People, Water, and the Great Lakes:
Ready for Change?

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People, Water, and the Great Lakes: Ready for Change?

PREPARED BY
THE CENTER FOR NEIGHBORHOOD TECHNOLOGY

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COVER: VISION OF SMART WATER INFRASTRUCTURE IN THE GREAT LAKES REGION Illustration by Craighton Berman

To learn more about *Smart Water for Smart Regions*, contact Harriet Festing, Director, CNT Water Program hfesting@cnt.org | (773)269-4042.

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The Joyce Foundation State Farm™

CNT is collaborating with the following organizations in its **SMART WATER FOR SMART REGIONS** initiative:

American Water Works Association

Alliance for Water Efficiency

Great Lakes Commission des Grands Lacs

Water Environment Federation the water quality people®

Executive Summary

The **Smart Water for Smart Regions** *initiative offers a blueprint for the responsible and sustainable utilization of water in the Great Lakes states.*

Ready for Change?

Stretching from Minnesota to New York, the Great Lakes states are connected by a common freshwater resource, and represent one of the world's leading metropolitan regions. These cities are also connected by similar challenges related to water resources: inadequate flood control, expensive wastewater management, and outdated water supply infrastructure that wastes potable water.

According to research by the Center for Neighborhood Technology (CNT), water infrastructure problems are widespread and a threat to cities. In the first surveys of their kind—one on urban flooding and one on water loss control—we reveal the magnitude of the problems facing water industry professionals, and identify opportunities to work across the industry in the Great Lakes states to alleviate these significant problems.

The evidence is clear: the cities of the Great Lakes region face serious problems in managing water.

All of the cities we surveyed– serving a combined population of over 19 million people– said they have flooding problems. Stormwater is flooding into people's backyards, streets, and parking lots (90 percent of cities surveyed), into the interior of their buildings through sewer backups (83.3 percent), and through the walls of their homes and buildings (46.7 percent). Yet despite the prevalence of flooding, only half of the cities we surveyed have a plan in place for tackling flooding, and even fewer have a system in place for tracking the plan's success or failure.

While **stormwater** is making its way into people's basements and backyards, damaging their homes and property, **treated drinking water** is leaking into the ground and onto streets. Collectively the 55 Great Lakes water supply utilities we surveyed manage 63,000 miles of pipe that are, on average 50 years old and leak an estimated 66.5 billion gallons of water each year. That is enough to cover 318 square miles in water one foot deep.

Kathryn Tholin,
Chief Executive Officer,
Center for Neighborhood Technology

The will is there.

An overwhelming majority of survey respondents are interested in working to address water problems.

Despite the vast amounts of water lost to leaks, less than 30 percent of respondents have a policy in place to reduce it. It is hard to make progress when budgets are tight, laws are lax, and there are no consistent standards or goals.

Yet the will is there. An overwhelming majority of survey respondents indicated their interest in working collaboratively to address their water problems.

The Center for Neighborhood Technology and its Smart Water for Smart Regions initiative offers a blueprint for the responsible and sustainable utilization of water in the Great Lakes states. The goal is to help cities deliver water services to homes and businesses more efficiently, while protecting the region's water resources.

While there are many challenges to managing water infrastructure, CNT's initial focus will be to work with communities to minimize leaks and reduce flooding through cost-effective, coordinated solutions including:

- **Inventive tools and services**
- **Common standards, targets, and metrics**
- **Public education and performance reporting**
- **Shared data collection and an open dialog**

Above all, the Smart Water for Smart Regions *initiative is about helping communities across the Great Lakes states achieve pragmatic changes in the way they manage water as a resource—changes that are good for residents, good for business, and good for the environment.*

This is a call for you to get involved.

The Problem

Sewage on the Carpet, Money Down the Drain

"As the largest property insurer in the US, State Farm understands how devastating water related losses can be for families and business owners. By bringing together key collaborative partners—public, residential, business and non-profits—CNT's Smart Water for Smart Regions initiative can help communities identify clear paths by which we can start to understand and address the problems."

Michael Rivas Rossman, State Farm

The public is suffering from disinvestment in our water infrastructure. They face rising water bills while faulty mains and pipes leak huge volumes of water, and millions of home owners, businesses, churches, and schools face misery from flooding. Inadequate water infrastructure also pollutes rivers and lakes and impairs wildlife habitat.

