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Affordable For Now: Water And Sewer Rates At U.S. Municipal Utilities

Oct 24, 2018

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[Table of Contents](#)

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Key Takeaways

- Water and sewer rates at S&P Global-rated U.S. public utilities vary widely depending on region, water source, treatment technology, and utility size. They are generally at levels we consider affordable given local incomes and poverty rates.
- Rate inflation is higher in water and sewer than in many other public utility sectors.
- Levels of household consumption affect affordability, as well as rate structure and operating and capital cost.
- Affordability plans can help reduce delinquencies and improve revenue reliability and rate-setting flexibility. Strong public outreach and information, as well as political and Public Utility Commission support, contribute to management flexibility for rate-setting.

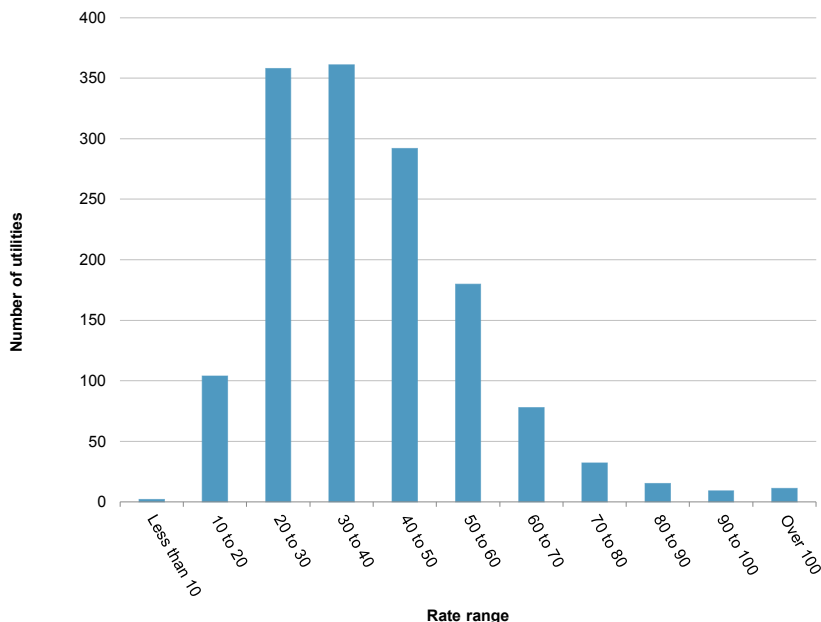
S&P Global Ratings maintains revenue debt ratings on 1,600 public water and wastewater utilities in the U.S. This includes multiple security types and issues but with the same obligor (e.g., Baltimore issues both water and wastewater revenue bonds that are separately secured by dedicated revenue streams). However, it excludes debt issued by wholesalers, as well as debt issued by state agencies to fund water and wastewater projects.

In general, water and sewer rates at rated utilities are still at levels that we consider affordable. However, rate inflation in the sector has been higher than in many other utility sectors, and we expect this trend to continue. Over time, we believe that affordability, particularly for low- and fixed-income residents, could come under pressure and constrain revenue-generating flexibility as public utilities work through large capital plans due to aging infrastructure, changing regulatory requirements, and concerns about securing long-term water supply. We will continue to examine the effects of revenue needs and affordability concerns on utility rates and overall financial performance.

Most U.S. Public Utilities Charge "Affordable" Rates

For both utility types, a monthly rate between \$30 and \$40 for 6,000 gallons of service is the most common. Nationally, rates tend to be slightly higher for sewer than water service: The median and mean are both \$37 for water, in contrast to \$42 (median) and \$45 (mean) for sewer. Less than 1% of the water utilities in the sample and less than 3% of sewer utilities have monthly rates over \$100.

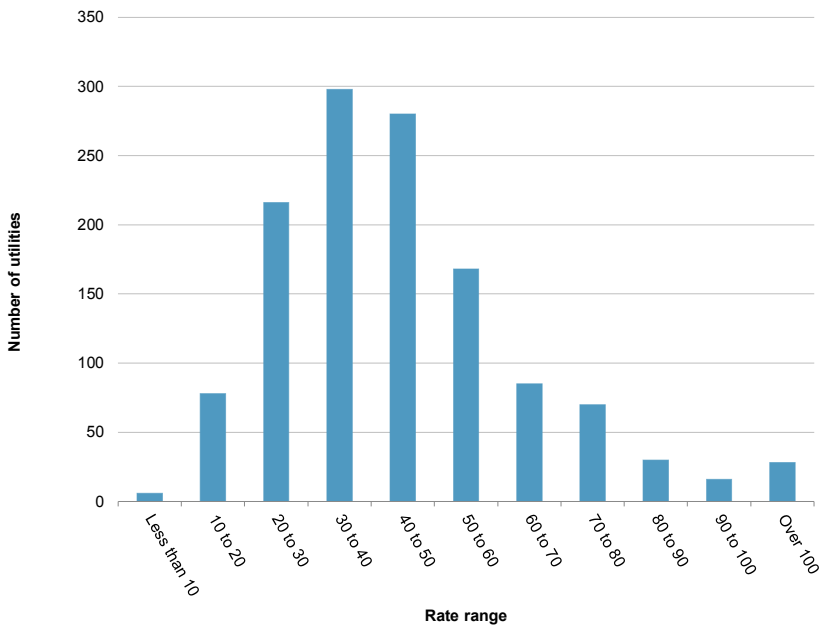
Chart 1 | [Download Chart Data](#)
Monthly Water Rates, 6k gal



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Chart 2 | [Download Chart Data](#)

Monthly Sewer Rates, 6k gal

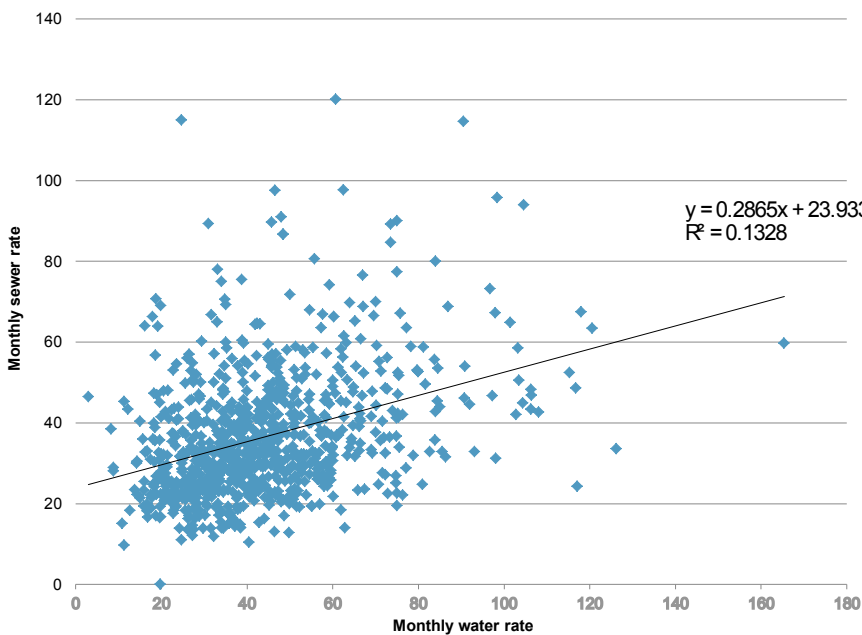


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A Note On The Sample

S&P Global Ratings has rate data for over 1,400 water utilities nationwide and 1,200 wastewater utilities, including publicly rated water, sewer, and combined utilities; wholesale utility participants and customers; and utilities that pledge revenue to support bonds where the public rating is based on a different pledge. We acknowledge that this is not a random sample, as we only maintain rate data on utilities associated with public debt. Due to the nature of this sample, these utilities will generally be larger and have greater financial capacity than the universe of all municipal water and sewer utilities in the U.S. Additionally, some states are underrepresented due to alternative forms of financing such as state bond banks (see "Many New England Water And Wastewater Utilities Have Strong Profiles But Face Costly Mandates And Aging Infrastructure," published July 12, 2017, on RatingsDirect). S&P Global Ratings uses a baseline assumption of 6,000 gallons of monthly water or sewer usage; while an average customer bill may not be the same as this 6,000-gallon amount depending on consumption, this single level is used throughout for comparability unless otherwise noted. This assumption is based on research and feedback during the request for comment phase prior to the implementation of the applicable criteria, "Rating Methodology And Assumptions For U.S. Municipal Waterworks And Sanitary Sewer Utility Revenue Bonds" (published Jan. 19, 2016).

