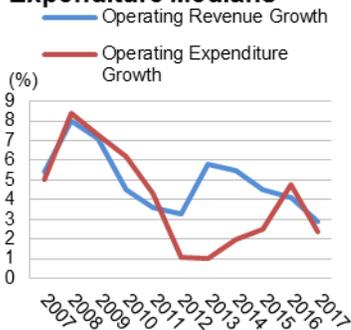


2017 Water and Sewer Medians

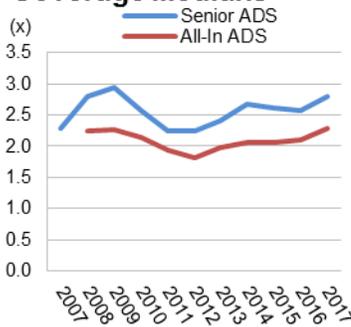
Special Report

Revenue and Expenditure Medians



Source: Fitch.

Debt Service Coverage Medians



Source: Fitch.

Related Research

2017 Outlook: Water and Sewer Sector (December 2016)

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Sector Strength Continues

This edition of 2017 water and sewer medians continues Fitch Ratings' effort to provide transparency to market participants by giving a clear understanding of certain statistical ratios used in its review of sector revenue bond credits and quantitative results, particularly as they pertain to retail systems. The medians continue to highlight the sector's overall financial strength despite ongoing capital and debt pressures.

Key Findings

National Medians

Revenues Still Slowing: Annual revenue growth — modest for the 2017 median year at under 3% — continued its downward trend of the past five years on flat water sales and only marginal increases in sewer flows. Revenue gains came from a mix of modest rate adjustments and limited organic customer additions.

Expenses in Check: Annual operating expenses, which had been on an upward trajectory in the past several years, dropped from the prior year and were below revenue gains for the period. While up slightly, debt carrying costs remained in check as well and equaled 21% of gross revenues, the same as last year.

Slight Increase in Existing Strong Coverage: The modest difference in revenues exceeding operating expenses translated into a slight improvement in debt service coverage (DSC), which remained strong on both a senior lien and all-in basis (2.8x and 2.3x, respectively).

Improved Net Margins: Surplus cash flows strengthened and fully covered annual depreciation expense (that is, annual renewal and replacement needs), only the second time since the 2010 medians this has occurred. Maintenance of such surplus revenues allows utilities the capacity to maintain depreciating assets on a pay-as-you-go basis without having to borrow for rehabilitation efforts (that is, a steady state).

Liquidity Down but Remains Robust: Key liquidity metrics were down from highs experienced with the 2016 medians but remained extremely strong and at their second-highest levels over the past 10 years.

Capital Spending Up but More Needed: Capital investment rebounded somewhat from spending lows of the 2016 medians but was insufficient relative to the amount of deferred maintenance. Consequently, the overall state of water and sewer facilities continued to age. At 15 years, this measure is now the oldest of any median result. Moderate increases in planned capital spending are expected for the 2018 medians and beyond, which should help incrementally extend the sector's infrastructure life cycle.

Improved Debt Profile: Key debt ratios dropped 6% for the year in the face of limited new money borrowings. Over the next five years, additional new money debt is expected to be modest, which will limit the growth in system debt levels to 0%–3% annually.

Analysts (continued)

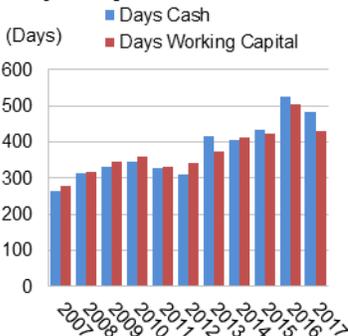
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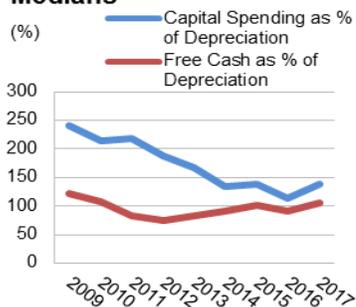
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Liquidity Medians



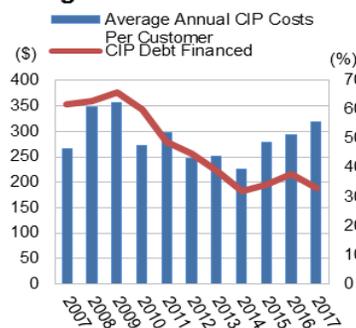
Source: Fitch.

Cost Recovery and Capital Spending Medians



Source: Fitch.

Capital Improvement Program Medians



Source: Fitch.

Related Criteria

[Revenue-Supported Rating Criteria \(June 2014\)](#)
[U.S. Water and Sewer Revenue Bond Rating Criteria \(November 2016\)](#)

Regional Medians

Far West: The Far West's financial performance continued to be among the strongest of all the regions, posting DSC, liquidity and cash flows that were in excess of or near the national levels, despite the challenges associated with the severe drought in California. The regional debt burden improved from last year's numbers and was the lowest of all regions, although future planned issuances over the next five years are expected to result in a return to above-average leverage relative to other regions.

Midwest: Financial results overall declined somewhat as additional debt was absorbed on the balance sheet and the resulting increase in debt carrying costs narrowed DSC and free cash flows. Positively, the borrowings allowed utilities to ramp up capital spending to almost 3.0x that of the national median. In turn, this spending helped to bring the age of facilities, which historically have been much higher than the rest of the U.S., down somewhat.

