

ARTICLE 38

# Local Government Water and Wastewater Enterprises

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## History

LOCAL GOVERNMENTS HAVE played a role in providing public<sup>1</sup> water services in North Carolina since at least the late eighteenth century when Salem (which later joined with Winston)<sup>2</sup> city and church leaders employed the services of a local craftsman to construct and manage one of the country's first public water systems. Oak pipes brought the water into the community from its source a mile away.<sup>3</sup>

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1. Terminology describing water and sewer services can be confusing and at times misleading. The term *public* is used in the context of describing who is served by the system rather than who owns the system. Public is used to refer to centralized systems serving groups of households as opposed to individualized systems such as household wells that serve a single family. Public systems can be privately owned or government owned.

2. David H. Howells, *Historical Account of Public Water Supplies in North Carolina* (Raleigh, N.C.: Water Resources Research Institute of the University of North Carolina, 1989), 2.

3. *Ibid.*

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Expansion of the services was slow, however. In 1888, twelve communities reported having water systems: Asheville, Charlotte, Concord, Durham, Fayetteville, Goldsboro, Greensboro, Raleigh, Salem, Salisbury, Wilmington, and Winston.<sup>4</sup> In 1900, twenty of the state's twenty-three cities with populations over 3,000 reported having water systems.<sup>5</sup>

The distribution of free flowing water, that did not have to be laboriously drawn from wells, encouraged abundant use and soon heightened the problem of what to do with it once it had served its purpose and had become "wastewater." Thirteen of the twenty-three cities with populations over 3,000 reported having sewer collection systems in 1900. None had sewage treatment. In all cases the cities reported that their "crude sewage" was being discharged into creeks and rivers. However, a few cities—Goldsboro and Wilmington, for example—reported that "sewage purification" was under consideration. Charlotte was facing two suits for water pollution from sewage. Many of these early systems were owned and operated by private companies. Eight of the twenty-three water systems were privately owned, including the systems in Raleigh and Wilmington.

### **A Local Government Service**

As time passed, water service was expanded throughout the state and became primarily the responsibility of local governments. Approximately 500 separate units of government now report providing some type of public water and/or sewer service in the state.<sup>6</sup> Cities continue to be the primary provider of water services with 392 of the 550 municipalities in the state reporting related revenues in 2004.<sup>7</sup> However, counties and special purpose units of government such as water and sewer authorities and sanitary districts serve as the principle providers in some areas of the state. Privately owned and operated systems within cities are now relatively rare. The drive to have water and sewer services in local government hands is strong and several cities including River Bend and Pine Knoll Shores have, at significant expense, purchased the private systems that had operated for years in their cities. Privately owned systems still exist in many unincorporated pockets of the state, normally serving relatively small numbers of residents.

Stricter regulatory requirements and the general decline in federal grant assistance have made running small water and sewer systems cost prohibitive for some small units of government. In most cases where units of government have sought to divest themselves of water and sewer responsibility, they have turned to other units of government rather than the private sector. For example, in the last few years, the towns of Garner and Wake Forest have transferred their water systems to their big city neighbor, Raleigh. Morrisville concluded a similar transfer to Cary and the Town of Erwin is in the final stages of negotiating a handover to Harnett County. In all of these cases, the receiving unit took complete control of system functions from managing treatment facilities to sending out bills.

### **Current Coverage**

According to the U.S. Environmental Protection Agency (USEPA), approximately three quarters (77 percent) of North Carolina citizens receive water from public community systems. These systems are owned and operated by a variety of organizations including local governments, nonprofit water corporations, and investor-owned utilities; however local governments are the predominant water provider serving 86 percent of those served with piped water in North Carolina.<sup>8</sup>

The majority of those not served by public systems have individual wells; however, there remain isolated pockets of households that do not have access to running water at their homes either due to extreme poverty, or in some cases, groundwater contamination. County governments, through their health departments, inspect new wells and provide limited water quality testing services.

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4. Ibid.

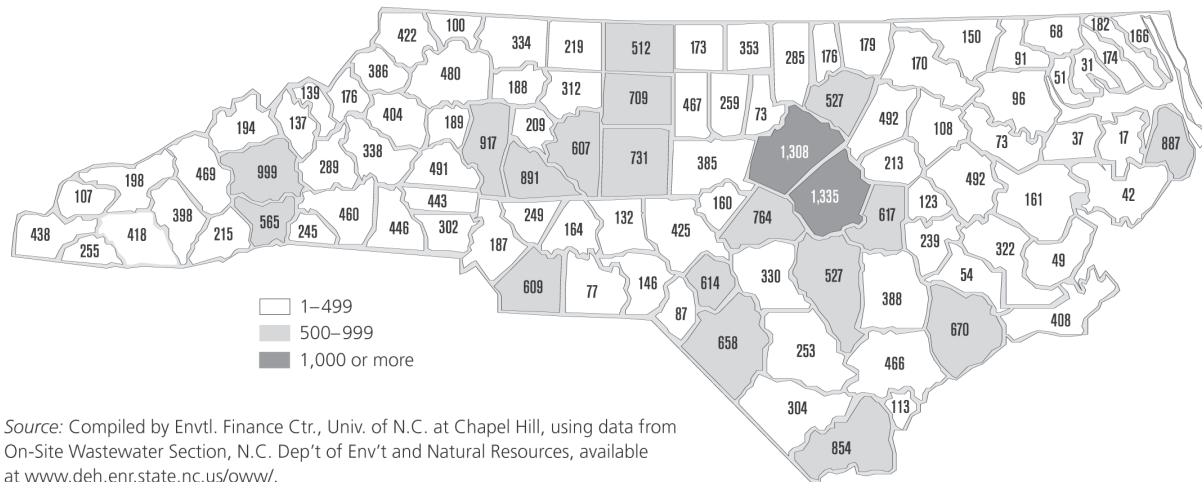
5. M. N. Baker, ed., *The Municipal Year Book 1902* (New York: Engineering News Publishing Company, 1902), 128–32.