Chart 3 | [Download Chart Data](#)
Water And Sewer Rates At Combined Utilities



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We have both water and sewer rates for over 800 utilities. This is significantly smaller than the total data set, as separate entities provide water and sewer service in many areas. Among those utilities where we do have both water and sewer rates, we can see that there is a positive association between them: Utilities that charge more for water often also charge more for sewer. There are a variety of possible reasons why this is the case, including management rate-setting philosophy, system age, local cost factors, and political support. The sewer bill is often slightly higher than the water bill, which is consistent with the national rate distributions shown above and our observation that generally sanitary sewer systems are more capital intensive, especially relative to groundwater-based drinking water systems.

The most expensive water rates in our sample are in Missouri. Missouri issuers tend to have higher debt levels and weaker asset management and long-term planning scores. Like many others on the list, these Missouri issuers are in more rural areas so they have smaller customer bases to absorb large fixed costs. The rates listed below do not include additional dry-period assessments and surcharges; many systems also charge higher rates for customers who live outside of the primary municipal jurisdiction ("out of town" rates and surcharges). Where the table identifies rate "up to" a given amount, it means there are multiple billing districts within the service area, but they do not represent "in town" and "out of town" rates.

Table 1 | [Download Table](#)

Most Expensive Water Rates At Publicly Rated Utilities, 2018

Peculiar, MO	\$120
West Wise Special Utility District, TX	\$111
Daviness County Public Water Supply District No.1, MO	\$111
North Prairie Rural Water District, ND	Up to \$110
Carroll County Public Water Supply District No. 1, MO	\$105
Ralls County Public Water Supply District No. 1, MO	\$103
Santa Barbara, CA	\$97
West Cumberland Utility District, TN	\$96
West Milford Township Municipal Utility Authority, NJ	\$94
Red River Authority, TX	Up to \$94

The list of the most expensive sewer utilities is more California-centric. California has one of the most restrictive regulatory regimes, which often requires more capital-intensive processes than in other parts of the country. Additionally, many utilities in the state discharge into sensitive environmental areas. Some utilities have high rates due to expensive regulatory-driven capital plans; others are small systems with few customers to bear the financial burden of maintaining aging systems. In several instances, especially where water consumption tends to be strongly seasonal and affected by summer irrigation, sewer bills are based on water consumption, but only in the winter months. We are assuming a 6kgal baseline despite the seasonality in consumption.

Table 2 | [Download Table](#)

Most Expensive Sewer Rates at Publicly Rated Utilities, 2018

Sanitary District No. 5 of Marin County, CA	Up to \$165
Pacifica, CA	\$157 (2017)
North Bend, WA	\$153
Newport, RI	\$135
Millbrae Public Financing Authority, CA	\$127
Montecito Sanitary District, CA	\$123
Healdsburg, CA	\$122
Mill Valley, CA	\$121
Deltona, FL	\$117
Oak Island, NC	\$115

The list of the most expensive combined rates includes many of the utilities listed above, but is more geographically diverse with only one state (California) appearing twice on the list. The trend of higher sewer rates continues, with all but one of the utilities charging more for sewer service than for water.

One surprise for many readers may be the absence of Atlanta and Austin, as they have received significant attention for recent rate increases and are often used as examples of areas with "high rates." Both water and sewer rates for both cities were included in our sample. While they are higher than the national average, with a monthly bill of \$43 for water and \$108 for sewer in Atlanta and \$38 for water and \$62 for sewer in Austin, the bills are not as high as those of many other utilities in the sample (although Atlanta does make the list of top 10 for combined rates).

Table 3 | [Download Table](#)

Most Expensive Combined Rates At Publicly Rated Utilities, 2018

	Water	Sewer	Combined
North Bend, WA	\$60	\$153	\$213
Newport, RI	\$65	\$135	\$200
West Milford Township Municipal Utility Authority, NJ	\$94	\$105	\$199
Healdsburg, CA	\$63	\$121	\$184
Peculiar, MO	\$120	\$61	\$181
West Travis County Public Utility Agency, TX	\$73	\$97	\$170
Oak Island, NC	\$52	\$115	\$167
Holly Village, MI	\$59	\$99	\$158
Atlanta, GA	\$43	\$108	\$151
Santa Rosa, CA	\$43	\$106	\$150

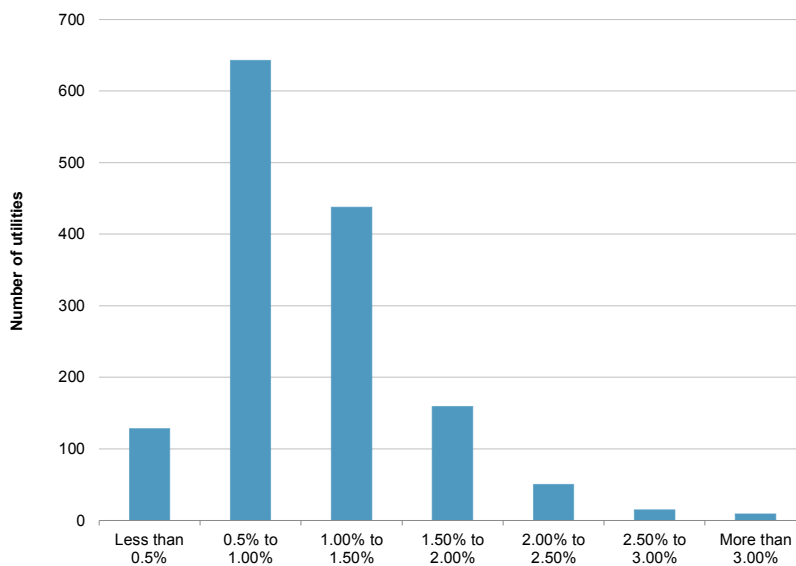
What Does "Affordable" Mean?

The Environmental Protection Agency (EPA) standard

There are a wide range of opinions on what it means for water and sewer service to be "affordable." There is no broadly applicable direct correlation between economic growth and system demands due to changing consumption patterns (discussed below). However, economic fundamentals are still a critical proxy for the current and likely future ability of the customer base to support utility operations and its revenue requirements, as municipal utilities tend to derive nearly all operating revenues from the local rate base. Regardless of the condition of the utility's service area economy, the relative ability of its customer base to pay the utility bill has remained important not only to credit quality but also to the sector itself. Both the EPA and the water utility industry's leading professional organization, the American Water Works Assn. (AWWA), have developed guidelines for measuring affordability.

The EPA's "Interim Economic Guidance for Water Quality Standards Workbook" (EPA 823-B-95-002, March 1995; Section 4) and "Combined Sewer Overflows--Guidance for Financial Capability Assessment and Schedule Development" (EPA 832-B-97-004, February 1997; Section 3) develop affordability criteria for sewer systems, including the residential indicator, which measures the annual utility burden as a percentage of median household income (MHHI). Under the EPA guidance, the benchmark for water systems is 2.5% of annual MHHI. EPA guidance also identifies a number of additional secondary screening criteria such as the local unemployment rate versus the national rate. S&P Global Ratings looks at median household effective buying income (MHHEBI) as opposed to MHHI, since it better captures after-tax, disposable income, or take-home pay (EPA's secondary screening affordability criteria also take into account the household tax burden). If we use the same benchmark of 2.5% despite the differences between MHHI and MHHEBI, approximately 98% of the utilities in our data set charge rates that are "affordable" by the EPA standard.