Northeast: Financial results in the Northeast saw the biggest gains of any region as rate adjustments outpaced costs by a wide margin. High leverage amounts in the Northeast traditionally have translated into relatively modest financial margins overall. Leverage remains high overall, but the latest medians showed signs of leverage holding relatively steady to declining.

Southeast: Southeast financial results were among the highest of the regions, consistent with prior results. In addition, debt levels in the Southeast remained favorable relative to the other systems nationwide. Also similar to prior medians, the only significant negative for the region relates to cost of service, which is among the highest of all the regions and near Fitch's affordability benchmark. However, there do not appear to be any significant concerns relating to costs given modest future planned rate hikes, manageable capital spending and relatively robust cash flows compared with nationwide statistics, providing sufficient operating flexibility.

Southwest: Financial results for the region were essentially flat from the prior year. Fiscal results for the region traditionally have been in the midrange for all the regions but slipped slightly this year based on the strong results in the Northeast. Debt metrics also remained relatively flat for the year and are expected to remain favorable verses other regions over the next five years due in part to continued strong principal amortization of debt.

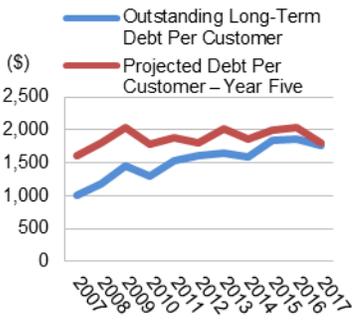
Medians Relative to System Size

Large Systems: Large systems (defined as utilities serving 500,000 or more persons) in general continued to have the greatest amount of debt and produce the lowest financial margins. Facilities remain among the oldest in the nation, but significant spending to date has improved asset life. Planned capital spending continues to climb, although this is not expected to significantly pressure existing debt or financial metrics over the next five years.

Midsized Systems: Midsized systems (defined as utilities serving between 100,000 and 499,999 persons) continued to generate stronger financial performance on balance than other utilities, while having the lowest debt burdens. Debt and financial metrics were essentially flat from the 2016 medians and are expected to remain relatively stable over the next five years.

Small Systems: Small systems (defined as utilities serving fewer than 100,000 persons) continued to produce financial and debt metrics in the midrange relative to other utilities. Like midsized systems, debt and financial results were very similar to those in the 2016 medians. Moreover, limited changes are expected in fiscal results over the next few years, although debt levels are expected to drop over the next five years based on the least amount of capital spending and debt financing relative to other utilities.

Debt Medians



Source: Fitch.

Limitations of Medians Analysis in the Rating Process

While the medians serve as a useful tool for market participants by allowing for broad assessments and comparisons of credit quality, Fitch maintains that the data complement the rating process rather than act as a substitute. Thus, when evaluating the medians in relation to the rating process, certain distinctions between them should be noted, as follows:

Point in Time: Medians largely provide a point-in-time snapshot of the rating category, region, class size or sector as a whole, whereas the rating process focuses more on trends at the issuer and specific rating level.

Exclusion of Rating Factors: Only a portion of the factors covered in Fitch’s rating process is reflected in the medians — in particular, qualitative aspects such as management, policies and legal provisions are excluded, although other quantitative ratios are also omitted.

Individual Credit Characteristics Excluded: The medians present a composite of the range of credits and do not delineate offsetting strengths or weaknesses at the individual credit level that may affect a rating.

Methodology and Data

Fitch first published its water and sewer medians in 2004 to provide issuers, consultants, analysts, investors and others with a quantitative framework of ratios used in Fitch’s water and sewer rating process. To this end, Fitch historically has grouped the medians according to their respective area within the criteria review process, and the 2017 medians continue this practice.

This report also continues Fitch’s presentation of key ratios used in the rating process to give the market a better understanding of the priority in weighting certain ratios. To allow a comparison with prior statistics, Fitch also has included historical information from the 2008–2016 medians (see Appendix D, page 9). Fitch expects to add subsequent information annually to Appendix D as ensuing medians are published to allow readers to follow long-term trends.

As with Fitch’s prior medians, those for 2017 cover either wholly or predominantly retail systems for which Fitch has taken rating actions on senior lien debt or debt that effectively acts as senior lien obligations. The data include water and sewer revenue bond credits rated between September 2015 and August 2016. Certain credits have been excluded for various reasons, as outlined below. In cases where the same issuer was rated multiple times over the median selection period, only data from the most recent rating were incorporated into the medians.

In the 2017 medians, combined water and sewer utilities accounted for 66 credits (57% of the total), individual water systems numbered 29 (25%) and individual sewer systems were 21 (18%). Certain credits with ratings of ‘BBB+’ or below were excluded for median-reporting purposes from the 2017 data set because Fitch traditionally has viewed these issuers as outliers with extenuating circumstances. Also excluded were issuers for which the majority of system revenues were derived from other utility (such as electric power) revenues. In both cases, the data have a tendency to skew median results.

