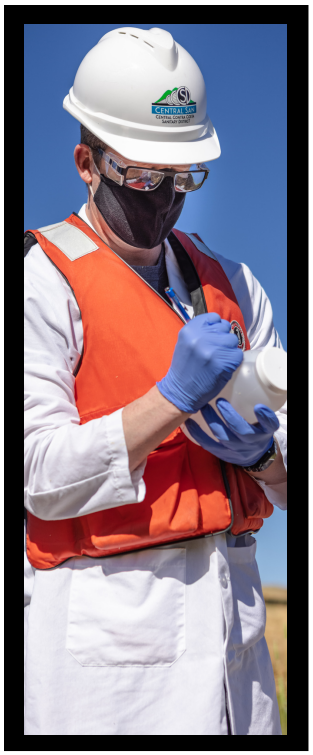
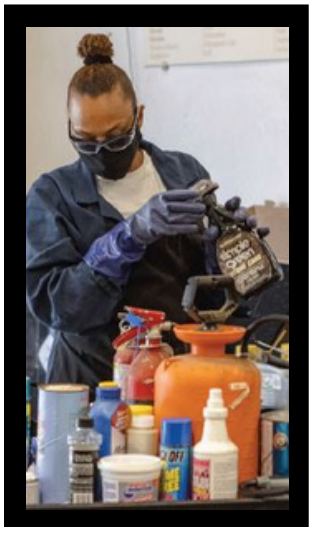
CENTRAL SAN
CENTRAL CONTRA COSTA SANITARY DISTRICT

FY 20-21

CENTRAL SAN BENCHMARKING STUDY





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EXECUTIVE SUMMARY

BACKGROUND

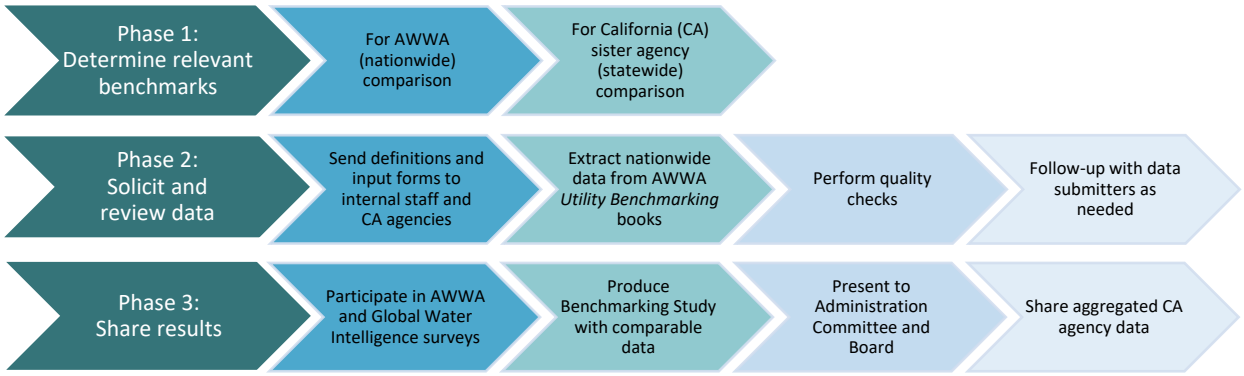
Benchmarking is an ongoing, cyclical process rooted in sound data collection and analysis, which can help an agency understand how it is performing against itself and similar entities across the state and country. Central San recognizes this "fitness check" exercise as a useful tool in performance measurement to help gauge current performance, understand differences from peer water sector utilities, and set reasonable targets for the future. Central San's third Benchmarking Study compares fiscal years (FY) 18-19 through 20-21 against other agencies on a statewide and nationwide scale, using the data and framework of the American Water Works Association (AWWA) Utility Benchmarking Program, to support Central San's commitment to its customers and affordability of service. The data can provide a window into potential opportunities that may save costs and serve Central San's culture of continuous improvement, innovation, optimization, and transparency. Central San has participated in the AWWA's Utility Benchmarking Survey every year since 2019 and is committed to benchmarking on an annual basis.

REPORT OBJECTIVES

- Share the findings of regular benchmarking initiatives
- Build upon the initial FY 18-19 study by comparing Central San's performance against itself over three FYs (FYs 18-19, 19-20, and 20-21), against sister agencies statewide (FYs 19-20 and 20-21), and against water/wastewater agencies nationwide (FYs 18-19 and 19-20)
- Develop consistent and valid data reporting
- Encourage self-evaluation and internal dialogue to objectively assess performance against internal perceptions
- Identify opportunities for consideration in strategic planning
- Emphasize the importance of systematic continuous improvement
- Articulate value proposition for stakeholders, including customers, businesses, and the environment

APPROACH

To achieve the objectives of this report, the project was executed in three phases. The implementation methodology of this phased approach is as follows:

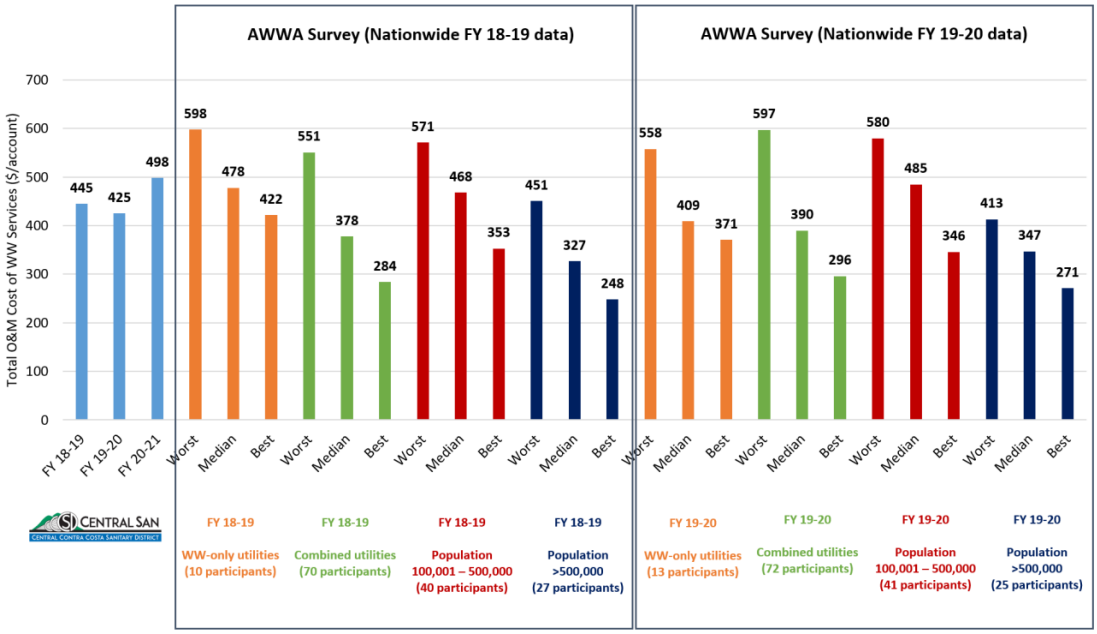


RESULTS/CONCLUSIONS

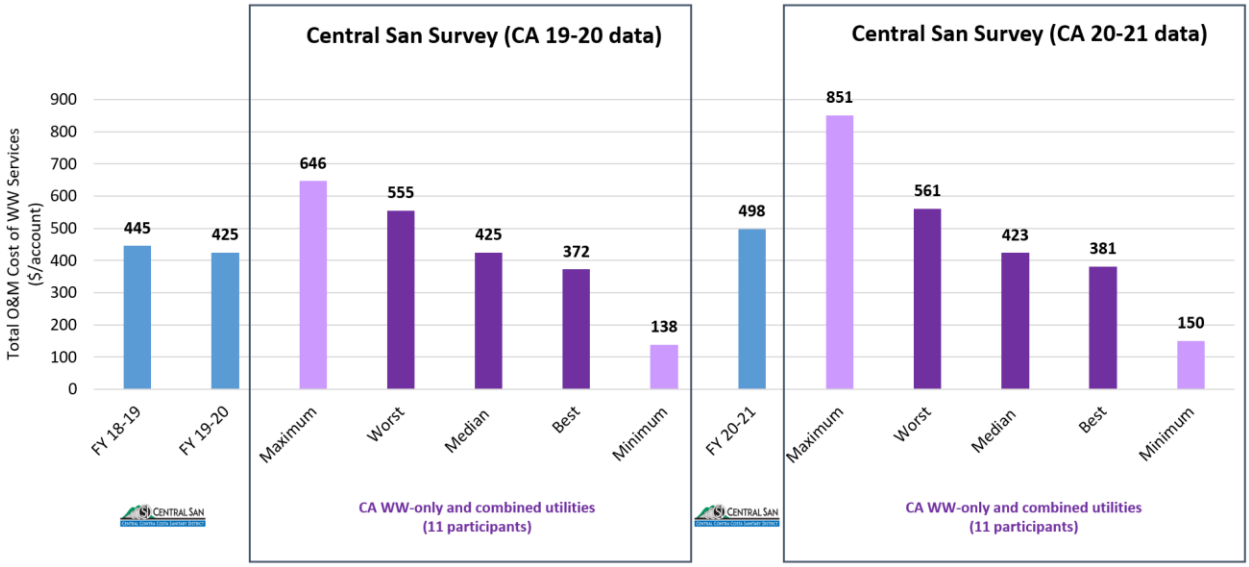
Central San's leadership team reviewed the results of this study and found some indicators to be more meaningful than others. One indicator, total operations and maintenance (O&M) cost per account (residential and nonresidential accounts), was of particular interest, given Central San's commitment to cost-effectiveness and ability to offer high-quality services at affordable rates. Below are the findings of Central San's performance over the last three FYs compared to the nationwide agencies in FYs 18-19 and 19-20 (first chart) and against the CA agencies in FYs 19-20 and 20-21 (second chart). Please see the O&M Costs for Wastewater Services indicator within the Productivity & Performance section of this report for more details on this benchmark and how it was calculated.

TOTAL O&M COST PER ACCOUNT

Central San* vs. Nationwide (*FYs 18-19 and 19-20* data)



Central San* vs. CA (*FYs 19-20 and 20-21* data)



* Central San treats wastewater (WW) from the cities of Concord and Clayton but does not maintain their pipelines. The total O&M cost includes costs of treatment and support services borne by the cities of Concord and Clayton, to approximate costs of a single entity with Central San. In FY 20-21, Central San paid off its UAAL balance of approximately $70.8 million; this one-time cost was included in the total O&M figure for that year.

In completing this study, staff found that benchmarking can be a subjective exercise as the definitions provided by AWWA are oftentimes vague and leave much room for interpretation. This leaves both the nationwide data from AWWA and the CA agencies survey data with some amount of uncertainty. The only way to truly have reliable results in benchmarking is for all participating agencies to formally commit to the process and come to an agreement on very clear definitions that are immune to misinterpretation. Typically, these clearer definitions are arrived at over time. The study also does not account for more nuanced operational and historical differences among the participating utilities, so there should not be an expectation that differing agencies will show identical performance. Staff has volunteered to serve on but has not yet become involved with the AWWA Utility Benchmarking Survey Advisory Committee to convey recommendations to improve the measurements on some of the benchmarks, as noted in this report. However, Central San remains engaged with AWWA in asking clarifying questions and recommending changes.

While there are serious limitations to consider in making strict apples-to-apples comparisons when reviewing this report, this study can be a useful tool in identifying strengths and performance gaps, where they exist. Staff will continue to benchmark periodically to promote consistent and accurate data gathering both internally and from other CA agencies.

Overall, given the limitations described above, it can be difficult to draw firm, immediately actionable conclusions from this study. The report is not intended to be an end-all, be-all, nor a call to action; it is a checkpoint to see how Central San compares against itself and its peers. Central San will continue its efforts toward meeting its customers' expectations, replacing aging equipment, employing optimizations and efficiencies, and performing strategic planning for managerial effectiveness, with the goal of seeing positive trends in performance against itself over the years, as well as seeing favorable comparisons with other agencies.

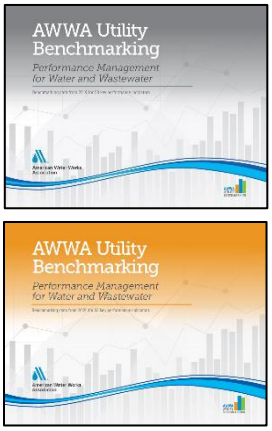
INTRODUCTION

PROJECT PURPOSE

The primary objectives of this study are to view levels and trends in Central San's performance over the past three FYs (18-19, 19-20, and 20-21); compare Central San's performance with California (CA) water/wastewater agencies over FYs 19-20 and 20-21; and compare Central San's performance with nationwide wastewater-only (WW-only) and combined water-wastewater utilities in FYs 18-19 and 19-20. This study is based upon the AWWA Utility Benchmarking Program, whose purpose is to provide objective performance measures for utility decision makers. Central San has participated in the AWWA Utility Benchmarking survey since 2019; therefore, its data is included in the nationwide data sets in this study, which were sourced from the *2020* and *2021 AWWA Utility Benchmarking* books.

This study is part of an ongoing effort to perform benchmarking regularly and share the results; develop consistency in data reporting; encourage self-evaluation and internal dialogue; identify opportunities for consideration in strategic planning; emphasize systematic continuous improvement; and articulate value proposition for stakeholders.

METHODOLOGY



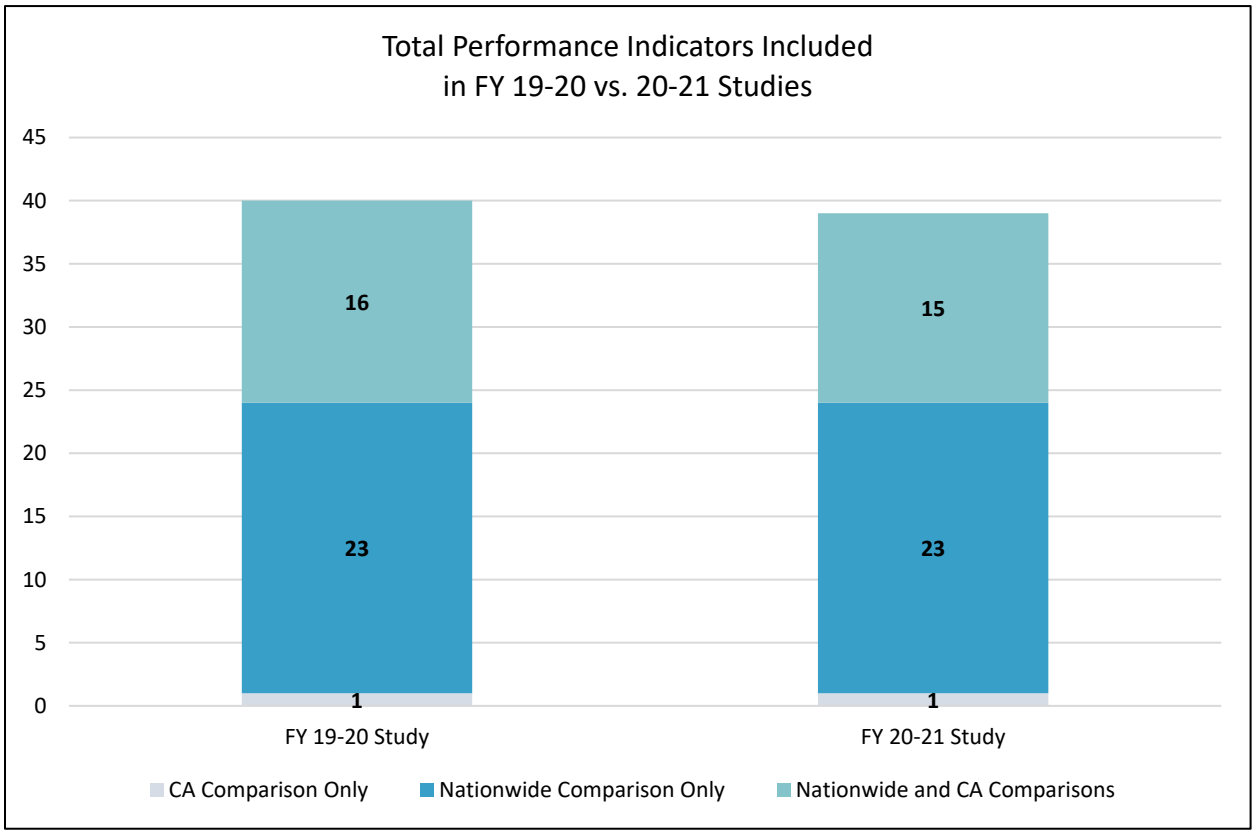
The AWWA Utility Benchmarking survey serves as a framework for this study. Using the definitions and performance indicators helps ensure a fair comparison across the three sets of data (Central San, CA agencies, and nationwide agencies). This study includes the FY 18-19 and 19-20 nationwide data from the latest *2020* and *2021 AWWA Utility Benchmarking* books (pictured), and it includes FY 19-20 and 20-21 CA agency data from Central San's statewide survey, which used AWWA methodology.

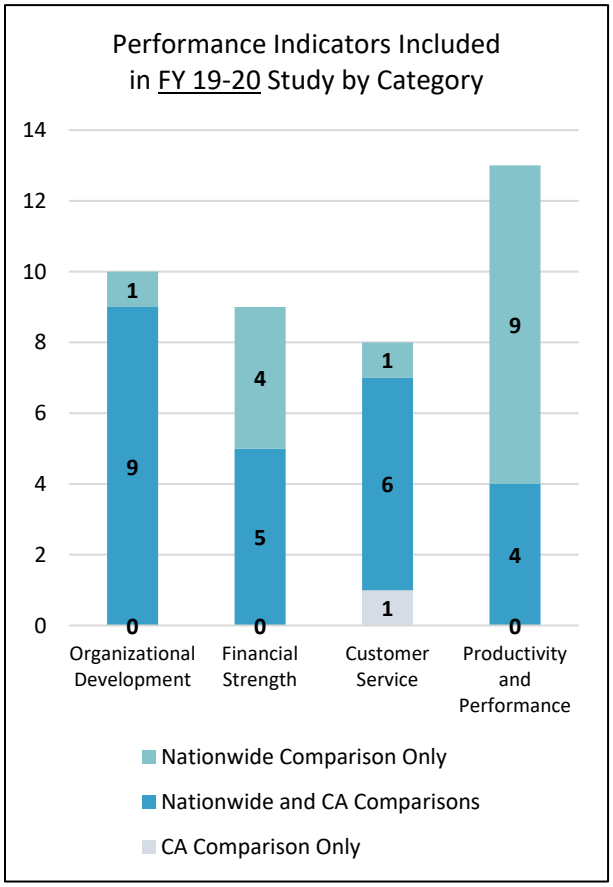
Nationwide AWWA FY 20-21 survey results are expected to be released in February 2023 via the *2022 AWWA Utility Benchmarking* book.

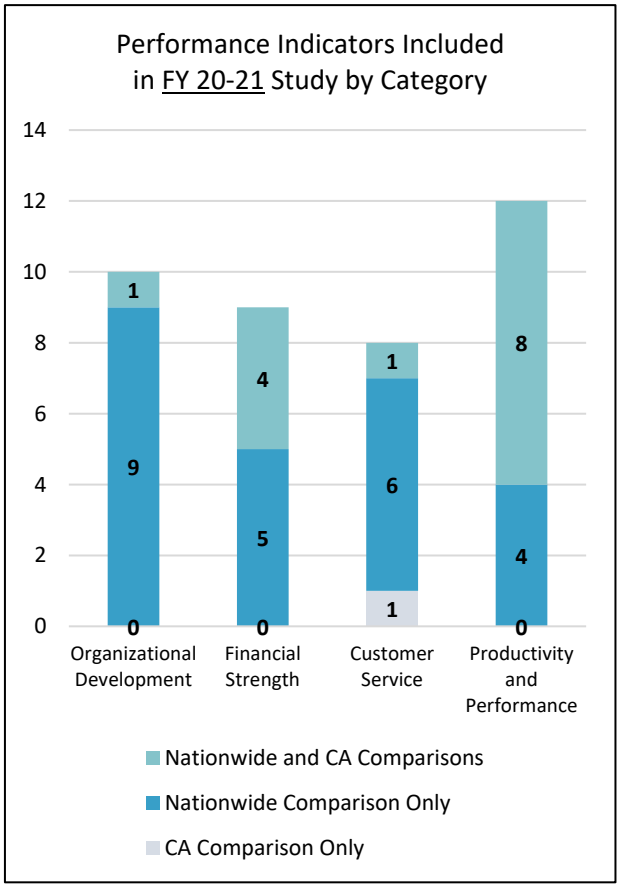
The project was executed in three phases:

Phase 1: Determine relevant benchmarks

From the AWWA book, staff selected benchmarks which were relevant to Central San and would provide meaningful comparable data. In total, 39 performance indicators (not including sub-indicators) are included in the study. These are the same indicators in the previous FY 19-20 study, minus the Digital Utility Initiative indicator, for which no new nationwide comparable data was available. The list of 39 performance indicators was further refined to 14 for inclusion in the CA agency comparison; thus, only 16 of the 40 performance indicators in this study include CA agency data. Performance indicators that were included in the previous study and this study are shown in the following charts.


Total Performance Indicators Included
in FY 19-20 vs. 20-21 Studies
45
40
35
30
25
20
15
10
5
0
16
23
1
15
23
1
FY 19-20 Study
FY 20-21 Study
CA Comparison Only
Nationwide Comparison Only
Nationwide and CA Comparisons


Performance Indicators Included
in FY 19-20 Study by Category
14
12
10
8
6
4
2
0
1
9
0
4
5
0
1
6
1
9
4
0
Organizational Development
Financial Strength
Customer Service
Productivity and Performance
Nationwide Comparison Only
Nationwide and CA Comparisons
CA Comparison Only


Performance Indicators Included
in FY 20-21 Study by Category
14
12
10
8
6
4
2
0
1
9
0
4
5
0
1
6
1
8
4
0
Organizational Development
Financial Strength
Customer Service
Productivity and Performance
Nationwide and CA Comparisons
Nationwide Comparison Only
CA Comparison Only

Phase 2: Solicit and review data

Central San's subject matter experts filled out data input forms to yield the performance figures of each indicator. These forms included the AWWA definitions to ensure consistency with the AWWA aggregate data. Reference material was provided where applicable so the data could be verified and/or revisited in later years if needed. After gathering, calculating, and quality-checking the data, and verifying perceived outlying data as needed, staff provided the findings to data submitters for review. Commentary from staff is included in this report. Adjustments were made to some of the reported data to better align Central San with the agencies in the study. For example, in addition to its WW operations, Central San operates a Household Hazardous Waste Collection Facility (HHWCF) and a Recycled Water program, which other agencies presumably do not. Therefore, in answering the data prompts, Central San has accounted for the resources dedicated to those programs and adjusted its calculation methods to represent Central San's performance in each service-specific indicator as best and as accurately as possible.

For the CA agency comparison, Central San requested FYs 19-20 and 20-21 data from 58 CA water/WW agencies in spring 2022, for 14 performance indicators. Statewide data for one indicator, Non-capacity and Capacity Sewer Overflow Rates, was obtained via the California Integrated Water Quality System (CIWQS). Partial to full responses were received from 14 agencies. There were nine new participating agencies, and eight agencies who had responded to previous years' surveys declined to respond this year. Participation was encouraged but may have been limited by the consequences of COVID-19 on staffing and priorities at other agencies. For agencies that participated, Central San staff reviewed the data and worked with the agencies as needed to refine or correct their reported data.

In performing quality checks on the CA agency data, both for data entry errors and use of AWWA methodology, various inconsistencies were found. Some agencies' data could not be applied to the calculations without producing an inaccurate result. For example, a "wholesale" agency who treats wastewater conveyed from pipes they do not own, operate, or maintain will have an inaccurately high total O&M cost per 100 miles of pipe. A "retail" agency, on the other hand, treats wastewater conveyed only from pipes they own, operate, and maintain, so their O&M cost will be accurately proportional to their miles of pipe. The quality check also found data entry errors and inconsistencies resulting from differing applications of AWWA's methodology. While some agencies submitted data based on strict definitions as provided, others appear to have included adjustments they believed were appropriate for their entity. This happened because many of the AWWA definitions leave room for interpretation or are inherently flawed (e.g., the AWWA methodology to calculate Debt-Service Coverage Ratio does not state whether to exclude depreciation from operating expenses). These shortcomings can affect the accuracy of not only the AWWA nationwide data but especially the CA agency data, which was not published through AWWA's Utility Benchmarking subject matter experts.

The only way to have a consistent set of data for benchmarking is to engage in a long-term effort with the full participation of participating agencies. Over time, Central San will encourage and pursue opportunities to enhance the benchmarking effort through fuller participation and

improved efforts to discuss inputs and results. The CA data presented in this report reflects the agencies' submissions, rather than attempts to make substantial efforts to ensure the use of consistent definitions. The only exception is where an agency's data reflects a clear typographical or data input error, in which case the error was corrected.

Phase 3: Share results

In April 2020 and 2021, staff submitted Central San's FY 18-19 and 19-20 data respectively to the AWWA Utility Benchmarking surveys for inclusion in the *2020* and *2021 AWWA Utility Benchmarking* books. Thus, Central San's data is factored into the 25th, median, and 75th percentile ("worst," median, and "best" as represented in the bar graphs respectively) nationwide data sets from AWWA. Central San also submitted FY 20-21 data to the AWWA survey in April 2022, but the nationwide results of that survey have not yet been published.

In 2021, Global Water Intelligence, a publisher and event organizer in the water industry, approached Central San to become part of their new cross-continental benchmarking initiative, focused on sustainability. As a member of their Leading Utilities of the World group, Central San provided feedback on performance indicators and completed the survey with four FYs of data. Global Water Intelligence presented a preliminary set of results at the Global Water Summit in May 2022.

To produce this Benchmarking Study, staff produced charts to show the comparisons of Central San over FYs 18-19, 19-20, and 20-21; CA agencies over FYs 19-20 and 20-21 (where included); and nationwide agencies over FY 18-19 and 19-20. The nationwide agency data is presented in "worst" (25th percentile), median, and "best" (75th percentile) values of different sub-categories by service type of WW-only, Combined (utilities providing both water and wastewater services), Population 100,001-500,000, and Population >500,000 utilities. Two sets of population data are provided as Central San serves a population around the mid-point of those two bands.

The statewide comparison produced a relatively small data set of 15 participants (including Central San) at most for any given performance indicator. If an agency's data produced an outlier performance figure, that agency's data was omitted from the aggregate results. For example, a wholesale agency may have reported collection O&M costs, yet, because that cost does not represent the full cost of maintaining the collection systems that convey all the wastewater flow to the agency's treatment plant, their performance figure for Collection O&M as a Percentage of Total O&M Costs would be misleadingly low, so their figure would not be reflected in the statewide data set. These efforts to narrow the data set for accuracy further reduced the amount of data to be aggregated. Therefore, statewide data is presented with additional worst (minimum) and best (maximum) values, along with the worst (25th percentile), median, and best (75th percentile) values.

For each performance indicator, this report states the AWWA definitions and calculation methods, staff's explanatory notes, and charts with the comparable data. Past years' data reported in Central San's previous Benchmarking Study may have changed while calculation methodologies have been refined internally and/or AWWA has changed the calculation methodology. Following the completion of this study, staff will share aggregate statewide

results with the agencies solicited in the CA study.

SURVEY PARTICIPANTS

Statewide Comparison

In spring 2022, Central San reached out to 58 CA agencies for their performance in 14 benchmarks, and 14 agencies participated in the study by returning partial or full survey responses. As the survey collection timeframe was during the COVID-19 pandemic, this was a challenging time for agencies to participate, and it is Central San's hope that more agencies will be able to take part in future surveys. The agencies were selected because they offer similar services, embody industry best practices, and are in the same state as Central San. Despite these similarities, each utility has nuances. Below is information on the 15 responsive agencies (including Central San) that comprise the statewide data set.

The responsive agencies whose data is included in this study are characterized as follows:

- 11 from Northern CA and 3 from Southern CA
- 9 WW-only and 5 combined utilities
- 7 "wholesale" utilities who treat some amount of wastewater from pipes not owned, operated, or maintained by them
- 4 utilities who offer other services besides water and wastewater, including recycled water, stormwater, household hazardous waste, and solid waste management. These other services may skew the performance data in some indicators such as staffing levels and O&M costs, as "shared service" staff such as Finance and Human Resources may or may not have been allocated by service type to reflect staffing for only core wastewater collection and treatment services.

Utility Characteristic	FY 19-20			FY 20-21		
	Minimum	Median	Maximum	Minimum	Median	Maximum
Average daily production of WW in million gallons per day (MGD)	5	13	414	0	12	148,124
Length of collection system pipe (miles)	39	288	1,430	37	267	1,535
Customer accounts	22,332	58,976	1,305,855	9,878	38,665	1,306,723
Total O&M costs (in millions)*	$10.6	$22.9	$316.0	$6.1	$24.6	$195.5

* not all agencies were able to provide total O&M costs.

Nationwide Comparison

A total of 11 WW-only utilities and 96 combined utilities participated in the 2020 AWWA benchmarking survey from 35 states, two Canadian provinces, three United States (U.S.) territories, and Curacao. A total of 14 WW-only utilities and 98 combined utilities participated in the 2021 AWWA benchmarking survey from 35 states; Washington, D.C.; three Canadian provinces; and one U.S. territory (including 18 utilities from CA).

BENCHMARKS INCLUDED IN THIS STUDY

The following chart lists the 39 benchmarks included in this study, and what Central San, statewide, and/or nationwide data is available.

	Performance Indicator (sub-indicators not listed)	Central San FYs 18-19, 19-20, and 20-21	Comparative Data Available	
			CA Agencies (Central San Survey) FYs 19-20 and 20-21	Nationwide Agencies (AWWA Survey) FY 18-19 and 19-20
Organizational Development	Organizational Best Practices	✓	×	✓
	Staffing Levels	✓	✓	✓
	Training	✓	×	✓
	Emergency Response Readiness Training	✓	×	✓
	Employee Turnover	✓	✓	✓
	Retirement Eligibility	✓	×	✓
	Recordable Incident Rate	✓	×	✓
	Near Misses	✓	×	✓
	Strategic Workforce Planning	✓	×	✓
	Employee Vacancies	✓	×	✓
Financial Strength	Debt Ratio	✓	✓	✓
	Return on Assets	✓	×	✓
	Days of Cash on Hand	✓	✓	✓
	Debt-Service Coverage Ratio	✓	✓	✓
	Days of Working Capital / Financial Liquidity	✓	✓	✓
	Operating Ratio	✓	×	✓
	Bond Rating	✓	×	✓
	Insurance / Claims	✓	×	Insurance only
	Risk and Resiliency	✓	×	✓
Customer Service	Residential Service Charges	✓	✓	✓
	Nonresidential Service Charges	✓	✓	×
	Service Affordability	✓	×	✓
	Service Complaints (Customer and Technical Service)	✓	×	✓
	Customer Service Cost per Account	✓	×	✓
	Stakeholder Outreach Index	✓	×	✓
	Customer Service Contact	✓	×	✓
	Wastewater Service Disruptions	✓	×	✓

(Continued on next page)

✓ = data is available for the performance indicator
× = data is not available for the performance indicator

	Performance Indicator (sub-indicators not listed)	Central San FYs 18-19, 19-20, and 20-21	Comparative Data Available	
			CA Agencies (Central San Survey) FYs 19-20 and 20-21	Nationwide Agencies (AWWA Survey) FY 18-19 and 19-20
Productivity and Performance	System Inspection	✓	✓	✓
	System Renewal and Replacement (R&R) Fund Allocation / Capital Expenditures to Depreciation Ratio	✓	Capital Expenditures to Depreciation Ratio only	System R&R Fund Allocation only
	Non-capacity and Capacity Sewer Overflow Rates	✓	From California Integrated Water Quality System Project (CIWQS)	✓
	Collection System Integrity	✓	✓	✓
	Regulatory Compliance	✓	×	✓
	Customer Accounts per Employee	✓	✓	✓
	Wastewater Processed per Employee	✓	✓	✓
	O&M Costs for Wastewater Services	✓	✓	✓
	Maintenance	✓	×	✓
	Energy Consumption	✓	×	✓
	Energy Optimization Plan	✓	×	✓
	Nutrient Recovery	✓	×	✓

✓ = data is available for the performance indicator

× = data is not available for the performance indicator

CONSIDERATIONS IN REVIEWING THE RESULTS

Benchmarking is based upon the consistent collection of data that, when applied toward metrics, allows a utility to gauge performance levels and trends. A benchmark is the level or degree of a performance indicator that serves as a reference or target.

In completing this study, Central San found that some of the definitions that provide the foundation for this benchmarking effort could be improved upon, as they are subject to interpretation by each participating utility. The only way to truly have reliable results is for all participating agencies to formally commit to benchmarking and come to an agreement on clear definitions that are immune to misinterpretation. This study is not meant to be a direct basis for action but an informational tool to try to compare Central San's performance to itself and other agencies.

AWWA generalized and normalized their benchmarks to provide the greatest general applicability to the utilities contributing to the survey, and AWWA itself recognizes that the data collection process can prove challenging as comprehensive utility benchmarking sometimes includes organization-wide measurements. Numerous system-specific factors can influence performance, such as the following variables that may be outside the control of a utility's management:

- Treatment requirements
- System age/materials
- Topography/environment
- Organizational vision and culture
- Historical factors
- Current strategic and operating plans
- Budget
- Customer base
- Services required to be obtained from centralized sources (such as a city or county) (e.g., finance, IT, Human Resources, etc.)
- Regulations
- Governance
- Political environment

Central San has benchmarked against nationwide data by AWWA sub-categories of WW-only, Combined, Population 100,001-500,000, and Population >500,000 utilities. This report does not include Water and Stormwater utility data. While Central San is considered a WW-only utility, because relatively few WW-only utilities participated in the survey, Central San is presenting comparable data for *both* WW-only utilities and Combined utilities. A combined utility provides both potable water and wastewater services, potentially in addition to other services such as power, transportation, or electric. Data from the two population categories (100,001-500,000 and >500,000) are presented because Central San had a service area population between

488,900 and 494,300 during FYs 18-19 through 20-21. Laying on the boundary of the two categories, Central San is arguably not an ideal fit in either.

There are additional categories of agency types which are not benchmarked separately but should be to account for operational differences. For example, WW enterprises who are part of a larger operation such as a city would be expected to have lower personnel and costs associated with WW treatment since staff (particularly support) may be split over multiple agency/city departments. Furthermore, wholesale agencies not operating their own collection system would possibly have lower staffing counts, overflow rates, total O&M costs, and customer accounts. These five categories of agencies which are not separately benchmarked are as follows:

1) Independent WW-only agency that operates its own collection system (e.g., Central San)
2) Agencies who are part of a city
3) Wholesale WW-only agencies
4) Wholesale combined (water and WW) agencies
5) Combined water-WW agencies.

Certain economic phenomena may further complicate utility-to-utility comparisons and influence the observed levels of performance, including the following:

- Economies of scale (as system size increases, efficiency may improve)
- Economies of scope (diversification of services may lead to efficiencies)
- Economies of density (as population density increases, unit costs may decrease).

Additionally, Central San has characteristics which could affect the ability to compare directly with other agencies statewide:

- On-site energy production to power the treatment process (leading to comparatively higher energy consumption usage based on AWWA calculation methodology).
- Multiple hearth furnace solids handling, which requires Central San to purchase landfill gas (increasing both costs and energy consumption). Central San, in fact, is the last remaining agency with a furnace in the state of CA.
- Operation of its own collection and treatment plant and treatment provided to the cities of Concord and Clayton by contract. Where applicable, Central San's data has been adjusted to provide a comparable data set to other agencies.
- Collection of ad valorem taxes. These funds have been included where appropriate.
- Operation of a HHWCF and recycled water treatment, distribution, and other facilities such as the Residential Recycled Water Fill Station. Related staffing and costs have been removed where possible.

To mitigate issues with normalizing the data, AWWA worked with participants to identify and correct questionable information before it became part of the final nationwide data sets,

including conducting an analysis of outliers to confirm unusually high or low values. AWWA has made some improvements to their survey; for example, for Debt-Service Coverage Ratio and other financial indicators, AWWA now asks for the values as reported in an agency's Annual Comprehensive Financial Report instead of asking for individual components of a formula that AWWA could use to calculate and independently report the Debt-Service Coverage Ratio. Because all data is self-reported, the validity and accuracy of comparable measures depend on each utility's consistent application of the definitions and accurate data collection. In corroborating the data collected both internally from staff and externally from other agencies, Central San has found that this is an imperfect process.

Overall, given the limitations described above, it can be difficult to draw high-confidence-level actionable conclusions from this study. Over time, as refinements to definitions are made, entities improve their data validation, and, as a group, the participants work to ensure consistent application of the definitions take place, the reliability of the results will improve. Even with that, however, there are limitations to benchmarking. While benchmarking is a worthwhile exercise to understand the metrics of industry peers, it is a relative comparison that does not consider differences in operations, historical circumstances, or service areas in terms of density, customer types, costs, etc. Given these factors, there should not be an expectation that different agencies will have identical performance, even with similarly competent management approaches.

GUIDE TO INTERPRETING THE DATA AS PRESENTED

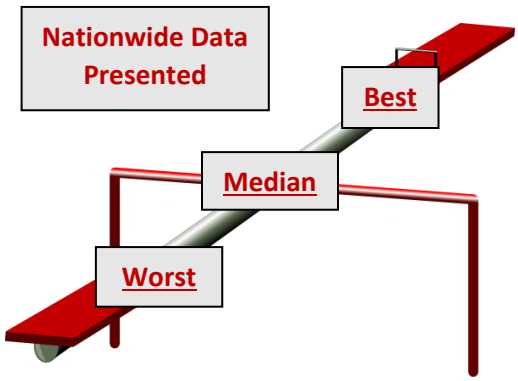
Each performance indicator presented in this report includes AWWA calculation methodology, AWWA definitions, and commentary from Central San. Some performance indicators contain a family of sub-indicators which help demonstrate a utility's performance within the greater indicator.

Central San's performance is shown in the form of bar graphs comparing the following:

- Central San's FY 18-19, 19-20, and 20-21 performance
- Nationwide FY 18-19 and 19-20 performance: aggregated as Worst quartile (usually the 25th Percentile), Median, and Best quartile (usually the 75th percentile)
- CA agencies' FY 19-20 and 20-21 performance (for some benchmarks): aggregated as Minimum/Maximum value, Worst quartile (usually the 25th Percentile), Median, Best quartile (usually the 75th Percentile), and Maximum/Minimum. The Minimum/ Maximum values provide a greater understanding of the spread of numbers given the relatively small data set.

The **nationwide aggregate data** is presented within each FY by quartiles, as listed below and represented by the figure below on the right:

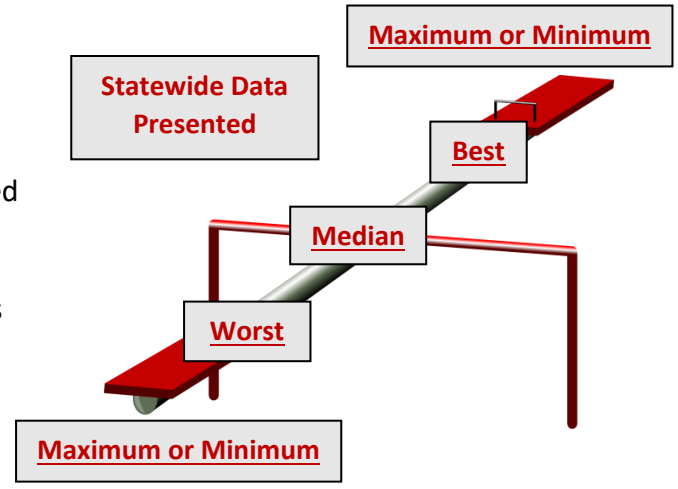
- **Worst** (the worst quartile) =
  the worst-performing 25% of agencies
  reported performance at or below that value
  (usually the AWWA results' 25th percentile)
- **Median** =
  the median performance value for all agencies
- **Best** (the best quartile) =
  the best-performing 25% of agencies
  reported performance at or above that value
  (usually the AWWA results' 75th percentile)



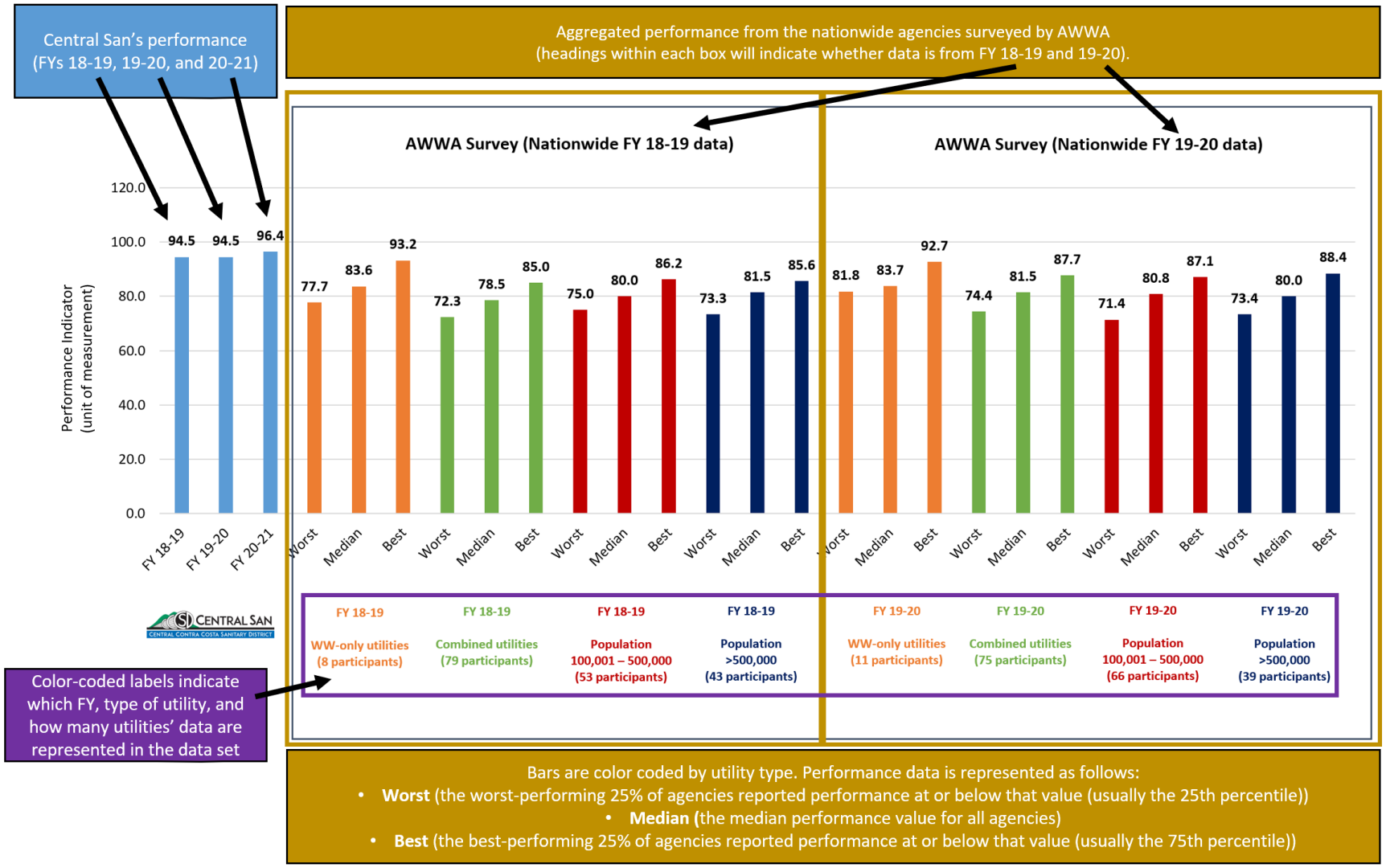
There are four sets of nationwide data presented within each of the two FYs:
WW-only utilities (most comparable to Central San but often a relatively small data set), *Combined* utilities, utilities with a *Population of 100,001-500,000*, and utilities with a *Population of >500,000* (Central San's total population including both retail and wholesale customers was 494,300, 483,630, and 484,790 in FYs 18-19, 19-20, and 20-21 respectively). Only 25th percentile, median, and 75th percentile values were available for the nationwide data set.

The **CA aggregate data** is presented within each FY by best or worst (25th or 75th percentile) values and the median, *in addition to* the maximum and minimum values, which are not available in the nationwide data set. This is further explained below and represented by the figure below on the right:

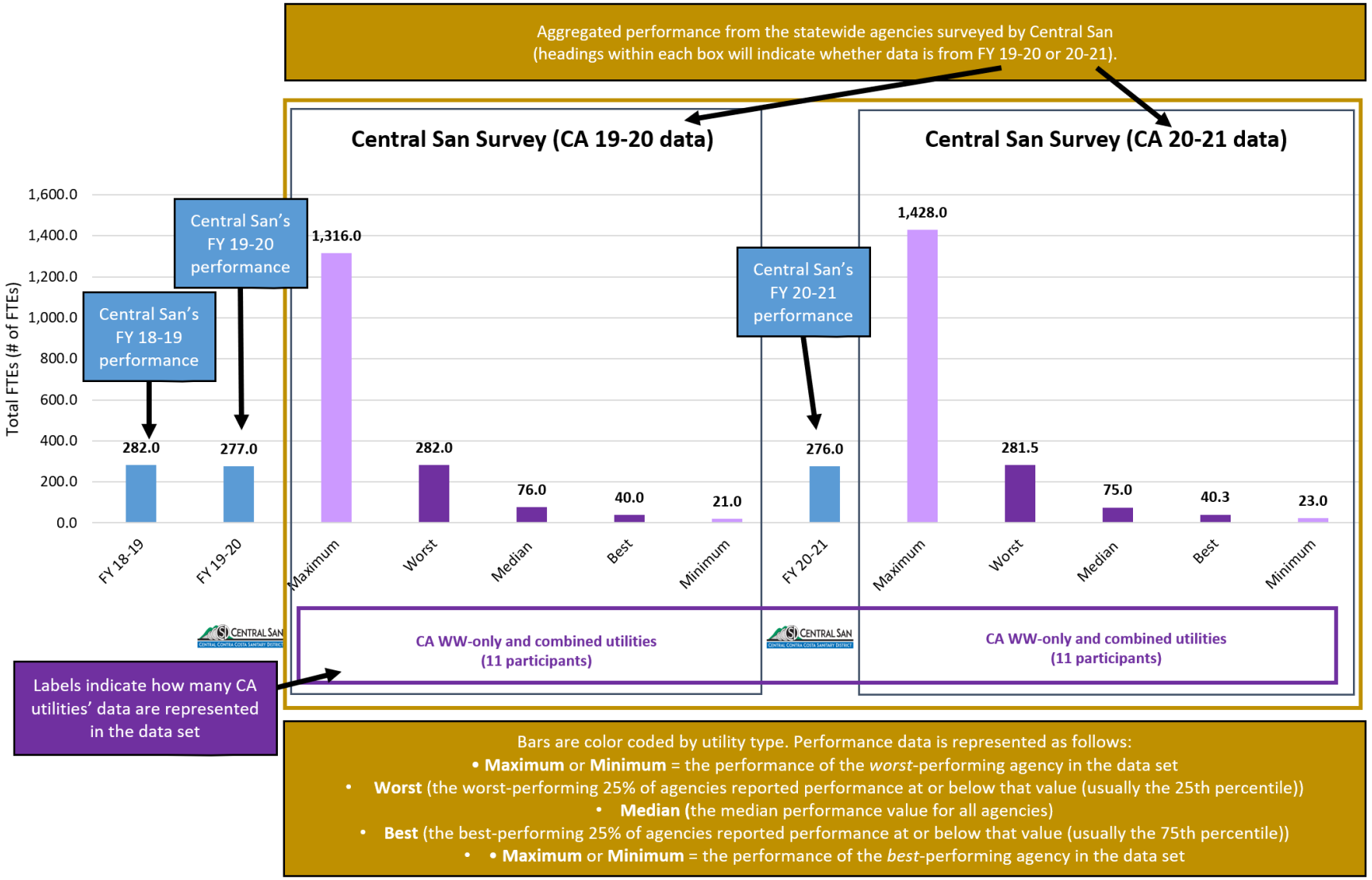
- **Maximum** or **Minimum** =
  the performance of the *worst*-performing
  agency in the data set
- **Worst** (the worst quartile) =
  the worst-performing 25% of agencies reported
  performance at or below that value
- **Median** =
  the median performance value for all agencies
- **Best** (the best quartile) =
  the best-performing 25% of agencies reported
  performance at or above that value
- **Maximum** or **Minimum** =
  the performance of the *best*-performing
  agency in the data set



Below is a sample of how each performance indicator's results are presented in bar chart form in the nationwide comparisons.



Below is a sample of how each performance indicator's results are presented in bar chart form in the statewide comparisons.



PERFORMANCE INDICATORS:
ORGANIZATIONAL DEVELOPMENT

ORGANIZATIONAL BEST PRACTICES

This indicator summarizes how well a utility integrates best practices, as scored on a scale of 1 to 5 as follows:

- 1 – This practice is not practiced
- 2 – This practice is implemented, but only occasionally or without uniformity
- 3 – This practice is implemented, but there is room for substantial improvement
- 4 – This practice is largely implemented, but there is room for improvement
- 5 – This practice is fully implemented

For combined utilities, there are 13 Management Practices against which to measure themselves. For WW-only utilities like Central San, there are 11 Management Practices, which are detailed in the table on the next page. The sum total scores of the Management Practices were averaged and reported as a percent of the total possible scores of 65 for combined utilities or 55 for WW-only utilities, as follows:

$$Organizational\ Best\ Practices\ Score\ for\ \boldsymbol{Combined}\ Utilities = \frac{Total\ Points\ Awarded\ in\ 13\ Categories}{65\ Total\ Points\ Possible}$$

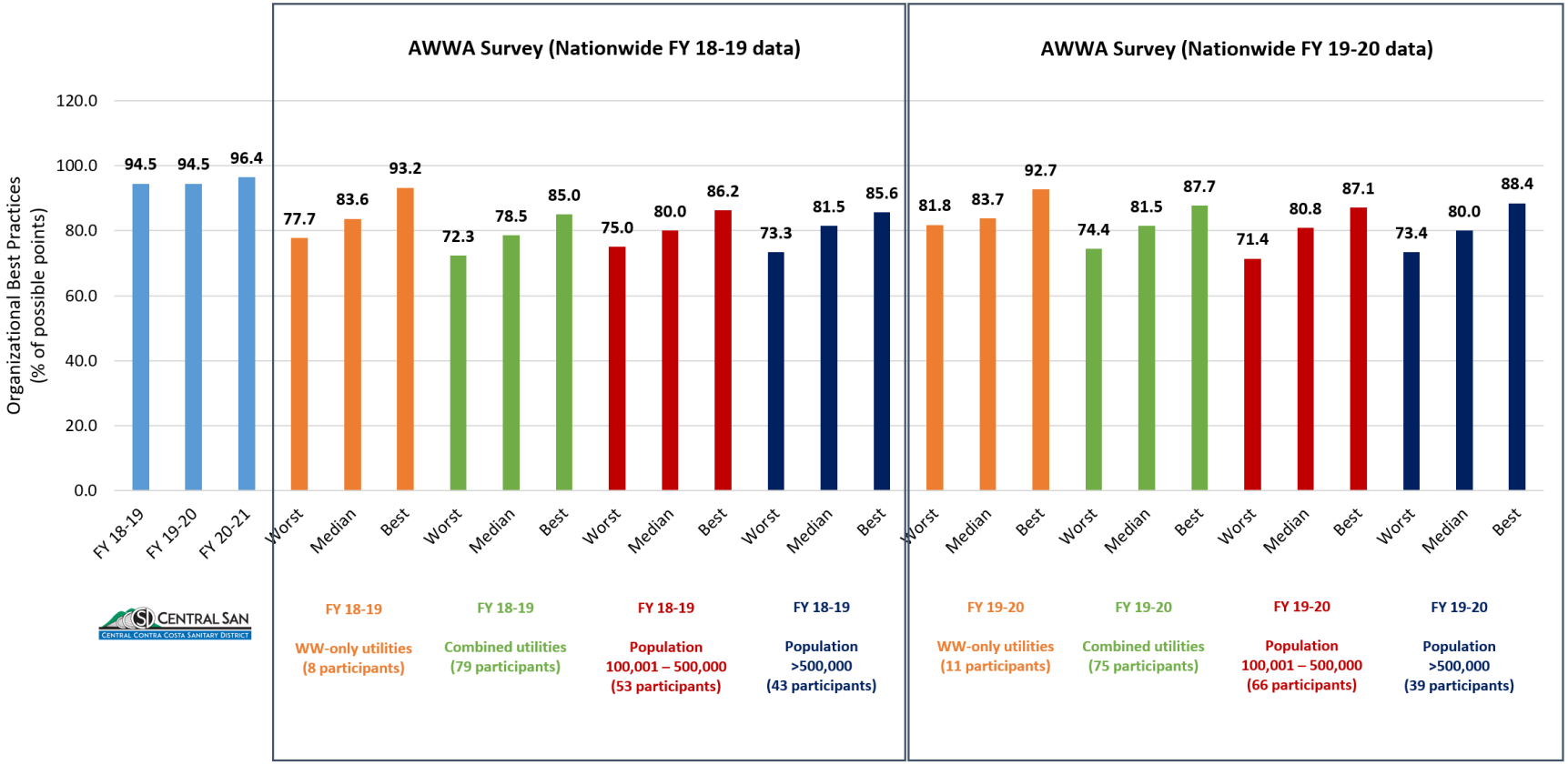
$$Organizational\ Best\ Practices\ Score\ for\ \boldsymbol{WW-only}\ Utilities = \frac{Total\ Points\ Awarded\ in\ 11\ Categories}{55\ Total\ Points\ Possible}$$

Central San Data Calculation Method
This type of self-assessment is necessarily subjective, so AWWA recommended soliciting a collective view to offer as true an assessment as possible. Thus, for Central San's performance figures, the Executive Team Members were asked to score Central San by consensus in each of the 11 Management Practices. The scores over the last three FYs are presented in the following table.

Management Practice	FY 18-19 Scores	FY 19-20 Scores	FY 20-21 Scores
Strategic Planning – a plan is up to date and progress is tracked and reported to the governing body at least annually.	5	5	5
Strategic Plan Implementation – percent of annual goals complete, mission/vision/values established.	5	5	5
Long-Term Financial Planning – annual projection at least five years into the future; all funds are considered and includes analysis of the financial environment, revenue and expenditure forecasts, debt position, and affordability analysis; transparent.	5	5	5
Risk Management Planning – foresee risks, estimate impacts, and define responses to issues.	4	5	5
Performance Measurement System Integration - data is collected, tracked, and evaluated and used to plan, organize, coordinate, communicate, and control performance at the strategic, operational, and individual performance levels.	5	5	5
Optimized Asset Management Program – program output meets a required level of service in the most cost-effective manner through the management of assets for present and future customers and driven by ongoing understanding of condition, risk, and asset criticality.	4	5	5
Customer Involvement Program – effectively sharing information that is important to the customer and utility, compels positive behavior, and achieves common goals.	5	5	5
Governing Body Relations – both governing bodies and staff are clearly acting in the public interest consistent with the requirements of policies and avoiding self-interest.	5	5	5
Succession Planning – a plan that increases the availability of experienced and capable employees that are prepared to assume these roles as they become available. Includes collecting and securing vital institutional knowledge.	4	4	4
Continuous Improvement Program Participation – an ongoing improvement program of processes, products, services, or processes and includes management and staff using a systematic approach to obtaining incremental and breakthrough improvements.	5	4	4
Leadership Effectiveness – leadership engagement, ethical climate, communication effectiveness, and management system use/effectiveness.	5	5	5
% of Possible Points (out of 55 points)	94.5%	96.4%	96.4%

ORGANIZATIONAL BEST PRACTICES

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



STAFFING LEVELS

This is a family of sub-indicators measuring the number of employees in the utility. To reduce bias in utility-to-utility comparisons, the AWWA survey instructed to include the hours of contractor work if that work applies directly to necessary utility functions. AWWA notes that where responses from combined utilities can be segregated by service (water or wastewater), they are presented in comparison with the results of utilities providing the same single service.

- *FTE* – Allocation of employee time equal to 2,080 hours per year based on 40 hours/week and 52 weeks/year. Part-time, temporary, and seasonal employees are converted to FTEs based on their total number of compensated hours divided by 2,080 hours. Consultants are not included in these estimates, and employee time from engineering and construction of new facilities is also not to be counted.

TOTAL FTES

Central San Data Calculation Method
To follow the AWWA methodology to provide comparable data for AWWA's survey, Central San totaled its FTEs with the following components:

- Budgeted District employees – tallied per the Organization Chart
- Non-District employees – calculated by converting temporary employee, student, and intern hours worked per payroll records to FTE equivalents
- Less any FTE equivalent time spent on the following:
  - Recycled Water and Household Hazardous Waste (HHW), to offer a fair comparison to other agencies, assuming most others do not offer such services
  - Construction of new facilities (Capital Projects and portions of Planning & Development Services staff), per Central San's interpretation of AWWA methodology.

The above represents how Central San calculated performance for inclusion in AWWA's nationwide survey. For Central San's statewide survey and the resulting data set, Central San redefined Total FTEs as Average Positions Filled, because the number of average full-time positions filled better represents an agency's staffing level and more accurately acts as the foundation upon which other performance data (e.g., WW processed per employee) may be calculated, assuming other agencies are not adjusting other performance data to reflect only the Total FTEs reported to AWWA using AWWA's methodology.

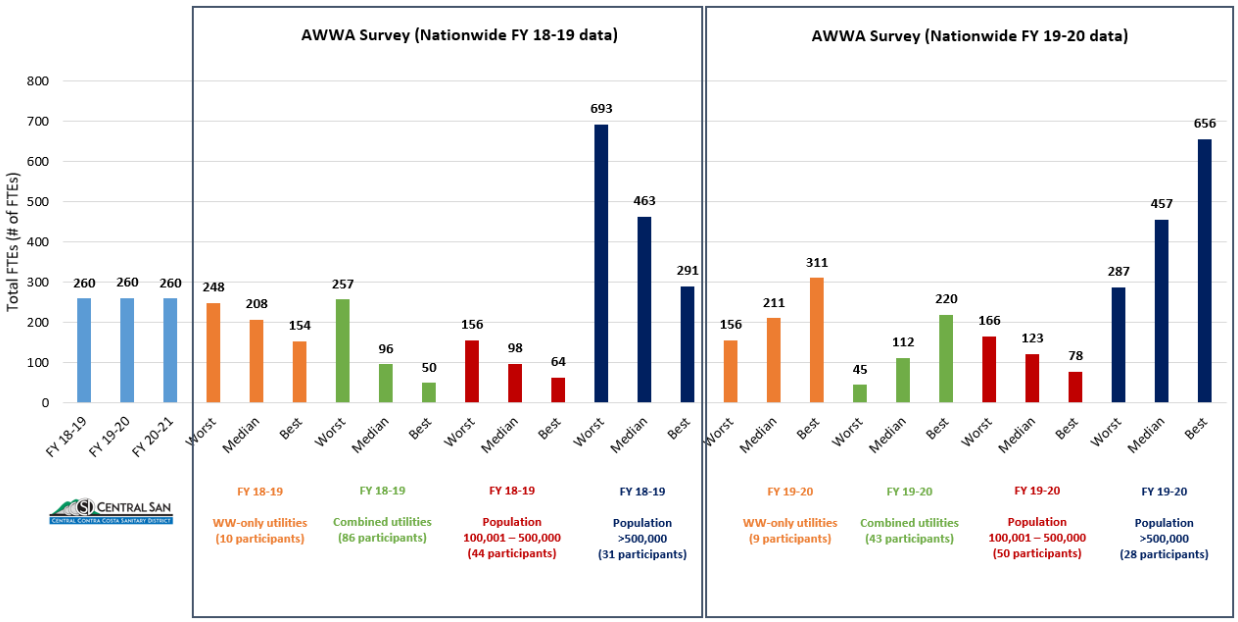
For reference, the following table shows the difference in the Central San FTE counts following AWWA methodology (rounded to whole numbers), represented as Average Positions Filled, and as shown in Central San's Organizational Chart:

Total FTE Methodologies	FY 18-19	FY 19-20	FY 20-21
AWWA Represented in the nationwide comparison bar chart. This FTE count follows the AWWA methodology, thus is the most comparable to the Total FTEs reported in the AWWA nationwide survey.	260	260	260
Average Positions Filled Represented in the statewide comparison bar chart. This FTE count is the average number of District employees working throughout the FY. For "per employee" performance indicators where the data was only available for all District employees, these values were used in the calculations as FTE counts to more accurately represent Central San's performance.	282	277	276
As Shown in Organizational Chart Not represented in any comparison bar chart. This information is provided to demonstrate the difference in following the AWWA methodology in Central San's counting staffing levels or using Average Positions Filled versus simply providing the total employees listed on the Organizational Chart.	290	292	291

TOTAL FTEs

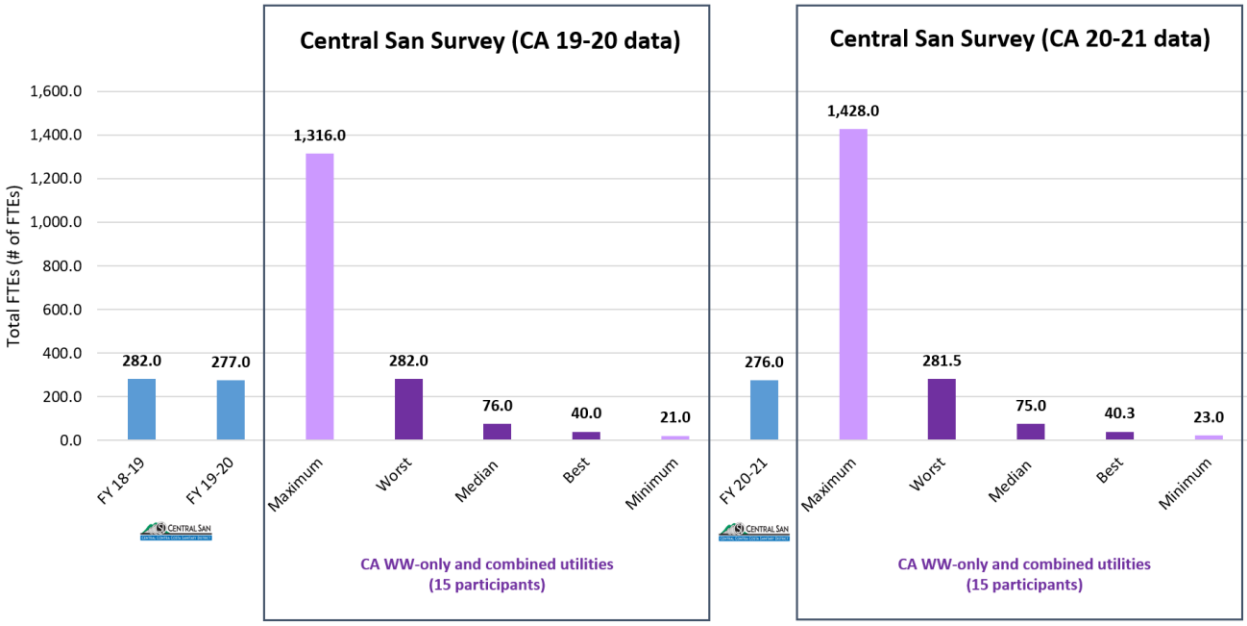
Central San vs. Nationwide (*FYs 18-19 and 19-20* data)

For comparison purposes, Central San's total FTEs using the AWWA calculation methodology is represented in this chart.



Central San vs. CA* (*FYs 19-20 and 20-21* data)

For comparison purposes, Central San's total FTEs using Average Positions Filled is represented in this chart.



* The CA agency data set makes no distinction between agencies that provide dual services (combined utilities), are retail agencies, or are agencies that are part of a larger operation. These differences could have an impact on the number of FTEs. For example, wholesale utilities may not include FTEs of other agencies that maintain the collection system which feeds their treatment plant, and WW enterprises that operate as part of a larger agency may be undercounting the centralized administrative staff of the larger agency.

FTEs – O&M
FTEs – MANAGEMENT, ENGINEERING, CUSTOMER SERVICE, OTHER

The next sub-indicators break out the total FTEs into two categories: 1) **O&M** and 2) **Management, Engineering, Customer Service, Other**. These indicators are expressed as a percentage of the employees in those job classifications out of the total number of FTEs, as follows:

$$FTEs\ (percentage\ of\ total\ FTEs) = \frac{Number\ of\ FTEs\ in\ given\ category}{Total\ number\ of\ FTEs}$$

While this benchmark is expressed as a percentage, below are the number of FTEs in this category, following AWWA methodology, provided as a reference:

Central San **# of FTEs** in O&M		
FY 18-19	**FY 19-20**	**FY 20-21**
136.7	138.7	137.0

Central San **# of FTEs** in Management, Engineering, Customer Service, Other		
FY 18-19	**FY 19-20**	**FY 20-21**
123.0	121.4	122.8

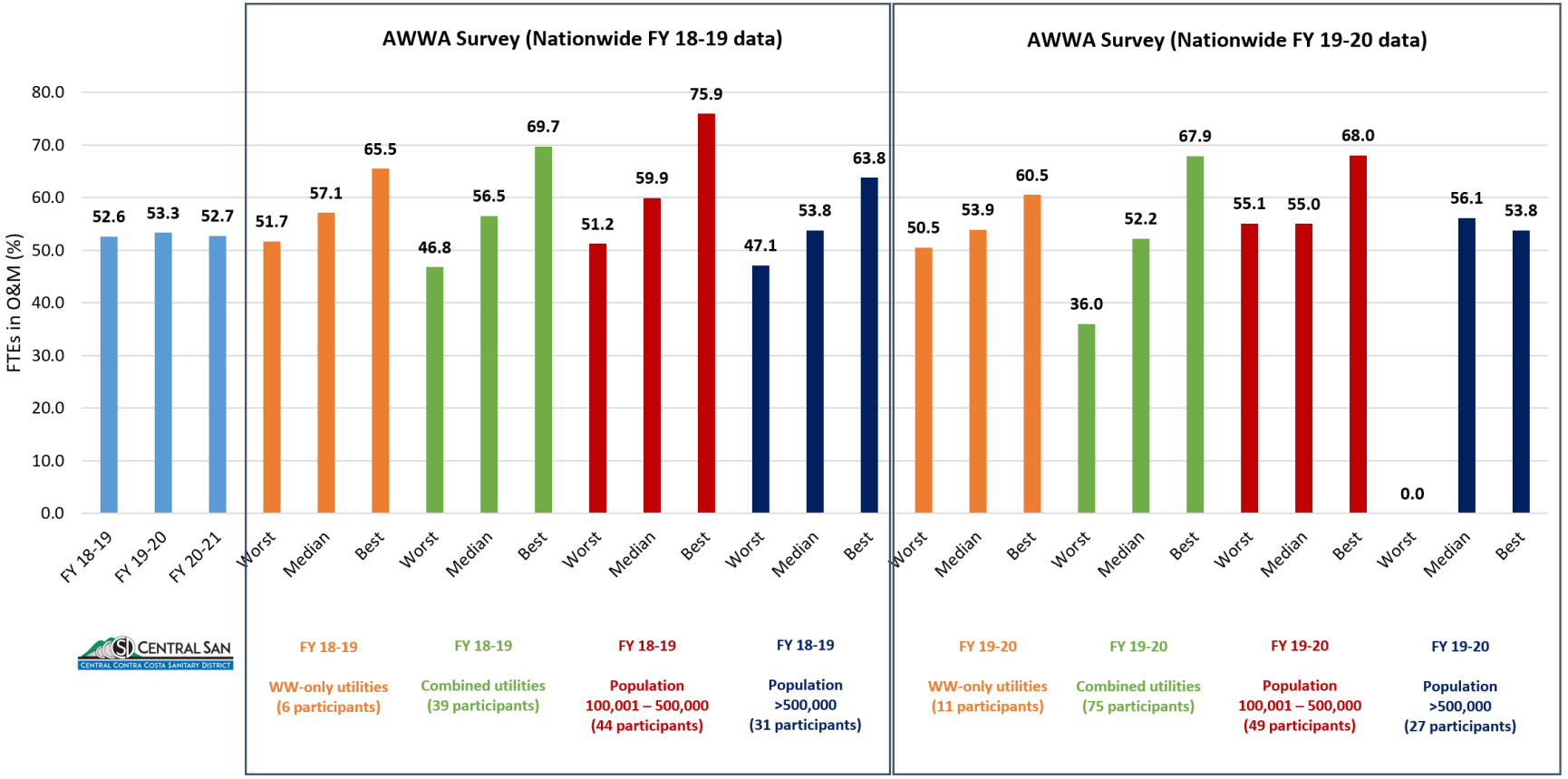
Further data on staffing levels, including the percentages of total FTEs of employees dedicated to each subcategory, can be found in the Appendix: Staffing Levels by Category and Appendix: Management, Engineering, Customer Service, and Other Staffing Levels by Subcategory sections.

