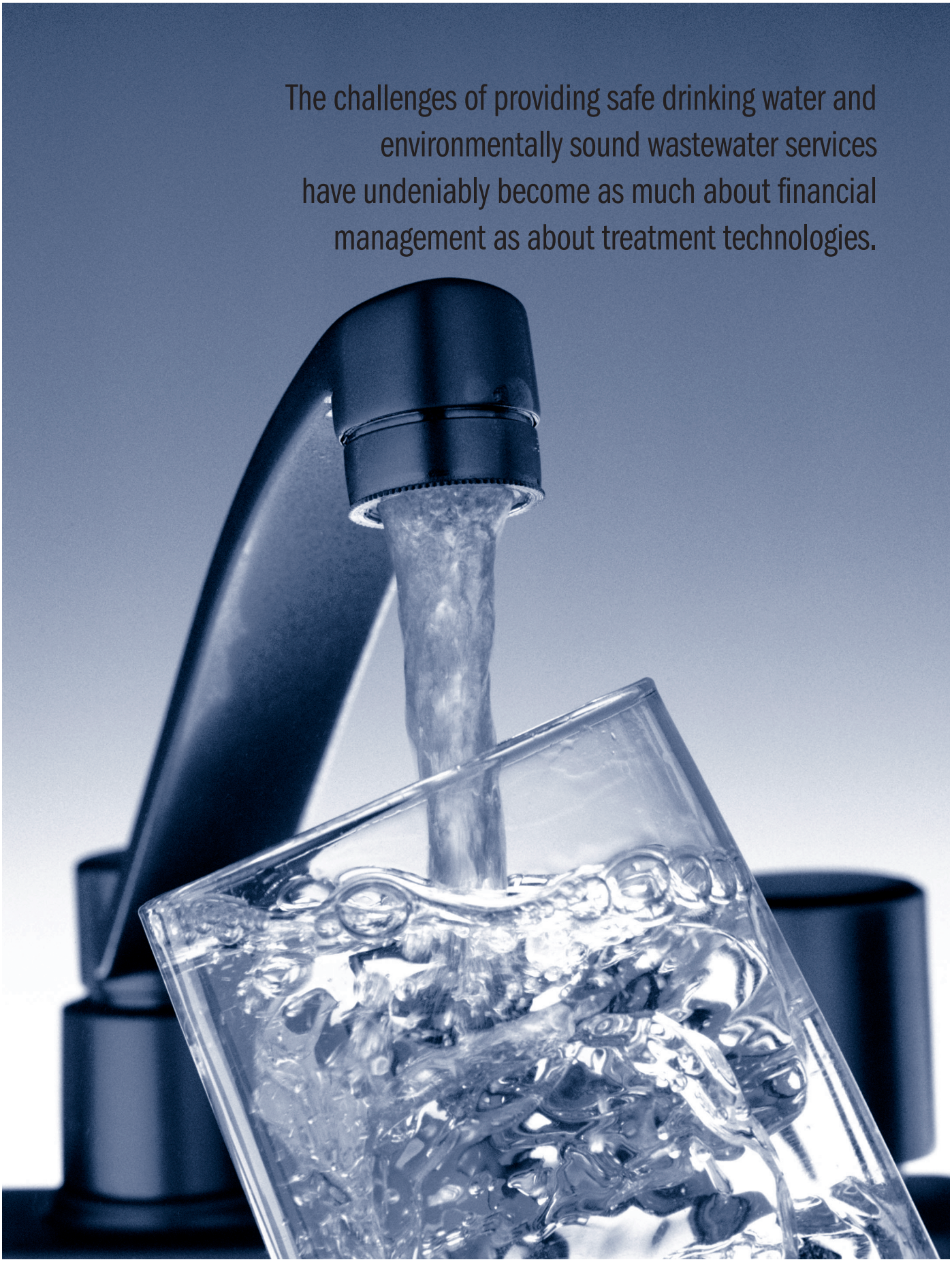
The challenges of providing safe drinking water and environmentally sound wastewater services have undeniably become as much about financial management as about treatment technologies.



Jeff Hughes

The Painful Art of Setting Water and Sewer Rates

- *An increase in mergers and acquisitions*
- *Almost $8 billion in assets and more than $1 billion in annual revenues*[1]
- *Changing regulations, affecting the bottom line*
- *A backlog in capital investment needs*
- *Interruptions in supplies that hurt revenues*
- *Loss of major customers*
- *Innovative pricing and customer-relations strategies*
- *Sagging revenues*

Does this scenario sound like Wall Street or the North Carolina furniture or textile industry? Does it sound like a business that has a fleet of business school graduates on its board and in high-level management?

These also are some characteristics of water and sewer enterprises owned by North Carolina local governments. Provision of centralized drinking water and sewer services resembles large business in many ways. However, the enterprises providing these services are not listed on Wall Street, and few government-owned water and sewer enterprises have even one business school graduate on their governing boards or in management.

Many features distinguish provision of water and sewer services from other businesses, but the challenges of providing safe drinking water and environmentally sound wastewater services have undeniably become as much about financial management as about treatment technologies. The financial decisions affecting water and sewer enterprises typically fall on governing boards that were chosen not as business or technical experts but as representatives of their constituents on a broad range of matters.

The drought of 2002 brought two types of water stories to the headlines: (1) the struggles of many communities to maintain their water supplies and (2) the financial difficulties of many communities due to decreased sales. The response to the first type of circumstance was immediate and significant: an executive order requiring conservation, and statewide initiatives to examine current supplies. The response to the second type of circumstance has been less obvious and less pronounced.

This article looks at the fundamental principles behind the water and sewer revenues that keep North Carolina's utilities in business. It focuses on high-priority financial decisions facing the boards governing water and sewer enterprises—decisions involving raising revenues from those whom they serve. The challenge is to evaluate and implement such decisions without forgetting that ultimately the water and sewer business is primarily about public health, not the bottom line.

Water and Sewer Revenues

In 2002 about 500 government-owned water and sewer enterprises collected more than $1.4 billion in revenues from their customers, and their combined net assets were almost $7.8 billion (see Table 1). These numbers are impressive. However, the projected numbers are staggering. According to a study by the North Carolina Rural Economic Development Center, the state will need more than $11 billion in investments to meet its capital needs for water and sewer infrastructure over the next twenty years.[2]

In North Carolina, as throughout the country, numerous water and sewer enterprises owned by local governments benefited from the federal government's ambitious construction grants program of the 1970s (for the patterns of federal wastewater funding from 1970 to 2000, see Figure 1). Many local government officials fondly remember those days of "free money." In fact, though, there was nothing free about that money. It was collected from citizens by the federal government through taxes, rather than by local governments through water and sewer charges.