6. Based on revenue reported to the State Treasurer's office in audit reports submitted in fiscal year 2002–3 (counties), fiscal year 2003–4 (cities, districts, and authorities).

7. Audited financial reports submitted to State Treasurer's office fiscal year 2003–4.

8. Data from the U.S. Environmental Protection Agency, SDWIS Database for fourth quarter, fiscal year 2003.

**Figure 38-1. New Operating Permits Issued for On-Site Wastewater Systems in North Carolina, by County, 2003**



On the wastewater side, approximately 50 percent of the residents receive centralized sewer service, primarily from local governments. A few countywide systems, such as Harnett County, have expanded sewer service into unincorporated rural areas over the last ten years. However, many unincorporated areas still do not have access to centralized sewer systems and continue to depend on decentralized systems (primarily septic tank systems). Over 34,000 new septic systems were constructed in 2003 (see Figure 38-1).<sup>9</sup> In most cases, local government responsibility for septic systems remains limited to initial construction permitting and inspection. Normally, health departments only take an active role in managing these decentralized systems when septic system failures become a noticeable public health problem. The Town of Nags Head is one of the few cities in North Carolina (and the United States in general) that provides on-going septic services. This practice is primarily due to the city's belief that properly managed septic systems can be environmentally sound and have the secondary impact of limiting the density of growth for their community. The environmentally damaging practice of discharging wastewater directly to streams without passing through a septic system (referred to as "straight-piping"), continues to be documented in some parts of the state.<sup>10</sup>

## The Regulatory Framework

### Regulatory Drivers

Water and sewer services are some of the most regulated services provided by local governments. Services are subject to a complex, dynamic body of federal, state, and local rules and regulations overseen by multiple institutions and agencies. In addition to being part of the "regulated community," the provision of safe services also requires local governments to become regulators themselves. For example, state law requires that local governments have watershed protection ordinances and programs designed to regulate development that might adversely impact drinking water supplies.

9. Information reported to DENR Division of On-site Sanitation fiscal year 2004.

10. North Carolina Wastewater Discharge Elimination Program, 2004 Annual Report to the North Carolina General Assembly, November 2004.

The body of rules and regulations covering local government water and sewer services can be traced to three fundamental, interrelated regulatory objectives: public health, environmental resource protection, and consumer rights protection. The evolution of many regulations, as they follow complicated federal and state legislative paths, may at times mask the objectives of regulations.

Despite water's admirable properties and uses, it is also an extremely effective disease transmission agent. The majority of regulations governing treatment and distribution of drinking water are designed to assure that the water that reaches a household's tap is free of biological pathogens or harmful chemical contaminants. Ironically, some of the disinfectants that have been so effective at eliminating biological threats are now known to also lead to the creation of disinfection by-products that have been linked to cancer. It is the regulation of these by-products and other chemical contaminants that now dominates much of the newest elements of the public health water regulatory framework.

Environmental resource regulatory objectives play a role in both the provision of drinking water as well as wastewater management. A local government that operates a wastewater treatment plant cannot escape the fact that by discharging treated wastewater they themselves are "polluters" and regulated as such. In the 1970s, local governments, through their efforts to improve their wastewater treatment plants, were credited with reducing the pollution that went into our surface waters. Now it is not unusual to see newspaper headlines criticizing a local utility for polluting a river due to some type of sewage overflow or other release. Even the best operated wastewater treatment plant is unable to eliminate all contaminants from the treated wastewater it discharges. As the assimilative abilities of our surface waters are stressed, even properly treated wastewater can introduce things to the environment that can be traced to serious environmental degradation. Fish kills in some of our state's rivers in the 1990s exemplified the potentially harmful impacts of even relatively low-level releases of nutrients, such as phosphorus and nitrogen.

In many areas of the state, environmental pressures are as much about the quantity and capacity of the environmental resource as the quality. There are now bodies of environmental resource regulations that focus on balancing the needs of growing communities with the need to assure the sustainability of the state's limited water resources.

Finally, almost all local government water and sewer providers operate as a monopoly: providing an essential product their customers need, while not offering a choice about it. All monopolies, even the most benevolent, require some basic customer oversight and protection. Protecting consumers against monopoly abuse and assuring that financial management practices meet basic standards has led to a separate body of financial oversight rules and requirements.

The different objectives behind water regulations have led to distinct bodies of regulations that are administered by distinct institutional agents and organizations.

