# Winning Strategies For Smart Cities, Smart Water, And Water Reuse

Every city facing infrastructure or operational challenges or concerns about maintaining quality of life in the face of population growth or a changing environment has benefits to gain from a unified smart-city approach. Here are some concepts for promoting understanding and acceptance among utility and government decision-makers, plus several examples of benefits already being garnered by smart cities large and small.

## A New Ecosystem For Productivity And Efficiency

What makes a smart-city approach a smarter choice for water utilities and the communities they serve?

- **Cost-Benefit Payoffs.** In the water industry, the economic benefits behind smart-grid advanced metering infrastructure (AMI) have now expanded to encompass many more aspects of utility and city management. They help maximize water distribution revenue and optimize maintenance activity for additional savings.

- **Energy Conservation.** Being more energy efficient by analyzing pump and blower performance according to actual energy use and managing by forecast demand means lower energy costs and an overall smaller carbon footprint.

- **Water Stewardship.** Current and future water scarcity issues can be a byproduct of population growth in arid areas or changing climate patterns. A smart-city approach that analyzes source water quality, water treatment efficiency, water use behavior, and water reuse opportunities can provide the information needed to make better decisions.

- **Preparation For The Future.** Perhaps the broadest benefit of a smart-city, smart-water approach is the ability to adapt to change — for day-to-day fluctuations and long-term transitions.

    - **Population Growth.** The global trend toward growth in metropolitan areas will put more pressure on existing and new infrastructure in concentrated spaces. The smart-city benefits of cost-sharing and productivity optimization will help communities deliver better results with lower energy and operating costs.

    - **Resource Optimization.** Sharing costs for business support functions such as billing and data communications, getting maximum value out of existing infrastructure, and integrating new, cleaner energy sources are all benefits of a smart-city approach.

- **Workforce Transition.** As seasoned employees retire, smart-city databases and automation provide an easier way to facilitate the transition to replacement employees by sharing institutional knowledge through easy-to-learn, easy-to-manage operational support systems.

## Covering All The Bases

The cost/performance benefits that smart-city adoption can deliver today may quickly evolve into additional, related benefits. For example, areas suffering from occasional water scarcity can do more to conserve resources by identifying non-revenue water losses due to leaks, reducing excessive pipeline pressure, and conserving energy. If water stress continues or increases, the same data from smart-water systems can help speed the transition to water reuse as a next level of operating efficiency.

A smart-city approach is as much about preparing for the future as it is about managing today's operations. Being able to accommodate future growth without making existing infrastructure obsolete helps to sustain economic development and maintain quality of life while keeping utility rates affordable. Integrating data management for regional infrastructure — from utilities to communications networks to new electric-vehicle charging stations — creates new benefits beyond the specific services themselves. It helps to:

- Improve overall communications and shorten emergency response times.
- Support collaborative efforts that can generate more cost-efficient results.
- Drive more environmentally responsive programs.

## Proof Of Concept: Something For Everyone

With smart-city capabilities available across a broad spectrum of applications and at varying levels of cost and capability, cities and water utilities of virtually any size stand to benefit.

Despite having a population of only 150,000 residents, Västeras, Sweden (Figure 1) has a multifaceted municipal utility that has applied a smart-city approach encompassing far more than water and wastewater. Their implementation even extends to data networks, electric vehicle charging infrastructure, hydropower generation and the power grid, emergency management, and predictive maintenance for roads, lights, and other city assets.

(Photo courtesy of ABB)

**Figure 1.** An aggressive smart-city strategy is helping the city-owned utility of Sweden's fifth-largest city forge sustainability with both ecological and economic benefits.

In Vietnam's Ho Chi Minh City (Figure 2) — a metropolitan area of 10 million residents — the impetus behind a smart-city approach was to staunch the flow of nearly 30 percent treated drinking water losses due to aging infrastructure. The smart collection of digital data from the field will offer real-time insights throughout the water distribution network, allowing the water utility to cut water losses, increase the quality of drinking water, and improve living conditions for residents.

