CAMDEN: RISING ABOVE THE FLOODWATERS



HE CITY OF Camden, referred to by poet Walt Whitman as "a city invincible,1" was once a major manufacturing and shipbuilding hub along

the Delaware River. At its peak in 1950, Camden's population stood at 125,000. Today, Camden is the 12th largest city in New Jersey at 77,000 people. The exodus of businesses and residents has strained the municipal tax base to the point where the city has difficulty providing even basic services. Neglected water and sewer systems in the city, some of which date back to the late 19th and early 20th centuries, have exacerbated the

An abandoned factory once used by the RCA Corporation to make the Victrola phonograph has been redeveloped into The Victor, luxury loft apartments with ground-floor restaurants and retail.

regular problems of an old combined sewer and stormwater system. Silt and debris are accumulating in sewer lines, reducing capacity to a fraction of what it was originally and causing backups and flooding across the city. An influx of new businesses would help to generate the tax revenue necessary to maintain and upgrade these systems; however, the city faces an unfortunate catch-22 if flooding and sewer backups cause businesses to seek other locations.

Despite these challenges, the city is starting to see sparks of revitalization. The downtown waterfront has been transformed into an entertainment district, featuring a minor league ballpark, aquarium, concert venue, market-rate housing and new office buildings. Local anchor institutions Rutgers-Camden, Rowan University and the Cooper University Hospital have made tremendous efforts to revitalize the areas around their campuses. Community groups have partnered with the city to revitalize parks and neighborhoods. The former Riverfront State Prison has been demolished and neighborhood plans have outlined visions for economic revitalization and waterfront parks.

A LOOK AT HOW THE CITY'S WATER INFRASTRUCTURE IS HAMPERING ITS REVITALIZATION, AND SOME OF THE STEPS IT'S TAKING TO ADDRESS THE PROBLEM.

Brick-lined sewers from the 19th and early 20th centuries still serve the city. Photo credit: Coopers Ferry Partnership.

The following stories illustrate the ways water infrastructure affects the people and places of Camden, for both good and bad:

Thinking Twice Before Going Out in the Rain: The challenges one neighborhood faces each time it rains, and the solution community leaders are putting in place.

"Rain Days" Stymie Camden Commuters: While most in New Jersey are familiar with delays and cancellations on snow days, Camden commuters face the same issues when it rains.

Making a SMARTer Difference, a Million Gallons at a Time: How residents, businesses and government have come together to build many small green-infrastructure projects that collectively make a big difference.

"Just the Cost of Doing Business"—Rebuilding Camden's Infrastructure, Block by Block, Grant by Grant: The steps that Camden has been taking to make development possible.

Although dysfunctional water infrastructure continues to allow flooding in Camden's homes, streets and highways, recent upgrades go well beyond fixing underground pipes. These projects are also greening Camden's neighborhoods with new parks and making sites shovel-ready for redevelopment.



THINKING TWICE BEFORE GOING OUT IN THE RAIN

THE CHALLENGES ONE NEIGHBORHOOD FACES EACH TIME IT RAINS, AND THE SOLUTION COMMUNITY LEADERS ARE PUTTING IN PLACE.

eishka Mitchell, a Camden native and vice president of neighborhood initiatives with Cooper's Ferry Partnership, a non-profit redevelopment organization in Camden, gives talks across New Jersey on the state of water infrastructure in her city. Along with the photos of flooded houses, she includes a video clip² of a school bus







Manny Delgado addresses water issues in many if not most of his projects. The Cramer Hill Community Development Corporation installs rain gardens to mitigate flooding for existing residents and helps them to pump out their basements after floods.

carefully navigating its way through floodwater in the Cramer Hill neighborhood in northern Camden. After the clip has finished, she points out, "That's not just rain," alluding to the fact that flooding exacerbates problems with the city's combined sewers, which often overflow during rain events and bring raw sewage to streets, parks and neighborhoods. Her audiences grasp the gravity of this situation when they realize that students on that bus will need to walk through these waters to get home, and they will encounter a similar health hazard if they play outside afterwards.

