

WATER SUPPLY FACILITIES AND PRICING IN GEORGIA

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Abstract: This paper presents the results of the 1995 survey of Georgia's public water systems. The survey was completed by 313 of the 527 public water systems in the state. The survey included questions about connections, capacity, peak demand, water source, average daily water use, revenues, rates, facilities, capital expenditure plans, employees, and conservation programs. Information on water pricing in Georgia was an important part of the survey. The results showed that 59% of the systems use a uniform pricing structure, 26% use a declining block rate, 8% an increasing rate and 5% a flat fee. The average water bill for 10,000 gallons to a residential customer was \$19.46 - ranging from zero to \$43.16.

INTRODUCTION

This paper presents the results of a survey of Georgia's community (public) water systems. A questionnaire was mailed to all community water systems in Georgia in February of 1995, with a follow-up letter in March and a second reminder with another survey in May of 1995. In June 1995, all systems with incomplete surveys or unclear answers were contacted by telephone.

The population for this study was taken from the Georgia Environmental Protection Division's list of community water systems in the state. This list consisted of all the water systems licensed by the state to operate a public water system. The list does not include the nearly 2,200 other water systems operating in Georgia that are run by private individuals, firms, or neighborhood groups as a private water system. The EPD list contains 527 systems in the state. From these, 313 usable surveys were returned, accounting for 59% of public water systems in Georgia. Using the method as described by Schaeffer, Mendenhall, and Ott (1979), a statistically valid sample at the 95% confidence interval is achieved with a sample of 231 of the 527 water systems.

CHARACTERISTICS OF GEORGIA WATER SYSTEMS

As is the case across the U.S., Georgia's public water systems are predominately small systems serving residential customers. In 1994, over 90% of the systems served less than 1,000 customers (Table 1). This was also the case in 1990.

The respondents to the questionnaire served over 1.8 million households, accounting for 6.3 million Georgians. The smallest system in the survey served 11 people while the largest served 1.5 million. The average population served by the sampled systems was 21,500. The average number of connections was 4,602 residential, 352 non-residential and 895 customers outside of the jurisdiction of the system. Total capacity of the 313 systems was 1.8 billion gallons per day with the largest system's capacity at 248 million gallons per day (mgd). The average systems capacity was 8.6 mgd, with average storage capacity of 4.5 mgd. The total capacity of the seven largest systems was 722 mgd --- or 40% of the total capacity of all surveyed systems.

While 75% of the surveyed systems get their water from ground sources, 81% of the water used by the respondents comes from surface water sources. The largest systems in the state use surface water, while ground water is the primary source for most of the small water utilities in

Table 1. Size of Georgia Water Systems - 1994

Water customers	Number	% in sample	Average service connections	% Residential
1 - 999	164	53%	328	87
1,000-9,999	117	38%	3,230	85
10,000-49,999	21	7%	21,160	81
50,000 & above	8	2%	118,064	74

Georgia. This is a result of the geographic nature of nature of Georgia. The largest systems in the state are primarily north of the fall line. Consequently, in north Georgia most systems use water from surface sources. In south Georgia where plentiful ground water is the predominate source, most utilities are small rural systems. Total water use was 826 mgd with 64% going to residential customers, 18% commercial, 14% industrial. The mean for unaccounted water was 11%.

The surveyed systems generated over \$575 million in revenue in 1994, with an average revenue of \$2.2 million --- ranging from \$792 to \$127.3 million.

WATER CHARGES

For the 313 public water systems that completed the survey, the average water bill for 10,000 gallons to a residential customer was calculated to be \$19.46 per month. The range was from zero (one system reported not charging customers) to \$43.16. For those charging a flat rate the mean was \$9.25, ranging from \$4 to \$19. Over the period 1990 to 1994, 16% of the systems had no rate increase. Of those that did increase rates, the average over the five years was 19%.