Central San Data Calculation Method / Commentary
It should be noted that the definitions and categories for the staffing categories are somewhat ambiguously written; that is, they are subject to interpretation which could lead to inconsistent conclusions utility to utility. For example, it is unclear whether a manager who works in WW collection or treatment (which fall under the AWWA "O&M" category) should be counted in O&M or the other category, which includes "Management" in its title. Central San counted those Managers as partially (fraction of an FTE) "O&M" and partially "Management, Engineering, Customer Service, Other."

FTEs – *O&M*

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)

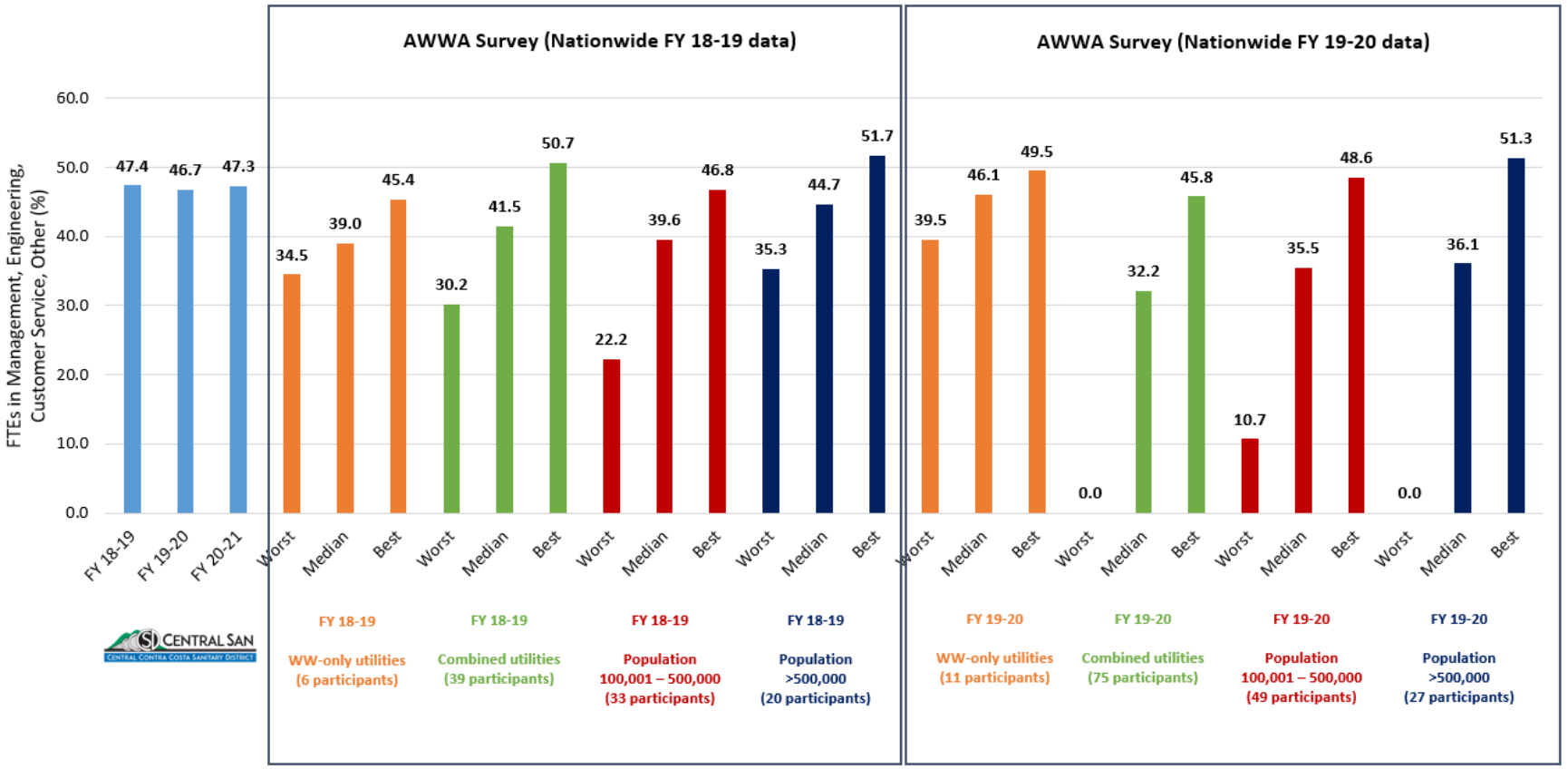
The chart below shows the percentage of FTEs dedicated to O&M, as opposed to the other category of Management, Engineering, Customer Service, Other.



FTEs – MANAGEMENT, ENGINEERING, CUSTOMER SERVICE, OTHER

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)

The chart below compares the percentage of FTEs dedicated to Management, Engineering, Customer Service, Other, as opposed to the other category of O&M.



TRAINING

This indicator measures the amount of training that employees receive, expressed as the annual number of training hours per FTE, as follows:

$$Training\ (\frac{hours}{employee}) = \frac{Total\ training\ hours\ completed\ by\ all\ employees\ during\ the\ reporting\ period}{Total\ number\ of\ FTEs}$$

- *Training* – meets at least one of the following descriptions:
  - A professionally developed program or session with a fixed agenda that is offered on- or off-site during compensated working hours
  - The classroom and study portions of a formal apprenticeship program completed during compensated work hours
  - A compensated training or related educational program, including an apprenticeship program, completed by an employee during nonwork hours. An apprenticeship program is a formal program designed to prepare an individual for journeyman status in any of several job categories.

- Training includes technical training, certification training, apprenticeship training, employee skill and development training, attendance at professional seminars and conferences, and college classes during the reporting period. Training is not limited to events for which continuing education credits are awarded. Training does not include initial on-the-job training for new hires and promotions.

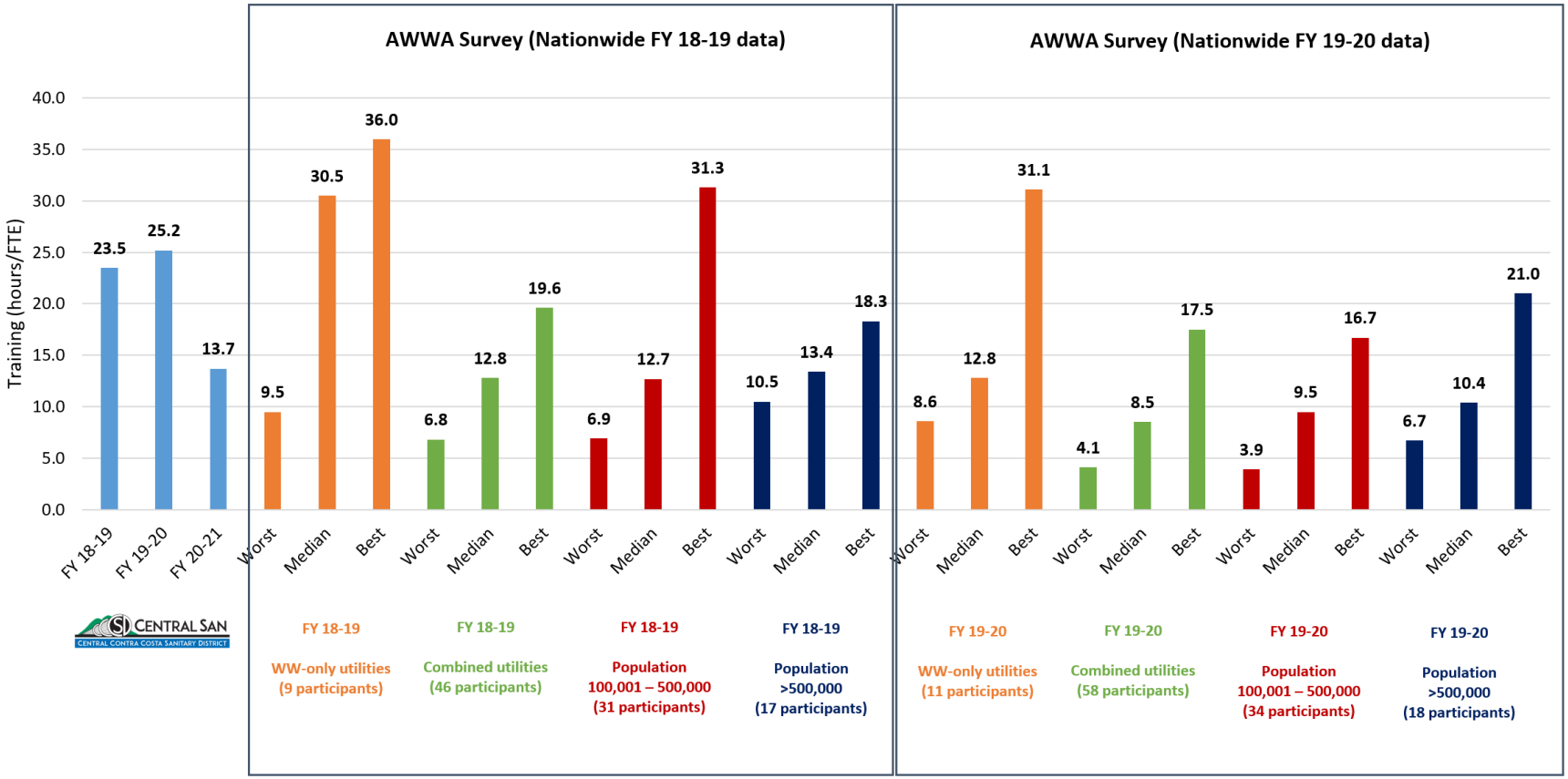
- Total training time includes all hours spent at the event from opening to closing, including all scheduled breaks. Travel time to and from the event and associated travel planning are not included. The trainer's time is not to be included in estimates of total training time.

Central San Data Calculation Method

In the absence of a comprehensive learning management system, Central San data may be incomplete. Generally, the reported hours include technical training, certification training, skills and development training, attendance at professional seminars and conference, Safety Tailgates, and Human Resources (HR) Brown Bags. They do not include college classes. Because adjustments were not made to exclude training hours completed by HHW, Recycled Water, Capital Projects, or construction of new facilities staff, the total number of FTEs used was the Average Positions Filled, not the number of FTEs reported in the Staffing Levels performance indicator using AWWA methodology.

TRAINING

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



EMERGENCY RESPONSE READINESS TRAINING

This indicator measures the amount of emergency response training, including safety training, received by all employees, calculated as follows:

$$Emergency\ response\ readiness\ training\ (\frac{hours}{employee}) = \frac{Total\ emergency\ response\ readiness\ training\ hours\ completed\ by\ all\ employees\ during\ the\ reporting\ period}{Total\ number\ of\ FTEs}$$

- *Emergency response readiness training* – includes formal training by all employees for emergencies as defined by a utility's emergency response plan(s), including safety training.

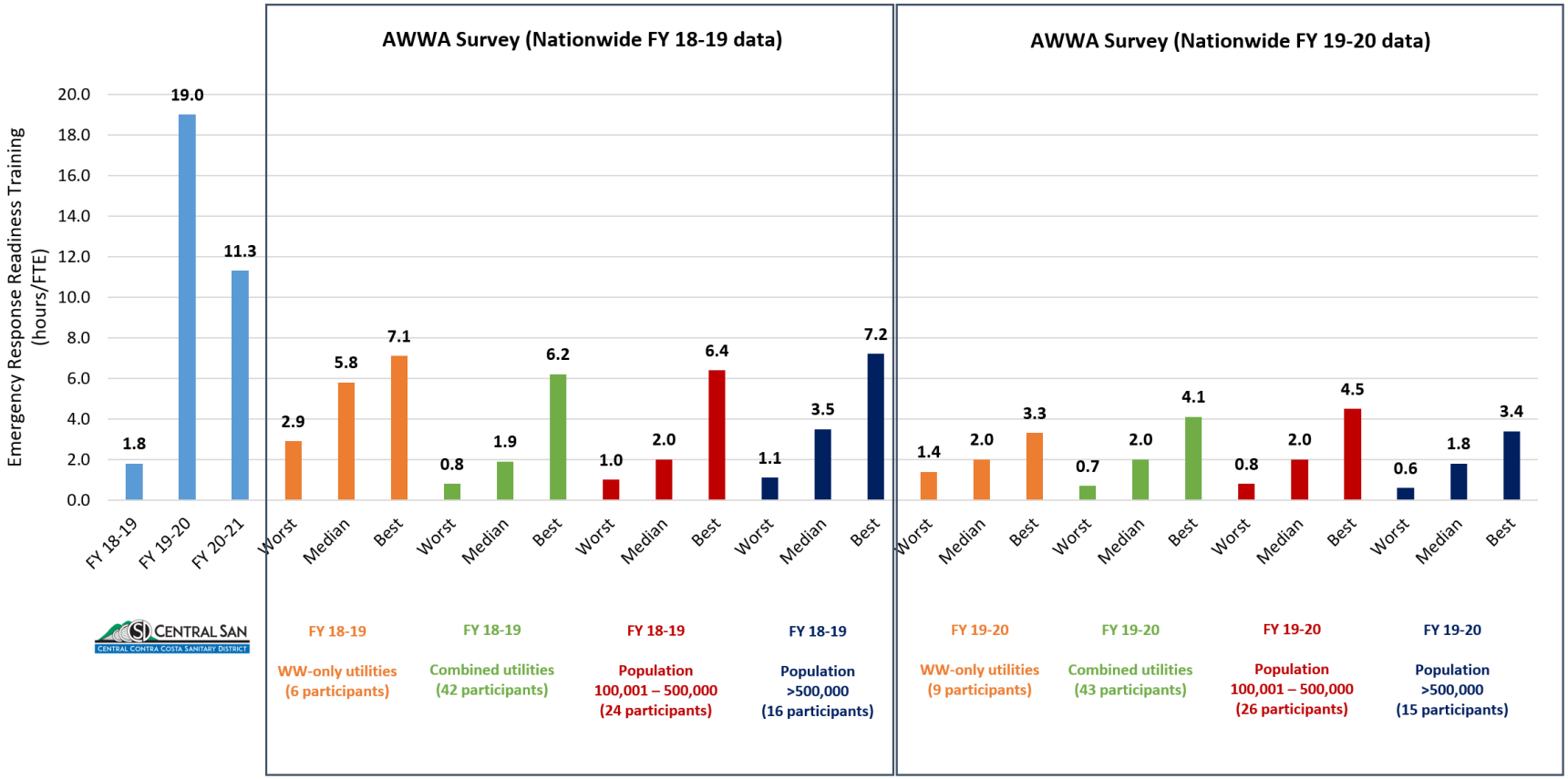
Central San Data Calculation Method

For Central San, the hours reported exclude preventive classes (e.g., the hours include fire extinguisher training but not fire prevention) and represent trainings conducted by both the Risk Management and Safety divisions. The FY 19-20 hours reported include estimated hours spent on practical exercises in response to the COVID-19 pandemic that were not needed in previous years, including time spent by employees reading emailed directives, the Pandemic Preparedness Plan, and the COVID-19 Exposure Prevention Plan, as well as time spent by remote workers getting trained on teleworking practices. These hours spent by staff prepare Central San for another pandemic or a natural disaster requiring procedural changes or a significant transfer of staff to offsite locations.

Because adjustments were not made to exclude emergency response readiness training hours completed by HHW, Recycled Water, Capital Projects, or construction of new facilities staff, the total number of FTEs used was the Average Positions Filled, not the number of FTEs reported in the Staffing Levels performance indicator using AWWA methodology.

EMERGENCY RESPONSE READINESS TRAINING

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



EMPLOYEE TURNOVER

This indicator quantifies annual employee departures per year normalized by the utility's workforce, expressed as the number of regular employee departures as a percentage of total FTEs, calculated as follows:

$$Employee\ turnover\ (\%\ of\ total\ employees) = \frac{Number\ of\ regular\ employee\ departures\ during\ the\ reporting\ period}{Total\ number\ of\ FTEs}$$

- *Regular employees* – those who worked more than 1,000 hours during the reporting period, including contractor work if it applies directly to necessary utility functions (to reduce bias in utility-to-utility comparisons).

- *Regular employee departures* – includes employees who leave voluntarily, retire, or are let go during the reporting period. Regular employees are those who worked more than 1,000 hours during the reporting period.

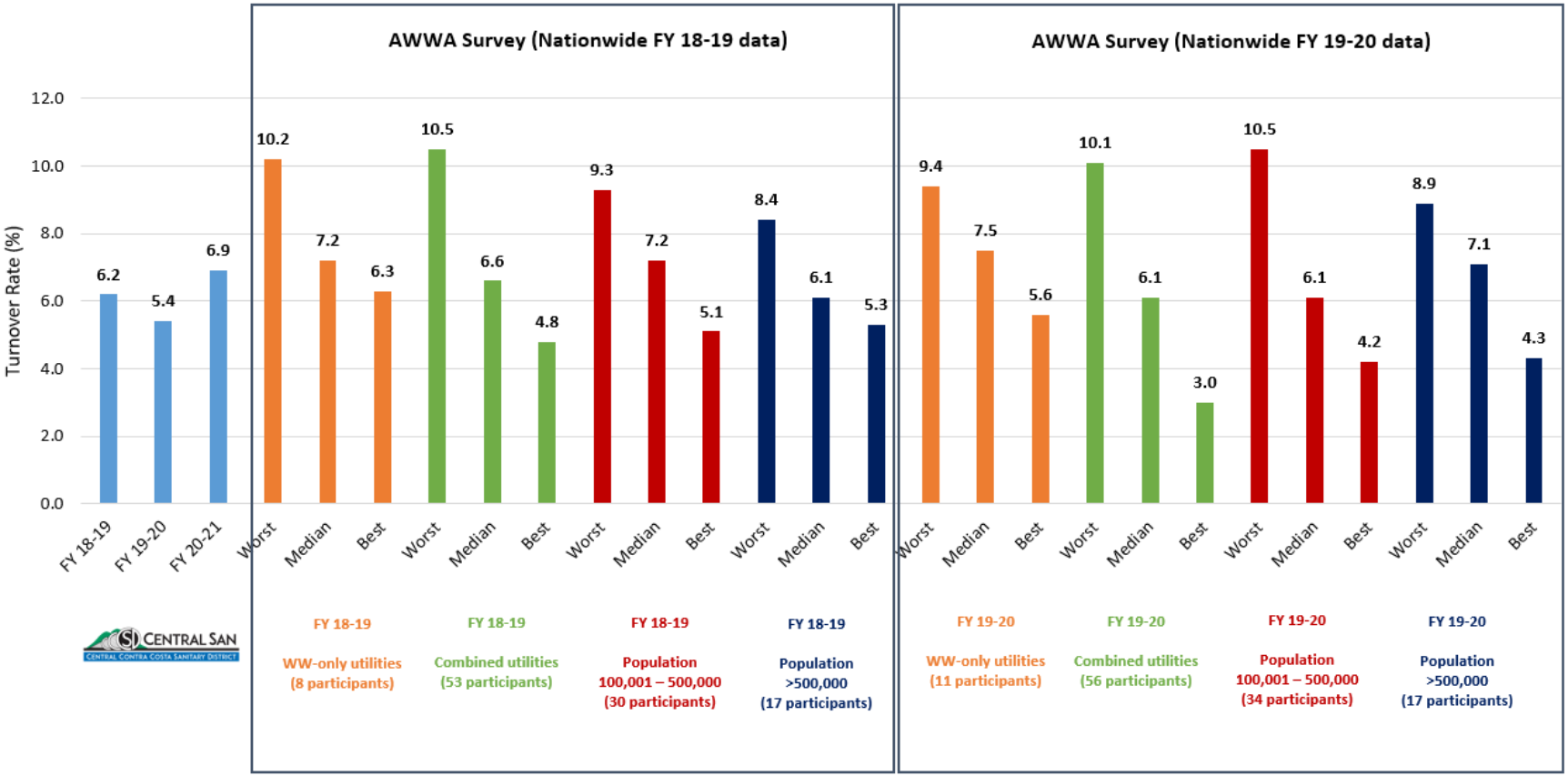
This benchmark prompts respondents to include retirements in employee departures. Below are the turnover rates including and excluding retirements, provided as a reference:

Turnover Rates	FY 18-19	FY 19-20	FY 20-21
Including Retirements (comparable data for benchmarking and represented in both nationwide and statewide comparison bar charts)	6.2%	5.4%	6.9%
Excluding Retirements (comparable data for benchmarking and represented in statewide comparison bar charts)	2.8%	0.7%	2.2%

Central San Data Calculation Method
Because adjustments were not made to exclude departing employees from HHW, Recycled Water, Capital Projects, or construction of new facilities, the total number of FTEs used was Average Positions Filled, not the number of FTEs reported in the Staffing Levels performance indicator using AWWA methodology. This also provides more alignment with how Central San has reported this figure in the past, outside this study.

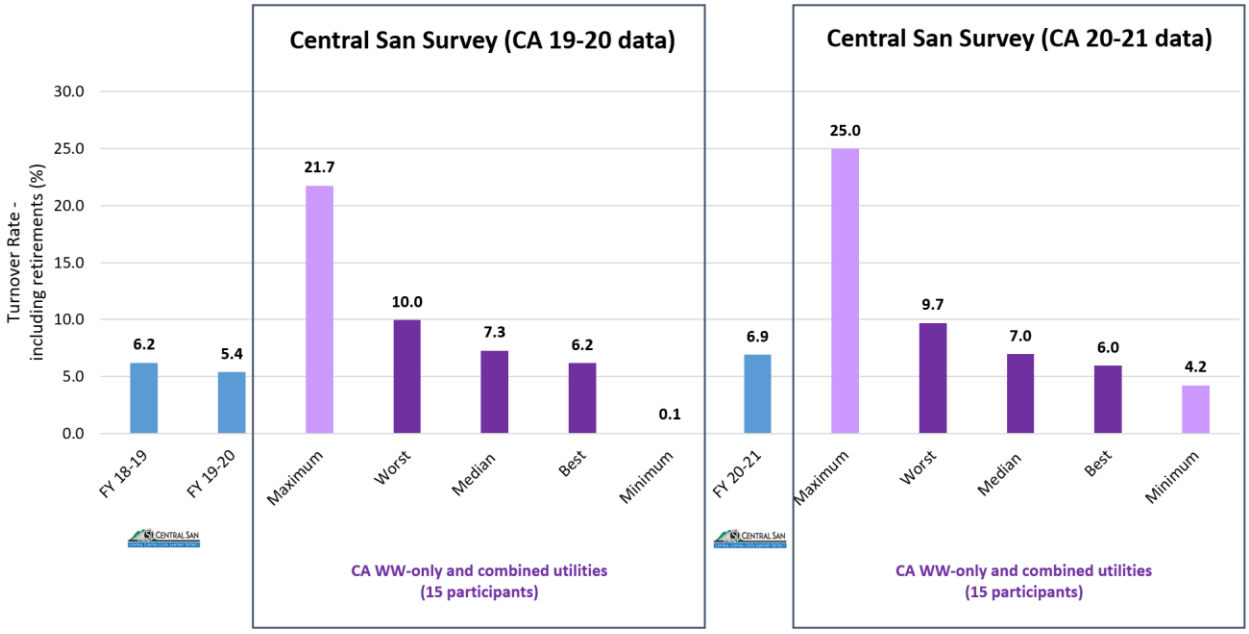
EMPLOYEE TURNOVER

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



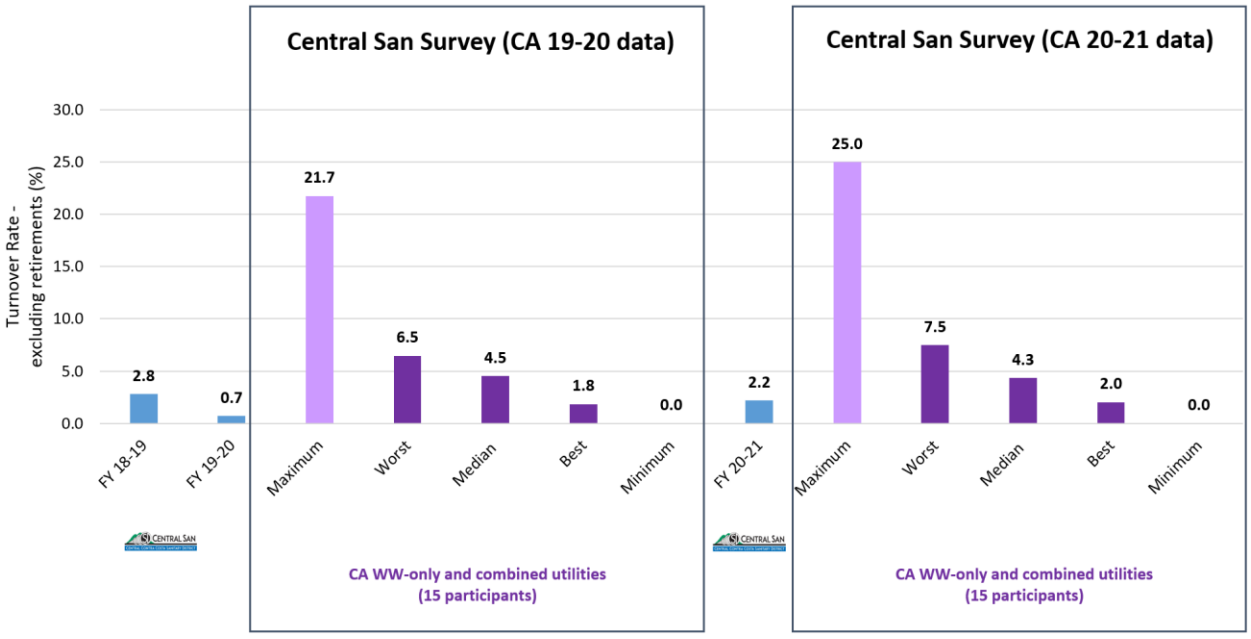
EMPLOYEE TURNOVER – INCLUDING RETIREMENTS

Central San vs. CA (*FYs 19-20 and 20-21* Data)



EMPLOYEE TURNOVER – EXCLUDING RETIREMENTS

Central San vs. CA (*FYs 19-20 and 20-21* Data)



RETIREMENT ELIGIBILITY

This indicator measures the number of regular employees eligible for retirement normalized by the utility's workforce, expressed as a percent and calculated as follows:

$$Retirement\ eligibility\ (\%\ of\ total\ employees) = \frac{Number\ of\ regular\ employees\ eligible\ for\ retirement\ in\ the\ next\ five\ years}{Total\ number\ of\ FTEs}$$

- *Retirement eligibility* – based on known eligibility from age and employment history according to a utility's retirement program and policies. An individual's eligibility to receive employer contributions is determined by whether he or she has satisfied the age and service requirements, and both early and regular retirement are to be included.

- *Regular employees* – those who worked more than 1,000 hours during the reporting period, including contractor work if it applies directly to necessary utility functions (to reduce bias in utility-to-utility comparisons).

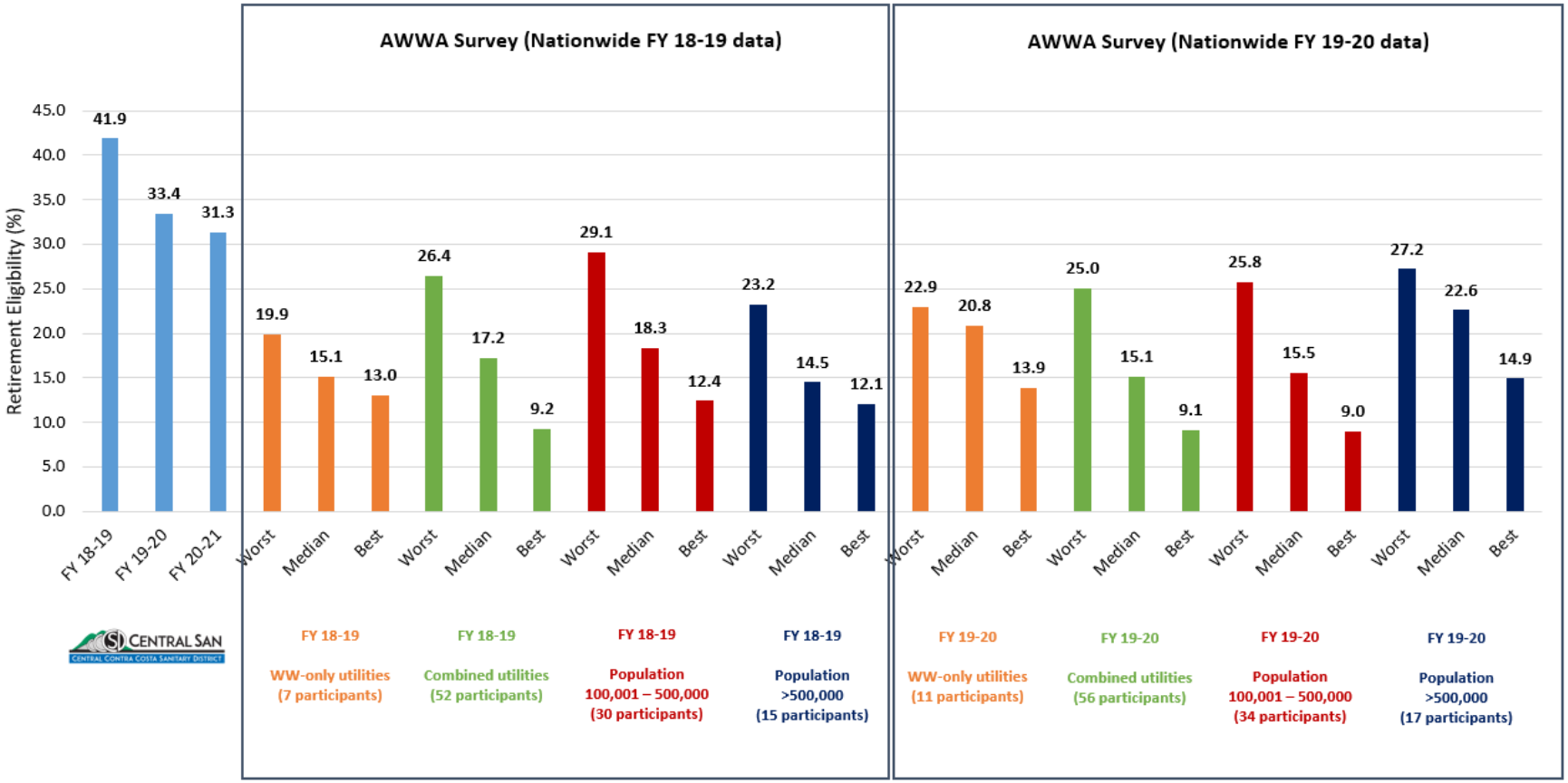
Central San Data Calculation Method
For Central San, the number of employees eligible for retirement in the next five years includes the employees who meet the following parameters:

- Age 55 with 10 years of service ("55/10") (for FY 20-21, this means by June 30, 2026)
- Age 62 with 10 years of service ("62/10") for Public Employees' Pension Reform Act (PEPRA) employees whose formula hits 2% (for FY 20-21, this means by June 30, 2026). This percent is the age factor in the following equation used to calculate retirement benefits: *Final Average Salary X Years of Service X Age Factor.*

Because adjustments were not made to exclude employees eligible for retirement in HHW, Recycled Water, Capital Projects, or construction of new facilities, the total number of FTEs used was the Average Positions Filled, not the number of FTEs reported in the Staffing Levels performance indicator using AWWA methodology. This provides a more accurate representation of Central San's workforce.

RETIREMENT ELIGIBILITY

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



RECORDABLE INCIDENT RATE

This indicator identifies the number of recordable incidents of injury or illness for a utility, which can be useful to help determine potential problem areas and processes for preventing work-related injuries and illnesses. This is calculated as follows:

$$Recordable\ Incident\ Rate = \frac{Number\ of\ recordable\ injuries\ and\ illnesses\ x\ 200{,}000\ hours}{Total\ hours\ worked\ by\ all\ employees}$$

The 200,000 hours in the formula represents the equivalent of 100 employees working 40 hours per week, 50 weeks per year, and provides the standard base for the incidence rates.

Central San Data Calculation Method
Central San used the following Occupational Safety and Health Administration (OSHA) definition in calculating its recordable incidents:

- *Recordable incidents* – work-related and resulting in death, loss of consciousness, days away from work, restricted work activity or job transfer medical treatment (beyond first aid), and significant work-related injuries or illnesses that are diagnosed by a physician or other licensed health care professional.

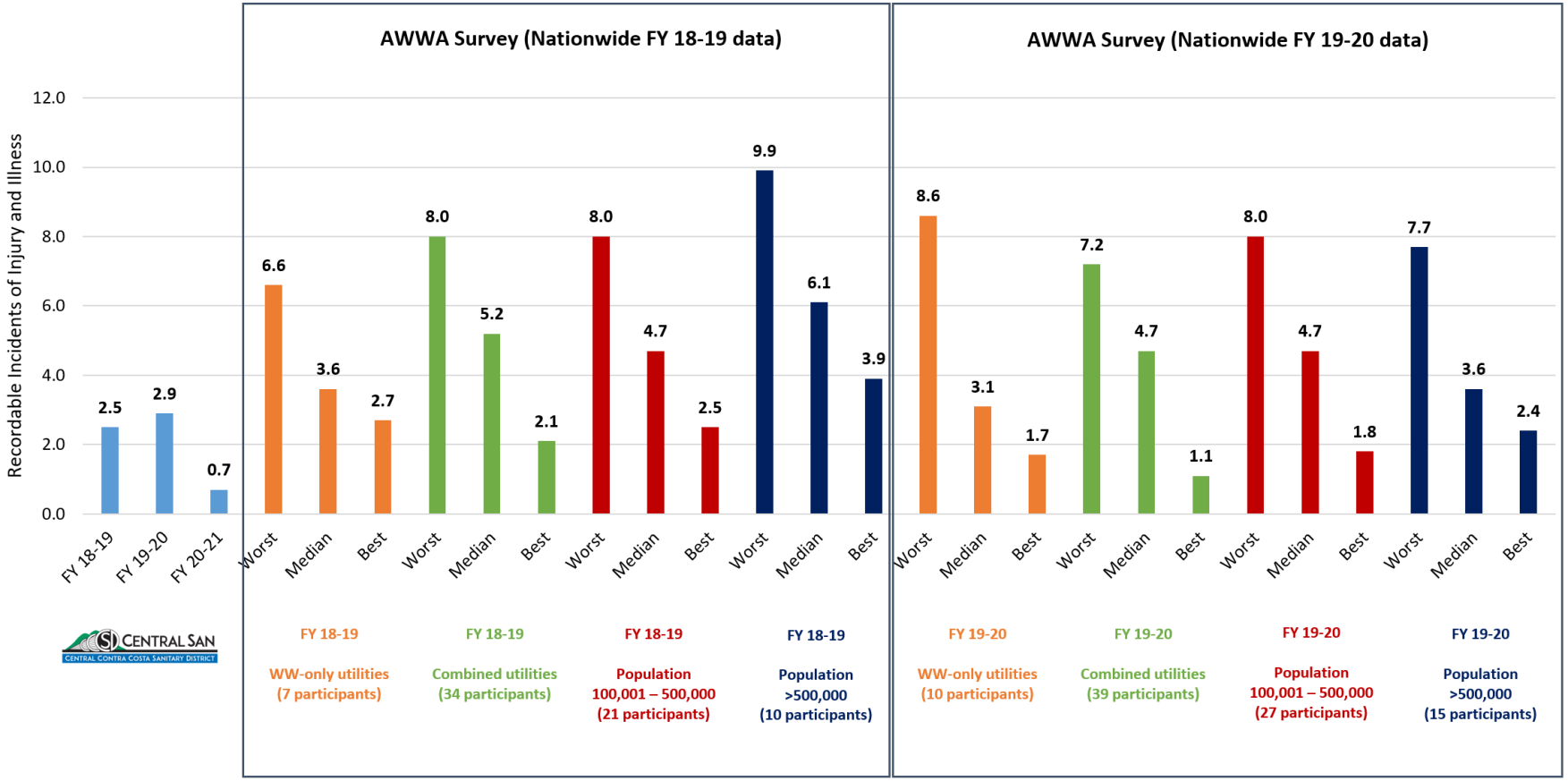
No adjustments were made to remove recordable injuries and illnesses, or employee hours worked by employees in HHW, Recycled Water, Capital Projects, and construction of new facilities.

Central San's numbers of recordable injuries and illnesses are as follows, provided as reference:

FY 18-19	FY 19-20	FY 20-21
7	8	2

RECORDABLE INCIDENT RATE

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



NEAR MISSES

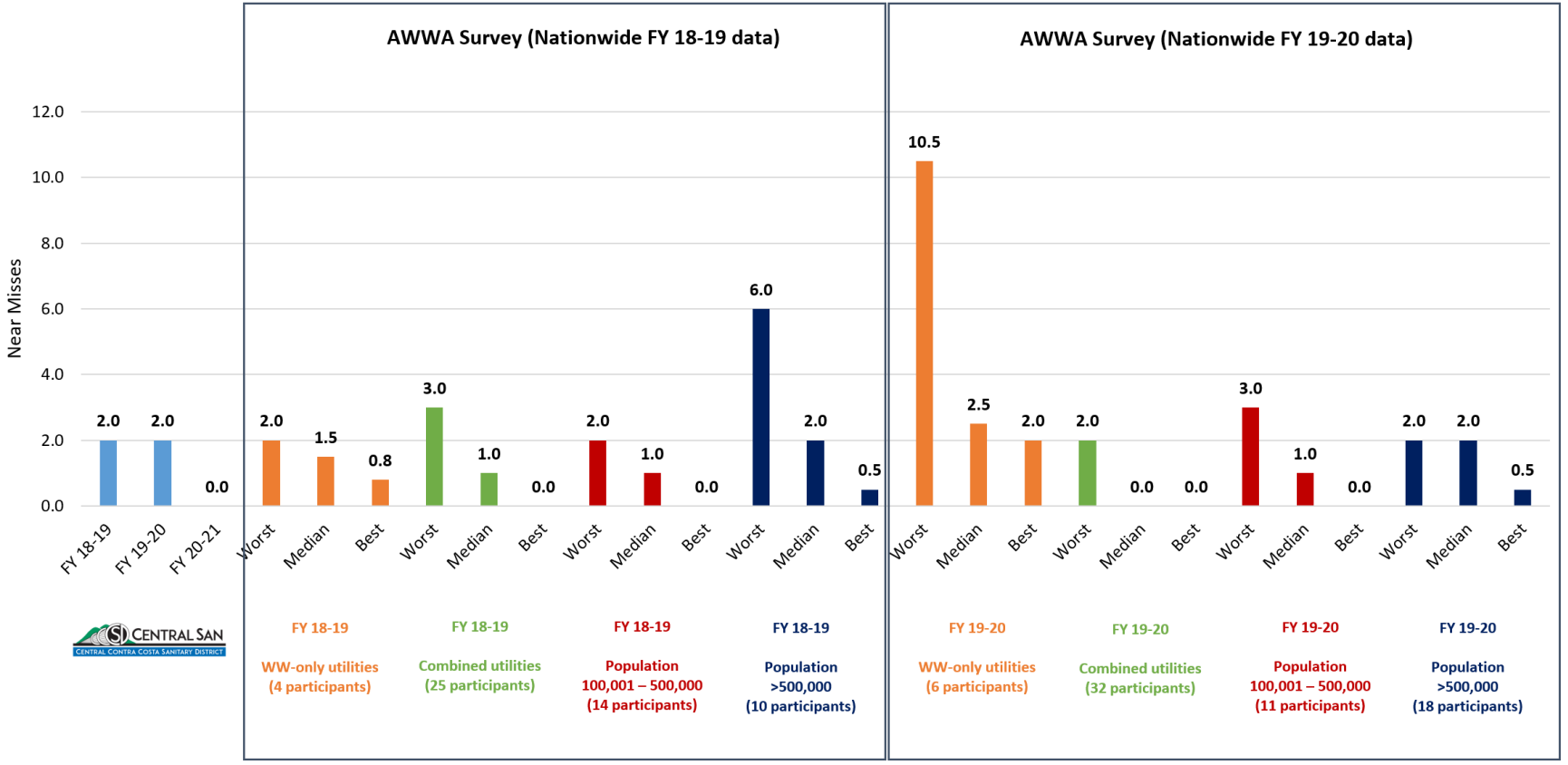
This indicator, along with Recordable Incident Rate, is a proactive means for utilities to anticipate, respond to, and avoid problems. This indicator also aligns with the Effective Utility Management (EUM) attribute on Enterprise Resiliency and provides an opportunity to identify, assess, and establish tolerance levels to effectively manage business risks and system reliability goals.

- *Near miss* – an unsafe situation or condition where no personal injury was sustained and no property was damaged, but where, given a slight shift in time or position, injury and/or damage could have occurred.

Central San Data Calculation Method
The reported number of near misses for Central San is the number of near miss reports filed District wide. No adjustments were made to remove near misses reported by employees in HHW, Recycled Water, Capital Projects, and construction of new facilities.

NEAR MISSES

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



STRATEGIC WORKFORCE PLANNING

The following family of sub-indicators provides a measure of a utility's ability to prepare for the changing workforce – particularly, how well a utility has developed and incorporated succession planning. These sub-indicators were identified by industry leaders as fundamental factors that a utility could use to help define their level of performance, ability to maintain a qualified workforce, and continue to provide efficient operations. For the sub-indicators, the following levels of performance were identified, with Level 5 being the greatest level of utility support provided.

- Level 1 – This activity is **never** practiced at our utility.
- Level 2 – This activity is implemented **infrequently**.
- Level 3 – This activity is implemented **sometimes**.
- Level 4 – This activity is implemented **frequently**.
- Level 5 – This activity is implemented **always**.

Central San Data Calculation Method
Central San was scored by the Deputy General Manager in FY 18-19 and by the Human Resources and Organizational Development Manager in FYs 19-20 and 20-21.

Central San's performance over the last three FYs in each of the sub-indicators is below:

Strategic Workforce Planning Sub-Indicator	Central San		
	FY 18-19	FY 19-20	FY 20-21
Level of Strategic Workforce Planning: Succession plan is an integral part of our organization's comprehensive strategic plan.	5	5	5
Level of Current Plan Implemented: Knowledge management process is up to date and most important staffing tool.	4	4	4
Level of Decision-Maker Commitment: There is a commitment from decision makers on succession planning.	5	5	5
Level of Resources and Collaboration: Gather resources for developing and implementing succession planning; collaborate with other agencies and programs.	4	5	5
Role in Strategic Vision and Goals: Value the role of succession planning in achieving the strategic vision and goals of our organization.	5	5	5

The following are explanations of the sub-indicators and the nationwide performance in FYs 18-19 and 19-20 (percentage of participants reporting the levels as indicated in the charts), with Central San's performance for that FY noted for reference, and Central San's FY 20-21 performance below each chart.

LEVEL OF STRATEGIC WORKFORCE PLANNING

Succession plan is an integral part of the organization's comprehensive strategic plan.

Central San vs. Nationwide (*FY 18-19* data)

Utility Type	FY 18-19					Participants
	Level 1	Level 2	Level 3	Level 4	Level 5 CENTRAL SAN	
WW-only	0%	0%	37%	38%	25%	8
Combined	0%	7%	33%	33%	27%	67
Population 100,001-500,000	0%	2%	36%	32%	30%	44
Population >500,000	0%	12%	22%	37%	29%	41

Central San vs. Nationwide (*FY 19-20* data)

Utility Type	FY 19-20					Participants
	Level 1	Level 2	Level 3	Level 4	Level 5 CENTRAL SAN	
WW-only	0%	0%	18%	45%	36%	11
Combined	0%	13%	23%	39%	25%	64
Population 100,001-500,000	0%	8%	26%	38%	28%	52
Population >500,000	0%	17%	35%	37%	12%	36

CENTRAL SAN performance for FY 20-21: **Level 5**

LEVEL OF CURRENT PLAN IMPLEMENTED

Knowledge management process is up to date and the most important staffing tool.

Central San vs. Nationwide (*FY 18-19* data)

Utility Type	FY 18-19					Participants
	Level 1	Level 2	Level 3	Level 4 CENTRAL SAN	Level 5	
WW-only	0%	0%	50%	50%	0%	8
Combined	4%	14%	45%	28%	9%	64
Population 100,001-500,000	0%	14%	43%	31%	12%	44
Population >500,000	1%	18%	53%	23%	5%	41

Central San vs. Nationwide (*FY 19-20* data)

Utility Type	FY 19-20					Participants
	Level 1	Level 2	Level 3	Level 4 CENTRAL SAN	Level 5	
WW-only	0%	0%	27%	73%	0%	11
Combined	0%	19%	34%	35%	11%	62
Population 100,001-500,000	0%	17%	35%	37%	12%	52
Population >500,000	0%	23%	40%	31%	6%	36

CENTRAL SAN performance for FY 20-21: **Level 4**

LEVEL OF DECISION-MAKER COMMITMENT

There is a commitment from decision makers on succession planning.

Central San vs. Nationwide (*FY 18-19* data)

Utility Type	FY 18-19					Participants
	Level 1	Level 2	Level 3	Level 4	Level 5 (Central San)	
WW-only	0%	0%	37%	13%	50%	8
Combined	0%	6%	37%	30%	27%	67
Population 100,001-500,000	0%	2%	41%	25%	32%	44
Population >500,000	2%	10%	29%	27%	32%	41

Central San vs. Nationwide (*FY 19-20* data)

Utility Type	FY 19-20					Participants
	Level 1	Level 2	Level 3	Level 4	Level 5 (Central San)	
WW-only	0%	0%	27%	36%	36%	11
Combined	0%	6%	35%	35%	23%	62
Population 100,001-500,000	0%	6%	35%	31%	29%	52
Population >500,000	0%	6%	31%	33%	28%	36

Central San performance for FY 20-21: **Level 5**

LEVEL OF RESOURCES AND COLLABORATION

The organization gathers resources for developing and implementing succession planning and collaborates with other agencies and programs.

Central San vs. Nationwide (*FY 18-19* data)

Utility Type	FY 18-19					Participants
	Level 1	Level 2	Level 3	Level 4 (Central San)	Level 5	
WW-only	0%	12%	50%	25%	13%	8
Combined	7%	23%	32%	23%	15%	66
Population 100,001-500,000	5%	23%	37%	23%	12%	44
Population >500,000	7%	17%	32%	27%	17%	41

Central San vs. Nationwide (*FY 19-20* data)

Utility Type	FY 19-20					Participants
	Level 1	Level 2	Level 3	Level 4	Level 5 (Central San)	
WW-only	0%	9%	36%	36%	18%	11
Combined	7%	23%	33%	28%	8%	60
Population 100,001-500,000	0%	27%	31%	25%	14%	52
Population >500,000	0%	23%	31%	34%	6%	36

Central San performance for 20-21: **Level 5**

ROLE IN STRATEGIC VISION AND GOALS

The organization values the role of succession planning in achieving the strategic vision and goals of the organization.

Central San vs. Nationwide (*FY 18-19* data)

Utility Type	FY 18-19					Participants
	Level 1	Level 2	Level 3	Level 4	Level 5 CENTRAL SAN	
WW-only	0%	0%	25%	25%	50%	8
Combined	1%	5%	30%	22%	42%	67
Population 100,001-500,000	0%	7%	32%	18%	43%	44
Population >500,000	2%	5%	15%	29%	49%	41

Central San vs. Nationwide (*FY 19-20* data)

Utility Type	FY 19-20					Participants
	Level 1	Level 2	Level 3	Level 4	Level 5 CENTRAL SAN	
WW-only	0%	0%	9%	36%	55%	11
Combined	2%	2%	28%	27%	42%	64
Population 100,001-500,000	0%	2%	25%	32%	40%	52
Population >500,000	0%	3%	19%	31%	47%	36

CENTRAL SAN performance for 20-21: **Level 5**

EMPLOYEE VACANCIES

The health of a utility's workforce is an important factor and essential to run an efficient utility. The following family of sub-indicators evaluates how well the utility has established, incorporated, and maintained an effective workforce succession plan. Industry experts, including members of the AWWA Workforce Planning committee, look to several key indicators to evaluate workforce health:

AVERAGE LENGTH OF EMPLOYEE TENURE

(in years)

AVERAGE VACANCY RATE

This provides a snapshot of the number of vacancies open at the time of reporting relative to total budgeted FTEs at the utility. It is a useful measure to track the overall health of an organization by monitoring trends in the organization's operations and the market in general. The average vacancy rate is calculated as follows:

$$Average\ Vacancy\ Rate\ (\%) = \frac{Vacant\ budgeted\ positions}{Total\ budgeted\ positions}$$

AVERAGE LENGTH OF POSITION VACANCIES

This is the average length of time (in days) that employee positions remained vacant. This provides a snapshot of the number of vacancies open relative to the total budgeted FTEs.

Central San Data Calculation Method

To calculate the Average Vacancy Rate, Central San calculated the average of the number of vacant budgeted positions divided by the budgeted positions for each quarter of the FY.

EMPLOYEE INTERNAL PROMOTION RATE

This is the total number of full-time non-entry-level hires resulting from internal promotions relative to the total number of non-entry-level positions filled during the FY. The employee internal promotion rate is calculated as follows:

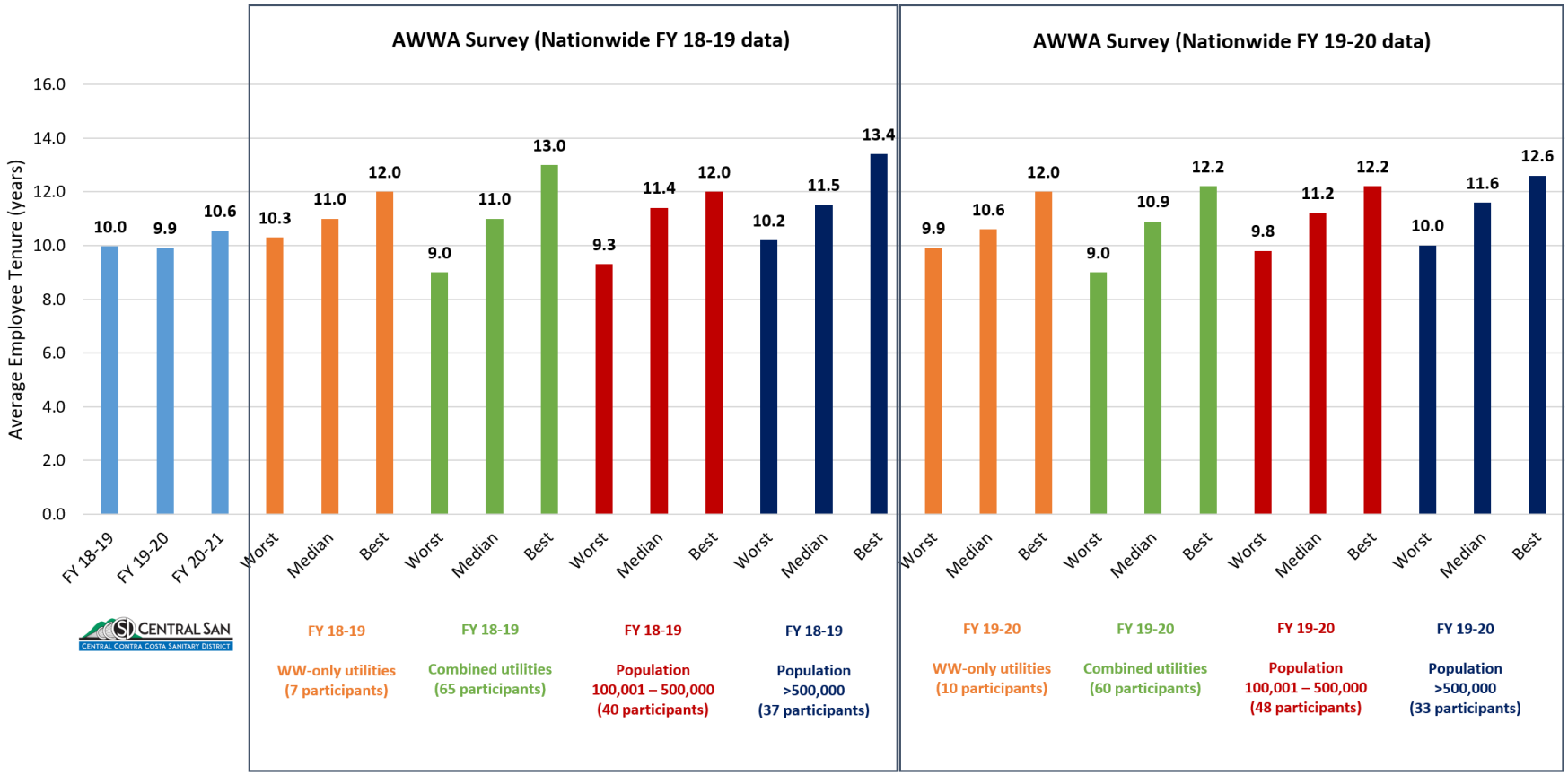
$$Employee\ Internal\ Promotion\ Rate\ (\%) = \frac{Non-entry-level, full-time\ hires\ resulting\ from\ internal\ promotions}{Total\ hires\ for\ non-entry-level\ full-time\ positions}$$

Central San Data Calculation Method (for all Employee Vacancies sub-indicators)

To calculate performance in all these sub-indicators, no adjustments were made to remove data related to employees or positions in HHW, Recycled Water, Capital Projects, and construction of new facilities.

AVERAGE LENGTH OF EMPLOYEE TENURE

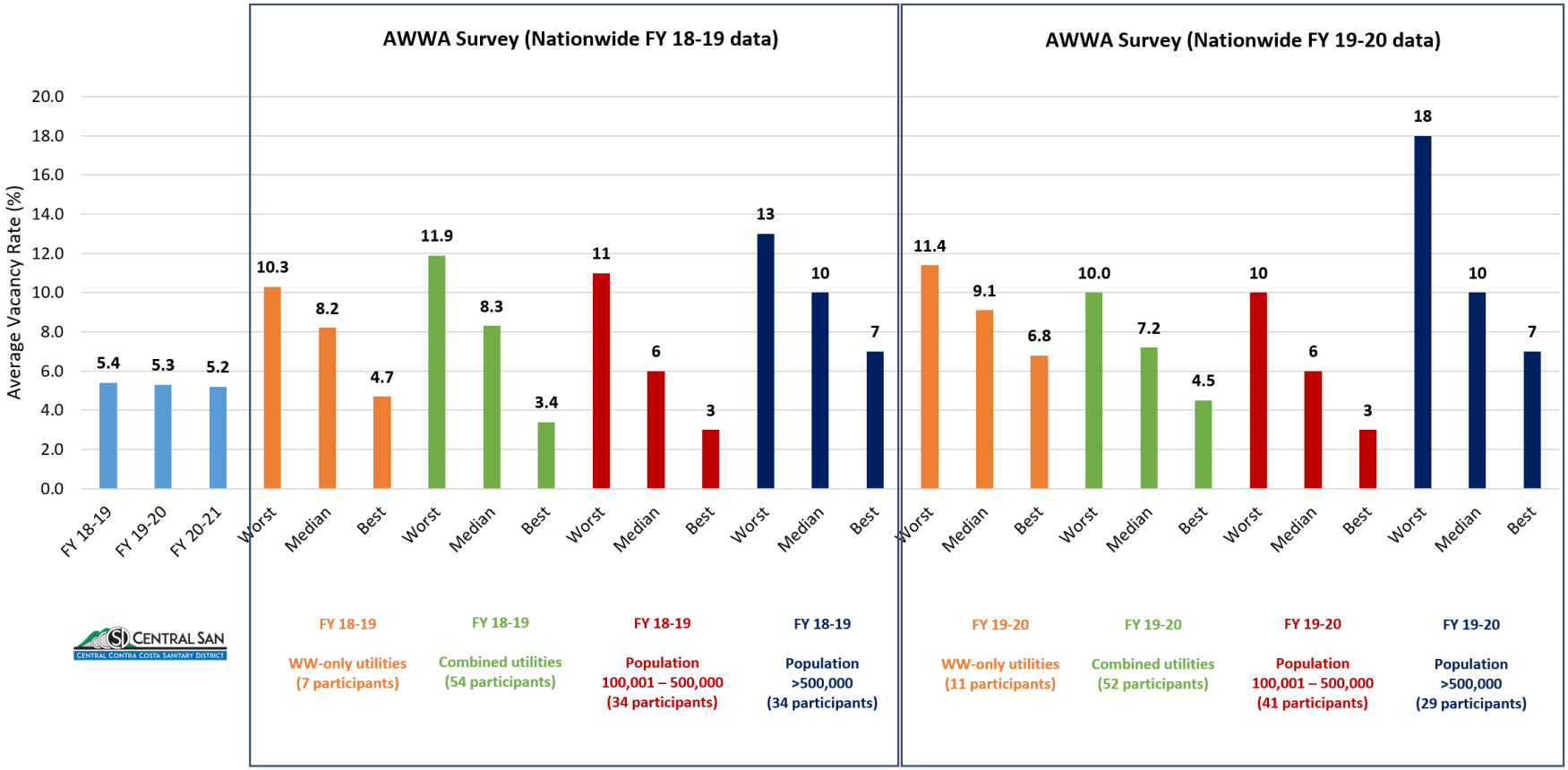
Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



AVERAGE VACANCY RATE

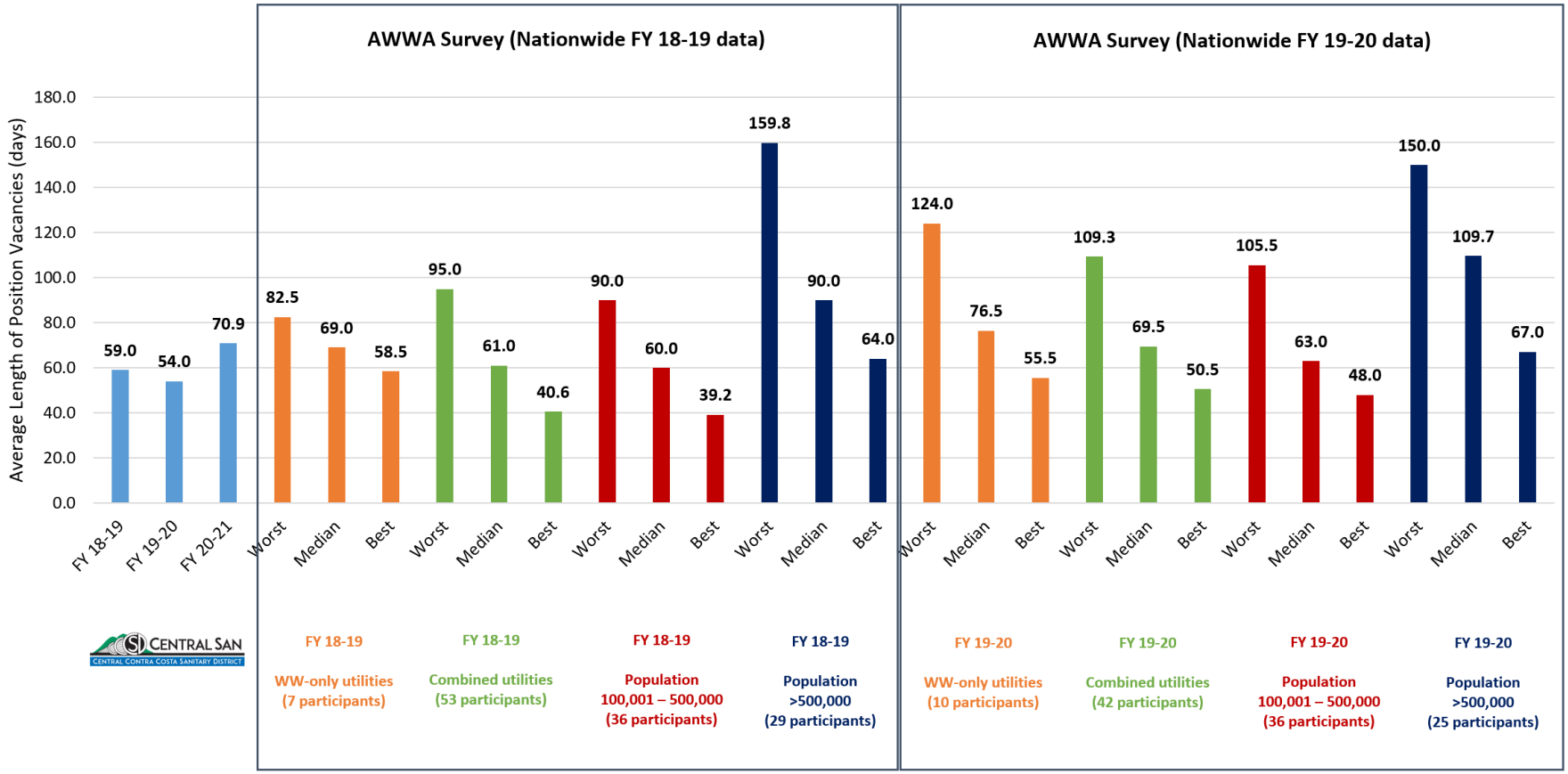
Central San vs. Nationwide (*FYs 18-19 and 19-20* data)

(AWWA reported nationwide data by population only in whole numbers.)



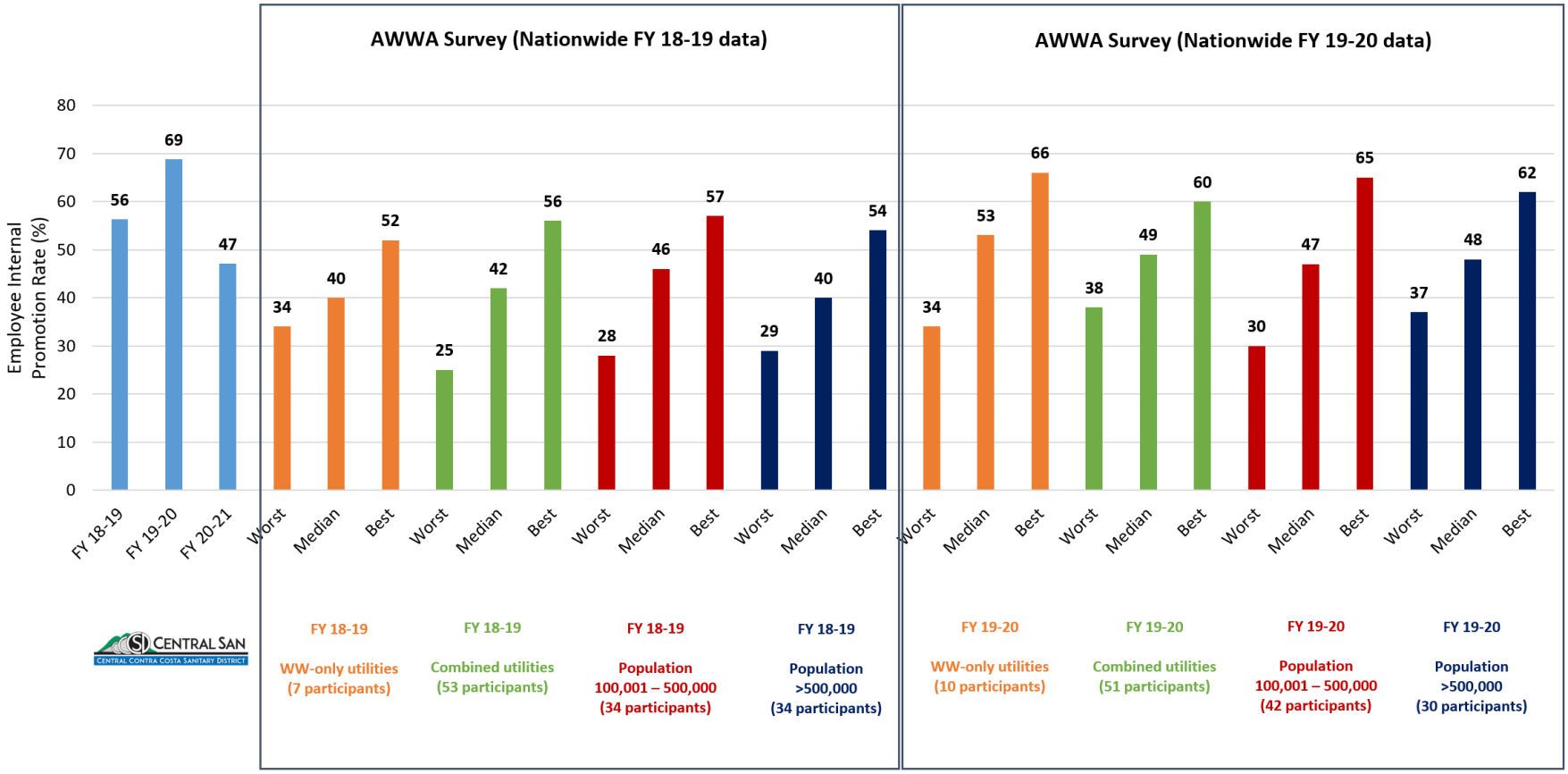
AVERAGE LENGTH OF POSITION VACANCIES

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



EMPLOYEE INTERNAL PROMOTION RATE

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



PERFORMANCE INDICATORS: FINANCIAL STRENGTH

DEBT RATIO

This indicator quantifies a utility's level of indebtedness and is a measure of the extent to which assets are financed through borrowing. The higher the debt ratio, the more dependent the utility is on debt financing. Debt Ratio is expressed as a percentage, calculated as follows:

$$Debt\ ratio\ (\%) = \frac{Total\ liabilities}{Total\ assets}$$

- *Total liabilities* – the entire obligations of the utility under law or equity, categorized as such on a utility's financial statement. In essence, this is the aggregate of all debts owed to others and includes outstanding bonds, outstanding long- and short-term debt, payments owed to others, accounts payable, and deposits collected from customers. In the U.S., liabilities are defined and designated by the Governmental Accounting Standards Board (GASB) or Federal Accounting Standards Board (FASB) as applicable to a specific utility.

