildbydesign.org/>

National Flood Insurance Program
<http://www.floodsmart.gov/>

National Hurricane Center
<http://www.nhc.noaa.gov/>

New Jersey Department of Environmental Protection
<http://www.nj.gov/dep/>

Sandy Relief Fund
<http://sandynjreliefund.org/>

WNYC
<http://project.wnyc.org/>

This pamphlet provides insight into the concept of flood risk, the hazards and the assets as well as context on how to interpret and view this information. The purpose of this pamphlet is to provide stakeholders in the Sandy-affected region with information to streamline the discussion for challenges at hand as the result of flood risk.

Disclaimer

The information presented in this pamphlet is intended for discussion with decision makers and stakeholders involved in the Rebuild by Design competition only. This information is not complete and or exhaustive and is provided for the US context. No rights can be deducted from this document and the authors are not responsible for errors and misinterpretation of the provided information.

OMA team

The OMA team intends to improve resiliency of critical nodes in high-density urban environments; points that are vulnerable and very productive (stacked functions) on a local level, but have a much broader (regional) impact.

Sources

American Public Transportation Association. (2007). Public transportation: Benefits for the 21st century.

Bloomberg, M., & Frankel, D. Department of Finance, Office of Tax Policy. (2012).

Fox News. (2013, July). Nyc unveils new hurricane flood zones. Retrieved from <http://www.myfoxy.com/story/22624022/nyc-unveils-new-hurricane-flood-zones>

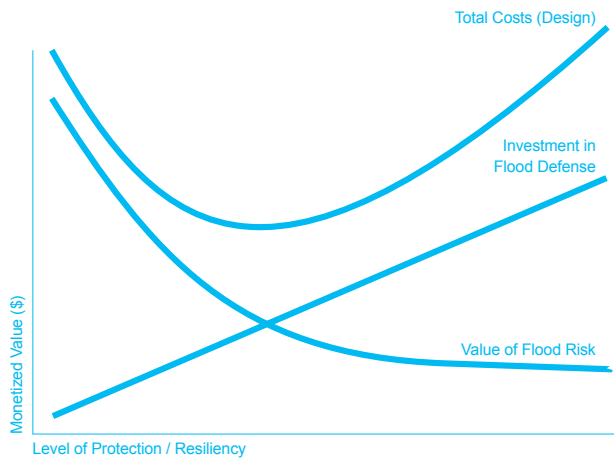
Hillen, M.M. et al. – Coastal defence cost estimates

Jonkman, S.N. et al. - An overview of quantitative risk measures for loss of life and economic damage

Jonkman, S.N. et al. - Costs of Adapting Coastal Defences to Sea-Level Rise

What is Flood Risk?

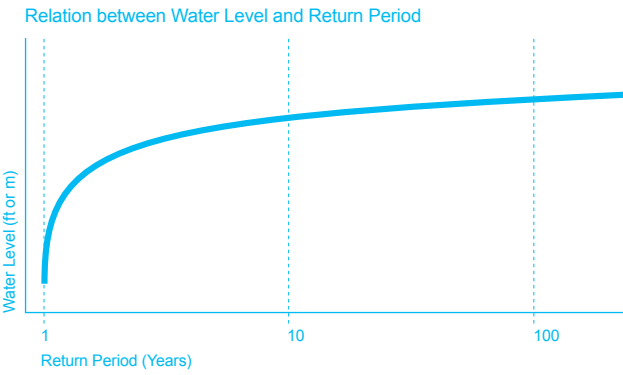
Flood risk is the vulnerability to flooding, and the total value of the assets at risk to flooding. Flood risk is determined by the summed probability of flood hazards, as well as the assets at risk of these hazards.



With investment in flood protection, the flood risk will go down. By monetizing both investment and risk, an economic optimal protection level can be selected.

What is 100-year flood?