A recent trend is the shift of the burden of collecting revenues away from the state and federal governments, toward local governments. This shift is painful for many in local government.

The state of North Carolina has periodically played the role of collector. As recently as 1998, citizens passed a referendum allowing the state to issue about $800 million in bonds to provide grant and low-interest capital funds for government-owned water and sewer enterprises. The majority of the funds were disbursed between 1999 and 2003. The debt service on them will be retired

Table 1. **Financial Overview of Water and Sewer Enterprises Owned by North Carolina Local Governments**

Number of enterprises	507
Annual revenues	$1,410,130,282
Equity	$7,774,753,555
Outstanding debt	$4,115,026,560

Source: Calculated by author using data from local finance reports submitted to Local and State Gov't Div., N.C. Dep't of State Treasurer, for fiscal year ending June 30, 2002.

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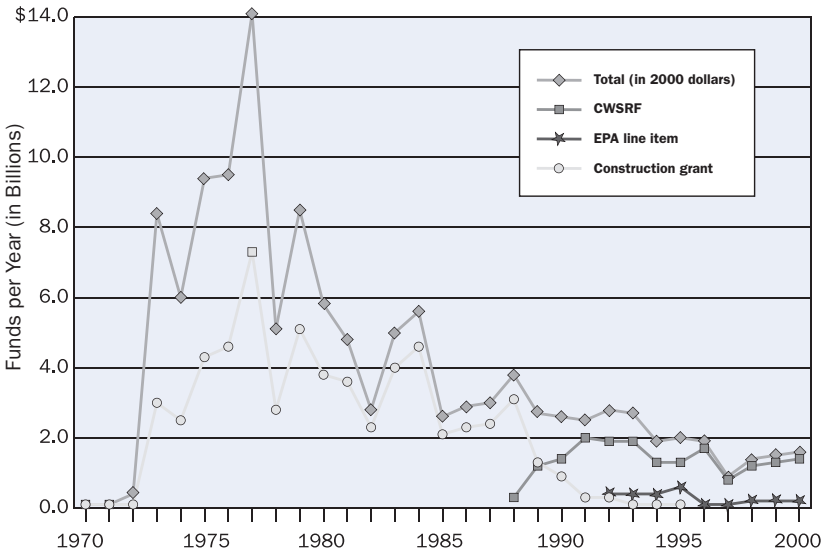
Figure 1. **Federal Funding for Wastewater Infrastructure, 1970–2000**



Source: Environmental Protection Agency, Report to Congress: Impacts and Control of CSOs and SSOs (Washington, D.C.: EPA, 2004).

Note: CWSRF = Clean Water State Revolving Fund. EPA = Environmental Protection Agency.

by the state using general revenues collected from state taxpayers.

The federal and state governments will likely continue to provide some water and sewer funds. However, given the economic pressures on the federal and state budgets, local governments probably will have to raise most of the revenues for their water and sewer services.

The need for increased revenues comes at a time when some water and sewer enterprises, especially small ones, are not even generating sufficient income from their rates to meet current needs. Many municipal utilities in North Carolina had negative operating margins in the fiscal year ending June 30, 2003.[3] Overcoming current deficits and meeting future capital needs will surely result in significant (and painful) pressure on local governments to increase the revenues that they collect from their customers.

Governance

About two-thirds of North Carolina residents pay a centralized provider for their drinking water, and half pay for centralized treatment of their wastewater.[4] Most residents not served by centralized providers rely on wells for their drinking water and septic systems for their wastewater treatment.

A variety of government organizations in North Carolina provide centralized water and sewer services, including municipalities and special units of government created solely to provide such services. Municipalities are the most common providers. However, the last few years have seen an increase in regional arrangements that include expanded county systems, partnerships among local governments, and regional-provider models. Although these joint undertakings have many similar responsibilities, their statutory authorities and governing board structures vary (for a summary, see Table 2).

Nongovernment service providers include numerous small, investor-owned companies and a few nonprofit organizations. However, on a statewide basis, these organizations serve far fewer customers than government-owned water and sewer enterprises do—320,000 versus more than 5 million—and collect far less revenues—about $50 million versus more than $1.4 billion.[5]

Table 2. **Enabling Statutes and Common Organizational Structures for Water and Sewer Enterprises Owned by North Carolina Local Governments**

Owner/Model	Enabling Statutes	Financial Management Authority *(Rate-Setting and Financial Planning)*
Municipality	G.S. 160A, Art. 16	Municipal council/mayor
County	G.S. 153A, Art. 15	County board of commissioners
County water and sewer district	G.S. 162A, Art. 6	County board of commissioners
Water and sewer authority	G.S. 162A, Art. 1	Varies—typically, appointed representatives from participating governments
Interlocal agreement, including joint management agency (JMA) (sometimes referred to as "authority" or "commission")	JMA: G.S. 160A-460 through -462; G.S. 160A, Art. 20, Pt. 1; G.S. 153A-278	Varies—typically, elected officials from participating governments
Sanitary district	G.S. 130A, Art. 2, Pt. 2	Officials elected to sanitary district board by citizens within district
Metropolitan water district/ metropolitan sewerage district	Water: G.S. 162A, Art. 4; sewerage: G.S. 162A, Art. 5	Varies—typically, appointed representatives from participating governments

Sources: Warren Jake Wicker, *Outline of Alternative Organization Arrangements for Providing Water and Sewerage Services in North Carolina* (June 1988) (unpublished manuscript, on file with author); Warren Jake Wicker, *Water and Wastewater Services*, in Municipal Government in North Carolina 691 (2d ed., David M. Lawrence & Warren Jake Wicker eds., Chapel Hill: Institute of Gov't, Univ. of N.C. at Chapel Hill, 1995).

The UNC Environmental Finance Center

The Environmental Finance Center at UNC at Chapel Hill conducts financial management training and assists local governments in developing innovative ways of paying for environmental programs and services. The center and the Institute of Government currently offer financial management workshops for the governing boards of utilities. For more information about these workshops and other environmental finance programs, visit www.efc.unc.edu.

