

infrastructure

BY MARLENE SUNDHEIMER, MATT ZONE,
AND ELISA SPERANZA

Beyond the tap: City water service as a catalyst for regional economic development

THE CLEVELAND WATER DIVISION
USED ITS COMPREHENSIVE
FINANCIAL PLAN TO DEVELOP
SUPPORT FOR NEEDED RATE
INCREASES BY PACKAGING
FINANCIAL PLANS WITH
REGIONAL ECONOMIC
DEVELOPMENT INCENTIVES.

A safe, reliable supply of potable water has long been recognized as essential to economic well-being and public health. The value of water, however, extends beyond the simple act of selling water service. Excess water capacity, coupled with economic and demographic forces, is driving water managers in northeast Ohio to link water system expansion to regional economic development agreements. In Cleveland, the regional water utility is using its assets to leverage community-to-community economic development agreements, and policy-makers are finding a compelling case for sustainable local water rates and investment in water infrastructure. The Cleveland Water Division's (CWD's) comprehensive financial plan provided a unique framework for the utility to develop support for needed rate increases by packaging financial plans with regional economic development incentives.

The CWD's management approach mirrors the US Environmental Protection Agency (USEPA) Office of Water's Sustainable Water Infrastructure Initiative. In this program, the USEPA collaborates with drinking water and wastewater utility managers, trade associations, local watershed protection organizations, and state and local officials to ensure that investment in the nation's water infrastructure is sustainable into the future. This is done by adopting management approaches, supporting research and development for new technologies, and reducing drinking water distribution and wastewater system costs. The Sustainable Water Infrastructure Initiative is organized around four areas.

- **Better management**—shifting utility management practices beyond compliance to a model of improved performance and sustainability, and incorporating best practices in asset management, environmental management systems,

consolidation, and public-private partnerships to save costs.

- **Full-cost pricing**—constructing, operating, and maintaining infrastructure to ensure that there are sufficient revenues in place to support the cost of doing business. When utilities recognize their full costs for providing service over the long term and promote rate structures and service charges that effectively recover costs, their customers can make better decisions about environmental improvements.

- **Efficient water use**—reducing the need for costly infrastructure by better management of water uses. By incorporating programs for enhancing water efficiency, including metering, water reuse, water-saving appliances, water-conserving landscaping, and public education, a utility will give customers choices in the way they use water and the costs associated with the choices they make.

- **Watershed approaches to protection**—when addressing sustainable infrastructure needs for the purposes of water supply and water quality from a regional perspective, it is important to look more broadly at water resources in a coordinated way. One approach is to prioritize water resources on a watershed basis to ensure that public policy decisions about investments in infrastructure within the watershed achieve the greatest benefits (USEPA, 2006).

CWD'S VISION FOR SUSTAINING INFRASTRUCTURE INVESTMENT: A REGIONAL APPROACH

The CWD's vision for ensuring sustainable investment in water infrastructure is a regional perspective. The CWD operates a large regional water utility in northeast Ohio. Its current management approach is focused on expanding the water system to use its excess production capacity to recapture stranded infrastructure investments and a customer base that has resulted from the effects of urban sprawl. The CWD service capacity is constrained by its existing USEPA-approved treatment capacity, and it is limited to service

within the Great Lakes Basin. For the past two decades, Cleveland's utility managers watched regional population shift from the urban core to the growing suburbs, which are beyond the outer reaches of their service area. Major industrial customers left for greener pastures or closed their doors for good in Cleveland. These trends manifested themselves in consistent, declining consumption and revenues, excess treatment capacity, and stranded investment costs.

Although the water utility was able to successfully raise rates to sustain its capital program, political decision-

The CWD is among the ten largest, full-service water utilities in the nation, owned and operated by the city of Cleveland. Lake Erie is the sole source of water for the system. Cleveland has an annual combined maximum treatment capacity for its four treatment plants of 537 mil gal. The utility serves 1.5 million people in more than 70 communities in northeast Ohio.