Manny Delgado echoed Meishka Mitchell's story with a phrase heard frequently when people discuss the flooding problems in Camden: "It doesn't take a lot of rain." While Manny is not a water expert by trade, he has become well versed in addressing water-related problems. As executive director of the Cramer Hill Community Development Corporation, Manny works to improve the quality of life for the residents of Cramer Hill, whether it is through the development of affordable housing, the recent development of the Salvation Army Ray and Joan Kroc Community Center, or community planning and organizing projects.

Another project takes Manny to nearby Von Neida Park, a 19-acre park with baseball fields, playgrounds, basketball courts, soccer fields, and a tennis court.

Flood "waters," the result of a combination of heavy rains, high tides and a collapsing, century-old combined sewage and stormwater system, plague the Cramer Hill neighborhood of Camden. Photo credits: Coopers Ferry Partnership.



Proposed improvements to Von Neida Park include separation of underground sewage and stormwater pipes and the reopening of a buried creek, along with construction of ball fields and other facilities. The project is scheduled to begin construction in early 2014. (The reopening of Baldwin's Run will take place to the west of the park.). Image credit: Coopers Ferry Partnership.

Over a century ago, the Baldwin's Run creek ran through the park on its way to the Delaware River. The stagnant waters welcomed mosquitoes, prompting officials to fill in the creek, but with little understanding of how the surrounding topography caused water to drain into the area. When the pipe carrying the combined sewer and stormwater from the park and surrounding neighborhood later collapsed, untreated sewage began flooding the park and surrounding basements during heavy rainstorms. According to Manny, an inch of steady rain can cause flooding of between two and three feet in and around Von Neida Park. In one recent flood event near the park, local basements filled with between six and eight feet of water and sewage. Not only do sewage backups create a public health hazard and serious inconvenience, they are tremendously costly for homeowners who lack sump pumps and/or the resources to move their furnaces and appliances up out of harm's way.

These problems are finally beginning to be addressed through upgrades to underground water infrastructure that will return a functioning park to its neighborhood. The Cramer Hill Community Development Corporation has teamed up with Coopers Ferry Partnership, the City of Camden, Camden County, the Camden County Municipal Utilities Authority (CCMUA) and other partners to reopen the buried creek to the west of the park and install new, separate sewer and stormwater lines using grants from the U.S. Environmental Protection Agency and the New Jersey Department of Environmental Protection Green Acres program. Restoring the natural drainage pattern of Baldwin's Run will allow rainwater to flow out to the Delaware River and reduce the strain on the sewer system.



This decorated utility box in Von Neida Park shows neighbors' awareness of the need to create a healthy park.



"RAIN DAYS" STYMIE CAMDEN COMMUTERS





WHILE MOST IN NEW JERSEY ARE FAMILIAR WITH DELAYS AND CANCELLATIONS ON SNOW DAYS, CAMDEN COMMUTERS FACE THE SAME ISSUES WHEN IT RAINS.

T'S NOT JUST the school buses that are slowed by flooding and sewage overflows. Rain events in Camden can bring transportation and commerce to a halt when aging sewer lines are unable to keep roadways clear of stormwater. U.S. Route 30, the highway that links Philadelphia, Camden and Atlantic City, follows the Cooper River through Camden. Despite a recent \$7.8-million drainage project, heavy flood events still force the closure of the road,³ causing a detour for 80,000 daily users.⁴

Adding insult to injury, high tides from the Delaware River amplify rain events, exacerbating flooding in Camden's downtown business and entertainment

Above: Heavy rain events in downtown Camden, like this one in July 2013, can bring the city to a standstill. Photo credit: Coopers Ferry Partnership.

Left: New Jersey Transit's southernmost light rail system, the RiverLINE, connects Trenton to Camden's waterfront, as long as the tracks are not flooded. Water main breaks, rain events and other water-related events accounted for 40 percent of all RiverLINE train delays between 2011 and 2012, or 541 trips.



Floodwaters from rain events have been known to reach the top of the train platform at Camden's Aquarium station, significantly higher than the threshold required to cancel RiverLINE service. The photo to the left shows how easily flood waters can reach the station platform, and the scale of this flooding is demonstrated by the photo to the right. Photo credits: Coopers Ferry Partnership (left), New Jersey Future (right).

districts and leaving employers with no choice but to close or risk their employees' being stranded. In addition, the city's outfalls lack tidal pumps, which are needed to push the combined sewage out during a high tide.

