



Working Together

**FACTORS LEADING TO
WATER SYSTEM MERGERS**

By **Martin Jaffe**, Director and Associate Professor, Urban Planning & Policy Program, University of Illinois at Chicago.

John Braden, Professor, Department of Agricultural & Consumer Economics, University of Illinois at Urbana-Champaign.

Min-Yang Lee, Graduate Research Assistant, Department of Agricultural & Consumer Economics, University of Illinois at Urbana-Champaign.

***Editor's Note:** Water system mergers have become more common over the last several years and much debate has occurred as to the efficacy of these mergers. The following article takes a comprehensive look at system ownership and examines factors that can lead to mergers.*

On recent years, the U.S. Environmental Protection Agency (EPA) has devoted millions of dollars to programs aimed at strengthening the technical, managerial, and financial (TMF) capabilities of small systems. These concerns are driven by differences in Safe Drinking Water Act (SDWA) compliance rates: a higher percentage of smaller water systems have water quality and reporting violations under the SDWA than do larger water systems. However, solutions are not always found in additional TMF investments. Sometimes it makes more sense to turn the systems over to new owners.

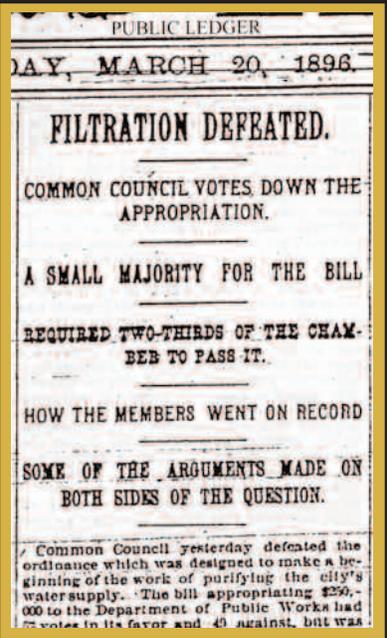
Compliance problems arise for many reasons. Some are attributable to limited customer bases. Fewer customers usually mean lower revenues to cover fixed costs, lower bond ratings (making borrowing more costly), and higher per-customer service costs. In such cases, encouraging underperforming systems to combine resources and administrative structures can reduce overhead while also gaining economies of scale. Larger systems generally can afford greater technical sophistication. They also have greater attractiveness in bond markets. Thus, encouraging small water system mergers and reorganizations can be an important strategy for improved compliance.

Most water utilities in the U.S. underwent enormous transformation in the late 19th and early 20th centuries. Within a period of two or three decades, most urban water systems changed from being predominantly privately owned to being predominantly publicly owned. This historical transformation is relevant today because, at the time they were initially acquired, many of these private waterworks had service areas and customer bases similar in size to those served by small water systems today. Further-more, many of these municipalized systems were also perceived as underperforming in meeting the water quality and quantity demands of their eras.

Historians and economists have proposed five reasons to explain this historical transformation: public health concerns, public finance pressures, contractual conflicts between private providers and their customers, corruption, and transaction costs. Each of these historical factors—especially transaction costs, as shown by our research on contemporary small water system consolidations—may also influence contemporary small water system acquisitions and mergers.



For more information about water system consolidation, see the articles “Regionalization: Forced, Voluntary, and Somewhere In Between” and “Regional Water Authority Helps Western New York” on the National Environmental Services Center Web site at www.nesc.wvu.edu.



As this Philadelphia newspaper article from 1896 shows, community water issues are often contentious.
 Courtesy of www.phillyh2o.org

Public Health and Safety

During the 19th century, public health crises often sparked outcries for municipal water services. For example, Chicago built its

new water distribution and treatment facilities and initiated its project to reverse the flow of the Chicago River to protect its Lake Michigan water supplies after 80,000 citizens died of typhus in 1885. Public concerns over fire risks also generated public dissatisfaction with private water companies. As York University economist Letty Anderson notes, many also thought that privately owned waterworks made most of their water supply decisions only to generate short-term profits from residential water sales rather than providing sufficient water to public hydrants for municipal fire protection.

