

RESILIENCY PARK PROJECT HOBOKEN, NJ

This case story is one in a series designed to highlight and bring to life stories of impactful infrastructure projects around the country funded by or eligible under programs within the Infrastructure Investment and Jobs Act (IIJA) or Inflation Reduction Act (IRA). The story you are reading focuses on the **Building Resilient Infrastructure and Communities (BRIC)** grant. BRIC provides funding directly to states for preventive investments in natural disaster resilience, including hazard mitigation planning and projects that will reduce the risk of damage in the event of a natural disaster.

The Local Infrastructure Hub is highlighting Hoboken, New Jersey's ResilienCity Park project, formerly Northwest Resiliency Park (NWRP), as it shows how BRIC grants can be used to invest in multipurpose infrastructure, incorporating resilience for extreme weather events and public amenities for daily functional use.

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PROJECT AT A GLANCE

Leadership: Mayor Ravi Bhalla
Caleb Stratton, Chief Resiliency Officer & Assistant Business Administrator

Location: City of Hoboken

Timeline: December 2016 – Fall 2023

Focus: Climate resiliency, stormwater management



PROJECT DESCRIPTION IN BRIEF

The ResilienCity Park project, formerly known as Northwest Resiliency Park (NWRP), is transforming [a former industrial site](#) into a public park that provides the community with both recreational and resiliency benefits. The park includes a new multi-purpose athletic field, a basketball court that doubles as a stormwater detention basin, playground, open lawn space, a recreational water feature, and below-ground stormwater infrastructure. The park will also have a terrace pavilion with a café and community room that will open when its construction is complete in Fall 2023.

ResilienCity Park can detain up to 2M gallons of stormwater, through above and below-ground infrastructure, that would have otherwise flooded city streets and residential basements, and forced untreated wastewater into the Hudson River through the combined sewer overflow system. The park's water infrastructure sequesters stormwater through a 1M gallon stormwater detention tank located below ground and up to another 1M gallons through above-ground green infrastructure such as rain gardens and a cistern for on-site irrigation. ResilienCity Park also includes an on-site, 30M gallon per day flood pump, constructed through a partnership with the North Hudson Sewerage Authority, which pumps water from the storage tank to the Hudson River as necessary during and after rainfall events.

PROJECT BRIEF (CONTINUED):

KEY PLAYERS

- Mayor Ravi Bhalla, Current Mayor of Hoboken
- Mayor Dawn Zimmer, former Former Mayor of Hoboken (2009-2017)
- Caleb Stratton, Chief Resiliency Officer & Assistant Business Administrator
- North Hudson Sewerage Authority, regional partner for planning, construction, and funding
- New Jersey Department of Environmental Protection, state-level partner providing administrative support in working with federal agencies
- New Jersey State Police, state-level collaborator for consideration and development of resiliency strategies