By its charter, the city's Board of Control sets water rates for the regional utility, subject to approval by the Cleveland City Council. The water division provides water service



Infrastructure failures affect public health and environmental and economic development.

makers were increasingly distracted by the urban sprawl debate and what role water service extension played in the dynamics. Many political leaders harbored a perception that the extension of water service beyond the existing service area was contributing to the flight out of the city and to the erosion of the city's income tax base. Cleveland's utility managers realized that they had reached a turning point; if they were going to reverse the direction of the ominous financial curves, they needed a new approach that leveraged the water system as a valuable regional asset and that allowed parties on all sides of the urban sprawl argument to realize benefits.

to its suburban communities through standard water service agreements for either direct service (retail) or master meter (wholesale) agreements.

The utility has used various strategies to sustain its investment in the water system. As part of its strategic business plan, a multiyear capital improvement financing plan is synchronized with a 10-year planning horizon. A programmatic approach to project delivery links phased design and construction schedules to the capital funding plan.

CWD uses a diverse funding portfolio, including long-term revenue bonds, operating revenues, and low-interest state revolving loan funds.

The state debt has an additional advantage in that the debt does not effect the debt service ratio and is not included in the calculation of debt service coverage for bond debt.

The capital program is supported by a series of incremental rate increases,

An important component of the comprehensive financial plan was obtaining buy-in from stakeholders in advance of offering recommendations.

typically over a five-year period. This strategy produces a predictable revenue stream that rating agencies like and is more affordable for rate payers. Cleveland's rates compare favorably with those of other large cities with comparable service areas. The city's political leaders and decision-makers appreciate the value of the utility as a regional asset and the important role it plays in contributing to the health, safety, and welfare of the greater Cleveland area. They take their stewardship role seriously, and since 1991 the Cleveland City Council has approved incremental rate increases.

Engineering philosophy. The cornerstone of Cleveland's engineering philosophy is system redundancy. Cleveland offers its municipal customers a fully redundant, self-reliant water system. Cleveland ensures its customers high-quality, reliable service by maintaining a system of interconnected water treatment, transmission, and pumping facilities based on design policies and standards that are focused on providing multiple paths of supply and eliminating single points of failure to minimize outages. Cleveland has redundancy in treatment capacity among its four treatment plants. An entire plant can be shut down with only 25% capacity loss. The redundancy in Cleveland's water system is its best defense against a security threat. In addition, Cleveland provides emergency backup service to several surrounding

water systems that are dependent on a single water treatment plant.

Cleveland's redundancy philosophy extends to backup power supplies at all of its major facilities. During the blackout of 2003, Cleveland's two power suppliers experienced a

complete grid failure. Cleveland experienced complete power failure at all treatment plants and a systemwide water outage. As a valuable lesson learned, the utility undertook a \$25 million power-generation project.

INVESTMENT HISTORY

Cleveland's investment in its water system before the 1980s can at best be described as reactionary and insufficient to sustain a regional water system in the long term.

In 1958, at the population peak, the city was serving 1.6 million people. Political strife between the city and its suburban water customers began to escalate over equitable distribution of costs. Suburban political leaders began to question whether the city should continue to own and operate the regional water system. Reacting to political pressures, Cleveland constructed two additional water plants, one on the east side of the system in 1951 and one to serve the west side in 1958.

Cleveland's heavy industry, which brought it wealth, also made it an environmentally challenging place to live. As pollution increased and urban quality of life declined, Cleveland saw its greatest population exit to the suburbs. Water consumption rose in the suburbs, and protracted political strife persisted. General fund tax revenues plummeted in reaction to the sluggish economy and high inflation, but the city council was unwill-

ing to approve higher rates to fund infrastructure improvements that would only benefit the suburbs. Throughout the 1960s and 1970s, Cleveland's investment in water infrastructure fell below sustainable levels. Annual capital improvement expenditures averaged \$10 million, an amount insufficient to maintain, much less expand the system to accommodate suburban demands.

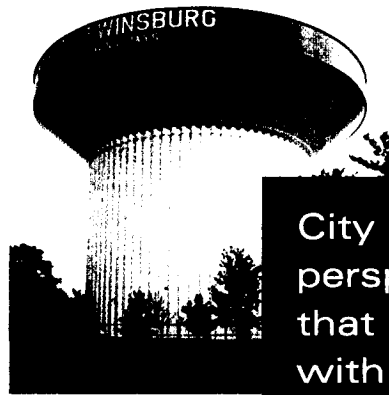
Ultimately, by the late 1970s, the rocky relationship between the water utility and its suburban customers culminated in the suburbs uniting against the city in a lawsuit over unfair rates, poor maintenance performance, and failure to meet their needs for growth. Settlement of the lawsuit in 1980 set the stage for Cleveland's renewed commitment to sustaining the water system. New water service agreements identified specific capital improvements throughout the system. The city agreed to a negotiated, 10-year capital improvement plan to address suburban needs. The CWD agreed to a \$375 million bond issuance and to raise the rates to pay for the agreed improvements. In exchange, the suburbs agreed to enter into standard water service agreements with established rate formulas applied to future rate increases and a covenant not to sue over water rates.