Recent studies dispute the presumed public health deficiencies of private waterworks, including one by University of Pittsburgh economic historian Werner Troesken that found that the transition of ownership did not bring about a significant reduction in water-borne disease outbreaks. In addition, private companies more frequently used filtration. Nevertheless, the move to public ownership probably indicated a strong public demand for change and improvement and a prevailing sentiment that public ownership was more likely to produce results.

Municipal Finance Pressures

A second set of forces contributing to the municipalization of urban water supplies involves the rapid rate of municipal annexation in the late 19th and early 20th centuries. These municipal expansions greatly increased the service areas of urban waterworks, especially after modern indoor plumbing was introduced to residential dwellings in the late-19th century.

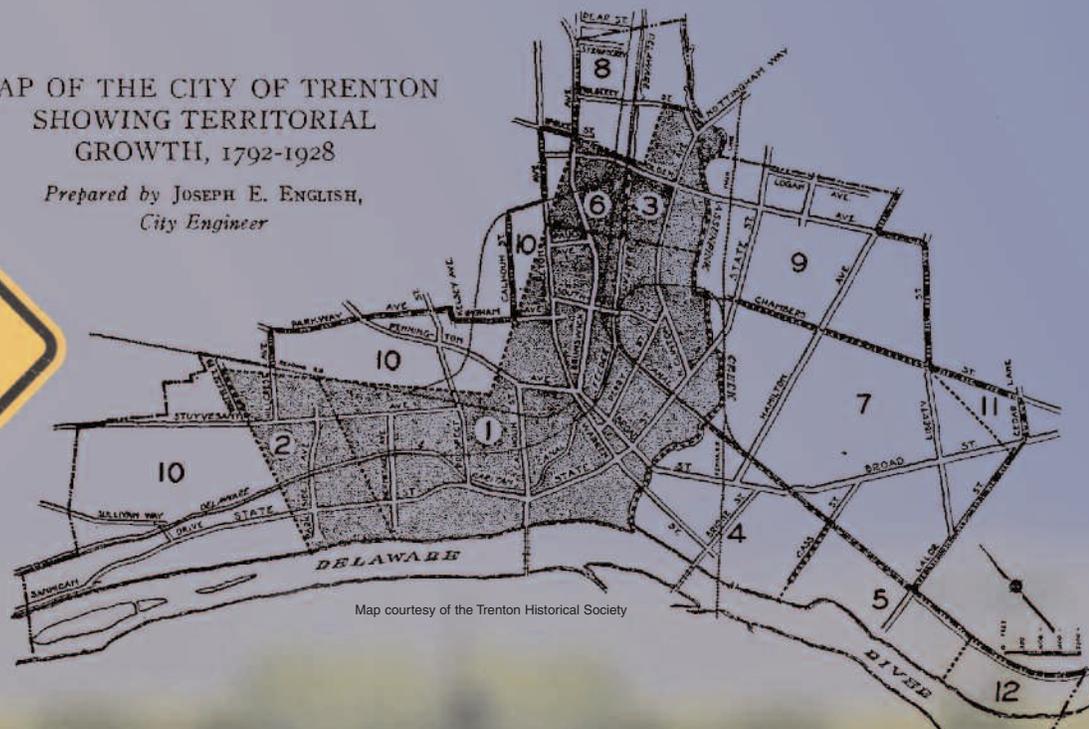
According to Harvard economists David Cutler and Grant Miller, this rapid rate of municipal annexation was associated with the ability of publicly owned and financed municipalities to tap financial resources that were unavailable to private water suppliers. After the development of modern bond markets, private investor and special-assessment

Municipal Growth

Many cities grew substantially following American independence. During this time, community water supplies began changing from private to public ownership.

MAP OF THE CITY OF TRENTON SHOWING TERRITORIAL GROWTH, 1792-1928

Prepared by JOSEPH E. ENGLISH,
City Engineer



financed waterworks simply could not raise capital as efficiently as municipalities could. Bonds provided savvy municipalities with the financial resources needed to meet rising demand for potable water at a time when the costs of constructing modern water systems to serve entire urban populations were too large for private firms to assume.

The ability of government to enforce universal payment for services and innovations in the bonding of public investments undoubtedly increased the capacity of municipalities to take over and operate water supplies. Nevertheless, private water companies have historically offered safe and significant returns to shareholders, so poor performance and financial weaknesses are not necessarily results of private ownership.