Chart 4 | [Download Chart Data](#)
Water Rates As A Percent Of MHHEBI



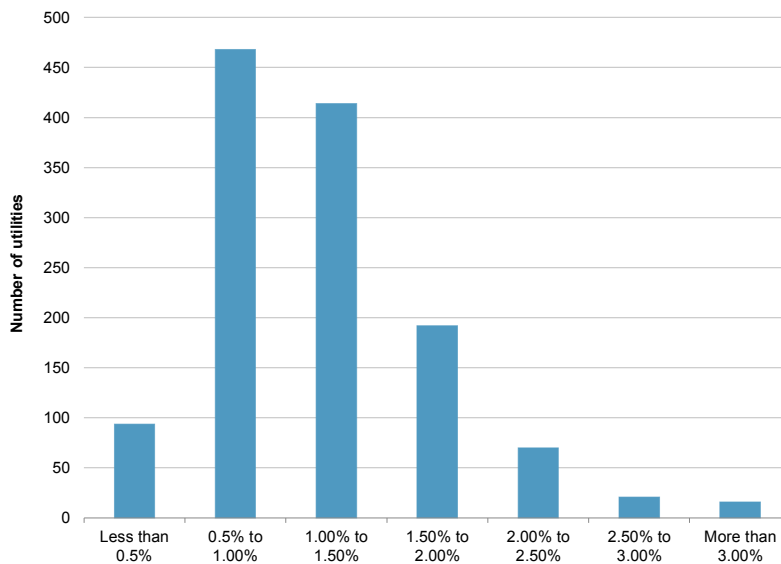
MHHEBI--Median household effective buying income.

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The EPA has a slightly lower benchmark for "affordable" sewer rates, at 2% of MHHI. Looking at the sewer utilities in our sample, the percentage that charge "affordable" rates is 92%, lower in part due to the higher rates in the sewer utilities than at water utilities, as well as the lower benchmark.

Chart 5 | [Download Chart Data](#)

Sewer Rates As A Percent Of MHHEBI



MHHEBI—Median household effective buying income.

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High Rates Are Not A Requirement For Creditworthiness

Not only is affordability one of many inputs into a utility manager's business decisions, but it is also a relevant credit factor. Under S&P Global Ratings' criteria for assessing the creditworthiness of water and sewer utilities, we assign each utility a "market position" score based on our opinion of the relative affordability, comparability of rates with those of peers in the region or state, and management flexibility to increase rates in the future if additional revenues are required to maintain financial strength. In addition to the average household bill as a percentage of MHHEBI, the score includes the county poverty rate. The relative poverty rate is important because service areas that have not just lower MHHEBI levels, but also disproportionately higher percentages of the population located in the lowest quintiles of the MHHEBI distribution curve, may exhibit greater sensitivity toward perceived affordability, even if adjusted for low inflation or a favorable cost of living.

Market position scores range from '1' to '6', with '1' being the strongest. The market position score calculation may use either the average monthly household consumption where available (as this better reflects the average household bill) or our 6,000 gallons/800 cubic feet (ccf) standard. For utilities with an anchor assessment of '5' or '6' that have recently completed or achieved substantial completion of a historically capital-intensive period, the anchor assessment may improve by one point. The committee may also adjust the market position score negatively if a utility is in a period of substantial rate increases, or it otherwise thinks that future rate-setting flexibility may be more constrained.

Table 4 | [Download Table](#)

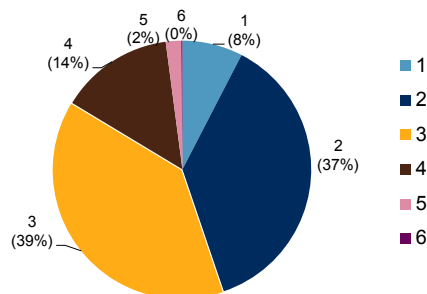
Market Position Assessment: Water- Or Drainage-Only Utilities

Percent of county population living in poverty	Annual utility bill as a percent of MHHEBI		
	Less than 1%	1% to 2%	More than 2%
Less than 10%	1	2	3
10% to 20%	2	3	4
20% to 30%	3	4	5
More than 30%	4	5	6

MHHEBI—Median household effective buying income.

Chart 6 | [Download Chart Data](#)

Market Position Score -- Water-Only Utilities



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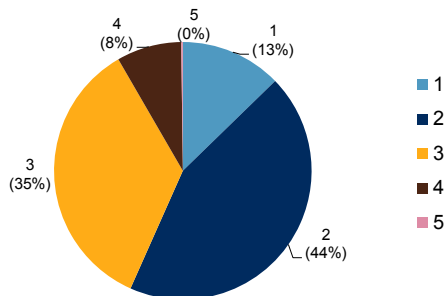
Table 5 | [Download Table](#)

Market Position Assessment: Sewer-Only Utilities

Percent of county population living in poverty	Annual utility bill as a percent of MHHEBI		
	Less than 1.25%	1.25% to 2.50%	More than 2.50%
Less than 10%	1	2	3
10% to 20%	2	3	4
20% to 30%	3	4	5
More than 30%	4	5	6

MHHEBI--Median household effective buying income.

Chart 7 | [Download Chart Data](#)
Market Position Score -- Sewer-Only Utilities



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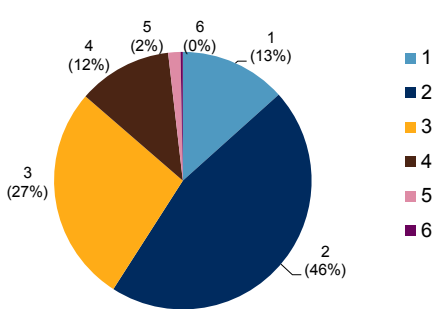
Table 6 | [Download Table](#)

Market Position Assessment: Water And Sewer/Draining Utilities

Percent of county population living in poverty	Annual utility bill as a percent of MHHEBI		
	Less than 2.25%	2.25% to 4.50%	More than 4.50%
Less than 10%	1	2	3
10% to 20%	2	3	4
20% to 30%	3	4	5
More than 30%	4	5	6

MHHEBI--Median household effective buying income.

Chart 8 | [Download Chart Data](#)
Market Position Score -- Combined Utilities



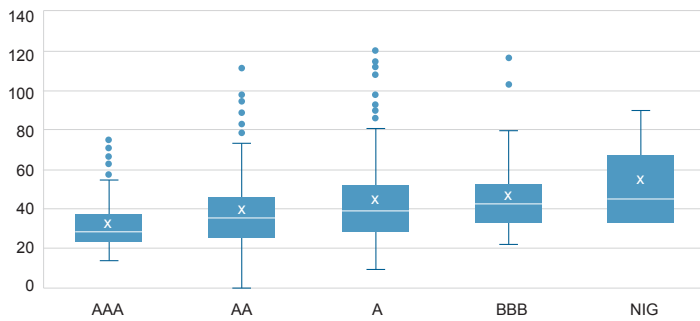
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As the charts show, sewer-only and combined water and sewer utilities tend to have stronger market position scores than water-only utilities have. Well over half of sewer and combined systems score a '1' or a '2', levels we consider extremely or very strong, whereas less than 45% of water utilities have this same flexibility. Sixteen percent of water and 12% of combined utilities score a '4' or higher, levels we consider adequate or vulnerable. Only 8% of sewer utilities have similar market position scores.