From the 1980s to the present, CWD has made sustained capital investments through serial rate increases and revenue enhancements. Between 1990 and 2005, \$1.5 billion has been invested in capital projects, with another \$380 million projected to be awarded through 2012. Aggressive past annual expenditures have allowed CWD to reduce the level of future investment. "We are extremely proud of the significant investments we have made in the past 20 years in this 150-year-old water system," said Julius Ciaccia, Cleveland director of public utilities. "While our level of investing will level off in the coming years, we are very mindful of our obligations to assure adequate funding for further improvements, especially as we focus on the distribution grid."

THE AWAKENING

When the water division began planning the next series of rate increases in 2003, managers realized that if they were to effectively sustain future investments in the water system, a new strategy was needed. The political and economic landscape had changed significantly since the last rate campaign.

City leadership touted a new perspective on regional issues that spoke of cooperation with the suburbs. For this campaign, the CWD would go in a new direction based on strategies set out in its strategic business plan for pursuing new business opportunities and revenue enhancements.



City leadership touted a new perspective on regional issues that spoke of cooperation with the suburbs.

Faced with these challenges, the water utility commissioned CH2M Hill's Utility Management Solutions Group to undertake the comprehensive financial plan. In addition to preparing for the next round of planned rate increases, the plan included several unique elements designed to address the city's need to sustain its operations well into the future. The scope of the plan included a cost-of-service study, rate design, a financial planning and rate model that included customer and demand forecast modules, stakeholder communication support, a water audit and studies of system expansion, new products, and automated metering.

Past rate campaigns were presented around the traditional rate studies that identified revenue needs to fund proposed capital improve-

ments. Former rate proposals followed the rate formula from the 1982 water service agreements. Although the city council approved rate increases, the proposed rates were usually cut back, necessitating revisions to the capital improvement program. Projects had to be either eliminated from the program or deferred for future bond issues. Afterward, managers opined over lost opportunities but ultimately took the high road and moved on.

A FRESH APPROACH

With this campaign, CWD wanted to do more than increase rates. First they wanted to address declining consumption and aggressively pursue new business opportunities to utilize excess capacity. The loss of major industrial customers from the region not only contributed to declining consumption but also left the water util-

ity with stranded investments in infrastructure, particularly those associated with production capacity. Since 2000, cost-cutting measures were instituted by increasing energy efficiency, automating plant controls, and implementing work management systems with more efficient and effective work practices. However, even minimal rate increases of 3.5% per year and other belt-tightening measures were not enough to offset declining consumption—17% from 2000 to 2005, with a projected decline of 12% through 2011.

CWD also wanted to recapture its vanishing customer base. After World War II, Cleveland's population within the city limits peaked at 1 million. By 2000, scarcely 500,000 people resided within the city limits. Although many of Cleveland's for-

mer residents stayed within the region, population growth was moving beyond the water utility's service area boundaries, contributing to the decline in both residential and commercial consumption. In addition, increasing sewer rates, conservation, and new water-saving technologies were affecting water use. To counter these trends, the water utility needed to add new communities with real economic growth potential to its customer base.

The challenge was to overcome the urban sprawl impediment. Cleveland's political leaders saw further expansion of the water system as a threat to the city's already shrinking tax revenues.

