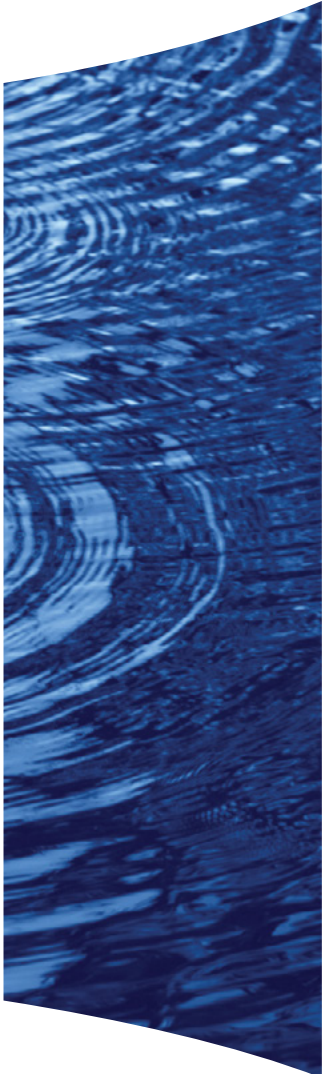
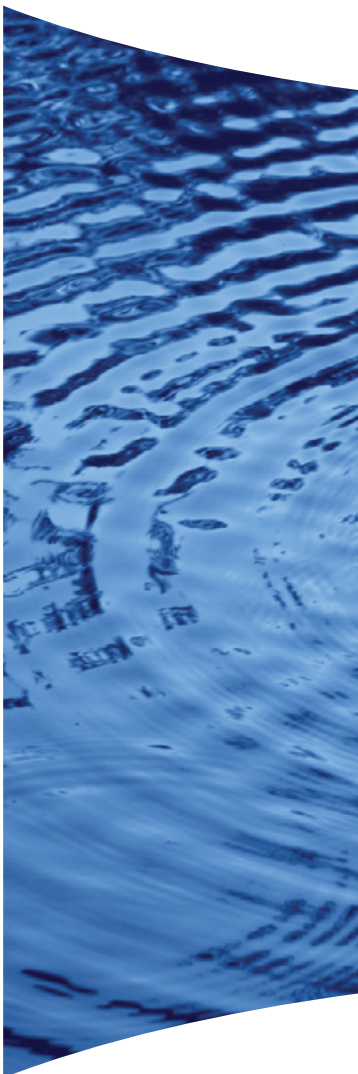




Developing an Agenda for Change for New Jersey's Urban Water Infrastructure



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Courtesy of City of Hoboken

About The Johnson Foundation at Wingspread

The Johnson Foundation at Wingspread, based in Racine, Wisconsin, is dedicated to serving as a catalyst for change by bringing together leading thinkers and inspiring new solutions on major environmental and regional issues. Over the course of 50 years, The Johnson Foundation at Wingspread has inspired consensus and action on a range of public policy issues. Several organizations have roots at Wingspread, including the National Endowment for the Arts, National Public Radio, the International Criminal Court and the Presidential Climate Action Plan. Building on this legacy, The Johnson Foundation at Wingspread has set a new, strategic mission designed to achieve greater, more sustained impact on critical environmental issues. Launched as part of this new direction is Charting New Waters, an alliance of leading organizations calling for action to avert the looming U.S. freshwater crisis.



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Developing an Agenda for Change for New Jersey’s Urban Water Infrastructure

Convening Report

Meeting Convened by
The Johnson Foundation at Wingspread
May 2014

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Charting New Waters



The latest phase of Charting New Waters is focusing on water infrastructure.

Specifically, this work aims to catalyze the widespread adoption of more sustainable and resilient water infrastructure systems in the United States. It is focused on synthesizing and disseminating information that helps local, state and national leaders set a course for and navigate decisions regarding the construction, financing, management and maintenance of sustainable and resilient water infrastructure for the future.

Partnership in Action

New Jersey Future, The Geraldine R. Dodge Foundation and The Johnson Foundation collaborated to convene a select group of New Jersey leaders to develop an action agenda to catalyze the transformation of water-supply, wastewater and stormwater infrastructure in the state's urban areas. Meeting participants represented diverse perspectives, including those of local, state and federal government; public and investor-owned water utilities; economic and community development organizations; environmental groups; businesses; and finance and technology companies.



Conferences that Inspire Solutions



Letter from the Director

What will it take to catalyze widespread urban revitalization through innovative investments in water infrastructure? In some ways, that has been one of the defining questions for The Johnson Foundation at Wingspread through the last six years of addressing national challenges in water sustainability and resilience. When [New Jersey Future](#) and the [Geraldine R. Dodge Foundation](#) suggested we partner with them in an effort to catalyze changes in New Jersey's cities, we immediately knew this was a great opportunity to apply and leverage what we have learned through our convenings.

New Jersey has been an especially interesting state in which to put Charting New Waters – The Johnson Foundation at Wingspread's freshwater initiative – to the test. The state's cities have some of the oldest water infrastructure in the country, including 21 cities that experience combined sewer overflows (CSOs). Nearly half a century after the federal Clean Water Act was enacted, these cities still do not have long-term CSO control plans. In addition, some water delivery systems in the state lose or cannot account for roughly one-fifth of their treated water. And Hurricane Sandy delivered an all-too-real lesson about the critical importance of resilient water infrastructure, with low-lying centralized treatment plants among the first services to go down due to storm surge flooding and power outages.