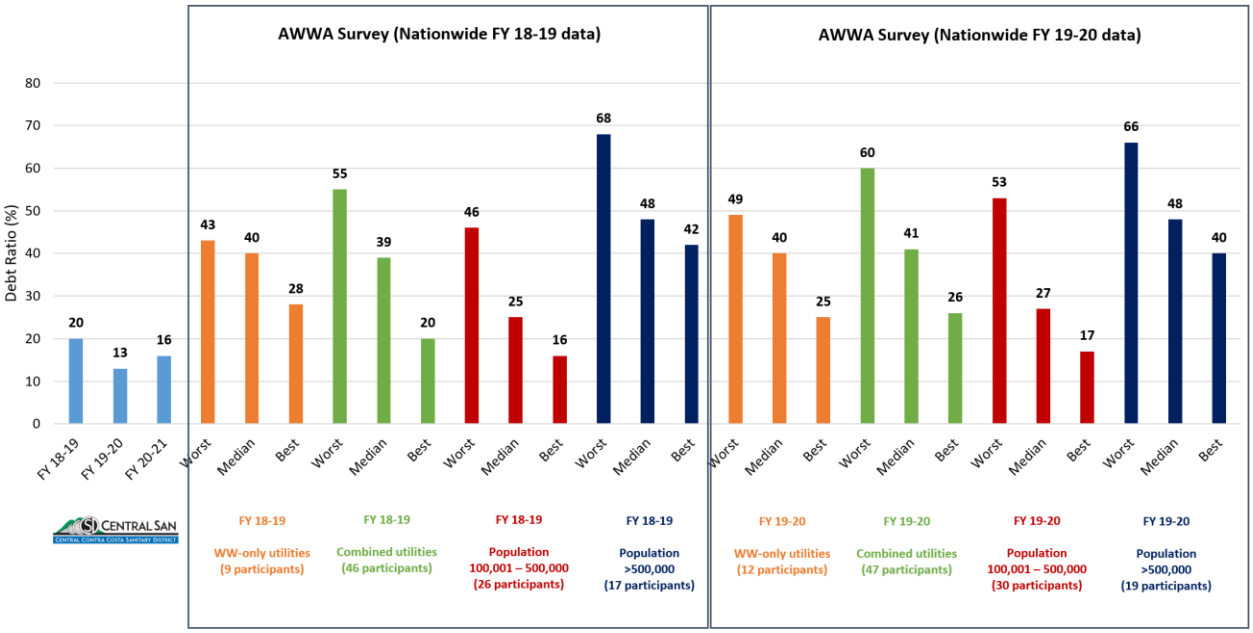
- *Total assets* – the entire resources of the utility, both tangible and intangible, as categorized on a financial statement. This includes the total value of properties and claims against others that are owned by the utility as expressed at original cost unless otherwise indicated and can also include accounts receivable, cash, inventories, service delivery facilities (less depreciation), cost of easements, cost of water rights, and all other items of value owned by the utility. In the U.S., assets are defined and designated by the GASB or FASB as applicable to a specific utility.

Central San Data Calculation Method
Central San considers the AWWA definition of total liabilities to be a broader measure than is typical when calculating the Debt Ratio. For example, it includes items such as Accounts Payable and Accrued Employee Liabilities. In calculating total liabilities for Central San for this study, Deferred Inflows of Resources was excluded. In calculating total assets for Central San, Accumulated Depreciation was included, and Deferred Outflows of Resources was excluded.

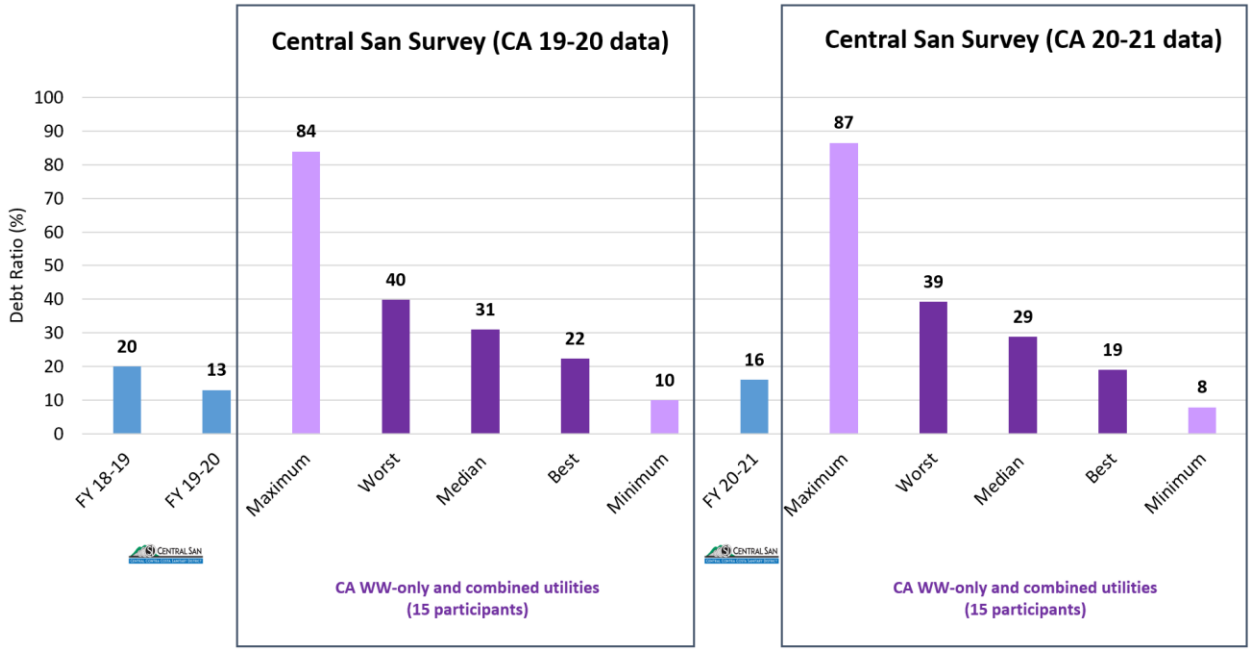
CA Agency Data Commentary
Major differences in the results between agencies can be attributed to the age of their infrastructure (and whether it was fully depreciated), where the agency was in their infrastructure's replacement cycle, and the agency's reliance on debt financing. The low debt burden reflected by Central San's figures is indicative of the historical pay-as-you go approach to funding capital expenditures, and the timing of the capital replacing cycle, with Central San's investment in capital assets (some financed by debt) continuing to increase in the coming years.

DEBT RATIO

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



Central San vs. CA (*FYs 19-20 and 20-21* Data)



RETURN ON ASSETS

This indicator is an estimate of a utility's financial effectiveness. Investor-owned and enterprise-fund utilities are particularly interested in this indicator, seeking higher ratios when possible and allowable. Some publicly owned utilities may find value in this indicator when seeking justification for improvements. Return on Assets is calculated as follows:

$$Return\ on\ assets\ (\%) = \frac{Net\ income}{Total\ assets}$$

- *Net income* – all revenues and gains minus expenses for the reporting period; it is titled as such on a utility's financial statement. In the U.S., net income is defined and designated by the GASB or FASB as applicable to a specific utility.

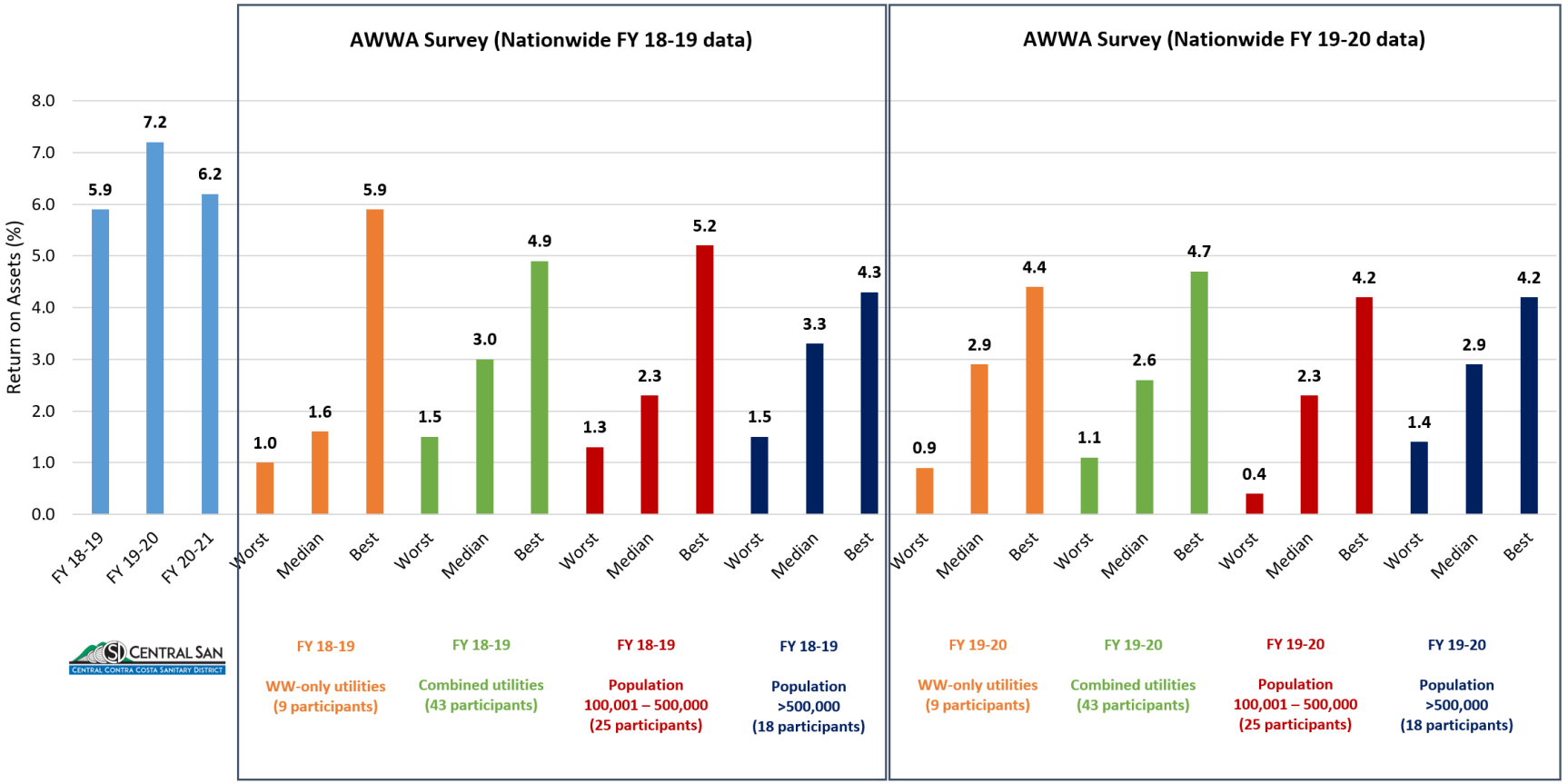
Central San Data Calculation Method / Commentary
Central San does not have a line item on its Statement of Revenues, Expenses, and Changes in Net Position called "net income," so Change in Net Position was used in its place. This figure is Operating Income/Loss, less matters such as taxes and interest, with additional line items such as contributions towards capital costs. Including monies received for capital replenishment best follows the AWWA definition and allows consistency as depreciation is included as an operating expense.

For total assets, the same definition and calculation method was used as in the preceding performance indicator for Debt Ratio, where Depreciation was included, and Deferred Outflows of Resources was excluded.

Central San's relatively high Return on Asset figures are reflective of its pay-as-you go approach to funding most capital expenditures, as well as setting rates to provide funding for such capital expenditures.

RETURN ON ASSETS

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



DAYS OF CASH ON HAND

This indicator quantifies the number of days of available cash on hand as a measure of financial liquidity. AWWA now instructs utilities to report their Days of Cash on Hand directly from their Annual Comprehensive Financial Report (ACFR) or annual information statement (AIS), or calculate it as follows:

$$Days\ of\ cash\ on\ hand\ (days) = \frac{(Undesignated\ cash\ \&\ cash\ equivalents)}{[\frac{(Operating\ expenses\ excluding\ depreciation)}{365\ days}]}$$

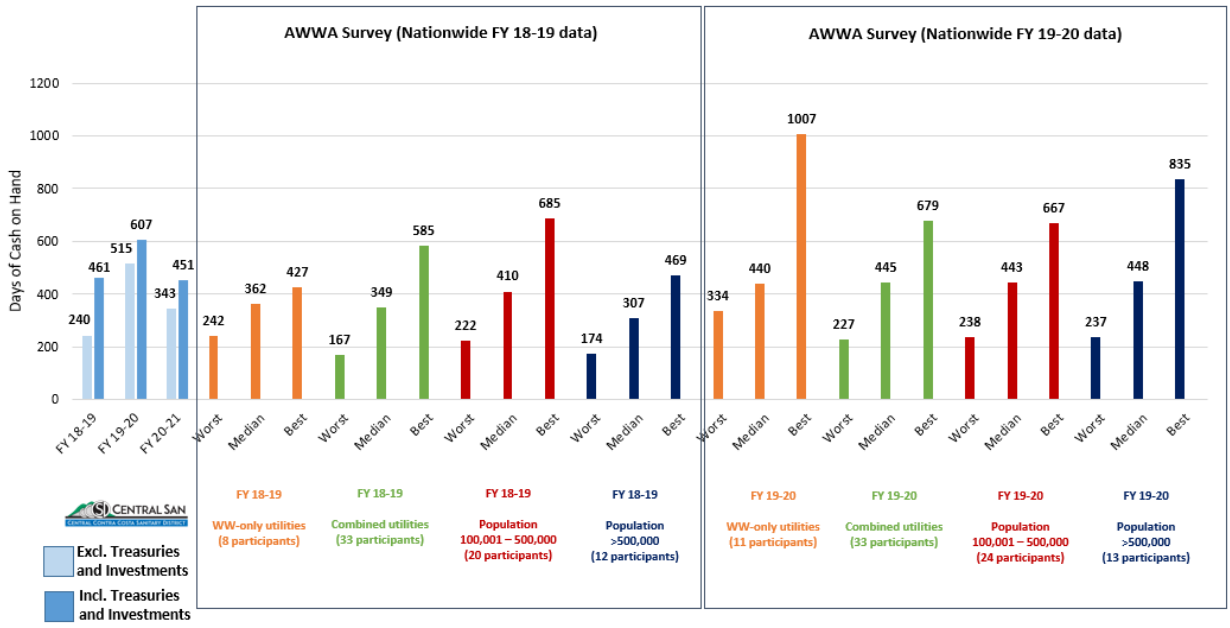
Central San Data Calculation Method
Central San has included two sets of data: 1) abiding by the strict definition of cash and cash equivalents and *not including* treasuries and investments and 2) *including* treasuries and investments. In its ACFR, Central San utilizes the latter definition in reporting its days of cash on hand and includes investments in its calculation. This formula, which uses 365 days, was adjusted to use 366 days in calculating the FY 19-20 data, since 2020 was a leap year.

Commentary
It should be noted that AWWA does not specifically state whether to include treasuries and investments in undesignated cash and cash equivalents. It is Central San's opinion that the definition of this figure should be clarified and clearly state to include these, since they represent funds that can be drawn as cash if needed.

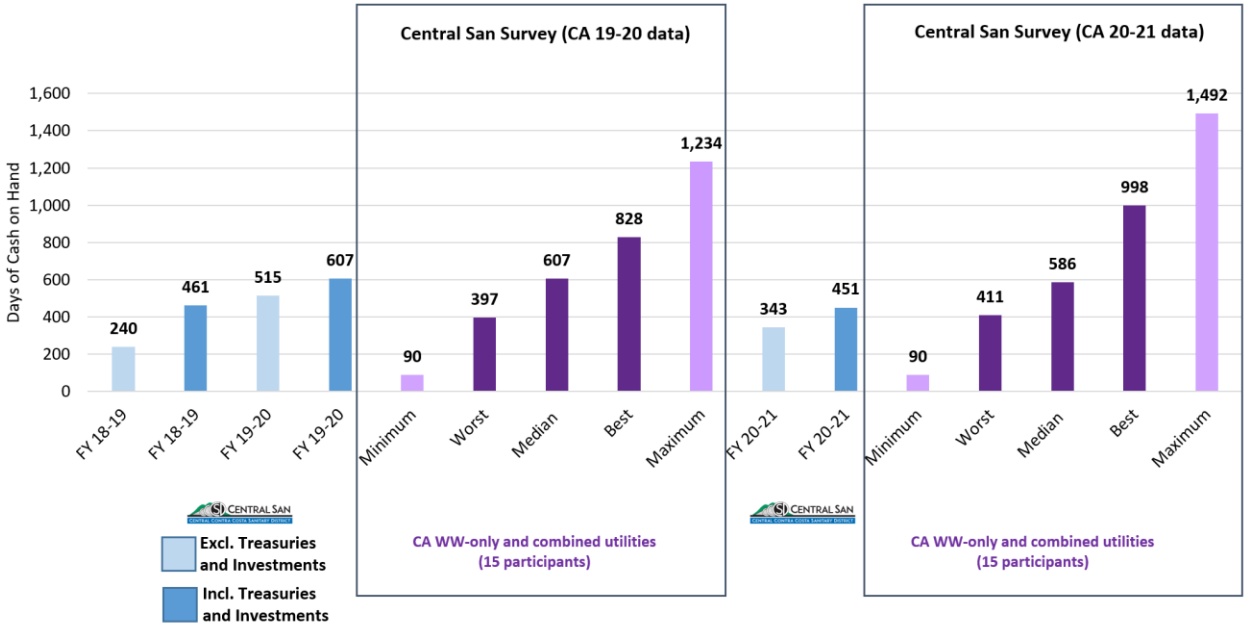
CA Agency Data Commentary
Some factors contribute to variances seen across agencies on this metric. The AWWA definition provided to the participating agencies excludes "investments" from the numerator of the formula, despite many agencies' practice of maintaining substantial short-term investments in lieu of cash. Central San added a note to its statewide survey instructions that cash equivalents should include treasuries and investments. Additionally, it is not clear whether all agencies are defining cash equivalents in the same manner.

DAYS OF CASH ON HAND

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



Central San vs. CA (*FYs 19-20 and 20-21* Data)



DEBT-SERVICE COVERAGE RATIO

Also known as Debt Coverage Ratio, this indicator is the ratio of net operating income to total debt service. It is the amount of cash flow available to meet interest, principal, and sinking fund payments. A Debt-Service Coverage Ratio of less than one indicates a negative cash flow, meaning a utility is not generating enough income to pay its debt obligations strictly through operations. Recognizing that many variables impact a utility's ratio, AWWA now instructs utilities to report their Debt-Service Coverage Ratio directly from their ACFR or AIS. AWWA also provides this calculation method:

$$Debt - service\ coverage\ ratio = \frac{Total\ operating\ revenue - Total\ O\&M\ costs}{Total\ debt\ service}$$

- *Total operating revenue* – revenue derived directly from utility services and sales plus other regular income sources related to the normal business operations of the utility, including rates, tap/connections fees, fines, and/or penalties.

- *Total O&M costs* – costs for salaries, direct benefits, and all costs necessary to support utility services. These include pumping costs associated with treatment and distribution or collection, as well as supporting functions, such as any related portion of centralized HR services, call center, health, safety, etc.

- *Total debt service* – the annual sum of principal and interest payments as required by short- and long-term obligations.

Central San Data Calculation Method
Total operating revenue for Central San includes City of Concord and ad valorem revenues. Total O&M costs include Unfunded Actuarial Accrued Liability (UAAL) costs. No adjustments were made to exclude Recycled Water or HHW costs, as they would not materially affect the outcome of the ratio. To follow the AWWA methodology, Central San adjusted the AWWA formula as follows in bold:

$$Debt - service\ coverage\ ratio = \frac{Total\ operating\ revenue - Total\ O\&M\ costs\ (\boldsymbol{excluding\ depreciation}) + \boldsymbol{Total\ non - operating\ revenue}}{Total\ debt\ service}$$

As Central San's ACFR values vary widely from the AWWA data set, Central San submitted the values using the adjusted AWWA methodology to AWWA's survey.

The following compares Central San's Debt-Service Coverage Ratios using the adjusted AWWA calculation methodology and the Central San methodology, as reported in the ACFR:

Debt-Service Coverage Ratio Methodologies	FY 18-19	FY 19-20	FY 20-21
Adjusted AWWA Methodology (as submitted to AWWA survey and represented in nationwide chart)	6.72	11.57	14.65
Central San Methodology (as reported in ACFR and represented in nationwide and statewide charts)	101.60	30.87	34.73

Commentary

The AWWA definition does not state whether to include depreciation in the total O&M costs. It is Central San's opinion that it should, to produce consistent data among the participating agencies. Elements of both the numerator and denominator of this calculation may be calculated differently per each agency's bond covenants. Use of pension obligation bonds is another example of a financial practice that could distort comparability of results. In the end, each agency relies on debt differently. If an agency followed the AWWA-provided calculation method, the reported results of this indicator may not necessarily speak to an agency's financial health or ability to meet debt service obligations.

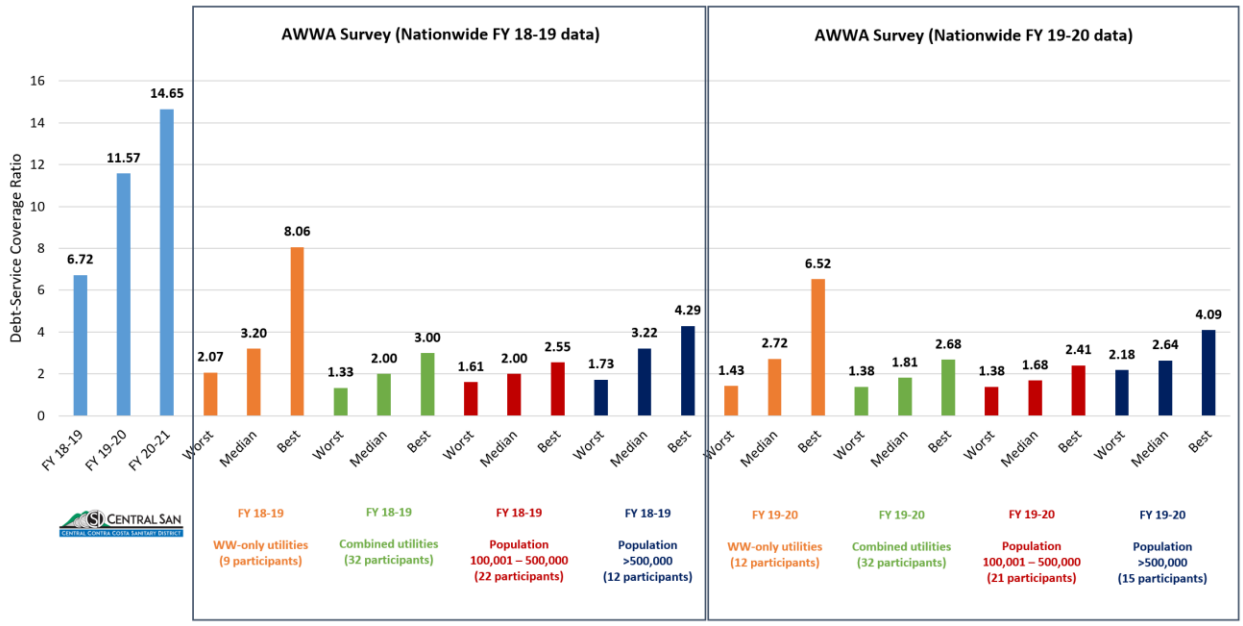
CA Agency Data Commentary

To minimize the effort needed from participating agencies, and to align with AWWA's new survey instructions (assuming most responding agencies reported their debt-service coverage ratio directly from their ACFR), agencies in Central San's survey were asked to provide the debt-service coverage ratio directly from their ACFR, as reported to investors in accordance with their bond covenants.

DEBT-SERVICE COVERAGE RATIO

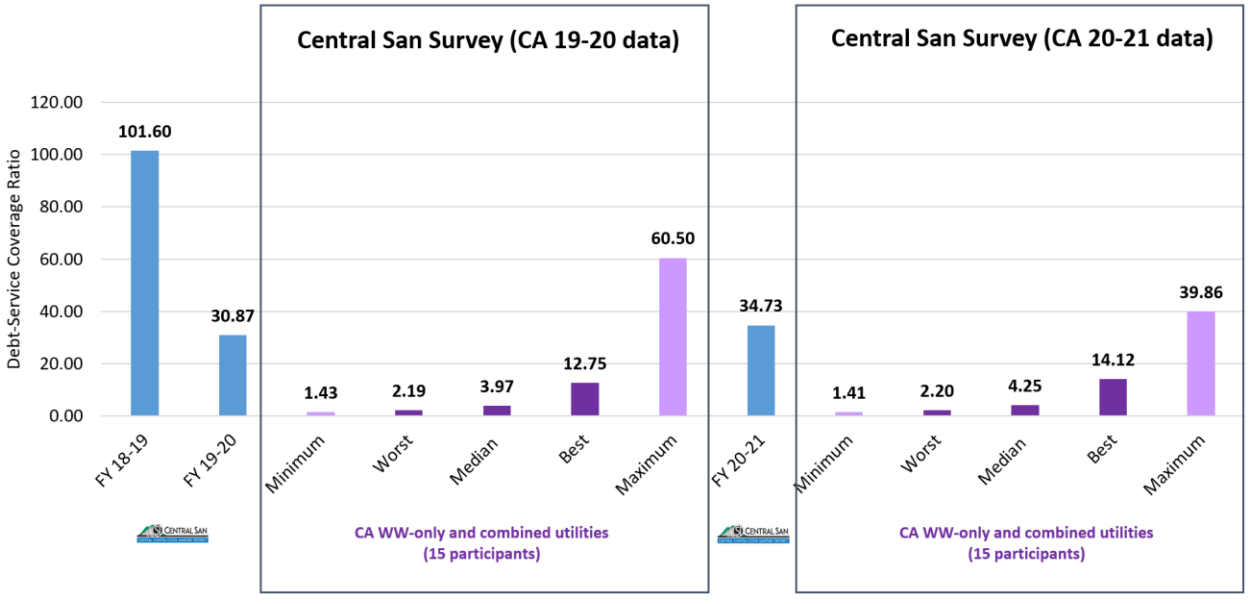
Central San* vs. Nationwide (*FYs 18-19 and 19-20* data)

For comparison purposes, Central San's debt-service coverage ratio using the adjusted AWWA calculation methodology is represented in this nationwide comparison chart.



Central San* Central San vs. CA (*FYs 19-20 and 20-21* Data)

For comparison purposes, Central San's debt-service coverage ratio as reported in the ACFR is represented in this statewide comparison chart.



* Because Central San has so little debt, its debt service coverage ratio is expected to be significantly higher than others'. Over time, as debt is issued, Central San's ratio will become closer to the benchmarking peer data.

DAYS OF WORKING CAPITAL / FINANCIAL LIQUIDITY

Days of Working Capital is also referred to as financial liquidity and indicates the relatively liquid portion of total enterprise fund capital, which constitutes a margin or buffer for meeting obligations. It is good practice for utilities to maintain adequate levels of working capital in their enterprise funds to mitigate current and future risks (e.g., revenue shortfalls and unanticipated expenses) and to ensure stable services and fees. Working capital is a crucial consideration in long-term financial planning. Credit rating agencies consider the availability of working capital in their evaluations of continued creditworthiness. Likewise, laws and regulations may speak to appropriate levels of working capital for some enterprise funds.

In past surveys, AWWA stated that this indicator refers to how many days it takes for a company to convert its working capital into revenue, which measures how efficiently a company is functioning. It also provided the calculation for Days of Working Capital as follows:

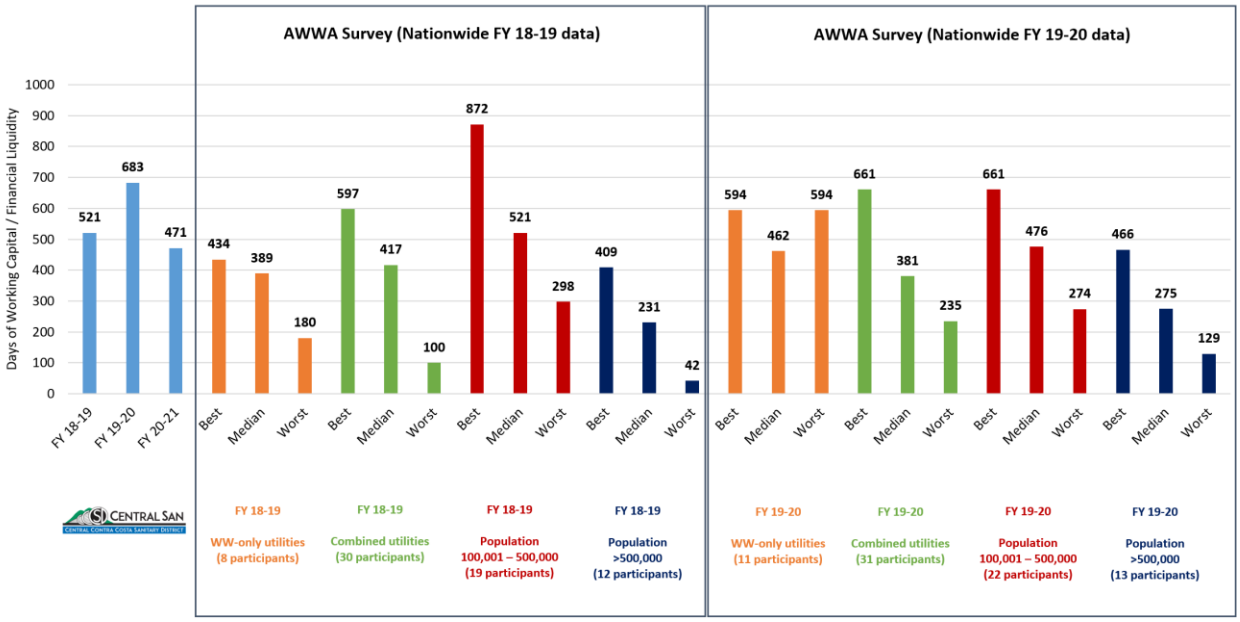
$$Days\ of\ working\ capital = \frac{(Current\ unrestricted\ assets - current\ liabilities)}{[(Operating\ expenses\ excluding\ depreciation/365\ days\ a\ year)]}$$

In its recent survey, AWWA instructed utilities to report their Days of Working Capital / Financial Liquidity value directly from their CAFR, AIS, or approved financial documents.

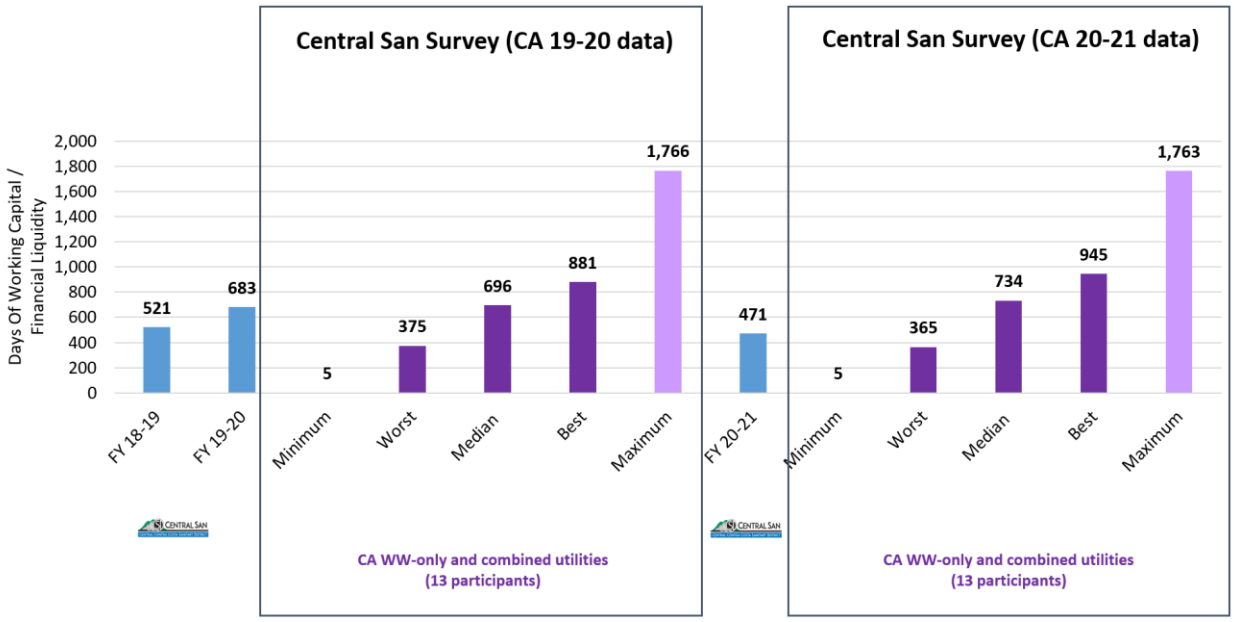
Central San Data Calculation Method
This formula, which uses 365 days, was adjusted to use 366 days in calculating the FY 19-20 performance, since 2020 was a leap year.

DAYS OF WORKING CAPITAL / FINANCIAL LIQUIDITY

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



Central San* Central San vs. CA (*FYs 19-20 and 20-21* Data)



OPERATING RATIO

This indicator is a utility's operating expenses divided by operating revenue or net sales, taking into account expansion or debt repayment. It is reported as a percentage and calculated as follows:

$$Operating\ ratio\ (\%) = \frac{Total\ O\&M\ costs}{Total\ operating\ revenue}$$

Central San Data Calculation Method
Recycled Water and HHW costs were excluded from total O&M costs, and City of Concord and ad valorem revenues were included in total operating revenue. In Central San's ACFR, Operating Revenue includes City of Concord revenues for O&M, but not capital revenues, and excludes capacity fees.

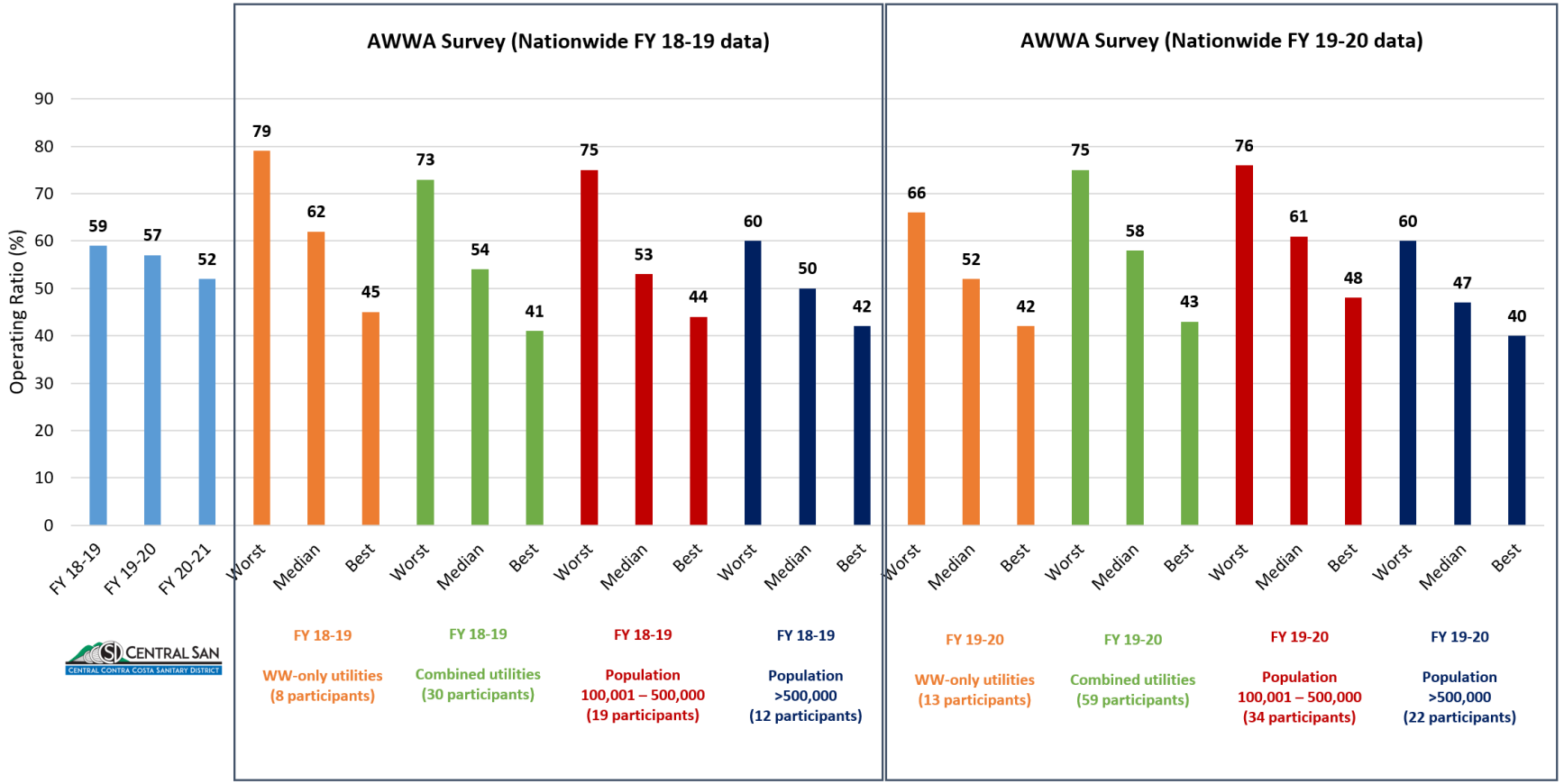
To calculate the reported Operating Ratio, Central San calculated its Operating Ratio as it would traditionally, which captures the fullest measure of costs and revenues (with adjustments to the AWWA formula in bold):

$$Operating\ ratio\ (\%)\ (Central\ San\ Methodology) = \frac{Total\ O\&M\ costs}{Total\ operating\ revenue + \boldsymbol{Non\ Operating\ Revenues} + \boldsymbol{Capital\ Contributions}}$$

CA Agency Data Commentary
Because the AWWA methodology is silent on whether to include depreciation in total O&M costs, there may be some difference in how agencies have chosen to report their total O&M. Additionally, total operating revenue can vary from utility to utility. Each agency has different revenue sources that they allocate in some cases subjectively to support various service offerings. How they classify those funds and the purposes for which they are used are different and can render the ability to make apples-to-apples comparisons difficult.

OPERATING RATIO

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



BOND RATING

This indicator is a grade that indicates a utility's creditworthiness. Private, independent rating services such as Standard & Poor's (S&P), Moody's, and Fitch provide evaluations of a bond issuer's financial strength based on its ability to pay a bond's principal and interest in a timely fashion. These ratings are viewed as an overall indicator of a utility's financial health and ability to finance needed capital investments. AWWA categorized various bond ratings from the three rating services as Prime, High Grade, Upper Medium Grade, and Low Medium Grade, as follows:

Bond Rating			Rating Category
Moody's	**S&P**	**Fitch**	
Aaa	AAA	AAA	Prime
Aa1	AA+	AA+	High grade
Aa2	AA	AA	
Aa3	AA-	AA-	
A1	A+	A+	Upper medium grade
A2	A	A	
A3	B	A-	
Baa 1 2 3	BBB +/-	B+/-	Lower medium grade

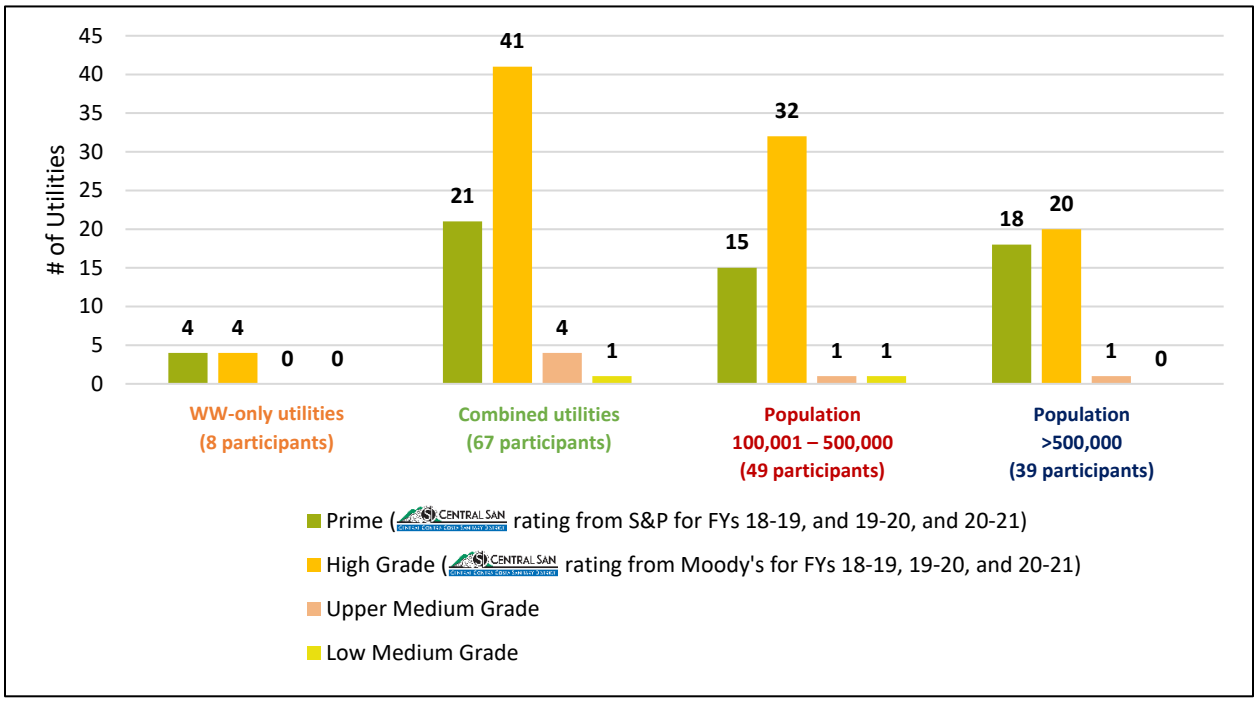
Central San has received a consistent AAA rating (Prime) from S&P and an Aa1 rating (High Grade) from Moody's for the last three FYs and has not applied for or received any ratings from Fitch, as shown in chart form below:

Bond Ratings from FYs 18-19 through 20-21		
Moody's	**S&P**	**Fitch**
Aa1 (High Grade)	AAA (Prime)	No rating

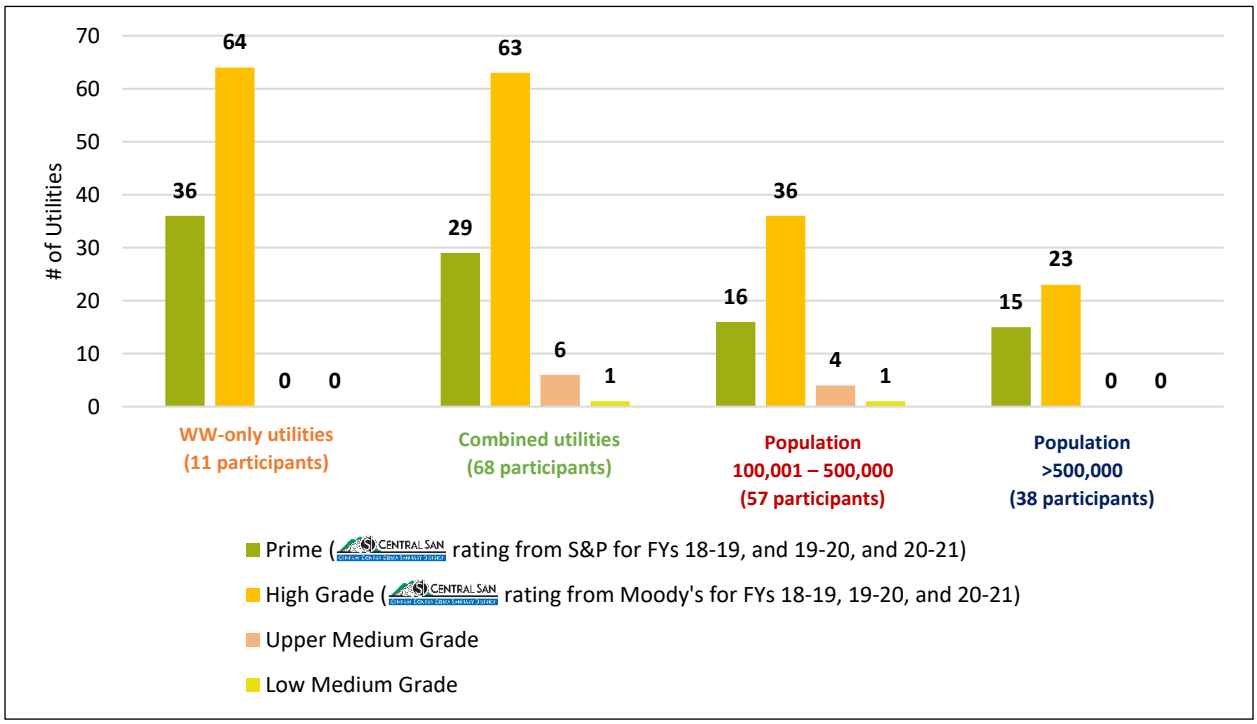
The following graphs show where Central San lies in the benchmarking comparison against the aggregate nationwide data from the AWWA survey, presented as one graph per FY, indicating only the rating category and not which rating services issued the ratings. Central San's rating category is indicated in each chart for comparison purposes.

BOND RATINGS FROM ALL RATING SERVICES

Central San vs. Nationwide (*FY 18-19* data)



Central San vs. Nationwide (*FY 19-20* data)



INSURANCE / CLAIMS

The insurance family of sub-indicators is designed by AWWA to examine the number, type, and severity of insurance claims to understand insurance coverage strength and vulnerability. This indicator also aligns with the EUM attribute on Enterprise Resiliency and can be used to anticipate and avoid operational challenges. The insurance-related measures, along with other measures, can help utilities plan for and maintain business continuity. In determining total number of claims, AWWA instructed to include tort claims (claims that have been filed against the utility) and exclude tort notices (notice to the utility of intent to file a claim). The sub-indicators are calculated as follows.

NUMBER OF INSURANCE CLAIMS

$$Number\ of\ insurance\ claims = \frac{200{,}000\ x\ (Number\ of\ general\ liability\ and\ auto\ insurance\ claims)}{Total\ hours\ worked\ by\ all\ employees}$$

SEVERITY OF INSURANCE CLAIMS

$$Severity\ of\ insurance\ claims = \frac{200{,}000\ x\ (Total\ dollar\ amount\ of\ general\ liablity\ and\ auto\ insurance\ claims)}{Total\ hours\ worked\ by\ all\ employees}$$

SEVERITY PER CLAIM

$$Average\ severity\ (\frac{\$}{claim}) = \frac{Reported\ severity}{Reported\ number\ of\ claims}$$

Commentary

To better capture the data intended to be captured, it is Central San's opinion that AWWA should collect information on all insurance claims, including self-insured losses not reported to the insurance carrier. This would better reflect costs to the utility from claims than the AWWA methodology above, which only captures the cost of claims reported to the insurance carrier.

Central San Data Calculation Method

For FYs 18-19, 19-20, and 20-21, Central San had zero insurance claims to report as defined by AWWA as there were none reported to the insurance carrier, since Central San is self-insured up to $500,000. Differing levels of insurance deductibles and interpretation of whether to report in this measure any losses or just claims covered by insurance make this performance indicator as written by AWWA less than entirely reliable for purposes of comparisons.

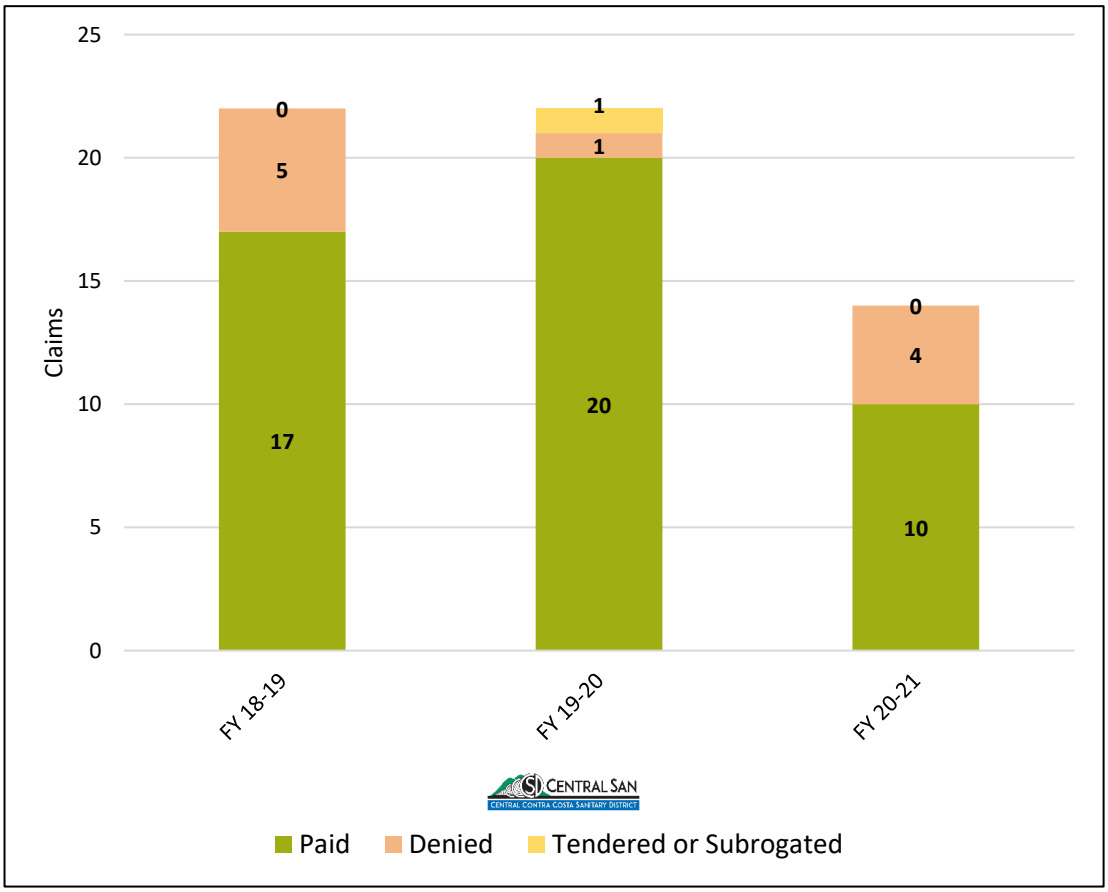
Because Central San's FYs 18-19, 19-20, and 20-21 performance figures for the above sub-indicators are zero, comparable nationwide data is not presented in the interest of brevity. However, Central San's claims totals are included below to provide a window into the agency's

performance in Insurance.

CLAIMS (NOT INCLUDED IN AWWA UTILITY BENCHMARKING SURVEY)

Because Central San has zero insurance claims to report as defined by AWWA, provided for reference below is the historical trend of Central San's total number of claims from third parties both denied and processed, including overflows, professional liability, plumbing reimbursements, general liability, and auto liability. These were self-insured losses that are not considered "claims" by insurance industry standards. No comparable nationwide or CA data is available.

Claims	FY 18-19	FY 19-20	FY 20-21
Paid	17	20	10
Denied	5	1	4
Tendered or Subrogated	0	1	0
Total	22	22	14



RISK AND RESILIENCY

The following family of sub-indicators aims to look at a utility's readiness for emergencies. With new requirements in place as a result of the America's Water Infrastructure Act, the following metrics help provide a utility with a starting point on its current plan and upcoming needed changes to meet compliance. The following are explanations of the sub-indicators and the nationwide performance in FYs 18-19 and 19-20 (percentage of participants reporting the levels as indicated in the charts), with Central San's performance for that FY in each chart for reference, and Central San's FY 20-21 performance below each chart.

Performance levels differ for each sub-indicator, but generally Level 3 is the best available ranking. Central San's performance over the last three FYs in each of the sub-indicators is below:

Risk and Resiliency Sub-Indicators	Central San		
	FY 18-19	FY 19-20	FY 20-21
Risk Assessment and Response Preparedness	2	3	2
Emergency Response Planning	2	2	2
Recovery and Mitigation Plan	3	3	3
Cybersecurity Preparedness	2	2	2

Central San Data Calculation Method
For each sub-indicator, the subject matter expert at Central San assigned the level.

RISK ASSESSMENT AND RESPONSE PREPAREDNESS

This sub-indicator evaluates whether a utility has assessed its all-hazards (natural and human-caused) vulnerabilities and risks and made corresponding plans for critical needs. Risk assessment includes evaluation for potential power outages, lack of access to chemicals, cybersecurity, extreme weather events, curtailed staff availability etc. Utilities were asked to rate themselves based on which of the following performance levels best applied to them:

- Level 3 – Emergent risks to all major assets are consistently addressed. Proactive and specialized shifts in operational procedures and updated capital investment criteria are changed when necessary.
- Level 2 – Utility capacity to understand and detect threats to the system is increased, risks to all major assets are identified and reduced, and all-hazards risk management needs are fully integrated into broader utility planning and investment activities.
- Level 1 – Risks to high-consequence assets have been identified and risks reduced.
- No Plan – No assessment was conducted in fiscal year.
- Not Applicable (percentage of utilities who responded with this are not represented in the chart).

Central San vs. Nationwide (*FY 18-19* data)

Utility Type	FY 18-19				Participants
	Level 3	Level 2 (CENTRAL SAN)	Level 1	No Plan	
WW-only	22%	45%	22%	11%	5
Combined	26%	39%	8%	27%	68
Population 100,001-500,000	24%	48%	9%	20%	46
Population >500,000	32%	26%	11%	34%	38

Central San vs. Nationwide (*FY 19-20* data)

Utility Type	FY 19-20				Participants
	Level 3 (CENTRAL SAN)	Level 2	Level 1	No Plan	
WW-only	55%	27%	9%	9%	11
Combined	39%	33%	14%	10%	72
Population 100,001-500,000	47%	37%	11%	5%	63
Population >500,000	52%	29%	13%	6%	36

CENTRAL SAN performance for FY 20-21: **Level 2.**

EMERGENCY RESPONSE PLANNING

This sub-indicator evaluates if a utility has in place an Emergency Response Plan at one of the following levels of complexity:

- Level 3 – Emergency Response Plan is enhanced with incident-specific Emergency Action Procedures (EAPs) for responding to a specific type of incident, and enhanced capability to test, exercise, and to refine the Emergency Response Plan is in place. Ability to respond to a full suite of unexpected events by implementing a comprehensive Emergency Response Plan.
- Level 2 – The Emergency Response Plan is enhanced with additional capabilities and supported through more structured relationships with potential response partners.
- Level 1 – Emergency Response Plan is developed containing basic policies and procedures.
- No Plan – No plan is in place.
- Not Applicable (percentage of utilities who responded with this are not represented in the chart).

Central San vs. Nationwide (FY 18-19 data)

Utility Type	FY 18-19				Participants
	Level 3	Level 2 (CENTRAL SAN)	Level 1	No Plan	
WW-only	33%	45%	11%	11%	9
Combined	37%	24%	10%	29%	70
Population 100,001-500,000	42%	35%	6%	17%	46
Population >500,000	33%	13%	10%	44%	38

Central San vs. Nationwide (FY 19-20 data)

Utility Type	FY 19-20				Participants
	Level 3	Level 2 (Central San)	Level 1	No Plan	
WW-only	55%	18%	18%	9%	11
Combined	47%	27%	10%	9%	70
Population 100,001-500,000	52%	29%	13%	6%	63
Population >500,000	58%	11%	8%	22%	36

Central San performance for FY 20-21: **Level 2**

RECOVERY AND MITIGATION PLAN

This sub-indicator assesses if a utility has in place a Recovery and Mitigation Plan at one of the following levels:

- Level 3 – Ability to recover from a full suite of incidents through implementation of comprehensive mitigation and recovery activities, projects, and funding is in place.
- Level 2 – Implementation of mitigation and recovery activities, projects, and funding is in place.
- Level 1 – General awareness of mitigation and recovery activities, projects, and funding is in place for efficient system and services restoration.
- No Plan – No plan is in place.
- Not Applicable (percentage of utilities who responded with this are not represented in the chart).

Central San vs. Nationwide (FY 18-19 data)

Utility Type	FY 18-19				Participants
	Level 3 (Central San)	Level 2	Level 1	No Plan	
WW-only	34%	22%	11%	33%	9
Combined	28%	22%	19%	31%	68
Population 100,001-500,000	26%	30%	21%	23%	46
Population >500,000	36%	21%	10%	33%	38

Central San vs. Nationwide (FY 19-20 data)

Utility Type	FY 19-20				Participants
	Level 3 (Central San)	Level 2	Level 1	No Plan	
WW-only	45%	27%	9%	18%	11
Combined	35%	32%	18%	13%	71
Population 100,001-500,000	32%	37%	21%	11%	63
Population >500,000	38%	32%	8%	22%	36

Central San performance for FY 20-21: **Level 3**

CYBERSECURITY PREPAREDNESS

This sub-indicator evaluates a utility's development and incorporation of an established cybersecurity plan at the following levels of complexity:

- Level 3 – Utility has established and fully incorporated a detailed cybersecurity plan which is routinely reviewed and implemented.
- Level 2 – Utility has developed a cybersecurity plan that has been approved and generally used throughout facility.
- Level 1 – Utility has identified and established a basic cybersecurity plan, which is minimally implemented.
- No Plan – No plan is in place.
- Not Applicable (percentage of utilities who responded with this are not represented in the chart).

Central San vs. Nationwide (FY 18-19 data)

Utility Type	FY 18-19				Participants
	Level 3	Level 2 (CENTRAL SAN)	Level 1	No Plan	
WW-only	25%	25%	25%	25%	8
Combined	37%	30%	13%	20%	71
Population 100,001-500,000	37%	29%	10%	25%	46
Population >500,000	39%	24%	12%	24%	38

Central San vs. Nationwide (FY 19-20 data)

Utility Type	FY 19-20				Participants
	Level 3	Level 2 (CENTRAL SAN)	Level 1	No Plan	
WW-only	36%	27%	18%	9%	11
Combined	30%	45%	6%	12%	69
Population 100,001-500,000	44%	39%	6%	11%	63
Population >500,000	31%	43%	9%	17%	36

CENTRAL SAN performance for FY 20-21: **Level 2**

PERFORMANCE INDICATORS:
CUSTOMER SERVICE

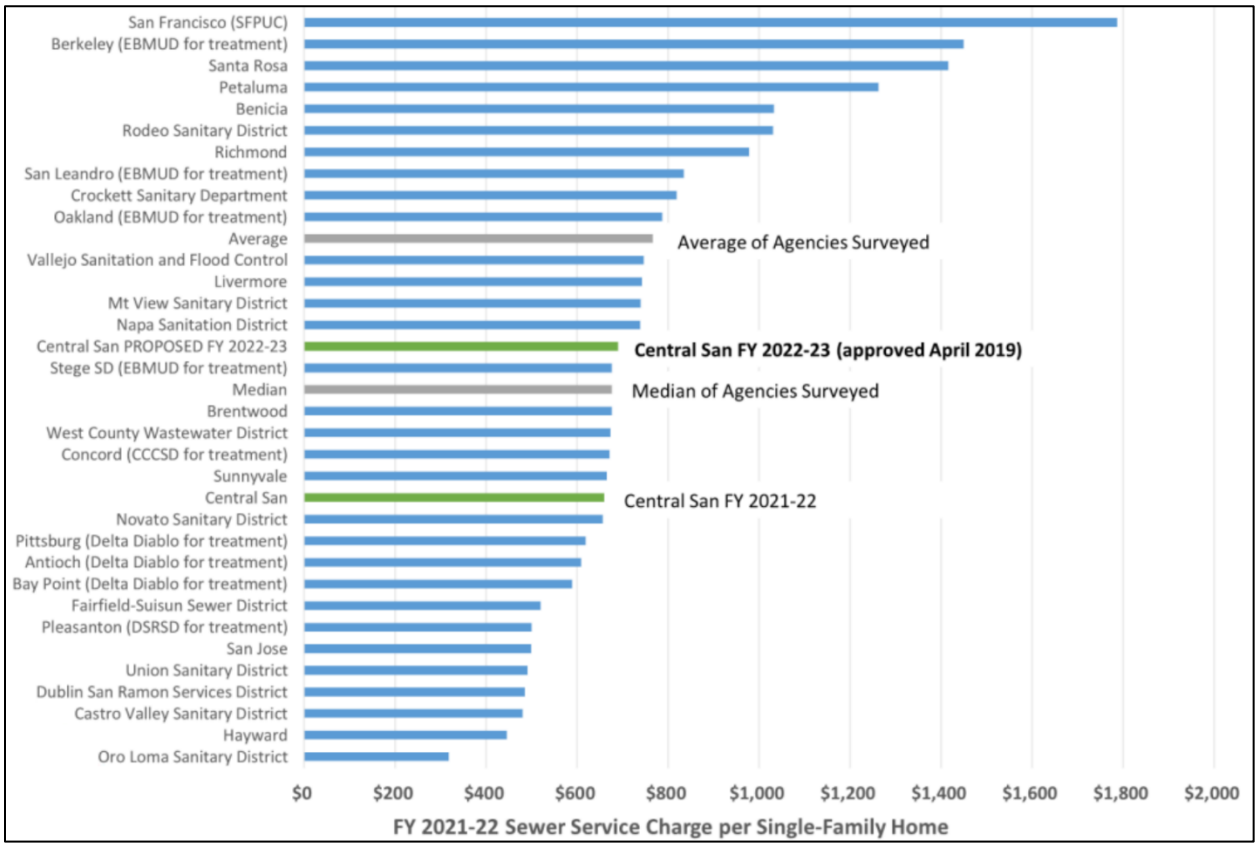
RESIDENTIAL SERVICE CHARGES

This indicator allows utilities to compare their *residential* charges for WW services based on an average residential bill. AWWA instructs to include any additional costs added to the bill for residential service, such as taxes, fees, and/or surcharges. If there was more than one rate zone, utilities were instructed to calculate the weighted average of charges of all zones.

- *Bill* – a periodic statement of charges (volumetric, surcharges, and taxes) for utility services. For purposes of benchmarking, multiple-service utilities that send a single bill count each service as a single bill (e.g., if water and wastewater services are combined, this is counted as two bills).

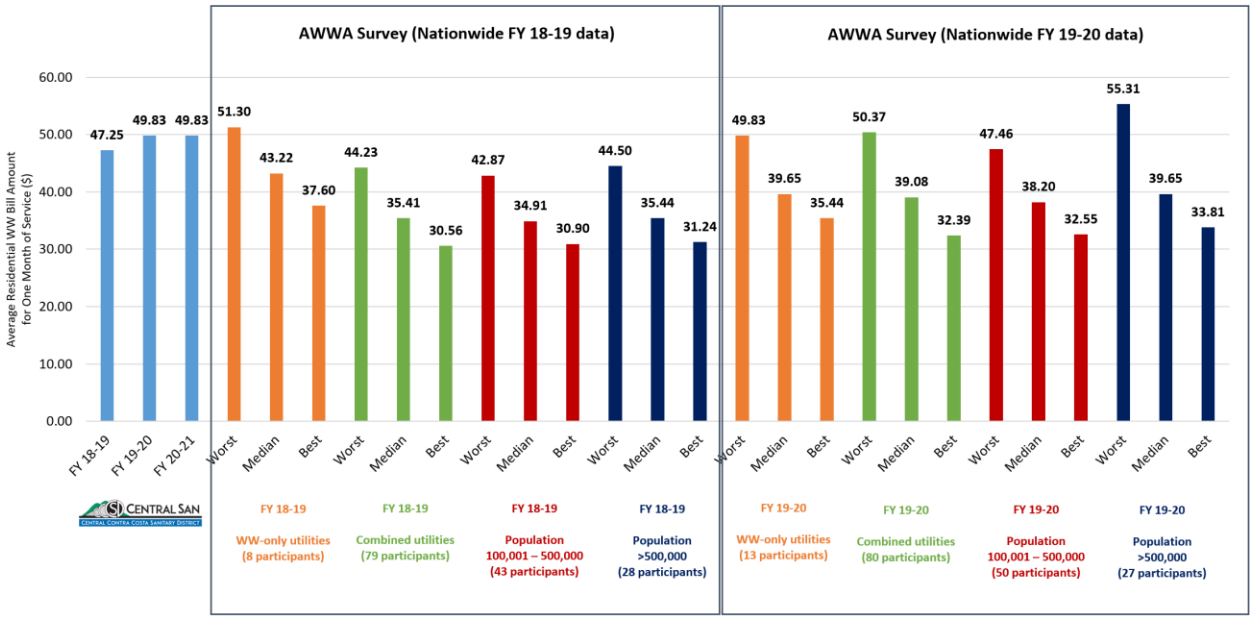
Central San Data Calculation Method
To calculate this for Central San, the annual Sewer Service Charge (SSC) rate was divided by 12 to yield a monthly average. Ad valorem taxes collected were not included in the reported bill amount because Central San did not benchmark against agencies that specifically collect ad valorem and may use those funds to offset rates.

Below is a table showing Central San's *annual* residential rates compared to other Bay Area agencies' *annual* rates, as presented at the March 2022 Board Financial Workshop, provided for reference. The comparison in the nationwide charts shows *monthly* rates.

