

BENCHMARKING

PERFORMANCE INDICATORS FOR WATER AND WASTEWATER UTILITIES: 2016 Edition



Survey Data and Analyses Report



American Water Works
Association



CONTENTS

Foreword	1
Introduction	3
Water and Wastewater Utility Benchmarking	3
Data Collection	4
Utility Comparisons	4
Methodology	5
Participants	7
Performance Indicators	12
Definitions	15
Bibliography	25
1. Performance Indicators—Organizational Development	27
2. Performance Indicators—Business Operations	43
3. Performance Indicators—Customer Service	57
4. Performance Indicators—Water Operations	81
5. Performance Indicators—Wastewater Operations	95
6. Performance Indicators Historical Trends, 2004–2013	107
Appendix A—Participant Summary	149
Appendix B—Performance Summary by Type of Utility	151
Appendix C—Performance Summary by Region	163
Appendix D—Performance Summary by Population Served	191
Appendix E—2016 Utility Benchmarking Survey	213
Index	233



FOREWORD

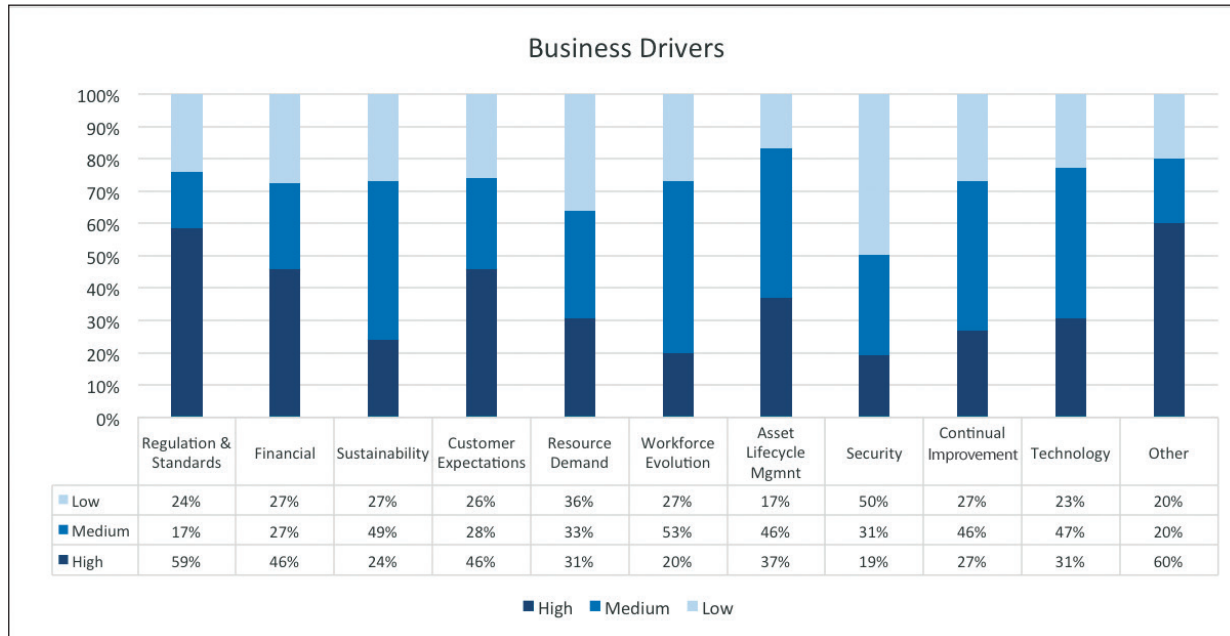
Many options exist day to day for utilities to work toward continuous improvement. Regardless of which avenue chosen, it is important for a utility to understand not only the organization's goals but to have comprehensive knowledge of the utility's structure, resources, and the community it serves. In addition to safeguarding public health, ensuring customer satisfaction, and protecting the environment, utility managers and staff must also maintain working relationships with civic, environmental, financial, and government stakeholders. Aggregate benchmarking data provides one framework for an individual utility to track its goals and improvement. Use of benchmarking data, or initiating the process of performance measurement, can be key to performance improvement. Efficient and effective improvements are necessary for utilities to meet customer expectations, manage rates, and meet more stringent regulations.

AWWA would like to thank the industry professionals at water and wastewater utilities for the important jobs they do and all of the benefits they provide to their communities and beyond. We'd like to give a special thanks to those who provided their utilities' 2015 data; this report represents the time and commitment of numerous organizations, utilities, and individuals, and the water industry is thankful for their participation and their overall commitment to improvement.

If you work for a water, wastewater, or combined utility that may be interested in participating in future benchmarking efforts, please contact AWWA at benchmarking@awwa.org for more information about the next AWWA Utility Benchmarking Survey.