A 100 year flood is not a flood which occurs every one hundred years, but a flood that has a 1% chance of occurring **every year**. A 100-year flood tells you something about the probability. The amount of devastation as a result of flooding

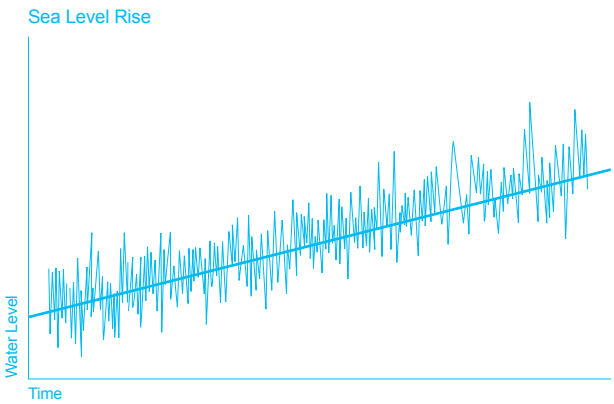


is site specific, as are the possibilities and costs for mitigation. Because of sea level rise (and potentially other climate change related effects) the probabilities of a 100-year flood increase over time, therefore the future 100-year flood is a more significant hazard.

There is a difference between a 100-year storm and a 100 year flood. Because storms are measured by different characteristics, a 100-year storm does not necessarily produce a 100-year storm surge or flood.

Changing Probabilities

The probability of flood hazards can change over time. The main contributor to an increased probability of coastal flooding is sea level rise. In addition, climate change may have an effect on increased precipitation patterns and might increase the occurrence of storm events. These changes in probability increase flood risk over time, but the high-density urban environment flood risk is also influenced by the performance and design of flood defense measures as well as the (increase of) assets at risk, those valuables which could be lost.



Assets at Risk

The consequences of a flood consists of affected and/or decreased property value, decreased quality of life and potentially loss of life. The assets at risk from a particular flood event motivate flood protection measures.

Hoboken's real estate value has skyrocketed over the past decade. Residential value psf has risen over 500%.

Hurricane Sandy caused \$100 million in property damages, and incurred significant costs in lost business revenue. While one-time property damages are the most visible toll of the storm, ongoing disruptions to business operations can be devastating to business owners, the communities they serve, and the workers they employ. For businesses operating at the margins of profitability, storm damage and disruption may be sufficient to cause the business to fail.

Safety & Quality of Life are also compromised during and after flood events.

Over two-thirds of Hoboken lies within the designated FEMA flood zone, and that number is expected to increase dramatically in the coming decade.

Critical Infrastructure is likely to be disabled or damaged after a flood, posing serious risk to our transportation systems, business operations and supply chains.

More than 50,000 people rely on public transit in Hoboken every single day.

Future Real Estate Development, which has been a major driver of Hoboken's economic growth in the past decade, is at risk for flood damage.

New housing development is necessary to accommodate the expected growth in residents, increasing the number of assets at risk.

Flood Risk

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Decreased by Mitigation

Increased by Sea Level Rise

Probability

x

Decreased by Adaptation

Increased by Population and Development

Consequence

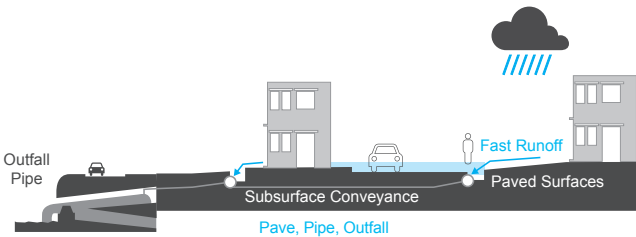
Quantify and Monetize Flood

Flood Event

Assets at Risk

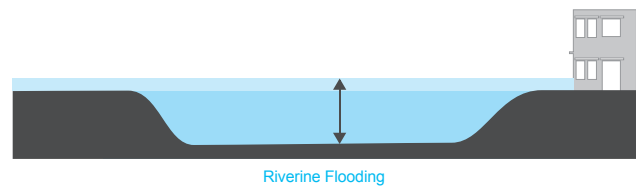
What is a flood?

High water levels in the Sandy-affected region can ultimately be attributed to storm events and precipitation.



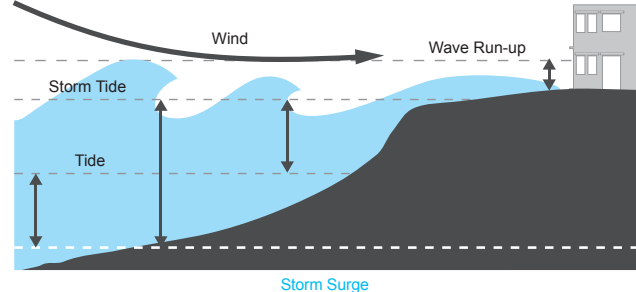
Urban Drainage

Precipitation may lead to flash flooding or inland flooding. Rain water cannot be stored or drained leading to overwhelming of the drainage system and flooding.