JOINT ECONOMIC ZONES CREATED

The CWD confronted the urban sprawl debate head-on by proposing to link economic development with water system expansion opportunities. The utility proposed economic development agreements that contained antipoaching provisions (based on antipoaching principles affecting the movement of businesses within the region), limits on tax abatement, the payment of annual impact fees, and tax-sharing arrangements for compensating Cleveland's general fund for potential economic losses resulting from the extension of water service. Ohio state and local laws authorize political entities to enter into such agreements to create joint economic development zones or districts for the purpose of attracting new businesses to the area. The parties may share income tax revenues generated within the designated development area, which go directly into the city's general fund, in exchange for providing water and sewer infrastructure or other shared services. A separate water service agreement is tied to the economic development agreement, the term of which runs concurrently. This model has been used successfully by the city of Akron, Ohio. Akron aggressively

Cleveland Water Division Profile

- 1.5 million customer base
- 640-sq-mi service area
- Serves Cuyahoga County and portions of Medina, Geauga, and Summit counties
 - 65 suburbs: direct service (retail)
 - 6 suburbs: master meter (wholesale)
- Four rate classes based on hydraulic grades
- 419,000 retail accounts
 - 32% in Cleveland; 68% in suburbs
 - 96% residential and 4% commercial
 - 43% of revenue from commercial accounts
 - 79% of revenue from suburban accounts
- Total approved treatment capacity: 537 mgd
- Total excess treatment capacity: 124 mgd
- Service area expansion limited to within the Great Lakes Basin
- Total annual production 80.8 bil gal, 221 mgd
- Number of employees: 1,200
- \$230 million annual operating budget
- \$130 million annual operations and maintenance expense
- \$20–\$30 million capital funded from operating revenue (average)
- \$5 million annual water main cleaning and lining program (currently in Cleveland only)
- \$50 million/year bond funds and state revolving loan funds for capital improvements (average)
- \$70 million annual debt service
- \$110 million annual reserve

markets its economic development areas and will not offer water service for any new major commercial development without an economic development agreement.

Cleveland was successful in obtaining city council authority to extend water service to several areas that included commercial development. This was done by using a model similar to an economic development agreement tied to water service based on the city's home rule authority. Through a special competitive-advantage ordinance, the council authorized the water utility to negotiate economic development agreements and antipoaching terms (along with a provision for annual economic impact

fees to be paid to the city's general fund) in consideration for water service at a more competitive rate than that offered to existing contract communities. This competitive-advantage ordinance may only be used when the new service area can be supplied from another water utility.

TROUBLE IN THE SUBURBS

Another goal of the CWD was to gain ownership of the suburban distribution water mains from direct service, or retail communities, to better control service delivery. The water division had made important contributions toward regional growth and development by building unprecedented reliability and redun-

dancy into the water system. Gone were summer water outages and outdoor water use bans. The suburbs thrived because Cleveland delivered on its promise to construct the transmission mains, pumping stations, and storage facilities to supply water where demanded.

As a result, the suburbs now carried ownership responsibilities for more than 3,600 mi of local distribution mains. Limited funding mechanisms and lack of political will left the suburbs with a tremendous backlog in infrastructure replacement. Contractual agreements with the suburbs made the water division responsible for maintenance of the local distribution mains, but it could not make capital improvements. The backlog was affecting CWD's operations and maintenance costs and driving rates upward, but with a \$2.8 billion price tag looking forward into the next century, suburban leaders believed they had few options to address the problem.

CWD offered the direct-service communities a solution: transfer ownership of their distribution mains to the water utility. In exchange, the water division would look at options for relief from current rate formula ratios based on cost of service and earmark \$10 million of its annual capital improvement program for replacing or cleaning and lining neglected distribution water mains. The deal would be tied to an economic development agreement with the city, amendments to the existing water service agreement, and an asset transfer agreement. The proposal was presented to the Suburban Water Council of Governments, a committee within the Cuyahoga County Mayors and City Managers Association, which was established as part of the settlement of the regionalization lawsuit. The proposal included a commitment from the water division that it would incorporate the proposal into a comprehensive financial plan and any resulting rate increases would reflect the cost of the proposal.

REACHING AN AGREEMENT

At the same time the water division was initiating its comprehensive financial plan studies, the city's mayor and other political leaders within the region were engaging in renewed debates over managing urban sprawl through regional cooperative agreements. Cleveland's Mayor Frank G. Jackson led the effort by presenting a new vision for the region's economy based on antipoaching principles that were affecting the movement of businesses within the region. The principles were aimed at limiting tax incentives and equitably sharing income taxes so as to ease the losses of a community when its businesses moved to another city. The goal was to develop a model economic development agreement around these principles. The forum for finalizing the terms was the Cuyahoga County Mayors and City Managers Association. By the time the water utility completed the comprehensive financial plan studies and presented its rate increase plan to Mayor Jackson, community leaders were reaching consensus on the final terms of an economic development agreement.