We know that the future will bring more challenges, and that New Jersey has what it takes to solve these problems. In May 2014, leaders from around the state, along with a few outside experts, joined us in Jersey City to help launch the discussion and identify actions necessary to spark positive change. Cities from Camden to Hoboken, different as they may be in some ways, share challenges around water infrastructure needs. Cities throughout the country have many of these same worries, but New Jersey has the opportunity to be the first to offer its citizens a set of shared priorities, principles and solutions. If water infrastructure improvements are approached in unison, a community of practice and economies of scale can bolster these communities' ability to seize the opportunities at hand.

From our Jersey City conference room, we looked out across the Hudson River to Battery Park City – known for its cluster of buildings with innovative on-site water capture and treatment systems. Despite being in the bullseye of Hurricane Sandy's wrath, residents of these buildings had barely any interruption to their water and sewer services. This model for both sustainability and resilience served as inspiration as we thought about New Jersey's future. With the momentum behind the resulting *Agenda for Change for New Jersey's Urban Water Infrastructure*, I hope it won't be long before people meeting on the shores of Manhattan will look west across the Hudson for inspiration.

Lynn Broaddus
Director, Environment Programs
The Johnson Foundation at Wingspread

Introduction

A water infrastructure crisis looms in New Jersey's oldest and largest cities – cities that comprise nearly one-fifth of the state's population and are projected to absorb much of its future growth, and yet have combined sewer systems, which carry both sewage and rainwater, dating to the 19th century. These combined sewers include overflow relief points that,

New Jersey's aging and degraded water-supply, wastewater and stormwater infrastructure threatens to disrupt daily life, commerce and industry and stunt future economic prosperity.

during rain events, often result in combined sewer overflows (CSOs), which discharge raw sewage into waterways. These combined systems can also result in raw sewage backing up into city streets, parks and homes, threatening public safety and health. Of the nation's 860 communities plagued historically by CSOs, just 84 have yet to upgrade their systems or adopt plans to address the

problem. Twenty-one of those 84 communities – one-quarter – are located in New Jersey.¹

Urban water infrastructure challenges in New Jersey are not limited to the 21 cities with combined sewers. Even outside the CSO cities, polluted stormwater runoff is the state's leading threat to water quality.² Many sanitary and separate storm sewer pipes and water-supply lines in the state are more than 100 years old and showing their age. The annual statewide loss (via leaks) of treated drinking water is estimated at 20–22 percent, with some distribution systems losing as much as 45 percent.³ Water main breaks and resulting service outages are a common aspect of life in many cities.⁴ In addition, preexisting flooding problems are being exacerbated by more intense rainfall events driven

by climate change, and such events are expected to become more frequent in the future.⁵ Most notably, in October 2012 Hurricane Sandy dramatically exposed the vulnerability of many of New Jersey's urban water systems to flooding and other storm damage. Collectively, the problems stemming from aging and degraded water-supply, wastewater and stormwater infrastructure threaten to disrupt daily life, commerce and industry in these communities, and stunt their future economic prosperity.

In May 2014, The Johnson Foundation at Wingspread partnered with New Jersey Future and the Geraldine R. Dodge Foundation to convene a diverse group of New Jersey leaders to develop an agenda for change aimed at catalyzing action to address urban water infrastructure challenges in the state. Participants represented diverse

Reports Highlight New Jersey's Urban Water Infrastructure Challenges

Two May 2014 reports from New Jersey Future detail the water infrastructure challenges facing cities in New Jersey. *Water Infrastructure in New Jersey's CSO Cities: Elevating the Importance of Upgrading New Jersey's Urban Water Systems* outlines the range of technical, regulatory and policy issues. *Ripple Effects: The State of Water Infrastructure in New Jersey Cities and Why it Matters* summarizes those issues and presents a collection of case studies that illustrates how water infrastructure affects people's lives – negatively and positively – in four New Jersey cities. Both reports are available online at www.njfuture.org/water.

perspectives, including those of local, state and federal government; public and investor-owned water utilities; economic and community development organizations; environmental groups; businesses; and finance and technology companies. The discussions focused on establishing guiding principles for improving urban water infrastructure in New Jersey's cities, identifying the driver for action and agreeing on priority action steps to

stimulate progress on the issue. The convening resulted in two products: 1) a three-page consensus *Agenda for Change for New Jersey's Urban Water Infrastructure*, which captured the collective priorities of the group, and 2) this report, which elaborates upon the consensus document and presents The Johnson Foundation's synthesis of the broader range of information, insights and ideas shared during the convening.⁶

Elevating the Importance of Water Infrastructure in New Jersey's Cities

Former New Jersey Governors James Florio and Christine Todd Whitman served as the honorary co-chairs of the May 2014 event to provide high-level leadership and inspiration to other New Jersey leaders who recognize the importance of tackling the state's urban water infrastructure problems. Florio served as governor from 1990 to 1994 and in the U.S. House of Representatives as representative of New Jersey's 1st Congressional District from 1975 to 1990. He is well known for his commitment to environmental issues, most notably as the author of the legislation that established the Superfund program, which requires the cleanup of hazardous waste sites across the country.