UNC ENVIRONMENTAL FINANCE CENTER

Investor-owned utilities are regulated by the North Carolina Utilities Commission, which is responsible for reviewing annual reports and approving customer rates and charges. Nonprofits are regulated primarily by their boards.

Financial oversight of government-owned utilities is provided by the North Carolina Local Government Commission (LGC). It reviews financial reports, approves audit contracts, and approves most debt, including debt for water and sewer purposes. Also, it often reviews existing rate structures. However, neither it nor any other state agency has approval authority over water and sewer charges imposed by government-owned water and sewer enterprises (see Table 3).

The provision of water and sewer services is a monopoly. Few customers have much choice in their service. All monopolies, even the most benevolent, require some basic customer oversight and protection. From a rate-setting standpoint, government-owned water and sewer enterprises are arguably one of the least regulated of any monopolies in North Carolina.

One justification for not having an autonomous rate-setting review body for government-owned water and sewer enterprises relates to the election process behind most utility boards. In most (but not all) cases, payers of local government water rates (the people who theoretically need protecting) have the direct ability to "fire" (by not reelecting) the owner of the monopoly that provides them service. The election process probably has more of an impact (positive and negative) on rate-setting than the other oversight options shown in Table 3 could ever have. The officials setting rates depend on the support and the good graces of their customers to stay in power.

In a publicly traded company, the managers of the company are responsible to their owners and their customers, in that order. For example, Krispy Kreme customers probably would prefer a donut that costs ten cents, but the managers of Krispy Kreme balance their interest in pleasing their customers with the constraints of keeping the company financially healthy.

In a government-owned enterprise, the line between owner and customer blurs: they normally are the same. As customers, citizens sometimes get blinded by the seduction of cheap services. This often overpowers their interest as owners in ensuring the long-term financial health of their water and sewer utilities. There are many more examples of citizen-customers complaining about rising water charges than there are of citizen-owners demanding increases in revenues to ensure the long-term health of the business. Striking a balance between pleasing customers and looking out for the good of the company is one of the central challenges in managing a government-owned utility.

Getting Down to Business: How Should Customers Pay?

> *A city may establish and revise from time to time schedules of rents, rates, fees, charges, and penalties for the use of or the services furnished by any public enterprise. Schedules of rents, rates, fees, charges, and penalties may vary according to classes of service, and different schedules may be adopted for services provided outside the corporate limits of the city. (G.S. 160A-314a)*

The preceding section of the North Carolina General Statutes authorizes municipalities to establish rates to support public enterprises, including water and sewer enterprises. It is the primary authorization and instruction for both the $5 late fee tacked onto an overdue water bill and the $50,000 impact fee that a large industry might be required to pay before getting sewer service. The laws governing county water and sewer enterprises and other government models appear in different parts of the statutes and have some variations.[6] However, all the laws governing rate-setting authority for government-owned water and sewer enterprises share the characteristic of providing general guidance and limitations with very few specific rules or procedures. The regulatory framework gives leaders of water and sewer enterprises much latitude in designing

Table 3. **Financial Regulatory Framework for Water and Sewer Services in North Carolina**

Review/Oversight of Type of Service	Review/Approval of Financial Statements	Rates and Charges
Municipality	N.C. Local Government Commission	Municipal council
County system (including county district)	N.C. Local Government Commission	County board of commissioners
Sanitary district	N.C. Local Government Commission	Sanitary district board
Water and sewer authority/ metropolitan district	N.C. Local Government Commission	Detailed in bylaws—typically, board appointed by participating municipalities and counties
Private company	N.C. Utilities Commission	N.C. Utilities Commission

rates and fees. Utilities that use revenue bonds or some type of public capital assistance may have to follow more specific requirements imposed by their lenders, such as raising rates to meet revenue targets. Even under these "rate covenants," though, utilities maintain a degree of flexibility in how they allocate costs to different customers.

The good news is that this flexibility provides local boards with countless options. The bad news is that they have countless options, with no one right answer or approach. With the flexibility comes responsibility. Choosing the combination and the structure of rates and fees that are appropriate for it can be a difficult task for a community, especially if the right and appropriate option requires a change from a long-established approach or negatively affects a particularly large customer or group of customers.

The pricing of goods and services is the core of private companies' operations. They review it continually and compare it with costs. Many government-owned enterprises have developed similar views about their water and sewer rates and fees. Some hire specialists to review their rates and suggest innovative techniques, such as charging different rates for different time periods (seasonal rates) or dividing consumption into blocks (e.g., 0–3,000 gallons/month, 3,000–6,000 gallons/month) and charging different rates for consumption that falls in each block. In some cases they incorporate rates into cash-flow models so that they can link every capital decision to rates. Rate review and modification may be incorporated into the annual budget process. For example, Cary uses a rate model to calculate rates each year. When costs go up, rates go up as well.

Unfortunately, many government-owned utilities, especially the smallest ones, are unwilling or unable to pay this amount of attention to their rates. They set rates and then forget about them (or avoid reviewing them) for as long as possible. It is easy to understand their avoiding what is normally a very difficult and unpopular responsibility. Yet from a business standpoint, an enterprise's inattention to revenue needs can affect its ability to provide quality services.

Making Key Decisions about Rates and Fees

Local government leaders face several key decisions about rates and fees.

Deciding on the Types of Charges

As noted earlier, North Carolina law states that government-owned water and sewer enterprises may use a variety of charges, but it does not specify what they should be or how they should be calculated. In practice, utilities have developed an assortment of rates, fees, charges, and penalties that vary widely in terminology, implications for financial strategy, and application.

At the most general level, customer-generated revenues fall into two general categories: the monthly bill and up-front charges, due before obtaining service—often referred to as "tap-on" or connection charges. Also, there are special assessments.

The Monthly Bill

Most customer-generated revenues are collected through monthly (or sometimes bimonthly or quarterly) bills sent to customers. The monthly bill often includes several charges. Many utilities use a fixed charge to recover a consistent amount every month. What is covered by this fixed charge varies significantly across utilities. It can include meter-reading costs, bill-processing costs, and a portion of capital costs.

From one utility to the next, the fixed charge may appear under different names. The names may or may not explain how the charge is used—for example, service charge (Orange Water and Sewer Authority—OWASA), base charge (Aberdeen), billing and availability fee (Greensboro), meter charge (Benson), and administrative fee (Chatham County).