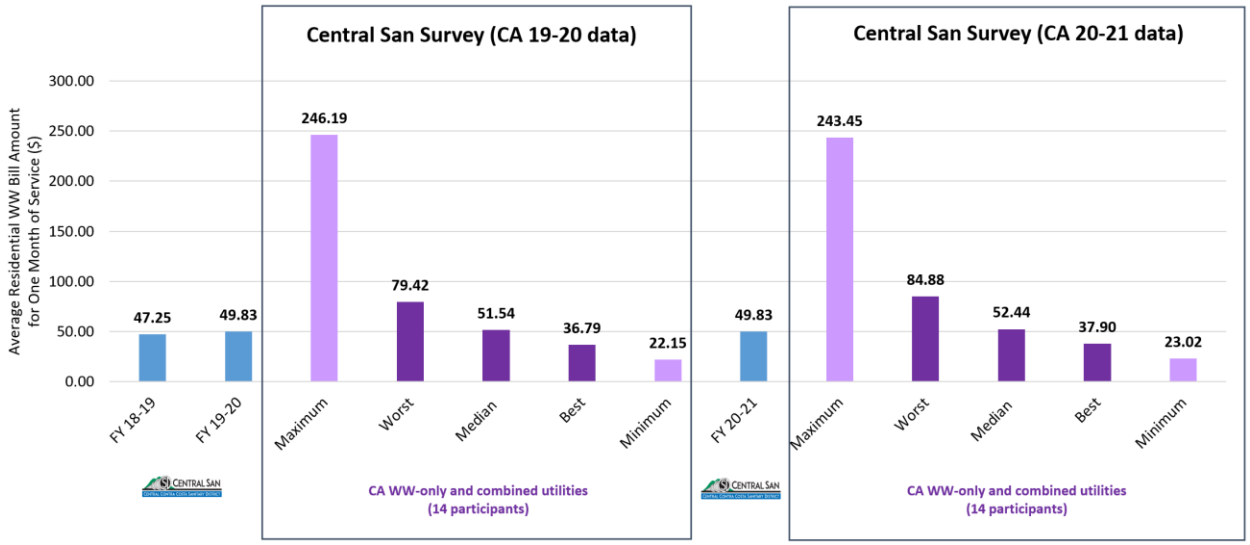


AVERAGE *RESIDENTIAL* WW BILL AMOUNT FOR ONE MONTH OF SERVICE

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



Central San vs. CA* (*FYs 19-20 and 20-21* Data)

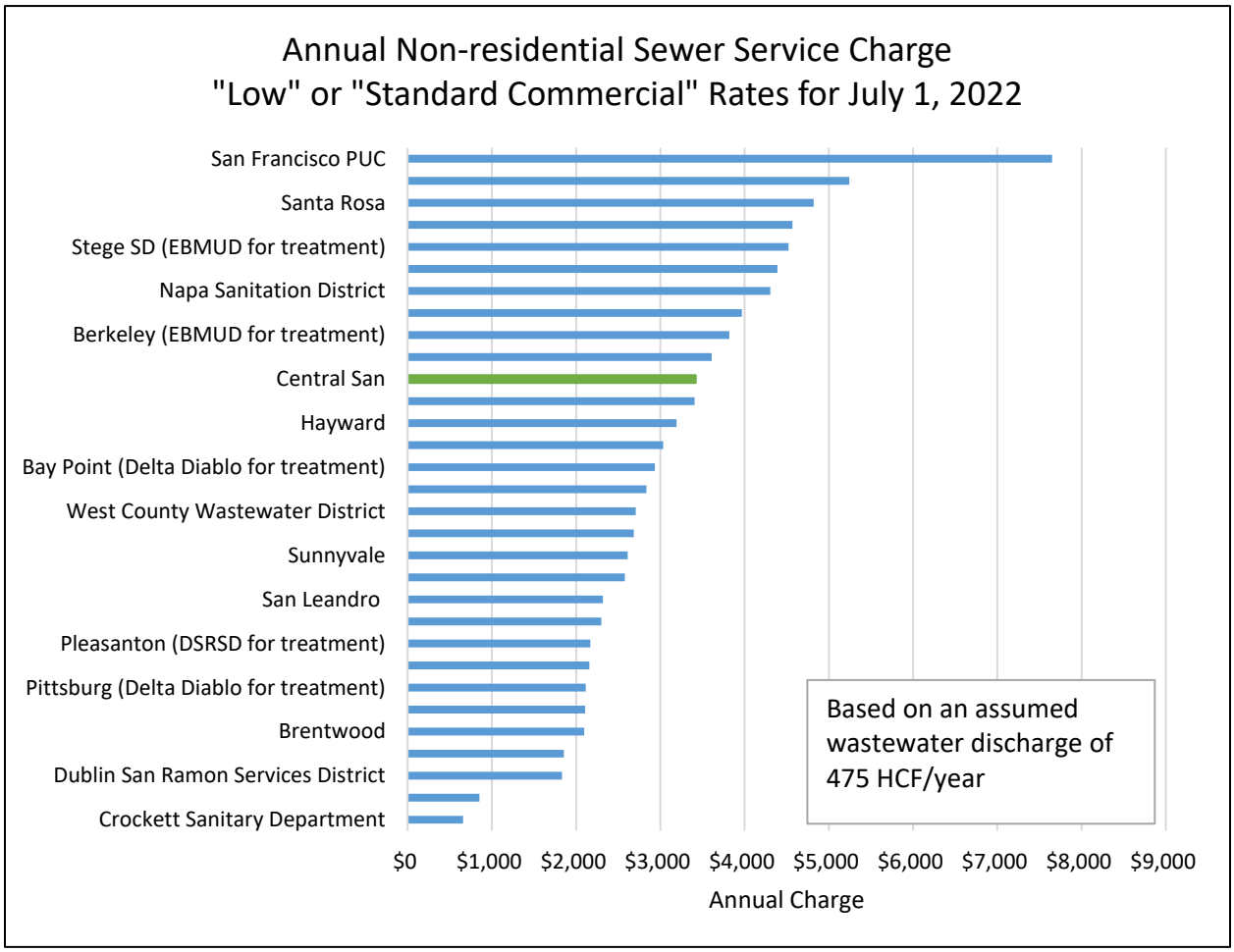


*The CA agency data makes no distinction between agencies that provide dual services (combined utilities), are retail agencies, or are agencies that are part of a larger operation. These differences could all have an impact on rates.

NONRESIDENTIAL SERVICE CHARGES
(NOT INCLUDED IN AWWA UTILITY BENCHMARKING SURVEY)

The AWWA survey did not include an indicator for nonresidential service charges, so Central San has benchmarked against itself and CA agencies.

Below is a chart of *annual* standard commercial SSC rates for Bay Area agencies including Central San as of July 1, 2022, based on average water consumption (475 hundred cubic feet (HCF) per year). To estimate these commercial rates, staff used an "average" non-residential water consumption of 475 HCF per year, multiplied by the "standard commercial" or "low strength" billing rates for each agency.



Central San Data Calculation Method

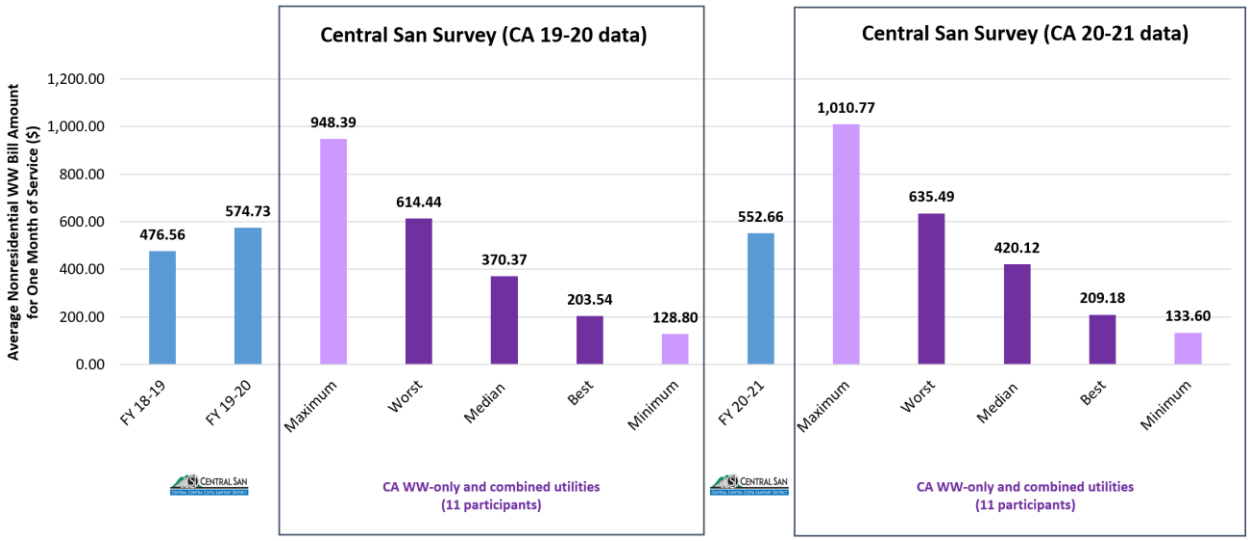
The reported amounts for Central San are the average charges, derived from the tax roll, for all non-residential customers. Ad valorem taxes collected were not included in the reported bill amount. This is because Central San did not benchmark against agencies that specifically collect ad valorem and may use those funds to offset rates.

AVERAGE *NONRESIDENTIAL* WW BILL AMOUNT FOR ONE MONTH OF SERVICE

Central San vs. Nationwide (*FYs 17-18 and 18-19* data) – Unavailable

AWWA nationwide data is unavailable as this indicator was not included in AWWA's *Utility Benchmarking* book.

Central San* vs. CA** (*FYs 19-20 and 20-21* Data)



* Central San's reported bill amount does not include ad valorem taxes collected.
**The CA agency data information makes no distinction between agencies that provide dual services (combined utilities), are retail agencies, or are agencies that are part of a larger operation. These differences could all have an impact on rates.

SERVICE AFFORDABILITY

This indicator measures the affordability of WW services as a percentage of local median household income (MHI) and is calculated as follows:

$$Service\ affordability\ \ (\%\ of\ MHI) = \frac{Average\ residential\ monthly\ wastewater\ bill\ x\ 12}{Real\ median\ annual\ household\ income}$$

AWWA notes that utility participants are encouraged to use this calculation as one means of assessing affordability. Alternative methods have been proposed and evaluated and will be included in the next AWWA benchmarking survey.

Central San Data Calculation Method

To calculate this for Central San, the real median annual household income used was the weighted average of annual household incomes of the cities in the service area, including Concord and Clayton, according to the 2012-2016 American Community Survey (census) for Contra Costa County, which was the latest census data available at the time of the study. The FY 19-20 and 20-21 real median annual household income includes adjustment to 2019 dollars which was provided by the census website.

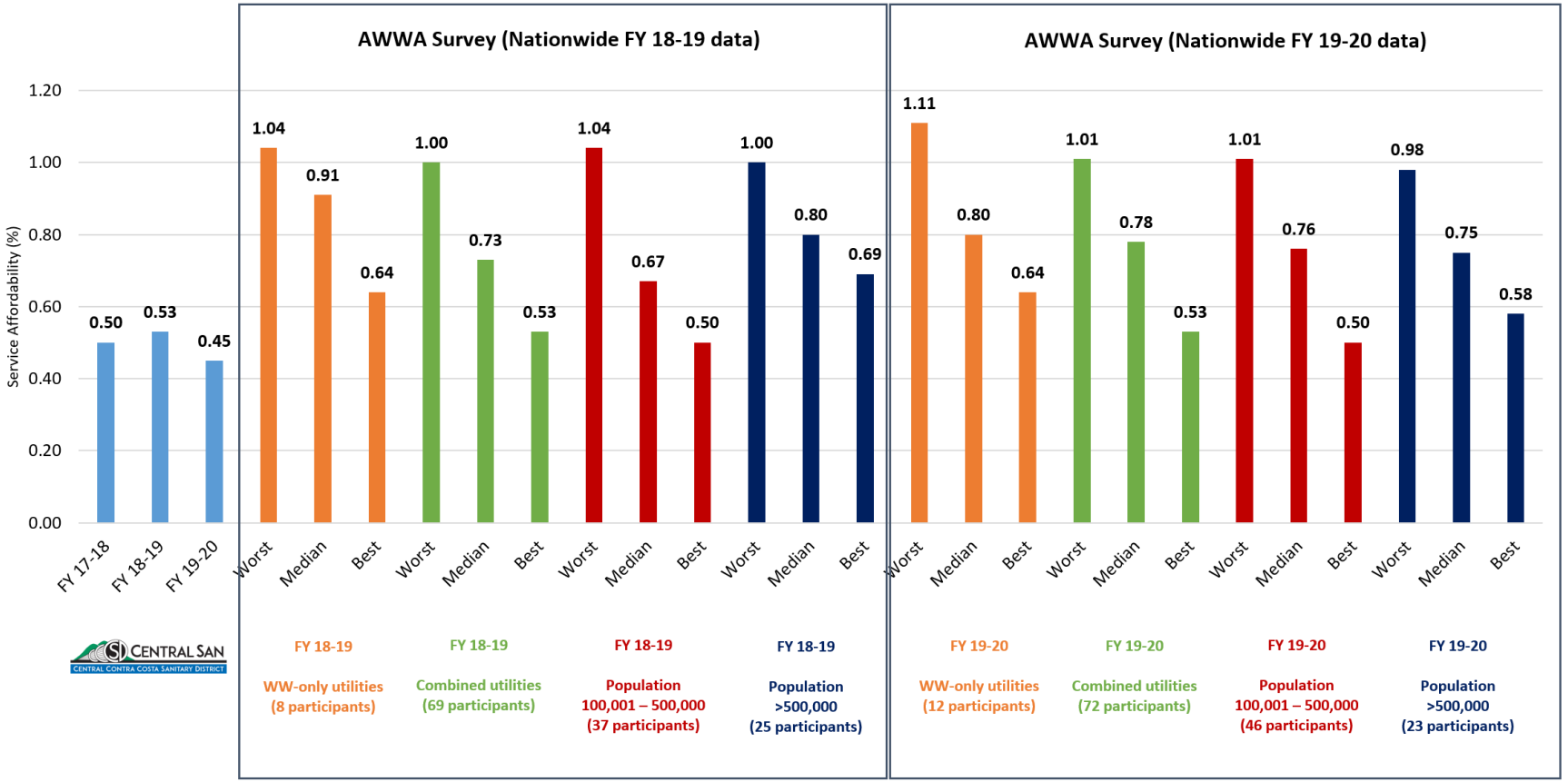
Ad valorem taxes collected were not included in the reported bill amount. This is because the nationwide agencies included in the AWWA study do not all collect ad valorem taxes.

Commentary

This survey does not make a distinction between agencies that are wholesale or retail agencies or are agencies that are part of a larger operation. These differences could all have an impact on rates.

SERVICE AFFORDABILITY

Central San vs. Nationwide* (*FYs 18-19 and 19-20* data)



*This information makes no distinction between agencies that are wholesale or retail agencies or are agencies that are part of a larger operation. These differences could all have an impact on rates.

SERVICE COMPLAINTS

This family of sub-indicators provides the complaint frequency related to customer service or core utility services, expressed as the number of complaints per 1,000 customer accounts. Two types of complaints are measured: 1) customer service (people related) and 2) technical (product related). Only those complaints which are related to utility business and are logged, whether acted on or not, are counted.

- *Complaint* – an expression of dissatisfaction conveyed to a utility employee acting in his or her official capacity. A complaint is a request for action, whereas an inquiry is a request for information. Complaints may be communicated orally or in writing.

CUSTOMER SERVICE COMPLAINTS

The customer service complaint frequency sub-indicator is expressed in two ways: 1) as the number of complaints per 1,000 customer accounts and 2) as the number of complaints per population served, calculated as follows:

$$Customer\ service\ complaints\ /\ 1{,}000\ accounts = \frac{Total\ number\ of\ customer\ service\ complaints\ x\ 1{,}000}{Number\ of\ residential\ accounts + Number\ of\ nonresidential\ accounts}$$

$$Customer\ service\ complaints\ /\ population\ served = \frac{Total\ number\ of\ customer\ service\ complaints\ x\ 1{,}000}{Population\ served}$$

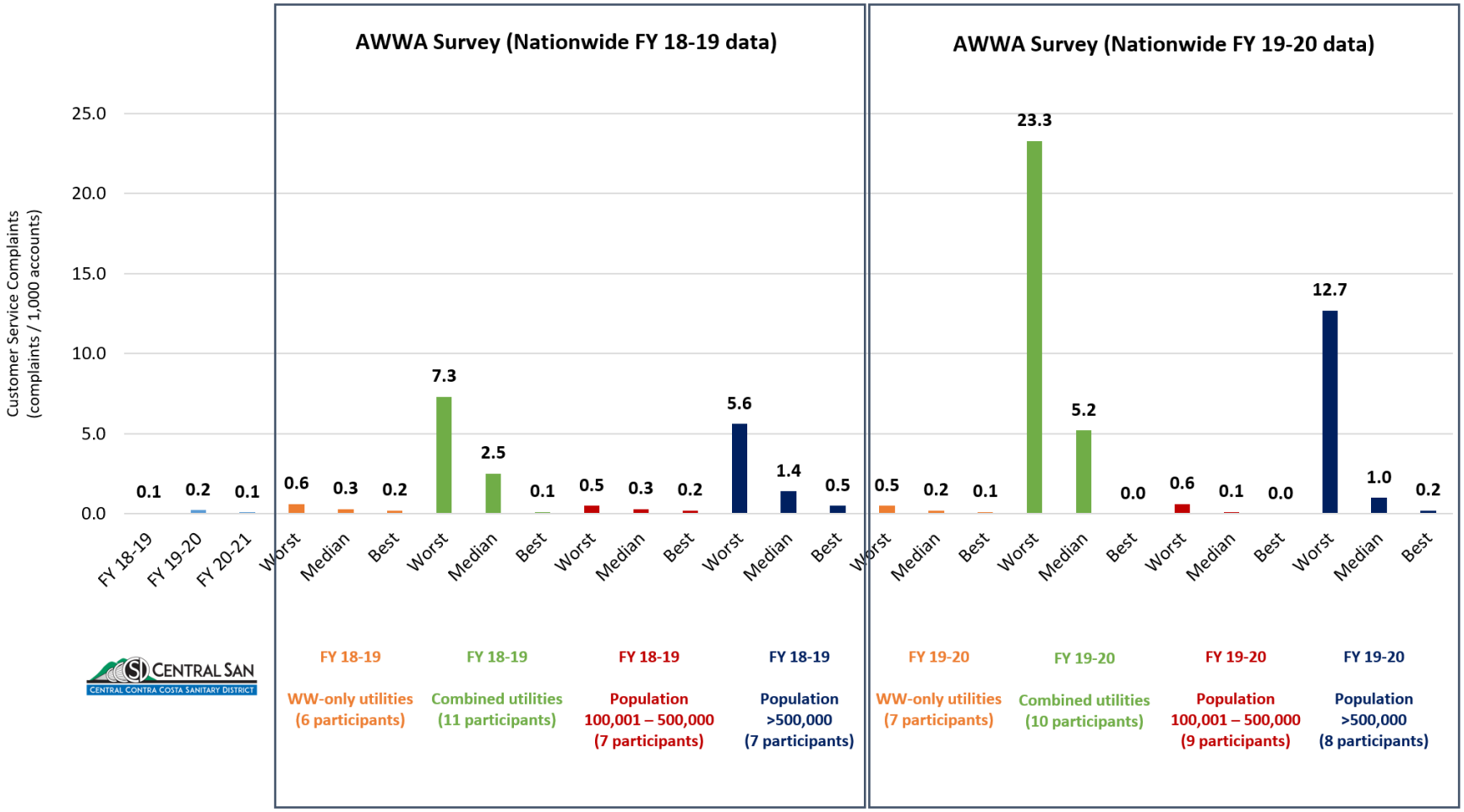
- *Customer service complaint* – refers to relationship factors, such as personal appearance, courteousness, helpfulness, professionalism, responsiveness, adherence to traffic laws while driving a vehicle, and timeliness. This also includes issues with customer support services, such as billing, rate setting, and communication.

Central San Data Calculation Method
To tally customer service complaints for Central San, various customer-facing divisions were asked to submit data. Given that Central San's services to the residents of Concord and Clayton are partial, the number of accounts or population served used does not include those cities. Financial Planning (Rates & Fees), Development Inspectors, and Environmental Compliance do not track complaints. The respondent work groups at Central San included the following:

- Risk Management, who tracks driving-related and other miscellaneous complaints
- Permit Counter, who tracks complaints via customer satisfaction surveys
- Collection System Operations (CSO), who performs service requests resulting from customer service complaints
- Front Desk, who fields miscellaneous complaints
- Secretary of the District, who tracks Proposition 218 protests to rate-setting

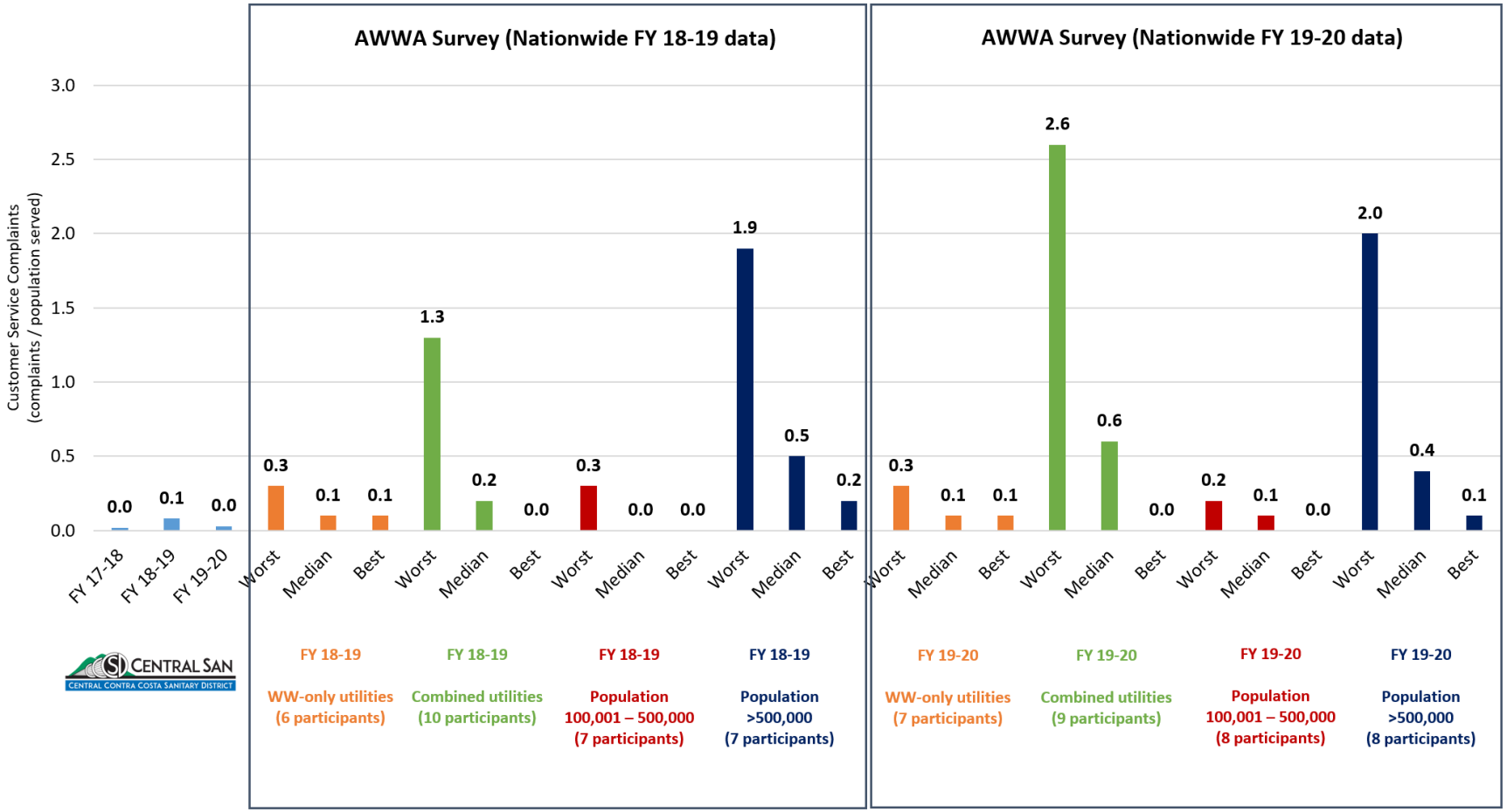
CUSTOMER SERVICE COMPLAINTS *PER 1,000 ACCOUNTS*

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



CUSTOMER SERVICE COMPLAINTS *PER POPULATION SERVED*

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



TECHNICAL SERVICE COMPLAINTS

The technical service complaint frequency sub-indicator is expressed in two ways: 1) as the number of complaints per 1,000 customer accounts and 2) as the number of complaints per population served, calculated as follows:

$$Technical\ service\ complaints\ /\ 1{,}000\ accounts = \frac{Total\ number\ of\ technical\ service\ complaints\ x\ 1{,}000}{Number\ of\ residential\ accounts + Number\ of\ nonresidential\ accounts}$$

$$Customer\ service\ complaints\ /\ population\ served = \frac{Total\ number\ of\ customer\ service\ complaints\ x\ 1{,}000}{Population\ served}$$

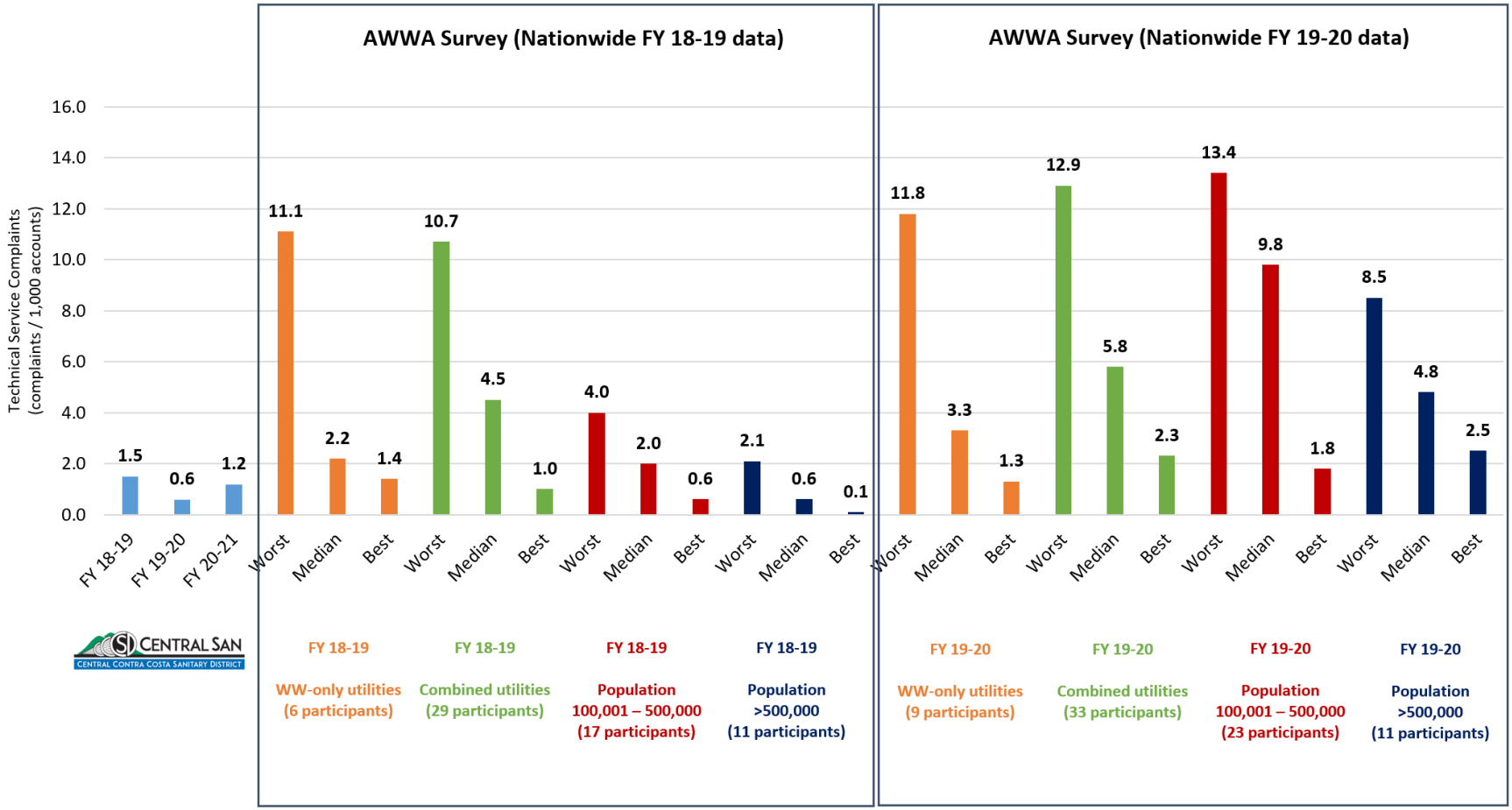
- *Technical service complaint* – directly related to core services of the utility. This includes complaints associated with odor, sewage backups and overflows, disruptions of service, disruptions of traffic, and facilities upkeep.

Central San Data Calculation Method
To tally technical service complaints for Central San, various customer-facing divisions were asked to submit data. Given that Central San's services to the residents of Concord and Clayton are partial, the number of accounts or population served used does not include those cities. The respondent work groups at Central San included the following:

- Communication Services, who receive construction project complaints
- CSO, who perform service requests in response to complaints and track odor complaints related to the collection system
- Plant Operations, who record odor complaints related to the Plant.

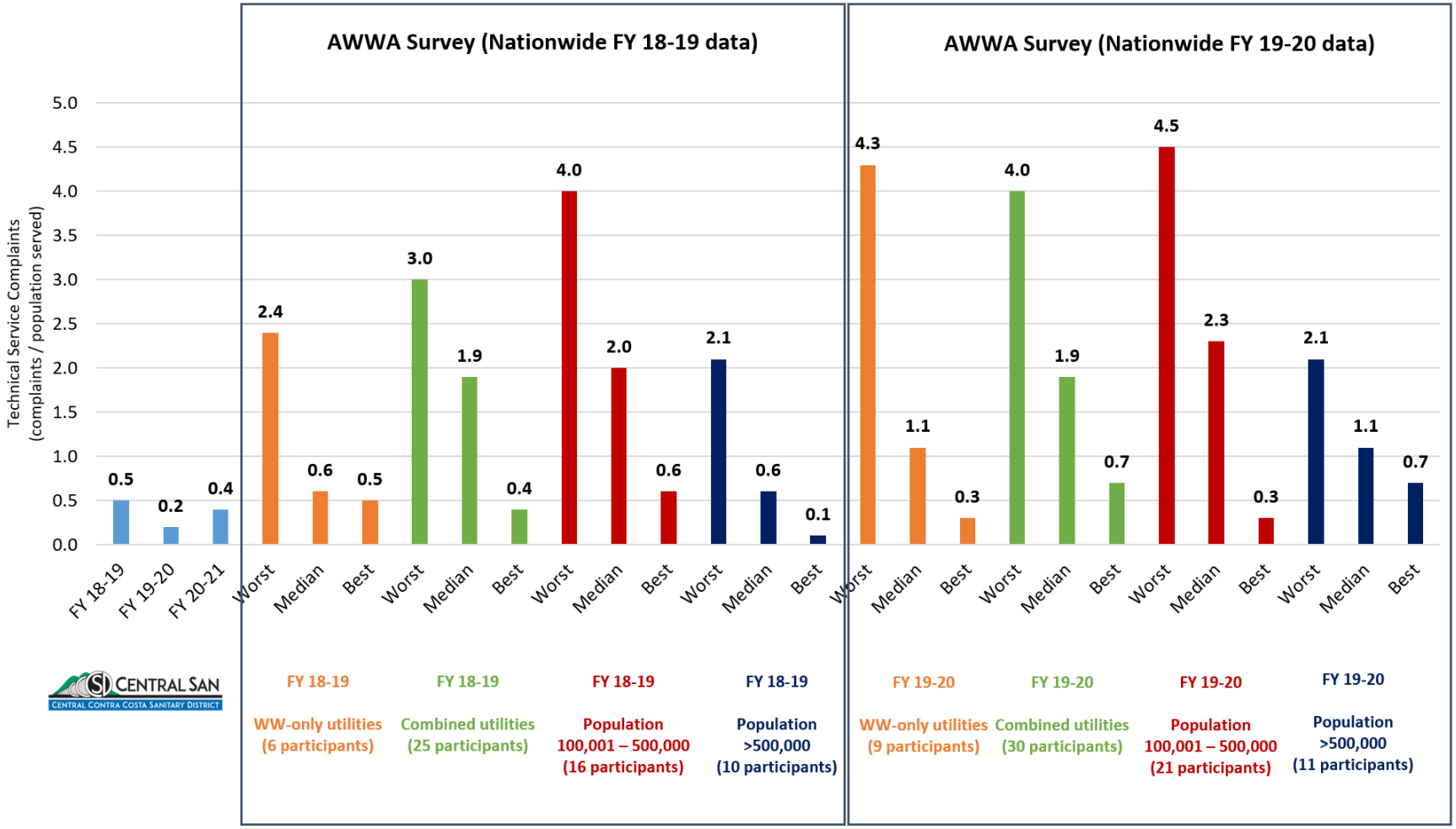
TECHNICAL SERVICE COMPLAINTS *PER 1,000 ACCOUNTS*

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



TECHNICAL SERVICE COMPLAINTS *PER POPULATION SERVED*

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



CUSTOMER SERVICE COST PER ACCOUNT

This indicator measures the amount of resources a utility applies to its customer service program over the course of a year, expressed as the cost of managing a single customer account for one year, calculated as follows:

$$\begin{aligned} &Customer\ service\ cost\ per\ account\ (annual\ \$\ /\ account) \\ &= \frac{Total\ annual\ customer\ service\ costs}{Number\ of\ residential\ accounts + Number\ of\ nonresidential\ accounts} \end{aligned}$$

- *Customer service costs* – all direct salaries, employee benefits, and direct costs, including contracts that are associated with providing the following services to customers, plus a proportional share of total utility indirect costs, for the following services: bill preparation and delivery; payment receipt and processing; records maintenance; receipt, investigation, and resolution of complaints; and preparation and provision of outreach and education materials, including the *Consumer Confidence Report*.

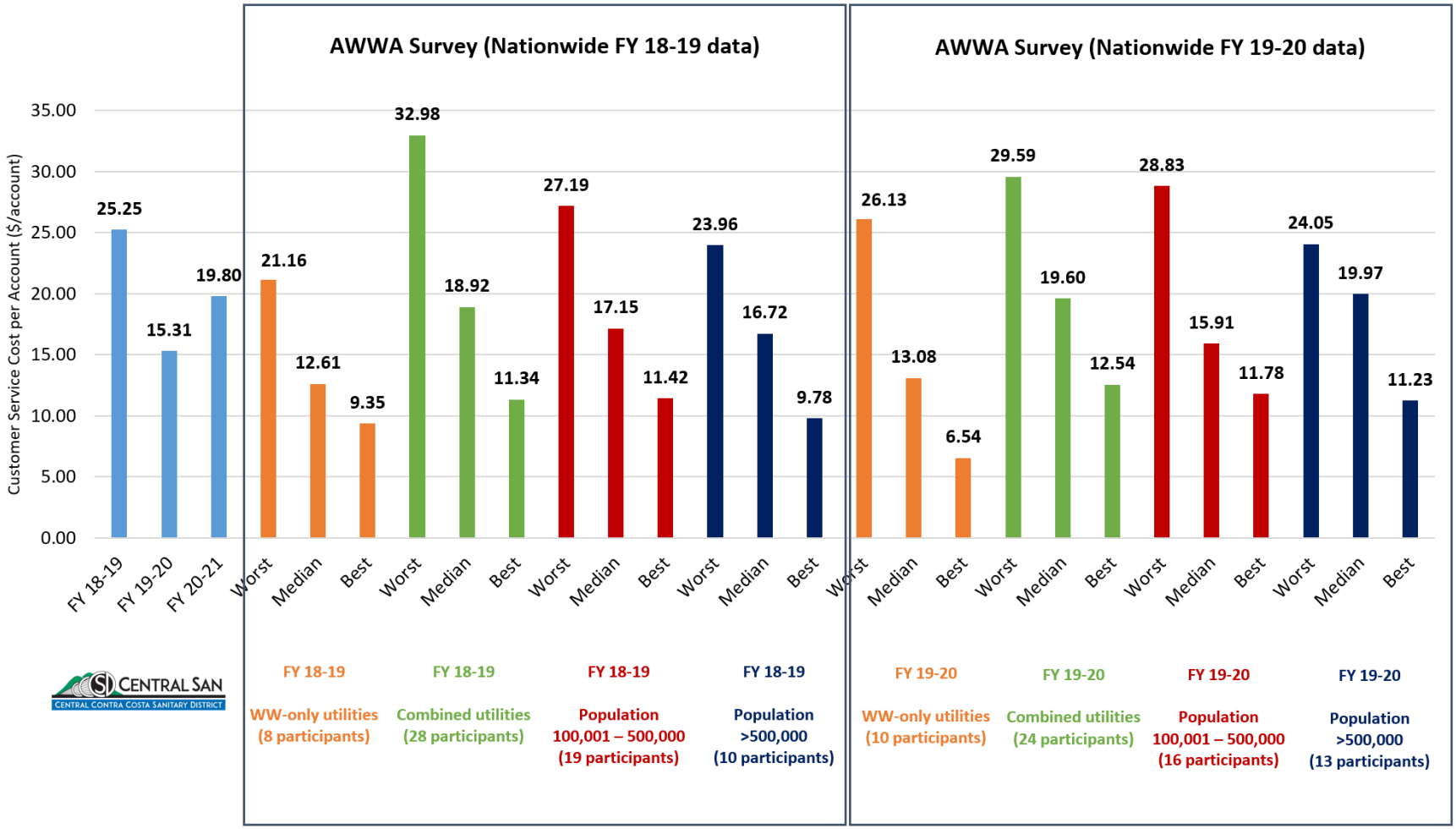
Central San Data Calculation Method

To calculate this for Central San, various divisions who perform the tasks delineated by the AWWA definition were asked to submit data. Given that Central San's services to the residents of Concord and Clayton are partial, the number of accounts used does not include those cities. The Secretary of the District work group does not track costs related to processing Proposition 218 and Public Records Act (PRA) requests and noted that other divisions receive PRA requests directly, and there would not be a way to calculate time spent by them. The respondent work groups at Central San included the following:

- CSO, for costs of fulfilling service requests
- Communication Services, for costs of producing the *Pipeline* customer newsletter, Proposition 218 notices, and educational videos. Costs of student educational programs (e.g., Pipe Protectors, Delta Discovery Voyage, and Sewer Science) and production of the Budget Book, Strategic Plan, and *Lateral Connection* employee newsletter were excluded.
- Capital Projects, for costs of investigating and resolving customer complaints. It should be noted that the costs reported are actual project costs not including employee benefits. There is no tracking mechanism for actual labor costs including overhead.
- Financial Planning (Rates & Fees), for costs of payment receipt/processing and records maintenance associated with new account setup.
- Permit Counter, for costs of payment receipt/processing and records maintenance.

CUSTOMER SERVICE COST PER ACCOUNT

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



STAKEHOLDER OUTREACH INDEX

This indicator provides a measure of a utility's stakeholder outreach activities. It is calculated based on self-assigned points found in the various categories in the stakeholder outreach checklist. Utilities were asked to have senior management assign values to each statement based on evidence that existed during the reporting period. The index is expressed as the total score as a percentage of the maximum possible score of 12. The values are as follows:

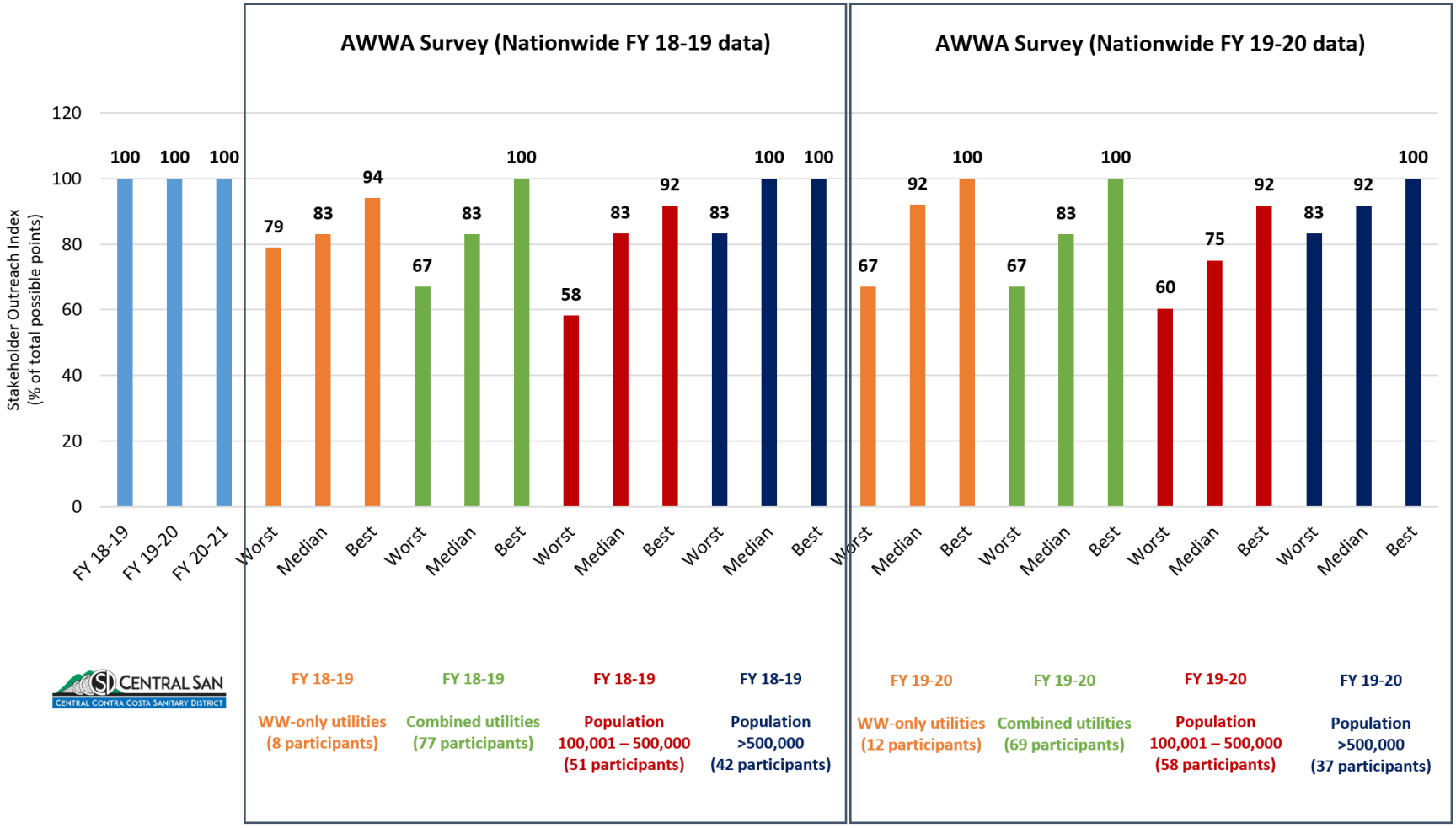
- 2 – At least annually
- 1 – Less than annual frequency
- 0 – Never/rarely

Central San Data Calculation Method
The Communications and Intergovernmental Relations Manager scored Central San as follows:

Stakeholder Outreach Index Statement	FY 18-19 Score	FY 19-20 Score	FY 20-21 Score
We regularly conduct customer satisfaction surveys that result in a statistically significant measure (or set of measures) for customer satisfaction.	2	2	2
We use the results of customer satisfaction surveys to improve our processes, practices, and systems.	2	2	2
We regularly conduct a series of interviews or open forums with key stakeholders such as public officials, regulators, community representatives, special-interest groups, developers, contractors, etc. (if "at least annually" / score of 2, must be for at least three of these groups)	2	2	2
We provide numerous channels and interactions (two-way) with stakeholders through publicly offered tours, speaking engagements, actively managed booths/kiosks, etc. on a regular, periodic basis (if score of 1 or 2, must be for at least three of these groups or channels/interactions)	2	2	2
We provide numerous outreach programs/products on a regular basis to targeted stakeholders via the media, mailers, newsletters, etc. (if score of 1 or 2, must be for at least three of these groups or programs/products)	2	2	2
We regularly review all sources of stakeholder feedback and develop actions to address areas of dissatisfaction or opportunities for improvement.	2	2	2
% of Possible Points (out of 12 points)	100.0%	100.0%	100.0%

STAKEHOLDER OUTREACH INDEX

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



CUSTOMER SERVICE CONTACT

The purpose of this indicator is to obtain a better understanding of how customers are reaching out to a utility to address inquiries or resolve customer service issues. For each method identified, utilities were asked to indicate the percentage of customers that use each method of communication. The methods of customer service contact include the following:

- Phone
- In-person
- Email
- Social media
- Other

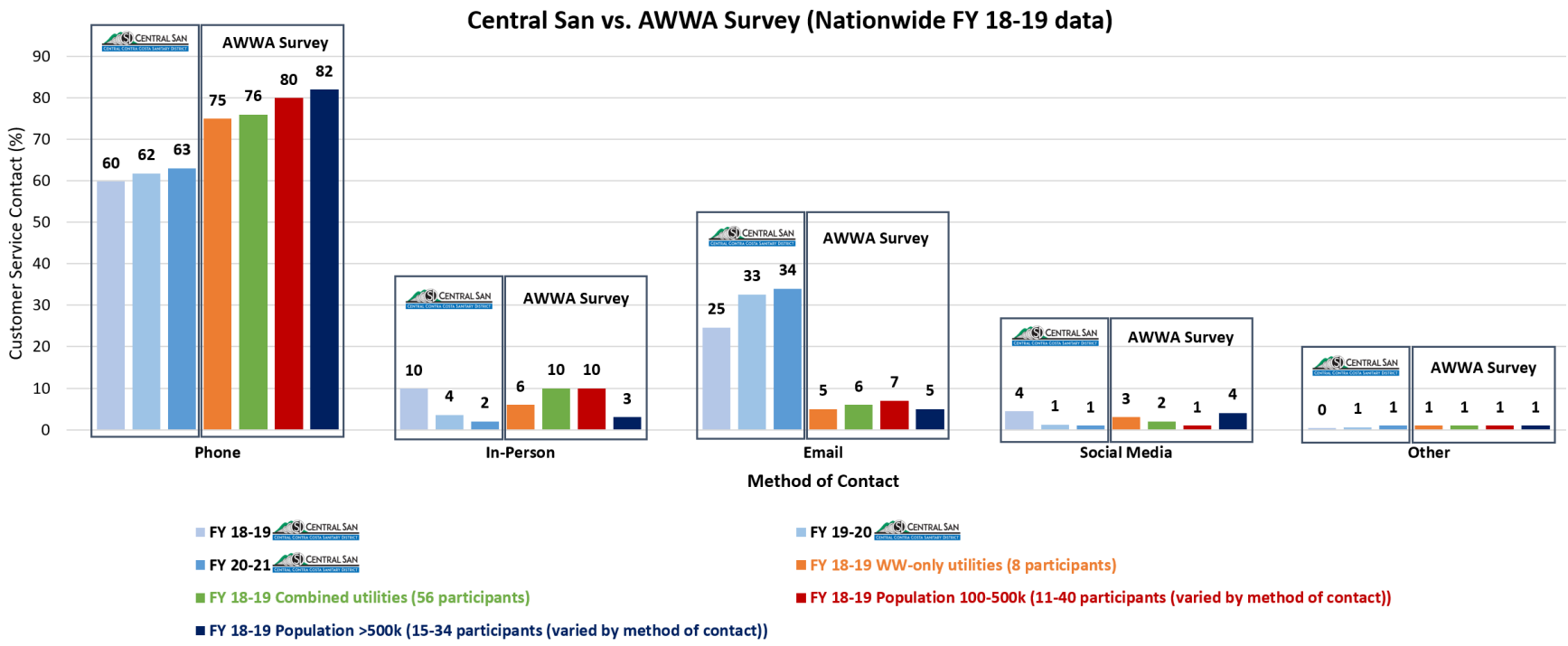
Central San Data Calculation Method
To calculate this for Central San, various customer-facing divisions were asked to submit their estimated percentage breakdown of how customers contact them, and those responses were averaged. The respondents included the following:

- Communication Services
- Front Desk
- Permit Counter
- Environmental Compliance
- Collection System Operations
- Secretary of the District

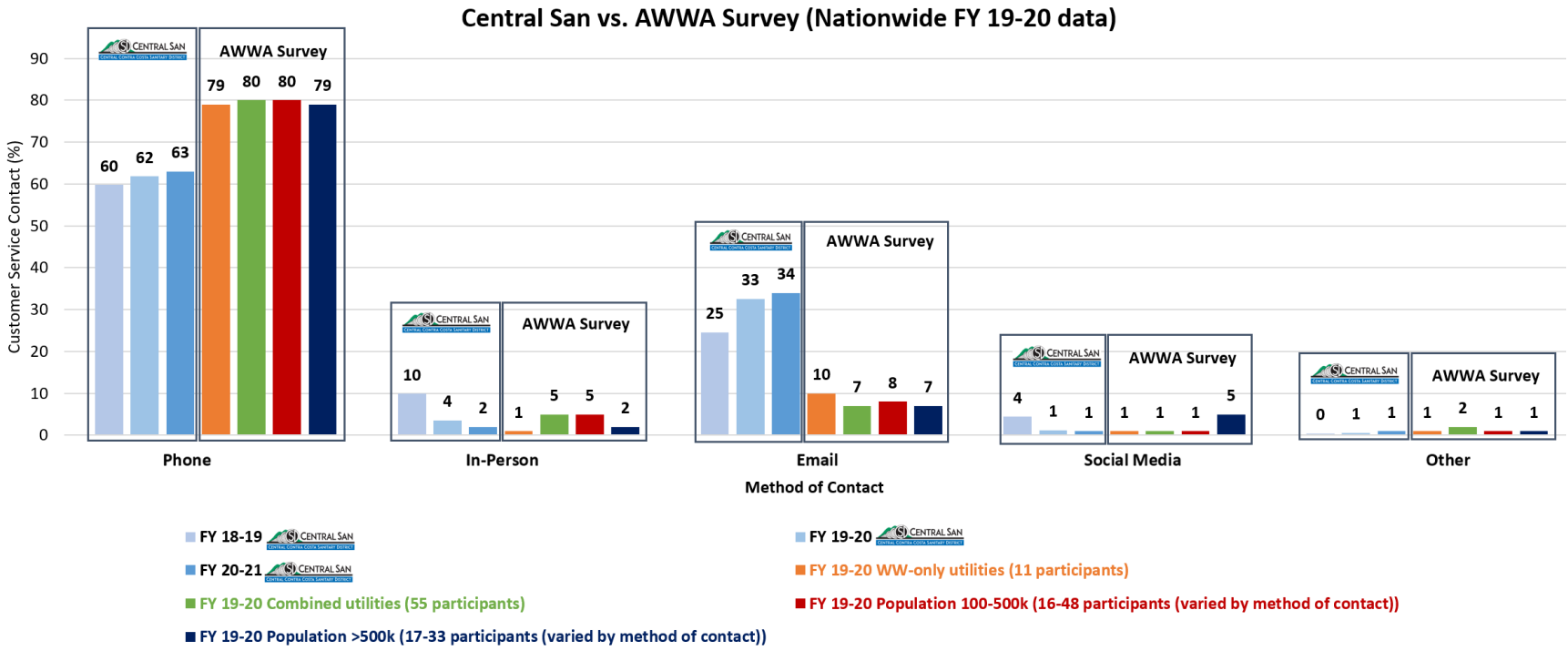
CUSTOMER SERVICE CONTACT

Due to the amount of data presented, each of the following charts shows Central San data over the last three FYs against only one set of nationwide data per graph. The performance data of each type of utility represent the median values.

Central San vs. Nationwide (*FY 18-19* Data Only)



Central San vs. Nationwide (*FYs 19-20* Data Only)



WASTEWATER SERVICE DISRUPTIONS

The WW service disruptions family of sub-indicators quantifies the number of planned and unplanned WW outages experienced by utility customers per 1,000 customer accounts and the time to address them. The benchmarks associated with WW Service Disruptions are as follows:

PLANNED WW SERVICE DISRUPTIONS <4 HOURS, 4-12 HOURS, >12 HOURS
UNPLANNED WW SERVICE DISRUPTIONS <4 HOURS, 4-12 HOURS, >12 HOURS

$$Disruptions\ of\ wastewater\ service\ (outages/1{,}000\ accounts) = \frac{1{,}000\ x\ total\ number\ of\ disruptions\ (planned\ or\ unplanned)}{Number\ of\ active\ residential\ accounts + Number\ of\ nonresidential\ accounts}$$

AVERAGE TIME TO ADDRESS PLANNED WW SERVICE DISRUPTIONS
AVERAGE TIME TO ADDRESS UNPLANNED WW SERVICE DISRUPTIONS

$$Average\ time\ to\ address\ wastewater\ service\ disruptions\ (hours) = \frac{Total\ time\ to\ address\ wastewater\ service\ disruptions}{Total\ number\ of\ wastewater\ service\ disruptions}$$

DISRUPTION FREQUENCY INDEX – PLANNED AND UNPLANNED
DISRUPTION FREQUENCY INDEX – PLANNED ONLY
DISRUPTION FREQUENCY INDEX – UNPLANNED ONLY

$$Disruption\ frequency\ index = \frac{Total\ number\ of\ wastewater\ service\ disruptions\ x\ 1{,}000}{Number\ of\ active\ residential\ accounts + Number\ of\ nonresidential\ accounts}$$

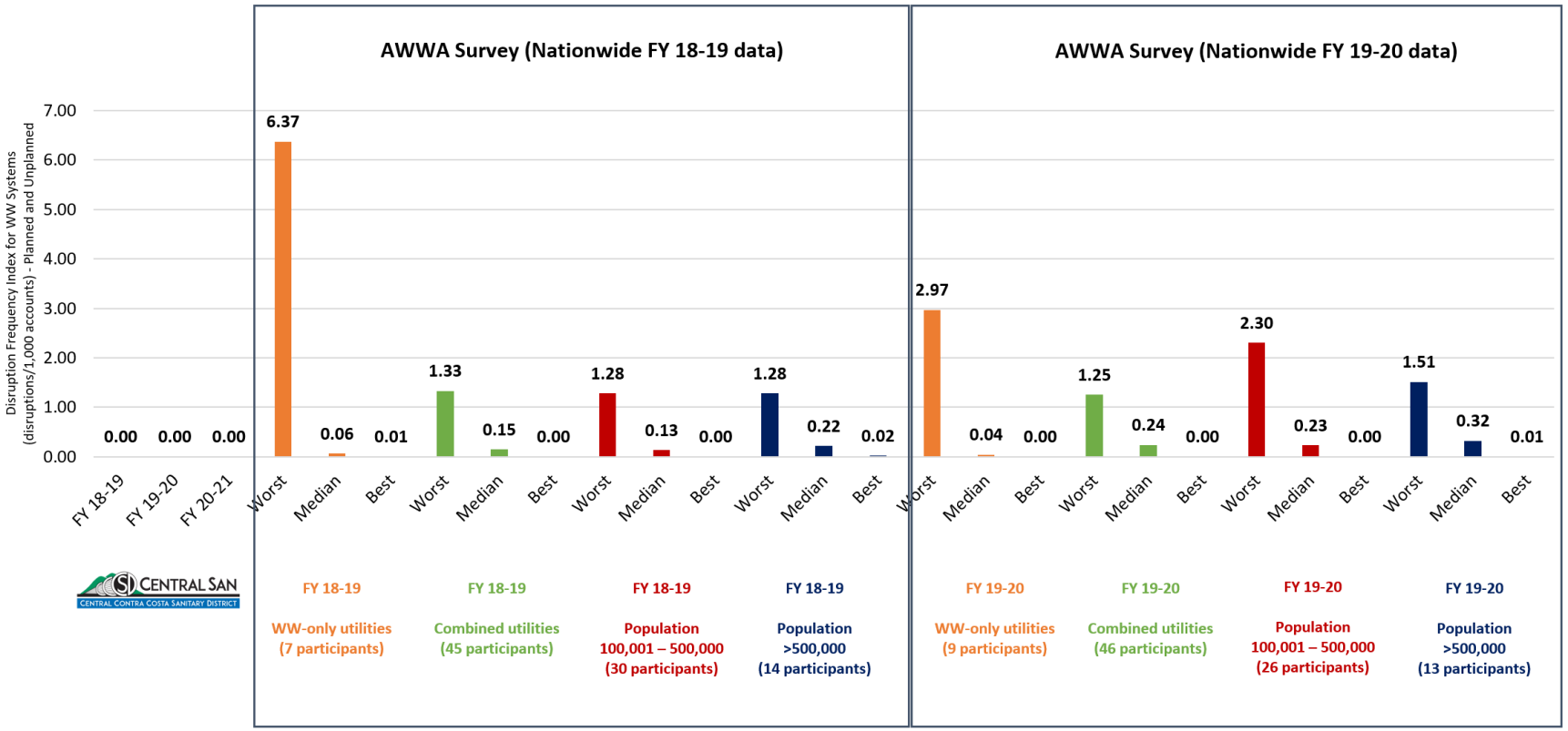
- *Disruption of service* – any event within treatment facilities or the distribution or collection system under control of the utility whereby a customer loses service. Disruption of sewer service includes backup of flow into the customer's sewer from a utility-caused backup, blockage, or flow restriction originating downstream of the customer's sewer connection. The total time to address service disruptions is the total time taken by all utility employees and contractors working for the utility to restore services following a planned disruption, including overtime. Disruptions are further sub-categorized as "planned" or "unplanned."
  - *Planned service disruptions* – prior notice is given to all affected customers.
  - *Unplanned service disruptions* – performed under emergency conditions where prior customer notice is not possible. Examples include emergency pumping facility failures and pipeline breaks.

Central San Data Calculation Method

Even in the cases of sanitary sewer overflows or lateral reconnections, Central San customers do not lose WW service. Because there were zero disruptions to service by this definition, planned or unplanned, between FYs 18-19, 19-20, and 20-21, comparable nationwide data is not presented for the seven sub-indicators above in the interest of brevity, except for Disruption Frequency Index – Planned and Unplanned, which provides a window into Central San's performance against other utilities in the realm of WW service disruptions.

DISRUPTION FREQUENCY INDEX – PLANNED AND UNPLANNED

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



PERFORMANCE INDICATORS:
PRODUCTIVITY AND PERFORMANCE

SYSTEM INSPECTION

This indicator is a measure of the amount of distribution system inspection accomplished over the course of a year and is calculated as follows:

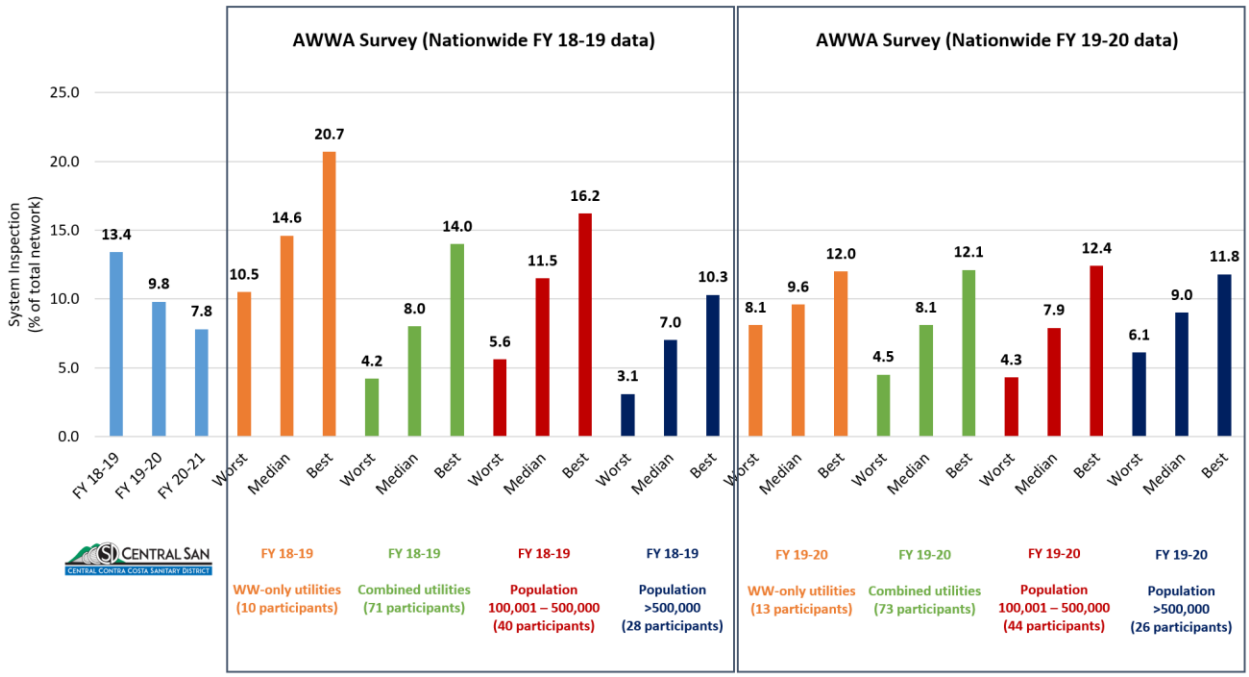
$$System\ inspection\ (\%\ of\ total\ network) = \frac{Length\ of\ pipe\ inspected}{Total\ length\ of\ pipe\ network}$$

- *Total length of pipe network* – the total length of the distribution or collection pipe network in a service area in miles, including mains of all diameters but not including lateral service lines.

Central San Data Calculation Method
While Central San performs some measure of inspection when cleaning pipes, length of pipe cleaned is not included in the length of pipe inspected.

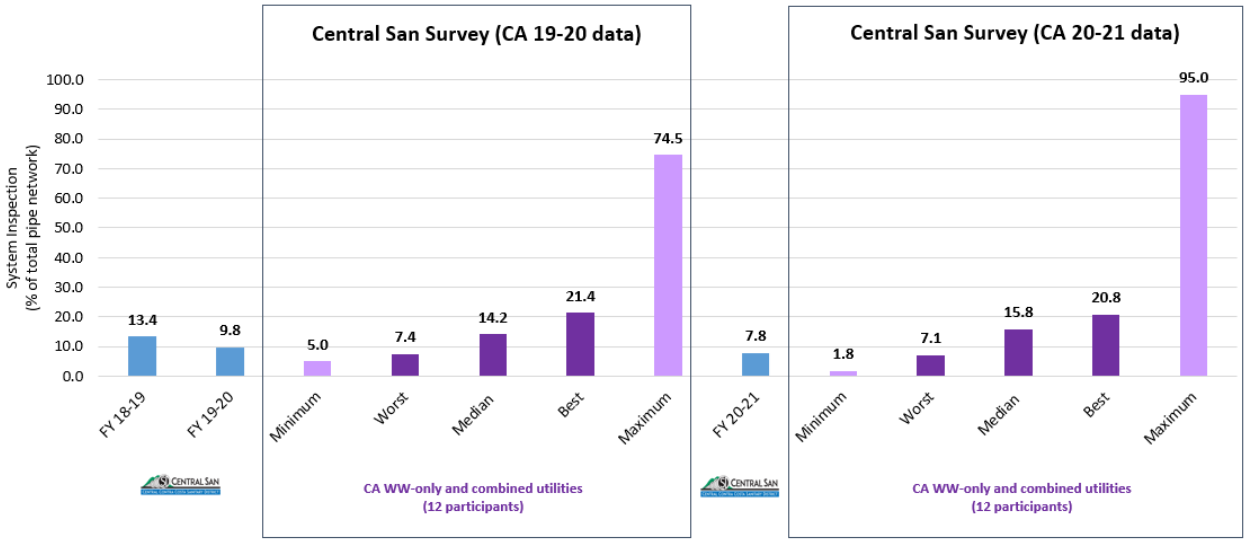
SYSTEM INSPECTION

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



Central San vs. CA* (*FYs 19-20 and 20-21* Data)

POTENTIAL CHART UPDATE IF ONE CITY CORRECTS THEIR FIGURE – they have forwarded our request to verify or fix their data to their wastewater operations division



* The CA agency data set makes no distinction between agencies that provide dual services (combined utilities), are retail agencies, or are agencies that are part of a larger operation.

SYSTEM RENEWAL AND REPLACEMENT (R&R) FUND ALLOCATION / CAPITAL EXPENDITURES TO DEPRECIATION RATIO

SYSTEM RENEWAL AND REPLACEMENT (R&R) FUND ALLOCATION

The System R&R Fund Allocation indicator quantifies the percentage of funds allocated for R&R activities in the broad asset groups of WW Collection, WW Pump Stations, and WW Treatment, calculated as follows:

$$System\ R\&R\ Funds\ (\%) = \frac{Total\ expenditures\ or\ amount\ of\ funds\ reserved\ for\ R\&R\ of\ an\ asset\ group}{Total\ present\ worth\ of\ R\&R\ needs\ for\ that\ asset\ group}$$

AWWA instructs that total present worth of R&R needs typically need to be estimated. A simplified approach, based on the asset replacement cost, starts with historic asset value and updates using the *Engineering News-Record* Construction Cost Index (CCI) (e.g., using the CCI, the complete replacement cost for a treatment facility constructed in 1990 would be calculated by multiplying the 1990 cost by the CCI for the reporting year divided by the CCI for 1990).

Asset life spans must also be estimated. When asset groups have subcategories with different lives, a weighted average should be calculated. Default values for asset-class life spans are 100 years for WW collection system components and 50 years for WW treatment and pumping facilities. An asset age factor (asset age/estimated life span) is then applied to the total replacement cost to estimate the total present worth of R&R needs. If the asset age exceeds the estimated life span, an asset age factor of 1.0 should be used.

For WW pipelines for which complete cost information is absent, AWWA states that it is permissible to simplify calculations by ignoring the effects of relatively low-cost WW access holes and cleanouts.