Whitman served as governor from 1994 to 2001 and as administrator of the U.S. Environmental Protection Agency (EPA) from 2001 to 2003. She has a record of dedication to improving the quality of New Jersey's watersheds and shorelines, with the state instituting a comprehensive beach monitoring system and watershed management program under her tenure as governor, which led to beach closings reaching an all-time low during her second term.

As honorary co-chairs, Florio and Whitman emphasized that improving water infrastructure will be critical to the ability of New Jersey's cities to continue to attract and support new residents and businesses into the future. Recognizing the imperative for success and the high cost of needed improvements, the former governors also stressed the need for diverse stakeholders to invest human resources and financial capital to revamp New Jersey's urban water infrastructure.



Former New Jersey Governor Christine Todd Whitman

Image courtesy of Christine Todd Whitman



Former New Jersey Governor James Florio

Image courtesy of Florio, Perrucci, Steinhardt & Fader



Guiding Principles

In the interest of providing a vision toward which New Jersey's cities can strive as they embark on revamping their water infrastructure, the May 2014 convening participants developed a set of guiding principles that reflect the desired end state of the transformational process they sought to catalyze. They agreed that to stave off crisis and position New Jersey's cities for prosperous futures, public, private and nongovernmental partners need to collaborate to ensure the necessary investments are made to design, construct and maintain 21st century water infrastructure that:

- **Strengthens cities:** Protects public health and the environment and enhances the attractiveness, livability and safety of cities, while making them more resilient to extreme weather events and natural disasters.
- **Enables economic growth:** Reliably and efficiently delivers safe and adequate drinking water, wastewater and stormwater management services that meet the needs of city residents and businesses today and into the future.
- **Leverages modern practices:** Employs state-of-the-art technologies and best management practices that generate multiple benefits – economic (cost savings, job creation, new businesses), environmental (improved water quality) and social (better quality of life).
- **Reduces flooding and energy use:** Reduces localized flooding from storms, water main breaks and sewer overflows, and enhances energy efficiency to reduce both water utility costs and air pollution.

- **Draws on multiple funding sources and maintains affordability:** Establishes adequate, sustainable funding streams to support improved water infrastructure and services, while ensuring affordable rates over time for city residents and businesses.

The Driver for Action

By January 2015, the New Jersey Department of Environmental Protection (NJDEP), per federal regulatory requirements, is slated to issue final permits requiring the responsible municipal governments and utility authorities in New Jersey's 21 CSO cities to develop, adopt and initiate implementation of CSO Long Term Control Plans (LTCPs).⁷ The NJDEP has proposed a three-year time frame for the submission of plans, but will consider a longer time frame for parties that collaborate across jurisdictions on comprehensive plans. This permit process cannot be avoided, and it can be leveraged to bring attention to the CSO issue as well as to urban water infrastructure problems in general.

While New Jersey is behind most other states in requiring the development and implementation of CSO LTCPs, the timing of the forthcoming permits presents a significant opportunity for the state's urban areas to learn from and adapt CSO control strategies implemented in cities across the United States. New Jersey's cities can draw on proven approaches that meet regulatory requirements for clean water while generating additional benefits, including enhanced resilience to extreme weather events, new local jobs, greater private investment and revitalized communities. By contrast, cities that fail to comply with the permits will perpetuate the pollution of waterways and communities and the

associated threats to public health. They will also be vulnerable to lawsuits and ultimately federal court sanctions that could impose a specific course of action and eliminate the opportunity to achieve broader community improvement goals.

Priority Action Steps to Stimulate Progress

The May 2014 meeting participants agreed that the looming regulatory mandate for CSO LTCPs presents an opportunity to focus attention on the full suite of New Jersey's urban water infrastructure challenges. The group built consensus around a set of recommended priority action steps it believes can catalyze the transformation of urban water infrastructure throughout the state; these actions are presented in the [Agenda for Change for New Jersey's Urban Water Infrastructure](#). The action steps are expanded upon here and in the next section to reflect additional ideas and examples that were not captured in the shorter, consensus-based document. The priority action steps to stimulate progress on New Jersey's water infrastructure challenges are:

- Educate and raise awareness
- Build capacity and foster cross-jurisdictional collaboration
- Optimize existing systems and implement asset management
- Take a "green first" approach and leverage early successes
- Diversify funding sources

Educate and Raise Awareness

Key stakeholders should design and implement a multi-faceted education and outreach program to raise awareness regarding the importance of clean water and the multiple benefits that sustainable and resilient water infrastructure solutions can generate

for cities, surrounding communities and the state as a whole. Many of the environmental, public health and safety benefits of better infrastructure are readily recognizable; they include less pollution flowing into rivers, clean drinking water, fewer sewer backups and water main breaks and more reliable water pressure for firefighting.