Leaking water supply systems waste public money, hinder the economy and risk long term water scarcity. Multiple reports,[1,2] by various national agencies have highlighted the risks. A 2011 report[3] by the American Society of Civil Engineers, for example, found that by 2020, the predicted deficit for sustaining water delivery and wastewater treatment infrastructure will be $84 billion. "This may lead to $206 billion in increased costs for businesses and households between now and 2020. In a worst case scenario, the US will lose nearly 700,000 jobs by 2020. Unless the infrastructure deficit is addressed by 2040, 1.4 million jobs will be at risk…."

Flooding from sewer backups, basement seepage, backyard and street flooding, and overbank flooding collectively cause damage worth millions of dollars each year in the United States,[4] not to mention causing stress and health problems for property owners, and effecting economic activity.[5] The situation is expected to get

1. American Water Works Association. Buried No Longer: Confronting America's Water Infrastructure Challenge. Denver: American Water Works Association, 2012.
2. American Society of Civil Engineers (ASCE). Failure to Act: The Economic Impact of Current Investment Trends in Water and Wastewater Treatment Infrastructure. Prepared by Economic Development Research Group, Inc., 2011.
3. American Society of Civil Engineers. Failure to Act: The Economic Impact of Current Investment Trends in Water and Wastewater Treatment Infrastructure. 2011.
4. http://www.floodsmart.gov/floodsmart/pages/media_resources/stats.jsp
5. CNT has been undertaking research with property owners affected by flooding in Cook County. The research will be published in autumn 2012.

Flooding in your community?

We're gathering stories of people who have been flooded. The information will help us develop supportive programs.

Visit **http://www.cnt.org/water** *to learn more*

worse. The Midwest has experienced a 31 percent increase in very heavy precipitation events (defined as the heaviest 1 percent of all daily storm events) between 1958 and 2007[6] and these trends are expected to continue.[7]

To learn more about water problems and opportunities, CNT conducted two surveys, one on urban flooding, and one on the loss of drinking water from leaking infrastructure. Together the surveys reached over 100 utilities and municipalities in major cities across the eight Great Lakes states (Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, and Wisconsin) and the Canadian province of Ontario.

Floods and leaks together demonstrate the risks of disinvestment in such vital infrastructure. But how are residents affected? Do communities want assistance?

"You finally have everything the way you want it, and it takes half an hour [of rain], and you lose everything."

Elizabeth Rafferty's home flooded four times in two years, thoroughly wrecking her basement.

Flooding from sewer backups, basement seepage, backyard and street flooding, and overbank flooding collectively cause

damage worth millions of dollars

each year in the US, not to mention causing stress and health problems for property owners, and effecting economic activity.

6. United States Global Change Research program, Global Climate Change Impacts, 2009
7. Illinois State Water Survey, Prairie Research Institute, University of Illinois

Our Findings

The voice of water industry professionals and communities

The two surveys, which targeted the most populous cities and/or the largest utilities in the Great Lakes states (our flooding survey also included Canada), are the first of their kind. The surveys identified three broad trends.

1. LOCAL RESIDENTS ARE DIRECTLY AFFECTED

Residents and property owners in every community suffer from basement, backyard, and street flooding. Water professionals do not take the threat lightly; by a wide majority they described future flooding as "likely" to "almost certain." At the same time, large amounts of potable water, the treatment of which was paid for by local residents through their bills and taxes, leaks from our antiquated water supply infrastructure.

2. LEADERSHIP FACES OBSTACLES

Despite its prevalence, only half of the stormwater utilities and municipalities surveyed have a plan to counter flooding, and less than 30 percent of the utility respondents have a policy in place for reducing water losses. Our surveys revealed a hodgepodge of definitions, measurements, and regulations to guide community leaders. Without common methods and standards and without dedicated budgets and resources, water professionals lack the tools they need to fix the problems.

3. WATER PROFESSIONALS ARE LOOKING FOR ASSISTANCE

Sixty percent of the respondents for the water-loss control survey, and 76 percent of respondents for our flooding survey, said that they were interested in working collaboratively to devise best practices. The Smart Water for Smart Regions initiative provides an ideal vehicle.

FLOODING

- The 30 survey respondents serve 330 municipalities and nearly 23% of the total population of the Great Lakes states and province.
- All 30 respondents received flooding complaints
- 80 percent characterize the annual number of complaints as medium or large.
- Stormwater is flooding into people's backyards, streets and parking lots (90% of respondents), into the interior of buildings through sewer backups (83.3%), and through the walls of homes and buildings (46.7%).
- Only 53.3% have a plan for dealing with property flooding; fewer have a system in place for tracking the plan's success or failure.
- 20% have estimated the cost of flood-related damage in their community.
- 75% are interested in improving collaboration and developing best practices.