Appendix A: Water and Sewer Median Definitions

Median	Definition	Significance
Population	Estimated population of the service area.	Provides an overview of the scope of operations in the service area.
MHI (\$)	Median household income for the primary municipal entity served by the utility based on the most recent year as reported by the U.S. Census Bureau.	Indicates the overall wealth of average residential customers and their ability to pay for services.
Total Water Customers	Most recent water customer accounts total, if applicable.	Provides an overview of the scope of operations in the service area.
Water Customer Annual Growth (%)	Percentage of historical average annual customer accounts growth rates over the prior five-year period.	Indicates the pressures a utility may be facing to meet customer demands.
Total Sewer Customers	Most recent sewer customer accounts total, if applicable.	Provides an overview of the scope of operations in the service area.
Sewer Customer Annual Growth (%)	Percentage of historical average annual customer accounts growth rates over the prior five-year period.	Indicates the pressures a utility may be facing to meet customer demands.
Top 10 Customers as % of Revenues	Total annual receipts from the 10 largest customers divided by total operating system revenues for the year.	Indicates revenue concentration levels.
Age of Plant (Years)	Total accumulated depreciation divided by annual depreciation.	Indicates age of facilities and potential deferred plant maintenance.
Water Treatment Capacity Remaining (%)	Percentage of average permitted treatment capacity remaining above most recent production level.	Indicates the pressures a utility may be facing to meet customer demands.
Sewer Treatment Capacity Remaining (%)	Percentage of average permitted treatment capacity remaining above most recent production level.	Indicates the pressures a utility may be facing to meet customer demands.
Average Annual CIP Costs per Customer (\$)	Total projected capital needs in the CIP divided by the number of years of the CIP, divided by total number of customers (for a combined utility, the aggregate number of water and sewer accounts is used).	Indicates effect of the CIP on ratepayers (principal only).
CIP Debt Financed (%)	Percentage of issuer's total CIP expected to be debt financed.	Indicates future debt leverage of capital assets.
Total Outstanding Debt to Net Plant Assets (%)	Total amount of utility long-term debt divided by the net asset value of the plant.	Indicates existing debt leverage of capital assets.
Debt to FADS (x)	Total amount of utility long-term debt divided by the total funds available for debt service.	Indicates existing debt leverage relative to existing funds available for debt service.
Debt to Equity (x)	Total amount of utility long-term debt divided by unrestricted net assets.	Indicates existing debt leverage relative to system equity.
Total Outstanding Long-Term Debt Per Customer (\$) ^a	Total amount of utility long-term debt divided by the total number of utility customers (for a combined utility, the aggregate number of water and sewer accounts are used).	Indicates the existing debt burden attributable to ratepayers (principal only).
Total Outstanding Long-Term Debt Per Capita (\$) ^a	Total amount of utility long-term debt divided by total population served by the utility.	Indicates the existing debt burden of a utility attributable to each person served by the utility (principal only).
Ten-Year Principal Payout (%)	Percentage of principal amortizing within 10 years.	Indicates longevity of system debt.
Twenty-Year Principal Payout (%)	Percentage of principal amortizing within 20 years.	Indicates longevity of system debt.
Projected Debt Per Customer – Year Five (\$) ^a	Total projected outstanding system debt (existing debt less scheduled amortization plus planned issuances) divided by total outstanding projected customers five years from the date of the rating (for a combined utility, the aggregate number of water and sewer accounts is used and is inflated by anticipated growth).	Indicates the total debt burden to ratepayers five years from the date of the rating (principal only).
Projected Debt Per Capita – Year Five (\$) ^a	Total projected outstanding system debt (existing debt less scheduled amortization plus planned issuances) divided by total projected population served by the utility (population is inflated based on anticipated growth).	Indicates the total debt burden of a utility to each person served by the utility five years from the date of the rating (principal only).
Individual Water/Sewer Utility Average Monthly Residential Bill (\$)	Average monthly residential bill for individual utilities; when billing was not calculated on a monthly basis, it was converted to a monthly amount for standardization.	Indicates the monthly cost of service to residential customers.
Individual Water/Sewer Utility Average Annual Bill as % of MHI	Average monthly residential bill for individual utilities times 12, divided by the most recent yearly MHI as reported by the U.S. Census Bureau.	Indicates the annual burden for cost of service to ratepayers.
Combined Water/Sewer Utility Average Monthly Residential Bill (\$)	Average monthly residential bill for combined utilities; when billing was not calculated on a monthly basis, it was converted to a monthly amount for standardization.	Indicates the monthly cost of service to residential customers.
Combined Water/Sewer Utility Average Annual Bill as % of MHI	Average monthly residential bill for combined utilities times 12, divided by the most recent yearly MHI as reported by the U.S. Census Bureau.	Indicates the annual burden for cost of service to ratepayers.

^aIndicates key ratio. MHI – Median household income. CIP – Capital improvement program. FADS – Funds available for debt service.

Appendix A: Water and Sewer Median Definitions (continued)