RATE STRUCTURES

Most public water systems in Georgia use a uniform rate structure to charge their customers. For the systems for which rate information was provided, 183 or 59% use a uniform structure (Figure 1), while 81 systems continue to use a decreasing structure. An increasing block rate is used by 26 systems and 17 use a flat fee. This is similar to the 1990 rate structures as shown in Figure 2. As noted, one system has no charges while three systems use a rate that at first increases and then decreases at high water use levels.

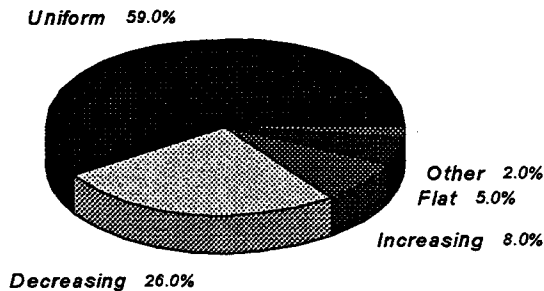


Figure 1. 1994/95 Water rate structures.

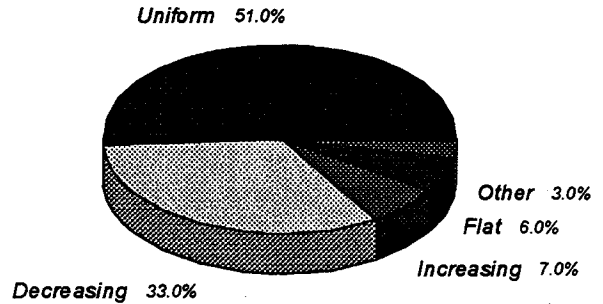


Figure 2. 1990 Water rate structures.

As a way to assess the level of knowledge regarding rate structure, the 1994 survey first asked the respondents to check whether their rate structure was uniform, increasing, decreasing, flat, or other. Then the respondents were asked to fill in their rates on the questionnaire. When the two questions were compared, 48% of the respondents had incorrectly identified their rate structures when compared to the actual data supplied. This indicates that those filling out the survey may not fully understand the rate terminology used in discussing water pricing.

OUTSIDE RATES

Utilities that provide service outside their city or county limits normally charge a rate differential. In Georgia, 51% of the systems charged an outside rate. For those systems that do charge an outside rate, the average monthly bill for 10,000 gallons was reported at \$28.40, compared to the \$19.46 for customers inside the jurisdiction. This represents an average differential of 45%. The differential ranged from \$9.63 to \$74.00

COMMERCIAL/INDUSTRIAL RATES

Utilities also often charge commercial and industrial users a rate differential based on either cost-of-service factors or economic development concerns. In the Georgia survey, only 80, or 26% of the reporting systems charged a rate differential to commercial/industrial customers. The average rate charged to these customers for 10,000 gallons per month was \$31.55 --- ranging from \$10.00 to \$114.00. Thus, the industrial/ commercial average differential was 62%.

MINIMUM CHARGES

For all but the 17 systems that charged a flat fee, most of the respondents charged their customers a minimum fee for a prescribed amount of water plus a unit fee based on the rate structure. For the respondent systems, the average minimum charge was \$7.45 for an average 2,161 gallons. The minimum charge ranged from zero to \$17.91. The gallons on which the charge was assessed went from zero to 7,500 gallons.

USE OF RATE BLOCKS

In the survey, 17 systems had a flat fee so no blocks were used and 185 used a one-block uniform rate. For the remaining 81 decreasing block and 26 increasing block systems, Figure 3 shows the number of blocks used. Most used either two or three blocks with the average rate charged in the last block of \$1.50 --- ranging from \$0.25 to \$5.00.

TAP OR CONNECTION FEE

Most utilities in the survey (284) charged their customers a fee to tap or connect onto the system. The average tap or connection fee was \$223, ranging from \$5.00 to \$1165.

CONSERVATION PROGRAMS

Since 1989, 38% (68) of the respondents instituted some type of conservation program. The range of initiatives is shown in Table 2.