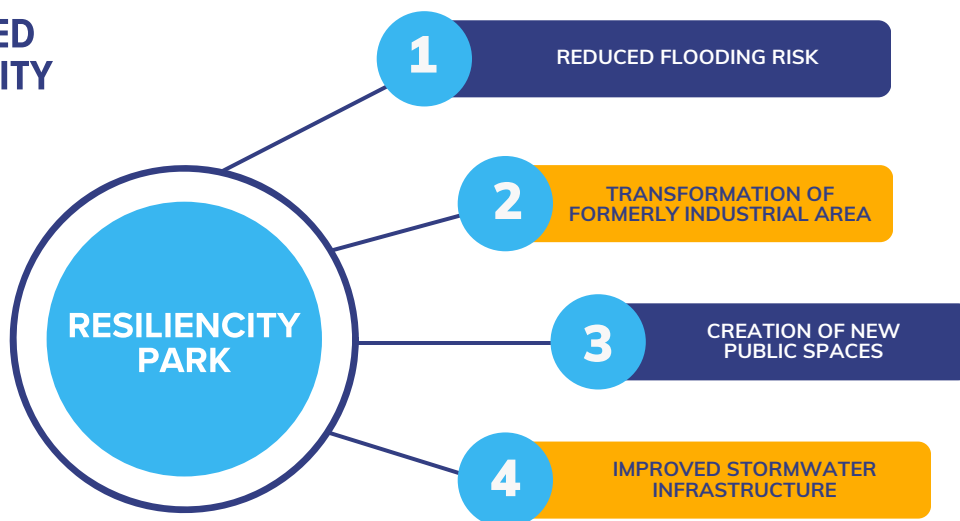
Funding Sources

- \$10M grant from BRIC [subrecipient]
- \$44M in low-interest financing, including \$2M in principal forgiveness, from the NJ Infrastructure Bank through the Environmental Protection Agency’s (EPA) Clean Water State Revolving Loan Fund
- \$24M in bonding through Hoboken’s Open Space Trust Fund

Project Dates / Timeline

The City first envisioned using the site that would become ResilienCity Park for a city park in their 2004 Master Plan. Following Hurricane Sandy in 2012, the City’s [2014 Green Infrastructure Strategic Plan](#) and [2015 RE.Invest Feasibility Study](#) identified the site’s potential as a green infrastructure and flood management park. In 2016, Hoboken acquired the six-acre site to transform the former industrial site into their largest public park having recently recognized its potential as a flood management park. In 2017, the city opened a pop-up park for temporary usage during earlier, pre-construction project phases. Construction for ResilienCity Park began in September 2019. A grand opening for the park was held in June 2023, with all components completed except for the terrace pavilion, which is expected to be complete in Fall 2023. This is Hoboken’s third resiliency park opened since 2017.

PROJECTED COMMUNITY IMPACT

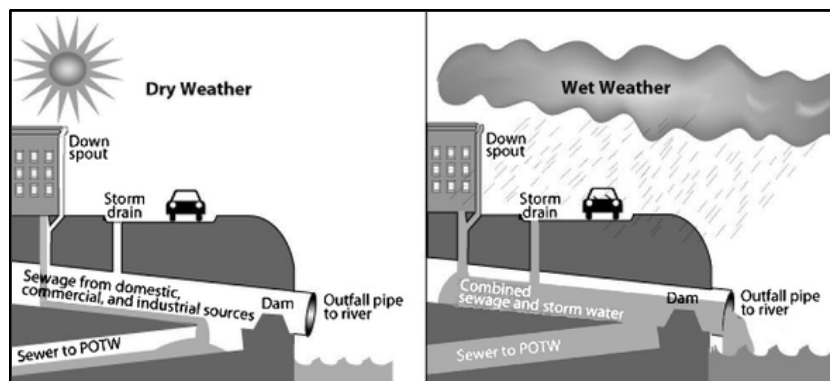


PROBLEM TO SOLVE

Following Hurricane Sandy in 2012, 75% of the city was inundated and significant portions of the city were inaccessible for almost a week. This was not the first time a large coastal storm caused costly flooding in the city - approximately 80% of the city is in a coastal floodplain. Furthermore, low-lying areas of western Hoboken can experience flooding if the city receives more than 0.8 inches of rain per hour.

The north, west, and southern sections of Hoboken are built on what was previously a tidal marsh with a hydraulic connection to the Hudson River. As a result, the city of Hoboken was effectively an island. In the late 19th century, the tidal marsh area was infilled for industrial development to support the waterfront community in Hoboken. Today, fill material covers 62% of the land area in Hoboken [[Resilient NJ; Northeastern New Jersey, Flood Impact Assessment](#)]. Many of these filled areas are less than three (3) feet above sea level. ResilienCity Park sits within this historically infilled and industrial area, in what is now a more residential neighborhood.

Most of Hoboken is covered in impermeable surfaces, and the City's combined sewer overflow (CSO) system heightens the effects of flooding. While working seamlessly in dry weather, in heavy rainfall events stormwater joins with sanitary flows, which can quickly overwhelm wastewater treatment facilities. As a result, stormwater floods streets, residences, and businesses, while untreated wastewater and stormwater flows into the Hudson River, polluting a regional water source, recreational amenity, and critical estuarine habitat for plants and animals. At high tide the combined sewer overflow system's outfalls can be blocked, further hindering the infrastructure's capacity.



