



**WATER AND WASTEWATER MANAGEMENT:
INNOVATIONS AND COST EFFICIENCIES**

**Underground Water Infrastructure: Getting Results
in Indianapolis through Continuing Improvement and
Modern Materials Procurement Practices**

By Mayor Gregory A. Ballard

We have established a culture committed to continuing improvement in Indianapolis City government. This means change or at least thinking outside the box to explore opportunities for increasing service delivery efficiency and effectiveness. One of the greatest challenges for a Mayor is providing leadership in developing a team geared for success that can problem solve. What we have learned in Indianapolis is that in order to increase service productivity and reliability, added value, and cost reductions we have had to challenge our traditional procurement patterns to fit each service application, especially where infrastructure investment is involved.

One of our most significant accomplishments in the area of infrastructure investments is our Combined Sewer Overflow (CSO) control plan first adopted as a 2006 consent decree and subsequently amended twice. More than 700 other communities in the US have CSO issues. In our case less than an inch of rain could sometimes exceed system capacity. On an annual basis it is estimated that rain events could generate as much as 7.8 billion gallons of overflow. When I came into office in 2008, the \$3.5 billion estimate for the mandated improvements and system upgrades had already grown another \$300 million. That is why I asked my Public Works Department to establish an expert team of engineering and consulting firms to take a holistic approach by looking at the entire wastewater system and storm water problem, think outside the box, and develop a control plan to ensure that cost-efficiency and sustainability criteria are met.

Indianapolis's Public Works Department, armed with increased and accurate engineering and stormwater information, successfully renegotiated the terms of the consent decree settlement in 2011 with the EPA and US Department of Justice. Today the EPA Region 5 Administrator refers to the amended control plan as a model for all communities. The new control plan is cheaper (by \$740 million), gets a greater level of environmental improvement by reducing overflows by an additional billion gallons annually, and accomplishes all this in less time than the 2006 consent decree plan.

I want to focus here on part of the overall strategy we employed to reduce costs, expand service delivery and increase environmental results. Our aging city water and wastewater infrastructure serves

nearly 1.1 million citizens. Two, of many, important factors in our thinking involved an upgrade of the existing physical plant, and the need to accommodate growth by expanding the service area. To limit stormwater we expanded the service area by switching a septic field over to the wastewater collection and treatment system. To improve system efficiency we changed our thinking about materials procurement because the repair and replacement of collection systems (and water supply distribution systems) was driven by aging pipes that were corroding and leaking water.



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These, and other, reasons prompted us to examine our procurement policies and practices. As we explored repair and replacement options we found that alternative pipe materials like PVC pipes have demonstrated superior performance in soil conditions present in our city. We also learned through life cycle analysis that the PVC pipe has both a longer useful life than traditional pipe materials, and has a lower cost to both install and maintain.

Indianapolis opened its procurement policies and practices to ensure we have a chance to also act outside of the box, which includes using alternative green technologies and durable and cost effective materials in the bids for our new combined sewer system. PVC now makes up 33 percent of the collection system. Water and wastewater operations and maintenance (O&M) costs, nationally, are increasing by six percent above inflation annually. Using a non-corrosive material is critical to keeping long-term maintenance costs down and minimizing our capital replacement budgets.

We have aggressively installed PVC pipe in our water distribution system which now makes up over 28 percent of the total length of the system. We are already experiencing a significant decline in

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Make the Business Case for Advanced Metering Infrastructure

By Ike Moss, Executive Director, Business Development, Aclara

Municipalities are facing numerous challenges with respect to delivering water to citizens. Aging water infrastructure in some cities increases the chances of leaks and main breaks, rapid growth in others pushes the limits of available capacity, and still other cities must balance conservation measures with increased operating costs. Plus, all municipalities are facing demands from citizens for improved service. In the age of smart phones and tablet computers, people expect not only plentiful and inexpensive water, but plentiful information about water usage and quick resolution to any problem.

Many cities are considering the advantages of advanced metering infrastructure (AMI) using fixed networks to address these challenges. Fixed networks are a permanent infrastructure consisting of data collectors that receive readings up to every hour from transmitters attached to every meter. The data collectors send the collected meter readings to the utility at regular intervals. These systems also allow the utility to communicate to individual meters, opening the door to benefits such as on-demand meter reads.

AMI has distinct advantages over traditional methods of reading water meters. Historically, cities employed people to manually read meters at set intervals during the year. Many cities in the recent past enhanced the traditional process by switching to automated meter reading solutions that collect readings when staff walk or drive by meters.

However, simply automating meter reading doesn't solve the basic problem associated with traditional solutions because walk by or drive by systems may not provide enough information to effec-

tively help utilities in their analyses of water usage. For example, walk-by or drive-by systems are limited to one meter reading a month and lack interactive capabilities. Yet, more information on how water is being used is exactly what is needed for cities to improve operational efficiencies, enhance customer service, and maximize water conservation.

Proactive Customer Service

Fixed-network AMI systems are a solution to the information needs not met by walk by and drive-by systems. They collect information from meters every day. One of the important uses for this data is to improve customer billing and service. AMI eliminates estimated bills, which can be highly inaccurate and often lead to billing errors and complaints. In fact, AMI alone can reduce billing errors by up to 80 percent.

The daily information gleaned from AMI data also can help customer service representatives resolve complaints quickly. For instance, when responding to a high-bill complaint a customer service representative can pull up-to-the-minute reports directly from the AMI system about water usage. This information makes it easier to analyze the customer's bill and answer questions.

Many utilities that employ fixed-network AMI also put information about daily usage on web sites so that customers can refer to it even before they call the water company. For example, having this data readily available to customers significantly reduced the number of customer service calls to the Boston Water and Sewer Commission, which employs the Aclara STAR Network AMI.

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our total water breaks as a result. PVC pipes in our system have a failure rate 2.5 times less than traditional pipe materials, and this we have realized significant cost savings for ratepayers.

Indianapolis will continue to face the challenges of wastewater and water infrastructure investment and service delivery because of population growth, unfunded federal mandates, and a changing

climate pattern. We are, as local government leaders, very mindful of the increasing costs to our citizens and as stewards of their trust. We will continue to challenge and transform old approaches to procurement that do not benefit the public. In our experience it has been demonstrated that solutions developed at the local level often involve innovative strategies to cost-effectively improve our ability to provide value to both the public and the environment.