Such benefits are important and should be highlighted, but it is the economic and social benefits that may have greater resonance and impact in New Jersey's cities. For example, integrating site-scale green infrastructure for stormwater management into existing streets, residential areas and commercial developments has been shown to enhance property values, and the creation of riverfront parks and public access points for water-based recreation stimulates economic development and revitalization opportunities.^{8, 9} In addition, safer and more reliable water infrastructure combined with the aesthetic improvements that come with well-designed green infrastructure raise the overall quality of life for residents and increase a city's potential for future growth.

Target audiences for such an education and outreach program in New Jersey include elected and appointed leaders, utility executives and professional staff, consultants and contractors, state and local agency personnel, ratepayers, the business community and schoolchildren. A key objective should be to identify and engage champions at the state and local levels



who can raise the visibility of water infrastructure as a public issue and communicate the opportunities associated with tackling it. Academic institutions and community-based organizations such as environmental commissions, green teams, faith-based institutions, watershed associations and professional associations can play an important role in delivering educational messages and information to target audiences. Decision support tools that clearly illustrate the costs and benefits of various water infrastructure projects, including the costs of inaction, could also be useful.

Build Capacity and Foster Cross-Jurisdictional Collaboration

The NJDEP's issuance of new CSO permits offers a significant opportunity for cities and local utilities to coordinate their efforts to learn about and implement technical, communications, financing and management best practices. Permittees can adopt engineering solutions that have controlled CSOs in other cities and adapt effective public communications strategies to engage and inform ratepayers and other stakeholders.

Gaining Political Support for Urban Water Infrastructure Investment



Image courtesy of Sasaki Associates
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At the May 2014 convening, Roxanne Qualls, former mayor and city council member of Cincinnati, Ohio, discussed strategies for generating public awareness and support for water infrastructure improvements. In August 2010, the Metropolitan Sewer District of Greater Cincinnati

finalized a Global Consent Decree with the U.S. EPA that outlines a multi-pronged strategy to control 12 billion gallons of annual combined sewer overflows. Cincinnati's approach involves extensive implementation of green infrastructure through a program known as [Project Groundwork](#) and aims to leverage water infrastructure improvements to achieve other community benefits, including revitalized neighborhoods, green jobs for residents, new parks and further private-sector investment in the city. From her perspective as an elected official, Qualls shared the following lessons from

Cincinnati's urban water infrastructure renewal experience to date:

1. Take an integrated approach: Rather than focusing solely on controlling the CSO problem, consider the regulatory mandate to be an opportunity to reinvest in and recreate communities.
2. Engage citizens in the process: Create an integrated communications strategy and a community-driven public participation process to engage citizens in planning from the start.
3. Make solutions and benefits visible: Develop a list of on-the-ground projects to pursue, and implement demonstration projects to make the benefits tangible and visible.
4. Collaborate across jurisdictional boundaries: Look for opportunities for municipalities and public agencies to collaborate across jurisdictions and leverage knowledge, technical capacity and finances to solve water infrastructure problems cost-effectively at a larger scale.

In addition, cities and utilities may be able to reduce the cost of improvements by coordinating the procurement of water infrastructure technologies and services among multiple jurisdictions. A shared-service approach could allow cities to pool and leverage their collective financial resources to increase purchasing power and spread financial risk across different entities. Bolstering their financial position through collaborative approaches could make cities' implementation of state-of-the-art solutions more attainable financially. However, incentives will be necessary to overcome the inertia of New Jersey's municipality-centered local government structure.

Potential mechanisms for building capacity and fostering cross-jurisdictional collaboration among CSO permittees and other cities aiming to improve their water infrastructure include establishing peer-to-peer training programs or learning cohorts. Key parties that ought to be involved in such efforts include the NJDEP, the U.S. EPA, other state and federal agencies, water utilities and departments, municipal agencies, planners, consultants and elected officials.

Optimize Existing Systems and Implement Asset Management

Before seeking ratepayer support for investment in major capital improvements, New Jersey's water utilities and departments should take aggressive action to optimize the efficiency and effectiveness of their existing systems and business practices. For example, water and wastewater utilities should perform routine maintenance such as cleaning lines to ensure they are operating at full capacity. Establishing a regular schedule for preventive maintenance can ultimately lower operational costs

by reducing the frequency of emergencies, for which response costs are much higher. Potential tools to support optimization activities include Environmental Management Systems for wastewater treatment plants, as well as Capacity, Management, Operations and Maintenance programs for collection systems.¹⁰ Water utilities can also lower overall treatment costs and reduce pressure on drinking water, wastewater treatment and combined sewer systems by aggressively promoting water conservation and efficiency. Procurement procedures and workforce management are additional areas utilities can examine to increase efficiency.

New Jersey's water utilities and departments should take aggressive action to optimize the efficiency and effectiveness of their existing systems and business practices.

At the Village of Ridgewood, New Jersey, wastewater treatment plant, the combination of a biogas-fueled engine generator and solar panel arrays can generate enough energy on-site to provide a majority of the electricity needed to operate the plant.