Combined Sewer Overflow (CSO) Diagram

Because of the flood risk, the city of Hoboken has just over 9,800 flood insurance policies through the National Flood Insurance Program (NFIP) covering a total asset value of \$2.3B. According to property tax assessments, the aggregate assessed property value in Hoboken is over \$11.8B. Additionally, the NFIP's coverage for residential properties maxes out at \$350K per policy, and \$1M for commercial properties. The average cost of a 1,000sqft condominium in Hoboken is about \$1M. So, if there is a total loss of contents, NFIP will not cover the full value of losses. As a result, there are \$9.5B in uninsured or underinsured liabilities, that residents are responsible for repairing or replacing in case of major damage.

In total, [flood impact assessments](#) estimate that rainfall-caused flooding leads to an estimated \$660-\$810M in expected loss in property values, with 530-560 buildings impacted out of a total of 850, and 68% of residents of Hoboken residing in impacted homes.

PROBLEM TO SOLVE (CONTINUED)

After Hurricane Sandy, city and community leaders recognized that they needed to pivot to new strategies to become more resilient, rather than rebuilding in the same way. Traditional approaches taken by FEMA, such as raising the community above grade, would not work, as doing so would eliminate the city's ability to have ground-level housing and retail. Thus, Hoboken needed an alternative that would mitigate the flood risks without losing the character of the community.

PRE-DEVELOPMENT

In May 2021, Governor Phil Murphy, HUD Secretary Marcia Fudge, Senator Cory Booker, then-Congressman Albio Sires, Mayor Ravi Bhalla, and former Mayor Dawn Zimmer [celebrated the groundbreaking](#) for the [Rebuild by Design](#) Hudson River project, which was made possible by over \$230M in Superstorm Sandy recovery funding from HUD and has been in planning for several years. The Rebuild by Design project is a national model for resilient infrastructure. The project's comprehensive approach to resilience consists of four integrated components – resist, delay, store, and discharge – to manage storm surge and rainfall events. The resist structure consists of hard infrastructure, such as bulkheads, floodwalls, and seawalls, as well as soft landscaping features, such as berms and levees. The remaining components are embedded in a combination of hard infrastructure and soft landscaping to defend against flooding events and interconnected infrastructure to manage stormwater runoff and drainage. The resiliency parks, all included in the Rebuild by Design Hudson River project, are an example of the delay, store, and discharge components in practice.

In the years since Hurricane Sandy, Hoboken has invested in developing partnerships and staff capacity by:

- Building the city's engineering department, that now has three (3) full-time professional engineers,
- Designating a floodplain manager in Hoboken's zoning office,
- Encouraging additional staff across city offices to obtain Certified Flood Manager designation and investing in staff training to support this,
- Bringing in environmental consultants to support with more complex plantings and systems, and
- Strengthening relationships with the North Hudson Sewerage Authority (NHSA), NJ Department of Environmental Protection (NJDEP), and NJ State Police.

Through relationships with NHSA and NJDEP, Hoboken saw where common goals could be pursued to leverage additional funding sources through collaborative efforts. The city identified the eventual site of ResilienCity Park for acquisition and redevelopment in 2004. A former industrial site turned vacant asphalt lot, the site was remediated for development by the Fordham Park based chemical company, [BASE](#), before the city was finally able to acquire the location in 2016 under the leadership of former Mayor Dawn Zimmer.

Prior to the start of the "Parks as Defense" strategy, there was community demand for a multifunctional parking garage that would serve as a "store" component within the [stormwater and flood risk mitigation framework](#). As Caleb Stratton, Chief Resiliency Officer, said "if you build a parking garage in Hoboken, people will name their children after you." However, given the cost of such a project the city could not produce a favorable cost-benefit analysis outcome despite using numerous modeling approaches. While the parking garage concept was not feasible, these initial engagements generated support for the broader concept of mixed-use public investments, combining infrastructure with public amenities.



The City of Hoboken, the project team, and community members in a public design charrette.

