

From Invisible to Invaluable: *Changing the Way We Think About Water Infrastructure*

Introduction

Water: A Critical Component to Life

More than we realize, water infrastructure is a critical part of everyday life. A strong water system is essential to protecting and supporting our families and businesses. But water infrastructure is often forgotten by the general public when compared to roads and bridges or rail transit, because the bulk of it is underground and out of sight.

We can no longer afford to overlook our buried water infrastructure. With millions of miles of drinking water and wastewater pipes in dire need of replacement, Americans must make a conscious connection between water infrastructure and the vitality of our communities. Only then will they support the investment necessary to keep our water systems strong and reliable.

This paper focuses on the link between water infrastructure investment and a healthy economy. It also highlights research conducted by the Value of Water Coalition that can help advocates inspire meaningful action to address the water infrastructure challenge.

The Current State of Infrastructure

The numbers tell a staggering tale. The massive network of pipes that allow 300 million Americans to enjoy clean drinking water and efficient wastewater service spans more than three million miles and is more than four times the length of the National Highway System.

But this system is in trouble. According to a *New York Times* analysis of Environmental Protection Agency data, it is estimated that there is now one water main break every two minutes in the United States, the result of pipes in cities such as New York and Philadelphia being, on average, approximately 75 years old. In cities such as Detroit, it is not unheard of for workers to dig up pipes laid in the 1800s.

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In a time of water scarcity in drought-stricken states such as California, America can ill afford the 1.7 trillion gallons of treated drinking water lost every year to leaks due to these aging pipes. This is the equivalent of the amount of water that flows out of the massive Mississippi River over a 4 day period. Without renewal or replacement, the proportion of water pipes in the U.S. that are classified as poor, very poor or life-elapsd will increase from 10 percent to 44 percent by 2020. Meanwhile, the EPA reports aging wastewater systems needing upgrades to meet today's more stringent standards still release more than 3 billion gallons of largely untreated wastewater into our surface waters every year.

For the most part, Americans are unaware of water infrastructure needs until catastrophes happen—like a leaking underground pipe that causes a sinkhole, leaving a street impassable, or a boil water order is issued due to the risk of waterborne illnesses.

As these issues grow in number and in scope, there is increased media attention on water infrastructure. For example, this past winter saw a record number of water main breaks in cities across the country. Photos and videos from places as diverse as Atlanta and Detroit showed drivers crossing treacherous sheets of ice that resulted from record low temperatures which broke water mains, and in turn, froze the outflow from busted pipes. Unfortunately, this attention is often fleeting and dissipates soon after the news cycle concludes.

The Challenge

The Investment Gap

Moreover, while these media events highlight the worst-case challenges of our aging water infrastructure, they do not successfully motivate the public to spend the estimated \$1.3 trillion dollars needed in improvements for drinking water, storm water and wastewater systems. The American Society for Civil Engineers (ASCE) gives both wastewater and drinking water systems a grade of 'D'—not far from failure. An American Water Works Association study found that more than \$1 trillion will be needed over the next 25 years to repair and expand drinking water infrastructure alone.

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Water infrastructure is a primary driver of business. Only 14% of water people use goes toward individual end users in their places of residence and work. Forty percent of the water we use is devoted to agriculture, and 46% is used to create the products we buy — for example, it takes 40,000 gallons of water to produce a single car on an assembly line.

ASCE estimates without investment deteriorating water infrastructure will cause American businesses to lose \$734 billion in sales between now and 2020, and the cumulative loss to our gross domestic product (GDP) will be \$416 billion. In addition, the U.S. economy will lose almost 700,000 jobs by 2020 and 1.4 million jobs by 2040, with those losses spread both through sectors traditionally employing people without extensive education and knowledge-based sectors.

Even outside the job losses, ASCE estimates families will earn less, with rising repair costs eating into smaller household budgets. By 2020, an individual household will be paying about \$82 a year more for water than they are today. Families will earn a cumulative total of \$541B less in 2020 than they earned in 2011. By 2020, this means that an individual household will be earning \$806 less per year. The total impact of increased costs and drops in income will reduce the standard of living for families by almost \$900 per year.