Flood conditions also force the closure of the RiverLINE, New Jersey Transit's light rail system in the region. Running from Trenton to Camden, the RiverLINE boasts an annual ridership of 2.8 million people, giving South Jersey access to state offices in Trenton as well as connections to New York, Atlantic City and Philadelphia. According to New Jersey Transit, in 2011 and 2012, 541 RiverLINE trips were delayed as a result of water main breaks, rain events or other waterrelated events, representing 40 percent of all RiverLINE train delays. When floodwaters rise above "curb height," according to RiverLINE Superintendent Maureen McCole, New Jersey Transit suspends light rail service along the final 1.5-mile section to prevent damage to railcars that could cost hundreds of thousands of dollars. This final stretch of the RiverLINE includes three stops that serve major destinations like the Rutgers-Camden campus; private offices such as L3 Communications and Susquehanna Bank; entertainment venues including the aquarium, baseball stadium and performing arts center; and nearby residential buildings that house RiverLINE commuters. NJ Transit can address some RiverLINE service closures with buses, but only when floodwaters still permit.

In the past year, heavier rain events have also begun to affect the Walter Rand Transit Center, the city's downtown transit hub that offers connections among the RiverLINE, local buses, and the PATCO transit line to Philadelphia. Eventually, this station will also serve as the northernmost terminus for the proposed Glassboro-Camden light rail line. Downtown flooding threatens the functionality of the entire regional transit network.



MAKING A SMARTER DIFFERENCE, A MILLION GALLONS AT A TIME

HEN WE FIRST went into the community, it was tough to get anyone to take us seriously," Dr. Chris Obropta of Rutgers University explains about the challenges his team faced when they decided to work in Camden. "They were used to classes of students coming in to the neighborhood for a semester-long project that would 'fix Camden,' only to leave once the semester was over and the grades were in." Only after he was able to explain that Rutgers University's Water Resources Extension Program staff would be there for the long term, and also had the money and resources to bring projects to fruition, was he taken seriously.

Dr. Obropta's team has been working in Camden as a member of the Camden SMART (Stormwater Management And Resource Training) Team, alongside Camden County Municipal Utilities Authority (CCMUA), the City of Camden, New Jersey Department of Environmental Protection, Coopers Ferry Partnership, HOW RESIDENTS, BUSINESSES AND GOVERNMENT HAVE COME TOGETHER TO BUILD MANY SMALL GREEN INFRASTRUCTURE PROJECTS THAT COLLECTIVELY MAKE A BIG DIFFERENCE.

and the New Jersey Tree Foundation. Camden SMART works to reduce flood events in at-risk neighborhoods through the utilization of rain gardens, rain barrels, street trees and other green infrastructure projects. Residents in affected neighborhoods play a major role in building these projects, learning about stormwater problems and solutions at the same time.

One of these projects is located in Camden's floodprone Waterfront South neighborhood, an area that was once an industrial hub for the city, but today is full of scrapyards and contaminated sites. To address concerns about both flooding and contamination, the Camden SMART team remediated a contaminated site that was

Above: City residents construct rain barrels with help from Rutgers Cooperative Extension's Water Resources Program staff. Photo credit: Shahid Rana, Coopers Ferry Partnership.



Mayor Dana Redd speaks to the second annual Camden SMART Forum in January 2014, explaining that, along with schools and safety, addressing the overall environmental quality of life in Camden is critical to making the city a place in which people will want to work, live, play and invest. Photo credit: Coopers Ferry Partnership.

previously used as a gas station and contained 12 underground storage tanks and over 1,800 tons of contaminated soil. Working with the community, the team transformed the site into a publicly accessible community park with a series of rain gardens that capture 470,000 gallons of stormwater annually – water that would otherwise enter the sewer system and contribute to sewer overflow events.

In the two years since the SMART Initiative began, 992 trees have been planted, 27 green-infrastructure projects have been installed, and 120 rain barrels have been distributed, allowing the city to capture and infiltrate 3.1 million gallons of stormwater each year. While this number is impressive, it represents a fraction of the 56 million gallons of stormwater and wastewater treated daily by the CCMUA. Members of the SMART Initiative recognize that their green-infrastructure initiatives will not replace the need to upgrade the city's combined wastewater and stormwater system. But these projects eliminate many of the floods from smaller rainstorms at the same time that they beautify neighborhoods, improve air quality and create recreational space. And, by working with the community on these hands-on projects, the SMART Initiative strengthens its advocacy network to address the bigger problems plaguing the water system.