TURNING STAKEHOLDERS INTO PARTNERS

An important component of the comprehensive financial plan was obtaining buy-in from stakeholders in advance of offering recommendations. This was done using a public outreach campaign that included a public opinion survey and in-depth stakeholder interviews with core constituencies such as large customers, business and community leaders, elected officials, and opinion leaders. The following themes and messages were developed to communicate these concepts:

- A sound water and sewer system is essential to the region's economic health and quality of life.
- A regional approach can successfully advance economic development and improve quality of life in northeast Ohio.

- The city of Cleveland is committed to stewardship of vital infrastructure and sound fiscal management.

- Infrastructure failure has profound effects on public health and environmental and economic development.

- The proposed financial plans and rate structure are equitable and are aligned with other municipal and regional priorities.

A key goal was to enlist partners whose support would be crucial to passing the new rate package. CWD leadership shared information every step of the way with the city administration, the suburban council of

ation of a customer service charge to cover actual costs of utility functions such as meter reading and billing. Cleveland utility managers used research from an AWWA report, "Avoiding Rate Shock: Making a Case for Water Rates," which was funded by the Water Utility Council with Water Industry Technical Action Funds, to advocate for a quarterly service charge to recover baseline costs for core customer service functions. After a spirited debate, "Cleveland Division of Water made the case that a customer service charge provided a base level of income as a necessary



Maintaining critical infrastructure components, such as flushing hydrants, is a key component of a utility's operations and maintenance program.

governments, and the city council. Proactive media relations also played a key role, as evidenced by editorial support from the region's newspaper of record, the *Plain Dealer*, which commended the mayor for the proposed plan.

Mayor Jackson introduced legislation to the city council implementing the new rate structure in April 2006. The Public Utilities Committee, led by its chair, Councilman Matt Zone, began hearings May 1, 2006, and continued the hearings for seven weeks, accepting more than 20 hours of testimony.

One controversial aspect of CWD's proposed rate package was the cre-

and predictable income stream," Zone said. The council passed the rate increase plan by a 20-1 vote. Most of the proposed elements of the plan survived intact. Changes included whittling the proposed customer service charge from \$7.50 to \$7.00, with no escalation, and reducing the rate schedule from five years to four years. The latter change was made so as not to bind a future council (which would take office in 2010) and was based on uncertainty about projections of declining consumption in the out-years.

The *Plain Dealer* article covering the council vote called the city's plan to hike rates and take over suburban water mains "historic" and "a

breakthrough approach.” According to Ciaccia, political leadership and teamwork were critical in linking the need for water rate hikes to support investments and regional opportunities. He stated, “Mayor Jackson quickly positioned himself to lead the debate on the need for regional solutions to a number of issues and recognized how the investment in our water system played into that debate. At the same time, City Council President Martin Sweeney and Chairman Zone coalesced the 21-member council.”

Other key elements of the rate package the council approved included the following:

- **Nonconsumption fees and charges.** Nonconsumption fees and charges were increased to recover an additional \$2.3 million per year. User-requested fees and charges, such as new service connections, turn on/turn off service, and hydrant rental fees, had not been updated for many years. The cost-of-service study has brought these charges in line with actual costs. The approved schedule of service fees and charges was tied to an escalator and would automatically increase throughout the rate period.

- **Affordability program.** A new affordability program was approved for low-income customers. CWD would now be offering a 20% discount on the entire water bill for qualified customers who met income and family-size criteria. The water division found a chapter of a forthcoming Water Environment Federation special publication on water and wastewater utility affordability programs very helpful in crafting a program that works well for Cleveland. This program piggybacks nicely with the existing discounted Homestead Rate Program, which offers a substantially discounted rate for elderly and disabled customers.

- **Rate stabilization fund.** The water utility projected that consumption would continue to decline over the rate period at 2% per year

and that for every 1% of decline in consumption, they would see a \$2 million revenue loss. Council members were concerned that if consumption declines did not follow the trend, the utility would realize a revenue windfall at the expense of the rate payers. The council created a water utility rate stabilization fund to hedge against future rate increases. The water utility would deposit revenue “savings” into a designated revenue stabilization fund each year that consumption was less than projected. At the end of the four-year rate period, any revenues in the fund would first be used to enhance the affordability program and then to reduce future rate increases.