WATER LOSS

- The 55 water service providers who responded to our survey serve almost 500 municipalities and a population of 9.8 million.
- Their collective water supply infrastructure system includes over 63,000 miles of pipe.
- The average pipe within these systems is 50 years old.
- Together they leak an estimated 66.5 billion gallons of water per year.
- Almost three-quarters (71%) have no policy in place to control water loss.
- Two-thirds (67.3%) do not publicly report on the condition of their infrastructure.
- Most utilities (76.4%) are already engaging their customers on water.
- 60% are interested in improving collaboration and developing best practices.

The Solutions

A Smart Transition

Smart Water for Smart Regions is a new, multi-partner effort to help community leaders and water industry professionals develop cost-effective solutions to the problems they face.

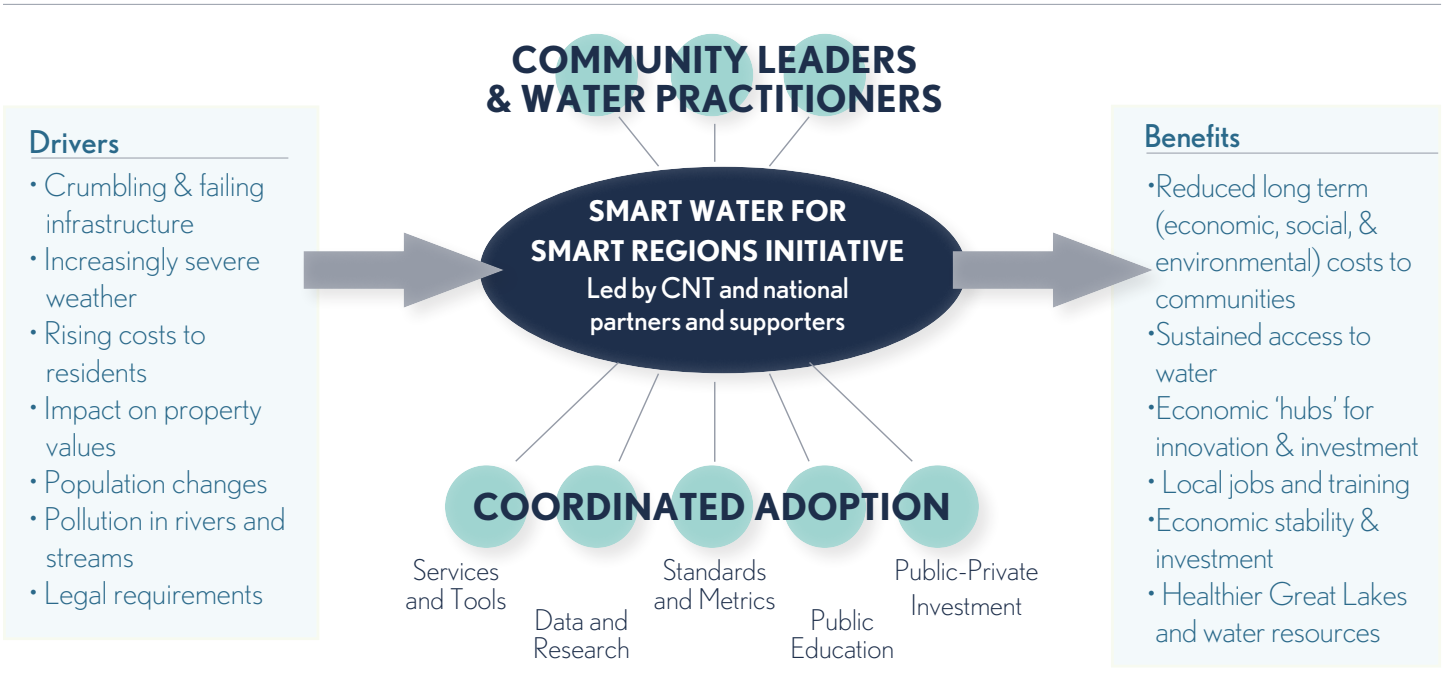
It seeks to strengthen innovation and investment in services and infrastructure by (a) water supply utilities, and (b) municipal stormwater departments and utilities through collective action.

We are inviting community leaders, industry professionals, and partners to contribute their expertise on joint activities to promote creative approaches, tools, services (such as financing and investment strategies), universal standards, metrics and methodologies, public education and outreach, and sharing of data.