Median	Definition	Significance
Average Annual Projected Water Rate Increases (%)	Sum of planned annual rate increases divided by the number of years over which increases are forecast.	Indicates the future expected burden for cost of service to ratepayers.
Average Annual Projected Sewer Rate Increases (%)	Sum of planned annual rate increases divided by the number of years over which increases are forecast.	Indicates the future expected burden for cost of service to ratepayers.
Three-Year Historical Average Senior Lien ADS Coverage (x) ^a	Most recent three-year historical average of annual revenues available for debt service divided by respective senior lien debt service for the year.	Indicates the historical trend in senior lien ADS coverage.
Senior Lien ADS Coverage (x) ^a	Current-year revenues available for debt service divided by current-year senior lien debt service.	Indicates the financial margin to meet current senior lien ADS with current revenues available for debt service.
Senior Lien ADS Coverage Excluding Connection Fees (x)	Current-year revenues available for debt service, excluding one-time revenues such as connection fees, divided by current-year senior lien debt service.	Indicates the financial margin to meet current senior lien ADS with current revenues available for debt service, excluding one-time revenues such as connection fees.
Senior Lien ADS Coverage Net of Transfers Out (x)	Current-year revenues available for debt service, excluding operating transfers out, divided by current-year senior lien debt service.	Indicates the financial margin to meet current senior lien ADS with current revenues available for debt service, excluding transfers out.
Minimum Projected Senior Lien ADS Coverage (x) ^a	Minimum debt service coverage projected typically over the ensuing five-year period, based on revenues available for debt service in any given fiscal year, divided by the respective senior lien debt service amount for that fiscal year.	Indicates the financial margin during the year in which future senior lien ADS coverage is projected to be the lowest.
Senior Lien MADS Coverage (x)	Current-year revenues available for debt service divided by projected senior lien MADS.	Indicates the financial margin to meet projected senior lien MADS with current revenues available for debt service.
Senior Lien Debt Service as % of Gross Revenues	Current-year senior lien debt service divided by current-year gross revenues.	Indicates the level of annual senior lien debt service burden on system operations.
Three-Year Historical Average All-In ADS Coverage (x) ^a	Most recent three-year historical average of annual revenues available for debt service divided by respective total debt service for the year.	Indicates the historical trend in total ADS coverage.
All-In ADS Coverage (x) ^a	Current-year revenues available for debt service divided by current-year total debt service.	Indicates the financial margin to meet current total ADS with current revenues available for debt service.
All-In ADS Coverage Excluding Connection Fees (x)	Current-year revenues available for debt service, excluding one-time revenues such as connection fees, divided by current-year total debt service.	Indicates the financial margin to meet current total ADS with current revenues available for debt service, excluding one-time revenues such as connection fees.
All-In ADS Coverage Net of Transfers Out (x)	Current-year revenues available for debt service, excluding operating transfers out, divided by current-year total debt service.	Indicates the financial margin to meet current total ADS with current revenues available for debt service, excluding transfers out.
Minimum Projected All-In ADS Coverage (x) ^a	Minimum debt service coverage projected typically over the ensuing five-year period, based on revenues available for debt service in any given fiscal year, divided by the respective total debt service amount for that fiscal year.	Indicates the financial margin during the year in which future total ADS coverage is projected to be the lowest.
All-In MADS Coverage (x)	Current-year revenues available for debt service divided by projected total MADS.	Indicates the financial margin to meet projected total MADS with current revenues available for debt service.
All-In Debt Service as % of Gross Revenues	Current-year total debt service divided by current-year gross revenues.	Indicates the level of annual total debt service burden on system operations.
Operating Margin (%)	Operating revenues minus operating expenditures plus depreciation, divided by operating revenues.	Indicates financial margin to pay operating expenses.
Operating Cash Flow Ratio (x)	Cash flows from current operations divided by current liabilities.	Indicates the strength of existing cash flows to meet near-term obligations.
Operating Revenue Growth – Current Year (%)	Most recent audited operating revenues divided by the immediately prior year operating revenues minus one.	Indicates revenue gains.
Operating Revenue Growth – Three-Year Average (%)	Average of operating revenues divided by the immediately prior year operating revenues minus one for the three most recent audited fiscal years.	Indicates revenue gains.
Operating Expenditure Growth – Current Year (%)	Most recent audited operating expenses divided by the immediately prior year operating expenses minus one.	Indicates expenditure pressures.

^aIndicates key ratio. ADS – Annual debt service. MADS – Maximum annual debt service.

Appendix A: Water and Sewer Median Definitions (continued)

Median	Definition	Significance
Operating Expenditure Growth – Three-Year Average (%)	Average of operating expenses divided by the immediately prior year operating expenses minus one for the three most recent audited fiscal years.	Indicates expenditure pressures.
Days of Operating Revenues in Accounts Receivable	Current unrestricted accounts receivable divided by operating revenues, divided by 365.	Indicates rate at which customer revenues are received.
Days Cash on Hand ^a	Current unrestricted cash and investments plus any restricted cash and investments (if available for general system purposes), divided by operating expenditures minus depreciation, divided by 365.	Indicates financial flexibility to pay near-term obligations.
Days of Working Capital ^a	Current unrestricted assets plus any restricted cash and investments (if available for general system purposes), minus current liabilities payable from unrestricted assets, divided by operating expenditures minus depreciation, divided by 365.	Indicates financial flexibility to pay near-term obligations.
Quick Ratio	Current cash plus current receivables divided by current liabilities.	Indicates financial flexibility to pay near-term obligations.
Current Ratio	Current assets divided by current liabilities.	Indicates financial flexibility to pay near-term obligations.
Free Cash as % of Depreciation ^a	Current surplus revenues after payment of operating expenses, debt service and operating transfers out divided by current-year depreciation.	Indicates annual financial capacity to maintain facilities at current level of service from existing cash flows.
Capital Spending as % of Depreciation	Current-year additions to property, plant and equipment divided by current-year depreciation.	Indicates annual improvements made to system facilities relative to level of annual depreciation to effectively determine if facilities are being maintained.

^aIndicates key ratio.