## **Drinking Water Treatment and Distribution**

The North Carolina Department of Environment and Natural Resources (DENR) is responsible for administering both state and federal drinking water regulations including the Safe Drinking Water Act. Its Division of Water Quality (DWQ) classifies the state's surface waters and designates those that are appropriate for use as drinking water supply sources. The Public Water Supply Section of DENR's Division of Environmental Health is responsible for approving all water treatment and distribution facility construction plans and assuring that the quality of water, as monitored and reported by local utilities, complies with federal and state requirements. As part of the most recent amendments to the Safe Drinking Water Act, the Public Water Supply Section also implements the state's federally mandated capacity development program that not only looks at what is in the water citizens drink but also at the technical, financial, and managerial capacity of the utilities that provide water. The state also requires that all water supply systems have certified water plant operators (G.S. Ch. 90A, Art. 2). Local governments are also responsible under state legislation (G.S. 143-214.5) for watershed protection, which is important for protecting both public surface-water supplies and general water quality.

## **Water Supply Planning and Permitting**

The Division of Water Resources within DENR is responsible for administering state water resource planning and permitting initiatives including Capacity Use Areas (143-215.11-.22), which regulate water withdrawal in areas potentially impacted by falling aquifers. The Division also works with local water suppliers to collect and analyze water use data from across the state as part of their statewide water planning responsibilities [G.S. 143-355(1)]. Utilities wishing to transfer water from one basin to another must also adhere to an Inter-basin Transfer Certification process managed by the department (G.S. 143-215.22I).

## Wastewater Collection Treatment and Discharge

The general structure for wastewater regulation is quite similar to that for regulation of water supply and treatment. Federal legislation has established the long-term fishable and swimmable goals for national water quality. In short, the surface waters are to be swimmable and fishable. The Environmental Protection Agency is the federal actor, but most national requirements are administered by the state. Key in this scheme is the DWQ's administration of National Pollution Discharge Elimination System (NPDES) permits. All discharges of municipal sewage to surface waters must meet certain standards in accordance with receiving stream classifications set by the state. Recognizing the variation in the quality and assimilative capacity of our surface waters, the state has increasingly relied on watershed specific regulations rather than a "one-size-fits-all approach." For example the "Neuse Rules," affecting wastewater providers discharging in the Neuse River Watershed, have far more stringent nutrient limits than most other watersheds. The DWQ also regulates discharges to the ground surface (spray irrigation). Regulation of subsurface discharges of sewage and other wastewaters including septic tank systems is the responsibility of the Division of Environmental Health at the state level and county health departments at the local level. Operators in charge of wastewater treatment plants must be certified by the state (G.S. Ch. 90A, Art. 3).

As the state's sewer collection systems age, sanitary sewer overflows (SSOs) have become of increasing concern. As part of its strategy to address this issue, the state created a new permit system, overseen by the DWQ (15A NCAC 2H .0227), that now requires most local government sewer systems to have permits for their collection systems as well as their treatment facilities.

## Economic Regulation

The state's Local Government Commission within the Department of the State Treasurer carries out the majority of financial water and sewer regulatory functions including approving most new water and sewer debt and requiring and reviewing audits of all local government water and sewer operations. Rate setting, one of the most important economic oversight responsibilities, remains in the hands of local utility governing boards. The state's public utilities commission does not exercise regulatory authority on local government owned and operated utilities.

## Consequences of Noncompliance

Local governments that fall out of regulatory compliance suffer a variety of consequences including financial penalties, public notification requirements, and strict limits on growth. For example, once a local government's wastewater treatment facility reaches 90 percent of its capacity, the government is precluded from adding new customers until it has taken formal steps to expand the facility's capacity (15A NCAC 2H .0223). For some small systems, these moratoriums bring enormous costs in terms of capital and lost development opportunity.

## Service Provision Models

As shown in Table 38-1, local governments in North Carolina have a wide array of institutional options for providing water and sewer services to their residents. Counties and cities are authorized to provide water and wastewater services as part of their authority to operate and finance public enterprise services. According to the financial statements submitted to the Department of the State Treasurer, 392 municipalities and 63 counties collect water and sewer revenue.<sup>11</sup> Other units of government, including water and sewer authorities (9); sanitary districts (27); metropolitan water and sewerage districts (4), have specific authority to operate and finance water and/or wastewater services.

Many city systems supply services to noncity residents directly outside their boundaries and a small number provide services to residents living in other cities (see below, "Local Government Partnership and Regionalization Options"). Only 5 percent of the respondents of a recent statewide water and sewer survey described their city system as a true "regional" water or sewer utility.

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11. Information on number of systems taken from local unit audit report information collected and compiled by the Department of the North Carolina State Treasurer was made available to the author. Information for cities, authorities, sanitary districts, and metropolitan water/sewerage districts are as of June 30, 2004, and for counties June 30, 2003.



**Table 38-1.** *Common Organizational Structures for Water and Sewer Enterprises Owned by North Carolina Local Governments*

<b>Owner/Model</b>	<b>Enabling Statutes</b>	<b>Financial Management Authority (Rate-Setting and Financial Planning)</b>
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 districts	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*, 2d ed., ed. David M. Lawrence & Warren Jake Wicker, 691 (Chapel Hill: Institute of Government, University of North Carolina, 1995).