COMMUNITY ENGAGEMENT

Caleb Stratton discussed the challenges that were faced early on in the community engagement process, from the start of discussions around building resilient infrastructure through the beginning of construction for ResilienCity Park. The first challenge came in ensuring that the city engaged the core constituencies that were most impacted by flooding events in their neighborhood. These community members wanted something done to build in resiliency, but there were four thematic constraints with that feedback:

1. Don't build in front of me,
2. Don't build behind me,
3. Don't build in my neighborhood, but
4. Don't leave me out.

An initial proposal was to build a flood wall in the city to redirect stormwater, however that would physically separate underserved and disadvantaged communities; the city's core constituencies were strongly opposed to this. Incorporating the community feedback in the planning forced the city to consider more innovative approaches to building resiliency. This thinking would result in the idea of multipurpose infrastructure that blends above-ground recreational facilities and green infrastructure with below-ground resiliency infrastructure within the parks. With this approach, an unpopular neighborhood necessity was turned into a neighborhood amenity.

This high level of community engagement would continue throughout the planning process and beyond. After site acquisition in 2016, Hoboken built a "pop-up park" on the site that would temporarily provide an additional public space to the community. In 2017, Hoboken commissioned the park's Pre-Design Analysis and Public Engagement Report that included extensive community input from an online survey and other city-wide engagement activities to identify what residents wanted to see in the new above-ground park.

COMMUNITY ENGAGEMENT (CONTINUED)

The report was based on engagement with over 1,400 community members, including youth, who provided feedback that would drive the design of the park, incorporating multi-generational interests and accessibility needs, multipurpose fields, flexible space designs, and community demand for various amenities (e.g., bathrooms and drinking fountains). As part of this process, Hoboken hosted a public design charrette.

Upon the release of the report, the project team began to develop design alternatives, before hosting a series of three public meetings to review proposed designs and the preferred concept design. The final design, as approved by the Hoboken City Council in March 2019, includes a multi-purpose athletic field, gardens, basketball courts, pavilion and stage. Several green and gray infrastructure components for stormwater management are built into this design above and below ground, including rain gardens, drainage to an irrigation reuse tank, and a 1M gallon stormwater storage tank with a pump system to control its discharge to the Hudson River.



NW Resiliency Park Final Design.

Construction began after closure of the pop-up park in September 2019, and continued through 2022, construction advanced through three phases:

1. Installation of 1M gallon storage tank,
2. NHSA's construction and related work, and then
3. Construction of the above-ground park.

A grand opening was hosted at ResilienCity Park in June 2023 with Mayor Bhalla and Governor Murphy in attendance, alongside other key stakeholders. The terrace pavilion, complete with restrooms, community room, and cafe, is set to open in the fall of 2023.



Mayor Bhalla, Governor Murphy, and project stakeholders at the ResilienCity Park grand opening.

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“Not only does this park provide much-needed, state-of-the-art open space amenities, it will also provide a critical defense against rainfall flooding.”

— Mayor Ravi Bhalla,
City of Hoboken

PARTNER ENGAGEMENT

There were several key partners that were engaged throughout the project, including the NJ State Police (NJSP), NHSA, NJDEP, FEMA, and outside advisors who provided varying support and resources. A guiding principle in partner engagement for this project was to identify and create opportunities for goal alignment across organizations that would facilitate collaboration and create access points for additional resources.

NJDEP has a strong engagement role as the sponsor for the Rebuild by Design - Hudson River project. The city's collaboration with the Department enabled Hoboken to be a subrecipient of BRIC funds and provided additional access to other federal resources. The city also recognized the impact the ability to split responsibilities with NJDEP had in maximizing their staff capacity. As Caleb Stratton recognized, NJDEP and other state entities handled the administrative burdens related to federal funding and related compliance, including for permitting, enabling the city to focus capacity on partner and community engagement and the easement acquisition necessary to allow the project to move forward.