Appendix B: 2017 Regional Medians

	Far West	Midwest	Northeast	Southeast	Southwest	All Credits
Community Characteristics/Customer Growth and Concentration						
Population	156,984	939,020	561,308	163,269	252,944	188,100
MHI (\$)	60,826	43,197	52,737	47,769	56,654	52,585
Total Water Customers	29,637	405,604	142,872	56,606	80,401	51,168
Annual Growth (%)	0.3	1.2	0.9	0.9	1.2	0.9
Total Sewer Customers	44,482	147,208	47,723	53,718	76,492	56,711
Annual Growth (%)	0.5	(3.3)	0.2	1.0	1.1	0.9
Top 10 Customers as % of Revenues	10	15	10	7	6	8
Capacity						
Age of Plant (Years)	15	22	14	15	15	15
Water Treatment Capacity Remaining (%)	55	59	16	52	61	55
Sewer Treatment Capacity Remaining (%)	42	57	30	43	37	38
Capital Demands and Debt Policies						
Average Annual CIP Costs Per Customer (\$)	378	642	348	278	321	318
CIP Debt Financed (%)	28	65	45	28	53	33
Total Outstanding Debt to Net Plant Assets (%)	41	75	63	48	37	45
Debt to FADS (x)	5.8	10.5	8.9	5.2	5.5	5.5
Debt to Equity (x)	2.8	(19.4)	4.6	2.8	2.4	2.8
Total Outstanding Long-Term Debt Per Customer (\$) ^a	1,547	3,251	3,287	1,652	1,631	1,756
Total Outstanding Long-Term Debt Per Capita (\$) ^a	458	1,014	680	385	515	487
Ten-Year Principal Payout (%)	41	35	36	43	52	44
Twenty-Year Principal Payout (%)	83	86	74	86	97	86
Projected Debt Per Customer – Year Five (\$) ^a	1,897	5,659	4,068	1,713	1,753	1,802
Projected Debt Per Capita – Year Five (\$) ^a	505	913	827	480	556	558
Charges and Rate Affordability						
Individual Water/Sewer Utility Average Monthly Residential Bill (\$)	42	39	34	46	36	41
Individual Water/Sewer Utility Average Annual Bill as % of MHI	0.8	1.1	0.9	0.8	0.8	0.8
Combined Water/Sewer Utility Average Monthly Residential Bill (\$)	74	N.A.	79	82	58	66
Combined Water/Sewer Utility Average Annual Bill as % of MHI	1.6	N.A.	1.7	1.9	1.1	1.7
Average Annual Projected Water Rate Increases (%)	5.3	5.6	2.7	2.5	3.8	3.5
Average Annual Projected Sewer Rate Increases (%)	2.6	10.8	2.9	2.5	4.4	3.0
Coverage and Financial Performance/Cash and Balance Sheet Considerations						
Three-Year Historical Average Senior Lien ADS Coverage (x) ^a	3.0	5.7	3.5	2.7	3.3	3.0
Senior Lien ADS Coverage (x) ^a	3.2	5.4	3.8	2.6	3.1	2.8
Senior Lien ADS Coverage Excluding Connection Fees (x)	2.8	5.4	3.8	2.4	2.6	2.6
Senior Lien ADS Coverage Net of Transfers Out (x)	3.1	4.6	3.5	2.4	2.6	2.6
Minimum Projected Senior Lien ADS Coverage (x) ^a	2.3	3.2	3.1	2.2	2.6	2.4
Senior Lien MADS Coverage (x)	2.6	N.A.	N.A.	5.2	2.2	2.5
Senior Lien Debt Service as % of Gross Revenues	11	13	14	18	17	16
Three-Year Historical Average All-In ADS Coverage (x) ^a	2.4	1.5	2.0	2.2	2.0	2.2
All-In ADS Coverage (x) ^a	2.5	1.5	2.0	2.3	1.7	2.3
All-In ADS Coverage Excluding Connection Fees (x)	2.4	1.4	1.9	2.1	1.6	1.9
All-In ADS Coverage Net of Transfers Out (x)	2.3	1.4	1.9	2.2	1.6	2.1
Minimum Projected All-In ADS Coverage (x) ^a	1.7	1.4	1.8	1.7	1.9	1.7
All-In MADS Coverage (x)	2.0	N.A.	1.4	2.5	1.9	1.9
All-In Debt Service as % of Gross Revenues	15	35	22	23	24	21
Operating Margin (%)	31	57	47	43	39	41
Operating Cash Flow Ratio (x)	1.2	0.5	1.6	1.6	1.3	1.4
Operating Revenue Growth – Current Year (%)	(0.6)	2.7	7.2	4.5	3.3	2.9
Operating Revenue Growth – Three-Year Average (%)	4.5	3.4	4.7	4.2	2.6	3.9
Operating Expenditure Growth – Current Year (%)	(0.8)	4.9	3.1	2.9	4.8	2.4
Operating Expenditure Growth – Three-Year Average (%)	3.7	2.0	3.2	2.9	5.2	3.4
Days of Operating Revenues in Accounts Receivable	45	98	43	43	44	45
Days Cash on Hand ^a	474	261	384	636	437	483
Days of Working Capital ^a	417	110	396	627	393	429
Quick Ratio	4.3	0.4	2.0	4.8	3.7	4.1
Current Ratio	4.6	1.3	2.6	5.5	4.2	4.3
Free Cash as % of Depreciation ^a	149	67	162	105	70	105
Capital Spending as % of Depreciation	152	389	269	109	134	138

^aIndicates key ratio. ADS – Annual debt service. CIP – Capital improvement program. FADS – Funds available for debt service. MADS – Maximum annual debt service. MHI – Median household income. N.A. – Not available.