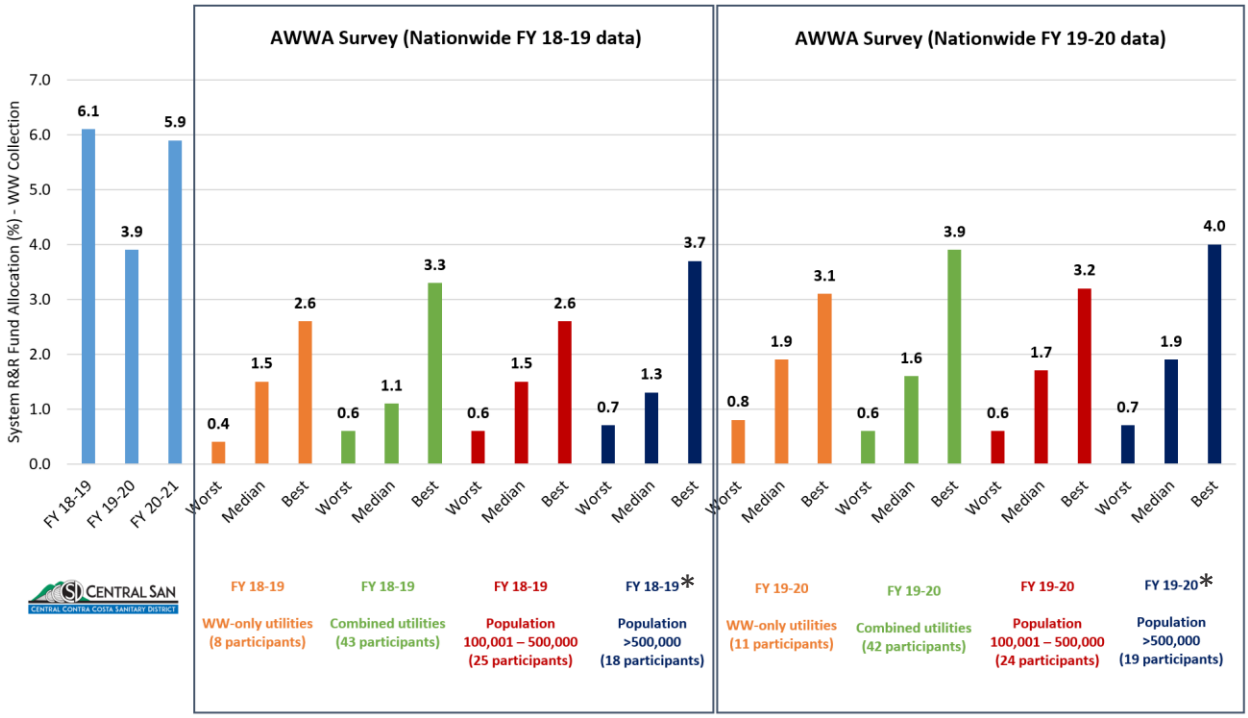
The three sub-indicators of this benchmark are as follows:

SYSTEM R&R: WW COLLECTION
SYSTEM R&R: WW PUMP STATIONS
SYSTEM R&R: WW TREATMENT

Central San Data Calculation Method
Central San has worked with AWWA to clarify the methodology in the past, and it remains unclear. Staff has followed the AWWA guidance as closely as possible to produce the performance figures for Central San.

SYSTEM R&R: WW COLLECTION

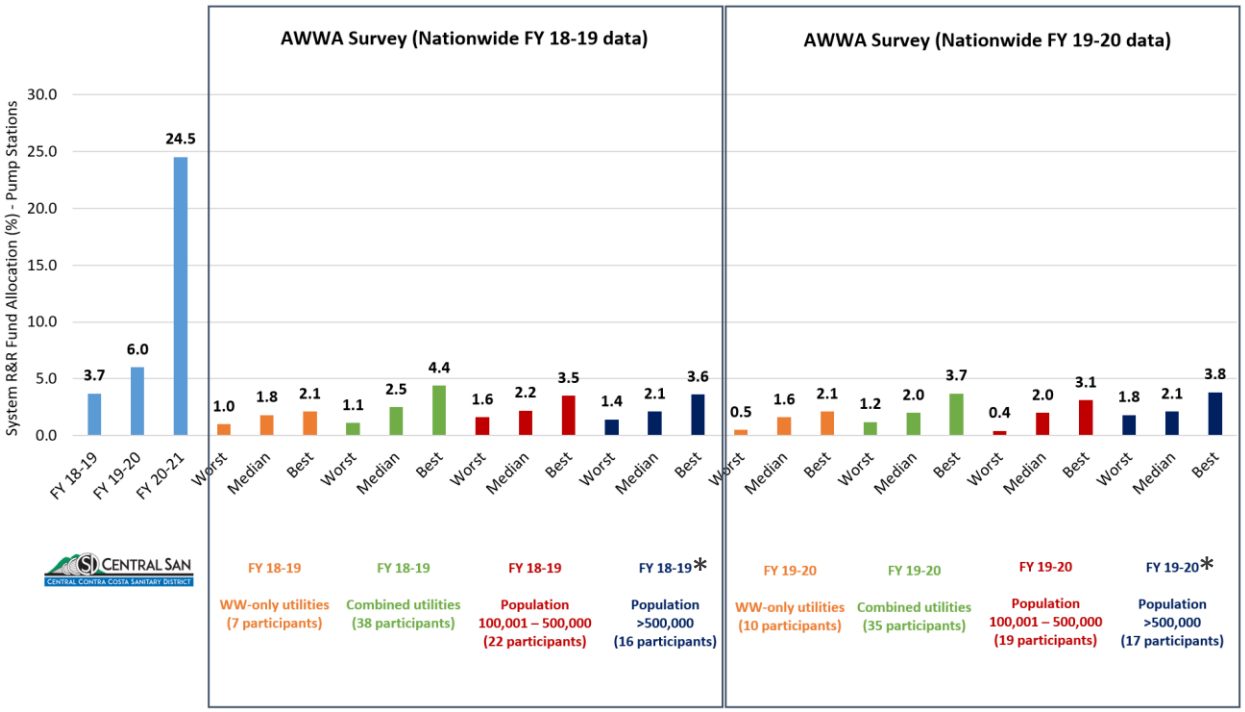
Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



*Central San does not maintain the collection system for Concord and Clayton. Without Concord and Clayton, the service area population is below 500,000; therefore, this data set is not as comparable to Central San but provided for reference.

SYSTEM R&R: WW PUMP STATIONS

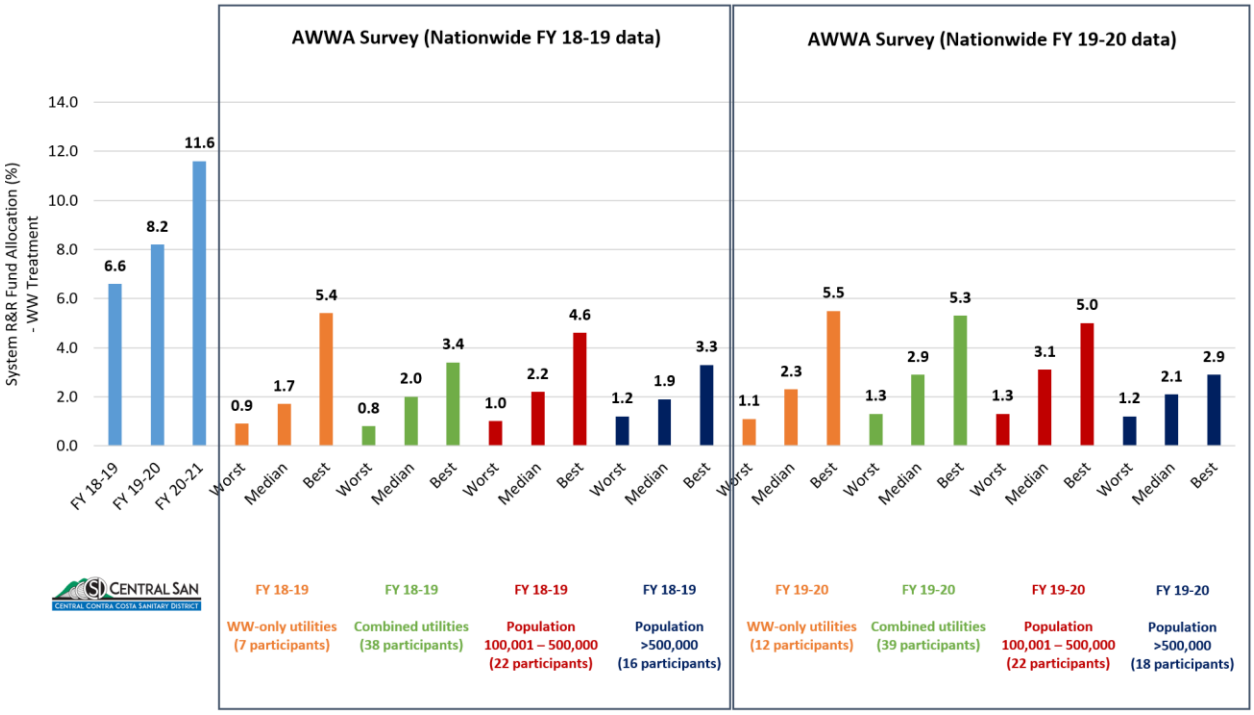
Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



*Central San does not maintain the pump stations for Concord and Clayton's collection system. Without Concord and Clayton, the service area population is below 500,000; therefore, this data set is not as comparable to Central San.

SYSTEM R&R: WW TREATMENT

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



CAPITAL EXPENDITURES TO DEPRECIATION RATIO

Because the AWWA performance indicator of System R&R Fund Allocation bears such complexity and room for interpretation, Central San has added a Capital Expenditures to Depreciation Ratio indicator to this study, which attempts to capture and better demonstrate the intent of the System R&R Fund Allocation. Central San included this indicator in its CA survey to obtain comparable data. This indicator is calculated as follows:

$$Capital\ Expenditures\ to\ Depreciation\ Ratio = \frac{Capital\ Expenditures}{Depreciation}$$

- *Capital expenditures* – any type of expenses that a utility capitalizes, or shows on its balance sheet as an investment, rather than on its income statement as an expenditure. Capitalizing an asset requires the utility to spread the cost of the expenditure over the useful life of the asset.

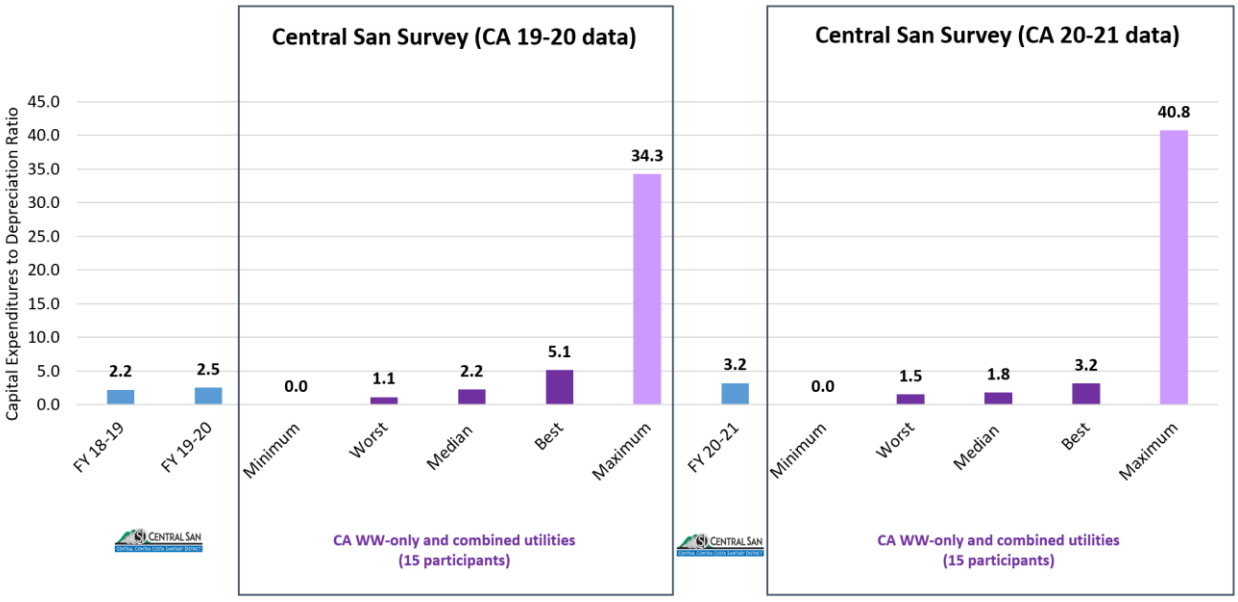
- *Depreciation expense* – this represents the current year amortization of fixed assets over their expected useful life.

CAPITAL EXPENDITURES TO DEPRECIATION RATIO
(NOT INCLUDED IN AWWA UTILITY BENCHMARKING SURVEY)

Central San vs. Nationwide (*FYs 18-19 and 19-20* data) – Unavailable

AWWA nationwide data is unavailable as this indicator was not included in AWWA's *Utility Benchmarking* book.

Central San vs. CA (*FYs 19-20 and 20-21* Data)



NON-CAPACITY AND CAPACITY SEWER OVERFLOW RATES

This family of sub-indicators measures the total number of non-capacity and capacity sewer overflow events expressed as the ratio of the number of events per 100 miles of sanitary collection system piping. They are intended to measure overflows created by conditions within collection system components under control of the utility, such as overflows from sanitary sewers and dry-weather overflows from combined sanitary/storm sewers. A dry-weather overflow occurs when sanitary and storm sewers combine to overflow during weather conditions when the portion attributed to stormwater is negligible. The non-capacity and capacity sewer overflow rates are calculated as follows:

NON-CAPACITY SEWER OVERFLOW RATE

$$Non-capacity\ sewer\ overflow\ rate = \frac{Number\ of\ non-capacity\ sewer\ overflow\ events\ during\ reporting\ period\ x\ 100}{Total\ miles\ of\ collection\ system\ piping}$$

CAPACITY SEWER OVERFLOW RATE

$$Capacity\ sewer\ overflow\ rate = \frac{Number\ of\ capacity\ sewer\ overflow\ events\ during\ reporting\ period\ x\ 100}{Total\ miles\ of\ collection\ system\ piping}$$

- *Sewer overflow* – A discharge from a sewer through a manhole, cleanout, pumping facility, customer floor drain, or the drain in a fixture, if that discharge is related to limitations or problems with collection or treatment system components under the control of the utility. Overflows caused by limitations or problems within customer-controlled piping and facilities are specifically excluded from this definition.

- *Non-capacity overflow* – a discharge related to maintenance issues. These include grease buildup, root intrusion, and a need to clean and rod the system. Overflows caused by limitations or problems within customer-controlled piping and facilities are specifically excluded from this definition.

- *Capacity overflow* – discharge that is a direct result of rain events that generally occur as a result of inflow and infiltration.

Below are the number of overflows reported for Central San, provided for reference:

Overflow Type	FY 18-19	FY 19-20	FY 20-21
Non-capacity overflows	30	22	23
Capacity overflows	0	0	0

Commentary

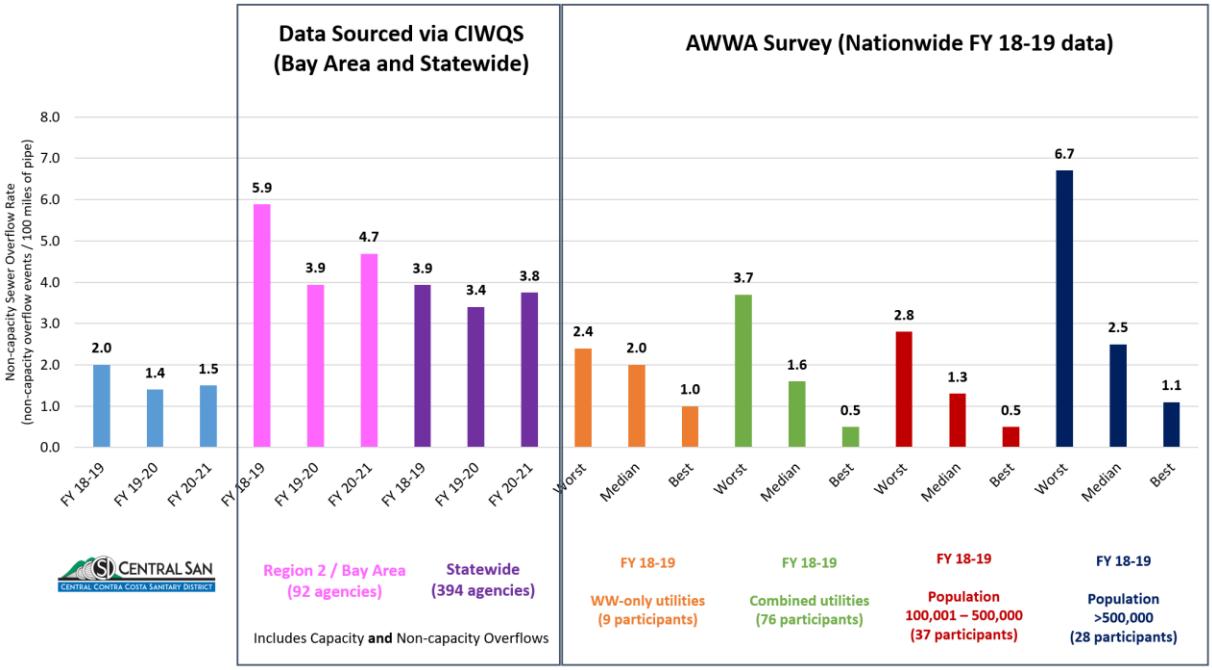
It should be noted that cities and states may have overflow reporting requirements that may be more stringent than one another. Additionally, some participating agencies may be wholesale or have combined sewers. It is Central San's opinion that AWWA should have separate benchmarks for retail and wholesale agencies since wholesale agencies do not maintain their collection system. This would yield more meaningful results and the ability to directly compare similar agencies.

CA Agency Data Commentary

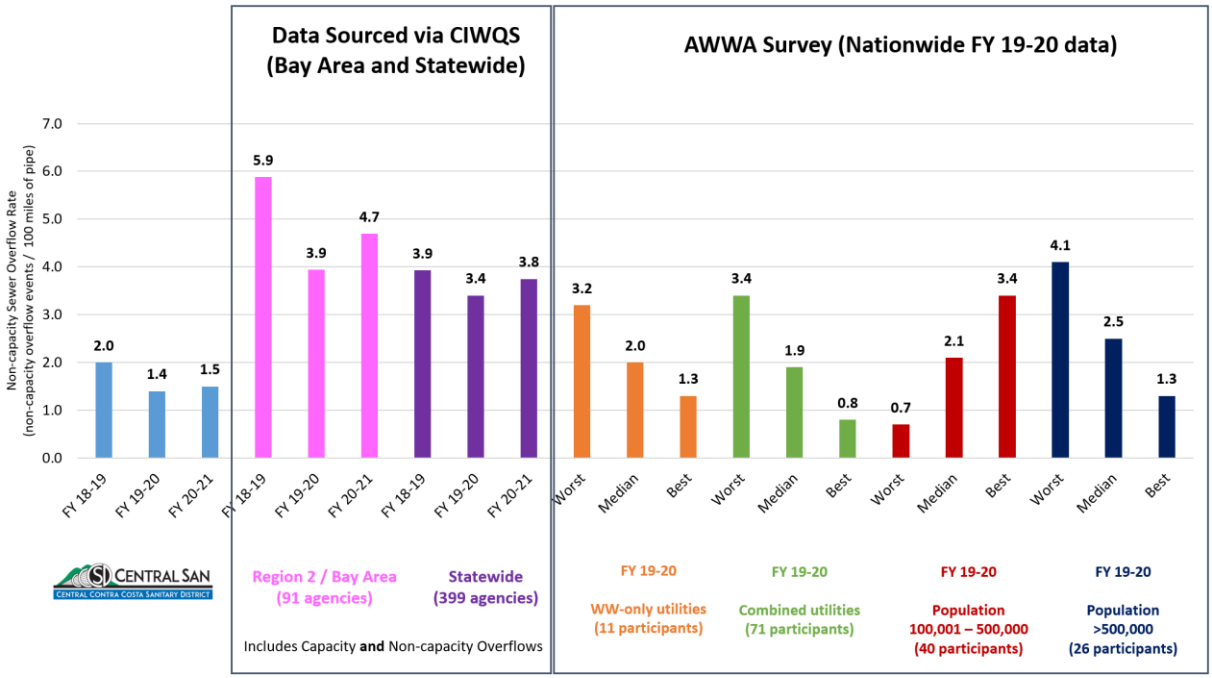
CA agency data was sourced by Central San from the California Integrated Water Quality System Project (CIWQS). This provides a comparison of Central San to CA agencies on both a statewide and regionwide (Region 2, or the Bay Area) level. The CIWQS data makes no distinction between capacity and non-capacity overflows; it is presented as the total number of overflows for all agencies who reported spills divided by the total miles of collection system piping of all the agencies who reported spills. It also makes no distinction between wholesale and combined sewers, which can affect overflow numbers.

NON-CAPACITY SEWER OVERFLOW RATES

Central San vs. CA* (*FYs 18-19, 19-20, and 20-21* Data via CIWQS) vs. Nationwide (*FYs 18-19* Data Only)



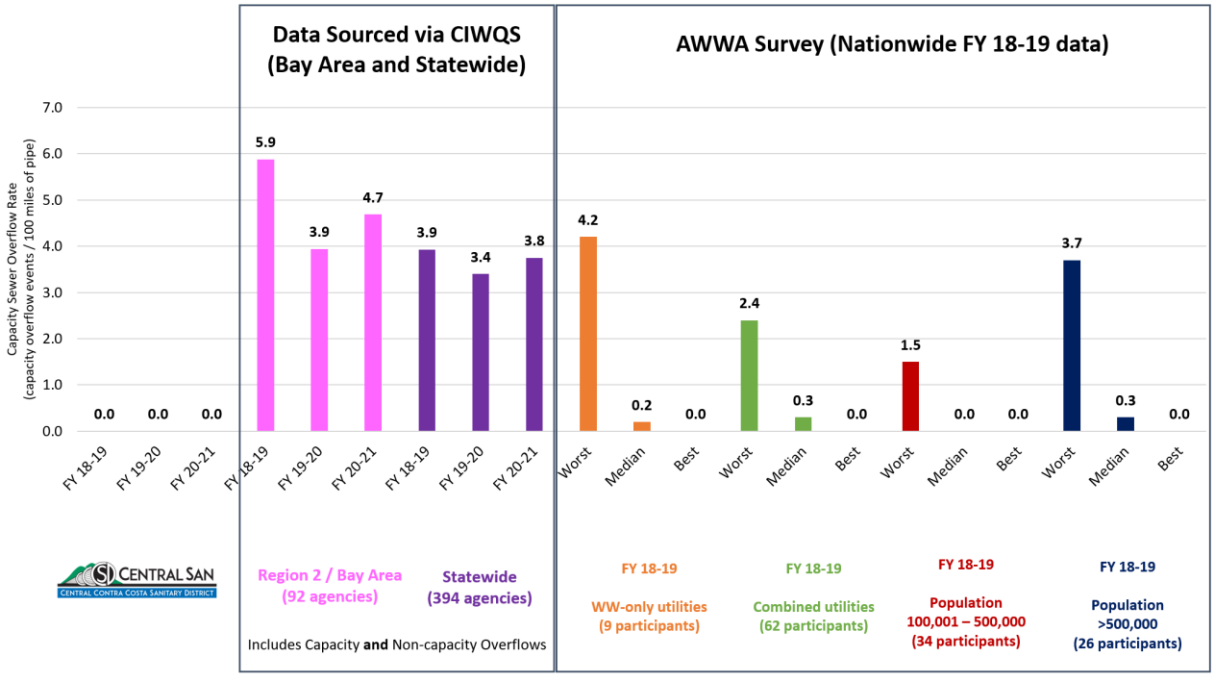
Central San vs. CA* (*FYs 18-19, 19-20, and 20-21* Data via CIWQS) vs. Nationwide (*FYs 19-20* Data Only)



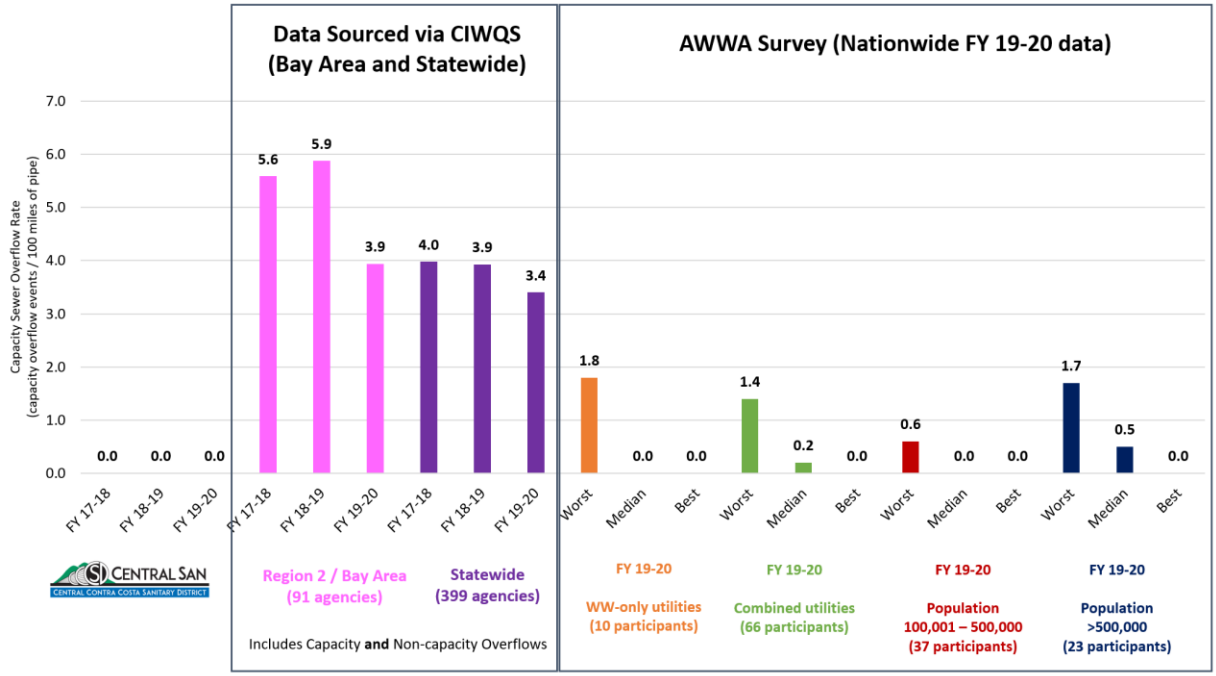
*The CA data from CIWQS makes no distinction between agencies that are wholesale or have combined sewers, which can affect overflow numbers. The data also includes both capacity and non-capacity overflows.

CAPACITY SEWER OVERFLOW RATES

Central San vs. CA* (*FYs 18-19, 19-20, and 20-21* Data via CIWQS) vs. Nationwide (*FYs 18-19* Data Only)



Central San vs. CA* (*FYs 18-19, 19-20, and 20-21* Data via CIWQS) vs. Nationwide (*FYs 19-20* Data Only)



*The CA data from CIWQS makes no distinction between agencies that are wholesale or have combined sewers, which can affect overflow numbers. The data also includes both capacity and non-capacity overflows.

COLLECTION SYSTEM INTEGRITY

This indicator quantifies the condition of a WW collection system expressed as the annual number of failures per 100 miles of collection system piping, calculated as follows:

$$\frac{Collection\ system\ integrity}{100\ miles\ of\ pipeline} = \frac{Total\ number\ of\ failures\ x\ 100}{Total\ miles\ of\ collection\ system\ piping}$$

- *Collection system failure* – A loss of capacity resulting from a flow restriction in gravity or pressurized WW systems. Flow restrictions may be caused by deposition of foreign materials; structural failures of pipes, appurtenances, or access holes; deterioration of collection system materials; and root intrusion. Low spots in gravity sewers (sometimes called swags) are failures if there is potential deposition and diminished sewer capacity.

  Electrical and mechanical lift station failures unrelated to flow restrictions, electrical power outages at lift stations, and failures that occur on customer properties should not be considered collection system failures. Also excluded are any failures directly caused by the action of a person authorized by the utility, such as failure caused by incidental damage during construction or repair.

Collection system failures as defined above do not always result in an overflow for Central San. Below are the number of failures reported for Central San (stoppages and sanitary sewer overflows), provided for reference:

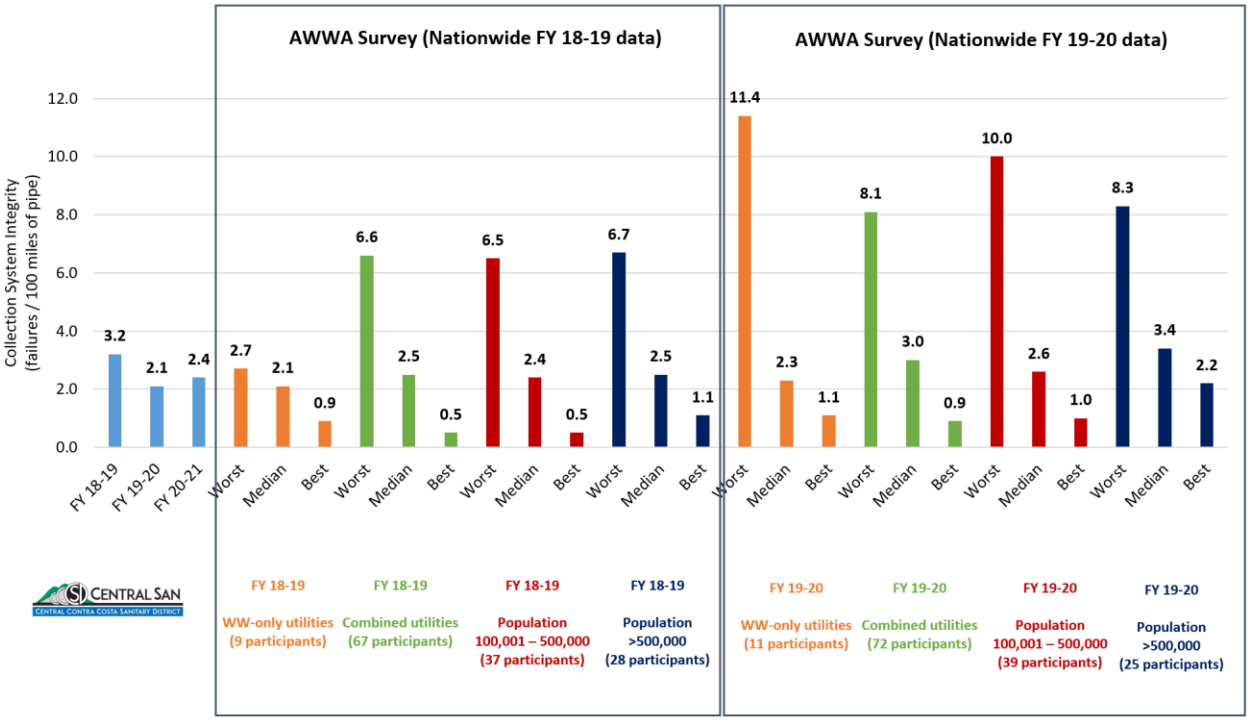
	FY 18-19	FY 19-20	FY 20-21
Collection System Failures	49	32	37

Commentary

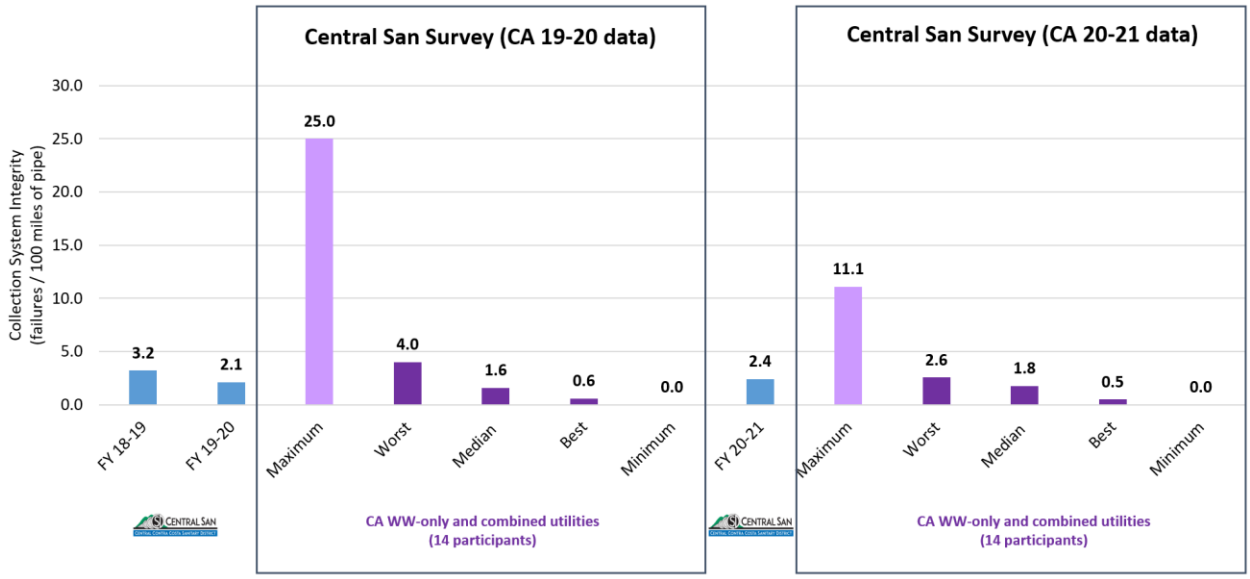
When comparing to the statewide and nationwide data, it is important to note that several factors may influence the ability to make an "apples-to-apples" comparison. Central San's service area has experienced drought in recent years, which has created voluntary and involuntary declines in potable water usage. Reduced influent flow in pipes can cause unavoidable collection system failures. Topography may also cause additional failures; for example, Central San's service area may have more plant life (i.e., roots) than other service areas, causing more collection system failures due to unavoidable root intrusions. Infiltration and inflow can also influence the number of collection system failures.

COLLECTION SYSTEM INTEGRITY

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



Central San vs. CA (*FYs 19-20 and 20-21* Data)



* The CA agency data set makes no distinction between agencies that are wholesale or have combined sewers, which can affect failure numbers.

REGULATORY COMPLIANCE

Regulatory compliance for WW treatment is expressed as a percentage of the number of events per the facility's permit limit in compliance to the summation of the total number of compliance events in the reporting period. This measure assesses compliance as related to the National Pollutant Discharge Elimination System and any other relevant federal (Clean Water Act, Safe Drinking Water Act, etc.) or state statute/regulations and permit requirements. The scope can include the quality of all related products, including drinking water, fire suppression water, treated effluent reused water, and biosolids (Environmental Protection Agency 503 Regulations), as well as quality related to operating requirements such as pressure and number of sewer overflows. These indicators report compliance related to the utility's wastewater treatment operations and wastewater collection system operations and are calculated as follows:

$$Regulatory\ Compliance\ (\%) = \frac{Total\ number\ of\ compliance\ events\ per\ utility's\ permit - number\ of\ events\ out\ of\ compliance}{Total\ number\ of\ compliance\ events\ per\ utility's\ permit}$$

This formula is applied to the following two sub-indicators:

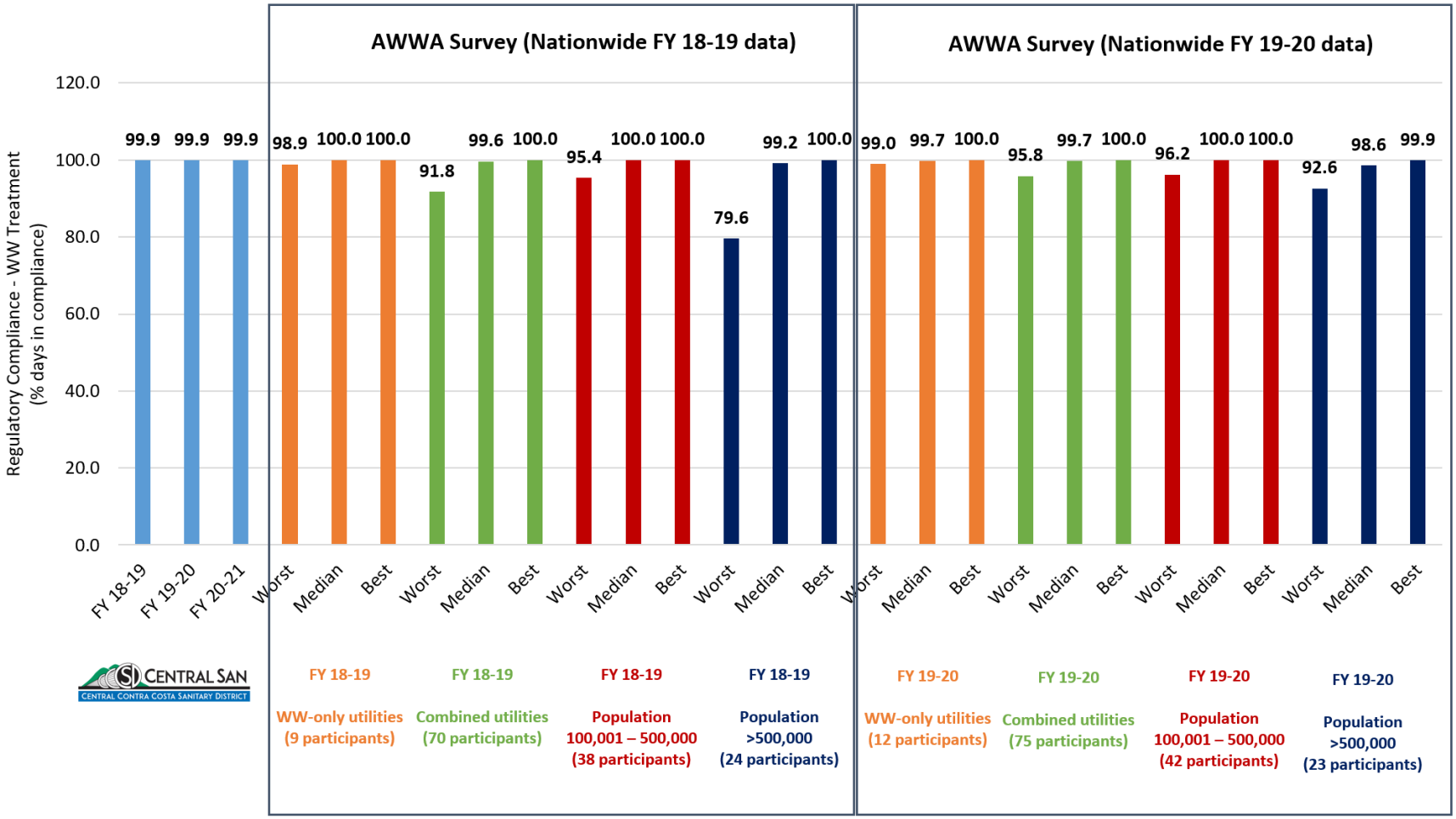
REGULATORY COMPLIANCE – WW TREATMENT

REGULATORY COMPLIANCE – COLLECTION SYSTEM OPERATIONS

Central San Data Calculation Method
There is some confusion associated with how this indicator should be interpreted. AWWA provides the formula above which utilizes the number of compliance events to calculate performance; however, the outputs are reported as "% days in compliance." In the online survey portal, AWWA asks for the number of days out of compliance. Central San utilized days out of compliance in calculating the performance figures, converting events out of compliance into partial days (reflecting the amount of time Central San was out of compliance).

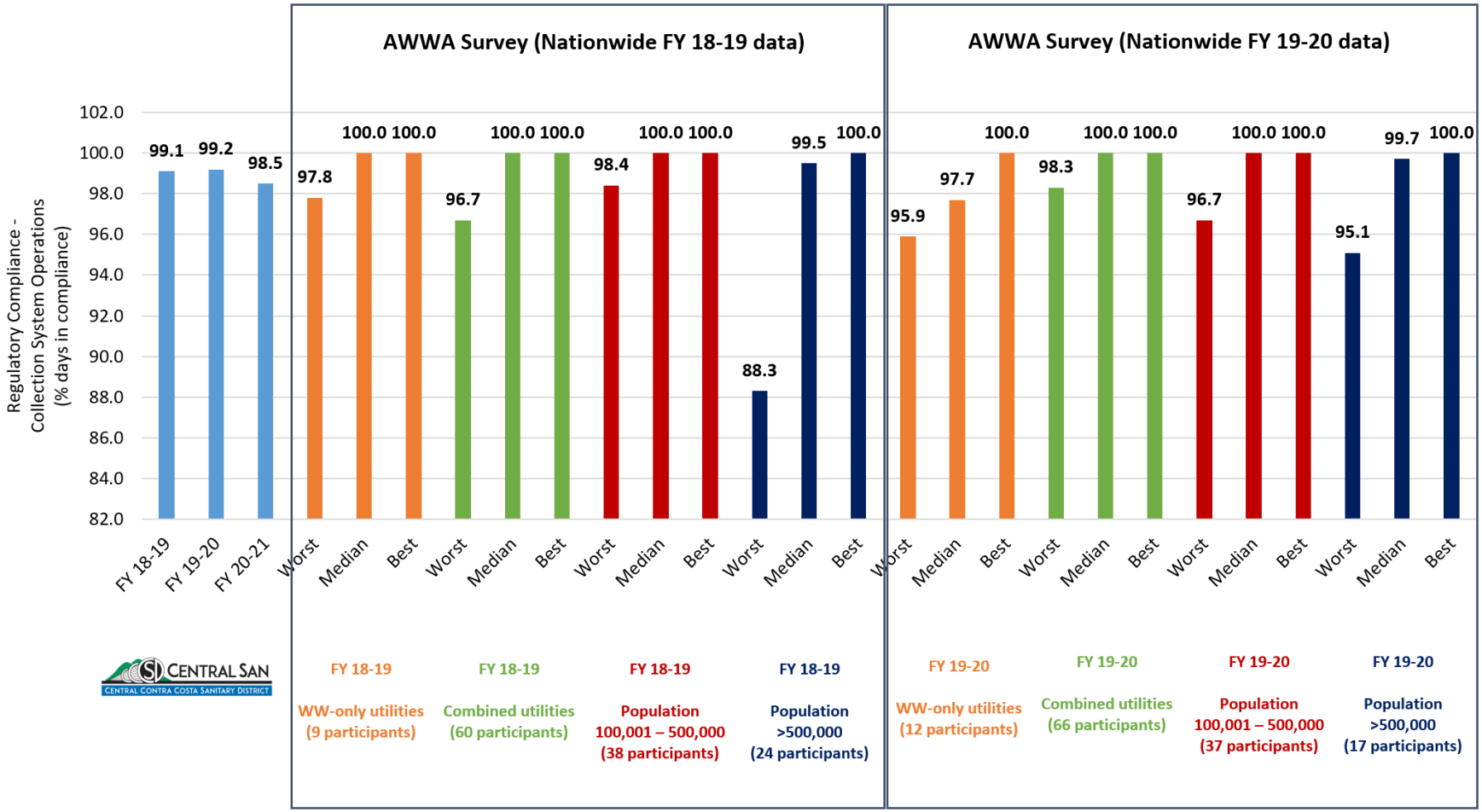
REGULATORY COMPLIANCE – WW TREATMENT

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



REGULATORY COMPLIANCE – COLLECTION SYSTEM OPERATIONS

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



CUSTOMER ACCOUNTS PER EMPLOYEE

This indicator measures employee efficiency in the form of the total number of active accounts serviced by utility employees (FTEs) per year, calculated as follows:

$$Customer\ accounts\ per\ employee = \frac{Number\ of\ active\ residential\ accounts + number\ of\ active\ nonresidential\ accounts}{Total\ number\ of\ FTEs}$$

- *Active account* – refers to a formal arrangement providing for regular services for some or all of the reporting period.

- *Customer* – describes an individual service agreement for water or WW service at a single property regardless of size or billing category. An individual may own more than one property and be counted as a customer more than once.

- *Nonresidential accounts* – institutional, commercial, and industrial (ICI) customers, including hotels/motels, schools/universities, restaurants, laundromats, car washes, office buildings, hospital/medical offices, food stores, auto shops, and industries.

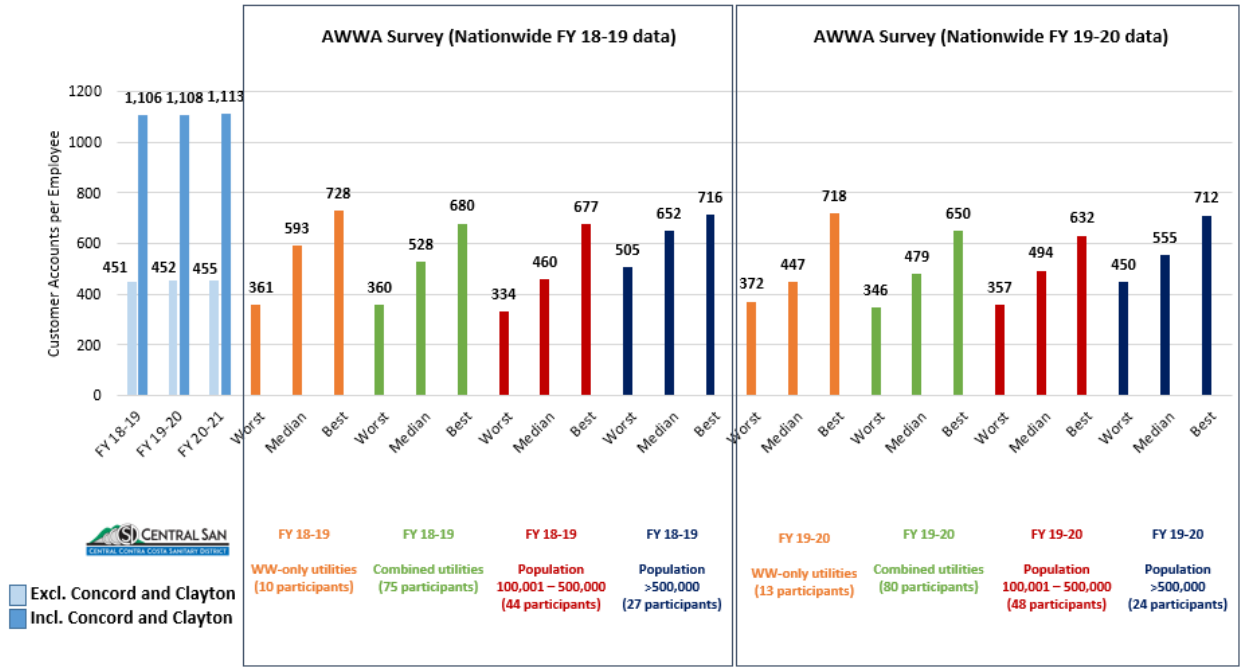
- *Residential accounts* – refer to single-family and multifamily customers.

Central San Data Calculation Method
Central San reported its numbers of residential parcels and nonresidential parcels as the "active residential accounts" and "active nonresidential accounts" respectively as that seemed to best fit the AWWA methodology. Central San provides WW treatment and trunk sewer service to the cities of Concord and Clayton by contract. Two sets of data have been presented to exclude and include these customer accounts.

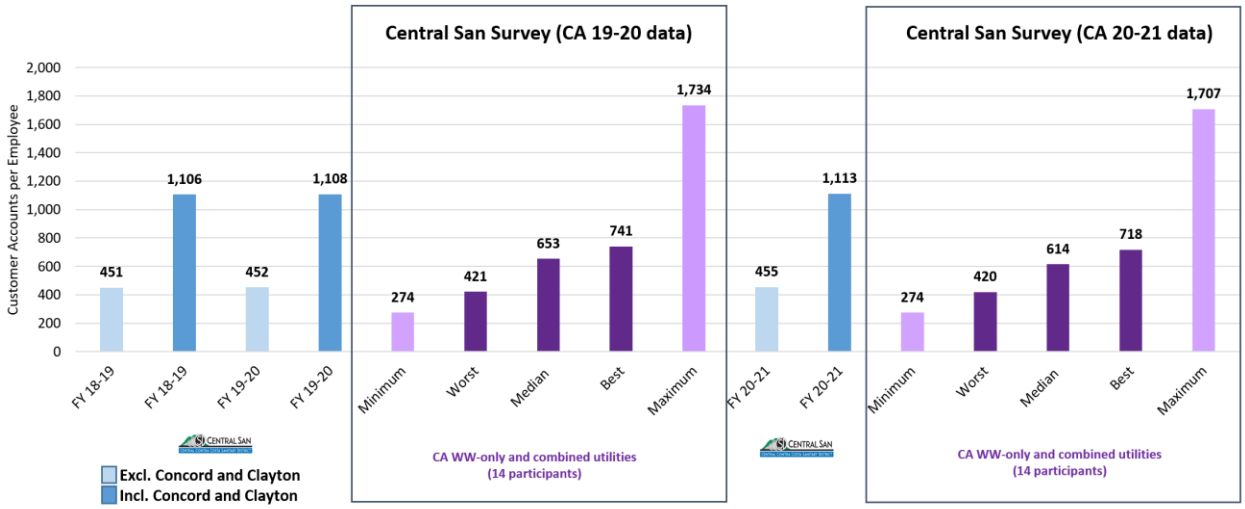
Commentary
It should be noted that not all customer accounts are created equal; for example, one nonresidential account could be a large hospital or a single retail business. Simply counting the parcels does not account for these potential discrepancies. An alternative and perhaps preferable way to measure customer accounts would be by Residential Unit Equivalents (RUEs), which will help normalize the data. It is unclear whether all agencies reported their customer accounts in the same way as Central San's, or by RUEs or some other method, since there is some room for interpretation in the AWWA methodology.

CUSTOMER ACCOUNTS PER EMPLOYEE

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



Central San vs. CA (*FYs 19-20 and 20-21* Data)



* The CA agency data set makes no distinction between agencies that provide dual services (combined utilities), are retail agencies, or are agencies that are part of a larger operation. These differences could have an impact on both the number of customer accounts and the number of FTEs; for example, the total number of FTEs reported by wholesale utilities may not include FTEs of other agencies that maintain the collection system which feeds their treatment plant.

WASTEWATER PROCESSED PER EMPLOYEE

This indicator provides a measure of employee efficiency as expressed by the amount of WW processed (in MGD) by utility employees (as FTEs) per year, calculated as follows:

$$MGD\ wastewater\ processed\ per\ employee = \frac{Average\ MGD\ wastewater\ processed}{Total\ number\ of\ FTEs}$$

Central San Data Calculation Method
For Central San, average MGD of WW processed is the average sum of final effluent and applied water treated daily.

For the nationwide comparison, total number of FTEs used follows AWWA's methodology of subtracting HHW, Recycled Water, Capital Projects, or construction of new facilities staff. For the statewide comparison, total number of FTEs used is average positions filled, to align with directions provided in Central San's survey.

For reference, below is Central San's average MGD wastewater processed (average-day flow) for the last three FYs:

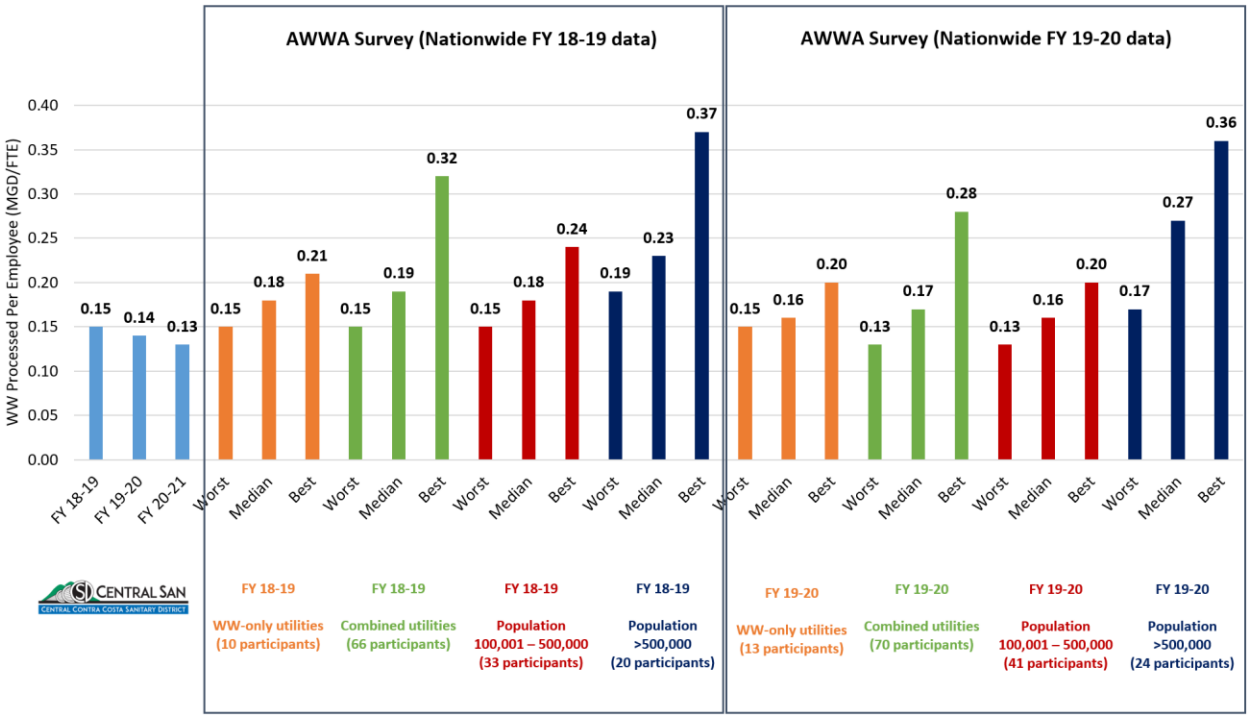
	FY 18-19	FY 19-20	FY 20-21
Average-Day Flow (MGD)	39.7	36.4	33.9

Commentary
It is Central San's opinion that AWWA consider separate benchmarks for retail and wholesale agencies. Wholesale agencies do not maintain their collection system, so the number of FTEs reported by those agencies may be undercounted as they may not be including the FTEs of other agencies that maintain the collection system that feeds their treatment plant. It should also be noted that because efficiency is directly tied to the amount of WW processed, agencies may seem less efficient because of circumstances out of the agencies' control, such as drought or water conservation efforts.

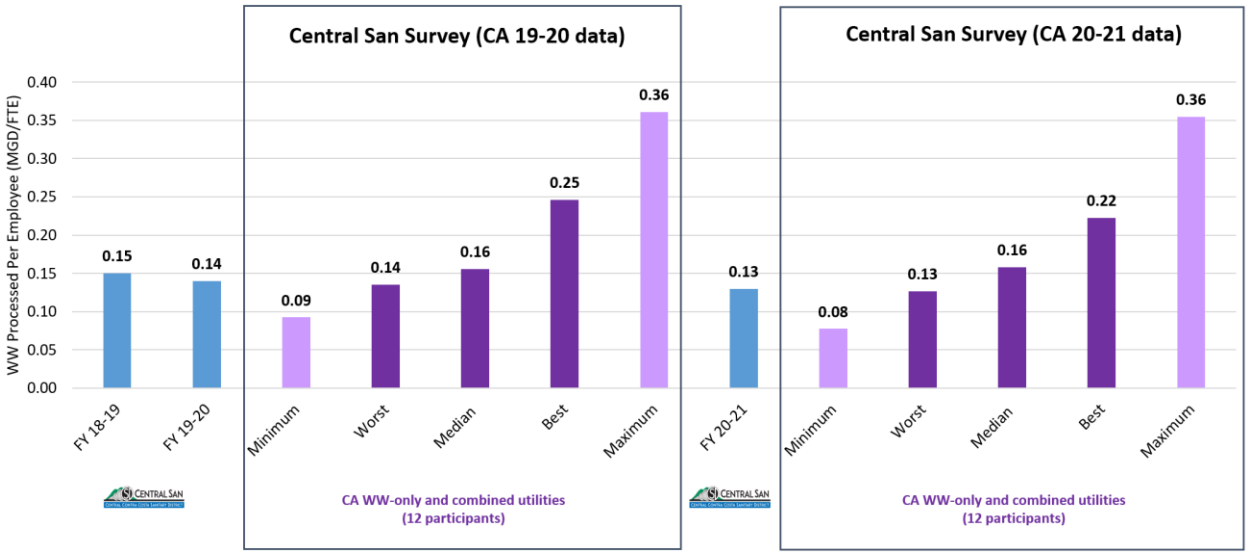
Furthermore, Central San believes that combined stormwater/WW treatment systems should be benchmarked in a separate category from systems only treating WW. Collecting treatment plant influent organic loading would be a helpful performance metric alongside flow; treatment plants in regions where water conservation measures have been implemented would likely have a lower amount of flow per unit of organic loading.

WW PROCESSED PER EMPLOYEE

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



Central San vs. CA* (*FYs 19-20 and 20-21* Data)



* The CA agency data makes no distinction between agencies that provide dual services (combined utilities), are retail agencies, or are agencies that are part of a larger operation. These differences could have an impact on the number of FTEs reported. For example, a utility that operates as part of a larger operation may be undercounting the centralized staff that supports their enterprise as FTEs of their utility, leading to a lower FTE count that is not reflective of the manpower that is needed to support just the WW operations.

OPERATIONS & MAINTENANCE COSTS FOR WASTEWATER SERVICES

This family of sub-indicators measures total O&M costs, collection O&M costs, and treatment O&M costs in various forms. O&M costs can be compared between utilities once normalized by WW processed rate, number of accounts served, or the length of collection system pipe. For utilities following GASB or FASB practices, the required total O&M cost information was instructed to be found on the audited financial statements, and depreciation was not to be included in the total O&M cost.

- *Total O&M cost* – include costs for salaries, direct benefits, and all costs necessary to support utility services. They include pumping costs associated with treatment and distribution or collection. They also include supporting functions, such as any related portion of centralized HR services, call center, health and safety, etc.

Central San Data Calculation Method
Central San provides WW treatment to customers in the cities of Concord and Clayton by contract but does not own, operate, or maintain their collection system. The City of Concord reimburses Central San with flow proportional share costs for treatment, based on the percentage of the Central San net influent flow volume every year. Central San adjusted for this in calculating performance data by factoring in the following for Concord and Clayton:

- Their treatment cost (the amount reimbursed by City of Concord)
- Their collection cost (the amount they spend in owning, operating, and maintaining their collection system)
- Their support services cost (WW O&M costs not attributable to collection or treatment – these figures were estimated)
- The number of residential and non-residential accounts served by Central San

Factoring this data allows Central San to present performance data that includes Concord and Clayton in all the O&M Costs for WW Services sub-indicators.

The sub-indicators for Total O&M costs are as follows:

TOTAL O&M COST PER ACCOUNT

$$Total\ O\&M\ cost\ of\ wastewater\ services\ (\frac{\$}{account}) = \frac{Total\ O\&M\ cost}{Number\ of\ residential\ accounts + number\ of\ nonresidential\ accounts}$$

Central San Data Calculation Method
The total O&M cost is the cost of treating WW from the service area, including Concord and Clayton (i.e., it includes the O&M cost for treatment which is reimbursed by the City of Concord), as well as Concord and Clayton's collection and estimated support services costs. The

accounts served by Central San in Concord and Clayton are included in the number of accounts. In FY 20-21, Central San paid off its UAAL balance of approximately $70.8 million; this one-time cost was included in the total O&M figure for that year.

TOTAL O&M COST PER MG

$$Total\ O\&M\ cost\ of\ wastewater\ services\ (\frac{\$}{MG}) = \frac{Total\ O\&M\ cost}{Average\ daily\ production\ x\ 365\ days}$$

Central San Data Calculation Method

The total O&M cost is the cost of treating WW from the service area, including Concord and Clayton (i.e., it includes the O&M cost for treatment which is reimbursed by the City of Concord), as well as Concord and Clayton's collection and estimated support services costs. No adjustments were made to the average daily production figure, which includes the WW from Concord and Clayton. This formula, which uses 365 days, was adjusted to use 366 days in calculating the FY 19-20 data, since 2020 was a leap year. In FY 20-21, Central San paid off its UAAL balance of approximately $70.8 million; this one-time cost was included in the total O&M figure for that year.

Commentary

Central San believes that combined stormwater/WW treatment systems should be benchmarked in a separate category from systems only treating WW. Collecting treatment plant influent organic loading would be a helpful performance metric alongside flow; treatment plants in regions where water conservation measures have been implemented would likely have a lower amount of flow per unit of organic loading.

For reference, below is Central San's average daily production (average-day flow) for the last three FYs:

	FY 18-19	FY 19-20	FY 20-21
Average-Day Flow (MGD)	39.7	36.4	33.9

TOTAL O&M COST PER 100 MILES OF PIPE

$$Total\ O\&M\ cost\ of\ wastewater\ services\ (\frac{\$}{100\ miles\ of\ pipe}) = \frac{Total\ O\&M\ cost\ x\ 100}{Total\ miles\ of\ collection\ system\ piping}$$

Central San Data Calculation Method

The total O&M cost is the cost of treating WW from the service area, including Concord and Clayton (i.e., it includes the O&M cost for treatment which is reimbursed by the City of Concord), as well as Concord and Clayton's collection and estimated support services costs. The total miles of collection system piping comprise of piping owned, operated, and maintained by Central San and by Concord and Clayton. In FY 20-21, Central San paid off its UAAL balance of

approximately $70.8 million; this one-time cost was included in the total O&M figure for that year.

Commentary
It should be noted that it is possible that agencies who perform WW operations as part of a larger enterprise may have submitted data to the survey for their total O&M costs that may not be comparable to Central San's. For example, an agency may inadvertently exclude support service costs which come from a centralized administrative office that does not provide exclusive support to WW operations, leading to deflated O&M costs, whereas Central San has counted all support service costs that support WW operations. Conversely, a responding agency may be reporting the total O&M costs including all their operations beyond WW, resulting in inflated O&M costs.

The sub-indicators for Collection and Treatment O&M costs are calculated as follows:

WW COLLECTION O&M COST PER 100 MILES OF PIPE

$$Collection\ O\&M\ cost\ of\ wastewater\ services\ (\frac{\$}{100\ miles\ of\ pipe}) = \frac{Collection\ O\&M\ cost\ x\ 100}{Total\ miles\ of\ collection\ system\ piping}$$

Central San Data Calculation Method
The Collection O&M cost includes Central San's as well as Concord and Clayton's collection costs. The total miles of collection system piping comprise of piping owned, operated, and maintained by Central San and by Concord and Clayton.

WW TREATMENT O&M COST PER MG

$$Treatment\ O\&M\ cost\ of\ wastewater\ services\ (\frac{\$}{MG}) = \frac{Treatment\ O\&M\ cost}{Average\ daily\ production\ x\ 365\ days}$$

Central San Data Calculation Method
The Treatment O&M cost includes the cost of treating WW from the service area, including Concord and Clayton (i.e., it includes the O&M cost for treatment which is reimbursed by the City of Concord). No adjustments were made to the average daily production figure, which includes the WW from Concord and Clayton. This formula, which uses 365 days, was adjusted to use 366 days in calculating the FY 19-20 data, since 2020 was a leap year.

For reference, below is Central San's average daily production (average-day flow) for the last three FYs:

	FY 18-19	FY 19-20	FY 20-21
Average-Day Flow (MGD)	39.7	36.4	33.9

The sub-indicators for the percentage of O&M costs spent on collection, treatment, and support services are calculated as follows:

WW COLLECTION AS A PERCENTAGE OF TOTAL O&M COSTS

$$Wastewater\ collection\ as\ a\ percentage\ of\ total\ O\&M\ costs\ (\%) = \frac{Collection\ O\&M\ cost}{Total\ O\&M\ cost}$$

Central San Data Calculation Method

The collection O&M cost and total O&M cost include Concord and Clayton's collection cost. The total O&M cost also includes the O&M cost for treatment which is reimbursed by the City of Concord, as well as Concord and Clayton's estimated WW support services cost.

WW TREATMENT AS A PERCENTAGE OF TOTAL O&M COSTS

$$Wastewater\ treatment\ as\ a\ percentage\ of\ total\ O\&M\ costs\ (\%) = \frac{Treatment\ O\&M\ cost}{Total\ O\&M\ cost}$$

Central San Data Calculation Method

Both the treatment O&M cost and total O&M cost include the cost of treating WW from the service area, including Concord and Clayton (i.e., it includes the O&M cost for treatment which is reimbursed by the City of Concord). The total O&M cost also includes Concord and Clayton's collection and estimated WW support services costs.

WW SUPPORT SERVICES PROVIDED BY OTHERS AS A PERCENTAGE OF TOTAL O&M COSTS

AWWA defines support services provided by others as O&M costs that cannot be directly allocated to collection or treatment O&M costs.

$$Wastewater\ support\ services\ as\ a\ percentage\ of\ total\ O\&M\ costs\ (\%) = \frac{Wastewater\ support\ services\ O\&M\ cost}{Total\ O\&M\ cost}$$

Central San Data Calculation Method

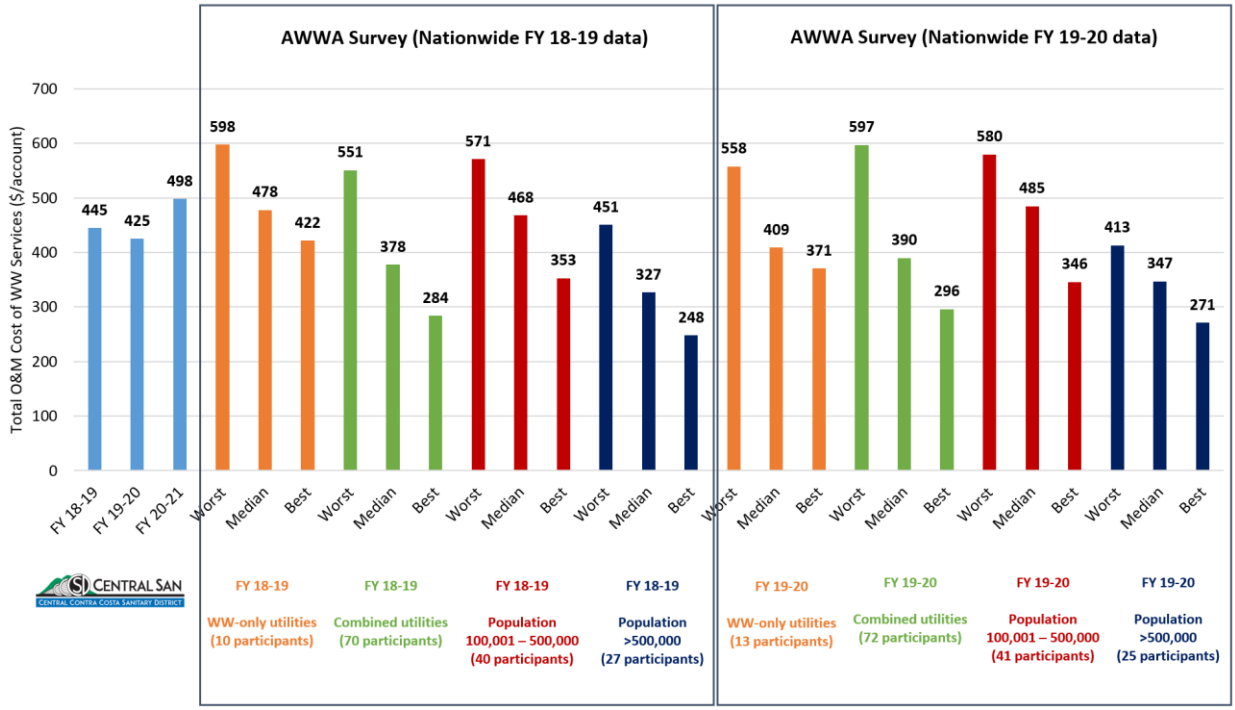
The total O&M cost includes the cost of treating WW from the service area, including Concord and Clayton (i.e., it includes the O&M cost for treatment which is reimbursed by the City of Concord), as well as Concord and Clayton's collection and estimated WW support services costs.