Rivers

Riverine flooding is determined by high water levels in the river as a result of the discharge of the river and/or the combination of high water levels as a result of high coastal water levels. High rivers discharge are caused by (upstream) precipitation.



Coasts

High water levels in the Atlantic Ocean are the result of a combination of causes. The largest contributing factor is storm surge, which is a large scale increase of the water level. In addition, storms can increase wave action. The influence of tides determines the height of the water level.

What are Flood Hazards?

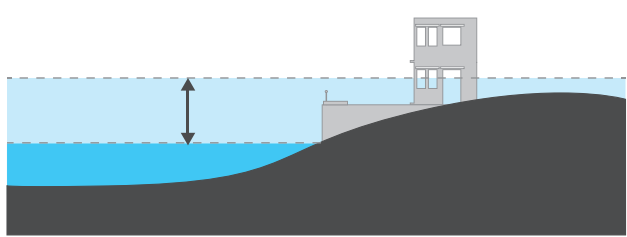
High water levels along the coasts and in rivers, as well as extreme precipitation can lead to various flood hazards. These flood hazards take into account the performance of the natural and built flood protection system and the urban drainage system. The main flood hazards in the Sandy-affected regions are:

Extreme water levels as a result of

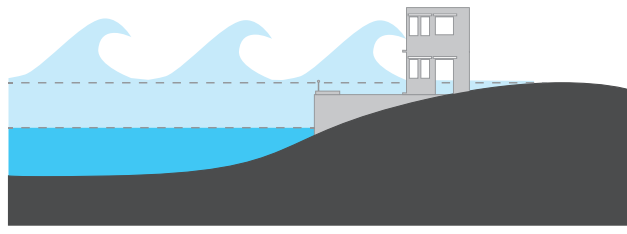
- Storm surge and/or offshore storm events
- High river discharges
- (Under) performance of flood defense measures

Overwhelming of the urban drainage system as a result of

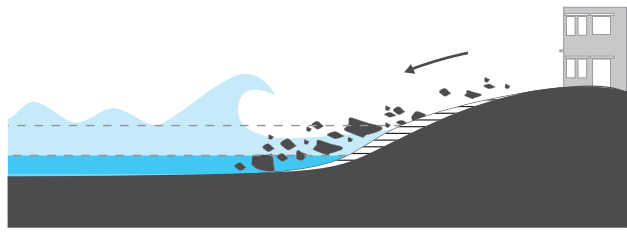
- Extreme precipitation
- Land use and impermeable surfaces
- (Under) performance of drainage system



Storm Surge Flooding



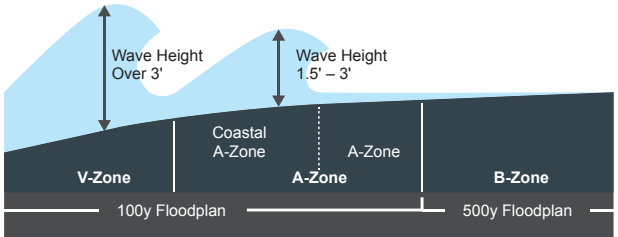
Wave Force



Erosion

What are flood zones?

(U.S. APPROACH)



Identifying areas of risk

The Federal Emergency Management Agency (FEMA) is part of the United States Department of Homeland Security. The agency manages the National Flood Insurance Program, which enables property owners to purchase insurance protection from the government against losses from flooding. FEMA uses Flood Insurance Maps (FIRMs) to designate areas that lie within risk premium zones that are called Special Flood Hazard Areas (SFHAs). Flood hazard areas are ranked according to their levels of risk:

- V Zone - Areas along coasts subject to flooding by the 1-percent-annual-chance flood event with additional hazards associated with storm-induced waves.
- A Zone - Areas subject to flooding by the 1-percent-annual-chance flood event.
- B Zone - Moderate risk areas with minor vulnerability to flooding.