Appendix C: 2017 Medians Relative to System Size

	System Size Classification			All Credits
	Large	Medium	Small	
Community Characteristics/Customer Growth and Concentration				
Population	1,012,957	202,470	41,697	188,100
MHI (\$)	50,938	55,843	49,034	52,585
Total Water Customers	312,908	56,996	12,640	51,168
Annual Growth (%)	1.3	1.2	0.3	0.9
Total Sewer Customers	250,974	59,081	10,800	56,711
Annual Growth (%)	1.0	1.1	0.6	0.9
Top 10 Customers as % of Revenues	7	7	13	8
Capacity				
Age of Plant (Years)	16	15	15	15
Water Treatment Capacity Remaining (%)	58	54	60	55
Sewer Treatment Capacity Remaining (%)	37	36	51	38
Capital Demands and Debt Policies				
Average Annual CIP Costs Per Customer (\$)	357	352	187	318
CIP Debt Financed (%)	56	33	20	33
Total Outstanding Debt to Net Plant Assets (%)	49	38	49	45
Debt to FADS (x)	7.3	5.1	5.2	5.5
Debt to Equity (x)	5.8	2.4	2.6	2.8
Total Outstanding Long-Term Debt Per Customer (\$) ^a	2,622	1,420	1,761	1,756
Total Outstanding Long-Term Debt Per Capita (\$) ^a	586	384	527	487
Ten-Year Principal Payout (%)	40	46	43	44
Twenty-Year Principal Payout (%)	81	87	91	86
Projected Debt Per Customer Capita – Year Five (\$) ^a	2,545	1,557	1,568	1,802
Projected Debt Per Capita – Year Five (\$) ^a	653	510	478	558
Charges and Rate Affordability				
Individual Water/Sewer Utility Average Monthly Residential Bill (\$)	40	41	43	41
Individual Water/Sewer Utility Average Annual Bill as % of MHI	0.8	0.9	0.8	0.8
Combined Water/Sewer Utility Average Monthly Residential Bill (\$)	68	71	64	66
Combined Water/Sewer Utility Average Annual Bill as % of MHI	1.5	1.7	1.7	1.7
Average Annual Projected Water Rate Increases (%)	5.8	4.0	2.4	3.5
Average Annual Projected Sewer Rate Increases (%)	3.0	3.1	2.5	3.0
Coverage and Financial Performance/Cash and Balance Sheet Considerations				
Three-Year Historical Average Senior Lien ADS Coverage (x) ^a	2.8	3.0	3.0	3.0
Senior Lien ADS Coverage (x) ^a	2.7	3.2	2.6	2.8
Senior Lien ADS Coverage Excluding Connection Fees (x)	2.5	2.6	2.4	2.6
Senior Lien ADS Coverage Net of Transfers Out (x)	2.6	2.8	2.5	2.6
Minimum Projected Senior Lien ADS Coverage (x) ^a	2.5	2.4	2.2	2.4
Senior Lien MADS Coverage (x)	2.3	2.5	3.7	2.5
Senior Lien Debt Service as % of Gross Revenues	16	15	17	16
Three-Year Historical Average All-In ADS Coverage (x) ^a	1.9	2.2	2.1	2.2
All-In ADS Coverage (x) ^a	1.9	2.3	2.4	2.3
All-In ADS Coverage Excluding Connection Fees (x)	1.7	2.0	2.2	1.9
All-In ADS Coverage Net of Transfers Out (x)	1.8	2.2	2.2	2.1
Minimum Projected All-In ADS Coverage (x) ^a	1.8	1.7	1.7	1.7
All-In MADS Coverage (x)	1.4	2.0	2.5	1.9
All-In Debt Service as % of Gross Revenues	26	19	21	21
Operating Margin (%)	47	40	40	41
Operating Cash Flow Ratio (x)	1.1	1.6	1.6	1.4
Operating Revenue Growth – Current Year (%)	1.9	4.0	2.4	2.9
Operating Revenue Growth – Three-Year Average (%)	3.7	3.9	3.8	3.9
Operating Expenditure Growth – Current Year (%)	1.8	3.6	1.5	2.4
Operating Expenditure Growth – Three-Year Average (%)	3.8	3.4	2.7	3.4
Days of Operating Revenues in Accounts Receivable	46	46	43	45
Days Cash on Hand ^a	269	591	495	483
Days of Working Capital ^a	257	554	455	429
Quick Ratio	2.2	4.6	4.5	4.1
Current Ratio	2.8	4.9	4.8	4.3
Free Cash as % of Depreciation ^a	89	124	97	105
Capital Spending as % of Depreciation	157	143	94	138

^aIndicates key ratio. ADS – Annual debt service. CIP – Capital improvement program. FADS – Funds available for debt service. MADS – Maximum annual debt service. MHI – Median household income.