As S&P Global Ratings considers rate affordability part of the rating process, it is consistent that affordable rates are a characteristic of higher-rated utilities. For water utilities, there is a clear pattern: Higher-rated utilities tend to charge lower rates for service. For sewer utilities, there is not such a clear correlation. However, both charts show that the financial strength needed for strong credit quality comes from more than just high rates. Many highly rated utilities tend to be in major metropolitan areas and therefore are able to spread fixed costs across a larger customer base; others are newer systems with fewer capital needs associated with maintaining aging infrastructure. (For additional information about the characteristics that tend to lead to higher credit ratings, see "[The Common Credit Characteristics Of Highly Rated U.S. Municipal Water And Sewer Utilities](#)," published March 7, 2017.)

Chart 9

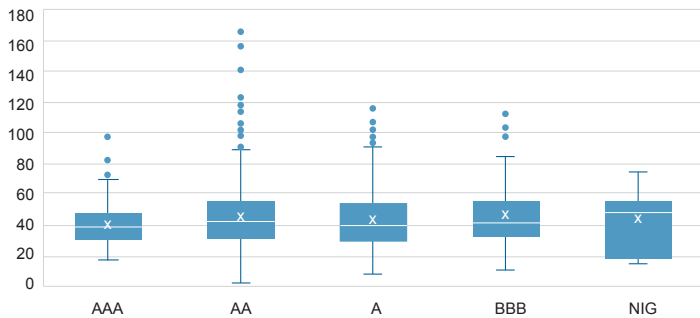
Water Rates By Rating Category



NIG--Noninvestment-grade. Source: S&P Global Ratings. Copyright © 2018 by Standard & Poor's Financial Services LLC. All rights reserved.

Chart 10

Sewer Ratings By Rating Category



NIG--Noninvestment-grade. Source: S&P Global Ratings. Copyright © 2018 by Standard & Poor's Financial Services LLC. All rights reserved.

Reading Box And Whisker Plots

Box and Whisker plots summarize a lot of information in a single image. For a given sample, the "box" covers the area from the first to third quartile of the sample (the interquartile range [IQR]), with the median marked by a line through the box. The bars extend to the maximum and minimum, excluding outliers. Outliers are identified by the dots, which represent data points more than 3x the IQR away from the edges of the box. An 'x' marks the mean. So shorter boxes depict more compact data sets, and taller ones represent a wider range of results.

High Rates As An ESG Concern

S&P Global Ratings has recognized that environmental, social, and governance (ESG) factors have rapidly grown beyond a niche in the global credit markets (see, for example, "[The Rise Of ESG In Fixed Income](#)," published on Sept. 10, 2018) and are now an established set of investing principles. Utility managers, however, may view other asset classes as being late to the game. Among water and sewer utilities, there has been embedded into management strategies the idea of the "triple bottom line" of environmental stewardship, financial integrity, and affordability, which aligns quite nicely with ESG. For this essential service, affordability takes on the question of whether water is a human right, a property right, a commodity, or something else entirely. Potable water is not free, because the infrastructure to access the raw water supply, properly and safely treat it, and ultimately deliver it to the end user is not free. But if it is not free, then how should the cost be determined? As a signatory to the United Nations Principles for Responsible Investment (UN-PR) global initiative in May 2016, S&P Global Ratings is committed to the goal of encouraging and developing greater transparency and consistency of ESG factors in the credit rating process and credit reports. Just as we seek to better incorporate affordability as part of utility-related ESG evaluations, so do we more broadly seek to update our global analytical approach (see "[S&P Global Ratings' Proposal for Environmental, Social and Governance \(ESG\) Evaluations](#)," published Sept. 24, 2018).

Do Affordability Programs Affect Creditworthiness?

Recent increases in water and sewer rates and charges have drawn attention to affordability concerns, for both local governments and federal officials. While there are federal affordability programs to help low- and fixed-income families afford housing, food, and energy, no such federal program currently exists for water and wastewater service. As a result, many local utilities and municipalities have explored introducing their own affordability programs. According to the most recent AWWA "State of the Water Industry Report," the percentage of survey respondents that indicated their utilities provide some form of bill assistance increased to 48% in 2018 from 39% in 2017. Utility managers have taken a broad range of approaches, including creating rate-funded rebate programs, providing "lifeline" rates, changing rate structures, providing payment plan options, and partnering with third parties to implement programs. Depending on the state, there may be restrictions on the type of programs that may be allowed or how they can be funded, and it is still most common for us to hear from utility managers that "our affordability program is to keep rates low for everyone."

In general, our criteria for creditworthiness are agnostic as to rate structure. This also applies to affordability programs; S&P Global Ratings does not think that affordability programs directly contribute to creditworthiness nor does it have a bias toward or against specific types of programs. However, depending on how a

program is implemented, a successful affordability program can contribute to overall credit strength, and a poorly conceived or implemented one can introduce additional risk that may affect our view of the overall creditworthiness of a utility.

Well-constructed affordability programs can improve revenue certainty and stability by helping reduce delinquency and nonpayment rates, and manage political opposition to rate increases for customers that a utility has determined to have a stronger ability to pay. Efforts to increase water and sewer rates are often met with the strongest opposition by people on low or fixed incomes, including retirees. By providing programs to help customers with the greatest affordability constraints, these efforts could reduce resistance to rate increases on others, provided the size of the differential does not get too extreme or raise questions about the cost of service.

Among the most high-profile examples is the process that ultimately led to [Great Lakes Water Authority](#) (GLWA), Mich.'s successful water residential assistance program (WRAP). While Detroit's water and sewer department did not experience the profound fiscal distress that the general government did, the city had for years been experiencing chronic delinquencies due to numerous factors, including antiquated billing procedures, inconsistent shut-offs and collection efforts, a significant number of inactive accounts, and socioeconomic factors limiting many residents' ability to pay. Billing enforcement actions such as service shut-offs faced public scrutiny and headline risk.

Soon after GLWA's creation, it established the WRAP and made it available to all qualified low-income customers in its service base. While many of the chronic issues described above are still pressuring collections in Detroit, GLWA has been able to integrate WRAP with its other collections efforts, providing means-based help that management has estimated has since averted 3,100 shut-offs and conducted over 1,000 water audits that have helped customers both detect leaks and establish more efficient conservation. The implementation of WRAP has also helped GLWA focus its collections efforts in several other ways. Collections have improved because the affordability program helps spread repayment of delinquent payments out over time. Because any customer who is both enrolled in a payment plan and current in its billing cannot have service shut off, it also focuses the city's efforts on shut-offs for habitually delinquent customers who have not engaged with the city to arrange for a payment plan. For fiscal 2019, GLWA budgeted \$4.9 million for the WRAP, against water and sewer operating revenues from just city of Detroit customers of \$359 million.

Despite the gains in a city like Detroit, attempts to introduce an affordability program can also create additional risks. Depending on the number of customers who qualify for financial assistance and the size of the benefit, program costs (appropriated costs or foregone revenues) could exceed projections to the detriment of system net revenues. Any attempts to introduce a program could face similar public opposition as rate increases often do, causing lawsuits and revenue uncertainty for extended periods. More complicated rate structures can also lead to customer confusion and increase the likelihood of administrative errors.