Contractual Conflicts

At the turn of the 20th century, franchise arrangements between cities and private water companies often required the companies to improve water treatment or expand their service areas without being able to increase their rates sufficiently to offset these additional expenditures. These fiscal limitations reduced dividends and thereby lowered the perceived value of their stock to their investors. This

decline in stock values, in turn, enabled municipal officials to later acquire the private water systems at reduced prices either by purchase, franchise revocation, or through eminent domain, or by simply building a public waterworks to undercut the private system.

The growing threats of public appropriation removed economic incentives for private water companies to expand their operations or improve their facilities. Foregoing these improvements was a rational investment decision intended to bolster the private waterworks' short-term profits; however, this inaction further reduced both the long-term value of the systems and the compensation received by the owners, when they were later expropriated and municipalized by public officials.

Contractual conflicts contributed to the simultaneous growth of state utility regulation, municipal ownership, and especially frequent litigation. Troesken and Cornell University economist R. Rick Geddes correlated these factors with later expropriation, also noting that the substantial metering costs commonly required of private waterworks by many municipal franchises created a quandary for privately owned water utilities: Unit prices of water were often too low to

justify a privately owned waterworks to spend money to install and read water meters, while failing to meter customers made it harder for the private waterworks to justify asking for increases in their usage charges and connection fees. Further, as noted by Scott Masten, a professor of Business Economics and Public Policy at the University of Michigan, many private water companies that couldn't adequately recover their metering fees had to rely on revenue transfers from government, further increasing the private utility's exposure to contractual conflict and appropriation.

Corruption

History has amply demonstrated the need for regulation of privately owned utilities by state utility commissions and through municipal franchise contracts. Syracuse University historian Nelson Blake's classic book *Water for the Cities: A History of the Urban Water Supply Problem in the United States* spells this out in detail. Examining the emergence of municipal water systems in New York, Philadelphia, Boston, and Baltimore in the early 19th Century, Blake showed how public water boards and commissions were pitted against speculative private water companies, with the battle played out in

Growth History of Trenton, New Jersey

1. 1792—Areas 1,2,3,6 show territory included by the first municipal charter
2. 1831—Taken from the City of Trenton and annexed to Trenton Township (later returned to Trenton)
3. 1844—Taken from the City of Trenton (later returned to Trenton)
4. 1851—Annexed Borough of South Trenton
5. 1856—Annexed part of Nottingham Township
6. 1858—Taken from Trenton and annexed to Ewing Township (later returned to Trenton)
7. 1888—Annexed Borough of Chambersburg
8. 1888—Annexed Millham Township
9. 1900—Annexed Borough of Wilbur
10. 1894 & 1900—Areas marked 10, along with 2 and 6, were annexed from Ewing Township
11. 1900—Annexed part of Hamilton Township
12. 1921—Annexed part of Hamilton Township

Photo courtesy of nj.usgs.gov

the backrooms of the state legislatures as they granted lucrative service franchises to private water systems.

In some cases, as in New York City's, the private water companies were merely corporate shells through which wealthy investors engaged in banking and other financial enterprises unrelated to water supply provision. Troesken later cited this concern over corruption by private water suppliers, and the larger national reform movement at the end of the 19th century, which embraced the cause of utility regulation, as a significant contributor to municipal expropriation of private water companies.

Troesken also notes that many public water systems themselves became instruments of urban machine politics, where patronage and politically determined rate structures filled the pockets of the well-connected while infrastructure maintenance was short-changed. A major reason that corruption theories remain so relevant in explaining institutional change is that water supply history might have come full circle, with the alleged operational inefficiencies and fiscal deficits of "corrupt" public water systems providing the justifications for the growing interest in water supply privatization today.

Transaction Costs

A recent statistical study of Midwestern water system mergers by Min-Yang Lee, a University of Illinois researcher, examined how the costs of reorganization affect the probability of merger. Lee found that the two factors having the greatest influence on the transaction costs of water system mergers are the system's form of ownership and the extent to which the water system is already interconnected with an adjacent system. Publicly owned water systems were six percent less likely to be acquired than privately owned ones. This finding suggests that the transfer of public assets is fraught with greater political complexity and higher bureaucratic costs than transfer of privately held assets. Water systems that purchased water were 13 percent more likely to be acquired than systems that were not already interconnected to an adjacent system. The existence of an operating relationship between two water systems almost surely reduces the costs of further system integration through merger.