Appendix D: Annual Sectorwide Medians

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Community Characteristics/Customer Growth and Concentration										
Population	234,103	162,338	144,162	150,142	153,272	172,778	149,025	190,713	161,967	188,100
MHI (\$)	45,733	45,820	47,179	50,146	50,294	51,518	49,655	50,610	51,683	52,585
Total Water Customers	61,076	50,410	37,264	40,755	39,441	48,169	40,431	47,982	47,643	51,168
Annual Growth (%)	2.4	1.6	1.7	1.4	0.5	0.4	0.6	0.6	0.7	0.9
Total Sewer Customers	64,039	48,000	40,306	48,949	34,984	50,296	35,210	52,802	53,657	56,711
Annual Growth (%)	2.5	1.9	1.5	1.7	0.6	0.8	0.6	0.6	0.9	0.9
Top 10 Customers as % of Revenues	8	8	7	7	8	8	8	7	8	8
Capacity										
Age of Plant (Years)	13	12	13	12	13	13	13	14	14	15
Water Treatment Capacity Remaining (%)	50	50	54	53	58	58	58	58	58	55
Sewer Treatment Capacity Remaining (%)	35	35	38	42	41	47	47	42	42	38
Capital Demands and Debt Policies										
Average Annual CIP Costs Per Customer (\$)	348	356	273	297	248	251	226	278	294	318
CIP Debt Financed (%)	63	66	60	49	45	39	32	34	38	33
Total Outstanding Debt to Net Plant Assets (%)	39	39	43	44	45	47	43	48	46	45
Debt to FADS (x)	—	4.9	5.5	6.4	6.7	6.8	6.1	6.2	5.9	5.5
Debt to Equity (x)	—	—	—	3.2	3.5	3.8	3.3	3.4	3.1	2.8
Total Outstanding Long-Term Debt Per Customer (\$) ^a	1,185	1,454	1,297	1,527	1,611	1,650	1,581	1,836	1,865	1,756
Total Outstanding Long-Term Debt Per Capita (\$) ^a	—	379	375	425	458	460	459	491	521	487
Ten-Year Principal Payout (%)	30	40	39	38	39	38	39	40	42	44
Twenty-Year Principal Payout (%)	70	82	80	79	80	78	80	82	86	86
Projected Debt Per Customer – Year Five (\$) ^a	1,808	2,036	1,774	1,877	1,803	2,024	1,868	1,997	2,035	1,802
Projected Debt Per Capita – Year Five (\$) ^a	—	607	446	531	532	566	519	522	526	558
Charges and Rate Affordability										
Individual Water/Sewer Utility Average Monthly Residential Bill (\$)	29	28	28	35	33	37	36	39	43	41
Individual Water/Sewer Utility Average Annual Bill as % of MHI	0.7	0.8	0.7	0.8	0.7	0.8	0.9	0.8	0.8	0.8
Combined Water/Sewer Utility Average Monthly Residential Bill (\$)	56	56	59	61	61	65	68	69	67	66
Combined Water/Sewer Utility Average Annual Bill as % of MHI	1.4	1.3	1.5	1.4	1.5	1.5	1.6	1.6	1.7	1.7
Average Annual Projected Water Rate Increases (%)	4.4	4.9	5.3	5.0	4.8	4.4	4.0	3.8	3.0	3.5
Average Annual Projected Sewer Rate Increases (%)	5.1	5.9	5.9	5.8	5.1	5.0	3.7	4.7	3.5	3.0
Coverage and Financial Performance/Cash and Balance Sheet Considerations										
Three-Year Historical Average Senior Lien ADS Coverage (x) ^a	2.7	3.0	2.9	2.7	2.5	2.4	2.5	2.6	2.5	3.0
Senior Lien ADS Coverage (x) ^a	2.8	2.9	2.6	2.3	2.2	2.4	2.7	2.6	2.6	2.8
Senior Lien ADS Coverage Excluding Connection Fees (x)	2.3	2.3	2.4	2.1	2.1	2.3	2.5	2.4	2.4	2.6
Senior Lien ADS Coverage Net of Transfers Out (x)	—	—	—	2.1	2.1	2.3	2.4	2.4	2.4	2.6
Minimum Projected Senior Lien ADS Coverage (x) ^a	1.9	1.9	1.9	1.8	1.9	1.8	2.1	2.0	2.1	2.4
Senior Lien MADS Coverage (x)	2.0	2.1	2.4	1.9	2.1	2.0	2.1	2.0	2.0	2.5
Senior Lien Debt Service as % of Gross Revenues	16	15	16	17	17	17	16	16	17	16
Three-Year Historical Average All-In ADS Coverage (x) ^a	—	2.1	2.4	2.3	2.1	2.0	2.0	2.1	2.1	2.2
All-In ADS Coverage (x) ^a	2.2	2.3	2.2	1.9	1.8	2.0	2.1	2.1	2.1	2.3
All-In ADS Coverage Excluding Connection Fees (x)	—	1.8	1.9	1.7	1.7	1.8	1.9	1.9	2.0	1.9
All-In ADS Coverage Net of Transfers Out (x)	—	—	—	1.8	1.7	1.8	1.9	2.0	1.9	2.1
Minimum Projected All-In ADS Coverage (x) ^a	—	1.7	1.6	1.5	1.6	1.5	1.7	1.6	1.7	1.7
All-In MADS Coverage (x)	—	1.8	2.0	1.7	1.6	1.6	1.7	1.8	1.8	1.9
All-In Debt Service as % of Gross Revenues	20	21	18	20	22	21	21	22	21	21
Operating Margin (%)	36	33	32	33	36	39	39	41	40	41
Operating Cash Flow Ratio (x)	—	1.1	1.0	1.0	1.1	1.3	1.3	1.4	1.5	1.4
Operating Revenue Growth – Current Year (%)	8.0	7.1	4.5	3.6	3.3	5.8	5.5	4.5	4.1	2.9
Operating Revenue Growth – Three-Year Average (%)	—	6.5	6.0	5.3	4.3	4.7	5.5	5.7	4.3	3.9
Operating Expenditure Growth – Current Year (%)	8.4	7.3	6.2	4.3	1.1	1.0	2.0	2.5	4.8	2.4
Operating Expenditure Growth – Three-Year Average (%)	—	7.5	7.7	8.1	4.1	2.7	1.9	2.8	3.5	3.4
Days of Operating Revenues in Accounts Receivable	45	47	48	46	47	46	46	45	48	45
Days Cash on Hand ^a	313	331	344	328	310	417	404	432	526	483
Days of Working Capital ^a	316	345	361	331	343	373	414	422	503	429
Quick Ratio	—	2.9	3.3	2.9	2.9	3.1	3.4	3.2	4.2	4.1
Current Ratio	—	3.3	3.8	3.3	3.9	3.8	4.1	3.7	5.0	4.3
Free Cash as % of Depreciation ^a	—	122	107	83	74	82	91	102	91	105
Capital Spending as % of Depreciation	264	240	214	219	187	167	134	139	113	138

^aIndicates key ratio. ADS – Annual debt service. CIP – Capital improvement program. FADS – Funds available for debt service. MADS – Maximum annual debt service. MHI – Median household income.