Image courtesy of Natural Systems Utilities

If they haven't already, water and wastewater utilities should develop and implement asset management plans to sustain efficiencies over time. Implementing asset management involves conducting a comprehensive assessment to map the physical location, age and condition of all assets in a system and to identify the most critical assets, which then facilitates the more effective

Significant opportunities exist to optimize the energy efficiency of water systems.

planning and prioritizing of capital investments. For water-supply utilities, effective asset management is a critical aspect of identifying and repairing leaks and reducing non-revenue

water loss, which can significantly improve an enterprise's bottom line. Implementing foundational optimization and asset management measures in a visible and transparent manner (potentially verified via a third party), and demonstrating the associated

cost savings, will help utilities and departments build trust with ratepayers and establish credibility to pursue necessary but costly infrastructure upgrades. In fact, the New Jersey Environmental Infrastructure Finance Program, an important source of capital improvement funds in the state, now requires utilities to have an asset management plan in place to be eligible for financing.¹¹

With energy being one of the largest operational costs for utilities, significant opportunities exist to optimize the energy efficiency of water systems. Wastewater utilities can increase the energy efficiency of core equipment at wastewater treatment plants by using variable frequency devices, implementing energy-saving automation schemes and right-sizing impellers. Water-supply utilities can begin by replacing inefficient pumps and optimizing pressure management with improved monitoring systems. Wastewater utilities can potentially move beyond the optimization of energy use and toward resource recovery and on-site energy generation. The installation of anaerobic digesters and biogas-fueled turbines, combined heat and power systems and other renewable energy technologies at wastewater treatment plants is a growing trend nationally. These technologies could enhance the resilience of New Jersey's wastewater utilities to disruptive events, potentially giving them the ability to generate enough energy independently to continue functioning through power grid outages. Such capacity could become particularly important in light of projected climate change impacts.

Take a "Green First" Approach and Leverage Early Successes

Cities and water utilities and departments seeking state- and local-level political support for innovative approaches to urban water infrastructure improvements should focus on achieving early

Rain garden complex built by the Camden SMART Team in the flood-prone Waterfront South neighborhood, on a site where a contaminated gas station previously stood.



Image courtesy of New Jersey Future

successes with highly visible projects. In many situations, conventional engineering solutions that rely on new or expanded “gray” infrastructure will be necessary, but municipalities should generally take a “green first” approach to new infrastructure, because green infrastructure solutions have the potential to

control the flows that cause CSOs at the lowest cost and with multiple benefits. Widespread implementation of green infrastructure can be leveraged to expand regional park networks and also help mitigate the adverse effects of extreme rainfall and other climate change impacts such as heat waves.

Address Regulatory Mandates Proactively to Achieve Multiple Benefits

George Hawkins, general manager of DC Water, has led the District of Columbia's efforts to reinvent the city's stormwater management strategy and wastewater treatment system. He encouraged New Jersey leaders to proactively develop CSO LTCPs that rely heavily on green infrastructure and achieve broad community improvement goals that enable the cities to compete in a global economy.

In 2001, the U.S. EPA issued the District a CSO LTCP consent decree, mandating the construction of massive underground stormwater storage tunnels. Extremely expensive and with the final one not due for completion until 2025, the tunnels will be hidden from ratepayers and remain empty except during heavy rainfall events. Since Hawkins became general manager, DC Water has worked intensively with the EPA to reopen the consent decree and incorporate a green infrastructure component to start mitigating CSOs sooner, and in a publicly visible way that generates local jobs and improves quality of life in the city. For New Jersey to avoid having to navigate the complicated process of reopening a consent decree, Hawkins suggested the following course of action for New Jersey's

cities, stressing the need to act before a potentially more expensive and less beneficial plan is imposed:

1. Engage mayors personally in the planning effort, to engender understanding and generate political support;
2. Analyze the cityscape to identify existing and potential locations where green infrastructure projects could be implemented;
3. Create a community-based water infrastructure design contest for the “best green option” and honor the top options in a public awards ceremony;
4. Implement demonstration projects based on the top one or two plans from the contest; and
5. Grow the green infrastructure movement through grassroots leadership.¹²



Image courtesy of TunnelTalk.com



Key steps to facilitate the widespread implementation of green infrastructure include mapping strategic locations for projects; creating incentives and performance standards for new development, redevelopment and retrofits through state and local policy changes and zoning mechanisms; and building demonstration projects that make neighborhood benefits tangible.

For example, the Camden Stormwater Management and Resource Training (SMART) Team works to reduce flood events in at-risk neighborhoods through

the use of rain gardens, rain barrels, street trees and other green infrastructure projects. The Camden SMART Team is composed of staff from Rutgers University, the Camden County Municipal Utility Authority, the city of Camden, the NJDEP, the Coopers Ferry Partnership and the New Jersey Tree

Foundation. Residents in affected neighborhoods play a major role in building these projects, learning about stormwater problems and implementing solutions, which is a model that could be replicated in other New Jersey cities. In addition to local residents, state and local leaders should also be engaged in the planning and rollout of new water infrastructure projects. Gaining political champions to tout successful projects will help build community support for additional projects.

Diversifying Funding Sources

Even with optimization and effective asset management, the cost of upgrading New Jersey's urban drinking water, wastewater and stormwater infrastructure will be expensive and will need to be

phased in over time. How the state's cities – many of which are economically distressed – will pay for these improvements was a central theme of the May 2014 convening. The group recognized that cities and utilities will need to draw on a range of options to secure capital for major improvements and generate adequate revenue to meet their debt obligations.