Commentary

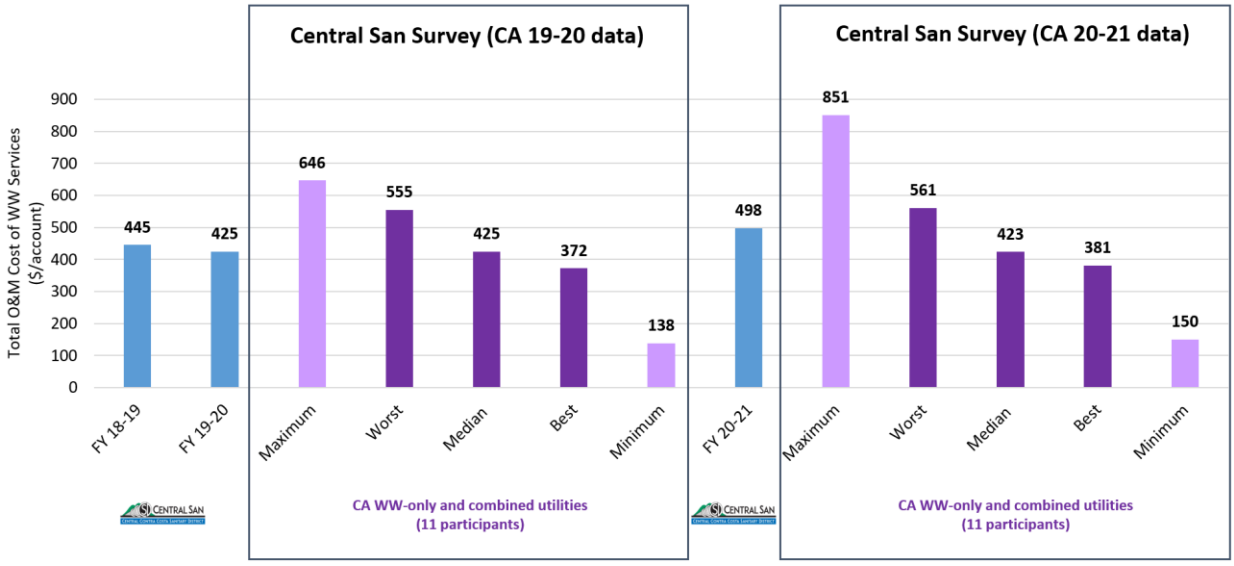
It should be noted that agencies may interpret the definitions of Treatment, Collection, and Support Services Provided by Others differently; meaning, one agency may count the cost of one service under Treatment, whereas another agency may count the same cost under Support Services Provided by Others. Central San's support services O&M cost includes UAAL costs for the entire workforce, and it is unclear whether other agencies allocated their UAAL costs similarly.

TOTAL O&M COST PER ACCOUNT

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



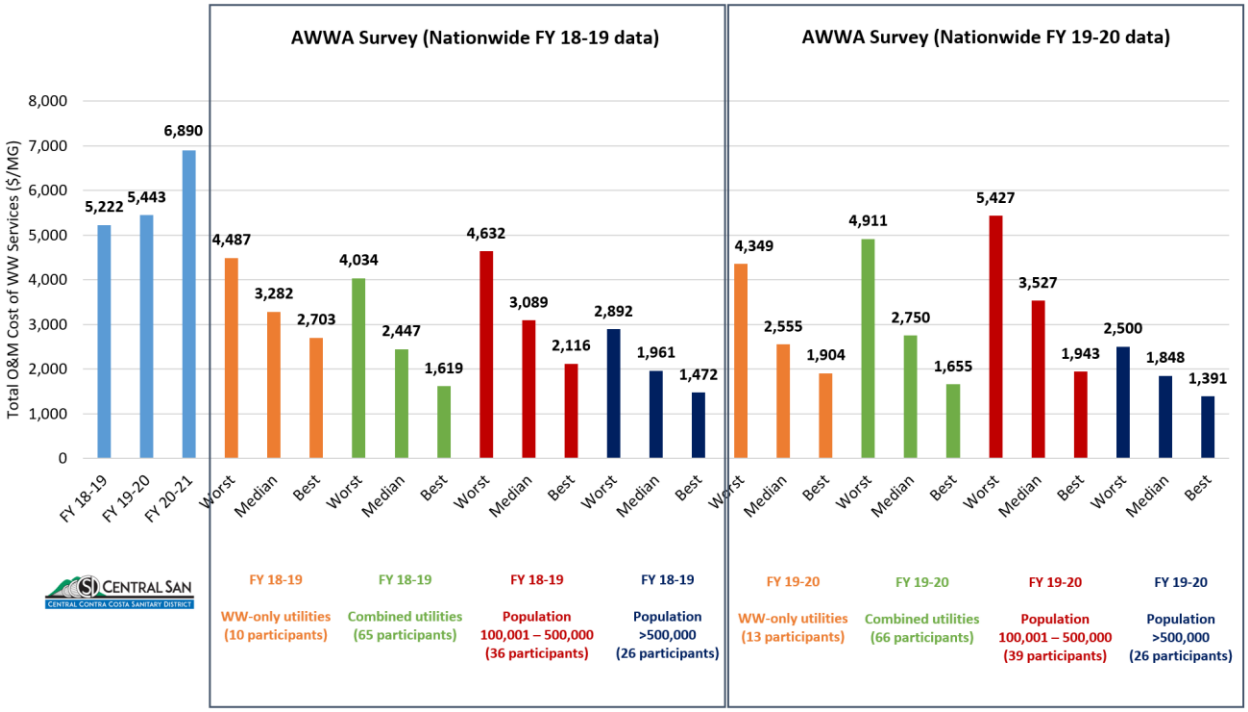
Central San vs. CA* (*FYs 19-20 and 20-21* data)



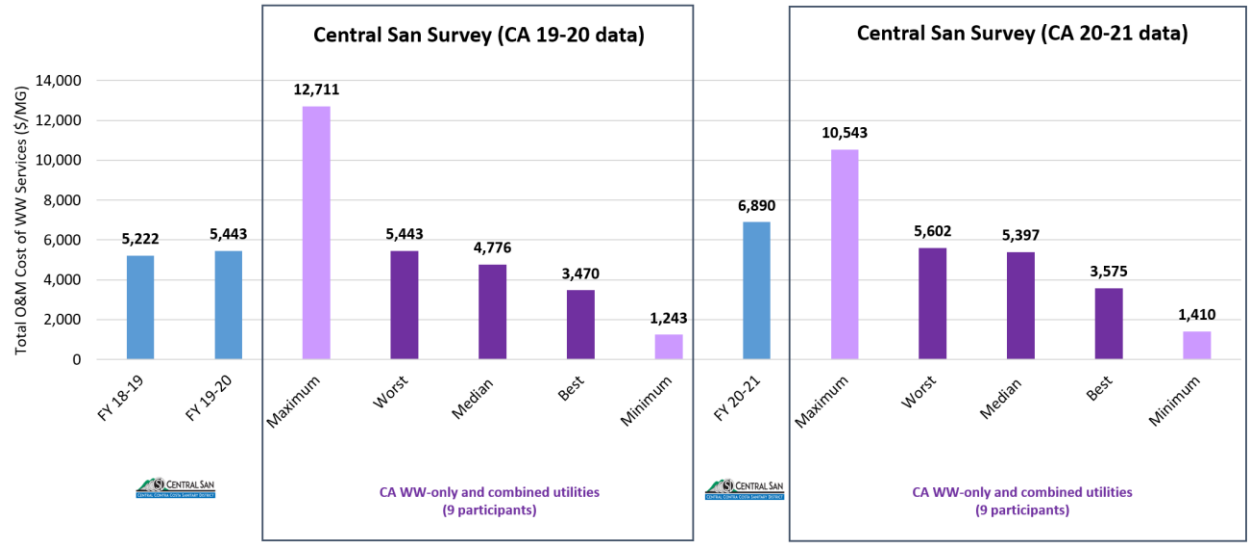
* The CA agency data makes no distinction between agencies that provide dual services (combined utilities), are retail agencies, or are agencies that are part of a larger operation. These differences could have an impact on these results. For example, a wholesale agency will have lower O&M costs since they do not maintain their collection system, yet they may still count the same number of customers as a similarly sized agency who does maintain its collection system at additional O&M cost.

TOTAL O&M COST PER MG

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



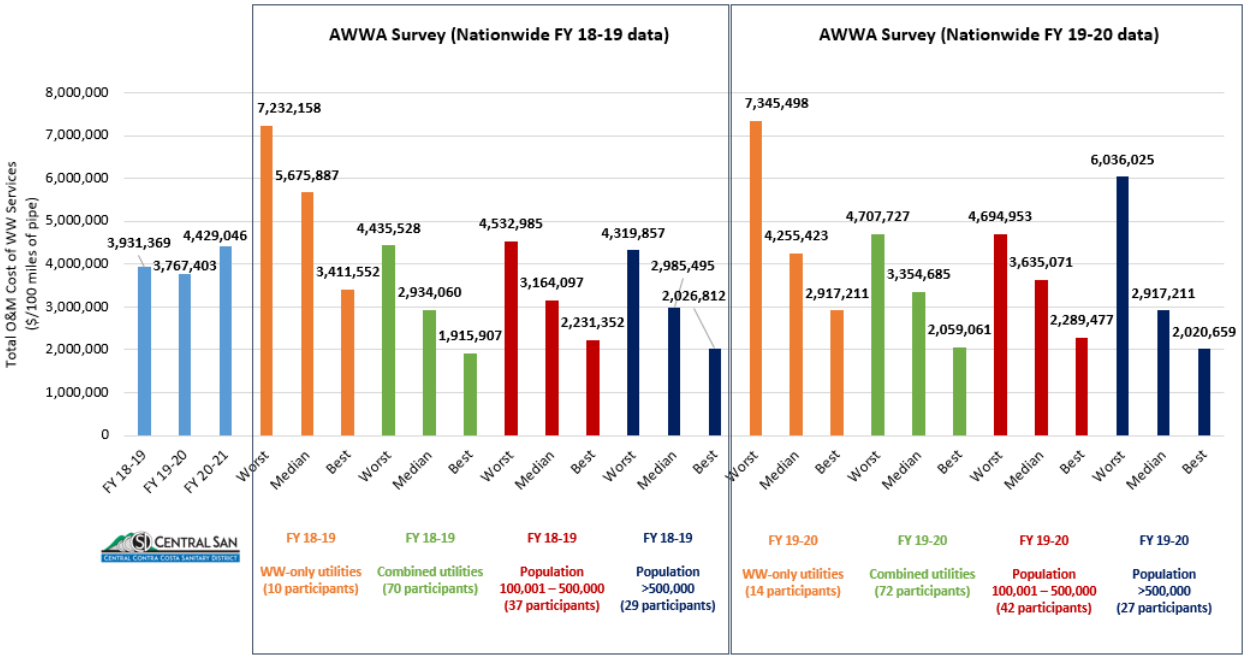
Central San vs. CA* (*FYs 19-20 and 20-21* data)



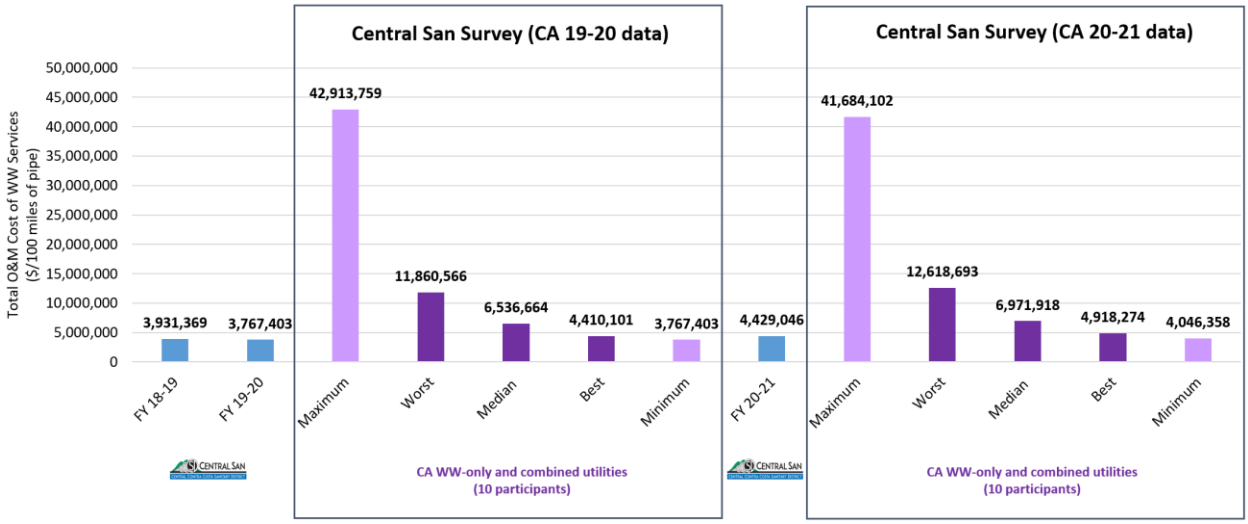
* The CA agency data set makes no distinction between agencies that provide dual services (combined utilities), are retail agencies, or are agencies that are part of a larger operation. The resulting differences, particularly in total O&M costs, could have an impact on these results.

TOTAL O&M COST PER 100 MILES OF PIPE

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



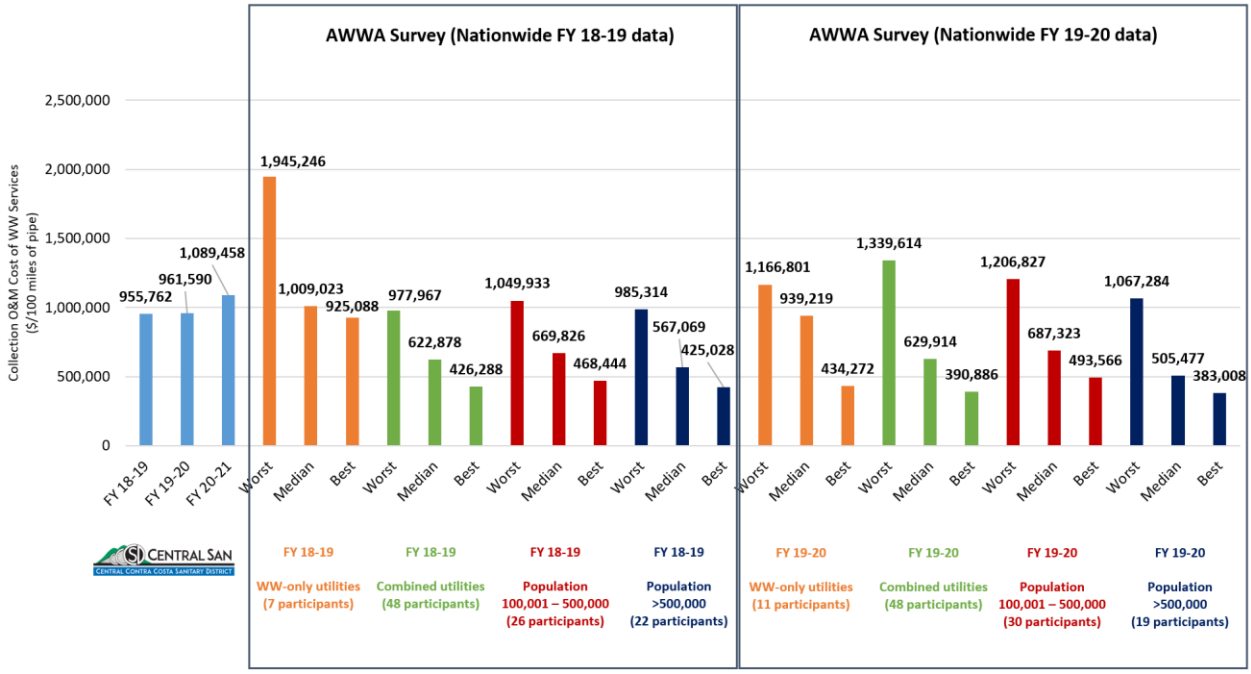
Central San vs. CA* (*FYs 19-20 and 20-21* data)



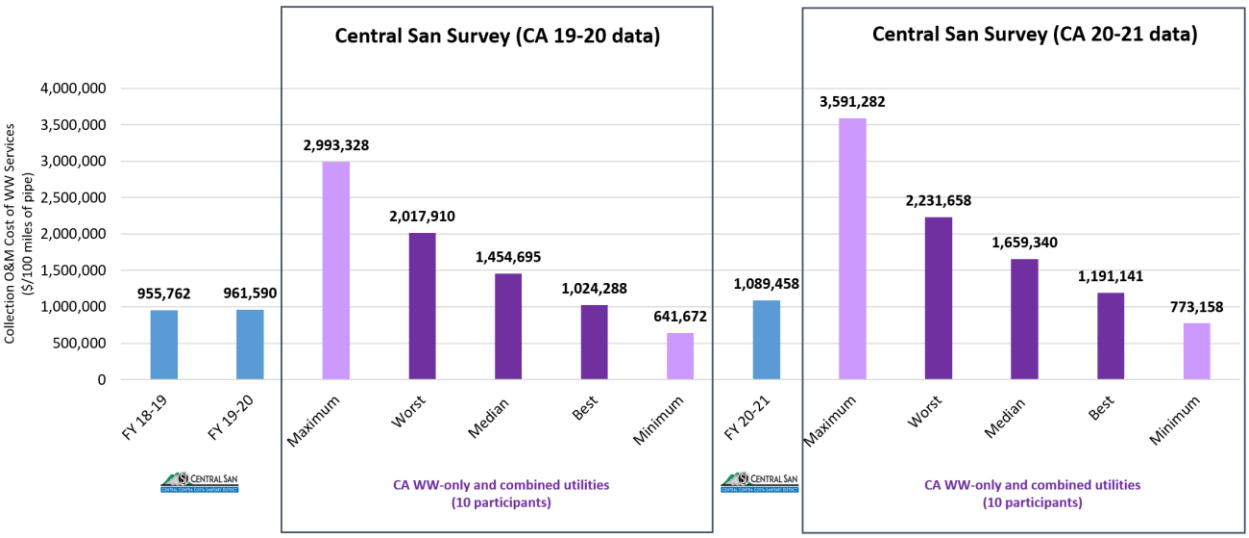
* The CA agency data set makes no distinction between agencies that provide dual services (combined utilities), are retail agencies, or are agencies that are part of a larger operation. The resulting differences, particularly in total O&M costs, could have an impact on these results.

WW COLLECTION O&M COST PER 100 MILES OF PIPE

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



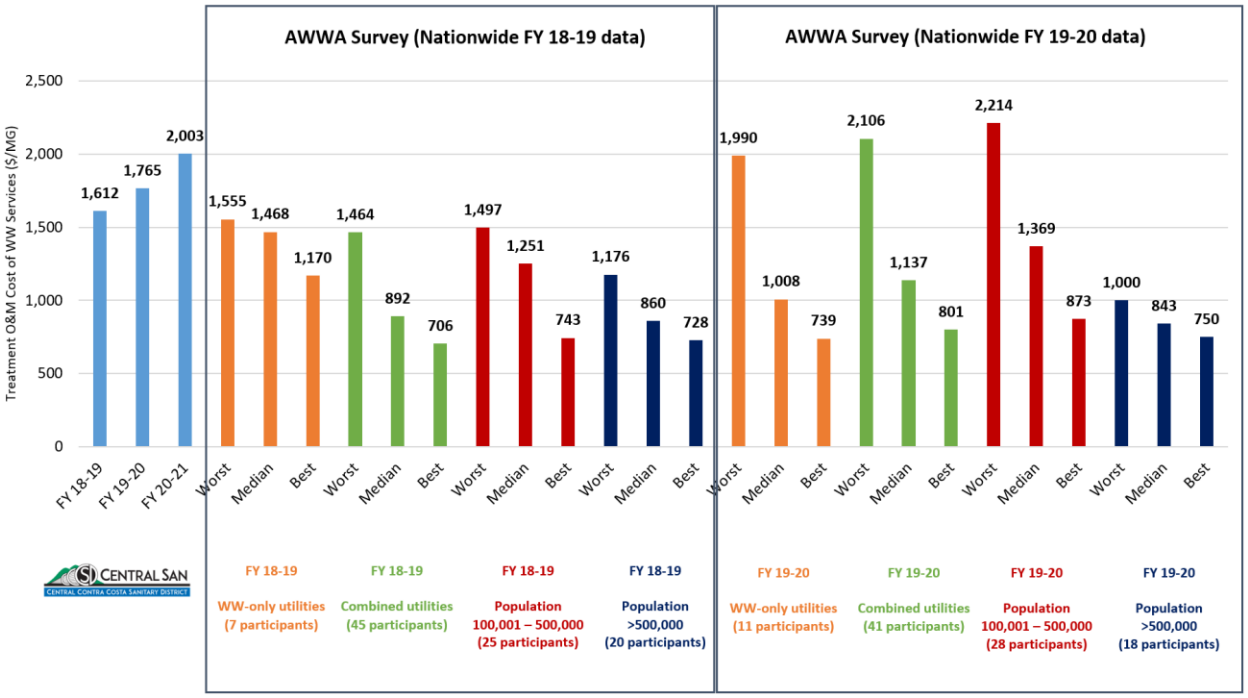
Central San vs. CA* (*FYs 19-20 and 20-21* data)



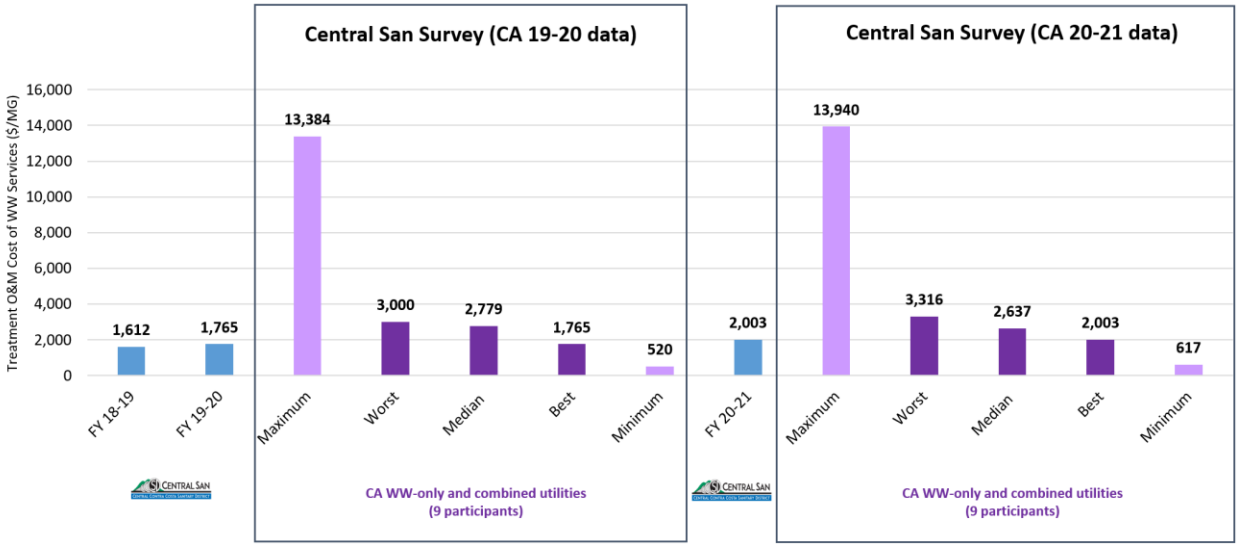
* The CA agency data set makes no distinction between agencies that provide dual services (combined utilities), are retail agencies, or are agencies that are part of a larger operation. These differences could have an impact on both the collection O&M costs and the miles of pipe.

WW TREATMENT O&M COST PER MG

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)

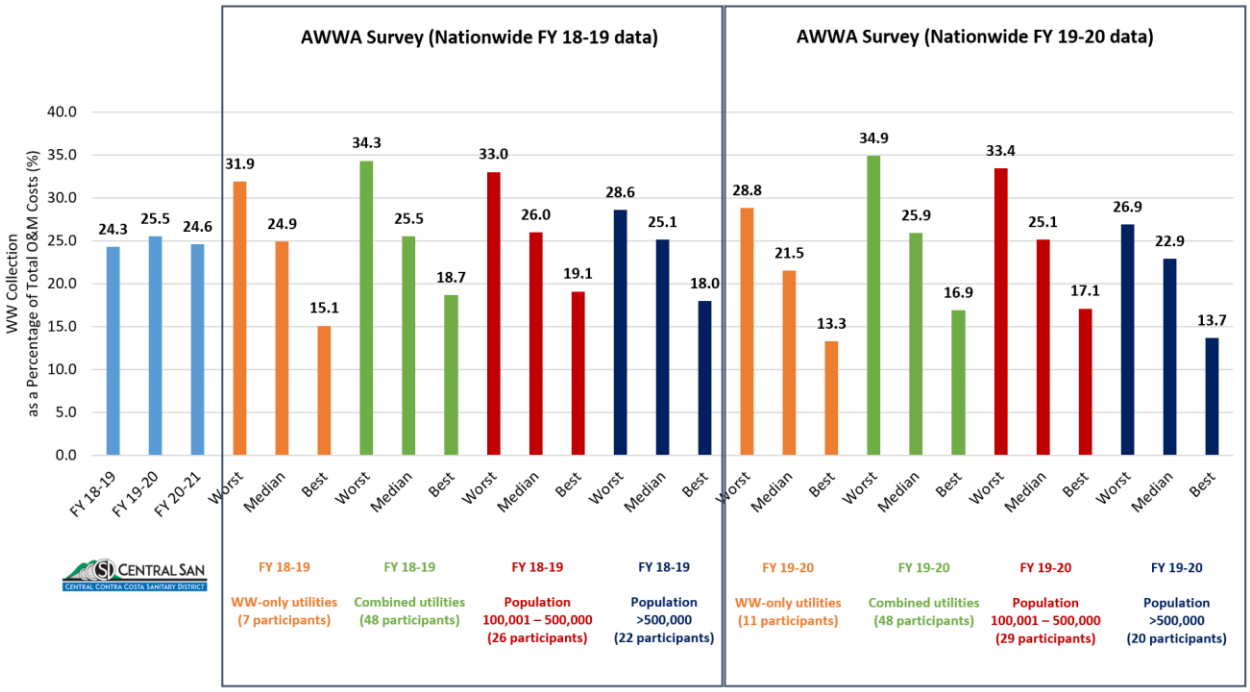


Central San vs. CA (*FYs 19-20 and 20-21* data)

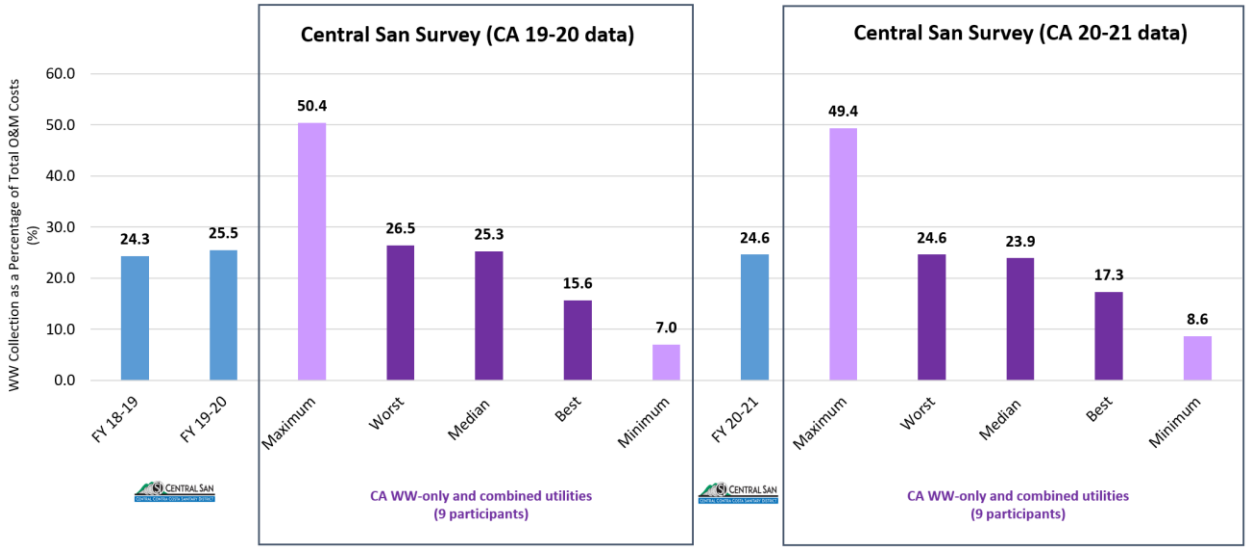


WW COLLECTION AS A PERCENTAGE OF TOTAL O&M COSTS

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



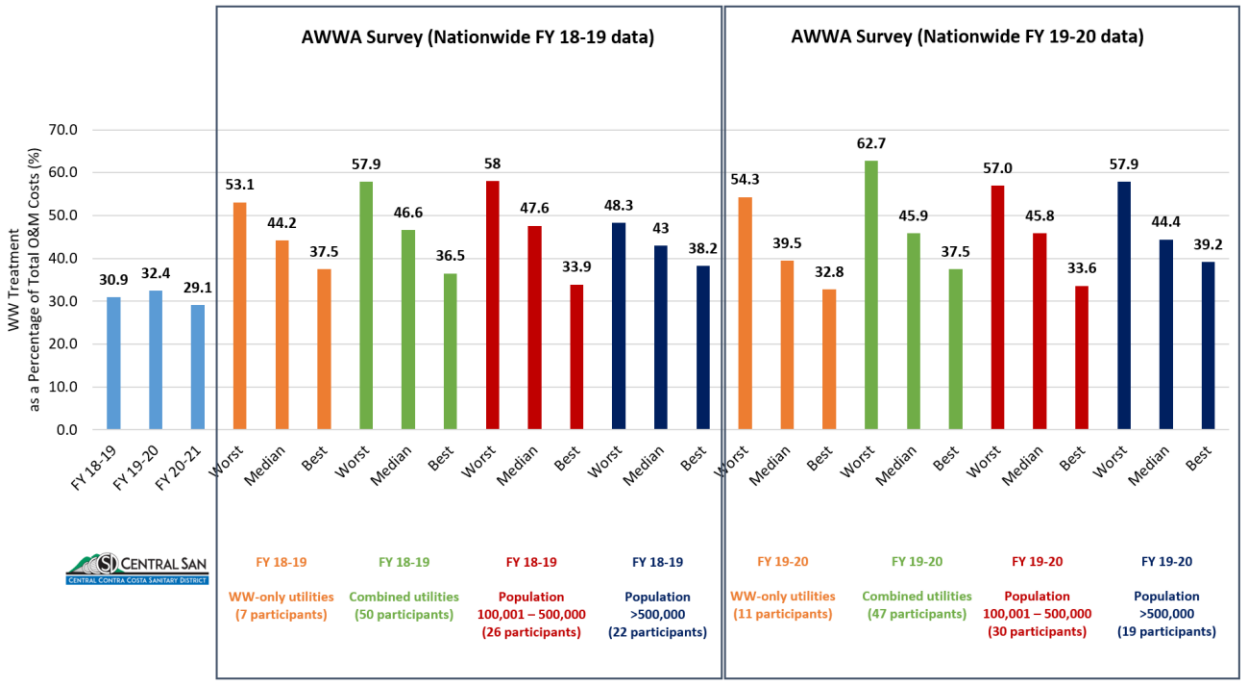
Central San vs. CA* (*FYs 19-20 and 20-21* data)



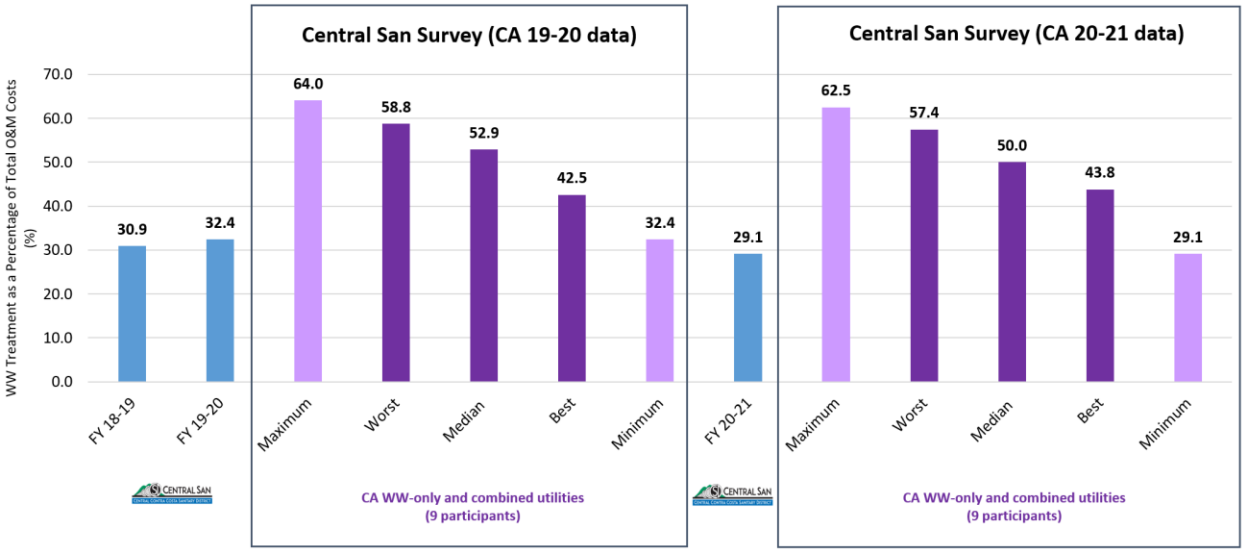
* The CA agency data set makes no distinction between agencies that provide dual services (combined utilities), are retail agencies, or are agencies that are part of a larger operation. These differences could have an impact on both the collection O&M costs and total O&M Costs.

WW TREATMENT AS A PERCENTAGE OF TOTAL O&M COSTS

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



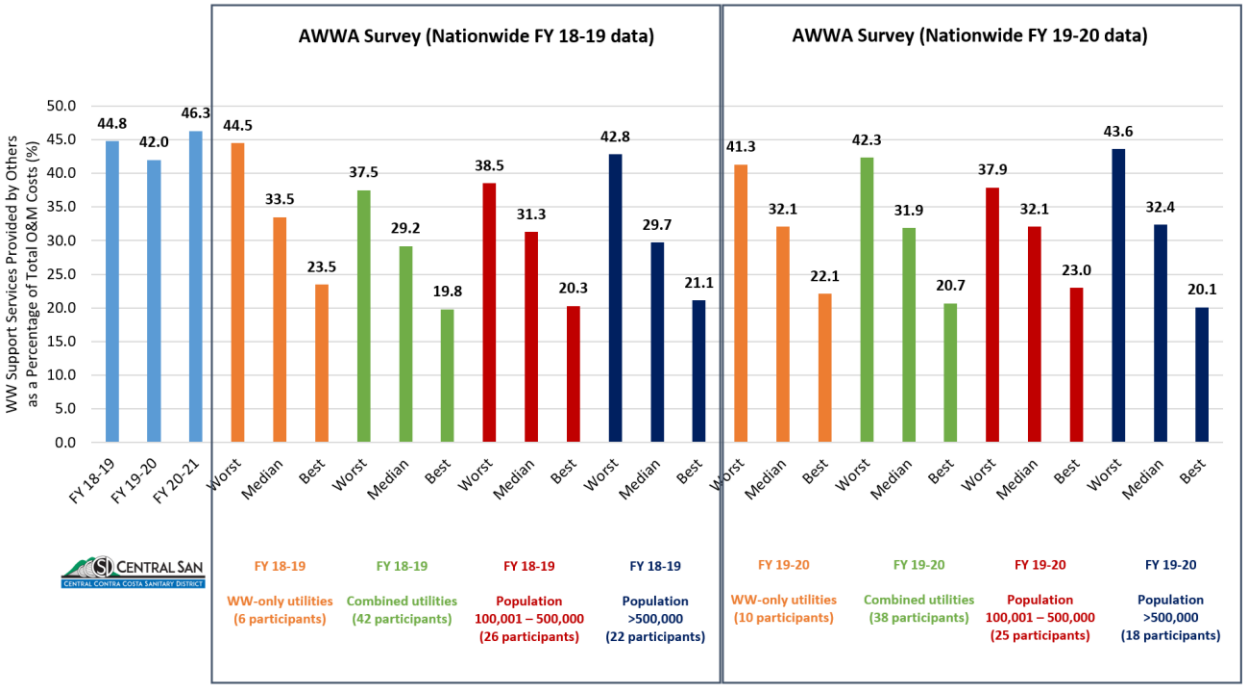
Central San vs. CA* (*FYs 19-20 and 20-21* data)



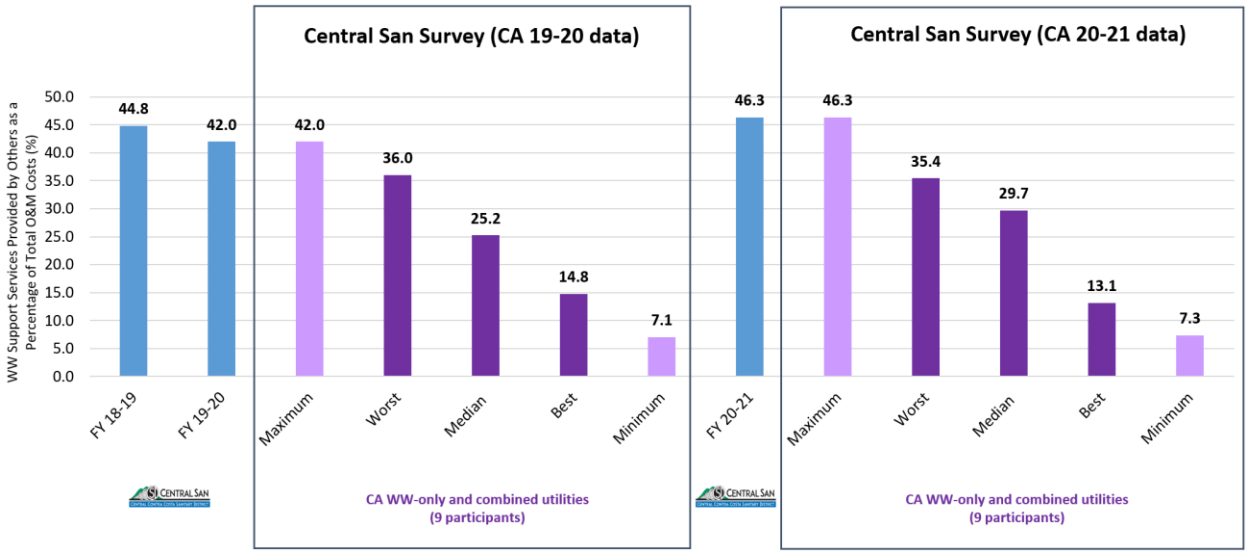
* The CA agency data set makes no distinction between agencies that provide dual services (combined utilities), are retail agencies, or are agencies that are part of a larger operation. These differences could have an impact on the total O&M costs.

WW SUPPORT SERVICES PROVIDED BY OTHERS AS A PERCENTAGE OF TOTAL O&M COSTS

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



Central San vs. CA* (*FYs 19-20 and 20-21* data)



* The CA agency data set makes no distinction between agencies that provide dual services (combined utilities), are retail agencies, or are agencies that are part of a larger operation. These differences could have an impact on both the support services costs and total O&M costs. For example, a WW enterprise operating as part of a larger agency could be undercounting the support services from the centralized staff of the larger agency.

MAINTENANCE

This family of sub-indicators quantifies a utility's efforts regarding planned (proactive) and corrective (reactive) WW maintenance. Time charged for maintenance work includes all time spent responding to the maintenance work order, including travel, obtaining tools and parts, and completing the work. Although maintenance time data specific to treatment or collection was not collected in the AWWA survey, overall comparisons to production and pipe network length are provided. Corrective and planned maintenance are separated as allocated to *linear* resources (distribution and collection systems) and *vertical* resources (plants and pump stations).

- *Corrective Maintenance* – all maintenance undertaken after asset failure. Corrective maintenance is always responsive but may not necessarily result in service disruption. Total time for corrective maintenance should include overtime attributed to these activities, including contractor time.

- *Planned Maintenance* – comprises all regular maintenance undertaken in advance of asset failure during the reporting period. Planned maintenance may be predictive or preventative and may not necessarily result in service disruption. Preventative maintenance is performed according to a predetermined schedule rather than in response to failure. Predictive maintenance is initiated when condition-monitoring signals from activities such as vibration and oil analysis indicate that maintenance is due. The total time for planned maintenance includes overtime attached to these activities, including contractor's time.

For the given reporting period, the sub-indicators are calculated as follows:

TOTAL PLANNED MAINTENANCE RATIO

$$Total\ planned\ maintenance\ ratio\ (\%\ of\ total\ maintenance\ time) = \frac{Total\ time\ for\ planned\ maintenance}{Time\ for\ planned\ maintenance + Time\ for\ corrective\ maintenance}$$

PLANNED VERTICAL MAINTENANCE RATIO

$$Planned\ vertical\ maintenance\ ratio\ (\%\ of\ total\ maintenance\ time) = \frac{Total\ time\ for\ planned\ vertical\ maintenance}{Time\ for\ planned\ maintenance + Time\ for\ corrective\ maintenance}$$

PLANNED LINEAR MAINTENANCE RATIO

$$Planned\ linear\ maintenance\ ratio\ (\%\ of\ total\ maintenance\ time) = \frac{Total\ time\ for\ planned\ linear\ maintenance}{Time\ for\ planned\ maintenance + Time\ for\ corrective\ maintenance}$$

CORRECTIVE VERTICAL MAINTENANCE TO PRODUCTION

$$Corrective\ vertical\ maintenance\ to\ production\ (\frac{hr}{MG}) = \frac{Total\ time\ for\ corrective\ maintenance}{Average\ daily\ production\ x\ 365\ days}$$

Central San Data Calculation Method

The average daily production figure used in this sub-indicator and the next was the average treated WW (final effluent and applied water), which was also used to calculate the WW Processed per Employee performance indicator results. This formula, which uses 365 days, was adjusted to use 366 days in calculating the FY 19-20 data, since 2020 was a leap year.

PLANNED VERTICAL MAINTENANCE TO PRODUCTION

$$Planned\ vertical\ maintenance\ to\ production\ (\frac{hr}{MG}) = \frac{Total\ time\ for\ planned\ maintenance}{Average\ daily\ production\ x\ 365\ days}$$

Central San Data Calculation Method

This formula, which uses 365 days, was adjusted to use 366 days in calculating the FY 19-20 data, since 2020 was a leap year.

CORRECTIVE LINEAR MAINTENANCE TO COLLECTION SYSTEM

$$Corrective\ linear\ maintenance\ to\ collection\ system\ (\frac{hr}{100\ miles\ of\ pipe}) = \frac{Total\ number\ of\ failures\ x\ 100}{Total\ miles\ of\ distribution\ system\ piping}$$

PLANNED LINEAR MAINTENANCE TO COLLECTION SYSTEM

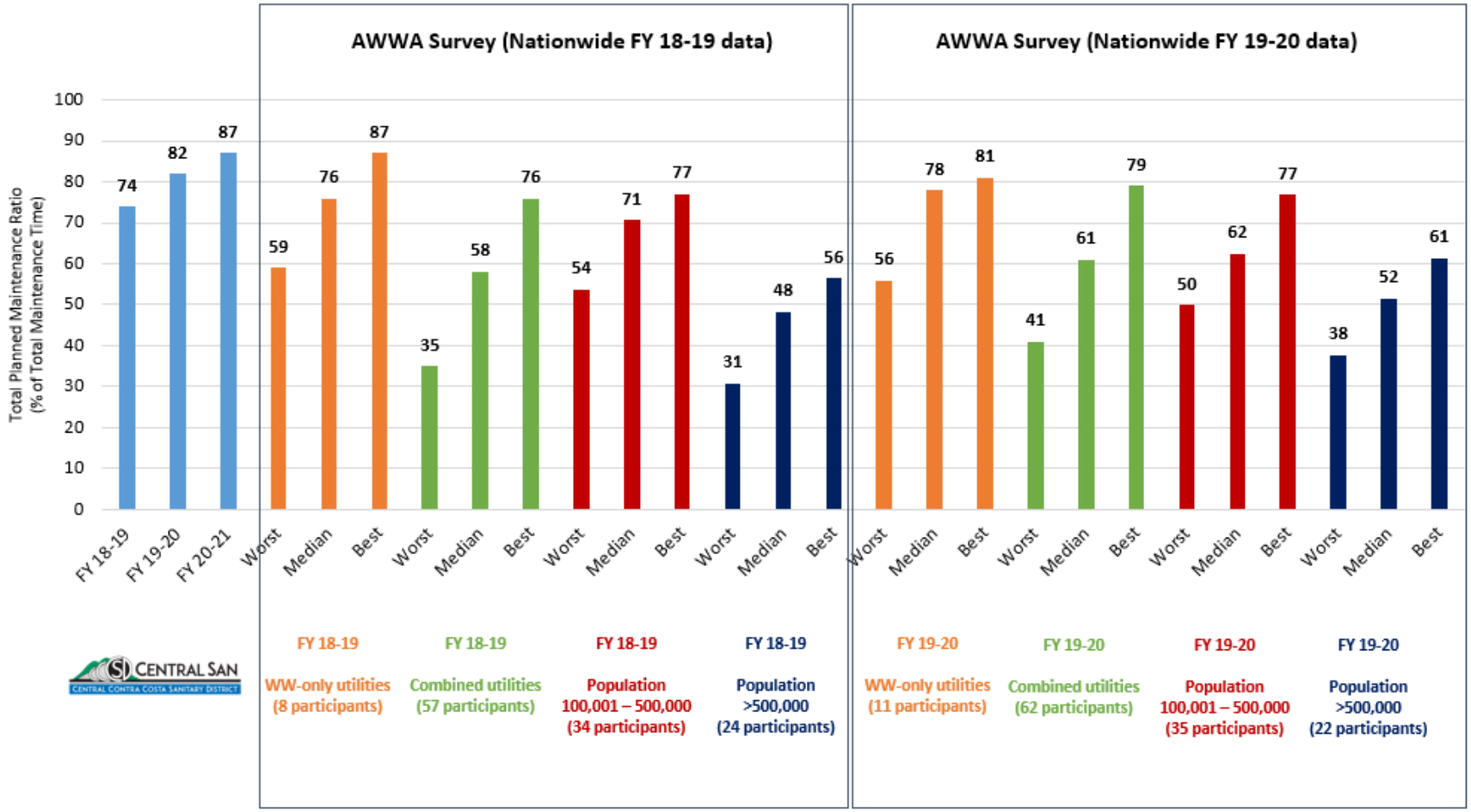
$$Planned\ linear\ maintenance\ to\ collection\ system\ (\frac{hr}{MG}) = \frac{Total\ time\ for\ planned\ maintenance\ x\ 100}{Total\ miles\ of\ distribution\ system\ piping}$$

Central San Data Calculation Method

Central San's computerized maintenance management system (CMMS) does not yet track Pump Station maintenance data, so both planned and corrective maintenance data for the Pump Stations is not included in the vertical maintenance figures. Staff is in the process of transferring Pump Station Operations maintenance work orders into the CMMS and is in the process of piloting it at one of the pump stations.

TOTAL PLANNED MAINTENANCE RATIO

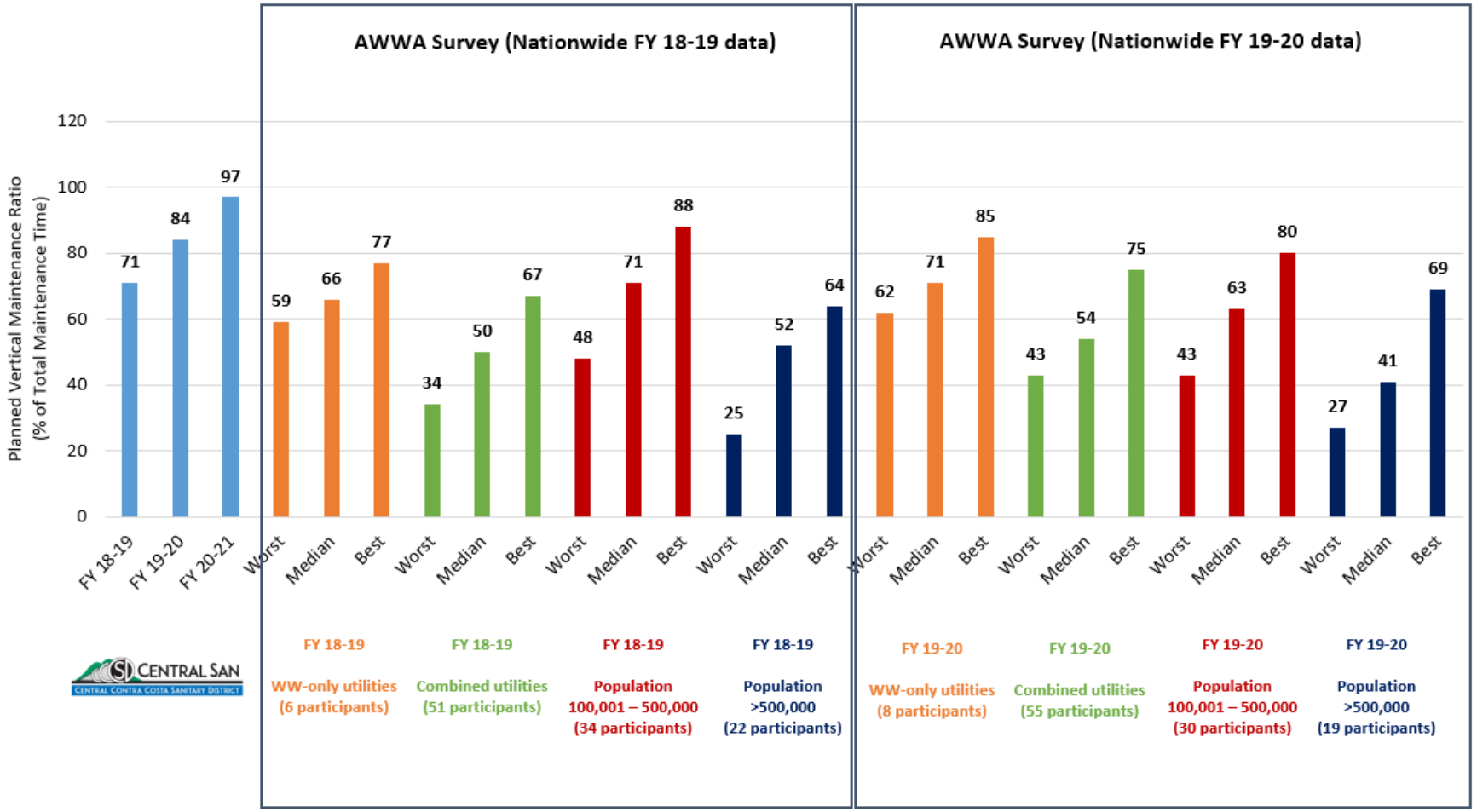
Central San* vs. Nationwide (*FYs 18-19 and 19-20* data)



*Central San's vertical maintenance hours exclude Pump Station maintenance time.

PLANNED *VERTICAL* MAINTENANCE RATIO

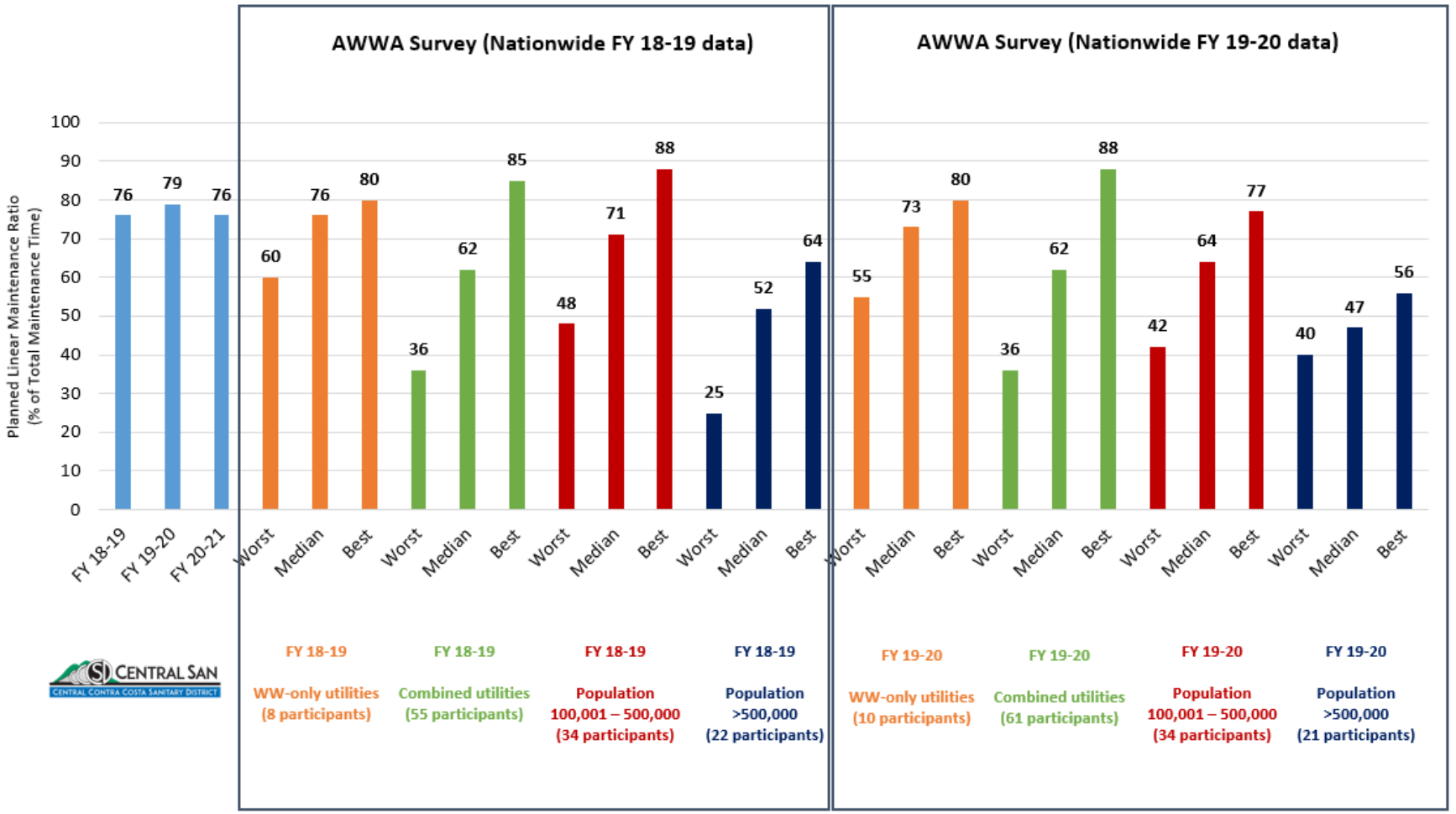
Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



*Central San's vertical maintenance hours exclude Pump Station maintenance time.

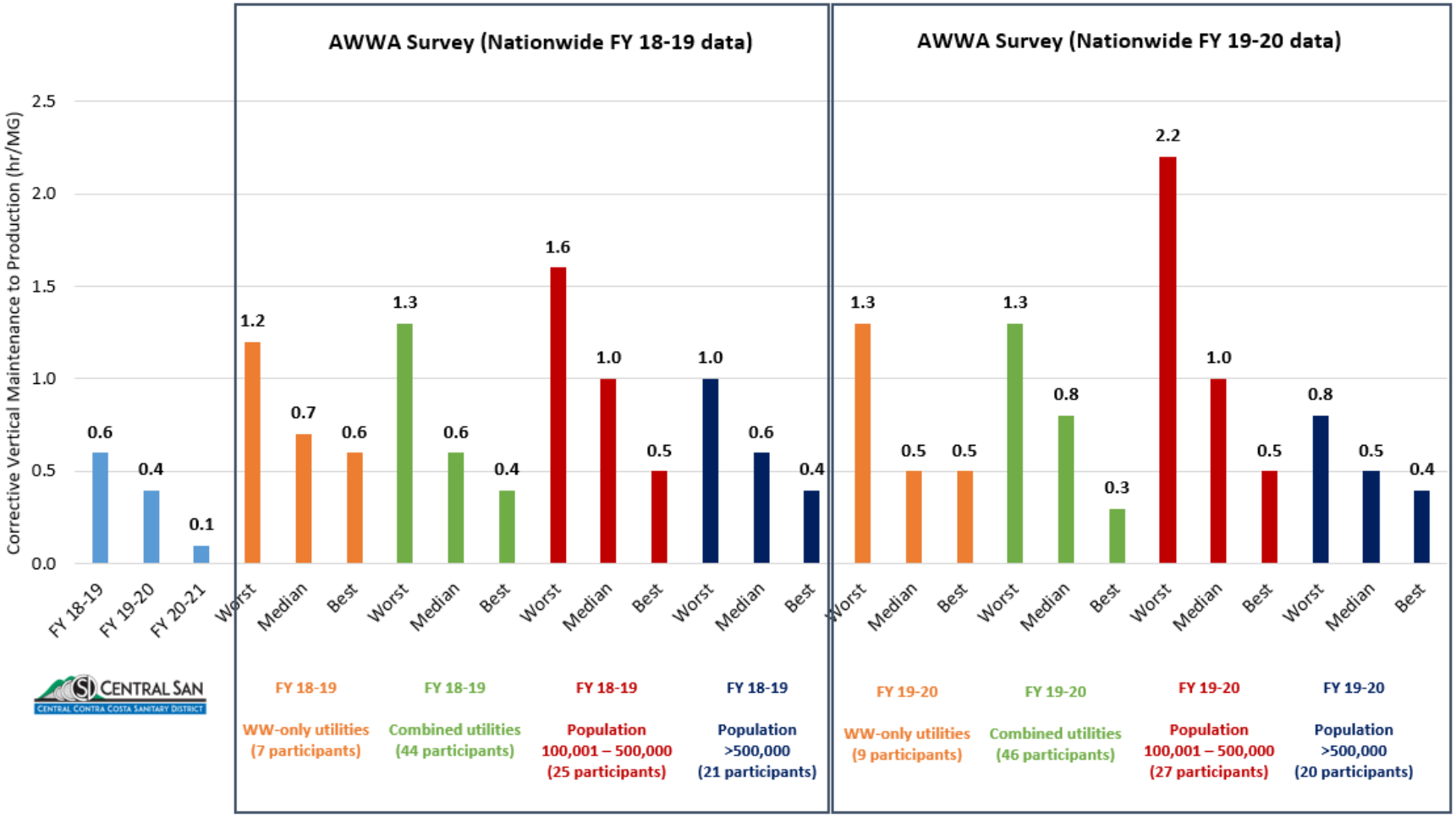
PLANNED *LINEAR* MAINTENANCE RATIO

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



CORRECTIVE VERTICAL MAINTENANCE TO PRODUCTION

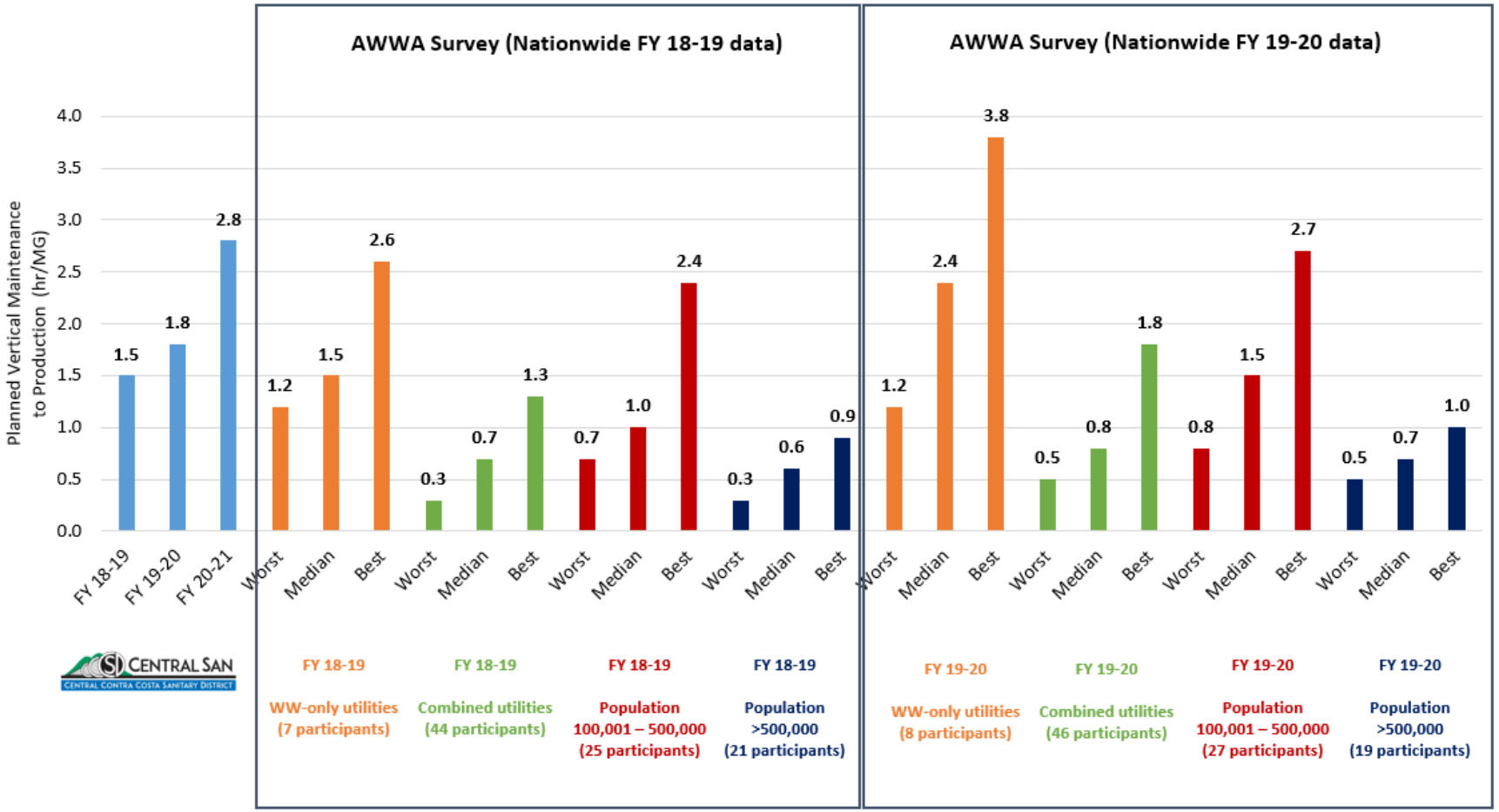
Central San* vs. Nationwide (*FYs 18-19 and 19-20* data)



*Central San's vertical maintenance hours exclude Pump Station maintenance time.

PLANNED VERTICAL MAINTENANCE TO PRODUCTION

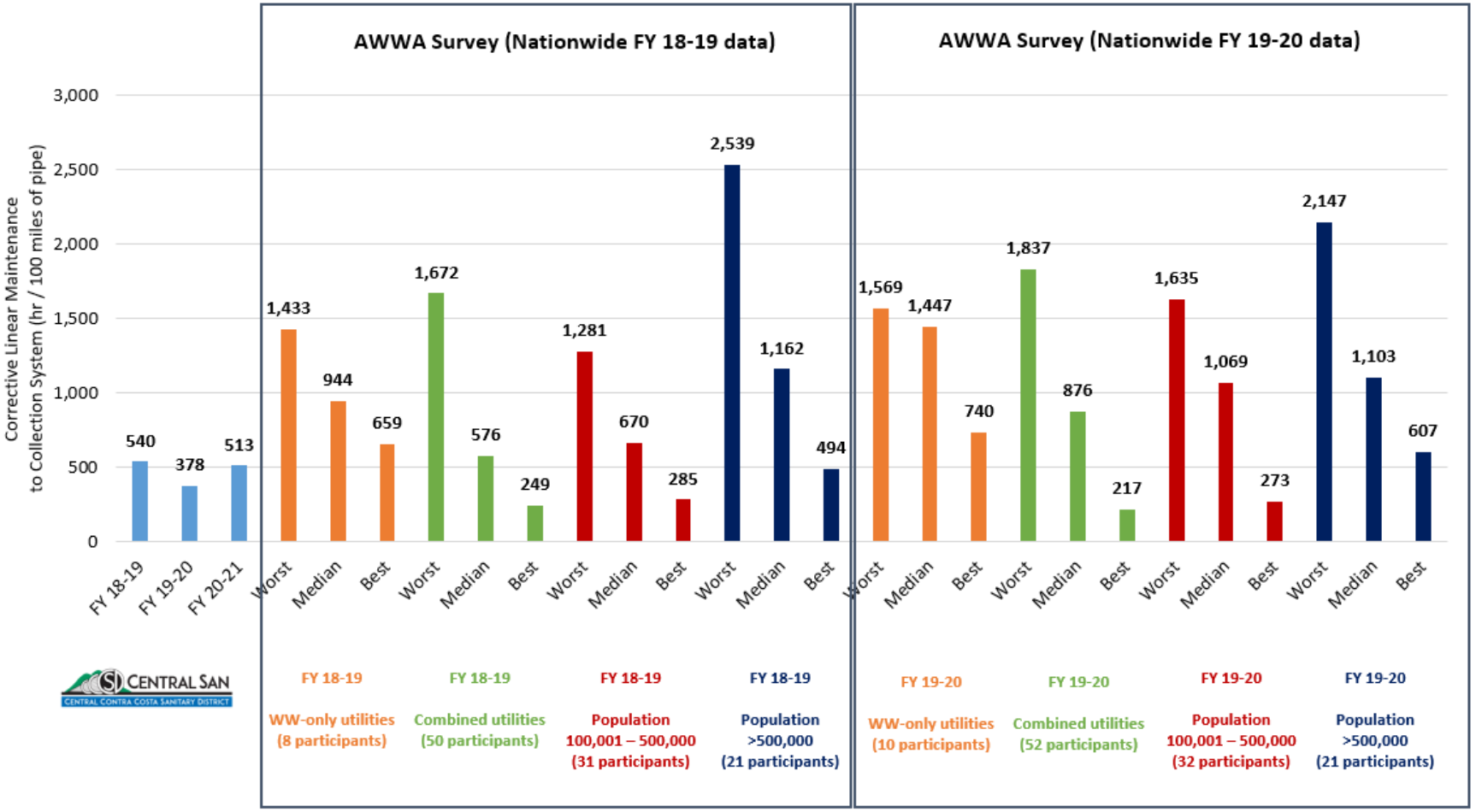
Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



*Central San's vertical maintenance hours exclude Pump Station maintenance time.