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U.S. exports will fall by a cumulative total of approximately \$6 billion by 2020, accounting for about 4% of the total decrease in business sales estimated for that year. The greatest losses are in the technology and manufacturing sectors, including aerospace, instruments, chemicals and drugs, as well as associated finance and professional services.



The Benefit

Economic Benefit of Investment in Water Infrastructure

Investing now would stem the predicted losses outlined above. But it would also stimulate economic growth, creating jobs, opportunity and overall economic development.

For example, the Economic Policy Institute reports that investing in water infrastructure will create 16 percent more jobs than a payroll tax holiday, a staggering 40 percent more jobs than across-the-board tax cuts, and five times more jobs than temporary business tax cuts. The Department of Commerce further estimates that each job created in the water and wastewater industry at the local level creates 3.68 jobs in the national economy, and that each public dollar spent yields \$2.62 dollars in economic output in other industries nationwide. Additionally, according to the U.S. Conference of Mayors, every dollar invested in water infrastructure adds \$6.35 to the national economy.

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And even more important than creating jobs, investing in our water infrastructure ensures the health, safety and high quality of life for future generations.

Research

Purpose

Clearly, there is a strong connection between a healthy water infrastructure and a healthy economy. This raises at least two the questions: Do people understand the current status of our water infrastructure? What moves them forward to take action to improve these issues?

We have seen in previous research that the answer to the first question is a resounding yes. In its 2012 Value of Water Index, water technology company Xylem Inc. found that 77 percent of Americans are concerned about the nation's water infrastructure system, and furthermore, 88 percent believe it needs improvement. An even more comforting statistic for those pushing for water infrastructure investment comes from the same study: once they're educated about the



state of our water infrastructure, 85 percent of Americans responding to the poll support additional investment.

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With that in mind, the Value of Water Coalition looked at which drivers translate that support into action.

Methodology

The research conducted was broken into two parts: a qualitative portion, and a quantitative analysis. For the first part, participants logged in to an online discussion board to: share their views about water and the water system, respond to creative and projective exercises, and react to messaging. These individuals were:

- A nationwide sample of men and women 18+
- Civically engaged
- A mix of races, ages, regions, parental status, religions/religious attendance and party ID
- Different views and relationships to water (behavioral, geographic, and attitudinal)

Using the findings from the qualitative research, the Value of Water Coalition conducted an online survey between May 30 and June 5, 2013 with 800 adults (18+), plus an oversample of 300 opinion elites across the country (n=1,100 overall). Opinion elites are higher income, more educated and engaged individuals.

Key Findings

The qualitative portion of the research conducted by the Coalition reinforced the concern for water infrastructure highlighted by the Xylem study, and also showed that there is a basic connection between the notion of growing jobs and investing in infrastructure:

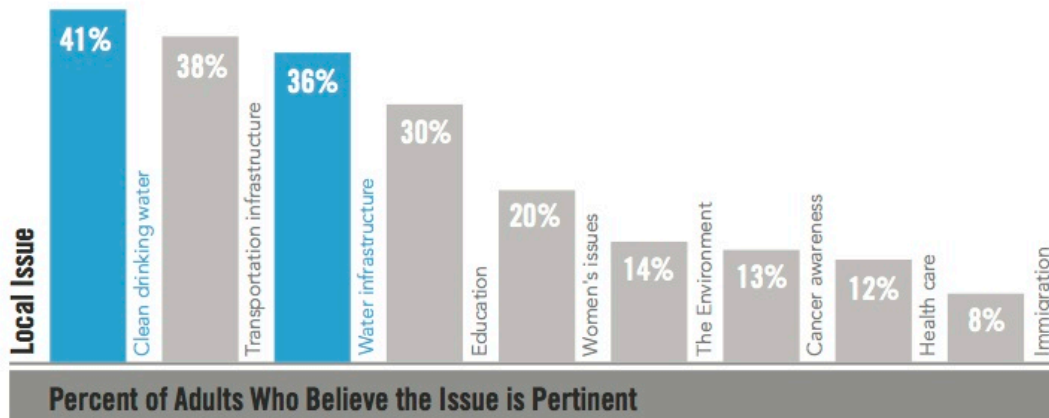
"When I think of infrastructure I think of framework like roads, utilities, sewage and water. Also I think of jobs."