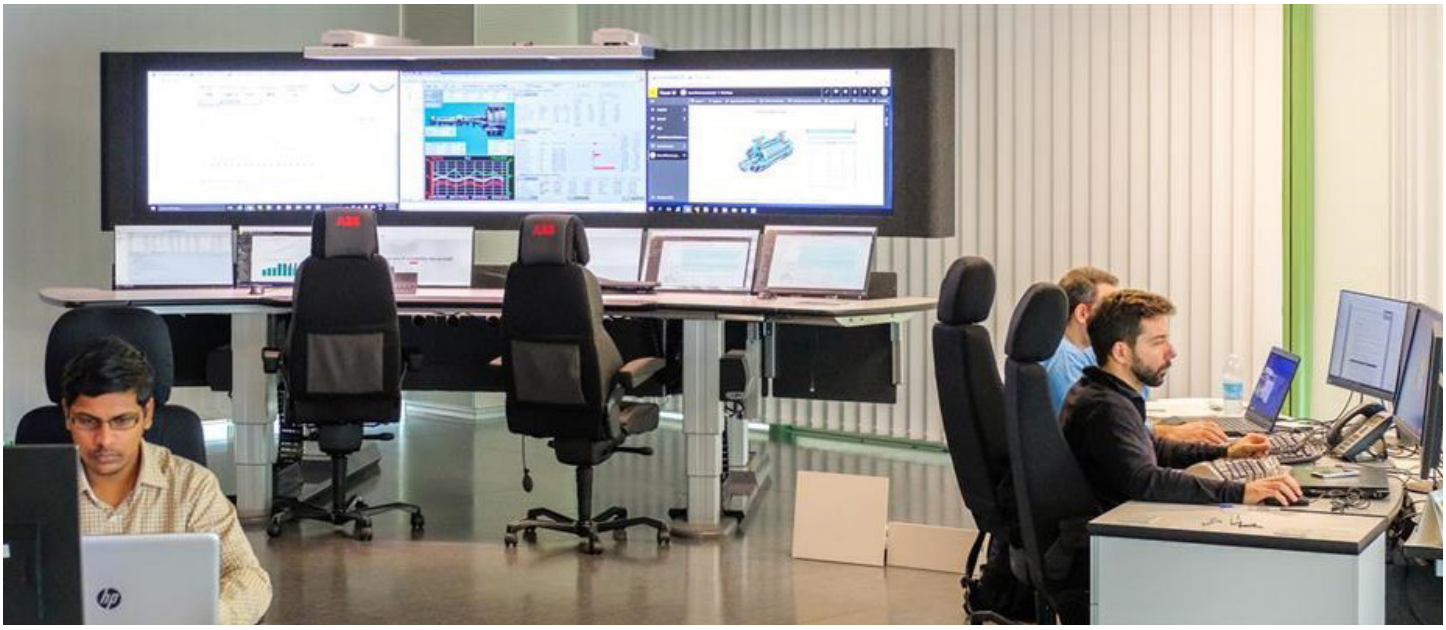
The Pure Water San Diego effort is one example of an integrated water reuse program designed to offset the rising cost of importing drinking water from beyond the city limits. It is one part of this smart-city's water sustainability program incorporating water conservation, recycling, and reuse. Home-grown projects like this are another example of how smart-city principles help communities cope with growth and quality-of-life issues through synergistic sharing of resources and information across multiple utilities.

## Collaboration Is Key

Any smart-city approach that crosses

(Photo courtesy of ABB)

**Figure 2.** The capital city of Vietnam is using smart-city technology to reduce non-revenue water losses from 30 percent to 10 percent in a growing city built around a core of aging infrastructure.



(Photo courtesy of ABB)

**Figure 3.** Centralized sites like this ABB Collaborative Operations Center can operate in parallel with a water utility's headquarters and production facilities to provide remote-enabled interactive support from industry-specific technology specialists. This enables process-specific support during emergencies or periods of technology transition or personnel turnover.

operational areas requires — and benefits from — collaborative efforts to leverage resources and share information. That can range from sharing a common meter-reading and billing system for water, gas, and electric utilities to optimizing power generation and power-grid management based on cumulative energy consumption and operating efficiencies throughout all utility functions. Among water-related operations, an increasingly common example is the integration and collaboration of water treatment, water distribution, wastewater treatment, and water reuse activities — particularly in resource-strapped areas.

Finally, there is another aspect to collaboration that can make smart-city implementation easier and more efficient for even the smallest cities. Collaborative support available as a service from control system OEMs (Figure 3) can also help smart cities get up to speed sooner and operate most efficiently by bringing water process knowledge and data insight to bear on better decision-making. ■