Lee also found that small water systems located within wealthier metropolitan areas were slightly more likely than average to be acquired. Even though urban systems are theoretically more expensive to acquire than water

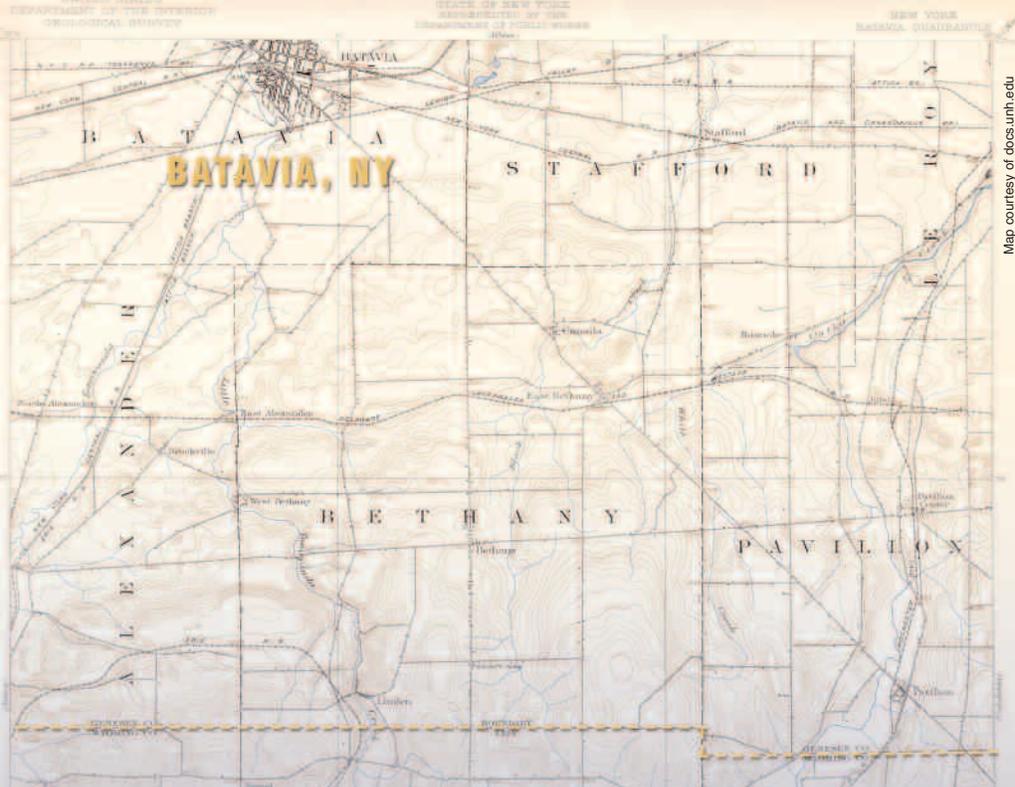
systems in more rural locations due to land costs and the number of parties interested in the transaction, their greater density of service connections also implies a relatively high ratio of operating income to fixed costs, which may offset some of the higher transaction costs. Lee found that an increase in the service connection density by 10 connections per square mile increased the likelihood of merger by approximately 0.2 percent.

Small System Mergers

Times were certainly different at the turn of the last century, when the regulatory context (rampant corruption, open-ended and perpetual franchises, and lack of regulatory oversight) and capital markets differed so extensively from the institutional framework under which small water suppliers currently operate. But the ongoing importance of safety, utility regulations, and financing makes these factors relevant today.