County government systems fall into several different categories. Several systems such as Harnett and Johnson own and operate countywide systems that serve both city and unincorporated residents in their jurisdiction. In Buncombe County, assets are in the hands of an autonomous sewerage district. Other counties, such as Chatham, operate county systems in select pockets of their counties not served by city systems. County-owned systems can be managed as a unified utility or as a collection of semiautonomous county water and sewer districts each able to assume debt and charge different rates, but all reporting ultimately to the county’s board of commissioners.

A county water and sewer district may be created within any county by its board of county commissioners. Territory within a municipality may be included only with the consent of its governing board. Once established, a district is a separate and independent unit of local government with the authority to provide water and sewer services. However, the members of the board of county commissioners are, by law, the governing body of the district. Typically, districts contract with the county in which they are located for administrative services. Thus they operate much like a separate fund within the county government.

Districts may levy property taxes, issue general obligation and revenue bonds, establish rates and charges, and impose special assessments to recover the cost of line extensions. Districts do not have land use regulatory authority, but because the same individuals comprise the governing bodies of the county and the district, coordination of county land use policies with district utility services can be achieved. County water and sewer districts are usually formed when services are needed in a portion of a county only and there is a need to issue general obligation bonds or to use property taxes to support part of the cost of the water and sewer services on less than a countywide basis. Craven and Lincoln counties are among the ten to fifteen counties that have employed the district system in the state.

Sanitary districts, stand-alone units of government with their own directly elected government boards, remain the primary water and sewer provider in several areas of the state and have been used primarily to serve stand-alone communities in unincorporated areas. However, there are examples of sanitary districts such as the Woodfin Sanitary District, which provides water service, and the Handy Sanitary District serving small cities and their surrounding residents.

### **Local Government Partnership and Regionalization Options**

Academia, the U.S. Environmental Protection Agency, NCDENR, and the Department of the State Treasurer are among the groups that have long promoted partnership and regionalization of water and sewer service as a strategy for improving service, reducing environmental impacts, and capturing financial benefits through “economies of scale.”

For many years, these recommendations have fallen largely on deaf ears and relatively few North Carolina residents received service from regional providers, but recent anecdotal evidence suggests that local governments are increasingly willing to enter into partnership arrangements.

Individual units of government wishing to work together to provide services have several alternatives. Many have used interlocal agreements to develop partnerships and joint utilities, while still maintaining some governance responsibilities. The most basic agreement may take the form of a bulk water or sewer services purchase contract in which one unit agrees to provide another with services. One-third of the local government-owned water systems in North Carolina purchase the majority of water they distribute from another system and many more have interconnections and smaller purchase agreements. More elaborate regional models such as the Winston-Salem/Forsyth county, Charlotte/Mecklenburg county, Salisbury, Raleigh, and Harnett county systems involve more complicated agreements that have resulted in one unit of government taking a lead in serving the residents in other units of government.

Agreements may include conditions related to rate setting and other aspects of governance. In some cases, such as in Winston-Salem, planning and policy-making powers have been vested in a specially created oversight body. While instrumental in management, the Utility Commission that oversees many aspects of the Winston-Salem/Forsyth system is not itself a unit of government and is unable to incur debt or own assets. The system it manages now includes Clemmons, Kernersville, Lewisville, Rural Hall, and portions of other small towns in Forsyth County. The Utility Commission has ten members and a chair. Five members are appointed by the Winston-Salem Board of Aldermen and five by the Forsyth Board of County Commissioners. The chair is appointed jointly by the mayor and the chair of the board of commissioners. All employees of the system are employees of the city. Rates and charges vary among the units and areas, reflecting agreements reached over time and the conditions under which systems were transferred to the joint city-county operation.

Cities and counties may also join together to create special purpose units of government including metropolitan sewerage and water districts and the more common water and sewer authorities. These regional providers have been created to play a variety of roles across the state from providing wholesale untreated raw water (Lower Cape Fear Water and Sewer Authority) to wholesale wastewater treatment (Water and Sewer Authority of Cabarrus County) to full water and sewer retail services (Orange Water and Sewer Authority and Onslow Water and Sewer Authority).

The need to greatly expand service or facilities quickly often serves as the impetus to create a new authority. The Neuse Regional Water Authority and the Piedmont Triad Authority, two of the most recently created authorities, were created by their member governments to manage large new water and sewer facilities (Neuse Regional Surface Water treatment plant and Randleman Reservoir).

## Revenue Options and Strategies

Compared with other services, local governments have fairly wide authority to raise revenue for water and sewer services using a number of different types of fees and charges. In 2002, government-owned water and sewer enterprises collected more than \$1.4 billion in revenues from their customers.

### Public Enterprise User Fees and Charges

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 cities 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. 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 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.

Most customer-generated revenues fall into two general categories: recurring monthly bills and one-time up-front charges that are due before obtaining service.

### **The Monthly Bill**

The rate structure that utilities use to calculate their customers' monthly, or for some utilities bi-monthly or quarterly, bills is one of the most important rate decisions that a utility must make. 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. 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).

Other utilities have decided to charge a flat minimum rate that includes the provision of a specific quantity. 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. A customer would be charged \$29.00 if they use any quantity between 0 and 4,000 gallons in a month, and all consumption above this quantity would be charged at the uniform or block rate.