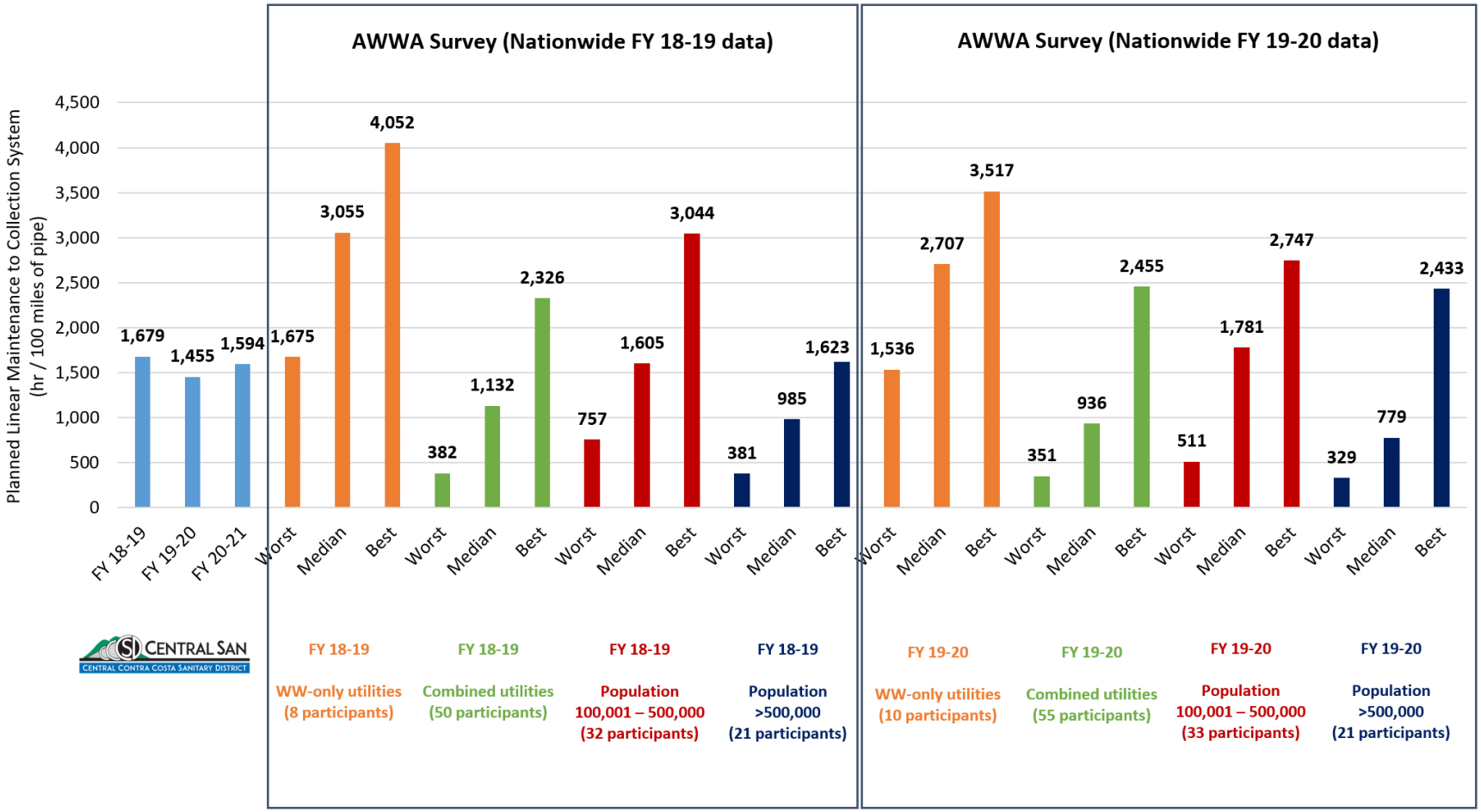
CORRECTIVE LINEAR WW MAINTENANCE TO COLLECTION SYSTEM

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



PLANNED LINEAR MAINTENANCE TO COLLECTION SYSTEM

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



ENERGY CONSUMPTION

This indicator quantifies the energy consumed to treat WW on an annual basis. Annual energy consumption fuel categories as listed by AWWA are electricity, natural gas, fuel oil #2, propane, renewable energy, resource recovery, and other. Stored amounts are not counted in energy consumption calculations. This benchmark is calculated as follows:

$$Energy\ Consumption: Wastewater\ \left(\frac{kBTU}{year\ x\ MG}\right) = \frac{Energy\ consumption\ based\ on\ purchases\ of\ electricity, natural\ gas, and\ other\ fuels\ (kBTU)}{Average\ daily\ flow\ (MGD)\ x\ 365\ days\ per\ year}$$

Central San Data Calculation Method
Central San's energy consumption data is comprised of the fuels which come into the treatment plant: electricity (purchased from Pacific Gas and Electric (PG&E) and, starting in FY 18-19, also from Marin Clean Energy (MCE)), natural gas (NG), diesel (fuel oil), and landfill gas (resource recovery). The amount reported to AWWA excludes the steam usage; however, energy consumption including steam has been provided for reference in the comparable graphs.

Pump Stations are on a separate meter from the main treatment plant, so Pump Stations electricity usage is not counted. Solar energy was not analyzed because the panels are only installed at the HHWCF and Collection System Operations offices, both of which are on a separate meter from the main plant.

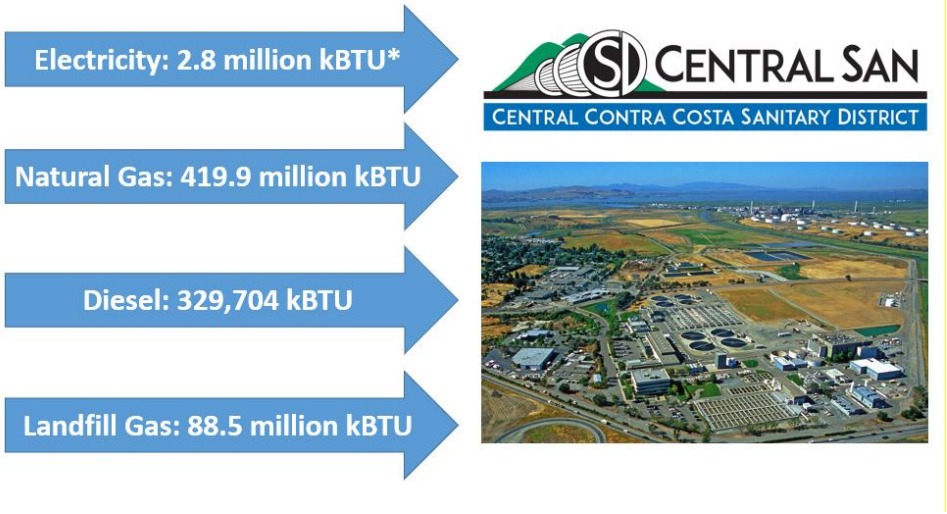
Cogeneration energy was not included as it is already counted under the NG usage. Similarly, stand-by power is counted with diesel. Landfill gas energy is used twice in Central San's processes: 1) to incinerate the sludge and 2) to create the steam, so steam recovered from the waste heat boilers (a.k.a., furnace steam) is not included to avoid double counting energy. Central San did not analyze propane usage.

Renewable energy is used in the form of renewable electricity imported from MCE, which started in mid-2018. For the purposes of reporting renewable energy amounts, it was estimated that 50% of total imported electricity in FY 18-19 and 60% of total imported electricity in FYs 19-20 and 20-21 was from MCE instead of PG&E. MCE is a public, not-for-profit electricity provider that gives PG&E customers the choice of having 60% to 100% of their electricity supplied from clean, renewable sources such as solar, wind, bioenergy, geothermal, and hydroelectric at competitive rates.

This formula, which uses 365 days, was adjusted to use 366 days in calculating the FY 19-20 data, since 2020 was a leap year.

Commentary

Average amounts of energy used for the Central San WW treatment process in FYs 18-19, 19-20, and 20-21 is displayed below in kBTUs (1,000 BTUs).

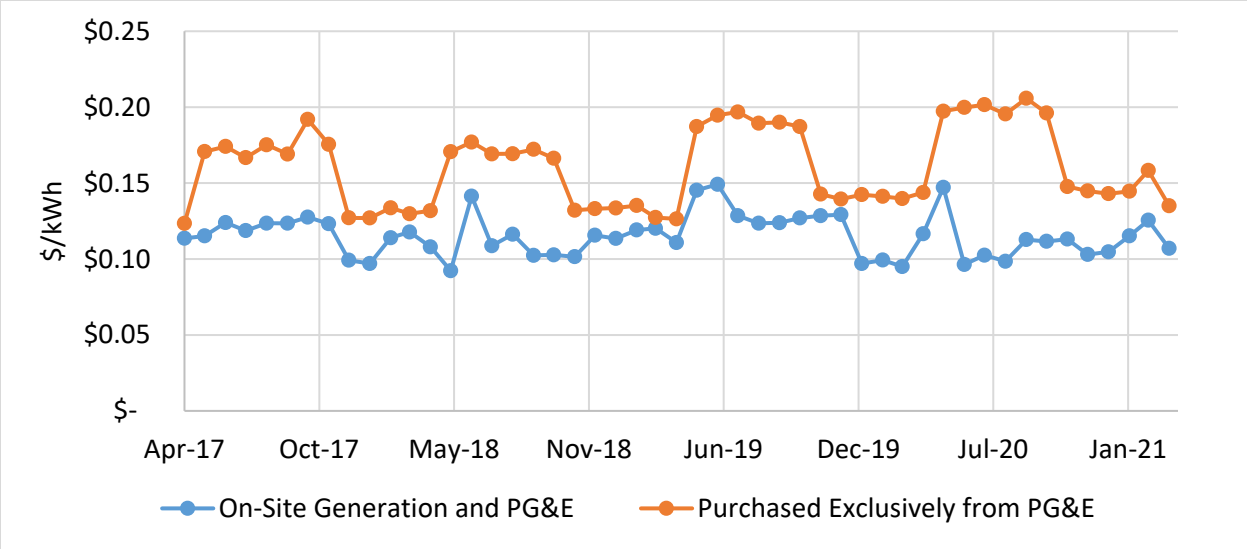


* It is estimated that 50% of total imported electricity in FY 18-19 and 60% of total imported electricity in FYs 19-20 and 20-21 is considered renewable as it was purchased from MCE.

Central San purchases a significant quantity of NG to meet a large portion of the treatment plant electricity demand (~95%) to feed the cogeneration system (cogen), which uses combined heat and power. Treatment plants like Central San that generate electricity with NG on site will have higher consumption values using the AWWA calculation method because it counts the energy lost during generation. Central San's cogen unit is ~22% electrically efficient (i.e., 100 kBTU of NG in the generator produces about 22 kBTU of electricity) and is ~50% efficient if steam generated is included. Steam used for the aeration blowers and other processes is also beneficially recovered in the cogen system after electricity production using waste heat boilers.

According to the AWWA calculation method, when a treatment plant purchases electricity from the electrical grid, any energy lost during electricity generation at an off-site facility is not included in the energy demand calculation (i.e., if the agency purchases 22 kBTU from the electrical grid, the energy from the fuel (perhaps ~100 kBTU of natural gas, coal, etc.) used to produce this electricity is not included in the 22 kBTU counted in the performance indicator calculation). Thus, energy from the fuel used to generate Central San's purchased energy is not counted. For example, any inefficiencies PG&E has when generating electricity does not affect Central San's benchmarking calculations.

The AWWA benchmarking calculation also does not account for operating cost savings benefits of generating electricity on site. The graph that follows shows the difference in price between Central San's current strategy of producing electricity on site supplemented by grid electricity versus purchasing all electricity from the electrical grid.



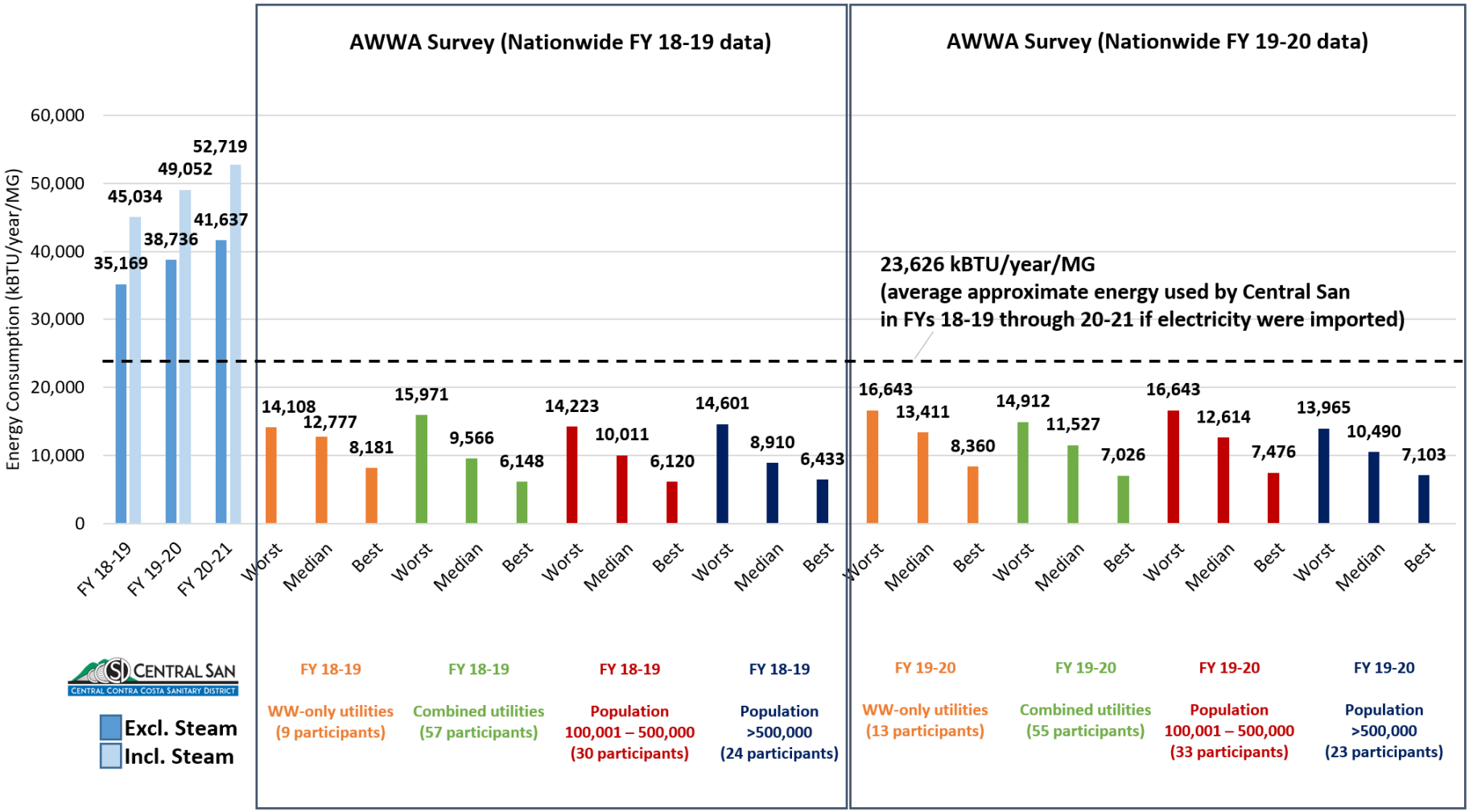
Costs for the current strategy include maintenance. These values are provided to the Board of Directors via monthly energy reports. While the difference in prices changes month to month, the overall trend suggests that the current strategy is more cost effective than purchasing all electricity from the grid. Additionally, the benefits for operational reliability of the on-site generation capacity of Central San's cogen unit should be considered. Also, while incineration is energy intensive, it reduces the volume of sludge to be trucked and hauled away by over 90%, since the volume of sludge is reduced significantly by turning it to ash.

Central San attempted to approximate the effect of energy loss during generation on the performance indicator calculated with the AWWA methodology through a sensitivity analysis in the 19-20 study. In the sensitivity analysis calculation, the electricity produced by cogen was instead imported from the electrical grid, and the steam typically produced by cogen was instead produced in the auxiliary boilers using NG. This calculation is an exercise to show the effect of energy lost during electricity generation on results calculated with the AWWA method; this does not include a cost analysis or the impact of energy recovery equipment capacity or redundancy. The results of the calculation show a decrease in the amount of energy required for the treatment process to 23,189 kBTU/MG, 23,173 kBTU/MG, and 24,517 kBTU/MG in FYs 17-18, 18-19, and 19-20 respectively. The average of those figures (23,626 kBTU/MG) is represented by a dotted line in the graphs to follow. This analysis was re-performed in 2022 and results did not change significantly.

To display the amount of energy recovered through the sewage sludge incinerator process, two sets of Central San energy consumption data are presented in the graphs to follow: 1) *including* the energy in steam produced from the waste heat boilers (which use heat produced in the sewage sludge incineration process), and 2) *excluding steam* (the figure reported to AWWA).

ENERGY CONSUMPTION

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



* The nationwide agency data set makes no distinction between agencies that have different treatment processes (e.g., incineration, nitrification, etc.). The CA agency data set makes no distinction between agencies that provide dual services (combined utilities), are retail agencies, or are agencies that are part of a larger operation.

ENERGY OPTIMIZATION PLAN

This indicator asks utilities to self-assess and define their energy optimization plan, which is an energy use plan that takes into consideration opportunities for energy conservation, opportunities to produce energy, reductions in greenhouse gas emissions, and opportunities to reduce energy costs. Utilities were asked to assign themselves one of the following levels:

- Level 5 – Plan is well defined and fully endorsed by staff, stakeholders, and decision-makers.
- Level 4 – Plan is well defined and endorsed by most staff, stakeholders, and decision-makers.
- Level 3 – Plan has been moderately defined and endorsed by some staff, stakeholders, and decision-makers.
- Level 2 – Plan has been somewhat defined and endorsed by few or no staff, stakeholders, and decision-makers.
- Level 1 – No energy optimization plan has been developed approach defined or endorsed.

Central San rated itself as follows over FYs 18-19 through FY 20-21:

FY 18-19	FY 19-20	FY 20-21
Level 3	Level 3	Level 3

The following charts show the nationwide performance in FYs 18-19 and 19-20 (percentage of participants reporting the levels as indicated in the charts), with Central San's performance for that FY in the chart for reference.

Utility Type	FY 18-19					Participants
	Well defined / fully endorsed (Level 5)	Well defined / mostly endorsed (Level 4)	Mostly defined / some endorsed (Level 3) CENTRAL SAN	Somewhat defined / few endorsed (Level 2)	Not defined / not endorsed (Level 1)	
WW-only	13%	50%	25%	12%	0%	9
Combined	16%	22%	42%	15%	5%	60
Population 100,001-500,000	11%	26%	41%	13%	9%	40
Population >500,000	26%	26%	31%	8%	9%	36

Utility Type	FY 19-20					Participants
	Well defined / fully endorsed (Level 5)	Well defined / mostly endorsed (Level 4)	Mostly defined / some endorsed (Level 3) CENTRAL SAN	Somewhat defined / few endorsed (Level 2)	Not defined / not endorsed (Level 1)	
WW-only	17%	33%	17%	17%	17%	12
Combined	19%	19%	32%	16%	13%	62
Population 100,001-500,000	19%	19%	32%	17%	13%	19
Population >500,000	27%	19%	30%	11%	13%	36

NUTRIENT RECOVERY

This indicator identifies the percent of WW treated that will eventually be used for nutrient recovery. Nutrient removal requirements are met through watershed processes rather than treatment at the plant.

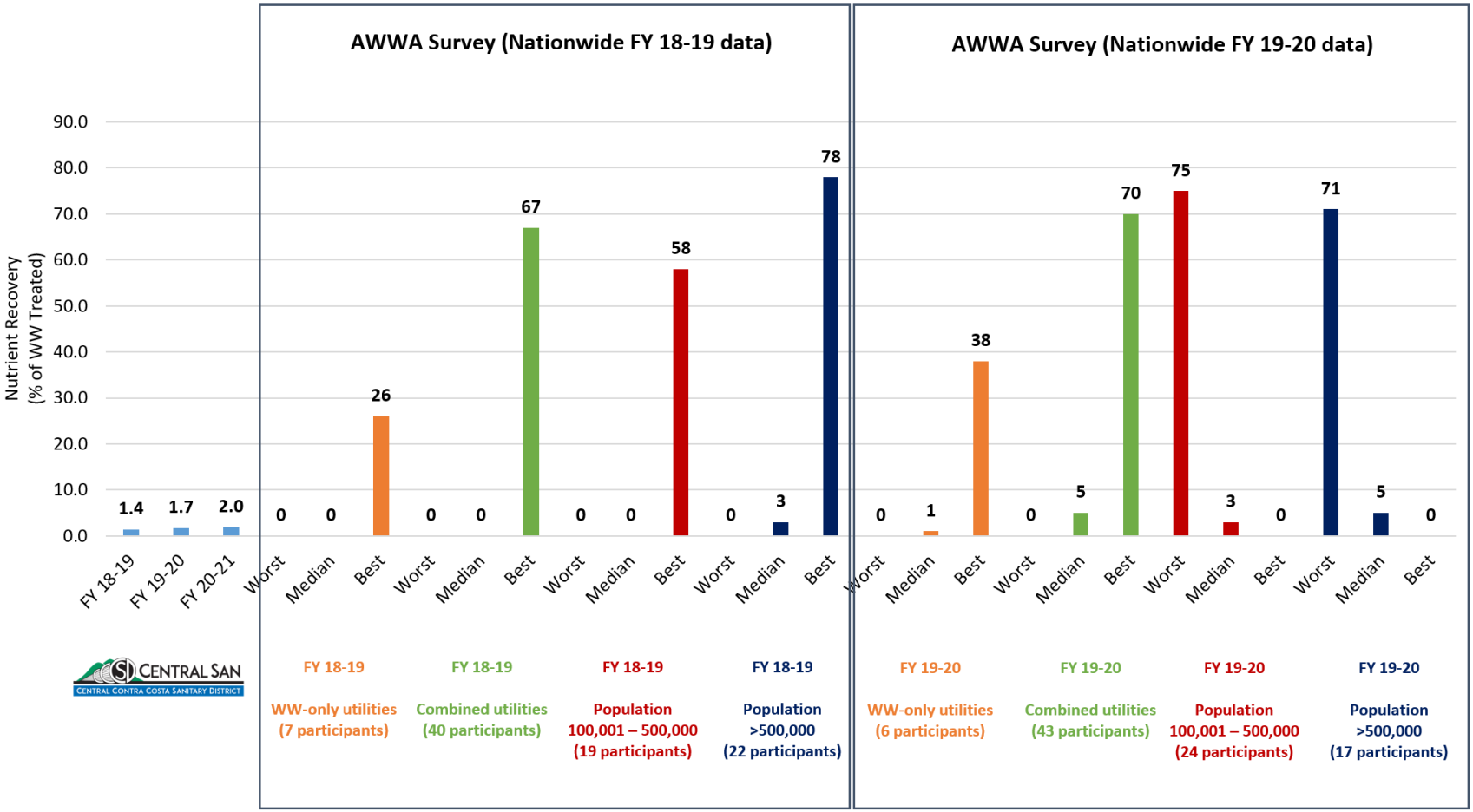
Examples could include land application, recovery of nitrogen or phosphorus (if either is directly recovered from the WW treatment process), composting, effluent reuse of reclaimed water for non-potable uses (e.g., irrigation), or indirect reuse (e.g., groundwater recharge). The focus of this question is on Watershed Sustainability.

Central San Data Calculation Method
Central San calculated the percentage of influent that is recycled water used for nutrient recovery (recovery of some nitrogen as a co-benefit of irrigating with recycled water). These include all uses where the recycled water will not come back to the District but excludes headquarters and plant office building dual-plumbed meters and the Maltby Pump Station.

It should be noted that, based on a limited data set, it is expected that the current WW treatment, solids handling, and ash disposal practices at Central San result in some nutrient recovery. Twice-weekly treatment plant influent and effluent liquid sampling has shown that the treatment process reduces the concentration of phosphorous by ~85%. The majority of this phosphorous is expected to be in the primary and waste activated sludge, which, in the current solids handling process, flow to the multiple hearth incinerators and become ash. Very limited data suggests the ash produced in the Central San incinerators has a high concentration of phosphorous (~12%). This ash is ultimately transported off-site to be used as a soil amendment by a private company; it would be expected that a fraction of the phosphorous in the soil amendment is ultimately accessible for irrigation purposes.

NUTRIENT RECOVERY

Central San vs. Nationwide (*FYs 18-19 and 19-20* data)



CONCLUSIONS

While there are limitations to consider in making strict “apples-to-apples” comparisons when reviewing the report, overall, this study is useful in identifying strengths and weaknesses and identifying potential areas on which to focus for improving performance over time.

Central San will continue to participate in the yearly AWWA nationwide survey and will continue working with Global Water Intelligence on their new benchmarking initiative. Staff will work on solidifying benchmarking practices through annual benchmarking and the building of relationships with CA agencies to foster consistent and accurate data gathering. Benchmarking data will be used to celebrate successes and recognize opportunities for improvement.

Staff has volunteered to serve on the AWWA Utility Benchmarking Survey Advisory Committee in the hopes of potentially assisting with fine-tuning the survey by conveying the recommendations noted in this report to remove the subjectivity in the data reporting, to make this a more useful tool for performance measurement and make the valuable data AWWA collects more easily interpretable. Separate benchmarks for retail and wholesale agencies would be a significant step in creating groups of utilities that are more comparable. Over time, the value of the benchmarking survey data may improve if the definitions are refined, participants commit to data validation, and participants ensure consistent application of the definitions.

Central San would like to thank all the staff from the California agencies who considered participating and who participated in the statewide survey, as well as to the Bay Area Clean Water Agencies for assisting in the survey distribution. Central San would also like to thank the individual internal data submitters for helping to present Central San’s performance data. Central San also appreciates AWWA for organizing and publishing the nationwide data set presented in this report, and Global Water Intelligence for spearheading their global benchmarking effort.

Central San will continue its efforts toward meeting its customers’ expectations, replacing aging and inefficient equipment, focusing on optimizations and efficiencies, and strategic planning for managerial effectiveness, with the goal of seeing positive trends in performance against itself over the years, as well as seeing favorable comparisons with other agencies.

APPENDIX

STAFFING LEVELS BY CATEGORY (% OF TOTAL FTEs)

This chart shows how Central San's employees are categorized in FY 18-19, 19-20, and 20-21 compared to the nationwide AWWA aggregate data for ***FY 18-19***.

FTE Category and Subcategory	Central San			Nationwide AWWA Survey (FY 18-19 Data)											
				WW-only (7 participants)			Combined (53 participants)			Population of 100,001-500,000 (5-44 participants)			Population of >500,000 (10-31 participants)		
	FY 18-19	FY 19-20	FY 20-21	Worst	Median	Best	Worst	Median	Best	Worst	Median	Best	Worst	Median	Best
FTEs – O&M	**52.6**	**53.3**	**52.7**	**51.7**	**57.1**	**65.5**	**46.8**	**56.5**	**69.7**	**51.2**	**59.9**	**75.9**	**47.1**	**53.8**	**63.8**
WW Collection	22.8	22.0	22.1	23.7	25.5	34.0	18.6	27.3	38.3	22.3	31.8	40.7	17.6	26.2	35.7
WW Treatment	29.8	31.3	30.6	25.0	30.2	36.6	22.5	28.8	36.0	22.3	29.6	46.8	25.6	30.5	34.3
FTEs – Management, Engineering, Customer Service, Other	**47.4**	**46.7**	**47.3**	**34.5**	**39.0**	**45.4**	**30.2**	**41.5**	**50.7**	**22.2**	**39.6**	**46.8**	**35.3**	**44.7**	**51.7**
Pretreatment Programs	3.9	3.8	3.8	0.9	3.8	4.4	1.2	2.8	4.8	1.1	2.1	4.8	1.1	2.8	4.2
Engineering	2.8	2.3	2.6	5.3	10.0	12.6	4.4	7.1	9.8	3.6	6.8	11.2	5.4	8.8	10.7
Utility Planning	5.5	4.4	4.4	5.4	5.8	9.5	1.6	2.5	4.5	2.2	4.6	5.6	0.7	1.7	3.7
Lab service / Compliance	6.0	6.0	5.8	4.2	5.2	6.0	3.2	4.8	6.5	3.2	4.5	5.6	3.1	4.9	7.1
Customer Service / Call Center	1.0	1.6	2.0	2.5	2.6	4.7	4.8	6.8	9.4	3.5	5.5	7.6	5.1	8.0	12.9
Customer Billing	0.4	0.4	0.4	1.9	3.3	6.7	1.4	2.1	3.7	1.4	2.9	4.1	1.3	2.0	2.2
Public Relations	1.4	1.3	1.7	0.6	0.8	1.1	0.5	0.9	1.4	0.5	0.8	1.2	0.5	0.7	1.1
Finance	4.0	3.8	3.6	1.9	3.9	5.4	2.4	3.2	5.2	2.0	3.2	4.6	2.0	2.8	3.4
Human Resources	2.6	2.5	2.8	1.7	2.0	2.3	1.4	1.7	2.5	1.2	1.6	2.0	1.4	1.7	2.0
Information Technology	4.3	4.3	4.3	3.3	4.6	5.0	1.7	3.3	4.4	1.4	2.4	4.6	2.0	3.6	4.4
Facilities	2.4	3.0	2.8	3.1	3.8	7.3	1.1	2.2	7.0	1.7	3.8	7.8	0.4	1.0	2.2
Fleet	1.7	1.7	1.7	2.4	2.8	3.3	0.7	1.6	2.8	1.7	2.3	2.9	0.2	0.7	1.5
Legal / Administration	2.7	2.7	2.8	1.9	2.7	2.7	1.3	3.2	5.5	1.8	2.9	5.4	1.0	1.5	4.5
Safety	1.2	1.2	1.1	0.5	0.5	0.7	0.5	0.7	1.4	0.5	0.6	1.0	0.4	0.5	0.8
Risks / Claims	0.6	0.6	0.6	0.6	0.6	0.7	0.2	0.3	0.8	0.4	0.8	0.9	0.1	0.2	0.4
Security	0.2	0.2	0.2	0.4	0.4	0.5	0.3	0.4	0.9	0.3	0.4	0.5	0.3	0.5	0.9
Other	6.5	6.8	6.7	8.7	19.8	13.0	2.6	3.4	7.0	3.3	5.8	7.5	2.2	3.2	6.7

STAFFING LEVELS BY CATEGORY (% OF TOTAL FTEs)

This chart shows how Central San's employees are categorized in FY 18-19, 19-20, and 20-21, compared to the nationwide AWWA aggregate data for ***FY 19-20***.

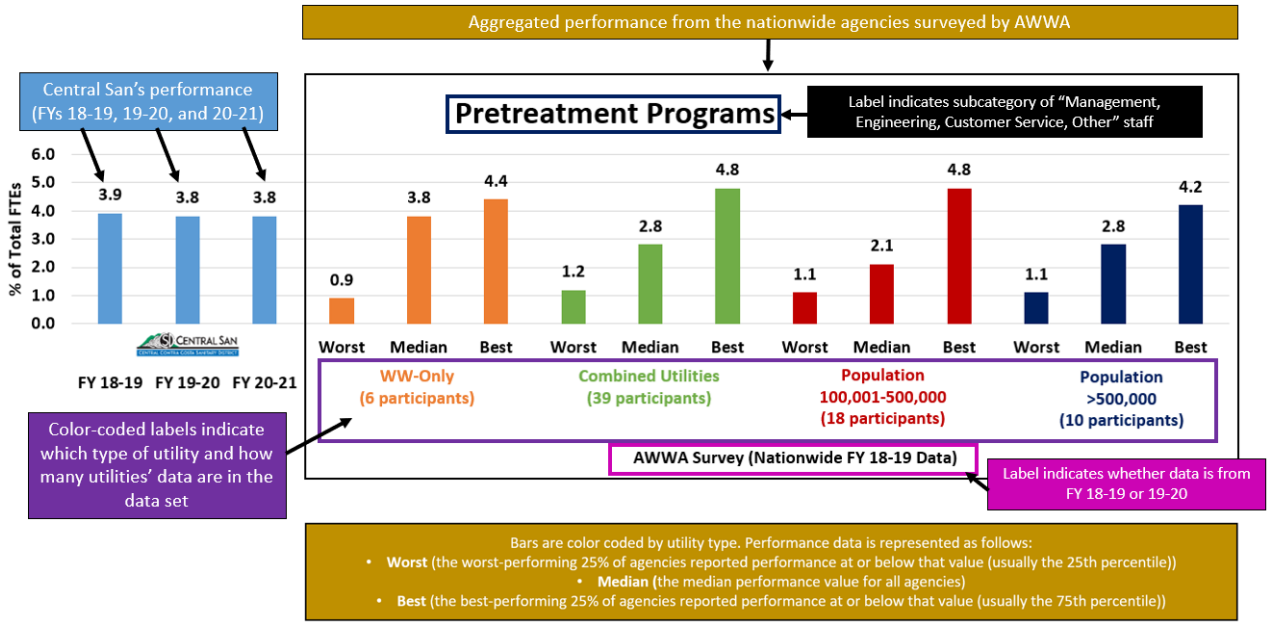
FTE Category and Subcategory	Central San			Nationwide AWWA Survey (FY 19-20 Data)											
				WW-only (13 participants)			Combined (88 participants)			Population of 100,001-500,000 (6-50 participants)			Population of >500,000 (1-28 participants)		
	FY 18-19	FY 19-20	FY 20-21	Worst	Median	Best	Worst	Median	Best	Worst	Median	Best	Worst	Median	Best
FTEs – O&M	**52.6**	**53.3**	**52.7**	**50.5**	**53.9**	**60.5**	**36.0**	**52.2**	**67.9**	**55.1**	**55.0**	**68.0**	**0.0**	**56.1**	**53.8**
WW Collection	22.8	22.0	22.1	23.0	30.8	35.0	20.2	29.5	40.2	22.0	31.6	40.9	17.9	26.2	31.5
WW Treatment	29.8	31.3	30.6	11.7	29.9	33.9	20.4	27.9	35.2	17.5	26.0	33.0	26.5	29.4	34.4
FTEs – Management, Engineering, Customer Service, Other	**47.4**	**46.7**	**47.3**	**39.5**	**46.1**	**49.5**	**0.0**	**32.2**	**45.8**	**10.7**	**35.5**	**48.6**	**0.0**	**36.1**	**51.3**
Pretreatment Programs	3.9	3.8	3.8	1.6	2.6	3.8	1.6	3.5	5.6	1.6	3.3	6.6	1.5	3.2	4.5
Engineering	2.8	2.3	2.6	6.4	10.6	14.2	5.2	7.7	11.4	5.0	7.2	11.6	6.5	8.7	11.5
Utility Planning	5.5	4.4	4.4	3.0	5.0	7.1	1.2	2.8	5.3	1.9	4.1	5.6	0.7	2.0	3.9
Lab service / Compliance	6.0	6.0	5.8	4.3	6.6	7.7	2.6	4.2	6.1	3.2	4.2	6.4	3.0	4.7	7.1
Customer Service / Call Center	1.0	1.6	2.0	1.4	1.6	2.5	4.3	6.5	9.0	2.5	6.5	8.5	3.3	7.0	9.4
Customer Billing	0.4	0.4	0.4	0.5	1.4	3.0	0.5	3.1	5.8	1.9	2.5	4.2	1.2	1.4	2.4
Public Relations	1.4	1.3	1.7	0.8	1.3	2.0	1.4	2.4	4.5	0.5	0.7	1.1	0.5	0.8	1.4
Finance	4.0	3.8	3.6	1.9	4.0	4.6	0.5	0.7	1.3	1.4	3.8	4.6	2.1	3.0	3.7
Human Resources	2.6	2.5	2.8	1.7	2.2	2.7	2.2	3.6	5.1	1.0	1.7	2.0	1.6	2.1	2.2
Information Technology	4.3	4.3	4.3	4.2	4.3	5.6	0.8	1.8	2.2	1.5	2.3	4.4	2.1	3.8	4.4
Facilities	2.4	3.0	2.8	3.3	7.4	14.1	1.8	3.0	4.4	2.1	3.9	11.2	0.3	0.9	2.8
Fleet	1.7	1.7	1.7	1.3	1.9	2.5	1.2	2.3	4.4	1.7	2.3	3.8	0.4	0.9	1.6
Legal / Administration	2.7	2.7	2.8	1.2	1.9	2.6	0.7	1.6	3.3	2.4	3.6	6.3	0.8	1.3	4.1
Safety	1.2	1.2	1.1	0.5	0.6	0.9	1.5	4.1	5.4	0.5	0.6	0.9	0.4	0.5	0.7
Risks / Claims	0.6	0.6	0.6	0.4	0.8	2.8	0.4	0.6	1.0	0.1	0.3	0.7	0.1	0.2	0.2
Security	0.2	0.2	0.2	0.4	0.5	2.6	0.1	0.2	0.5	0.1	0.3	0.4	0.2	0.6	0.9
Other	6.5	6.8	6.7	4.2	6.4	7.5	0.2	0.3	0.7	2.6	3.6	6.9	2.1	2.8	4.7

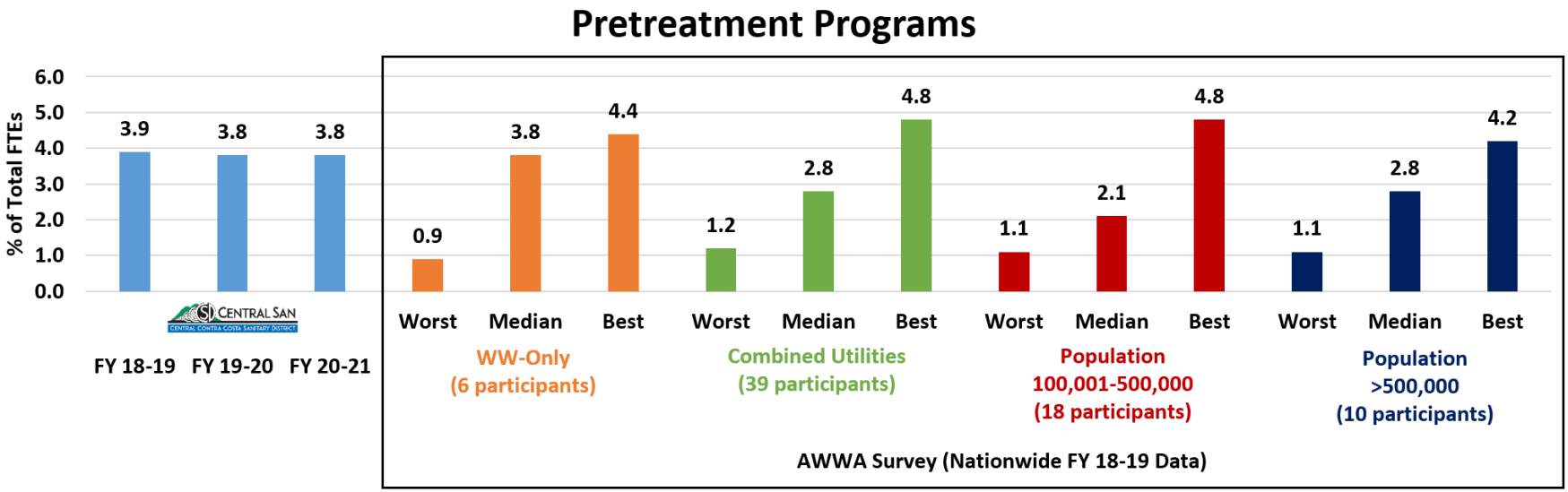
MANAGEMENT, ENGINEERING, CUSTOMER SERVICE, AND OTHER STAFFING LEVELS BY SUBCATEGORY (% OF TOTAL FTEs)

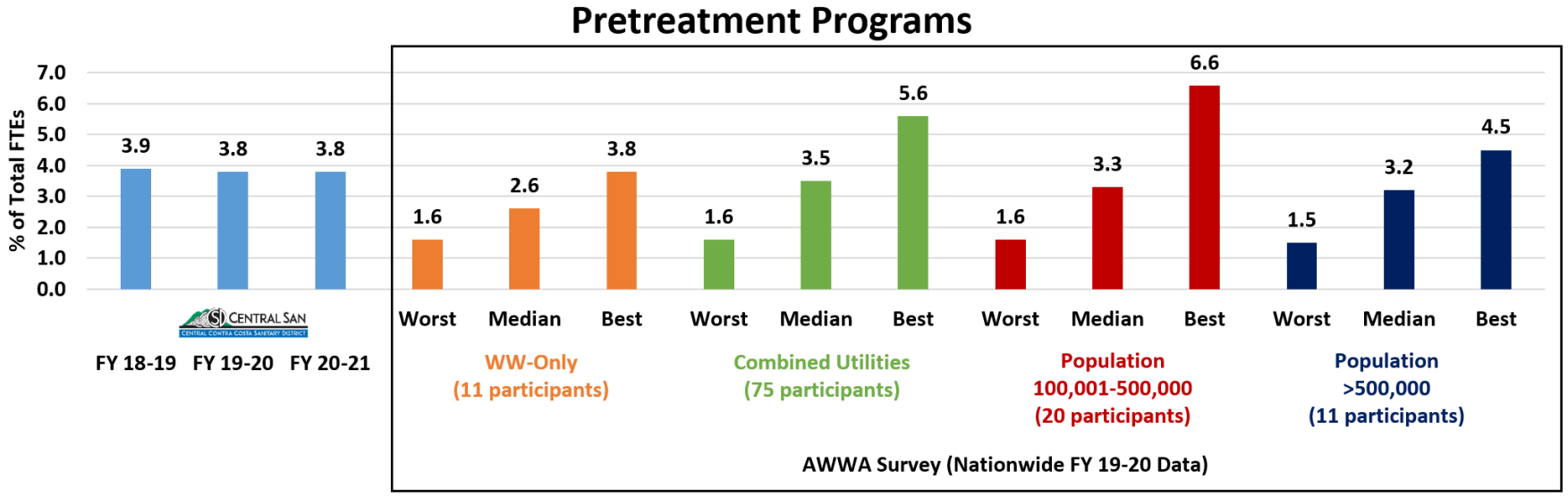
The following are graphical representations of the bottom section of the above charts. The graphs compare Central San's FYs 18-19, 19-20, and 20-21 staffing levels to the nationwide FYs 18-19 and 19-20 staffing levels in the following subcategories of the "Management, Engineering, Customer Service, Other" staff:

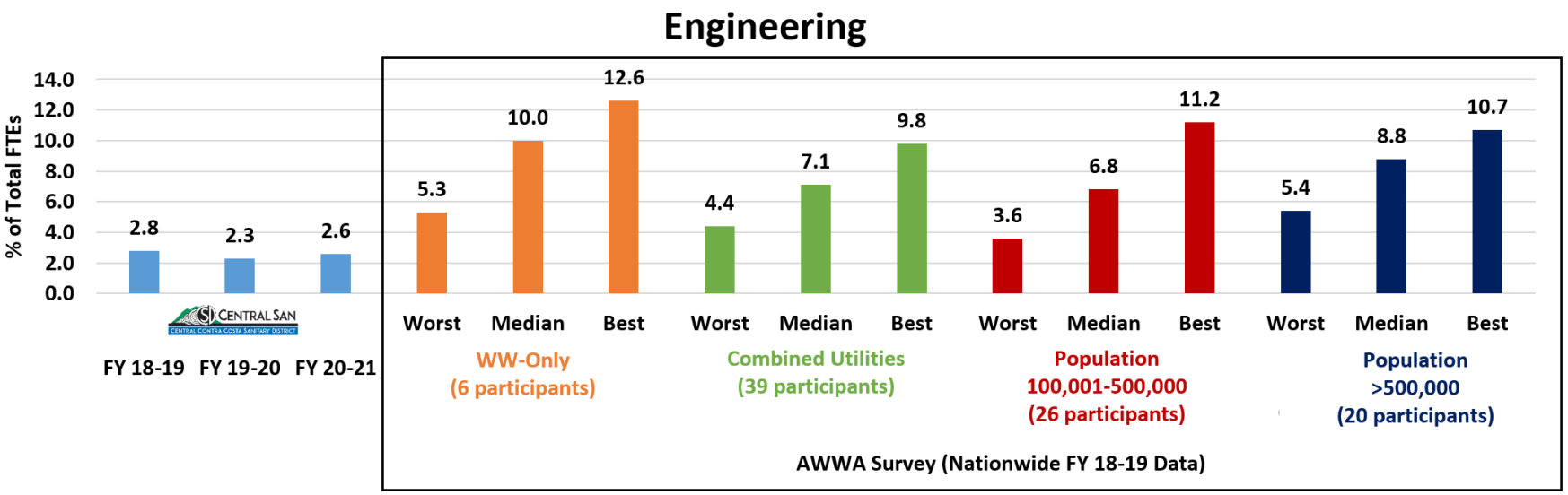
- Pretreatment Programs
- Engineering
- Utility Planning
- Lab service / Compliance
- Customer Service / Call Center
- Customer Billing
- Public Relations
- Finance
- Human Resources
- Information Technology
- Facilities
- Fleet
- Legal / Administration
- Safety
- Risks / Claims
- Security
- Other

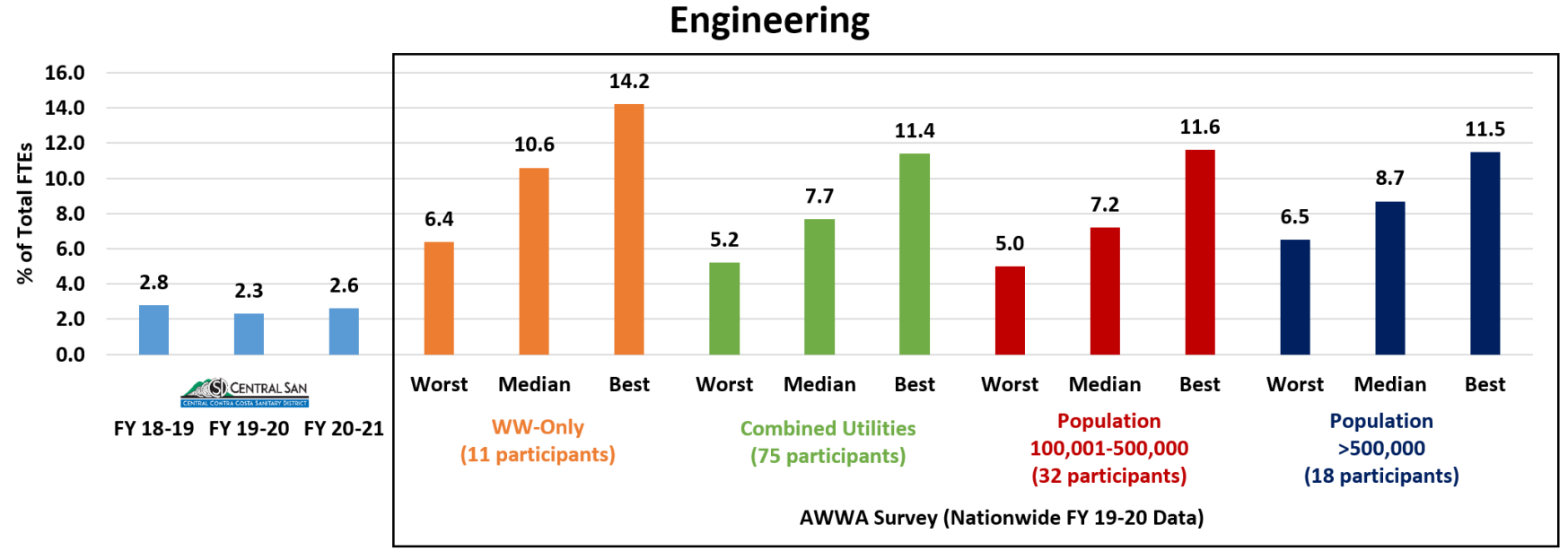
Below is a sample graph and guide to interpreting the results:

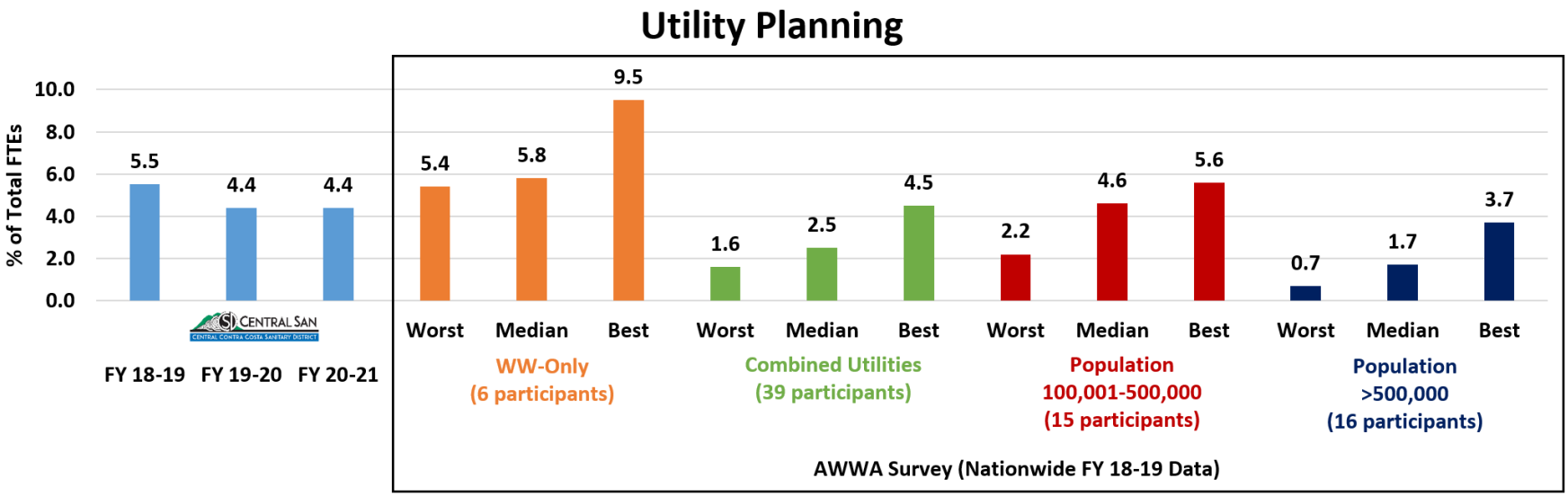


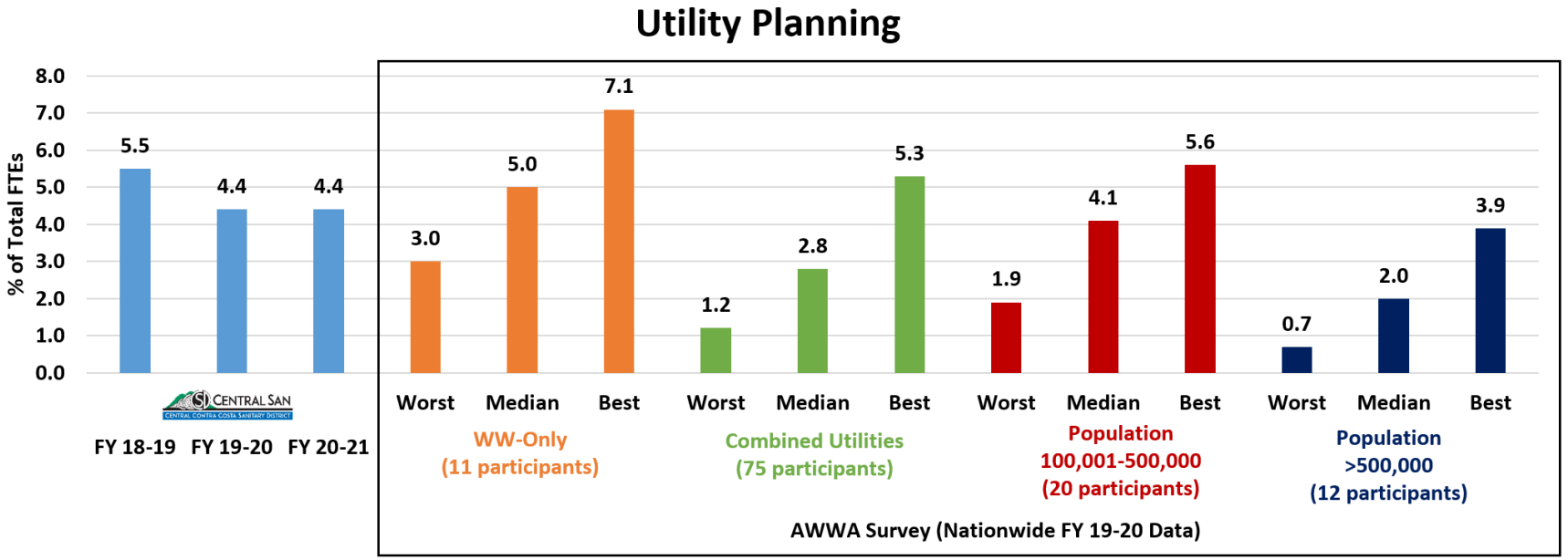

Pretreatment Programs
% of Total FTEs
6.0
5.0
4.0
3.0
2.0
1.0
0.0
3.9
3.8
3.8
FY 18-19
FY 19-20
FY 20-21
0.9
3.8
4.4
1.2
2.8
4.8
1.1
2.1
4.8
1.1
2.8
4.2
Worst
Median
Best
WW-Only
(6 participants)
Combined Utilities
(39 participants)
Population
100,001-500,000
(18 participants)
Population
>500,000
(10 participants)
AWWA Survey (Nationwide FY 18-19 Data)

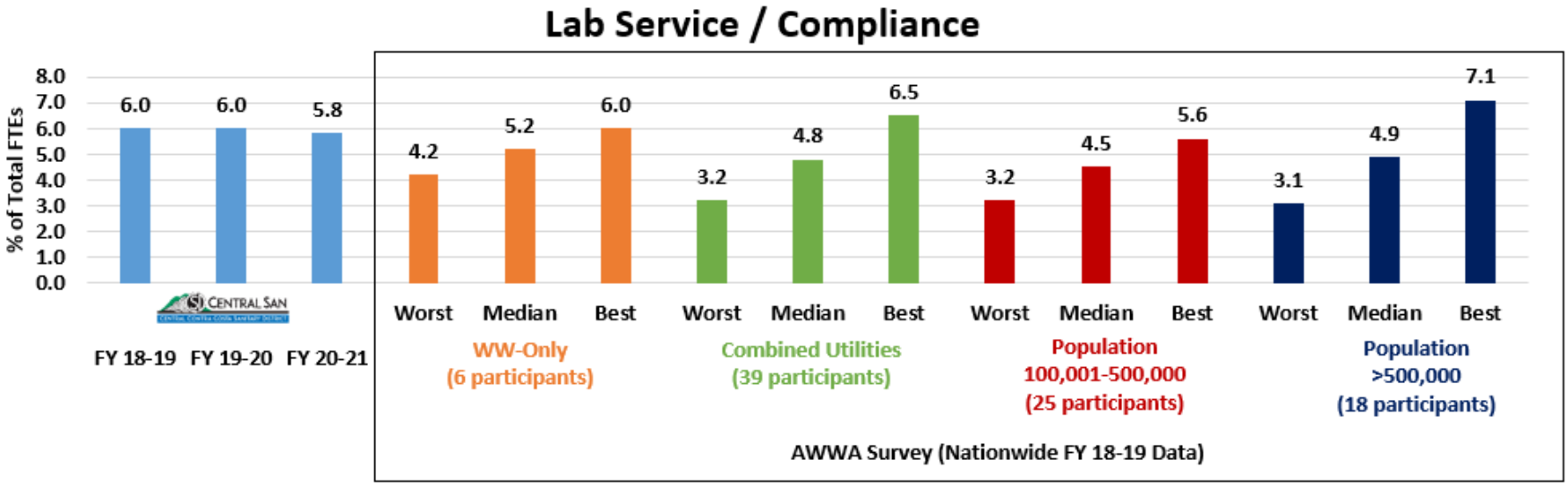

Pretreatment Programs
% of Total FTEs
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
3.9
3.8
3.8
FY 18-19
FY 19-20
FY 20-21
1.6
2.6
3.8
1.6
3.5
5.6
1.6
3.3
6.6
1.5
3.2
4.5
Worst
Median
Best
WW-Only
(11 participants)
Combined Utilities
(75 participants)
Population
100,001-500,000
(20 participants)
Population
>500,000
(11 participants)
AWWA Survey (Nationwide FY 19-20 Data)

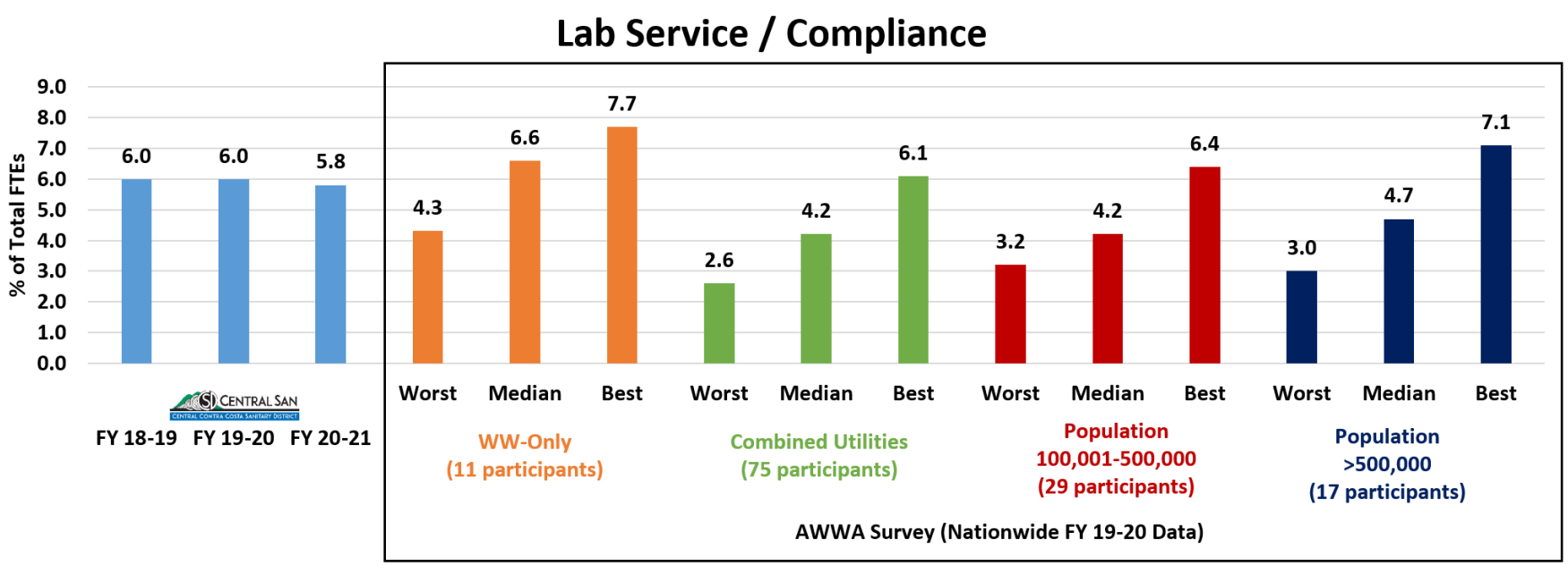

Engineering
% of Total FTEs
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
2.8
2.3
2.6
FY 18-19
FY 19-20
FY 20-21
5.3
10.0
12.6
4.4
7.1
9.8
3.6
6.8
11.2
5.4
8.8
10.7
Worst
Median
Best
WW-Only
(6 participants)
Combined Utilities
(39 participants)
Population
100,001-500,000
(26 participants)
Population
>500,000
(20 participants)
AWWA Survey (Nationwide FY 18-19 Data)


Engineering
% of Total FTEs
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
2.8
2.3
2.6
FY 18-19
FY 19-20
FY 20-21
6.4
10.6
14.2
5.2
7.7
11.4
5.0
7.2
11.6
6.5
8.7
11.5
Worst
Median
Best
WW-Only
(11 participants)
Combined Utilities
(75 participants)
Population
100,001-500,000
(32 participants)
Population
>500,000
(18 participants)
AWWA Survey (Nationwide FY 19-20 Data)

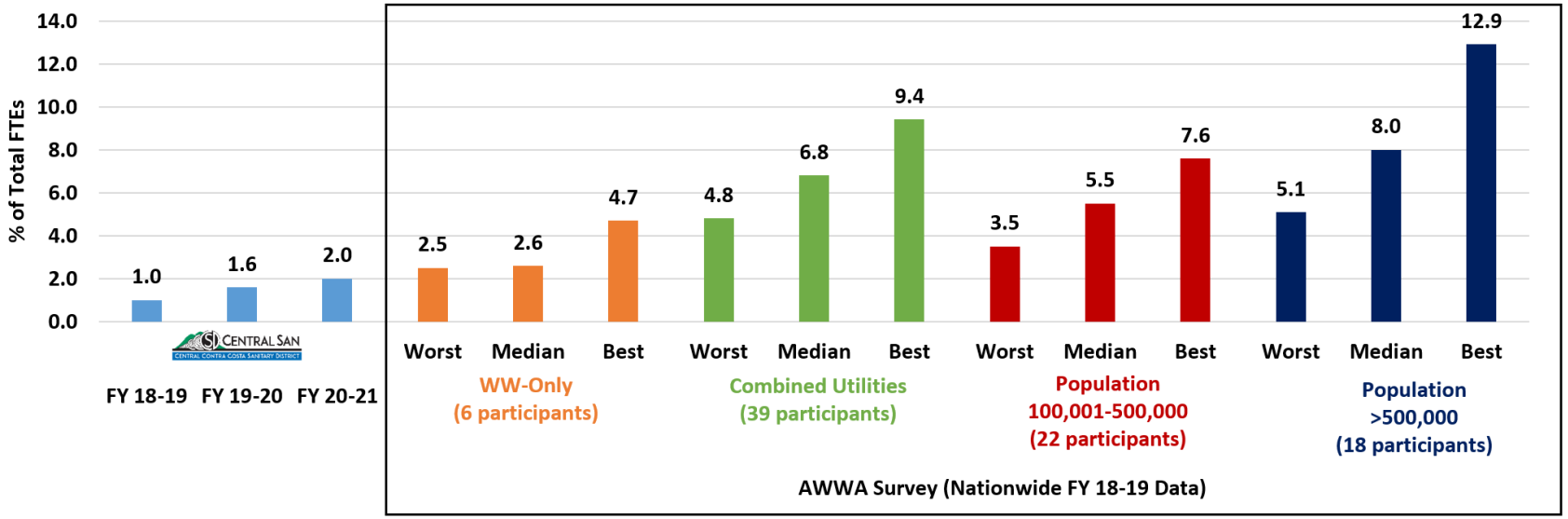

Utility Planning
% of Total FTEs
10.0
8.0
6.0
4.0
2.0
0.0
5.5
4.4
4.4
FY 18-19
FY 19-20
FY 20-21
5.4
5.8
9.5
1.6
2.5
4.5
2.2
4.6
5.6
0.7
1.7
3.7
Worst
Median
Best
WW-Only
(6 participants)
Combined Utilities
(39 participants)
Population
100,001-500,000
(15 participants)
Population
>500,000
(16 participants)
AWWA Survey (Nationwide FY 18-19 Data)


Utility Planning
% of Total FTEs
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
5.5
4.4
4.4
FY 18-19
FY 19-20
FY 20-21
3.0
5.0
7.1
1.2
2.8
5.3
1.9
4.1
5.6
0.7
2.0
3.9
Worst
Median
Best
WW-Only
(11 participants)
Combined Utilities
(75 participants)
Population
100,001-500,000
(20 participants)
Population
>500,000
(12 participants)
AWWA Survey (Nationwide FY 19-20 Data)

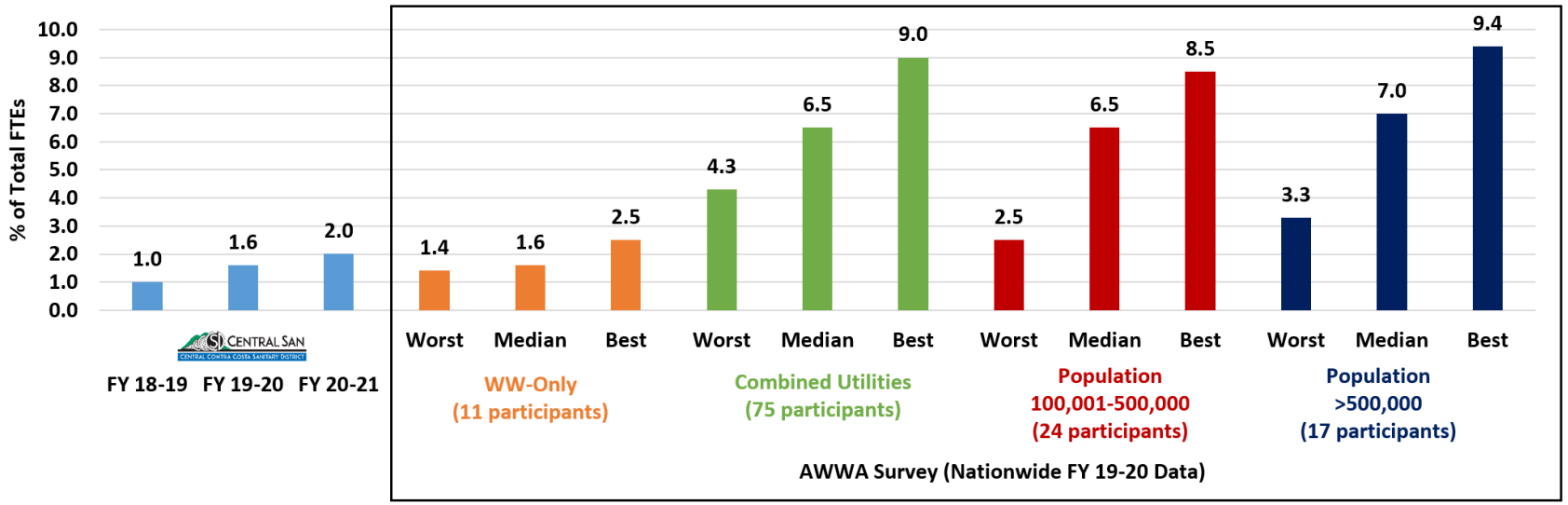

Lab Service / Compliance
% of Total FTEs
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
6.0
6.0
5.8
FY 18-19
FY 19-20
FY 20-21
4.2
5.2
6.0
3.2
4.8
6.5
3.2
4.5
5.6
3.1
4.9
7.1
Worst
Median
Best
WW-Only
(6 participants)
Combined Utilities
(39 participants)
Population
100,001-500,000
(25 participants)
Population
>500,000
(18 participants)
AWWA Survey (Nationwide FY 18-19 Data)