In addition to the fixed charge, there normally is a charge that is based on the volume of water used or treated.

Rather than have a fixed component and a volume charge, many water and sewer enterprises charge a "minimum" for a set amount of service. For example, Oak Island charges $29.00 as a monthly minimum for the first 4,000 gallons of wastewater, plus $6.90 for every 1,000 gallons of wastewater above 4,000 gallons.

Up-Front "Tap-on" or Connection Charges

In addition to charging their customers recurring fees for use, most water and sewer enterprises require that new customers pay some type of up-front charge before they can be provided service. North Carolina law does not specifically define the terms "tap-on charge" or "connection charge," and the terms have come to mean different things to different utilities. For the average new residential customer, these charges can range from a few hundred dollars for utilities that charge only a basic meter installation fee to more than $5,000 for recovery of a percentage of the existing or future facility costs necessary to serve the new customer.

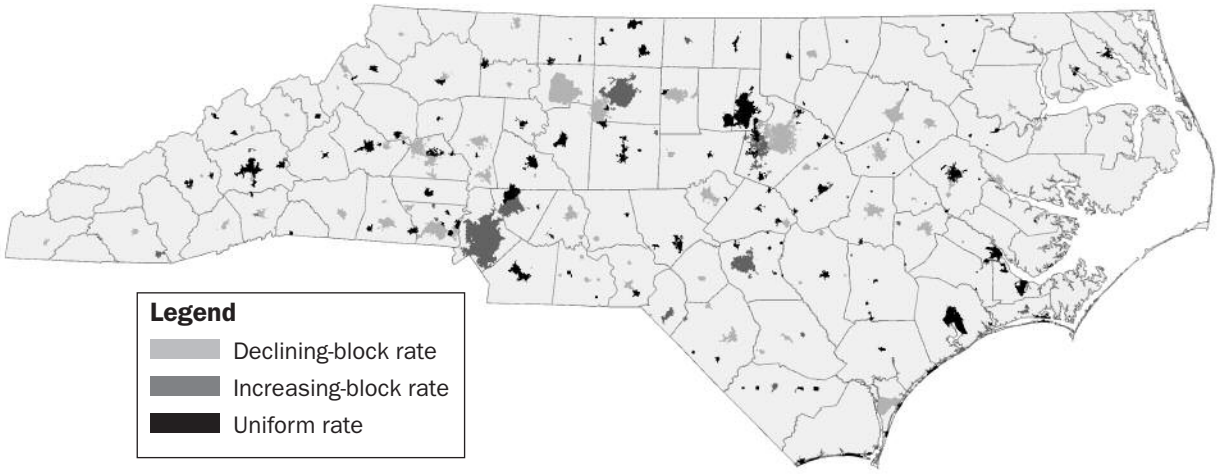
The North Carolina League of Municipalities conducts a rate survey of municipal water and sewer enterprises every two years. In the most recent survey, 91.9 percent reported using a tap-on or connection fee, 44.8 percent a nonrefundable hookup fee, 20.2 percent a frontage/acreage fee, 17.9 percent a capital recovery charge, and 15.2 percent an impact fee.[7]

In one system, "tap-on fee" or "connection charge" may be an umbrella term that characterizes several fees with different purposes, from recovering a portion of past capital cost to offsetting direct installation expenditures. In another system the same term may refer to a particular fee, such as one that covers the actual cost of installing a water meter. Explaining these to customers often is a challenge, especially because fees increasingly cover costs for facilities such as water treatment plants or water tanks that customers never see.

Special Assessments

Many types of government-owned water and sewer enterprises, including county and municipal ones and water and sewer authorities, are authorized to use special assessments for improvements. Unlike the case with other common water and sewer charges, the law contains many specifics on how these should be calculated and implemented.[8] Under a special assessment, the owner of a property that is improved by the provision of water and sewer infrastructure can be assessed his or her relative

Figure 2. **Structure of Residential Water Charges, North Carolina, 2002**



Source: Compiled by UNC Environmental Finance Center using database of local government rate structures prepared as part of biannual North Carolina League of Municipalities Rate Survey (2002).

Note: The shading shows the political boundaries of municipalities with the particular type of charge. In some cases the service area would extend beyond the political boundaries, so the shading does not represent the service area.

portion of the overall project's cost, whether or not the owner connects to the system. Assessments are linked to a particular construction project and can be paid in a lump sum at the conclusion of the project or spread out over a number of years.

A utility can combine all the basic components of rates and fees and apply them differently on the basis of its community's characteristics, interests, and priorities. The rest of this article describes different approaches and strategies.

Deciding on a Rate Structure

The rate structure that utilities use to calculate their customers' bills is one of the most important rate decisions that a utility must make. Given the flexibility that governing boards have in so many areas related to rate-setting, a subtle change in how they calculate rates or how they allocate costs among customers can have significant impacts on the bottom line as well as on customer behavior.

Key decisions about rate structure include how large to make the fixed portion of the bill and how to calculate the volume charge. Regarding the latter, the unit price for a specific amount of consumption (say, 1,000 gallons) may remain the same as the customer consumes more or less. This is called a "uniform charge." Alternatively it may decline as the customer consumes more or increase as the customer uses more. These are called a "declining block charge" and an "increasing (or inverted) block charge," respectively.

Some utilities, such as OWASA, have moved to a seasonal rate structure, under which the unit price varies by the season —October through April, versus May through September (the peak season).

The use of different structures varies across the state (see Figure 2).

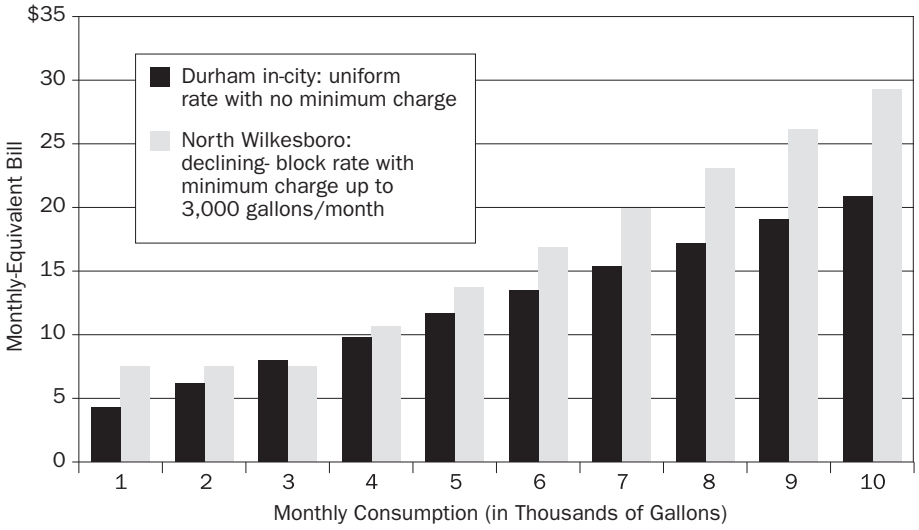
Durham, OWASA, Burlington, Greensboro, and North Wilkesboro provide examples of five rate structures commonly used in North Carolina for drinking water (see Table 4). Every two months, Durham in-city customers with a 5/8-inch water meter are charged a fixed fee of $4.88 plus $1.38 for each