Safety Levels vs. Flood Risk

- Flood risk takes into account the economic consequences. A 1% safety level only says the probability that a flood will occur within a given year is 1%, but not how severe this flood will be if it occurs.
- When monetized, flood risk can be used to determine the economically optimal safety level.
- It is important to realize that decision-making regarding risks is complex and that not only technical aspects but also political, psychological and social processes play an important role.
- With an economic approach towards flood risk the vulnerability, assets at risk and also the protection costs are weighted. This asset consideration allows for the chance to prioritize resiliency of flood protection actions and evaluate investments.

Appendix 5 - Team



OMA is a leading international partnership practicing architecture, urbanism, and cultural analysis. OMA's buildings and masterplans around the world insist on intelligent forms while inventing new possibilities for content and everyday use. OMA is led by seven partners and sustains an international practice with offices in Rotterdam, New York, Beijing, Hong Kong and soon Doha. The counterpart to OMA's architectural practice is AMO, a research studio based in Rotterdam. While OMA remains dedicated to the realization of buildings and masterplans, AMO operates in areas beyond the traditional boundaries of architecture, including media, politics, sociology, renewable energy, technology, fashion, curating, publishing, and graphic design.

Responsible for OMA's operations in the Americas, OMA New York was established in 2001 and has since overseen the successful completion of several buildings – including Milstein Hall at Cornell University (2011), Seattle Central Library, the IIT Campus Center in Chicago (2003), and Prada Epicenter in New York (2001). Under the direction of Partner Shohei Shigematsu, the New York office is currently overseeing the construction of the Musée national des beaux-arts du Québec, a private foundation in the Phillipines, and a new performance space for Marina Abramovic.

Partner-in-Charge: Shohei Shigematsu
Project Manager: Daniel Pittman
Team: Isaiah Miller, Stephen Clipp, Matthew Davis, Cyrus Penarroyo, Filippo Nanni, Maria Saavedra



Royal HaskoningDHV, the oldest engineering firm of the Netherlands, has an excellent track record on water management. Over 300 people from Royal HaskoningDHV work on water management and flood risk reduction challenges around the world. They are involved in solutions in cities as New Orleans, Rotterdam, Bangkok, St. Petersburg and many other places. Royal HaskoningDHV's global flood risk reduction planning comprises integrated planning, multi-layer safety and state-of-the-art flood modelling. They realized cutting edge multipurpose and nature-driven design solutions, resulting in a wide range of hard and soft solutions.

Project Manager: Marten Hillen
Team: Nanco Dolman, Mathijs van Ledden, Ronald Stive, Bart-Jan van der Spek



BALMORI

Balmori Associates, Inc. is a landscape and urban design firm founded by Dr. Diana Balmori in 1990. The practice is recognized worldwide for designing sustainable infrastructures that serve as the interface between landscape and architecture. The firm's approach is rooted in the exploration of the boundaries between nature and structure through landscape. Inventive thinking, and analysis of hydrological, ecological and temporal dimension leads to an artistic and functional design aesthetic. This approach involves architects, engineers, ecologists and artists and has led to a portfolio of award winning projects for public and private clients in Europe, Asia and America.

Partner-in-Charge: Diana Balmori
Project Manager: Mark Thomann
Team: Javier Gonzalez-Campana, Moa Carlsson, James Bykowski, Reva Meeks, Isabel Lezcano, Matt Choot, Jessica Roberts



HR&A Advisors, Inc. (HR&A) is an industry-leading real estate, economic development and energy efficiency consulting firm. We have provided strategic advisory services for some of the most complex mixed-use, neighborhood, downtown, campus, and regional development projects across North America and abroad for over thirty years. We understand the importance of linking accretive private investment with public resources to support investors and communities' responsibilities and aspirations.

HR&A has guided planning and decision-making for future resiliency within communities across the Sandy-affected region of the northeastern United States and cities throughout the United States. This includes our work managing NY Rising Community Reconstruction Program efforts for New York State and our work with the Rockefeller Foundation on its 100 Resilient Cities initiative to develop resilience strategies around the world. We have provided key economic framework guidance for resiliency efforts and a public-private approach to implementation that draws on project value for funding.

Partner-in-Charge: Eric Rothman
Project Manager: Elissa Hoagland Izmailyan
Team: Lindsey Gael, Elizabeth Waldorf