The North Carolina League of Municipalities and the School of Government Environmental Finance Center collected and analyzed rate structures for over 350 utilities that together account for 90 percent of the total centralized water and sewer customers in the state.<sup>12</sup> The median fixed and minimum charges for inside water customers based on the municipal population size are shown in Table 38-2. Small utilities more frequently employ minimum charges than larger utilities. Furthermore, larger municipalities charged lower fixed and minimum charges than smaller municipalities, probably due to lower average costs resulting from economies of scale being captured by the larger systems.

If a portion of a water customer's bill is based on consumption, that portion may have a fixed unit price, e.g., per 1,000 gallons. This is called a *uniform charge*. Alternatively, a utility could charge more or less per unit as the customer's consumption increases or decreases. Commonly, a utility may charge one rate up to a certain consumption threshold, beyond which they charge a lower rate up to another consumption threshold, and so on. This rate structure is called a *declining block charge*. Conversely, a utility may charge one rate up to a certain consumption threshold, beyond which they charge a higher rate up to another consumption threshold, and so on. This rate structure is called an *increasing (or inverted) block charge*.

Most utilities employed a uniform rate structure in 2004 (see Tables 38-3 and 38-4). Among the 358 areas participating in the 2004 rate survey, 188 areas had uniform rates, 97 areas had decreasing block, and 68 areas had increasing block structures. Seasonal uniform rates (in which the uniform rate is higher during the summer months than in the winter months) were used by two utilities in three areas in North Carolina. Similarly, among the 283 sewer-served areas, uniform rate structures were used in 219 areas, decreasing block in 30 areas, increasing block in 28 areas, while flat fees or tiered flat fees were used in six areas in North Carolina.

### **Use of Outside/Inside Differentials**

North Carolina communities have differing views on whether the amount they charge their customers should depend on where the customers live. 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 depending on where they live in the county, it usually does so because it has created service districts that have different capital costs. One reason that cities or counties might charge more for residents living outside their political boundaries is to account for the taxpayer's share of utility financing within; some systems

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12. North Carolina League of Municipalities (NCLM) and UNC School of Government (UNC SOG), 2005 Water and Sewer Rate Structure Survey.



**Table 38-2.** Fixed and Minimum Water Charges for 275 Municipalities, by Municipal Population Size

Municipal Population Size	Number of Water Utilities (Municipalities)	Median Fixed Charge among Utilities	Percent of Utilities using Fixed Charges	Median Minimum Charge among Utilities	Percent of Utilities using Minimum Charges
< 1,000	77	\$10.00	14	\$12.38	86
1,000–2,499	66	\$9.50	18	\$11.70	80
2,500–4,999	46	\$7.75	22	\$11.50	72
5,000–9,999	33	\$5.60	21	\$10.00	79
10,000–24,999	30	\$5.50	47	\$8.55	50
≥ 25,000	23	\$3.71	91	\$3.44	9

**Table 38-3.** Distribution of Commodity Rate Structures among 346 Water Utilities Serving 358 Areas in North Carolina, in FY 2004–5

	Number of Utilities or Areas	Percent of Uniform Fees	Percent of Decreasing Fees	Percent of Increasing Fees	Percent of Seasonal Fees	Percent of Tiered Flat Fees
Municipality	275	56	26	18	0	0
County	41	39	24	27	5	5
Authority	5	40	20	20	20	0
Districts	16	31	38	31	0	0
Not-for-Profit	21	48	43	9	0	0
Full Sample	358	53	27	19	1	1

**Table 38-4.** Distribution of Commodity Rate Structures among 280 Wastewater Utilities Serving 283 Areas in North Carolina, in FY 2004–5

	Number of Utilities or Areas	Percent of Uniform Fees	Percent of Decreasing Fees	Percent of Increasing Fees	Percent of Flat Fees	Percent of Tiered Flat Fees
Municipality	254	78	10	10	2	<1
County	17	82	6	12	0	0
Authority	3	67	0	33	20	0
Districts	8	62.5	12.5	12.5	12.5	0
Not-for-Profit	1	100	0	0	0	0
Full Sample	283	77	10	11	2	<1

require significant transfers from general funds, which were contributed by taxpaying municipal customers. 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 may be an incentive for those areas to request annexation.<sup>13</sup>

Customers who live outside the city limits of their municipal service provider may pay significantly more for water and sewer services than those who live inside the city limits. Approximately 80 percent of municipalities surveyed charged higher outside rates than inside rates. The majority of these utilities charge outside customers twice as much as inside customers.

Some municipal systems seeking to increase their customer base have reexamined their rate structures and moved to a uniform structure 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.

### 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.

Impact fees are one of the more controversial revenue tools at the disposal of local governments. These fees seek to recover all or a portion of the capital costs related to serving new previously unserved customers through one-time fees. Most of the controversies have related to the use of impact fees to cover nonenterprise services such as education. While only a few communities have authorization to use impact fees for nonenterprise purposes, the wide authority of G.S.160A-314/G.S. 153-277 language gives all cities and counties running water or wastewater enterprises authorities to enact water and wastewater fees.

Figuring out the net costs of a new customer can be a challenge and there is clearly no single approach in theory or in practice. Utilities that rely on water and wastewater impact fees use different approaches for calculating them. For the approaches taken by Carolina Beach, Charlotte, Chatham County, and OWASA, see Table 38-5.