Table 4. **Effects of Rate Structures on Monthly-Equivalent Bills for Drinking Water**

		Monthly-Equivalent Bill		
Utility	**Rate Structure (In-City Water)**	**For 2,000 GPM**	**For 6,000 GPM**	**For 12,000 GPM**
Durham	Bimonthly, fixed service fee based on meter size, plus uniform charge based on volume	$ 6.13	$13.51	$24.58
Orange Water and Sewer Authority	Monthly, fixed service fee based on meter size, plus uniform charge based on volume and season	13.61	23.37	38.01
Burlington	Bimonthly, declining-block rate for 4 blocks, with fixed minimum charge	5.16	15.23	29.21
Greensboro	Quarterly, fixed service fee based on meter size, plus increasing-block rate for 4 blocks	4.94	14.67	33.14
North Wilkesboro	Bimonthly, declining-block rate for 7 blocks, with fixed minimum charge	7.50	16.83	34.45

Note: Amounts are for households with a 5/8-inch water meter, in the off season where applicable. GPM = gallons per month.

Figure 3. **Relationship between Rate Structures and Monthly-Equivalent Bills for Water Services**



Source: Compiled by UNC Environmental Finance Center using rate structures from Durham, N.C., and North Wilkesboro, N.C., Water and Wastewater Utilities.

100 cubic feet ($1.84 for each 1,000 gallons) that they use.

OWASA's rate structure is similar to Durham's. However, the amount that customers pay for their consumption depends on the time of year. From October through April, customers pay $2.44 per 1,000 gallons; from May through September, $4.61.

In Burlington and Greensboro, customers are charged a different price for different blocks of consumption. In Burlington, as a customer uses more water, the unit price decreases. In Greensboro, as a customer uses more water, the unit price increases.

Customers in North Wilkesboro are charged a minimum of $15.00 every two months, which covers 6,000 gallons of consumption. In other words, if customers consume 0–6,000 gallons during the two months, they are charged $15.00 for water. North Wilkesboro's rate structure also has a declining-block component.

Rate structures affect monthly bills (see Figure 3). For example, North Wilkesboro customers who use about 3,000 gallons a month pay approximately as much as Durham customers with the same consumption. For other levels of consumption, though, North Wilkesboro customers pay considerably more.

The power of rate structures has never been as evident as it was during the drought of 2002. Local governments with increasing block rates, which encourage conservation, gave their customers an incentive for limiting irrigation during dry periods. Local governments with declining block rates sent the opposite message. As the drought worsened and customers were tempted to water lawns more often, the price of water decreased.

On the revenue side, many utilities with increasing block rates that implemented mandatory conservation measures experienced huge decreases in revenues. Utilities with minimum rates or significant flat-fee components of their monthly bill were much less affected by declines in use than utilities with small or no fixed fees were. If use declined 10 percent, but only half of a typical monthly bill was due to use, then revenues may have fallen only 5 percent.

When faced with the need to increase overall revenues, many utilities impose across-the-board rate increases—for example, 10 percent for all classes of customers. Often this strategy is appropriate, but as the nature of a community changes, periodically reviewing rate structures also makes sense. Chatham County's water system began like many rural water systems as a collection of individual systems serving sparsely populated communities. To ensure a reliable, consistent amount of revenues, the county set up a minimum-rate structure. Over the years, the county's customer base began to shift from rural residents using small amounts of water to suburban commuters with gardens. The consumption pattern changed, yet the rate structure remained the same. The retired couple using 1,000 gallons per month was charged for using 3,000 gallons, therefore paying much more per gallon than the wealthy family that used 20,000 gallons in the summer to water its yard.

When the time came to raise revenues, the county looked at the structure along with the rates and decided to implement an increasing block charge. The change in rates and rate structure led to substantially greater revenues while shifting the financial burden from modest users to large users.

Developing Classes of Customers

Utilities have the authority to establish different rates and rate structures for different classes of customers. The types of classes are not defined by law. How-

Table 5. **Examples of Methods Used to Calculate Drinking-Water Impact Fees**

	Name	Amount*	Basis
Carolina Beach	Water user fee	$500–$5,000	$500 per bedroom
Charlotte	Water capacity charge	$235	Tiered on basis of size of meter
Chatham County	Water availability fee	$1,750	Tiered on basis of size of meter
OWASA	Water availability fee	$805–$4,854	Tiered on basis of square footage

Note: OWASA = Orange Water and Sewer Authority.

*Amount paid by new residential customer with 5/8-inch meter.

ever, most utilities have at least one residential and one nonresidential class. Some divide residential into multiple classes, such as multifamily and single family (e.g., Chatham County). Large industries may fall into a class separate from smaller commercial customers and institutional customers.

As with rate-setting, the creation of different classes of customers varies widely across the state. Larger systems with many types of customers often hire specialized firms to analyze their cost structures carefully and develop customer classes.