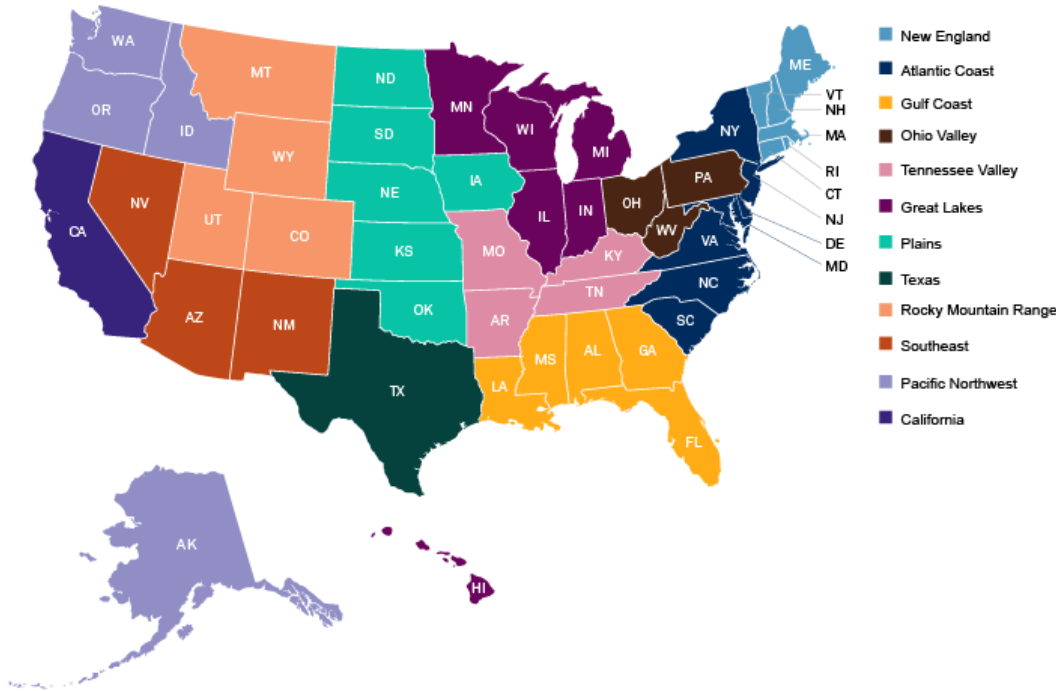
System Location Matters

There are a number of geographic factors that contribute to customer rates, such as climate and type of water supply, as well as utility size and population density. Economic factors can also affect rates, such as local income and poverty levels. Many of the utilities we rate have higher rates for out-of-town customers, to capture those costs associated with the extra distance to their homes, as well as, in some cases, the lack of financial support from the municipality where the utility is based.

S&P Global Ratings rates utility revenue-backed bonds in almost every U.S. state, although the number of ratings depends on a number of factors, including access to state bond banks and debt restrictions. For monitoring and analytical purposes, we have divided the country into 12 regions; these regions share some common characteristics such as climate and consumption patterns, the preponderance of agriculture, and to some extent economic characteristics.

Chart 11

S&P Global Ratings Regions

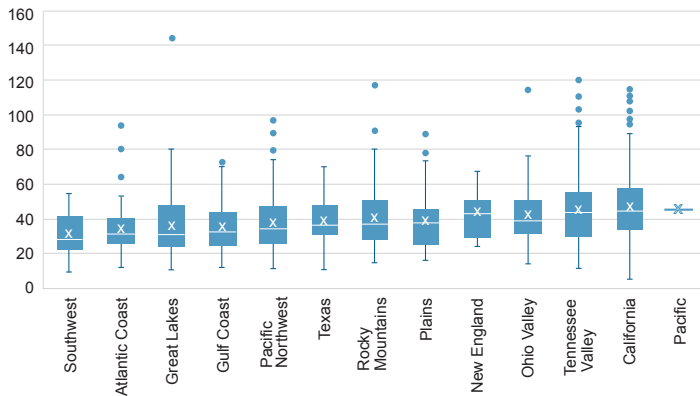


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Looking at water bills across these regions, the median rate ranges from \$28 in the Southwest to \$45 in the Tennessee Valley and California. The lower rates in the Atlantic Coast (per the chart legend) and Great Lakes states are less surprising given the strong availability of surface and groundwater sources, as well as Public Utility Commission (PUC) regulation of rates in some states (e.g., Wisconsin and Indiana). Low rates in the Southwest are more surprising due to the scarcity of water and large amounts of infrastructure and energy required to transport water to population centers, although many of the systems in that region are newer and don't have as many costs associated with aging infrastructure.

Chart 12

Water Rates By Region



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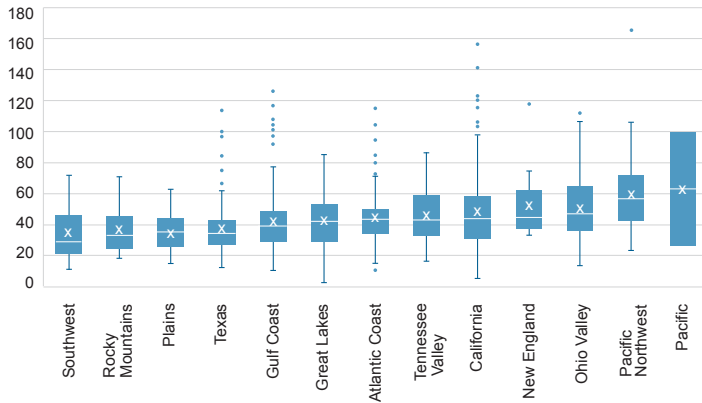
High rates in California partially reflect the cost of large infrastructure to move water from the northern to the southern parts of the state, as well as substantial infrastructure to buffer interyear variance in water supply, as most annual precipitation occurs in a few atmospheric river events during the year. Additionally, more stringent regulatory and environmental requirements than elsewhere in the nation lead to more complex and expensive capital infrastructure and the utilities pass these costs on to their customers.

We expect rates in the West, where scarcity is the norm and supply concerns garner attention even in the mainstream media, to be no less immune to pressures. The recently approved "California Water Fix" is among the most high-profile regional collaboration in decades. In 2017 dollars, the state estimates the project could cost close to \$16.7 billion assuming no cost overruns and the project is fully operational in 2033. One of the participants, the [Metropolitan Water District of Southern California](#) (MWD, AAA/Stable) is allocated 26% of the total project, but has also committed to assume the Central Valley Project allocation, increasing total

participation up to \$10.8 billion, or 64.6% of the total cost. The management team has estimated the project could affect the average retail ratepayer by about \$4.80 per month. We view the potential for a deviation from budget and timeline as likely, and the actual effect on individual households will likely vary widely based on local circumstances, such as the specific purveyor's water supply mix. We would most likely view it as credit impactful if MWD's members begin to push back, either for continued alternative delivery options and a reduced take from MWD, or in an extreme scenario, trying to affect an exit from their contractual relationship with MWD, citing wholesale (and therefore, retail) rates that are already somewhat high.

The Southwest also has the lowest sewer rates in our sample, with a median rate of \$29. Many Southwest systems benefit from being relatively young, whereas aging infrastructure and the need to separate old combined sewer systems have increased capital costs at many systems in other parts of the nation. The Pacific Northwest is highest with a median of \$57. The Pacific Northwest number includes 40 utilities in the Seattle-Tacoma-Bellevue metropolitan statistical area, and may be affected by the consent decree signed between the U.S. EPA and [Seattle](#) (see more on consent decrees below). Other regions with high sewer rates, such as the Ohio Valley and New England, tend to have high costs due to aging infrastructure and the presence of systems built with combined sewer and wastewater systems.