**Table 38-5. Determining Net Costs of a New Customer**

System	Name	Amount (in dollars) for Single-Family Residence	Basis
OWASA	Water availability fee	906–5,466	Meter and Building size
Carolina Beach	Water user fee	750–7,500	\$750 per bedroom
Chatham County	Water availability fee	1,750	Meter size
Charlotte	Water/sewer capacity charge	310–1035	Meter size

Each of these approaches tries 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 into the equity of the existing system. The charge is calculated by dividing the number of customers by the value of the system's assets. For both Charlotte and Chatham County the fee is based on a new customer's meter size. Meters come in standard sizes, and most residential customers are served by a 5/8-inch or 3/4-inch meter.

13. NCLM/UNC SOG Rate Setting Practices Survey—yet-to-be-published results.

The impact fee at other times is viewed as a way to develop capital reserve funds. In such a case, it is argued that the new customer will use a portion of the capacity of the existing water treatment plant thereby hastening the day when the plant will require expansion. The impact fee may thus be directed to a capital reserve for that purpose.

OWASA conducted a study to determine what factors influenced consumption patterns. 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 should 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.

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 one-time charges more favorably than a community that is struggling to halt a population decrease.

### Assessments

Many types of government-owned water and sewer enterprises, including counties, cities, and water and sewer authorities, are authorized to use special assessments for improvements. Unlike the case with other water and sewer charges, the law contains many specifics on how these should be calculated and implemented.<sup>14</sup> 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 portion of the overall project's cost, whether or not the owner connects to the system.

The use of special assessments is authorized by G.S. Chapter 160A, Article 10 (cities); GS 153A, Article 9 (counties), and GS 162A-6 (authorities). The authorization specifies that once a special assessment is made against a lot or a tract, that property is available to satisfy the payment of the special assessment in the same manner found with property tax levies. The major advantages of the special assessment are that the property stands behind the charge and a utility may allow installment payments of the assessment for a period of up to ten years. The chief disadvantage is that a utility must provide the front-end money to make the improvement. Such funds may come from bond proceeds, a revolving fund, capital reserves, or current appropriations.

No petition of the property owners is required. Interest on unpaid assessments may be set by the utility, not to exceed 8 percent. Assessments may be apportioned according to frontage on the lines, acreage, the increased value of improved property, or on a per-lot basis. The theory supporting special assessments is that the presence of the water or sewer line adds value to the property; thus the charge is made against vacant properties as well as against improved properties.

### Local Taxes

For many, one of the defining characteristics of a public enterprise such as a water and sewer utility is that it is supported by enterprise fees rather than by general tax dollars. However, there is no legislative prohibition against using nonuser fee revenue, such as property taxes or shared sales tax, to offset the cost of water and wastewater services. At one time, some sales tax revenues even had partial earmarking for water and sewer capital expenditures (G.S. 105-487, -504). While less prevalent than in the past, many utilities continue to rely on some form of nonuser fee general tax revenues to meet their costs. In some cases, tax revenues have been carefully earmarked for a specific purpose such as to support economic development-related water capital projects. In other cases, taxes are used to supplement user fees simply as needed to cover shortfalls. With the departure of large textile customers, some local governments have decided that using nonuser revenues is preferential to raising rates.

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14. 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.

## Developer Agreements and Contributed Capital

Utilities commonly have water and sewer system development policies that require developers to install water and sewer infrastructure according to local specifications and then to transfer the ownership of the assets to the utility. Under current GAAP reporting requirements, local governments are required to record the value of the assets they receive from developers as revenue. For many high-growth communities, this noncash revenue is significant.

## Funding Water and Sewer Capital Infrastructure

Provision of centralized drinking water and sewer services resembles large business in many ways. Many features distinguish provision of water and sewer services from other businesses, but the challenges of providing safe drinking water and environmentally sound wastewater have undeniably become as much about financial management as about treatment technologies. Balancing revenue concerns with the objective of providing affordable public service creates inevitable management tension. 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. One of the biggest financial challenges facing utilities is the scope of capital needs they face.

The Environmental Protection Agency estimated in 2003 that North Carolina has almost \$11 billion dollars in drinking water system capital needs over the next twenty years.<sup>15</sup> This only takes into consideration drinking water facilities and does not include wastewater capital needs. To put this number in perspective, as of June 30, 2003, state and local governments had approximately \$2.6 billion in outstanding debt including the balance on the 1998 state water and sewer bonds.

The provision of water and sewer services is capital intensive involving interconnected systems of pipes, pumping stations, treatment facilities, not to mention heavy equipment needed to maintain facilities. All of these capital assets have a finite life span. Some assets, such as properly installed water distribution pipes, may last seventy-five or more years, but eventually every component of a water and sewer system will need to be replaced or rehabilitated. As a utility's assets begin to reach the end of their useful life, maintenance problems increase and the ability of the asset to function steadily degrades, ultimately leading to service impairment and, potentially, a public health threat.