Stephanie Passarelli, PE
Benchmarking and Standards Engineer

While some utilities participated for the first time in the FY15 AWWA Utility Benchmarking Survey, others have remained involved with the program as it has evolved. Each of the utilities involved has a variety of goals and drivers that encourage its participation. FY15 participating utilities identified these key categories of business drivers that affect their day-to-day operations. Utilities responded that all drivers listed were of importance to the utility in terms of day-to-day operations. In general, responding utilities felt Regulations & Standards, Finances and Customer Expectations were top priorities.



Performance Indicators

This report broadly categorizes performance indicators into five areas: organizational development, business operations, customer service, water operations, and wastewater operations. The full list of indicators in each category is as follows, and each is fully defined in subsequent sections.

Organizational Development

- Organizational Best Practices
- Staffing Levels
 - Total FTEs
 - FTEs by Job Category (%)
- Training (hr per employee)
- Emergency Response Readiness Training (hr per employee)
- Customer Accounts (accounts per employee)

- Employee Turnover (%)
- Retirement Eligibility (%)
- Employee Health & Safety Severity Rate

Business Operations

- Debt Ratio (%)
- Return on Assets (%)
- Days Cash on Hand
- Debt-Service Coverage Ratio
- Operating Ratio (%)
- Bond Rating
- System Inspection (%)
- System Renewal/Replacement (%)
- Triple-Bottom-Line Index (%)

Customer Service

- Service Complaints
 - Customer Service Complaints/1,000 accounts
 - Technical Service Complaints/1,000 accounts
- Call Center Indicators
 - Average Wait Time (minutes)
 - Average Talk Time (minutes)
 - Abandoned Calls (%)
 - Average Calls per Call Center Representative
- Water Service Disruptions
 - Disruptions of Water Service (outages/1,000 accounts)
 - Planned by Event Duration (< 4 hr, 4–12 hr, > 12 hr)
 - Unplanned by Event Duration (< 4 hr, 4–12 hr, > 12 hr)
 - Average Time to Address Water Service Disruptions (hr)
 - Disruption Frequency of Water Service
- Wastewater Service Disruptions
 - Disruptions of Wastewater Service (outages/1,000 accounts)
 - Planned by Event Duration (< 4 hr, 4–12 hr, > 12 hr)
 - Unplanned by Event Duration (< 4 hr, 4–12 hr, > 12 hr)
 - Average Time to Address Wastewater Service Disruptions (hr)
 - Disruption Frequency of Wastewater Service

- Residential Service Charges
 - Residential Cost of Water Service (\$/month)
 - Residential Cost of Wastewater Service (\$/month)
 - Residential Cost of Stormwater Service (\$/month)
- Customer Service Cost per Account (\$/account)
- Billing Accuracy (errors/10,000 billings)
- Per Capita Consumption (gal/person/day)
- Service Affordability
 - Water Service Affordability (%)
 - Wastewater Service Affordability (%)
 - Stormwater Service Affordability (%)
- Stakeholder Outreach Index

Water Operations

- Regulatory Compliance—Water (%)
- Water Produced (MGD per employee)
- Water Supply
 - Current Water Demand (%)
 - Available Water Supply (years)
- Water Distribution System Integrity
 - Leaks/100 miles of pipe
 - Breaks/100 miles of pipe
 - Combined Leaks and Breaks
- O&M Costs for Water Services
 - (\$/account)
 - (\$/MG)
 - (\$/100 miles of pipe)
 - Treatment O&M costs
 - Distribution O&M Costs (\$/100 miles of pipe)
 - O&M Percentage of Water Services
- Maintenance—Water
 - Planned Maintenance (%)
 - Corrective Maintenance to Production (hr/MG)
 - Planned Maintenance to Production (hr/MG)
 - Corrective Maintenance to Distribution System Length (hr/100 miles of pipe)
 - Planned Maintenance to Distribution System Length (hr/100 miles of pipe)
- Energy Consumption—Water (kBTU/year/MG)
- AWWA Water Audit Software

Wastewater Operations

- Regulatory Compliance—Wastewater (%)
- Wastewater Processed per Employee
- Non-Capacity Sewer Overflow Rate (per 100 miles of pipe)
- Capacity Sewer Overflow Rate (per 100 miles of pipe)
- Collection System Integrity (failures/100 miles of pipe)
- O&M Costs for Wastewater Service
 - (\$/account)
 - (\$/MG)
 - (\$/100 miles of pipe)
 - Collection O&M Costs (\$/MG)
 - Treatment O&M Cost (\$/100 miles of pipe)
 - O&M Percentage of Wastewater Services
 - O&M Percentage of Stormwater Services
- Maintenance—Wastewater
 - Planned Maintenance (%)
 - Corrective Maintenance to Production (hr/MG)
 - Planned Maintenance to Production (hr/MG)
 - Corrective Maintenance to Distribution (hr/100 miles of pipe)
 - Planned Maintenance to Distribution (hr/100 miles of pipe)
- Energy Consumption—Wastewater (kBTU/year/MG)

Definitions

The performance indicators used in AWWA's Utility Benchmarking Program are based on the following definitions and were identified in the FY15 Survey.