To tackle these larger problems, the CCMUA has recently received \$5.5 million from the New Jersey Environmental Infrastructure Trust to separate seven of the worst combined sewers in the city, remove 5.5 acres of pavement in the Waterfront South neighborhood, and create additional rain gardens and improvements to Von Neida Park. CCMUA is also working with surrounding suburban municipalities, whose sewage and stormwater systems are already separated, to reduce their infiltration and inflow⁵ into the county system, in order to make more room for Camden's combined sewage during rain events. These projects will help to take the strain off of the existing system, while also making necessary repairs and improving quality of life in Camden.





Camden SMART transformed a former contaminated gas station site (top) in the Waterfront South neighborhood into a pedestrian-accessible rain garden (above) that now absorbs 470,000 gallons of stormwater annually. Sites like this feature low-cost infrastructure projects that educate and involve the community while reducing flooding and beautifying the neighborhood. Photo credits: Frank McLaughlin (top), and Rutgers Water Resources Program (bottom).

> Andy Kricun, CCMUA's executive director, heads the organization responsible for treating wastewater from the City of Camden and neighboring municipalities. CCMUA plays a leadership role in promoting green-infrastructure projects in Camden that capture stormwater where it falls – before it hits the

combined storm and sewer pipes. The less water that makes its way into the system, the less sewage CCMUA must treat, and the fewer backups, floods, and overflows Camden must endure. Photo credit: CCMUA.



Crews replace a water main in Camden's downtown waterfront area, as part of Coopers Ferry Partnership's work to create the infrastructure necessary to spur economic development in Camden. Photo credit: Coopers Ferry Partnership.

REBUILDING CAMDEN'S INFRASTRUCTURE, BLOCK BY BLOCK, GRANT BY GRANT

OR THE COOPERS Ferry Partnership to attract redevelopment projects in Camden, replacing and separating deteriorating water, sewer and stormwater pipes is "part of the cost of doing business." Coopers Ferry works with the city and other local partners to make key sites viable for redevelopment by securing the funding necessary to upgrade the water, wastewater and stormwater pipes and adjacent roads. (Technically, the city requires private developers to upgrade infrastructure; however, the cost of doing so can mean the difference between attracting a business to Camden and watching it locate elsewhere.) While the process is slow and piecemeal, each of these retrofits adds stronger pipes and additional capacity to the entire system, reducing the chances of future overflows.

When the planned closure of the Riverfront State Prison was announced in 2007 and the building was demolished two years later, Camden was given an opportunity to continue the progress made in reinventing its waterfront. In 2008, a local community group, Save Our Waterfront, along with Coopers Ferry Partnership, the City of Camden and other stakeholders, developed



As part of the community visioning plan for the former Riverfront State Prison site, Coopers Poynt would be a mixed-use development with recreational amenities and green infrastructure. Image credit: Coopers Ferry Partnership.

a vision plan for the prison site that included a mix of residential and retail development, recreational amenities, green infrastructure and reconstructed wetlands.

In advance of its potential redevelopment, Coopers Ferry Partnership continues to work with the North Camden community to refine the vision for reuse of the site. In February 2014 the Camden City Council adopted the redevelopment plan for the area, the North Camden Waterfront Study Area Redevelopment *Plan.* Since the site is owned by the state of New Jersey, the next step in the process will be for the New Jersey Economic Development Authority to issue a request for proposals for its redevelopment. New Jersey's Department of Transportation has partnered with Coopers Ferry Partnership in the past to replace and separate sewage lines as part of new road construction. Plans for road construction and sewer separations are currently being developed for the prison site, and once these plans are completed, Coopers Ferry Partnership will pursue state and federal transportation enhancement funding for the construction phase, adding modern infrastructure to yet another waterfront parcel.



Adjacent to the Ben Franklin Bridge and Camden's downtown business district, this vacant lot was once the site of Riverfront State Prison and is now the subject of multiple development proposals.