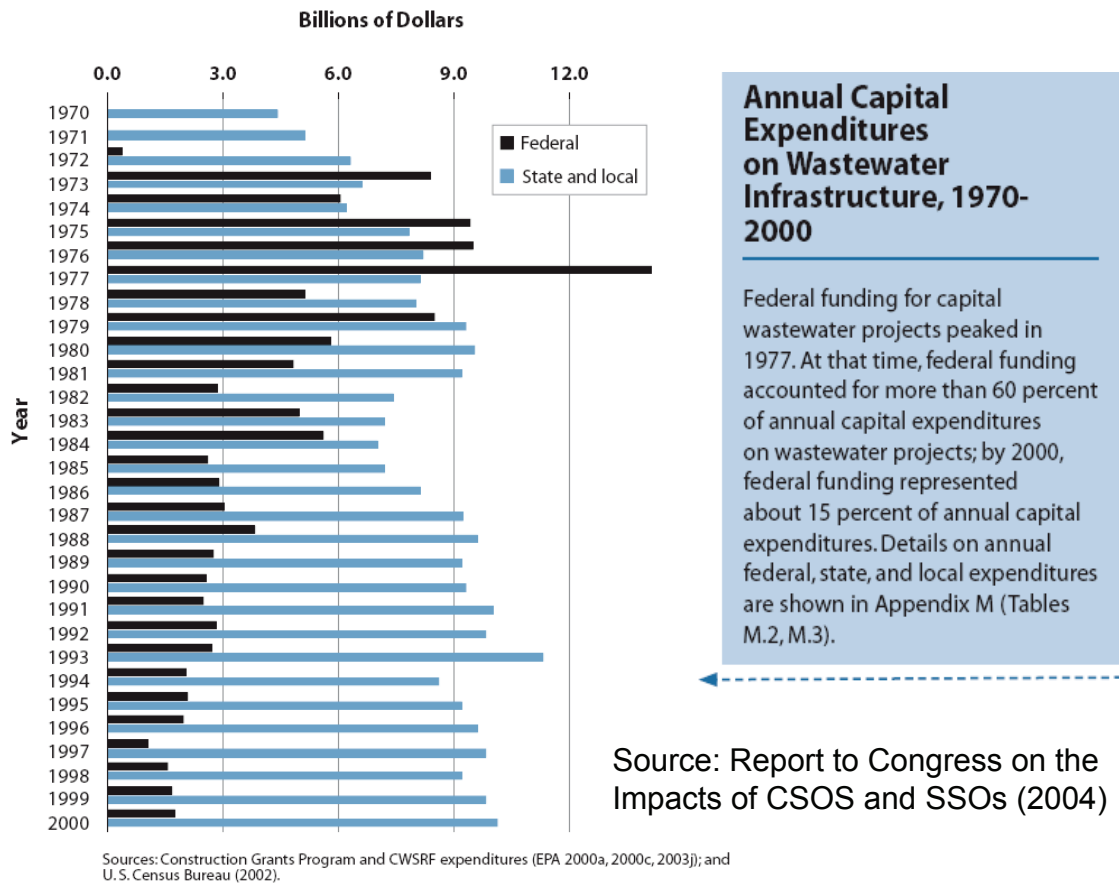
If replacing aging capital assets were a utility's only capital issue, the challenge might be less daunting, however many utilities in growing areas are faced with the additional need to expand their facilities. Finally, the evolving regulatory framework continues to produce capital needs. For example, the concern over disinfection by-products and resulting regulatory limits has led to millions in capital retrofit costs to install new treatment technology. Capital investments in facility expansions may be linked to new customers that bring in new revenue that can offset some capital costs, but regulatory and rehabilitation capital investments must be incurred without the benefit of new revenue.

A utility with capital needs has four fundamental methods of acquiring the needed funds: (1) they can save in advance by putting aside some of their revenue in a reserve fund that can be accessed when needed; (2) they can space out capital spending so that in a given year they are able to use some of their current revenues to meet their capital needs; (3) they can borrow funds and pay the lender back with future revenues; or (4) they can be fortunate enough to find another entity willing to provide grant funds to them that are retired or funded with nonuser fee revenue (usually state or federal tax dollars).

In the 1970s the latter method was much more common as a result of an enormous national funding initiative arising out of the Clean Water Act. The large grant programs of the 1970s are long gone, replaced with a patchwork of federal loan and grant programs. Figure 38-2 shows the evolution of wastewater spending by the federal government. Many local government officials fondly remember the days of "free money." In fact, 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.

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15. U.S. Environmental Protection Agency, 2003 Drinking Water Infrastructure Needs Survey and Assessment: Final Report to Congress. EPA 816-R-05-001, June 2005.

**Figure 38-2. Annual Capital Expenditures on Wastewater Infrastructure, 1970–2000**

The state of North Carolina has periodically used state-generated revenue to invest in water and sewer capital projects. 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 and as of 2006 almost all of the federal and state funding for water and sewer capital is available in the form of subsidized loans.

Whether through subsidized loans, the capital market, or commercial bank loans, local governments are turning increasingly toward debt to meet their capital needs (see Article 17 for a more detailed discussion of capital finance options).