Active Account: An active account refers to a formal arrangement providing for regular services for some or all of the reporting period.

Actual Maximum Daily Production: Actual maximum daily production refers to the observed maximum production of all treatment plants in a system over the reporting period in million gallons per day (MGD).

Apparent Losses: Apparent losses consist of unauthorized use and inaccuracies associated with metering. Apparent losses consist of unauthorized consumption, customer metering inaccuracies, and systematic data handling errors.

Average Annual Available Water Supplies Based on Current Yields: The average available water supply is the annual water volume available based on current yield within regulated, authorized withdrawals, and delivery system or infrastructure limitations.

MGD OF WATER PRODUCED PER EMPLOYEE

This indicator provides a measure of employee efficiency as expressed by the amount of potable water delivered by utility employees (as full-time employees [FTEs]) per year. For a given reporting period, it is calculated as follows:

$$\text{MGD of Water Produced per Employee} = \frac{\text{Average daily demand}}{\text{Total number of FTEs}}$$

Table 4-2 presents the aggregate data for the MGD of Water Produced per Employee indicator for water and combined utilities from the 2015 data set.

Table 4-2 Aggregate data for the MGD of water produced per employee indicator

	Top Quartile	Median	Bottom Quartile	Sample Size
Water Operations	0.29	0.19	0.13	48
Combined Operations—Water	0.29	0.21	0.16	91

Customer Service Cost per Account (\$/account)

Historical trends for the customer service cost per account are shown in Figures 6-26, 6-27, and 6-28 for water, wastewater, and combined utilities, respectively. None of the dollar amounts have been adjusted for inflation. Over the periods shown, the median customer service cost per account ranged from approximately \$33 to \$46 per account for water utilities, \$5 to \$46 per account for wastewater utilities, and \$23 to \$48 per account for combined utilities. At the 75th percentile, the greatest customer service cost per account was approximately \$79 per account for water utilities, \$103 per account for wastewater utilities, and \$63 per account for combined utilities. At the 25th percentile, the lowest customer service cost per account was approximately \$23 per account for water utilities, \$5 for wastewater utilities, and \$15 per account for combined utilities. Overall, the customer service cost per account was somewhat variable, more so for wastewater utilities than water or combined utilities. In general, the customer service cost per account for wastewater utilities was much less than for water or combined utilities for the periods shown and from these groups of respondents.

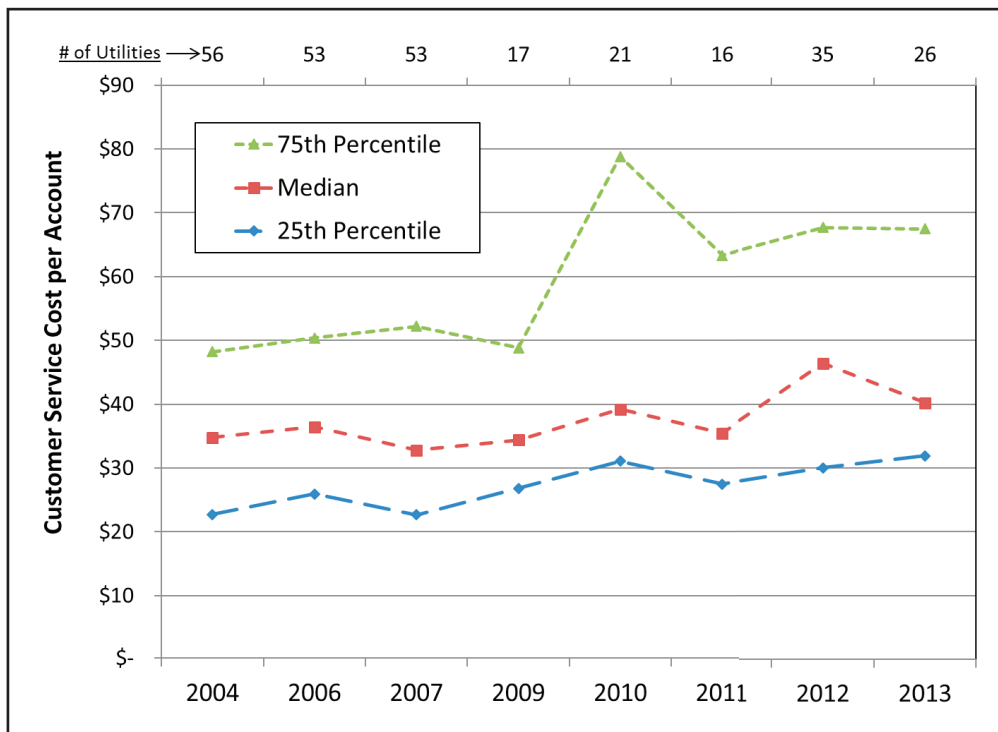


Figure 6-26 Water utility—Customer service cost per account