Meishka Mitchell of Coopers Ferry explains that replacing water infrastructure is "just the cost of doing business," a necessity to attract private investment and revitalize Camden's neighborhoods and downtown. Photo credit: Coopers Ferry Partnership.

Notes

CAMDEN

1 Whitman, Walt. Leaves of Grass. 1900.

2 Camden SMART. "Camden SMART 2014 Trailer." YouTube video, 2:09. Posted by "Camden Smart," January 29, 2014. https://www. youtube.com/watch?v=rULgne7stg4

3 DeNardo, Mike. "Admiral Wilson Boulevard Floods Despite Costly Drainage Project." KYW Newsradio 1060, April 19, 2011. Accessed April 9, 2014. http://philadelphia.cbslocal.com/2011/04/19/admiralwilson-boulevard-floods-despite-costly-drainage-project/

4 Delaware Valley Regional Planning Commission. US 30 Corridor Study: Camden County, New Jersey. Delaware Valley Regional Planning Commission, July 2002. Accessed April 9, 2014. http:// www.dvrpc.org/reports/02028.pdf

5 The terms infiltration and inflow refer to the unintended entry of water into a sanitary sewer line through defects in the line, and can come from rainwater that is absorbed into the soil either from above or from the water table below.

HOBOKEN

6 Walk Score ranks neighborhoods and municipalities on a scale of 0-100 depending upon as-the-crow-flies proximity to everyday amenities such as restaurants, grocery stores, schools and parks. Hoboken's Walk Score is 95, which puts it at the top of Walk Score's list for small cities (population 50,000-100,000). The average Walk Score of New Jersey's 61 largest municipalities is 59.

7 OMA, Royal HaskoningDHV, Balmori Associates and HR&A Advisors. "Resist, Delay, Store, Discharge: A Comprehensive Strategy for Hoboken." Plan presented at the Hoboken City Council Meeting as part of the Rebuild By Design initiative, March 5, 2014.

8 Rebuild by Design. "Resist, Delay, Store, Discharge: a comprehensive strategy for Hoboken." Accessed April 16, 2014. http://www.rebuildbydesign.org/project/comprehensive-strategy/

9 Together North Jersey. "Hoboken Green Infrastructure Strategic Plan." Accessed April 16, 2014. http://togethernorthjersey.com/wpcontent/uploads/2014/04/20140404_Hoboken- Report_sm.pdf

10 City of Hoboken. "Southwest Park Design Concepts." Accessed April 16, 2014. http://www.hobokennj.org/content/wp-content/ uploads/2013/10/SW-Park-4-Design-

11 LEED (Leadership in Energy and Environmental Design) Certification is the U.S. Green Building Council's audit-based system that awards points to green buildings based on the number of sustainable actions taken. Certifications start with Basic and move up through Silver, Gold and Platinum.

12 The Hostess Building is not without its share of environmentsustaining features: It boasts a 20,000-sq.-ft. green roof, the first of its kind in Hoboken. Concepts.pdf

JERSEY CITY

13 Hackensack Riverkeeper. "The Truth About CSOs." YouTube video, 7:26. Posted by "Hackensack Riverkeeper," November 26, 2013. https://www.youtube.com/watch? v=wBY3idYRKbw

14 ioby. "About ioby." Accessed April 8, 2014. http://www.ioby.org/ about.

PASSAIC

15 Williams, William Carlos. *In the American Grain*. 1925. Reprint, New York: New Directions, 2009.

16 Beale, David T., Karin Platt, Robert B. Nicholas, John P. Leidy, and John Kolesar, Director. *Pollution Control on the Passaic River*. Princeton, New Jersey: Center for the Analysis of Public Issues, 1972.