## Stormwater Utilities

Local governments including cities, counties, and water and sewer authorities are authorized to provide stormwater services as a public enterprise (“utility”), however, compared to drinking water and wastewater, relatively few local governments have opted to provide these services through a utility. In 2005, approximately thirty local governments, primarily cities, reported having a stormwater utility.<sup>16</sup>

Prior to 2000, stormwater enterprise services were limited to structural and natural drainage systems. After the City of Durham’s use of fees to cover nonstructural services, such as education, was successfully challenged in court in 1999 (*Smith Chapel Baptist Church v. City of Durham* (350 N.C. 805)), the General Assembly expanded the definition

16. North Carolina Rural Center. Based on preliminary unpublished findings from a statewide survey.



of stormwater services to include nonstructural services ((G.S. 160A-311) (cities), G.S. 153A-274 (counties), G.S. 162A-2 (authorities)). This change was critical, as many of the new stormwater regulations such as the Phase II regulations require the implementation of nonstructural services.

The number of stormwater utilities has been increasing at a steady rate over the last few years as local governments have seen the number of stormwater services they are required to provide escalate in response to new and expanded state and federal legislation (see Article 25).

The principal source of revenue for North Carolina stormwater utilities comes in the form of a household stormwater fee that is linked to the impervious service of a residence or business. Fees across the state currently range from one to seven dollars a month for an average single-family home. Utility fees are collected in a variety of ways including being added to water and sewer bills or property tax bills.

Local governments must follow significantly more rules in establishing and implementing stormwater fees than drinking water and wastewater fees. Specifically, fees can not be implemented or modified without a public hearing; a customer can not be charged fees by multiple local governments; and the fees can not exceed the cost of providing the service.

## Electric Service

North Carolina cities have been authorized to provide electric service since the early days of electric power development. Seventy-one North Carolina cities (as of 2005) own and operate electric distribution systems. In addition, one city, Lake Lure, owns and operates a hydroelectric generation plant but sells its output to Duke Power Company, which is the distributor of electric power for the city and the surrounding area. These cities, in operating their electric systems, have all the general enterprise powers detailed above for water and sewer services, including establishing rates and charges (which are not subject to state regulation), using tax funds, borrowing, and condemning land.

Legislation enacted in 1965 (G.S. 160A-331 through -340) allocates service areas for electricity providers in urban areas. Under this legislation, cities not now providing electric service are unlikely to be able to add the service in the future. Furthermore, expansion of existing service to surrounding areas by cities currently operating electric distribution systems is often restricted by the legislation, which gives preference in serving new areas to the providers who are nearest.

Under the authority of the Joint Municipal Electric Power and Energy Act (G.S. Chapter 159B), cities may jointly own and develop facilities for generating and transmitting electricity. Fifty-one of the state's cities that operate electric distribution systems purchase their power through one of the two joint power agencies that they have created pursuant to this authority. As members of the joint power agencies, they own a share of generation plants constructed and operated by Duke Power Company and Progress Energy Company. The other twenty cities that distribute electricity purchase power wholesale from a private power company or through a neighboring city that is a member of one of the joint agencies. Only one city, Fayetteville, has significant generating capacity, enough to meet a portion of its demand. A few others have supplementary generating facilities that are employed to shave peak demand and thus to lower the cost of purchased power.

Sixty-nine of the cities operating electric distribution systems belong to ElectriCities of North Carolina, an association that provides consulting, technical assistance, and management services to its members. Nonmember cities are Highlands, Lake Lure, and Oak City.

The nine cities with the largest operating revenues in 2004 (more than \$40 million) were Concord, Fayetteville, Gastonia, Greenville, High Point, Lexington, New Bern, Rocky Mount, and Wilson. (Fayetteville, Greenville, and Wilson each had electric revenues in excess of \$100 million.) Some small cities also provide electricity, among them Bostic, Hamilton, Hobgood, Macclesfield, Oak City, and Waltonsburg, each of which had 2004 electric revenues of less than \$500,000.

At one time many electric systems were operated by commissions appointed by the city council but separate from city government. Today only Fayetteville and Greenville retain such commissions; the other electric cities provide services through their central city administrations.

Cities that provide electric service do so on a self-supporting basis. Historically, earnings from a city's electric fund were typically transferred to its general fund and used to help keep the city's property tax rate lower than it otherwise might have been. More recently cities have had difficulty in earning enough of a profit on electric services to be able to make such transfers, making them much less common than formerly.

## Natural Gas Service

Natural gas in North Carolina is distributed by five private companies regulated by the North Carolina Utilities Commission,<sup>17</sup> and by systems owned and operated by eight cities. The four regulated companies are North Carolina Gas Service, North Carolina Natural Gas Company, Piedmont Natural Gas Company, and Public Service Company of North Carolina. The eight cities are Bessemer City, Greenville, Kings Mountain, Lexington, Monroe, Rocky Mount, Shelby, and Wilson.

In 2004 the five companies, the Georgia city, and the eight North Carolina city systems provided service in eighty-eight of the state's 100 counties; in addition, the private companies were franchised to provide service in eight of the currently unserved twelve counties. The eight cities that provide natural gas service are important within their own communities, but the expansion of natural gas service to all parts of the state is, as a practical matter, the responsibility of the private sector.

The gas services in the eight cities all contribute to the cities' general funds from earnings that exceed operating and capital costs—except in Greenville, where they are operated as regular city departments. Greenville provides natural gas service through the same separate commission that operates electric and water and sewer services for the city.

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17. The City of Toccoa, Georgia, provides natural gas service to southern Macon county and is also regulated by the N.C. Utilities Commission.