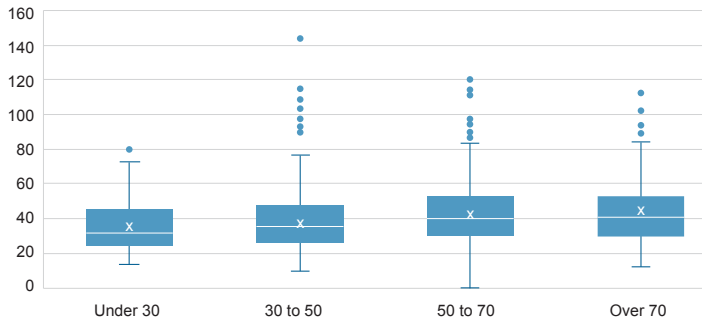
Chart 13
Sewer Rates By Region



Source: S&P Global Ratings.
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Local economic factors can also be a factor in rate setting, as system managers and public officials in charge of rate setting consider ability to pay and the political palatability of rate increases. Under our criteria, we look at a variety of economic factors to help determine creditworthiness, including local income levels (measured using MHHEBI), unemployment levels, the strength of the metropolitan service area (an aggregate assessment that looks at employment diversity, employment growth, and the employment base), the presence of a stabilizing institution such as a major university or military base, and population growth trends. While not all of these factors are likely to affect customer rates, we did look at income levels and poverty rates within the customer base, due to likely concerns about affordability in the rate-setting process and the potential for public opposition to rate increases.

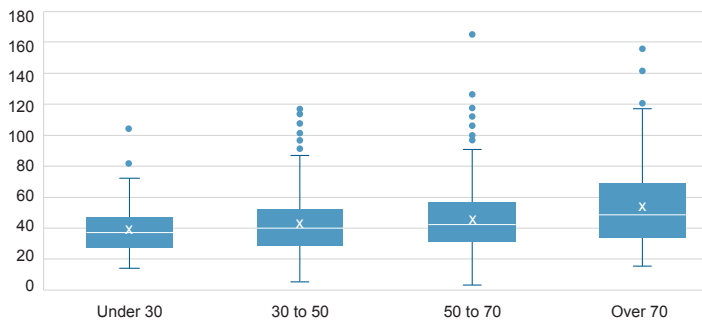
Chart 14
Water Rates By MHHEBI Levels



MHHEBI—Median household effective buying income. Source: S&P Global Ratings.
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Chart 15

Sewer Rates By MHHEBI Levels

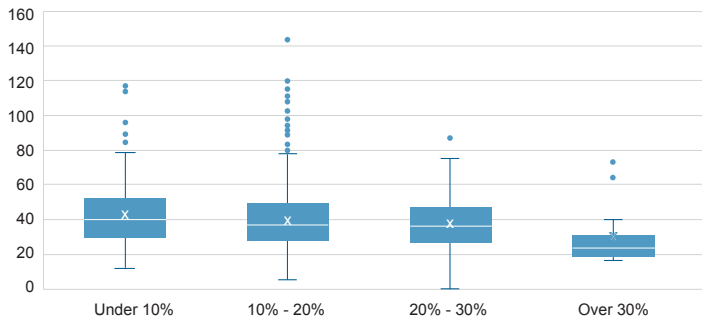


MHHEBI—Median household effective buying income. Source: S&P Global Ratings. Copyright © 2018 by Standard & Poor's Financial Services LLC. All rights reserved.

Looking at the data, it appears that higher poverty rates and lower income levels correlate with lower water and sewer bills. In short, ability to pay is a consideration in the rate-setting process. Both income and poverty rates appear to have a more substantial impact on sewer than water bills, possibly because one of the greatest factors in sewer capital plans is regulatory requirements, and there is regulatory sensitivity to affordability concerns. In contrast, water system costs are more the result of local water supply factors than regulatory requirements. It should be noted that the sample of rated utilities with poverty rates over 30% is substantially smaller than the other groups, as these communities likely seek to finance capital investments from other sources before issuing debt in the public market.

Chart 16

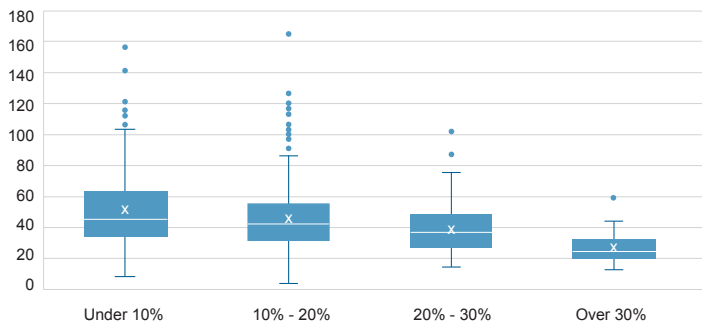
Water Rates By County Poverty Rate



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Chart 17

Sewer Rates By Poverty Rate



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Geography Isn't Everything

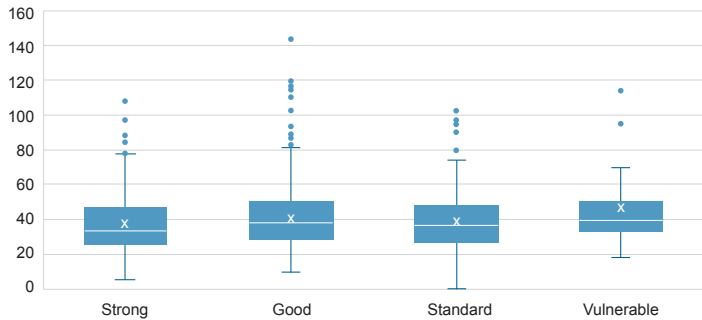
There are a number of other contributors to system costs and rates, which are less easily quantified and not included in our analysis of creditworthiness. They include, among other factors, the type of technology used for processing and treatment (which affects energy, chemicals, and personnel costs); the average age of infrastructure and its condition; payments in lieu of taxes and other payment to or receipts from local governments; state and local regulatory requirements that may exceed federal standards; and economies of scale from using wholesale providers or combining administration of water, sewer, stormwater, and other utility billing and administration. Additionally, in states where a PUC regulates the rates of publicly owned water and sewer systems, this can affect both the size and timing of rate changes.

One factor that we are able to review with our data set is whether the strength of rate-setting practices affects the rates charged to customers. The strength of rate-setting practices is part of our assessment of a system's operational management. The score reflects whether a utility does an annual check for revenue sufficiency,

how proactive a utility is in setting rates to meet future revenue needs, whether an authority adopts multiyear rate increases or includes an annual adjustment for inflation, legal restrictions such as PUC oversight or control, and compliance with rate covenants and other financial requirements. There does not appear to be a substantial difference in rates depending on the strength of the rate-setting process. As with the percentage of utilities with county poverty rates over 30% above, the proportion of utilities with rate-setting assessments of "vulnerable" is substantially smaller than the rest of the sample.