The New Jersey Environmental Infrastructure Financing Program (NJEIFP), administered by the New Jersey Environmental Infrastructure Trust and the NJDEP, is an existing source of capital that can provide subsidized, low-cost funding via the Clean Water State Revolving Fund program.¹³ Opportunities exist throughout the year for any eligible borrower in the state to submit qualified projects to the NJEIFP.

While government funding programs like the NJEIFP and the traditional municipal bond market will likely remain primary financing sources, and ratepayers will be the primary revenue source to repay loans, some cities and utilities may choose to explore new mechanisms or capital sources to finance major system improvements. For example, some municipalities may be able to issue “green bonds,” which target a growing group of investors interested in financing projects and enterprises that focus on green design, sustainability and resilience.¹⁴ Also, state pooling of municipal bonds might enable certain cities or utilities with low credit ratings to more readily access lower-cost funds on the national capital markets.

Municipally owned utilities might consider forming public–private partnerships (P3s) with investor-owned water utilities or private water services companies that include agreements for the private entity to invest a designated amount of capital

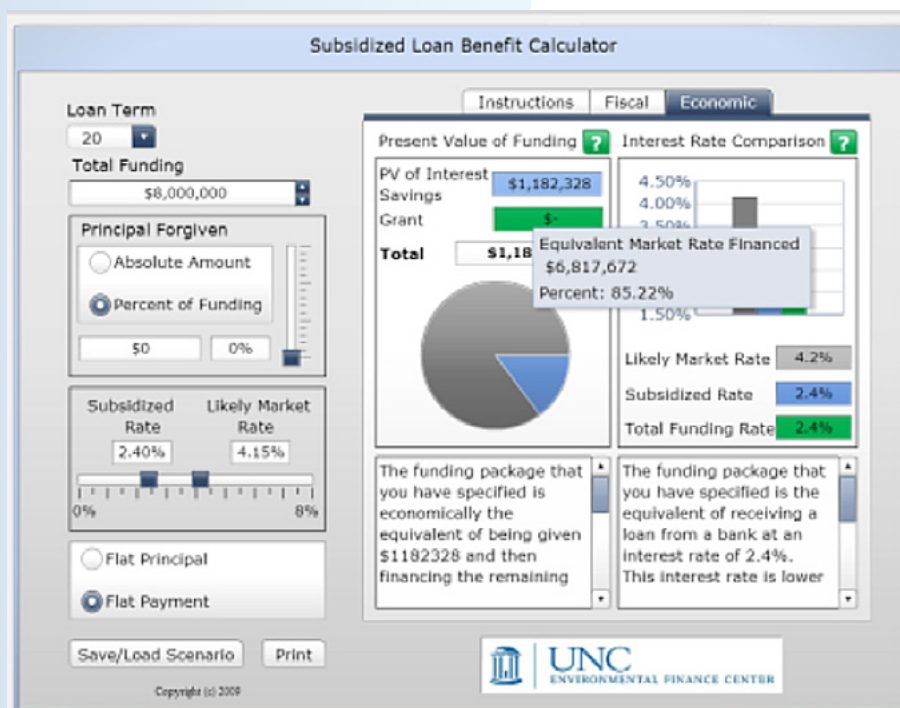
The cost of upgrading New Jersey's urban water infrastructure will be expensive and will need to be phased in over time.

in infrastructure improvements over a set period of time. A P3 was forged between the Bayonne (New Jersey) Municipal Utilities Authority (BMUA) and United Water (with financial participation by private investor KKR) in 2012, for example. Through this 40-year deal, the BMUA will continue to own its water and wastewater assets, while United Water operates the system under a rate schedule established in the contract, retires \$130 million of BMUA debt and invests \$107 million into upgrading

aging infrastructure.¹⁵ In Maryland, the Urban Stormwater Retrofit Public-Private Partnership Demonstration Pilot in Prince George's County is designed to leverage private equity to finance the implementation of green infrastructure projects that will control stormwater and help the county meet its regulatory obligations under the Chesapeake Bay Total Maximum Daily Load. The project is also expected to create numerous local jobs and boost economic growth.¹⁶

Communicating Financing Options to Stakeholders

Jeff Hughes, director of the Environmental Finance Center at the University of North Carolina (UNC EFC), offered insights on a critical question: How will New Jersey's cities pay for water infrastructure upgrades? In addition to outlining various common financing strategies water and wastewater utilities can use to support infrastructure improvements, Hughes presented the EFC Subsidized Funding Benefit Calculator, developed at the UNC EFC. The tool illustrates in clear and understandable terms the cash-value proposition of subsidized interest rates, such as those provided by the NJEIFP, and can be useful for explaining the benefits of low-interest loans to ratepayers, elected officials and other stakeholders. The calculator is available on the [UNC EFC website](#).¹⁷



Cities also have opportunities to coordinate and leverage public and private investment in water infrastructure. Water utilities or departments can coordinate with other local departments (e.g., transportation, parks and recreation) to leverage funding for joint projects. It is also possible to encourage private investment in water infrastructure by establishing state and local performance standards for new development and redevelopment, as well as financial incentives for developers to manage stormwater onsite (e.g., state tax credits, reduced monthly utility fees,

Cities will need to coordinate and leverage public and private investment in water infrastructure.