Finally, the council authorized the administration’s proposed economic development initiatives linking the extension of water service with economic development agreements based on the antipoaching principles outlined previously. Direct service communities that are members of the Cuyahoga County Mayors and City Managers Suburban Water Council of Governments have been invited to enter into joint economic development zone (JEDZ) agreements with the city of Cleveland. Upon execution of the JEDZ agreement, direct-service communities will be offered amended water service and asset-transfer agreements. For those communities that transfer their assets, the CWD will determine a schedule of capital improvements, with input from the Suburban Water Council of Governments, to begin to address the distribution system infrastructure replacement backlog. Wholesale communities have also been invited to enter JEDZ agreements with the city for a rate reduction from the standard rate formula. A similar offer has been extended to all existing contracted communities within the CWD’s service area.

With the new policy in place, the CWD will be pursuing other opportunities within the region. In its strate-

gic business plan update, the CWD will be enhancing asset management capabilities and looking at further business opportunities, including possible consortium agreements with competitor water utilities and other shared services such as expanded billing services, coordinated project management, and contract operations.

ABOUT THE AUTHORS



Marlene Sundheimer (to whom correspondence should be addressed) is deputy commissioner of the Cleveland Water Division, 1201 Lakeside Ave.,

Cleveland, OH; e-mail

Marlene_Sundheimer@

ClevelandWater.com. She began her

career with the city in 1989 as the Water Division’s chief legal advisor.

In 1992, she joined the commissioner’s staff as its first risk manager and was instrumental in estab-

lishing environmental and safety groups within the organization to maintain regulatory compliance.

Sundheimer is currently an AWWA appointee to the Awwa Research Foundation Board of Trustees. She

graduated from Hiram College, with a BA in political science, and the Cleveland-Marshall College of

Law. Matt Zone is city councilman for Ward 17 in Cleveland. Elisa

Speranza is vice-president for CH2M HILL’s Global Water Business Group and global service team

leader for its Utility Management Solutions Group.

REFERENCES

AWWA, 2004. Avoiding Rate Shock: Making a Case for Water Rates. AWWA, Denver.

USEPA (US Environmental Protection Agency), 2006. Sustaining Our Nation’s Water Infrastructure. USEPA, Washington.

If you have a comment about this article, please contact us at journal@awwa.org.

102

Beyond the tap: City water service as a catalyst for regional economic development

Marlene Sundheimer, Matt Zone, and Elisa Speranza

To develop support for needed rate increases, the Cleveland Water Division (CWD) used a comprehensive financial plan. Their management approach mirrors the US Environmental Protection Agency (USEPA) Office of Water's Sustainable Water Infrastructure Initiative. In this program, the USEPA collaborates with drinking water and wastewater utility managers, trade associations, local watershed protection organizations, and state and local officials to ensure that investment in the nation's water infrastructure is sustainable into the future. CWD com-

missioned CH2M HILL's Utility Management Solutions Group to undertake the comprehensive financial plan. The plan included several unique elements designed to address the city's need to sustain its operations well into the future. The scope of the plan included a cost-of-service study, rate design, a financial planning and rate model that included customer and demand forecast modules, stakeholder communication support, a water audit and studies of system expansion, new products, and automated metering.—MKK

109

The infrastructure "crisis"?

John E. Cromwell, Elisa Speranza, and Haydn Reynolds

Much has been written about the infrastructure "crisis" facing water and wastewater utilities. Today's utility managers and governing board members are in a position to mobilize and sustain proactive investments in utility infrastructure asset management to prevent catastrophic or disastrous conditions from developing. When asset management initiatives are grouped into a coherent risk management program, it is possible to see the connections between a given level of capital replacement and the necessary repair, rehabilitation, and con-

dition assessment. In turn, board members can better appreciate risk management and begin to make the case for ramping up key expenditures. In addition to providing a risk management framework, asset management is a continuous improvement process that facilitates knowledge transfer from one generation of managers and board members to the next. It also provides direction for research and development of repair and replacement technologies and a better understanding of sustainable service levels.—MKK