Chart 18

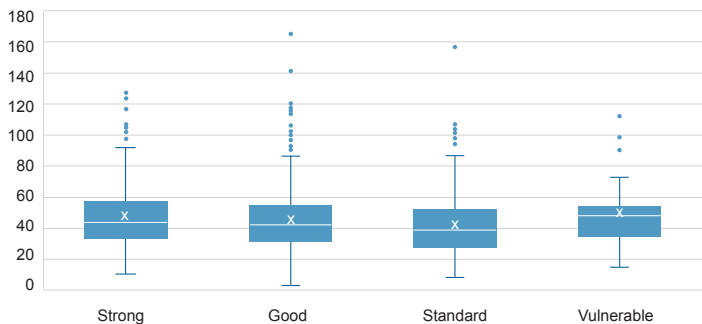
Water Rates By Rate-Setting Practices



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Chart 19

Sewer Rates By Rate-Setting Practices

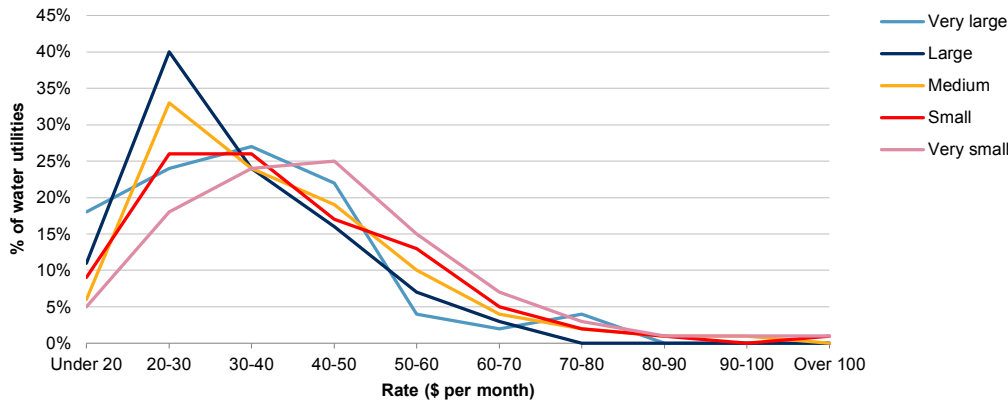


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Another factor we considered was utility size. There are a number of advantages to operating a large utility: They are often located in areas with high population density, so there are more ratepayers per mile of pipe, and more customers in total to help pay for system costs. According the 2018 AWWA survey, half of respondents from very large utilities expressed confidence that they would be "very able" to cover the full cost of providing service, in contrast to 27% and 29% of respondents from small and midsize utilities, respectively. The majority of utilities tracked by S&P Global Ratings fall into our "small" and "very small" categories (between \$5 million and \$25 million in annual operating revenues, and less than \$5 million, respectively). While the bulk of utilities in the "small" to "very large" categories charge rates still below \$40 per month, the highest rates in the sample get bigger as the systems get smaller: The highest rate in a very large system is less than \$80, but by the time you get to a midsize system, it is nearly \$110. Also, the distribution in very small systems appears skewed higher, with nearly half of very small systems setting monthly rates over \$50 as opposed to one-third of larger systems. In addition to having a smaller number of customers to absorb operating and fixed costs, smaller systems also tend to have more regulatory infractions, which can lead to fines and unanticipated capital expenses. (For more information about the effects of utility size, see "[U.S. Municipal Utilities Sector 2018 Outlook: Being Bigger Has Its Advantages](#)," published Jan. 18, 2018.)

Chart 20 | [Download Chart Data](#)

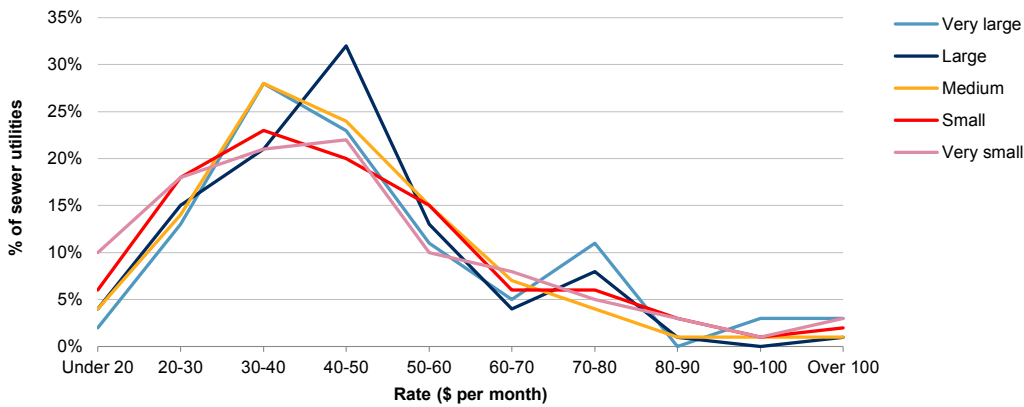
Water Rates By Utility Size



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Sewer Rates By Utility Size



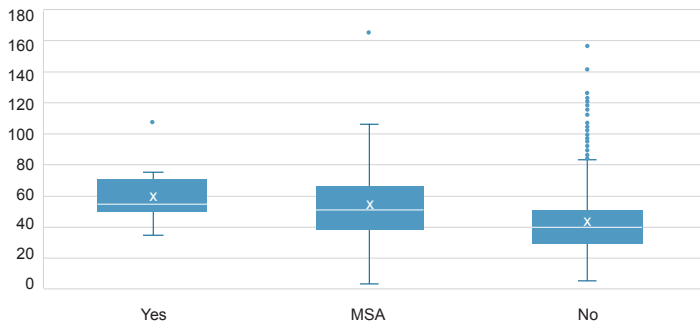
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There does not appear to be such a clear trend in sewer systems, potentially due to the importance of regulation in determining sewer system capital plans.

Some states or municipalities have their own environmental and health requirements above and beyond federal standards, such as Florida's restrictions on ocean outflows or local fluoride requirements. State-level differences would be captured in the regional analysis above. However, one of the major sources of costs for sewer utilities in recent decades has been federal EPA consent decrees for sanitary sewer and combined sewer overflows. Plans to address overflows often take decades and many millions of dollars of capital work to address, including such activities as separating combined sewer systems, expanding wet weather capacity at treatment plants and in conveyance systems, and reducing inflow and infiltration throughout the system. As can be seen, the rates at utilities under a consent decree are substantially higher than those that are not.

Chart 22

Sewer Rates By Consent Decree



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We have also included a third category: utilities in the same metropolitan area as a utility under a consent decree. The effect of a consent decree on these systems can be either direct or indirect. Systems can be affected directly as wholesale customers of the system under a consent order. For example, the **Allegheny County Sanitary Authority** (ALCOSAN) serves 83 municipalities in the Pittsburgh area, and the majority of these systems only do collection and conveyance to ALCOSAN.

As ALCOSAN has worked through implementing its Wet Weather Plan, it has adopted significant annual increases in the rates that its wholesale customers pay; these utilities then had to pass their rising costs on to ratepayers. Many of the municipalities have also had to do additional work to reduce inflow and infiltration within their service areas. In other areas, the effects may be more indirect, as rising rates at the utility under consent order may make rate increases more politically palatable for neighboring communities. While there will not always be such regional impacts, rates at utilities near one under consent order are also notably higher than those elsewhere. Given that consent decrees appear to lead to rate increases, it is important to note that the EPA does consider the affordability of system improvements. Those utilities (such as ALCOSAN) that have demonstrated affordability concerns have been able to work with the EPA to modify capital plans to reduce affordability stress, including prioritizing capital investments and extending the amount of time to implement capital plans.

Nationwide, Rates Are Rising

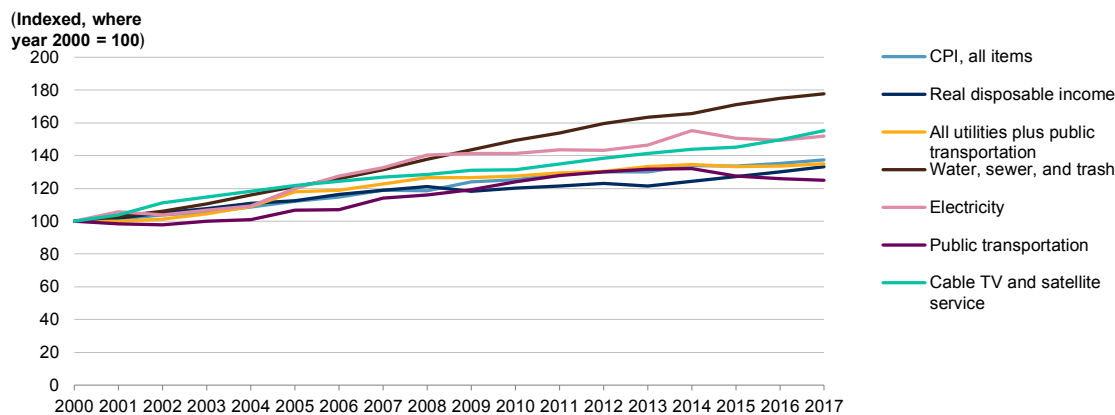
The AWWA each year since 2004 surveys its membership as part of its annual "State of the Water Industry" report. In the most recent report (May 2018), AWWA captures the continued trend of greater efficiency (generally measured in the industry as declining per capita per day consumption) keeping total water sales flat if not slightly declining as fixed costs for replacements and renewals (regardless of whether discretionary or via unfunded mandates) increase. Simply put, greater revenue requirements and fixed costs are being spread over flat-to-declining sales. Simple numerator-denominator relationships do not favor rates, which remain pretty much the only source of operating revenues for utilities and the ability to pay for capital improvements. The AWWA survey's top two concerns among respondents are replacing aging infrastructure and the ability to finance those replacements.