grants). In the summer of 2014, for example, the Philadelphia Water Department launched the Green Acre Retrofit Program, which provides grant funding to companies or contractors to construct stormwater projects on private property in the city's combined sewer area. The program is specifically targeted at companies and project aggregators that can assemble large areas for stormwater management projects.¹⁸ Crowdfunding initiatives are another emerging opportunity to bring private funding into the public sphere and have been particularly successful to date when applied to civic projects focused on greening neighborhoods.¹⁹

Most cities and utilities will need to increase their revenue streams to honor more substantial debt obligations associated with major capital improvements. While rate increases will be unavoidable in some cases, other revenue sources will often be necessary as well. Fortunately, other revenue tools and mechanisms are available that can help cities in New Jersey supplement rate-based revenues and help keep rates affordable. Low-hanging opportunities include establishing legal protection of designated water utility revenues, and consistently collecting connection

fees instead of waiving them as an incentive to attract development or business. Regardless of the revenue-generation scheme, decision makers will have to address affordability issues, which could be especially challenging in poorer cities where household assistance programs will be difficult to finance. Regional or statewide approaches may be necessary to address this issue.

A potentially significant source of revenue to fund projects to control CSOs and stormwater runoff are stormwater utility fees. Cities and towns across the nation, including Philadelphia and Washington, DC, have successfully implemented stormwater utility fees that are based on the amount of impervious surface area on a given property.²⁰ However, statutory support for stormwater utility fees is weak in New Jersey, with none currently existing in the state.²¹

Some CSO cities are examining existing avenues through which they may be legally able to establish stormwater fees. The examination centers on the argument that municipalities should be able to charge for the control or treatment of stormwater because technically it becomes sewage once it merges with sanitary flows in a combined system. While existing statutes on sewer rates apparently allow CSO municipalities to charge for stormwater contributions to combined sewers, other municipalities lack clear authorization to charge for stormwater management. Authorization outside of combined sewer areas would require legislative action. A statewide clean water fee could be another option for New Jersey, with potential models established in Maryland and proposed in Delaware. The revenue from Maryland's Bay Restoration Fund Fee (commonly known as the "flush tax") is dedicated to upgrading wastewater treatment plants, fixing failing septic systems and funding cover crops to improve the health of the Chesapeake Bay.²²

Navigating Toward the Infrastructure of the Future in New Jersey

The Framework for Change presented below reflects a continuum of change for the transformation of U.S. water infrastructure – from optimizing existing

systems to implementing truly transformative changes that will be needed to address future challenges. The Framework shows examples for each phase of change that align with discussions during the May 2014 convening regarding the trajectory of and vision for New Jersey's urban water infrastructure.²³

Figure 1: Framework for Change: Examples for New Jersey

PHASE 1 Optimize



Image courtesy of iStock Photo

Example: Conduct a water audit and an assessment of assets, such as pipes and pumps, including their location, age and condition, and then adopt a schedule to repair leaks and fix or replace severely degraded system components, with the goal of reducing water loss; preventing main breaks, sewer collapses and backups; and increasing overall operational efficiency.

PHASE 2 Transition



Image courtesy of Michele Bakacs and Rutgers New Jersey Agricultural Experiment Station Cooperative Extension

Example: Implement green infrastructure projects using best management practices such as rain gardens, tree box filters, bioswales, green roofs and pervious pavement, with a focus on capturing stormwater where it falls and reducing pressure on combined and separate storm sewer systems. Implement on-site energy generation systems, such as biogas-fired turbines fueled by methane produced in anaerobic digesters, at wastewater treatment plants.

PHASE 3 Transform



Image courtesy of WRT Design and the City of Philadelphia

Example: Scale up citywide implementation of green infrastructure projects to generate an array of compounding benefits, including reduced flooding; control of combined sewer overflows; groundwater recharge; public green spaces; reduced urban heat-island effect; economic growth and an overall higher quality of life for residents. In addition, achieve energy neutrality for wastewater treatment and recover phosphorous and other useful products from sewage.



Conclusion: Leadership for Sustainable New Jersey Cities

Garnering the political will and funding to address New Jersey's urban drinking water, wastewater and stormwater infrastructure challenges will require concerted, collaborative leadership from the private, public and nongovernmental sectors. The participants in the May 2014 convening agreed that the imperative to address CSOs represents an opportunity for the state's cities to leverage long-overdue investments in water infrastructure to create sustainable and resilient urban communities with healthy environments, vibrant economies and

an excellent quality of life. Cities and utilities have an opportunity to go beyond baseline compliance and develop integrated plans that solve water problems while generating other community benefits that make life better for current residents and attract new people and businesses. With the May 2014 convening, New Jersey Future, the Geraldine R. Dodge Foundation and the participating leaders created a platform for significant and strategic action to catalyze the transformation of New Jersey's urban water infrastructure. The imperative now is to continue to build and sustain that momentum for change so that New Jersey's cities will be able to seize the opportunities before them.