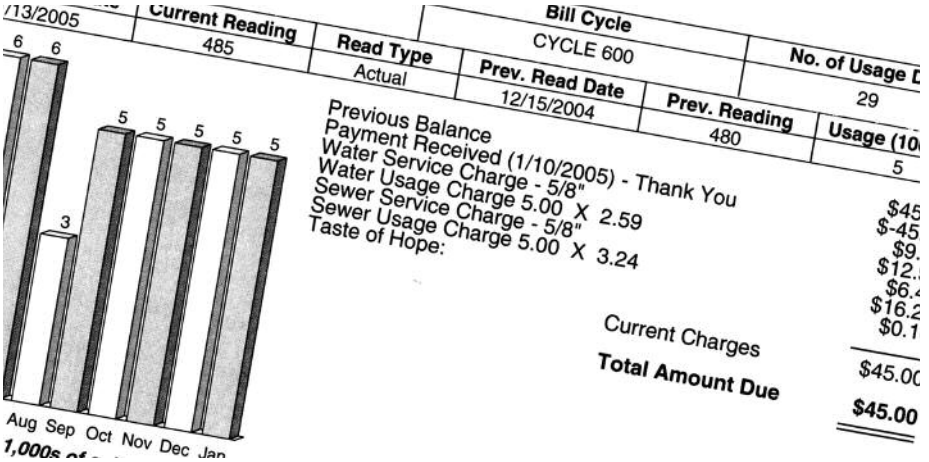
One of the principal decisions facing water and sewer enterprises is whether to treat their residential customers differently from their commercial customers. To make this decision, they must understand the use patterns of different customers. Residential customers in a primarily urban setting with small yards have different use patterns than suburban customers with large irrigation systems. Irrigation causes peaks in use that have different cost impacts than use of a relatively stable amount of services throughout the year.

Innovative rate structures, such as conservation rates or seasonal rates, are most effective if the customers to whom the rates apply can change their behavior. For example, Chatham County's approach of applying its increasing block rate only to its residential customers has become common throughout the state, under the justification that many commercial and industrial customers have little variation in their use throughout the year and generally have fewer discretionary uses.

In developing customer classes for sewer services, utilities often rely more on the type of wastewater being treated than on the flow patterns. For example, utilities such as Kernersville that have diverse industrial customers link elements of their rate structure to the characteristics of the sewage effluent that their customers discharge.

Recovering Up-Front Costs from New Customers

New customers bring new costs, but they also generate new revenues. Figuring out the net costs of a new customer can be a challenge. To continue the business analogy, some utilities can benefit from a pricing strategy that supports selling more water. This is one area in which "doing what your neighbor does" is clearly not the best practice, especially if the neighbor has a different cost structure. The decision about how significant to make one-time charges is not always a purely financial one. A community's vision and philosophy inevitably are reflected in the rate structure. A community struggling with growth pressures is likely to view the use of significant up-front charges more favorably than a community that is struggling to halt a population decrease.



Utilities that rely on impact fees use different approaches for calculating them. For the approaches followed by Carolina Beach, Charlotte, Chatham County, and OWASA, see Table 5.

A community struggling with growth pressures is likely to view the use of significant up-front charges more favorably than a community that is struggling to halt a population decrease.

All the approaches try to link the fee in some way to the amount of service that will be provided to the property, but the method varies significantly. Carolina Beach bases its fee on the number of bedrooms in a new residence. Charlotte uses a detailed financial model that is based on having new customers buy in to the equity of the existing system. The charge is calculated by dividing the number of customers by the value of the system's assets. Both Charlotte and Chatham County set the fee on the basis of a new customer's meter size. Meters come in standard sizes, and most residential customers are served by a 5/8-inch meter.

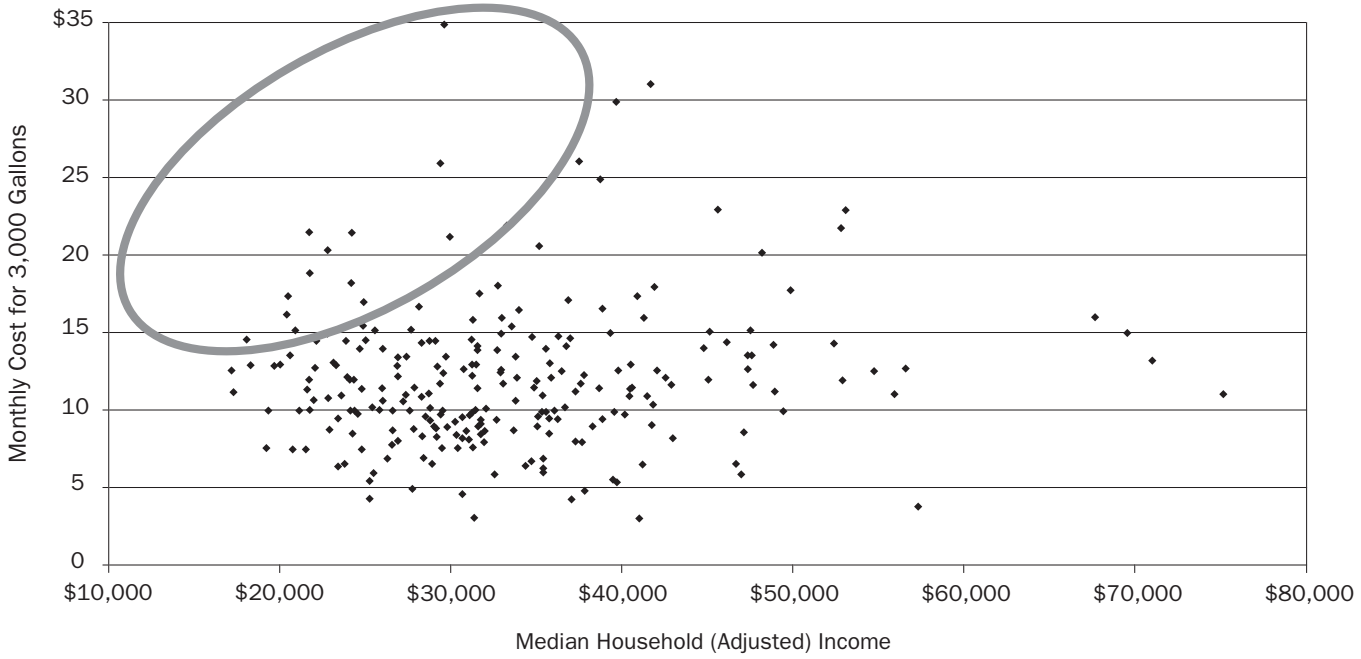
OWASA carried out a study several years ago to determine what factors influenced consumption.[9] The study clearly showed that customers living in larger houses used more water than customers living in smaller houses and had larger shifts in water use during the year, even if they had the same size meter. Water and sewer facilities need to be sized to meet the peak demands of customers, regardless of whether the peak lasts several days or is consistent across the year. As a result, OWASA modified its impact charges to take into consideration the size of the building in addition to the size of the meter. OWASA's system has resulted in much greater and more refined variation in what new customers pay, than if the utility relied only on the size of the meter.