Adding to the mix is that during the last major phase of large investments in the 1970s and 1980s, the federal level of participation was slightly larger, even as its total contribution to water and sewer infrastructure has remained relatively small overall ("Four Trends in Government Spending on Water and Wastewater Utilities since 1956," Shadi Eskaf, U.S. EPA's Region 4 Environmental Finance Center at University of North Carolina, Chapel Hill. Sept. 9, 2015). Most of the costs of most the infrastructure in the U.S., especially for water and surface transportation, has been borne by state and local governments (SLG). We have previously commented that even if an infrastructure incentive package is approved by Congress and the president, the SLG percentage of the total is unlikely to change appreciably.

While water and sewer provision in the developed world remains incredibly efficient and still with actual costs generally lower than premium TV or smart cellphones, the rate of growth year to year has generally outstripped those services and even outstripped both inflation and real incomes (see chart below). S&P Global Ratings anticipates this trend will continue unabated unless and until a different scheme for paying the costs of an extraordinarily capital-intensive industry has been established and proven.

Chart 23 | [Download Chart Data](#)

Selected Inflation Rates, 2000 To 2017



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The Effects Of Consumption On Average Bills

While this article has focused mostly on rates for 6,000 gallons, the actual average bill for households is strongly affected by the rate structure and average consumption levels. Where utility management is able to provide average consumption, we often consider that figure in place of the 6,000-gallon baseline so that our assessment of affordability more closely reflects an actual household bill. For example, in Pennsylvania, many issuers report average household consumption of 4,000 gallons per month (and some are even lower). However, this does not always affect affordability, as many Pennsylvania issuers charge a flat monthly rate, since encouraging conservation is far less of a concern than having predictable levels of revenue given local consumption patterns and water supply. In contrast, utilities in the West often report average consumption of 10,000 gallons or more, given significant irrigation in a dry climate. Rate structures that base sewer bills on winter water consumption attempt to avoid charging for wastewater treatment where water is being used for lawns, not toilets. Additionally, while the rates discussed above have assumed a non-conservation scenario, water rates during drought and other conservation periods can be substantially higher. Some of the utilities we rate charge an additional \$5 per thousand gallons or more during drought periods. These conservation rates are meant to serve as a short-term demand management tool. We would only expect customers to maintain usage levels and pay substantially higher bills for a prolonged period in areas with very low price sensitivity.

In recent years, increases in water and sewer rates have been tempered by increases in conservation. Managers at the utilities we work with have reported declining per capita consumption and flat water demand even as their customer bases have grown. S&P Global Ratings has reflected that within its approach to assessing rates: Its default assumption used to be 8,000 gallons of monthly usage, but it is now 6,000 gallons. However, many of the greatest conservation gains associated with the transition to low-flow appliances have been realized, and we increasingly hear from management that the decline in per-household usage is tapering. Additionally, with national trends of lower consumption and a higher share of fixed costs, many utilities are starting to generate more revenues from fixed charges, as

opposed to volume-based revenues. Whereas in the past, increases in volumetric rates were offset by lower use, further increases will have more of an effect when consumption doesn't change or when rate structures draw more revenue from fixed charges.

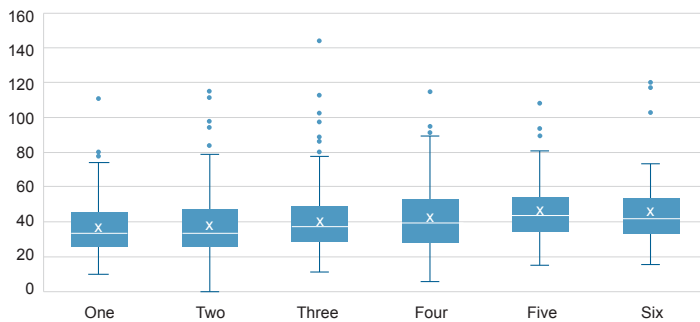
What Lies Ahead For Water And Sewer Rates?

We do not anticipate that the rise in water and sewer rates will slow anytime soon. The tragedy of Flint, Mich., and periodic other high-profile infrastructure crises may create a fever pitch for elected officials and decision-makers to re-think priorities, but local and state budgets are already competing against other infrastructure needs that sometimes also affect rates, such as resilience, climate change, and emerging risks such as cybersecurity. The effect of rising rates on households has been somewhat mitigated over the past decade as water consumption rates have declined across the country and consumers become more savvy about water conservation and efficiency. However, many utilities report that the consumption curve has started to level off, as many of the easy fixes of low-flow plumbing have already been implemented. Shifts to increase the fixed portion of the bill to meet fixed utility costs and fewer easy ways to reduce water bills mean that future rate increases will affect households more directly. Changes will be most difficult in small and rural communities that lack economies of scale and have large amounts of infrastructure relative to the population.

There have been a number of policy proposals in recent years focused on spurring greater infrastructure investment, including in water and sewer systems. However, it appears that few of these will address concerns about rising system costs and affordability. Most of the policy proposals have focused on expanding federal state revolving funds, the Water Infrastructure Finance and Innovation Act, and other sources of debt, while some focus on increasing private participation in public utilities. However, based on our sample, we can see that higher levels of debt correlate with higher rates. In time, declining public funding and additional debt financing for capital needs will push more system costs onto ratepayers.

Chart 24

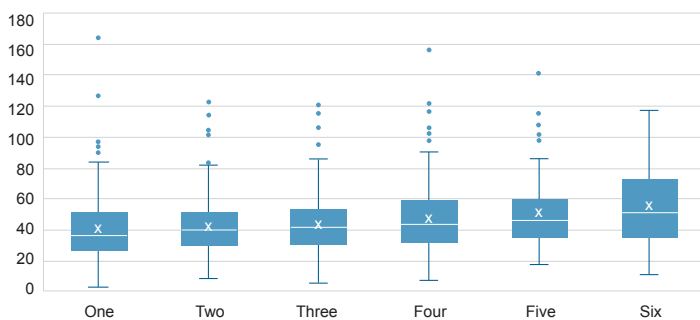
Water Rates By Debt Score



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Chart 25

Sewer Rates By Debt Score



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The federal EPA has already demonstrated its willingness to work with utilities to allocate more time than was originally proposed to meet overflow concerns while reducing rate shock. Last year, a bill was introduced in the U.S. House of Representatives to create a program to provide grants to municipalities and public water and sewer utilities affected by federal consent decrees so they can provide assistance to low-income households. Some in the EPA as well as local utilities nationwide have pushed for an update to the definition of "affordability" to look at the effects of rates on low- and fixed-income populations, as opposed to the current approach, which focuses on a single metric. AWWA also reports increased interest in affordability programs, and some utilities are already implementing alternative payment plans, base rates, and other forms of financial assistance.

We at S&P Global Ratings will continue to monitor this negotiation between rising costs and affordability concerns to see if management teams continue to obtain the revenue increases as needed to maintain financial strength and keep the water and sewer sector one of the most highly rated in public finance.

This report does not constitute a rating action.

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