Appendix E: 2017 Medians Relative to Rating Category

	Rating Category			All Credits
	AAA	AA	A	
Community Characteristics/Customer Growth and Concentration				
Population	330,421	188,100	69,117	188,100
MHI (\$)	63,329	52,584	45,035	52,585
Total Water Customers	90,783	51,844	12,975	51,168
Annual Growth (%)	1.1	0.9	0.1	0.9
Total Sewer Customers	86,744	54,757	20,437	56,711
Annual Growth (%)	1.0	1.0	0.1	0.9
Top 10 Customers as % of Revenues	4	10	10	8
Capacity				
Age of Plant (Years)	16	15	12	15
Water Treatment Capacity Remaining (%)	57	55	58	55
Sewer Treatment Capacity Remaining (%)	43	37	40	38
Capital Demands and Debt Policies				
Average Annual CIP Costs Per Customer (\$)	437	312	208	318
CIP Debt Financed (%)	25	36	38	33
Total Outstanding Debt to Net Plant Assets (%)	20	45	76	45
Debt to FADS (x)	3.1	6.0	9.1	5.5
Debt to Equity (x)	1.3	3.0	6.5	2.8
Total Outstanding Long-Term Debt Per Customer (\$) ^a	863	1,823	2,875	1,756
Total Outstanding Long-Term Debt Per Capita (\$) ^a	251	514	834	487
Ten-Year Principal Payout (%)	54	45	35	44
Twenty-Year Principal Payout (%)	90	86	86	86
Projected Debt Per Customer Year Five (\$) ^a	1,117	1,788	2,593	1,802
Projected Debt Per Capita Year Five (\$) ^a	284	525	844	558
Charges and Rate Affordability				
Individual Water/Sewer Utility Average Monthly Residential Bill (\$)	35	41	43	41
Individual Water/Sewer Utility Average Annual Bill as % MHI	0.5	0.8	1.3	0.8
Combined Water/Sewer Utility Average Monthly Residential Bill (\$)	64	65	97	66
Combined Water/Sewer Utility Average Annual Bill as % of MHI	1.3	1.7	2.7	1.7
Average Annual Projected Water Rate Increases (%)	3.3	3.9	2.4	3.5
Average Annual Projected Sewer Rate Increases (%)	2.8	3.0	2.5	3.0
Coverage and Financial Performance/Cash and Balance Sheet Considerations				
Three-Year Historical Average Senior Lien ADS Coverage (x) ^a	4.5	2.9	2.2	3.0
Senior Lien ADS Coverage (x) ^a	5.0	2.8	2.4	2.8
Senior Lien ADS Coverage Excluding Connection Fees (x)	4.3	2.4	2.3	2.6
Senior Lien ADS Coverage Net of Transfers Out (x)	4.6	2.6	2.1	2.6
Minimum Projected Senior Lien ADS Coverage (x) ^a	3.1	2.2	1.8	2.4
Senior Lien MADS Coverage (x)	4.4	2.4	2.4	2.5
Senior Lien Debt Service as % of Gross Revenues	9	16	26	16
Three-Year Historical Average All-In ADS Coverage (x) ^a	2.8	2.2	1.5	2.2
All-In ADS Coverage (x) ^a	2.6	2.3	1.6	2.3
All-In ADS Coverage Excluding Connection Fees (x)	2.6	1.9	1.6	1.9
All-In ADS Coverage Net of Transfers Out (x)	2.6	2.1	1.6	2.1
Minimum Projected All-In ADS Coverage (x) ^a	2.4	1.8	1.3	1.7
All-In MADS Coverage (x)	2.3	1.8	1.4	1.9
All-In Debt Service as % of Gross Revenues	15	20	32	21
Operating Margin (%)	34	41	44	41
Operating Cash Flow Ratio (x)	1.5	1.3	1.5	1.4
Operating Revenue Growth Current Year (%)	2.4	2.9	3.9	2.9
Operating Revenue Growth Three-Year Average (%)	2.5	3.8	4.3	3.9
Operating Expenditure Growth Current Year (%)	1.5	2.4	4.7	2.4
Operating Expenditure Growth Three-Year Average (%)	2.7	3.4	3.9	3.4
Days of Operating Revenues in Accounts Receivable	46	44	49	45
Days Cash on Hand ^a	518	499	374	483
Days of Working Capital ^a	498	487	364	429
Quick Ratio	5.5	3.8	3.1	4.1
Current Ratio	5.8	4.0	3.7	4.3
Free Cash as % of Depreciation ^a	116	108	76	105
Capital Spending as % of Depreciation	139	147	91	138

^aIndicates key ratio. ADS – Annual debt service. CIP – Capital improvement program. FADS – Funds available for debt service. MADS – Maximum annual debt service. MHI – Median household income.

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