By working together, water industry professionals can improve decision making, drive down costs, and stimulate public- and private-sector investment and job creation.

"Restoring the health of the Great Lakes and area waterways is critical to the sustainability of the region. Investments in this work are vital to supporting a vision to protect the environment and resources for the future. For many years, the Joyce Foundation has helped CNT develop innovative, cost-effective solutions to water infrastructure woes. We are delighted to support them in the Smart Water for Smart Regions initiative as they develop networks of communities that will bring their solutions to scale across the Great Lakes."

Molly M. Flanagan, The Joyce Foundation



Planned Activities

We are planning the following activities as part of this initiative.

STORMWATER

Inventive tools and services for flood abatement strategies use simple, low-cost tools such as repairing private lateral sewage pipes, building rain gardens, installing permeable paving, and collecting roof runoff in rain barrels. We will design, pilot, and support replication of a wet weather retrofit service for public and private properties.

Common standards, targets, and metrics for flood abatement can help water practitioners benchmark progress in a logical way. A report by the Water Environment Federation highlighted the current disconnect between flood control and water quality treatment and called for a "21st Century Infrastructure" approach. They note the example of integrating green infrastructure into a watershed not only to treat water quality and reduce frequent flooding, but also to provide many other environmental and social benefits. By working together, cities can help shape the development and roll-out of this methodology. We will continue to develop user-friendly tools and strategies for appropriate wet weather planning.

Public education and performance reporting is needed to make the case for investing in stormwater infrastructure. Working with insurance companies and public agencies, we will help reveal the cost and impacts that arise from flooding. Working with communities, we will develop public knowledge of flooding and flood strategies in the context of urban water infrastructure.

Shared data collection and an open dialog were referred to by several of the utilities and municipalities that we surveyed. Many water practitioners have common challenges—how to address infiltration and inflow or how to measure and map flood prevalence—as they seek to address these challenges. It makes sense for them to do so collectively. We will catalog and promote best practices in the region.

WATER SUPPLY

Inventive tools and services are needed to assist utilities in adopting 21st century practices and infrastructure and maintaining robust water supply systems now and in the future. With limited resources at hand, water utilities would benefit from a line of public and private services; an example might be the shared use of water audit and leak detection teams. We will explore the potential for regional vendor networks that supply these services to a group of utilities every year to reduce costs and ensure compliance with universal best practices.

Common standards, targets, and metrics for water loss control and auditing help utilities measure and benchmark progress among peers. The M36 Manual of Water Supply Practices "Water Audits and Loss Control Programs" by the American Water Works Association (AWWA)outlines both a working definition and a best practice auditing process for tracking water loss. We propose to support water supply utilities in adopting these standards by hosting webinars and other training courses in using the manual.

Public education and performance reporting keeps the importance of water service in front of customers and communities and helps them understand the need for service and infrastructure investment. We will encourage the adoption of public reporting by water supply utilities through the creation of a universal reporting template. We will establish a working group of utilities and affiliated agencies to brainstorm what this template could look like and pilot its adoption in select utilities before encouraging wider adoption.

Shared data collection and an open dialog were stated desires of the utilities we surveyed. We propose to establish an easily accessible, public list of existing water suppliers within the eight Great Lakes states. This will further the sharing of information and best practices as well as assist utilities in creating data collection standards that allow the industry to begin tracking performance and progress.

ABOUT THE CENTER FOR NEIGHBORHOOD TECHNOLOGY

The Center for Neighborhood Technology (CNT) is an award-winning innovations laboratory for urban sustainability. Since 1978, CNT has been working to show urban communities in Chicago and across the country how to develop more sustainably. CNT promotes the better and more efficient use of the undervalued resources and inherent advantages of the built and natural systems that comprise the urban environment.

As a creative think-and-do tank, we research, promote, and implement innovative solutions to improve the economy and the environment; make good use of existing resources and community assets; restore the health of natural systems and increase the wealth and well-being of people—now and in the future. CNT's unique approach combines cutting edge research and analysis, public policy advocacy, the creation of web-based information tools for transparency and accountability, and the advancement of economic development social ventures to address those problems in innovative ways.

CNT works in four areas: transportation and community development, water, energy and climate. CNT has two affiliates, I-GO™ Car Sharing and CNT Energy.

CNT is a recipient of the 2009 MacArthur Award for Creative and Effective Institutions.

More information about CNT is available at **www.cnt.org**

To get involved in the **SMART WATER FOR SMART REGIONS** initiative,
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