17 National Park Service. "Lowell National Historic Park (1978-2008): 30 Years of Preservation and Innovation for Future Generations." Accessed April 11, 2014. http://www.nps.gov/ lowe/parkmgmt/upload/NPS_30th%20-%20small.pdf. Similar to Paterson, Lowell was developed in the early 19th century as a planned industrial community for the production of textiles. Following a decline similar to Paterson's, parts of Lowell were declared a National Historic Park in 1978, becoming the nation's first urban national park. However, success did not happen overnight; the restoration and revitalization of Lowell has continued to the present. Thirty years later, in 2008, 3,850,000 square feet or 77 percent of the historic mills have been rehabilitated, attracting nearly 700,000 visitors annually

18 Hamilton Partnership for Paterson. "Mill Mile –Paterson
Great Falls National Park." YouTube video, 1:35. Posted by
"HamiltonPartnership," April 23, 2013. https://www.youtube.com/
watch? v=owlZ_L1R-bE

19 Passaic Valley Water Commission. "2012 Water Quality Report." Accessed April 8, 2014. http://www.pvwc.com/water%20quality/ PVWC_1605002_2013CCR_2012WQReport.pdf

20 The PVWC Consumer Confidence Report reads: "Lead: Passaic Valley Water Commission PWS ID NJ1605002 exceeded the lead action level during the July 1 - December 31, 2012, monitoring period. Customers were notified about this in the lead brochure that was mailed out in December 2012. Additional information is provided elsewhere in this report regarding steps you can take to reduce your exposure to lead in drinking water and how to obtain additional copies of this report and a copy of the lead brochure."

21 The PVWC Consumer Confidence Report details action being taken: "PVWC is moving forward with design and construction of satellite corrosion control treatment systems to reduce the potential of lead dissolving into the water. These treatment systems are being phased in as part of the reservoir improvement project where each phase will provide treatment to specific areas of the distribution system. Once the reservoir improvement project is completed and the uncovered finished water reservoirs are replaced by covered storage tanks, the entire service area will receive corrosion control treatment. In addition, PVWC continues implementing a multi-faceted lead public awareness and education program."

22 According to the USGS Stream Gauge in Little Falls, N.J. (immediately upstream of Paterson), of the 25 largest recorded floods in the past century, 11 occurred in the past 25 years, with nine being considered major floods (at least two feet over flood stage), and two being considered moderate floods (at least one foot over flood stage). 23 Malinconico, Joe. "Paterson ready to approve 11 buyouts on city's north side." Paterson Press, May 27, 2013. Accessed April 9, 2014. http:// www.northjersey.com/news/paterson-ready-toapprove-11-flood-buyouts-on-city-s-north-side-1.565713

24 Passaic County Department of Planning and Economic Development, with assistance from Parsons Brinckerhoff. "Moving Passaic County: Transportation Element of the Passaic County Master Plan." Accessed April 16, 2014. http://www. passaiccountynj.org/DocumentCenter/View/126



ABOUT NEW JERSEY FUTURE



Founded in 1987, New Jersey Future is an independent not-for-profit organization, working for better development and quality growth in the Garden State. New Jersey Future focuses on promoting smart growth and advancing implementation of the State Development and Redevelopment Plan by conducting research and analysis on key issues, building consensus for broad solutions, hosting events to educate and inform, and implementing plans on the local level to build stronger, more resilient communities.

ABOUT THE AUTHORS



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Chris Sturm directs New Jersey Future's policy development and advocacy across a host of issues including state and regional planning, sustainable infrastructure, and incentives for compact, equitable development.

She spearheaded the adoption of legislation authorizing better cluster development tools, and is frequently quoted in the media. Chris serves as a trustee for the Council on Affordable Housing and the Environment, and is a member of the Clean Water Council of New Jersey and the New Jersey Climate Adaptation Alliance. Her career experience includes serving as the assistant director of the Capital City Redevelopment Corporation, as well as working for the MSM Regional Council (now PlanSmart NJ), the Eagleton Institute, and the Office of State Planning. She holds a master's degree in public affairs from the Woodrow Wilson School at Princeton University, where she concentrated in urban and regional planning.



Nicholas Dickerson, Planning and Policy Analyst

Nick focuses on policy and planning initiatives ranging from research to on-the-ground implementation, focusing on issues including water and natural resources, sustainable infrastructure and ways to develop compact, livable communities.

Prior to joining New Jersey Future, he served as the community and natural resource planner for Pike County, Pennsylvania, where he monitored implementation of the county open space plan, provided planning assistance to local municipalities, coordinated the county's shale gas task force and communicated with print and televised media on planning projects. Recently Nick was selected to participate as a member of the Environmental Leadership Program's Eastern Regional Fellowship Class of 2014.