The NHSA engaged with this and other city-led resiliency projects given their mandates and requirements for environmental regulations, such as those from the EPA via the Clean Water Act. One component of related EPA mandates and policies are those for a [CSO program](#) and a related permitting program that the sewerage authority is subject to. The [EPA's CSO Control Policy](#) consists of two phases to help communities reduce and control overflow events. With these policies in mind, Hoboken saw a clear opportunity to align goals and collaborate with NHSA, as improving stormwater infrastructure would support both entities' missions. The partnership with NHSA is formalized through memoranda of understanding, shared service agreements, joint projects, and crossover between internal engineering teams and external project consultants. The collaboration between the two entities enabled Hoboken to access additional resources for the ResilienCity Park, and broader resilient infrastructure work in the city. NHSA is responsible for construction, ownership, and operations of the pump associated with the park's underground storage tank.

PARTNER ENGAGEMENT (CONTINUED)

Given the impact of heavy rainfall events on emergency response capacity, the City of Hoboken has engaged with NJSP to ensure that resiliency projects support continuity of emergency response services and capacity. City representatives meet with NJSP semi-annually to advise them on current and upcoming projects and collaborate on their efforts.

As the federal agency responsible for mitigation, disaster preparedness, response, and recovery activities, FEMA is the primary federal partner/collaborator for the resiliency park projects and broader mitigation work in Hoboken. In addition to being responsible for administering BRIC, FEMA manages the NFIP. As noted by Stratton, FEMA has a significant and vested interest in projects that will reduce, if not eliminate, flood risks in the community, given the agency's exposure to risk for insured and uninsured or underinsured properties. Therefore, FEMA was willing to support the project beyond the BRIC program.

Outside advisors provided additional support to the project at various points, such as a team from the Netherlands that was addressing similar challenges related to coastal flooding in communities in their country, as well as the Obama Administration's Hurricane Sandy Rebuilding Task Force led by then HUD Secretary Shaun Donovan and representation from cabinet-level agencies and White House domestic policy staff. Hoboken engages with external consultants and the Army Corps of Engineers to ensure that the city's shoreline and inland water projects are done within the right permitting framework. They also point to the execution of inland projects to communicate their broader objectives regarding investments in resiliency infrastructure and to drive collaboration. For example, ResilienCity Park will serve as an interior drainage feature for a coastal flood protection levee when the levee is completed.

PROJECT FUNDING

ResilienCity Park costs approximately \$78M, including the site acquisition costs of \$26M and site development costs totaling \$52M. The project is funded by a \$10M BRIC grant, \$24M in bonding from the city's Open Space Trust Fund, and at least \$44M in low interest financing, with \$2M in principal forgiveness through NJ's Infrastructure Bank, who administers the Clean Water State Revolving Loan Fund.

CAPITAL STACK

BRIC	\$10M
State Revolving Loan Fund (NJ I-Bank)	\$44M (financing)
Hoboken, Open Space Trust Fund	\$24M (financing)
Total	\$78M

PROJECT FUNDING (CONTINUED)

In September 2023, Hoboken received an additional \$6.2M BRIC grant for expansion of their Southwest Resiliency Park. Several of the other components of Hoboken’s flood mitigation and resiliency infrastructure are funded in part by BRIC grants as well, including Harborside Park, which incorporates elevated flood protection features. The City of Hoboken has received five (5) BRIC grants over the past six (6) years to support its resilience efforts.

In discussing their successes with BRIC awards, Caleb Stratton, said “the language that local government speaks doesn’t necessarily translate to the federal lexicon when putting projects into programs. There is a needed translation of the project’s intent into the format the federal government can digest.” In other words, cities need to adapt and design projects to ensure they fit the funding sources at the federal level. Additionally, city leaders need to identify what relationships are necessary to go from a local level in designing and developing a project, to the federal level for funding; in many cases, such as for BRIC, cities need to work with states or other eligible entities to ensure that they can access federal funding opportunities.

COMMUNITY IMPACT

ResilienCity Park will have a dual impact on the local community. First, the new park transforms the former industrial development and vacant lot into a permanent, modern park asset with green space and infrastructure, a multipurpose field, and community gathering spaces. Secondly, the project is removing risk from the floodplain due to the capacity of Hoboken’s new green and gray infrastructure. Rather than offloading risk via insurance vehicles, the City of Hoboken is making needed improvements to mitigate flood-related risks.