The resulting structure, although put in place to link fees to actual costs, had the secondary effect of lessening the financial impact on low-income community members choosing to build smaller properties. The OWASA fee is designed to cover existing as well as anticipated capital costs of serving new customers. Being able to justify these fees, especially as they get larger, is essential.

Deciding Whether to Vary Rates on the Basis of Location

North Carolina communities have different views concerning whether the amount they charge their customers should depend on where the customers

Figure 4. **Current Charges for Water by Median Household Income, North Carolina, 2002**



Source: Compiled by UNC Environmental Finance Center using database of local government rate structures prepared as part of biannual North Carolina League of Municipalities Rate Survey (2002), and data from U.S. Census Bureau, Census 2000, Summary File 3.

live as well as how much the customers use. City- and county-owned water and sewer enterprises are permitted to charge their customers different rates depending on where the customers live in the county (county systems) or whether or not they live within government corporate limits (county or municipal systems). If a county charges customers in different parts of the county different rates, it usually does so because it has created service districts that have different capital costs.

According to a recent survey, the most common reason cited by municipalities for charging different rates to inside and outside customers is that it is the "prevailing practice."[10] The original rationale for doing so was that some systems required significant influxes of money from general funds, which were contributed by taxpaying municipal customers. This practice has faded, but the rate differential remains.[11]

Some systems can track their different rates to the higher costs of serving customers in less dense areas. Other systems do not have a cost-driven justification but use rates as a growth-and-development tool. For example, high rates for areas outside the city limits often are an effective incentive for those areas to request voluntary annexation.

In practice, customers who live outside the city limits of their municipal service provider pay significantly more for water and sewer services than those who live inside the city limits. For example, a single-family residential household living outside Cary city limits with a 3/4-inch water meter pays a $7.86 base charge per service, $9.84 per 1,000 gallons for water (up to 5,000 gallons), and $11.19 per 1,000 gallons for sewer service, monthly. A single-family residential household living inside the city limits with a 3/4-inch meter pays a $2.62 base charge per service, $3.28 per 1,000 gallons for water (up to 5,000 gallons), and $3.73 per 1,000 gallons for sewer service, monthly.

Some municipal systems seeking to increase their customer base have reexamined their rate structures and moved to a more uniform one throughout their service area. For example, Salisbury now provides service throughout Rowan County and charges all its customers the same rates, whether or not they live in the city. The equal treatment of customers has helped the system grow and has offset the disenfranchisement of customers outside the city limits, who cannot vote for the governing board that sets their rates.

Addressing the Impact of Rates on People in Need

As the price of water and sewer services increases, the impact often is particularly hard on low-income families. More and more communities are struggling to maintain a financially healthy water and sewer enterprise without imposing excessive hardships on their financially struggling customers.

The impact of rates on customers always is a difficult issue for utilities. Every community has low-income customers who will be negatively affected by rate increases. Before communities make decisions on the basis of low-income considerations that may jeopardize their utilities' financial health (and ultimately the public health), they should assess how serious the issue is for them.

One method of conducting such an assessment is to examine current charges according to the median household income of a community (see Figure 4). For communities in the upper-left part of the chart (indicated by the oval), with high current charges and low median household incomes, raising rates clearly is a major issue. For communities in other parts of the chart, the story is not so clear. The chart shows that many

Table 6. **Financial Impact of Rates on Households**

System	Rate in Effect	Monthly-Equivalent Water and Sewer Bill for 6,000 GPM	MHI 1999	Annual Cost as % of MHI	Annual Cost as % of Poverty Threshold*	% in Poverty
Durham	In city	$38.75	$41,160	1.1	3.5	11.3
	Out of city	77.50	41,160	2.3	7.0	11.3
Burlington	In city	32.27	35,301	1.1	2.9	9.7
	Out of city	64.54	35,301	2.2	5.8	9.7
Greensboro	In city	34.45	39,661	1.0	3.1	8.6
	Out of city	79.58	39,661	2.4	7.2	8.6
Orange Water and Sewer Authority	Nonseasonal	47.71	39,140	1.5	4.3	6.4
	Seasonal	60.73	39,140	1.9	5.5	6.4
North Wilkesboro	In city	37.03	22,813	1.9	4.1	21.8
	Out of city	45.85	22,813	2.4	5.1	21.8

Source: The data on median household income are from U.S. Census Bureau, Summary File 3, available at http://factfinder.census.gov.

Note: GPM = gallons per month. MHI = median household income.

*The 1999 poverty threshold for a family of two was $10,869; for a family of three, $13,290. U.S. Census Bureau, Current Population Survey, available at www.census.gov/prod/2003pubs/c2kbr-19.pdf. North Wilkesboro has an average household size of two people (2.25). The remaining four systems have average household sizes of three people.

communities still pay relatively little for water compared with other communities. It also shows that many communities have a fairly high number of resources and could conceivably cope with significant costs without major hardship.

The financial impact of rates on customers can be analyzed by several methods (see Table 6). The monthly water and sewer bill for a family living inside or outside the municipal boundaries that uses 6,000 gallons a month is shown as a percentage of the median household income for the municipality. The percentage ranges from 1.0 for households living within Greensboro city limits to 2.4 for households outside the municipal boundaries in Greensboro and North Wilkesboro.

More and more communities are struggling to maintain a financially healthy water and sewer enterprise without imposing excessive hardships on their financially struggling customers.

In some cases the cost of water and sewer services as a percentage of median household income does not tell the entire story. The effect of rates on the poorest residents of an area can be analyzed by looking at the monthly bill in terms of the poverty threshold (see Table 6). For example, 11.3 percent of the population of Durham is at or below the poverty threshold. A family of three living in poverty in Durham and using 6,000 gallons of water a month pays 3.5 percent of its income for water and sewer. In North Wilkesboro the percentage of families living in poverty is significantly higher than it is in the other communities.

North Carolina law does not give municipal water and sewer enterprises the authority to develop classes of customers solely on the basis of income or to have separate rate structures based on the household income of customers. In other words, a system may not charge a low-income customer who uses 5,000 gallons less than it charges a wealthy customer who consumes 5,000 gallons. However, water and sewer enterprises may consider household income in developing rate structures that apply to all customers.

