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Group Seeks Sustainable, Integrated Water Projects

By Catherine A. Cardno, Ph.D.



The Re.Invest Initiative is seeking eight cities interested in overhauling their storm-water handling systems in a manner that combines multiple infrastructure projects, uses sustainable solutions, and saves time and money. Photo by Alan Cressler, USGS
A new initiative is seeking as many as eight cities for a pilot program that will upgrade municipal water infrastructures with sustainable options that save both time and money.

January 29, 2013—A new water infrastructure initiative, funded in part by a grant from the New York City-based Rockefeller Foundation, is seeking as many as eight cities within the United States to participate in a two-year program that will overhaul their municipal storm-water and wastewater infrastructures with sustainable options. The Re.Invest Initiative will pair the ideas of sustainable solutions and community resiliency, bring together public and private entities, and match investors with cities in need.

Speaking on the subject on behalf of the Obama administration, Nancy Sutley, the chair of the Council on Environmental Quality, and David Agnew, the director of Intergovernmental Affairs, wrote on their [blog](#) that the Re.Invest Initiative—and other programs like it—are an “encouraging step to support clean and healthy cities and save taxpayer dollars.”

The Re.Invest Initiative is designed to bring together engineering, legal, and private financial assistance to help cities upgrade their water infrastructure, with a focus on projects that can incorporate upgrades to broadband internet and energy infrastructure simultaneously, according to Shalini Vajjhala, Ph.D., a cofounder of Washington, D.C., and Honolulu-based c.dots development LLC, which is managing and implementing the initiative’s plans. (The development company was cofounded with Celeste Connors.)

“We’re looking for cities that are interested in making a transition to a green water infrastructure, that could [also] benefit from integrating systems,” Vajjhala says. “Cities that are looking to dig up their roads, put underground power lines in, or to do broadband network expansion, often end up paying twice to dig up their streets—once to put down pavement for storm water and

the second time to actually put things under the street.”

The reason for this, Vajjhala notes, is that public municipalities have tightly scripted budgets and what she terms “silos” of responsibility that make it difficult if not impossible to coordinate efforts—for example, to use money slated for transportation repairs to upgrade water systems, or vice versa. Re.Invest hopes to change that by bringing multiple small projects together into one program that will enable integrated, long-term solutions to truly create resilient communities that are prepared for future extreme storms, she says. (See “[Engineering Critical to Avoiding Global Risks](#)” on Civil Engineering online).

In addition to bundling together projects to maximize resources, the Re.Invest Initiative also includes a “green” focus on infrastructure upgrades, an approach that aims to save even more time and money. The upgrades will reorient the fundamental purpose of water infrastructure systems, translating a “traditional water system that functions like a funnel, where you catch all the water and funnel it under your streets, [into] a green system that functions more like a sponge, which involves repaving your roads [with porous pavement]; putting in new drainage, new trees, green roofs, and wetlands; and a whole collection—or a basket—of infrastructure, rather than a few hard engineered pieces and parts,” she says.

Such a system is significantly cheaper, she says, than traditional projects—as has been found by those involved in Philadelphia’s “Green City, Clean Waters” program. (See “[Philadelphia Proposes Ambitious ‘Green’ Infrastructure Plan](#),” Civil Engineering, December 2009.) Philadelphia has estimated that it can save up to 60 percent on the cost of upgrading a typical water infrastructure system through its green upgrades. “The estimates that they have are between two and three billion for the green system, and six to eight billion for doing traditional replacement of their hundred-year-old pipes under the street and their water treatment plant,” she says.

But that is only the first benefit of shifting to a spongelike system rather than a tried-and-true funnel system. “A second benefit is that it actually helps a great deal when you’re dealing with floods and severe storms to have a city that’s absorptive,” Vajjhala says. When hard rainfall hits hard surfaces, you can have “cascading failures in systems” as the water infrastructure becomes overloaded and water starts to collect on surface streets. The problem is exacerbated during such extreme events as 2012’s Hurricane Sandy, which resulted in “millions of gallons of raw sewage going out through the traditional stormwater pipes,” she explains. If various green elements can absorb a significant amount of the rainfall in place, it will take much longer for existing systems to become overtaxed, she points out.

Because the needs of each city can be different, the Re.Invest initiative will be looking for “targets of opportunities”: key failures in the existing water infrastructure of a municipality, and multiple benefits to be realized from improvement, Vajjhala says.

“We work with local, state, and federal officials, with major engineering and design firms, and with community partners to develop an integrated solution, but it’s very much taking a problem-solving approach, rather than a consulting approach,” she notes. “What we are doing is going out there and saying, ‘We’ve noticed that this is a problem—are you willing to try a solution that’s framed as a broader approach to what you’ve been doing up to this point?’”

The program involves three main tracks: the systems design and engineering track that looks for opportunities to integrate infrastructure according to a city’s multiple priorities; a legal and policy track that works with city officials to develop locally appropriate public-private partnership structures; and a private funding system that brings interested investors to the table and packages the pieces of the system for that investment.

The initiative’s investment efforts are similar to those of the West Coast Infrastructure Exchange, in that both programs strive to bring together interested private investors with public works needs so that infrastructure upgrades can take place, Vajjhala says. (See “[West Coast States, Province Jointly Fund Infrastructure](#)” on Civil Engineering online.)

“We haven’t done big infrastructure in a very long time [and] the country has many, many examples of Band-Aid solutions for our systems,” Vajjhala says. “Finding ways, creating a template for cities to do this in new and coordinated ways, is really the agenda going forward: it’s what you heard in President Obama’s inauguration speech [and] it’s what’s come out of all of the work in the states affected by Hurricane Sandy, at the state and federal level.”

The Rockefeller Foundation will provide up to \$3 million in seed money for the initiative, which has tapped CH2M HILL, the Englewood, Colorado-based engineering firm, to serve as its technical solutions collaborator. Cities interested in participating in the pilot program should contact [c.dots.development](#) for more information.

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