Before developing the park, the city modeled both flood depth and extent; this park will modify both of these within the floodplain. Hoboken has since submitted a Conditional Letter of Map revision to FEMA that would remove 80% of the community from the coastal floodplain when the greater Rebuild by Design - Hudson River project is completed. While the city will still experience shallow urban ponding in certain low-lying areas, upon its completion, the Rebuild by Design project will have reduced, or eliminated, the majority of risk affecting billions of dollars of assets.

Altogether, ResilienCity Park and the Rebuild by Design – Hudson River project will result in lower flood insurance costs for most property owners in Hoboken and will narrow the gap between insured and uninsured risk community-wide, while also providing for \$8M in annual savings to the city, per the park project’s benefit-cost analysis.

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**“The costs for this project are in the millions,
but the savings are in the billions”**

**— Caleb Stratton,
Chief Resiliency Officer, City of Hoboken**

CONCLUSION

Today, ResilienCity Park alongside other resiliency parks in Hoboken, is a critical component for interior drainage in Hoboken in rainfall and coastal events. Through an innovative combination of above-ground green infrastructure, and below-ground gray infrastructure, ResilienCity Park alone can store 2M gallons of stormwater that would otherwise flood the streets and basements in Hoboken, costing residents and responding agencies thousands of dollars for response, repairs, and replacement. The 30M gallon per day pump, operated by the NHSA, enables a delayed and controlled discharge of the detained stormwater to reduce the risk of overflow of the combined sewage overflow system, helping to keep the Hudson River clean.

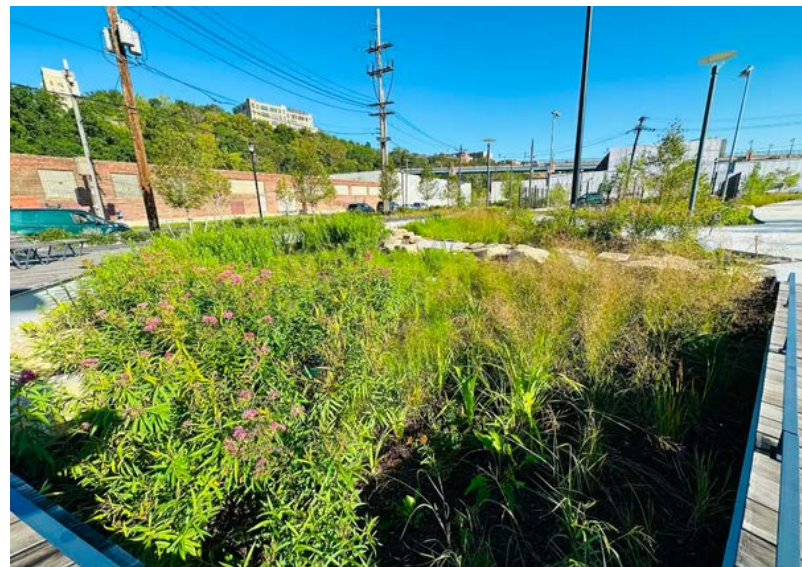
In [September 2023](#), the park’s effectiveness was visible when Tropical Storm Ophelia brought 2.15 inches of rain to Hoboken. The NHSA’s pumps connected to resiliency parks pumped a total of 17M gallons of stormwater out of the city during the storm. ResilienCity Park’s green and below-ground infrastructure withheld stormwater from the city’s streets, alongside other resiliency parks in the city; after pooling water on Monday night, and the park was dry by Tuesday morning.

The City will begin construction on the expansion of the Southwest Resiliency Park before the end of the year, doubling the existing park’s size from one acre to two acres (1-2), and increasing stormwater detention capacity at the Southwest Park from 200,000 gallons to 510,000 gallons. Hoboken is also conducting a public planning process to design a fourth resiliency park at 800 Monroe Street in the west end of the city.

Once all parks are completed, the City will have expanded resiliency parks by approximately ten (10) acres since 2016, and together the four (4) parks will detain over three million gallons of stormwater that would otherwise cause damage costing residents, businesses, and FEMA for repair and replacement.



Pooling at NW Resiliency Park (Before)



Pooling at NW Resiliency Park (After)

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