Appendix: Meeting Participants

Honorary Co-Chairs

James Florio
*Governor of New Jersey,
1990–1994*
Founding Partner
Florio Perrucci Steinhardt & Fader

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Ed Clerico
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Endnotes

- ¹ D.J. Van Abs, et al., *Water Infrastructure in New Jersey's CSO Cities: Elevating the Importance of Upgrading New Jersey's Urban Water Systems*, New Jersey Future, May 2014, p. 2. Available online at: <http://www.njfuture.org/wp-content/uploads/2014/04/Urban-Water-Infrastructure-Report-Final-May-9-Under-10MB.pdf>.
- ² U.S. Environmental Protection Agency (EPA), "New Jersey Water Quality Assessment Report: New Jersey Probable Sources Contributing to Impairments for Reporting Year 2010." Available online at: http://ofmpub.epa.gov/waters10/attains_state.control?p_state=NJ#prob_source.
- ³ *Facing Our Future: Infrastructure Investments Necessary for Economic Success*, Council of New Jersey Grantmakers, April 2013, p. 33. Available online at: www.cnjg.org/facingourfuture.
- ⁴ Van Abs, p. 125.
- ⁵ *Understanding New Jersey's Vulnerability to Climate Change*, Georgetown Climate Center and Rutgers Climate Institute, February 2014. Available online at: http://www.georgetownclimate.org/sites/default/files/understanding-new-jerseys-vulnerability-to-climate-change_0.pdf.
- ⁶ See <http://www.njfuture.org/wp-content/uploads/2014/06/Agenda-for-Change.pdf> to download the three-page consensus *Agenda for Change for New Jersey's Urban Water Infrastructure* from the New Jersey Future website.
- ⁷ See <http://www.nj.gov/dep/dwq/cso.htm> for more information about the New Jersey Department of Environmental Protection's Combined Sewer Overflow Permit Program.
- ⁸ Green infrastructure uses small-scale measures such as rain gardens, pervious pavement, vegetated roofs, street trees and other landscaping features to capture stormwater before it reaches combined sewers or separate storm sewers. See <http://water.epa.gov/infrastructure/greeninfrastructure/index.cfm> for information from the U.S. EPA.
- ⁹ S.H. Black, "Better Stormwater Management for a Better Bottom Line," *Development*, NAIOP: Commercial Real Estate Development Association, Spring 2014. Available online at: <http://www.naiop.org/en/Magazine/2014/Spring-2014/Development-Ownership/Better-Stormwater-Management.aspx>.
- ¹⁰ See <http://www.epa.gov/ems/> for information about Environmental Management Systems, and http://www.epa.gov/npd/pubs/cmom_guide_for_collection_systems.pdf for a guide to evaluating Capacity, Operations and Maintenance programs for sanitary sewer systems.
- ¹¹ See <http://www.nj.gov/dep/watersupply/pdf/guidance-amp.pdf> for information and guidance regarding the asset management requirements of the New Jersey Environmental Infrastructure Financing Program.
- ¹² See <http://www.dcwater.com/workzones/projects/cleanrivers.cfm> for more information about DC Water's CSO LTCP, known as the Clean Rivers Project.
- ¹³ See <http://www.nj.gov/recovery/infrastructure/cwsrf.html> for more information about New Jersey's Clean Water State Revolving Fund.
- ¹⁴ See http://www.dcwater.com/news/listings/press_release663.cfm for information about DC Water's green bond offering in July 2014.
- ¹⁵ See <http://www.unitedwater.com/bayonne/company-overview.aspx> for more information about the public-private partnership between Bayonne Municipal Utilities Authority and United Water.
- ¹⁶ See <http://yosemite.epa.gov/opa/advpress.nsf/0/C73E9DD8611D83AD85257C5C005CBD1B> for more information about the Prince George's County Urban Stormwater Retrofit Public-Private Partnership Demonstration Pilot.
- ¹⁷ See <http://www.efc.sog.unc.edu/reslib/item/subsidized-funding-benefits-calculator> for more information about the EFC Subsidized Funding Benefit Calculator.
- ¹⁸ See <http://www.phila.gov/water/wu/Stormwater%20Grant%20Resources/GARPFactSheet.pdf> for more information about the Philadelphia Water Department's Green Acre Retrofit Program.
- ¹⁹ R. Davies, *Civic Crowdfunding: Participatory Communities, Entrepreneurs and the Political Economy of Place*, MIT Center for Civic Media, June 2014. Available online at <http://ssrn.com/abstract=2434615>.
- ²⁰ See <http://www.phila.gov/water/wu/stormwater/Pages/default.aspx> for information about the Philadelphia Water Department's stormwater fee, and <http://www.dcwater.com/customer-care/iab.cfm> for information about DC Water's Clean Rivers Impervious Area Charge.
- ²¹ W. Campbell, *Western Kentucky University Stormwater Utility Survey 2013*, Western Kentucky University, 2013. Available online at: http://www.wku.edu/engineering/civil/fpm/swsurvey/western_kentucky_university_swu_survey_2013.pdf/.
- ²² See <http://www.mde.state.md.us/programs/Water/BayRestorationFund/Pages/Index.aspx> for more information about Maryland's Bay Restoration Fund.
- ²³ The Framework for Change presented here builds upon iterations presented in previous Charting New Waters reports from conferences held in April, August and December 2013. Those reports are available online at: <http://www.johnsonfdn.org/aboutus/chartingnewwaters>.





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