Some participants went even further in this connection, recognizing how this infrastructure could be used to bring in specific jobs programs, such as those around sporting and special events:



"Strong and efficient infrastructure also supports the local and national economy. When cities and towns are able to host events, tradeshows, sports tournaments/matches, concerts, festivals, parades, and possibly even the Olympics...think about the degree of positive impact that does for the local economy and state. This in return makes people feel more connected to their community and care and become involved about the places they live. The ROI can be exponential."

What was illuminating was the perspective from which Americans viewed the issue of water infrastructure. There has been much discussed, including in this paper, about water infrastructure and the nation writ large. But as revealed by the research, Americans in general understand water and water infrastructure as a local issue with local solutions. While Americans understand the macro view of water infrastructure's impact on the economy, seeing where jobs are created in their specific cities and counties makes the issue much more pertinent, thereby driving the desire to take action.



While talking about the importance of water infrastructure at the macro level still has value, it is more effective and compelling to connect its impact to the local economy, local job creation, and people's personal lives when talking about the need for investment. Verbatim quotes from participants included:

"Water plants and maintenance bring jobs to our community, clean water brings new business and fuels current businesses, and the opposite would harm our local economy."

"Millions of dollars were spent to build a subway system that transports people a few blocks but the water we drink and need to live comes through pipes older than most of the passengers who ride the system. Please consider sponsoring a bill that will bring local dollars to this area to



improve the water systems. Water is an essential part of our lives and we need it to build the economy."

"The need for good clean water and the infrastructure to deliver it at a personal, local and country wide level."

Another difference revealed in the research was the variation between water and other kinds of public infrastructure. Most people cannot wrap their heads around "electricity" as a specific thing, since only its benefits, and not the item itself, can be seen. Similarly, few take much notice of a perfectly paved road or bridge. By comparison, people love a hot shower and a cold glass of water.

Conversely, though, this direct relationship to water leads to individuals only thinking about the water coming out of their taps. Wastewater's importance and economic effects do not rank as highly as that of drinking water. The data indicated that while 61% of water services customers think drinking water is very important, only 40% linked it to reliable infrastructure. And even when water services customers do think about infrastructure, they tend to be more aware of the endpoints such as treatment plants, rather than the pipes under their feet.

Most important elements of country's infrastructure:

- Water treatment plants: 34%
- Solid waste treatment / disposal: 29%
- Wastewater treatment plants: 24%

Conclusion

This research performed by the Value of Water Coalition implies water infrastructure advocates should employ at least two strategies in order to be successful in increasing investment:

1. To move concern to action, it is clear that water infrastructure advocates must work closely with local utilities and regulators to raise these issues on the local level. Individuals need to specifically understand the benefits of a certain investment in the local water system in terms of new jobs created and growth to the overall community's economy.
2. Water infrastructure advocates must do more to remind water services customers that water infrastructure is not just water treatment plants for delivering clean tap water, but also the systems that treat wastewater and storm water, and the pipes that bring all these components together.



The good news is that some local water utilities have already begun to highlight the local impact of their work. For example, Cleveland has said it will create 6,500 construction jobs in the next 24 years via investment in its wastewater and storm water infrastructure. Elsewhere in Ohio, Cincinnati said it will create 1,000 jobs via sewer improvements. Similarly, in California, San Francisco said it will create 11,000 jobs via a \$4.6 billion rebuild of its water system, and Los Angeles said the water sector provides an estimated 34,000 in the county. Highlighting these kinds of figures will help to convince water services customers not only of the imperative to invest, but the imperative to invest now.

Moving forward, there is a multitude of potential solutions that can address water infrastructure challenges at the local level. From introducing new technologies and green infrastructure to collaborating across water sectors, water professionals continue to confront the challenge of deteriorating infrastructure daily. But one of the most important messages in all of this discussion is that increased investment will bring economic benefits to local economies. By emphasizing the equal importance of buried pipes and wastewater treatment as a part of overall water infrastructure, water professionals can help Americans understand the essential connection between water and their everyday quality of life.