For example, in some areas, customers living in large houses have been shown to have higher amounts of base consumption than customers living in small houses. The latter type of customer may use 3,000 gallons a month, the former 8,000 gallons. A water and sewer enterprise can design its rate structure so that the price per gallon for the first 3,000 gallons is significantly lower than the price per gallon between 3,000 and 8,000.

This approach often can be supported by cost considerations. Serving large users of water, especially those that use much more in the summer than in the winter, can usually be shown to be more costly than serving users of more modest amounts. Many utilities use this fact to justify charging a lower amount for lower consumption levels than for higher levels.

Differentiating among users in this way has the important secondary result that low-income users who do not have large yards to irrigate pay less.

One of the common reasons cited by boards, especially those in smaller communities, for not raising rates is the impact on low-income customers. As revenue needs become more urgent, some utilities have looked for alternative structures to reduce the impact on low-income communities without keeping the price of water low for all customers.

One approach is to shift the responsibility for caring for low-income water and sewer customers from the utility to other areas of government, such as social services. Rather than maintain artificially low rates for all customers, governments are realizing that it is more efficient to provide direct assistance to the customers in need. For example, OWASA has started an innovative program called Taste of Hope, under

which it gives its customers the option to round up their bills. Revenues from this rounding are distributed to a local social services organization that disburses assistance directly to disadvantaged applicants.

This approach works well in an area with relatively few low-income customers. It probably would not be as effective in areas with a high poverty rate.

Deciding When to Adjust Rates

Most evidence suggests that the answer to the question "When should rates be adjusted?" is not the obvious "When more revenues are needed to meet service needs." In practice, utilities follow three general approaches to review and modification of rates: they do it as infrequently as possible, they do it every three to four years, or they do it annually as part of the budget process. In 2003, 45.5 percent of municipalities responding to a North Carolina League of Municipalities survey reported adjusting their rate in the last year.[12]

Rate increases are never popular, but water and sewer enterprises with more frequent adjustments are able to spread "sticker shock" over time. In addition to making financial sense, more frequent rate reviews help systems convey to customers the reality that costs are rising. Many customers assume that no increase in ten years is due to the efficiency of operations. So when the inevitable large increase comes, they think that it is due to a sudden decrease in efficiency rather than the utility's having to make up for lost time.

Faced with this problem, one utility in North Carolina recently sent out a notice to its customers explaining that the pending rate increase was due to years of sagging revenues and artificially low rates. This approach may help explain a rate increase, but it does not send a positive message to customers about the financial management practices of the enterprise.

Involving the Public

Public participation in rate-setting often is dictated by law, as with for-profit water companies in North Carolina and government-owned water and sewer enterprises in West Virginia. North Carolina laws governing rate-setting for drinking water and sewer services by government-owned utilities have few requirements for involving the public.[13] However, many utilities have found it beneficial to involve their customers in rate review and modification.

For example, several years ago, faced with large investment needs and the loss of several major customers, Salisbury carried out an aggressive public relations and education campaign that included mobile displays, advertising, and an animated website. According to Matt Bernhardt, Salisbury's assistant manager for city utilities, the goodwill created by the city's outreach efforts has had lasting effects that have helped it make a variety of financial decisions.

A recent study by the American Water Works Association found that a lack of understanding of and appreciation for the true value of water was one of the biggest causes of customer "rate shock."[14] A program of public education and participation will not result in customers' welcoming rate increases, but it may take some pain out of the process and help governing boards make the tough financial decisions that keep the water flowing.

Conclusion

Maintaining safe drinking water and environmentally sound sewer services is one of the most important responsibilities of a local government. As providing water and sewer services becomes more expensive, local governments face the constant challenge of balancing their interest in offering customers a fundamental public health service at an affordable price, against the necessity of managing their programs in a financially sustainable manner. Local leaders have an array of options allowing for local finance and revenue strategies that take into consideration local conditions and objectives. Despite these choices, managing water and sewer services inevitably involves asking customers to pay more for the services. As difficult as it is to do so, leaders should never lose sight of the inevitable health and environmental costs of failing to ensure that their water and sewer operations have sufficient financial resources to serve the public.

Notes

1. The figures were calculated by the author using data from local finance reports submitted to the Local and State Gov't Div., N.C. Dep't of State Treasurer, for the fiscal year ending June 30, 2002.

2. North Carolina Rural Economic Development Center, Clean Water: Our Livelihood, Our Life (Raleigh: the Center, Oct. 1998).

3. Statistical Information on Water and Sewer Operations, Memorandum #1017, from Local and State Gov't Div., N.C. Dep't of State Treasurer, to Municipal Officials (Apr. 2005).

4. The analysis was conducted by the UNC Environmental Finance Center using data from the U.S. Census Bureau, Census 2000, 5% Public Use Microdata Sample.

5. North Carolina Utilities Comm'n, 2002 Report: Major Activities through December 2001 (Raleigh: the Commission, 2002).

6. *See*, *e.g.*, G.S. 162A-6 (9), water and sewer authorities; G.S. 130A-64, sanitary districts; G.S. 162A-49, metropolitan water and sewer districts; and G.S. 162A-72, metropolitan sanitary districts.

7. North Carolina League of Municipalities, How Much Does Clean Water Cost? Results of the 2002 NCLM Water and Sewer Rates and Services Survey of NC Municipalities (Raleigh: the League, Dec. 2002).

8. *See*, *e.g.*, G.S. 160A, art. 10, for municipal systems; G.S. 153A, art. 9, for county systems; and G.S. 162A-6 for water and sewer authorities.

9. Orange Water and Sewer Authority, Making Your Infrastructure Affordable: Service Availability Fees Based on Finished Area of New Homes. Presentation at the American Water Works Association Infrastructure Conference (Spr. 2000).

10. *Id.*

11. Warren Jake Wicker, *Water and Wastewater Services*, in Municipal Government in North Carolina 691 (2d ed., David M. Lawrence & Warren Jake Wicker eds., Chapel Hill: Institute of Gov't, Univ. of N.C. at Chapel Hill, 1995).

12. North Carolina League of Municipalities, How Much Does Clean Water Cost?

13. Other environmental services such as stormwater have more stringent public hearing requirements than drinking water or wastewater treatment. For example, G.S. 160A-314 (a1) (1) requires public hearings before the establishment or revision of stormwater fees or charges.

14. American Water Works Association, Avoiding Rate Shock: Making the Case for Water Rates (Denver, Colo.: the Ass'n, 2004).