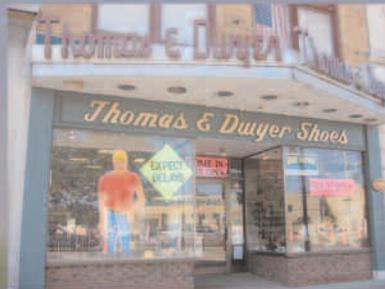
Health and safety concerns still account for most of the short-term pressures for change within the water industry. Public disclosure requirements expose systems to increased public scrutiny. EPA and states mandate and monitor water system compliance with new drinking water standards

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Map courtesy of docs.unh.edu

During the 1990s, the town of Batavia, New York (shown at right) faced the challenge of continuing to provide clean, safe drinking water. Rather than replace their aging treatment plant, local officials crafted an arrangement with neighboring Erie and Monroe counties, both of whom had more capacity than they were using. By the end of the project, 31 other communities became involved in the \$35 million project.



Photos courtesy of www.downtownbataviany.com



Continued from page 17. and other regulatory mandates. These include, for example, EPA's copper, lead, arsenic, microbe, disinfection by-product, and radionuclide rules, which are driving new investments in treatment technologies. Because these investments are expensive, many small water utilities can most economically meet these new demands by spreading their water filtration and treatment costs over a larger customer base, rather than continually raising their water rates. This creates an incentive for institutional change, especially through water system expansion or consolidation.

The need to purchase advanced treatment technologies, in turn, raises many of the issues that private water systems faced in meeting new demand at the turn of the last century, when cities were rapidly growing and privately owned utilities' access to capital was constrained. These capital needs are likely to grow simply because of the need to replace old pipes, expand service to meet new demand, and comply with post-9/11 security needs. Most analysts consider water service bonds to be a safe investment, but bond returns are still influenced by the size and scale of the water utility. It's often easier and cheaper for larger water utilities to borrow money than smaller ones because of their larger revenue streams. State revolving loan funds can theoretically offer smaller water systems capital at lower rates than could private bond markets, but because the demand for these funds outstrips supply, access to that capital can involve a long wait on a state priority list.

More stringent public oversight (by state environmental agencies and public utility commissions) of water systems can influence institutional change. Public utility commissions have resolved most of the historic problems of corruption, but regulatory red tape can also impede needed improvements, especially if it limits a small utility's ability to raise its water rates to pay for its growing treatment and operational

costs, or denies its requests for expansion of its service area. Larger water systems with their larger staffs simply have greater administrative capacity to handle the reporting and the paperwork generated in meeting state public utility regulations as well as SDWA mandates. So, in the same way that some scholars believe that contractual conflicts on the state and municipal level drove urban water system changes in ownership in the 19th and 20th centuries, state and federal conflicts may still create incentives for water systems to change their scale or operations in the 21st century.

Finally, reducing the transaction costs of acquisition could be a useful strategy to encourage mergers between water systems so that they can realize better economies of scale and thus achieve higher rates of regulatory compliance. Lee's statistical analyses of water system mergers in the Midwest reinforce current beliefs that merger can be an effective way for smaller water systems with SDWA violations to achieve regulatory compliance. The fact that smaller water systems and water systems with SDWA violations are both more likely to be acquired gives some credence to those beliefs.

However, this same analysis shows that small water systems in rural counties with lower incomes and low or declining growth rates are apparently not using merger as a compliance strategy, despite their higher rates of SDWA violations. If regulators and policy makers want to encourage mergers as one way to shift more capital and resources to troubled small rural water systems, adopting policies to reduce the transaction costs of a merger make a lot of sense. Because water systems that purchase water often are acquired by the system that they purchase water from, adopting state and federal policies that encourage the transfer or sale of water between adjacent rural systems is likely to be the most helpful approach to reducing some of these costs.

Other strategies can also be considered. Either offsetting high transaction costs with direct grants or loans, or deregulating the merger process (especially if water systems are treated like public utilities) will certainly encourage more mergers. Reducing some of the political burdens on transfers of publicly owned systems (by removing requirements for public referenda, for instance) might also reduce some of these costs, making mergers a more effective strategy for dealing with SDWA violations by small water systems.

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By Martin Jaffe,
Director and Associate
Professor, Urban
Planning & Policy
Program, University of
Illinois at Chicago.



John Braden,
Professor, Department
of Agricultural &
Consumer Economics,
University of Illinois at
Urbana-Champaign.



Min-Yang Lee,
Graduate Research
Assistant, Department
of Agricultural &
Consumer Economics,
University of Illinois at
Urbana-Champaign.