Through their own estimate, the mean impact of the programs was thought to be an 11% demand reduction. However, it was not clear if the estimates provided were the result of statistical analysis or simply a feeling of the

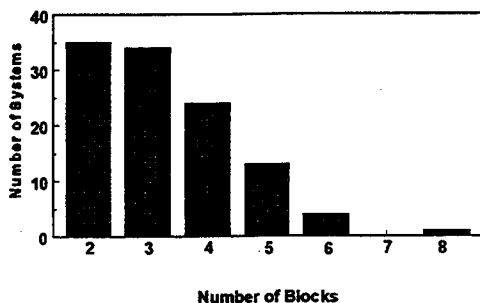


Figure 3. Number of pricing blocks.

TABLE 2. Types of Conservation Programs Since 1989

Type of program	Number of systems	% of systems that did conservation
Shift to increasing rate structure	8	13
Shift to uniform rate structure	11	17
Summer surcharge	10	16
Information in bills	21	33
Education program in community	31	48
Education program in schools	15	23

respondent. A total of \$661,240 was spent on conservation programs, with a mean estimated cost of \$25,432. Further, 40 systems instituted restrictions at some point since 1990. Of those, 40% used voluntary restrictions, 51% used mandatory and 9% used both.

TRENDS SINCE 1990

A similar study was conducted in 1990. In order to accurately compare the results of the two surveys, only those systems that responded to both surveys were analyzed. For this purpose, 212 systems participated in answering the questionnaire in both 1990 and 1994. Table 3 shows some of the data from both surveys.

Both the size of the population served and the number of connections increased from 1990 to 1994. While population increased 34% the average number of connections only went up 7%. This may indicate an increase in the density of populations, perhaps the result of more multifamily dwellings in the paired systems.

The systems in the two surveys increased in both capacity and water use over the time period. The average capacity expanded 35%, while average daily water use increased 35%. With a smaller change in average connections, the difference in water use can be seen in the use per connection. The average use per connection in 1994 was 63% higher than in 1990. One explanation of this could be the extreme flooding that occurred in 1994 and the damage many systems experienced. It is possible that water as pumped but not sold. Looking at revenue figures, 1994's total revenue was only 13% higher than in 1990 and only 6% more per connection.

Examining rates, the 212 systems paired in the two surveys exhibited some movement away from decreasing

**TABLE 3. Selected Comparison Data: 1990 and 1994
Georgia Water Survey**

	1990	1994
Mean population served	19,815	26,467
Average number of connections	5,570	5,940
Mean capacity (gal)	7,328,375	9,913,920
Average daily water use (gal)	2,308,187	3,115,956
Highest average one-day demand (gal)	6,024,678	6,162,141
Average yearly revenue (\$)	2,080,969	2,355,110
Average daily water use per connection (gal)	281	458
Average yearly revenue per connection (\$)	282	300
Mean water bill for 10,000 gallons per month (\$)	17.66	19.77

in need of a review of rates to keep up with increased costs and demand. That water rates and revenues just kept up with inflation may mean needed expansion and maintenance is being deferred.

rates to more uniform rate structures. In 1990, 38% of the systems used a decreasing block structure. In 1994 only 26% of the paired systems employed decreasing rates. Uniform rates went from 50% in 1990 to 58% in 1994. The number of systems using increasing rates went from 12 to 22 in 1994.

Finally, the average water bill for 10,000 gallons went from \$17.66 in 1990 to \$19.77 in 1994. This 11.9% increase was the same as the 11.9% increase in the CPI over the same period. This indicates that water bills and revenue remained fairly constant in real terms over the four year time frame.

CONCLUSION

As with the rest of the country, Georgia's public water utilities are mostly small operations that serve less than 1,000 people. Although decreasing rate structures still exist, over two-thirds of the surveyed systems charge customers so that their bills increase as does water use.

Examining the trends between 1990 and 1994 surveys, it appears that the water industry in Georgia has remained relatively unchanged. Certainly in financial matters there has been little movement in rates and revenues over the four-year period. This indicates that water systems may be