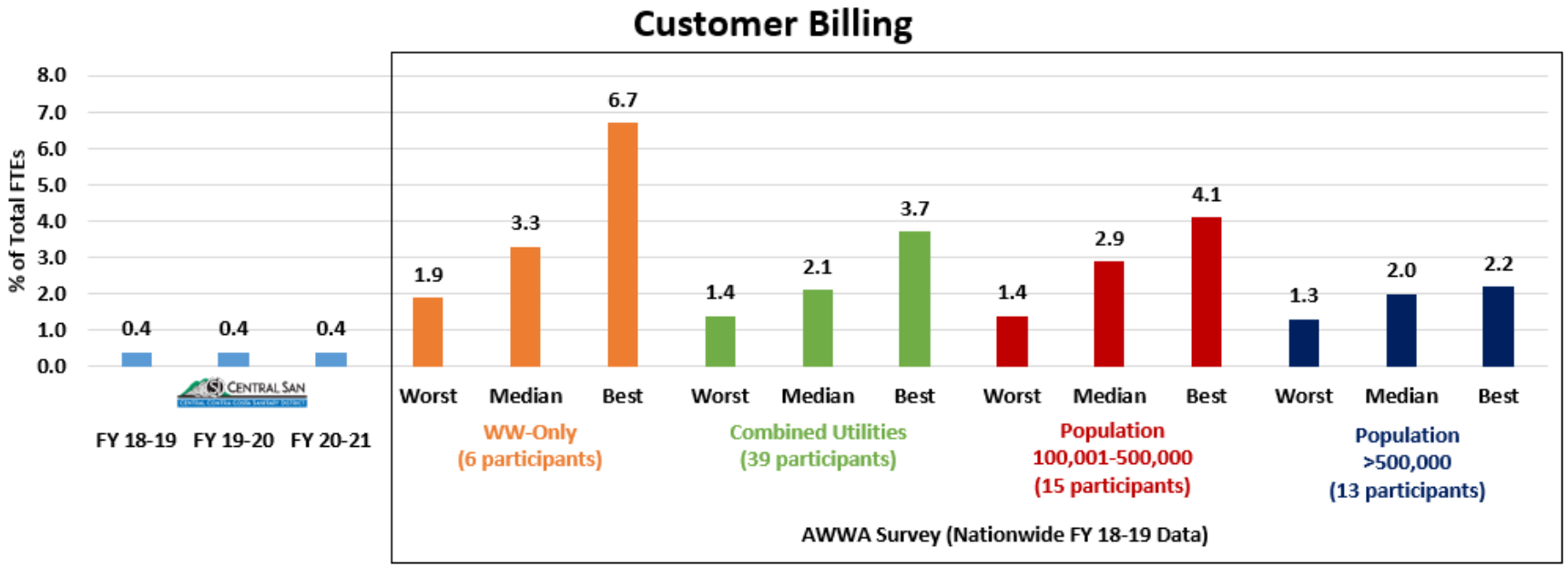

Lab Service / Compliance
% of Total FTEs
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
6.0
6.0
5.8
FY 18-19
FY 19-20
FY 20-21
4.3
6.6
7.7
2.6
4.2
6.1
3.2
4.2
6.4
3.0
4.7
7.1
Worst
Median
Best
WW-Only
(11 participants)
Combined Utilities
(75 participants)
Population
100,001-500,000
(29 participants)
Population
>500,000
(17 participants)
AWWA Survey (Nationwide FY 19-20 Data)

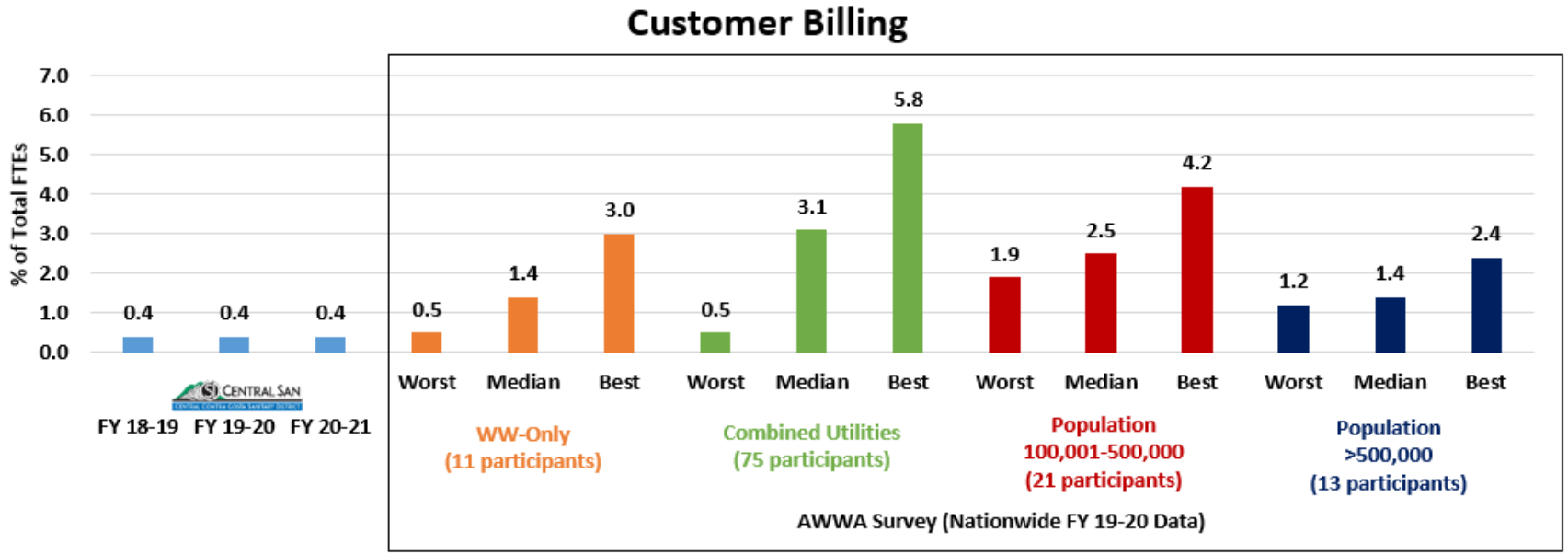
Customer Service / Call Center

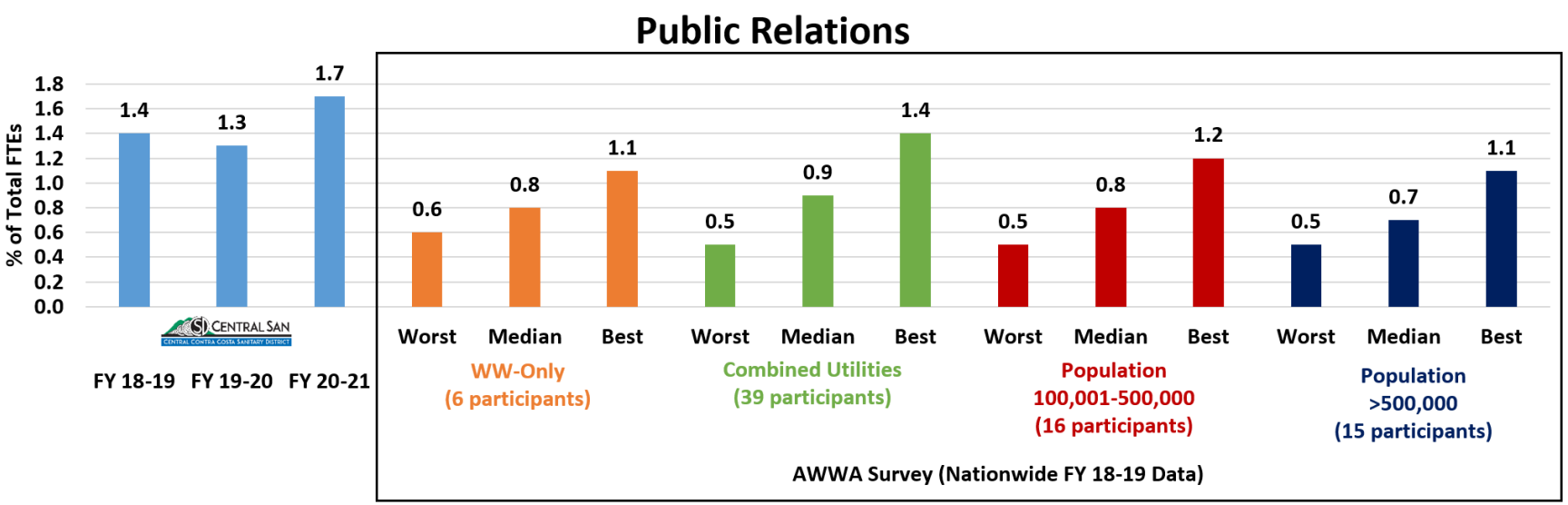


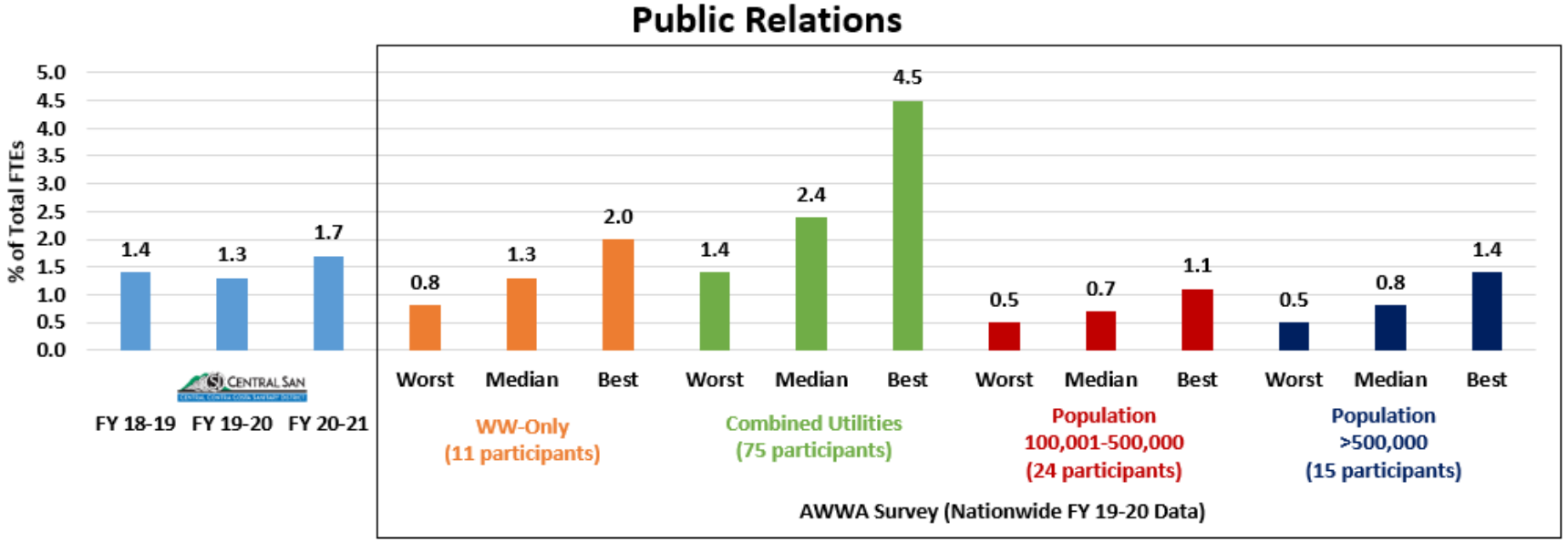
Customer Service / Call Center

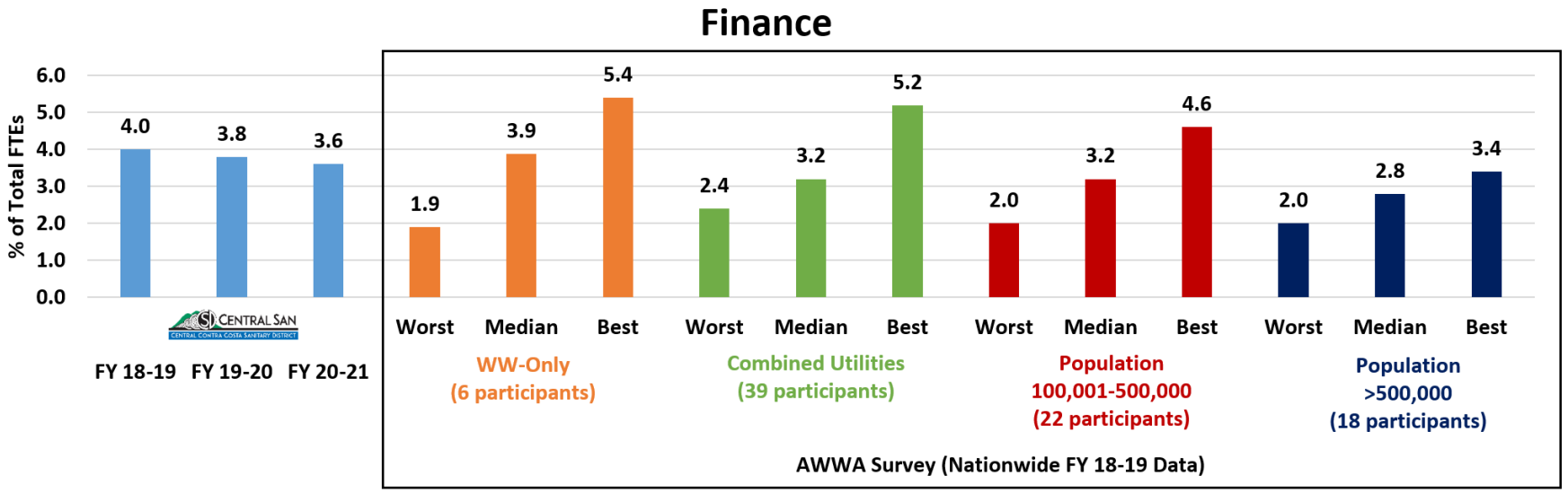


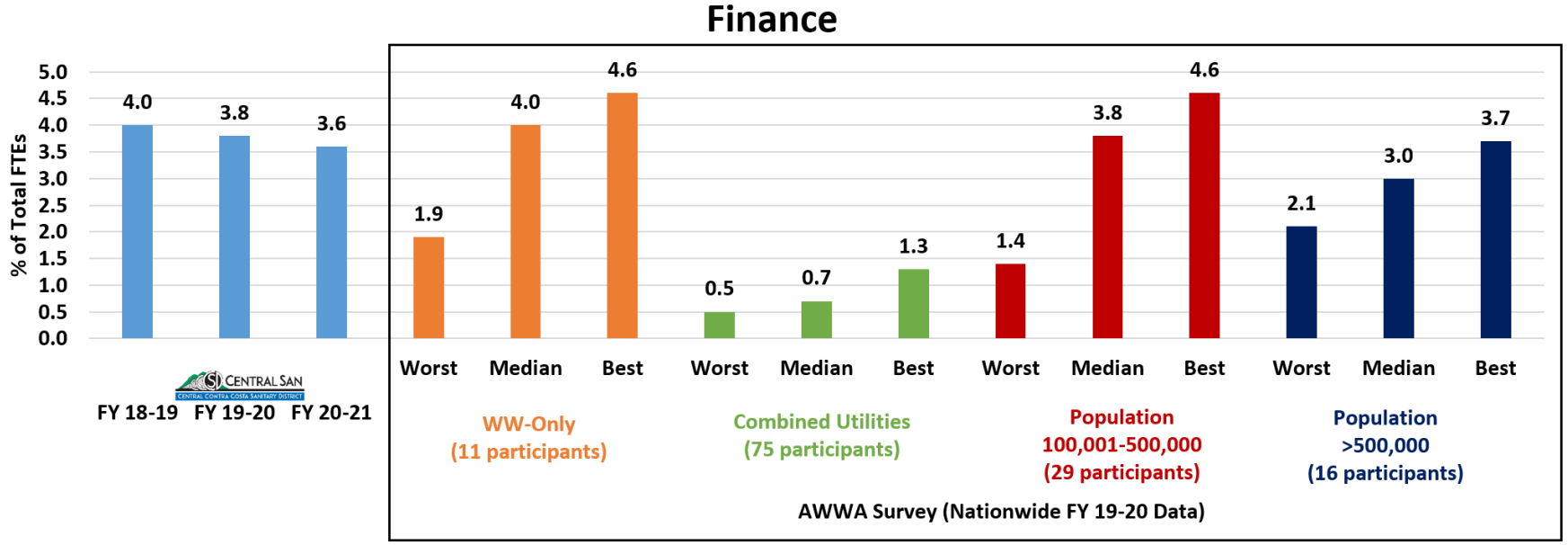

Customer Billing
% of Total FTEs
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.4
0.4
0.4
FY 18-19
FY 19-20
FY 20-21
1.9
3.3
6.7
1.4
2.1
3.7
1.4
2.9
4.1
1.3
2.0
2.2
Worst
Median
Best
WW-Only
(6 participants)
Combined Utilities
(39 participants)
Population
100,001-500,000
(15 participants)
Population
>500,000
(13 participants)
AWWA Survey (Nationwide FY 18-19 Data)

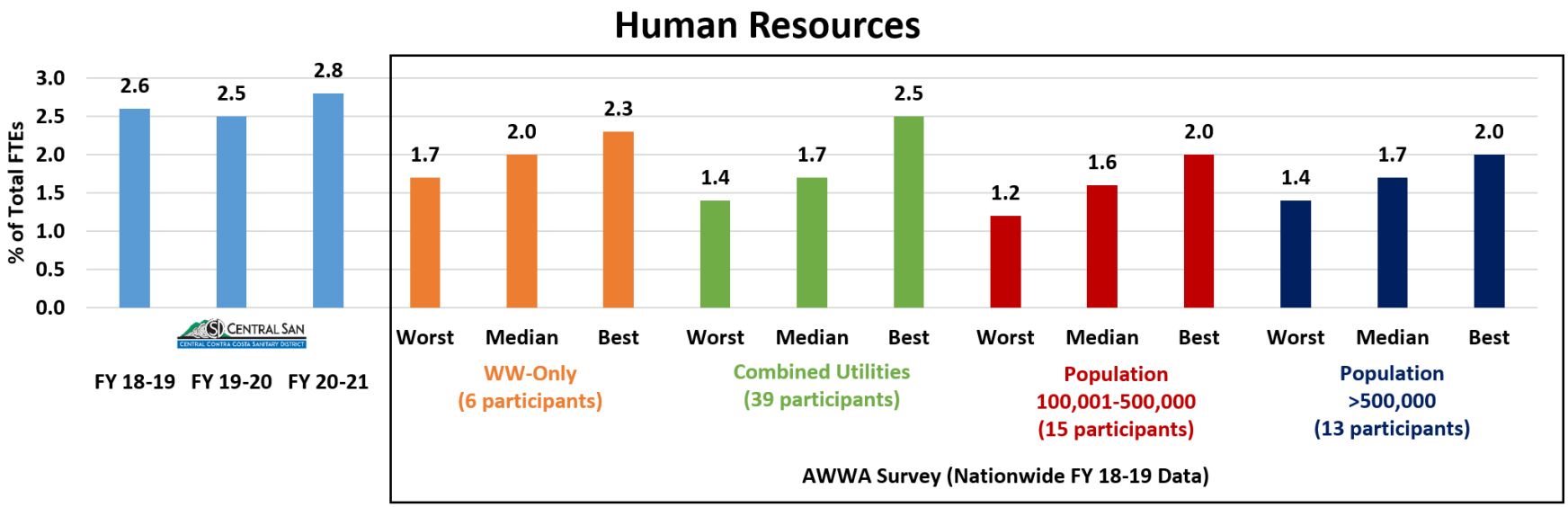

Customer Billing
% of Total FTEs
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.4
0.4
0.4
FY 18-19
FY 19-20
FY 20-21
0.5
1.4
3.0
0.5
3.1
5.8
1.9
2.5
4.2
1.2
1.4
2.4
Worst
Median
Best
WW-Only
(11 participants)
Combined Utilities
(75 participants)
Population
100,001-500,000
(21 participants)
Population
>500,000
(13 participants)
AWWA Survey (Nationwide FY 19-20 Data)

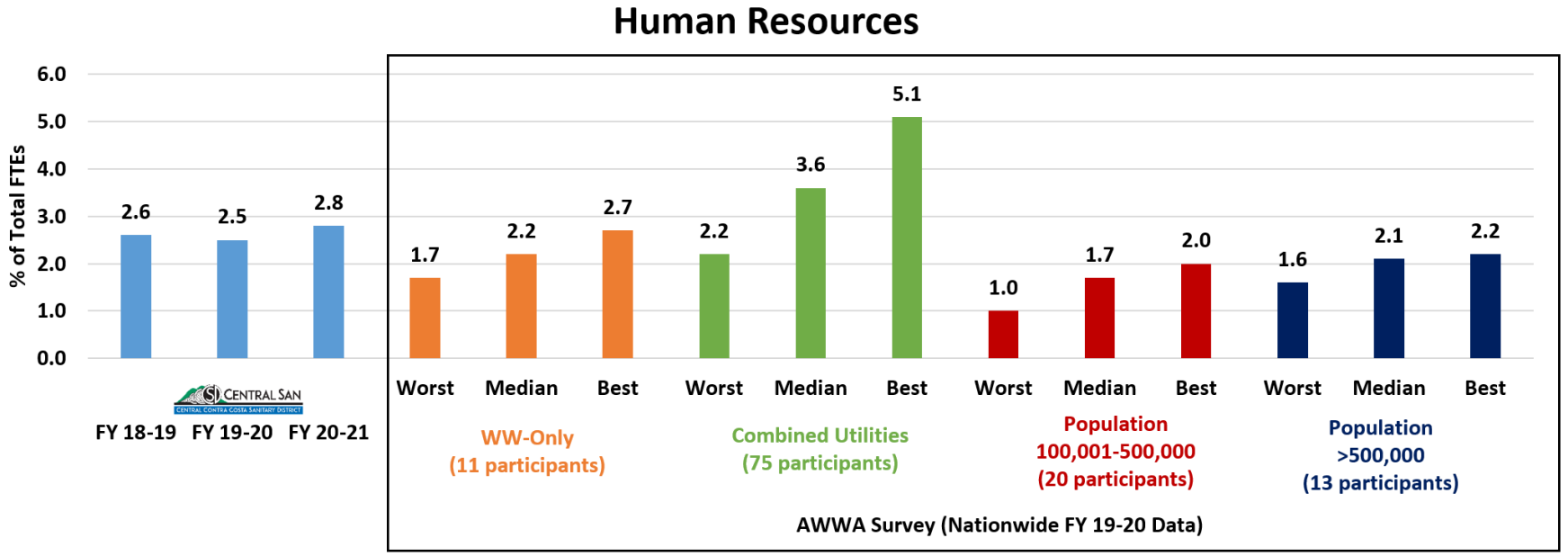

Public Relations
% of Total FTEs
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
1.4
1.3
1.7
FY 18-19
FY 19-20
FY 20-21
0.6
0.8
1.1
0.5
0.9
1.4
0.5
0.8
1.2
0.5
0.7
1.1
Worst
Median
Best
WW-Only
(6 participants)
Combined Utilities
(39 participants)
Population
100,001-500,000
(16 participants)
Population
>500,000
(15 participants)
AWWA Survey (Nationwide FY 18-19 Data)

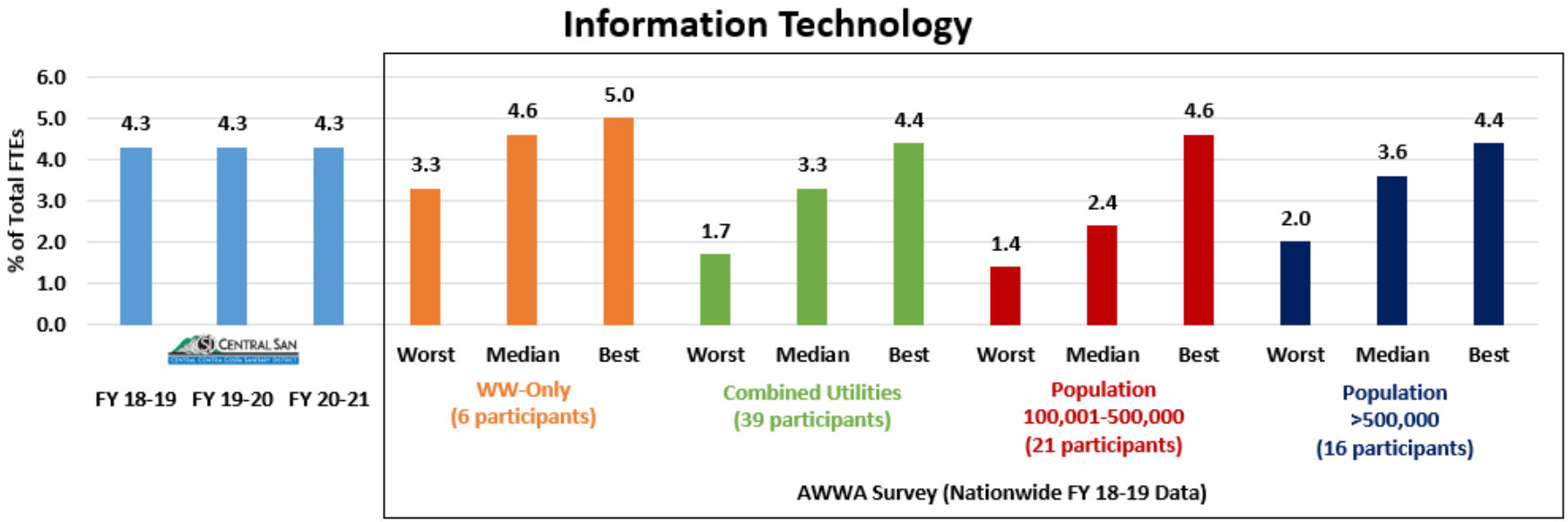

Public Relations
% of Total FTEs
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1.4
1.3
1.7
FY 18-19
FY 19-20
FY 20-21
0.8
1.3
2.0
1.4
2.4
4.5
0.5
0.7
1.1
0.5
0.8
1.4
Worst
Median
Best
WW-Only
(11 participants)
Combined Utilities
(75 participants)
Population
100,001-500,000
(24 participants)
Population
>500,000
(15 participants)
AWWA Survey (Nationwide FY 19-20 Data)

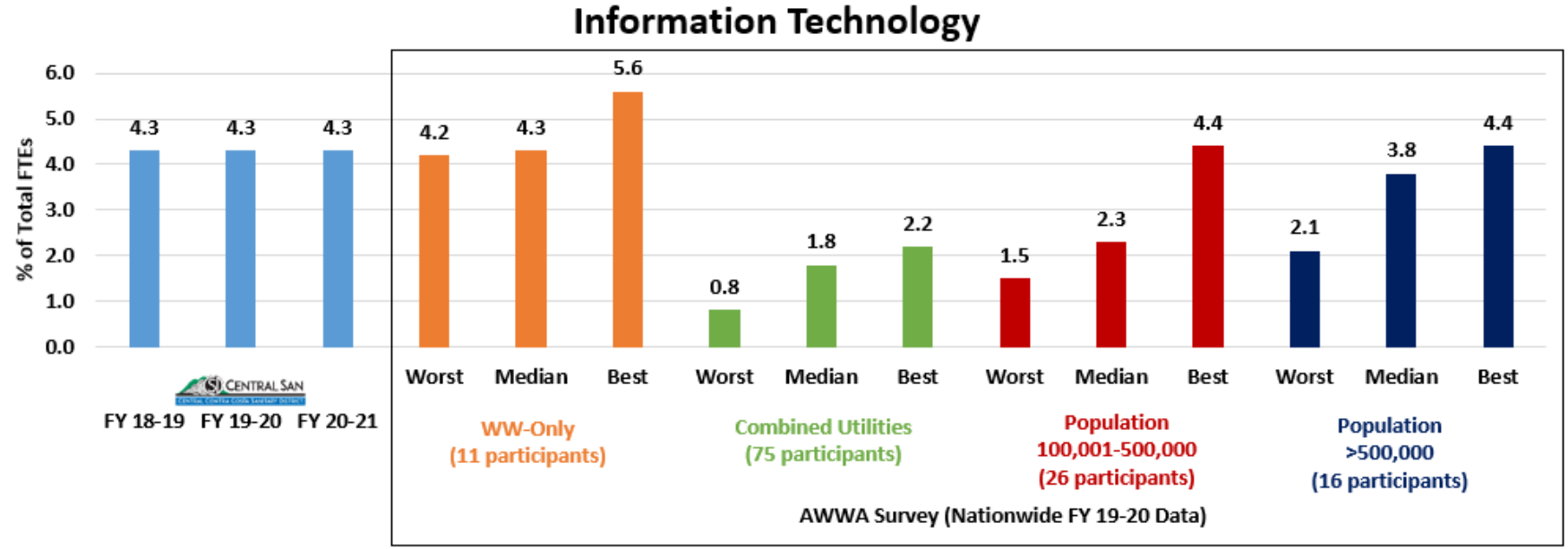

Finance
% of Total FTEs
6.0
5.0
4.0
3.0
2.0
1.0
0.0
4.0
3.8
3.6
FY 18-19
FY 19-20
FY 20-21
1.9
3.9
5.4
2.4
3.2
5.2
2.0
3.2
4.6
2.0
2.8
3.4
Worst
Median
Best
WW-Only
(6 participants)
Combined Utilities
(39 participants)
Population
100,001-500,000
(22 participants)
Population
>500,000
(18 participants)
AWWA Survey (Nationwide FY 18-19 Data)

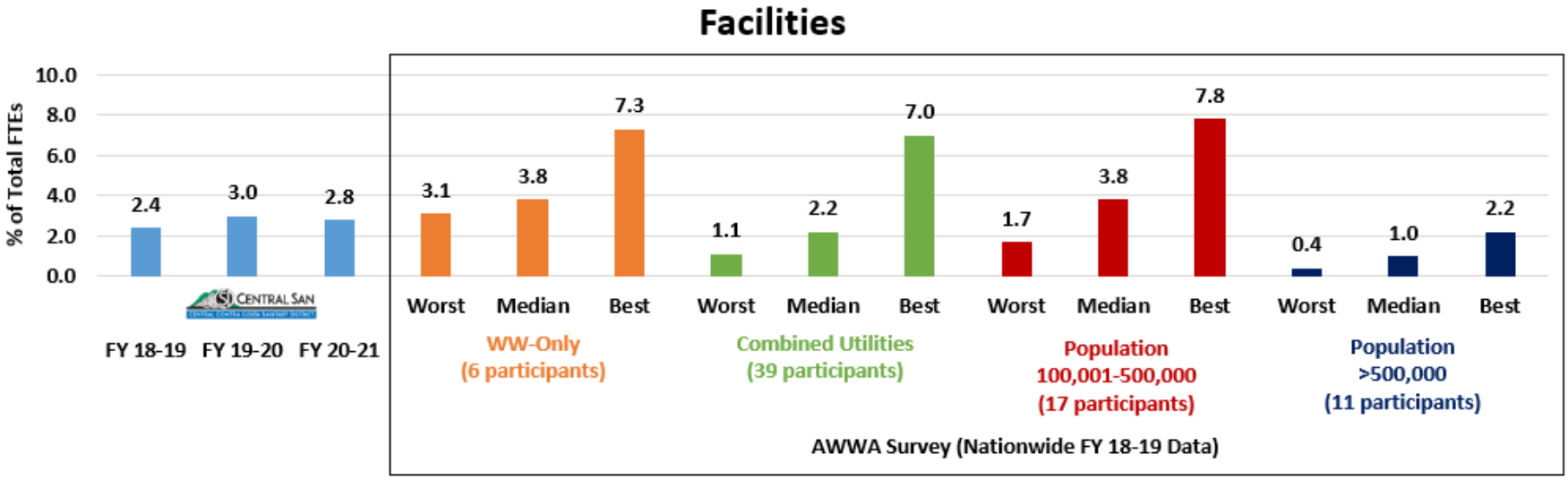

Finance
% of Total FTEs
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
4.0
3.8
3.6
FY 18-19
FY 19-20
FY 20-21
1.9
4.0
4.6
0.5
0.7
1.3
1.4
3.8
4.6
2.1
3.0
3.7
Worst
Median
Best
WW-Only
(11 participants)
Combined Utilities
(75 participants)
Population
100,001-500,000
(29 participants)
Population
>500,000
(16 participants)
AWWA Survey (Nationwide FY 19-20 Data)

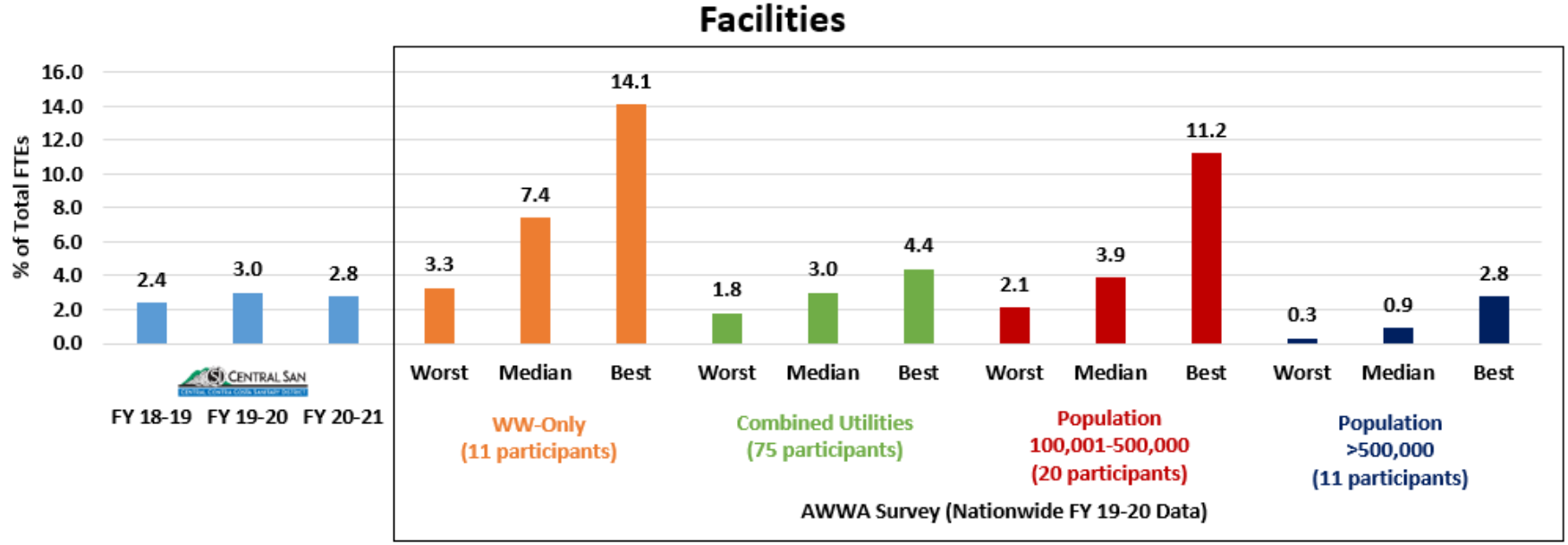

Human Resources
% of Total FTEs
3.0
2.5
2.0
1.5
1.0
0.5
0.0
2.6
2.5
2.8
FY 18-19
FY 19-20
FY 20-21
1.7
2.0
2.3
1.4
1.7
2.5
1.2
1.6
2.0
1.4
1.7
2.0
Worst
Median
Best
WW-Only
(6 participants)
Combined Utilities
(39 participants)
Population
100,001-500,000
(15 participants)
Population
>500,000
(13 participants)
AWWA Survey (Nationwide FY 18-19 Data)

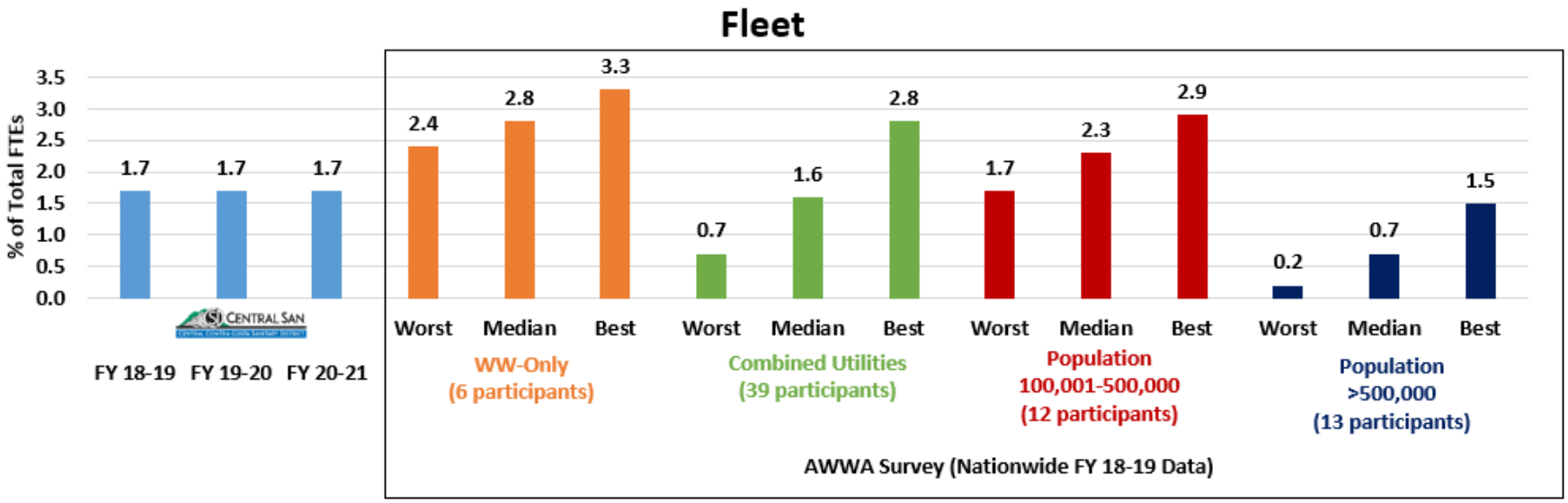

Human Resources
% of Total FTEs
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2.6
2.5
2.8
FY 18-19
FY 19-20
FY 20-21
1.7
2.2
2.7
2.2
3.6
5.1
1.0
1.7
2.0
1.6
2.1
2.2
Worst
Median
Best
WW-Only
(11 participants)
Combined Utilities
(75 participants)
Population
100,001-500,000
(20 participants)
Population
>500,000
(13 participants)
AWWA Survey (Nationwide FY 19-20 Data)

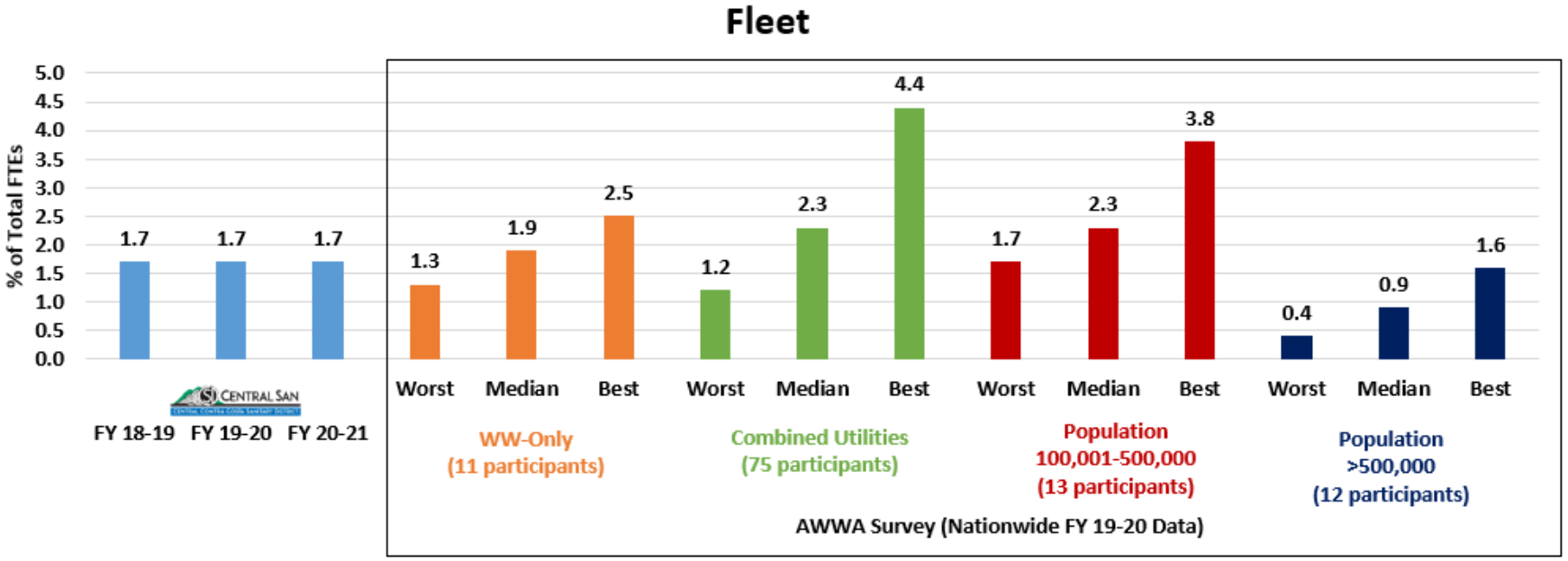

Information Technology
% of Total FTEs
6.0
5.0
4.0
3.0
2.0
1.0
0.0
4.3
4.3
4.3
FY 18-19
FY 19-20
FY 20-21
3.3
4.6
5.0
1.7
3.3
4.4
1.4
2.4
4.6
2.0
3.6
4.4
Worst
Median
Best
WW-Only
(6 participants)
Combined Utilities
(39 participants)
Population
100,001-500,000
(21 participants)
Population
>500,000
(16 participants)
AWWA Survey (Nationwide FY 18-19 Data)


Information Technology
% of Total FTEs
6.0
5.0
4.0
3.0
2.0
1.0
0.0
4.3
4.3
4.3
FY 18-19
FY 19-20
FY 20-21
4.2
4.3
5.6
0.8
1.8
2.2
1.5
2.3
4.4
2.1
3.8
4.4
Worst
Median
Best
WW-Only
(11 participants)
Combined Utilities
(75 participants)
Population
100,001-500,000
(26 participants)
Population
>500,000
(16 participants)
AWWA Survey (Nationwide FY 19-20 Data)

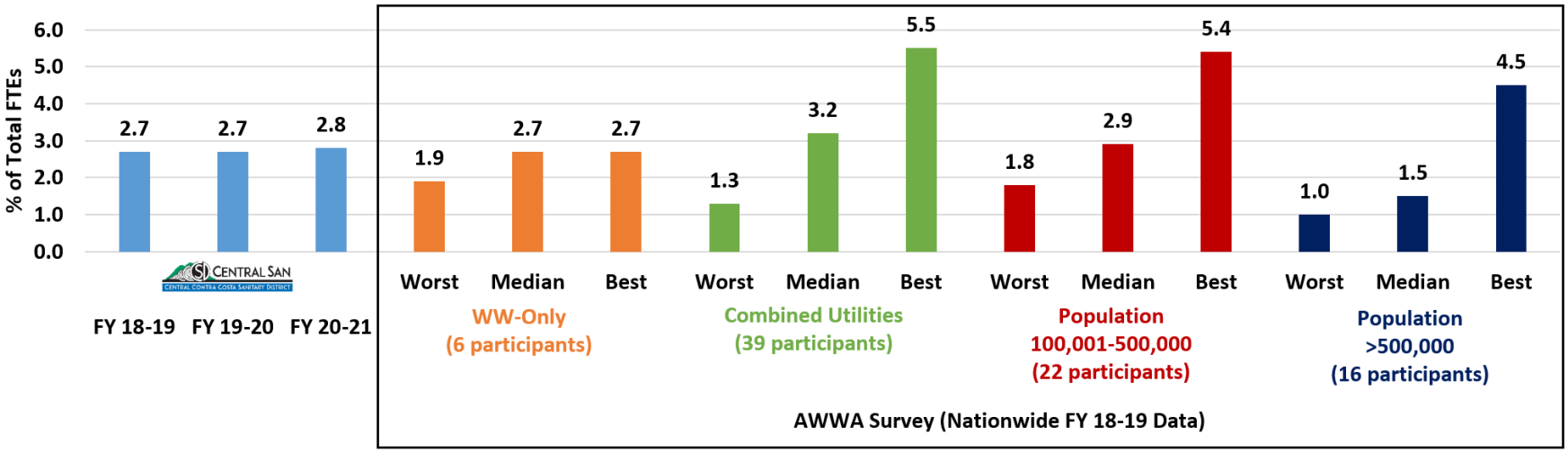

Facilities
% of Total FTEs
10.0
8.0
6.0
4.0
2.0
0.0
2.4
3.0
2.8
FY 18-19
FY 19-20
FY 20-21
3.1
3.8
7.3
1.1
2.2
7.0
1.7
3.8
7.8
0.4
1.0
2.2
Worst
Median
Best
WW-Only
(6 participants)
Combined Utilities
(39 participants)
Population
100,001-500,000
(17 participants)
Population
>500,000
(11 participants)
AWWA Survey (Nationwide FY 18-19 Data)


Facilities
% of Total FTEs
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
2.4
3.0
2.8
FY 18-19
FY 19-20
FY 20-21
3.3
7.4
14.1
1.8
3.0
4.4
2.1
3.9
11.2
0.3
0.9
2.8
Worst
Median
Best
WW-Only
(11 participants)
Combined Utilities
(75 participants)
Population
100,001-500,000
(20 participants)
Population
>500,000
(11 participants)
AWWA Survey (Nationwide FY 19-20 Data)

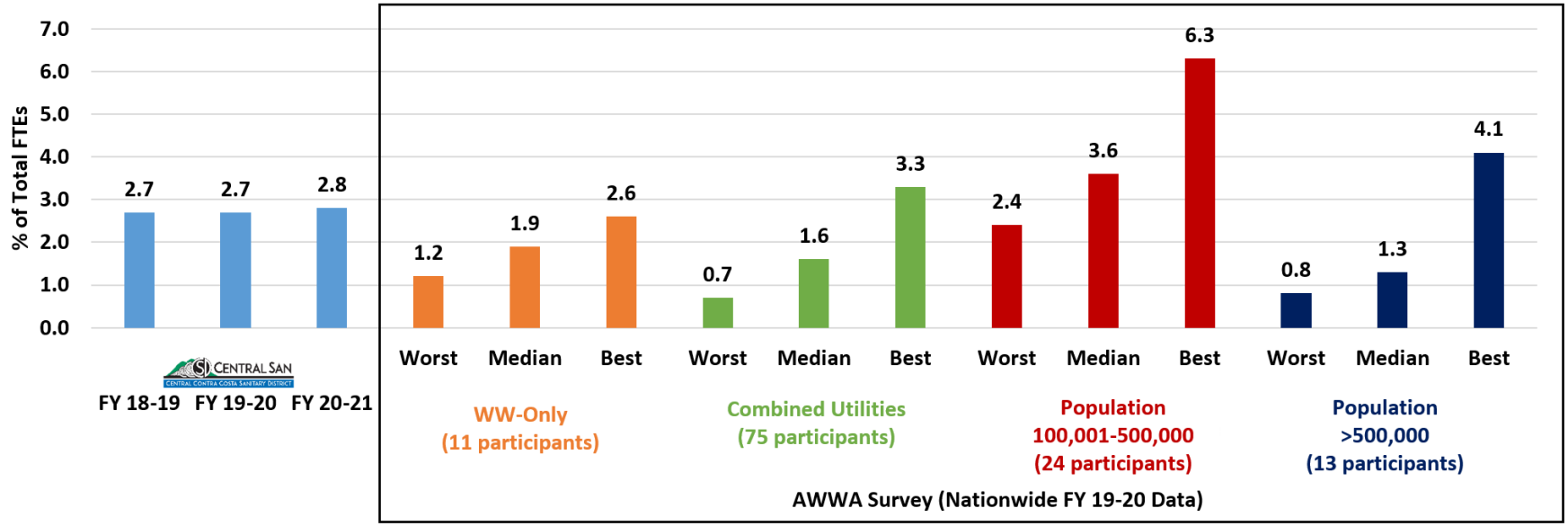

Fleet
% of Total FTEs
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1.7
1.7
1.7
FY 18-19
FY 19-20
FY 20-21
2.4
2.8
3.3
0.7
1.6
2.8
1.7
2.3
2.9
0.2
0.7
1.5
Worst
Median
Best
WW-Only
(6 participants)
Combined Utilities
(39 participants)
Population
100,001-500,000
(12 participants)
Population
>500,000
(13 participants)
AWWA Survey (Nationwide FY 18-19 Data)

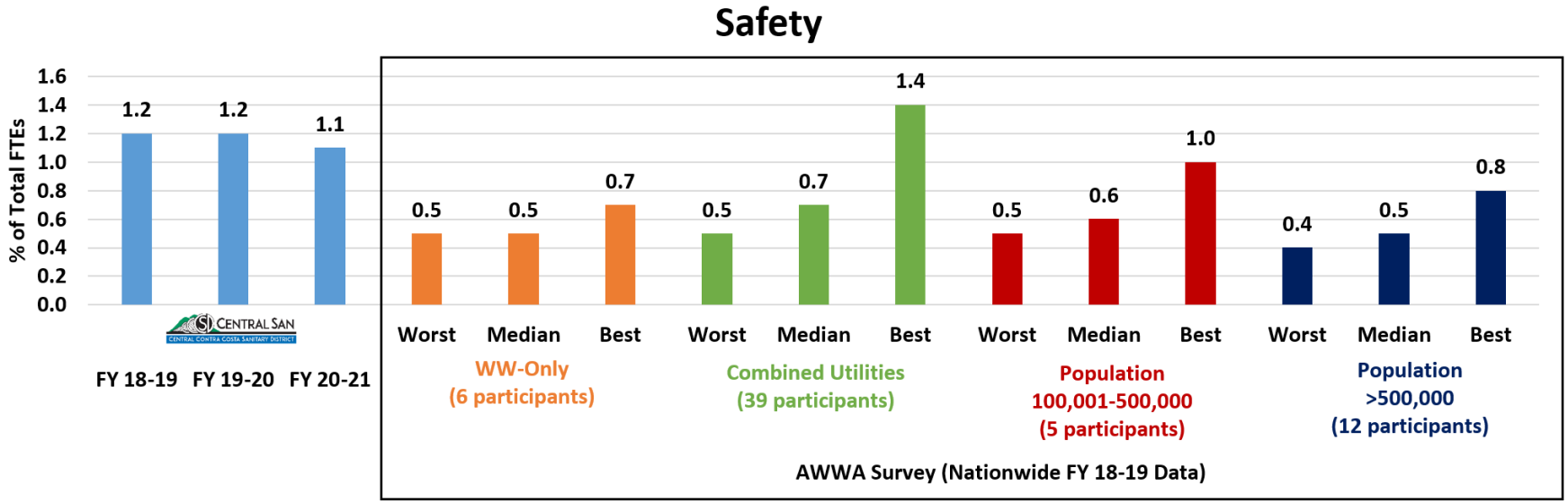

Fleet
% of Total FTEs
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1.7
1.7
1.7
FY 18-19
FY 19-20
FY 20-21
1.3
1.9
2.5
1.2
2.3
4.4
1.7
2.3
3.8
0.4
0.9
1.6
Worst
Median
Best
WW-Only
(11 participants)
Combined Utilities
(75 participants)
Population
100,001-500,000
(13 participants)
Population
>500,000
(12 participants)
AWWA Survey (Nationwide FY 19-20 Data)

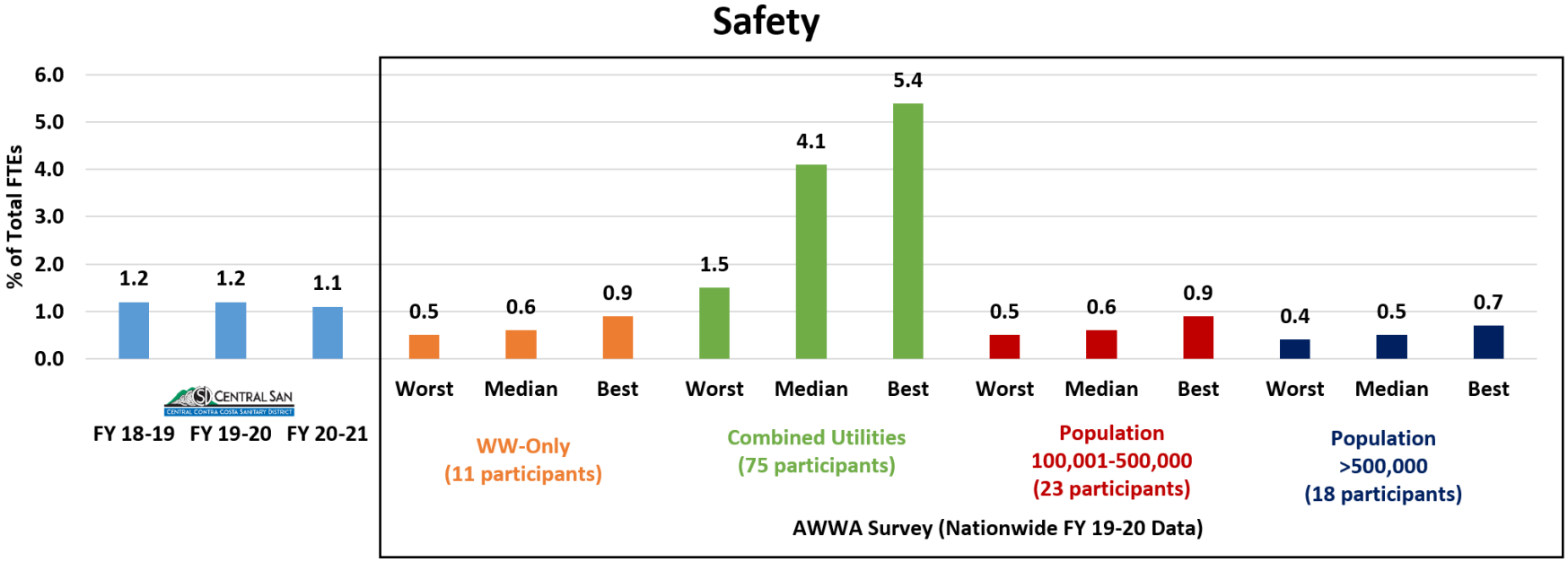
Legal / Administration

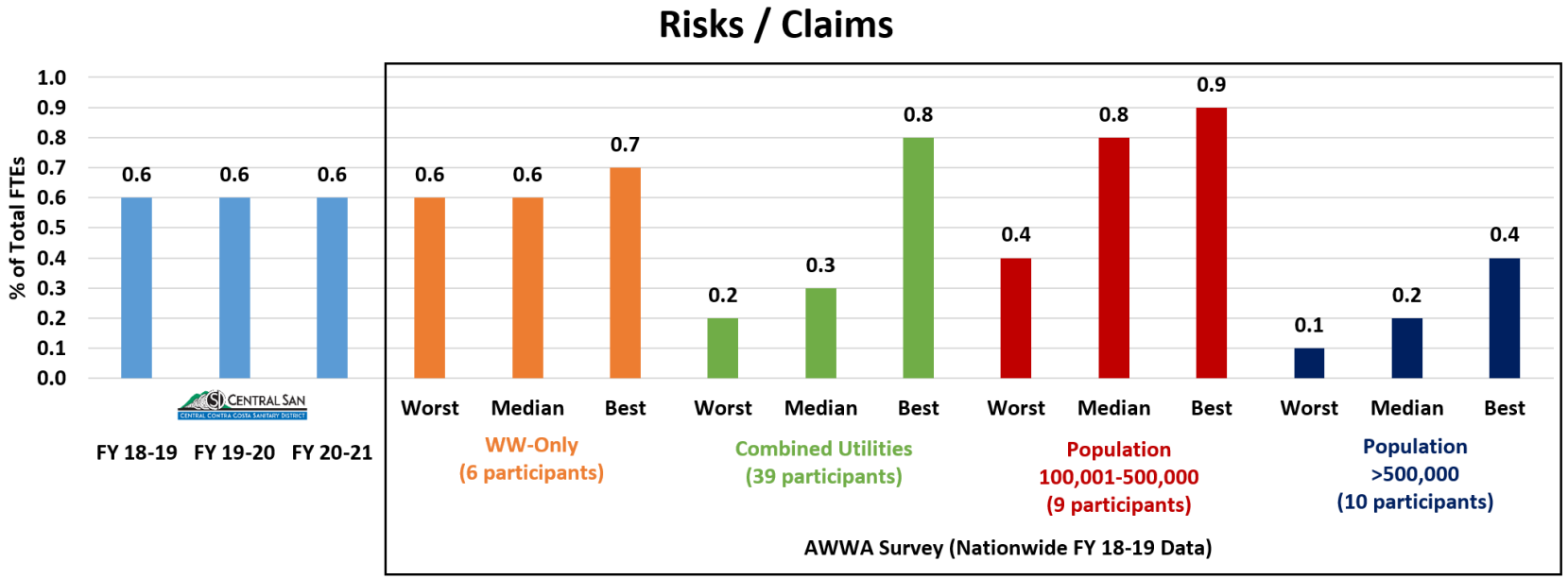


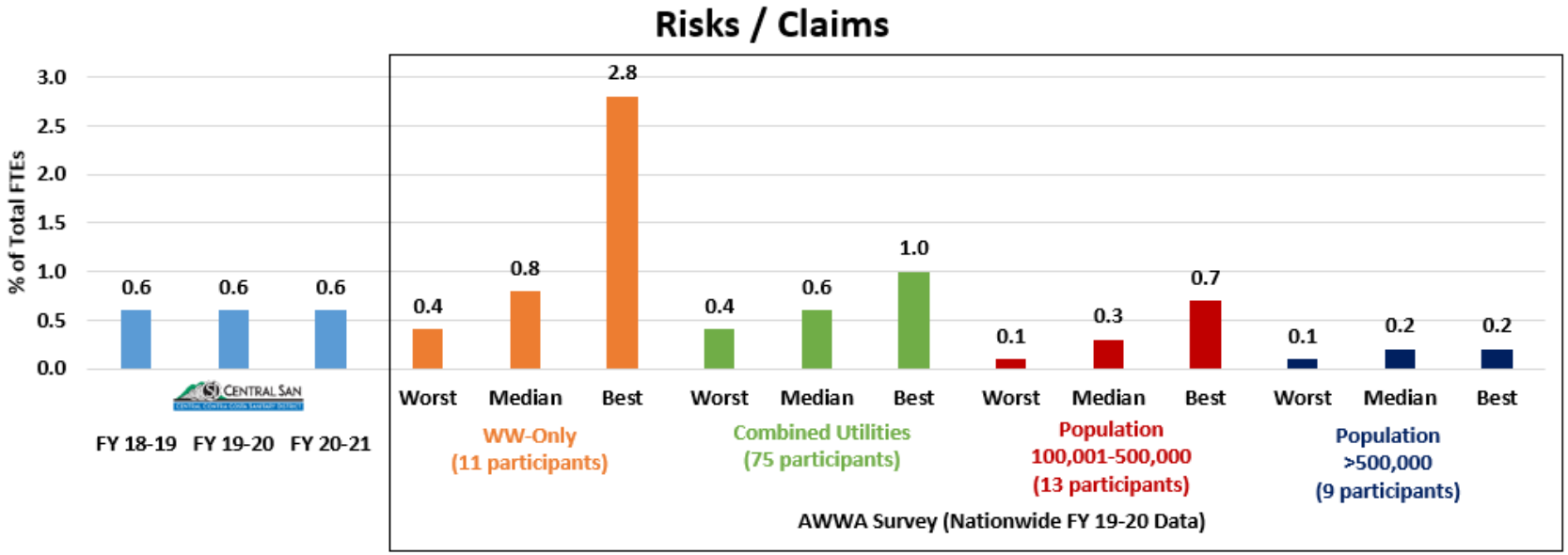
Legal / Administration

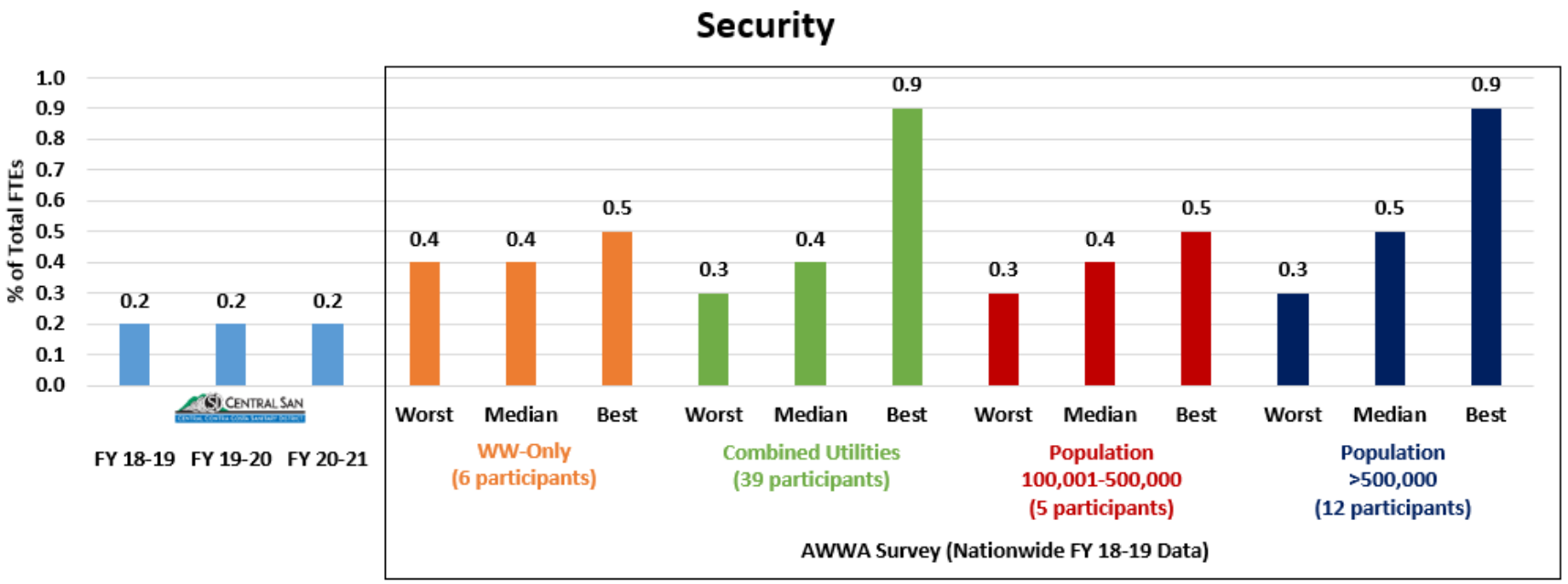


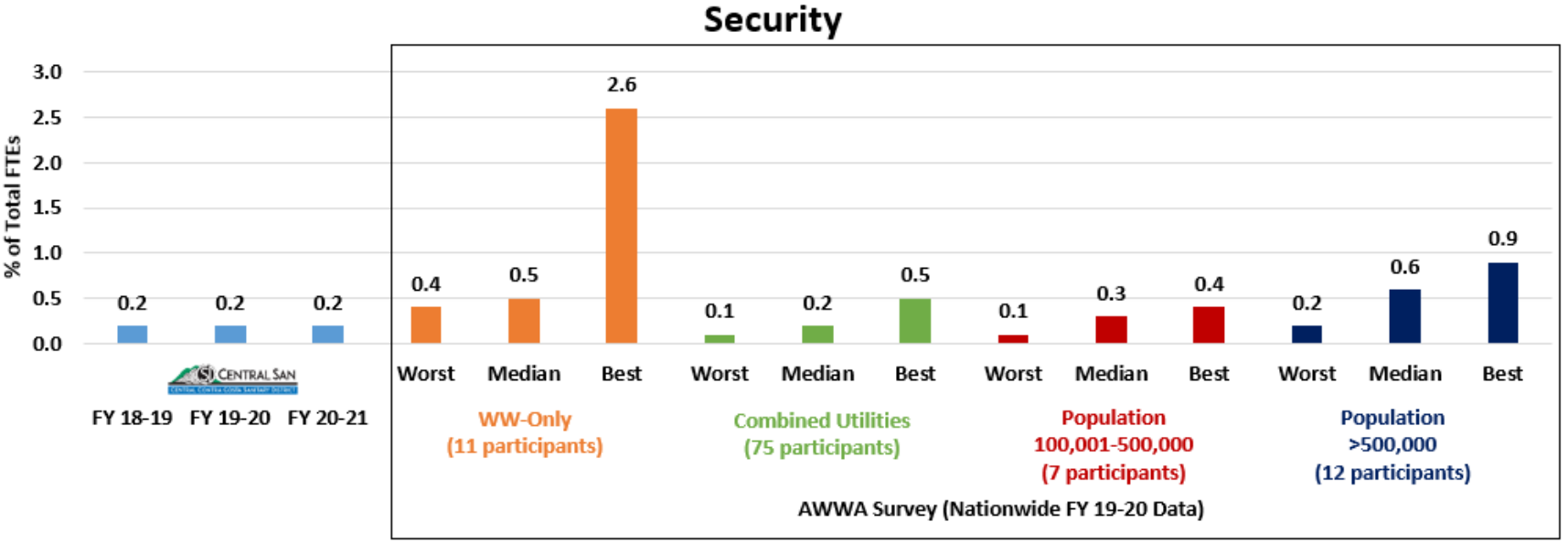

Safety
% of Total FTEs
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
1.2
1.2
1.1
FY 18-19
FY 19-20
FY 20-21
0.5
0.5
0.7
0.5
0.7
1.4
0.5
0.6
1.0
0.4
0.5
0.8
Worst
Median
Best
WW-Only
(6 participants)
Combined Utilities
(39 participants)
Population
100,001-500,000
(5 participants)
Population
>500,000
(12 participants)
AWWA Survey (Nationwide FY 18-19 Data)

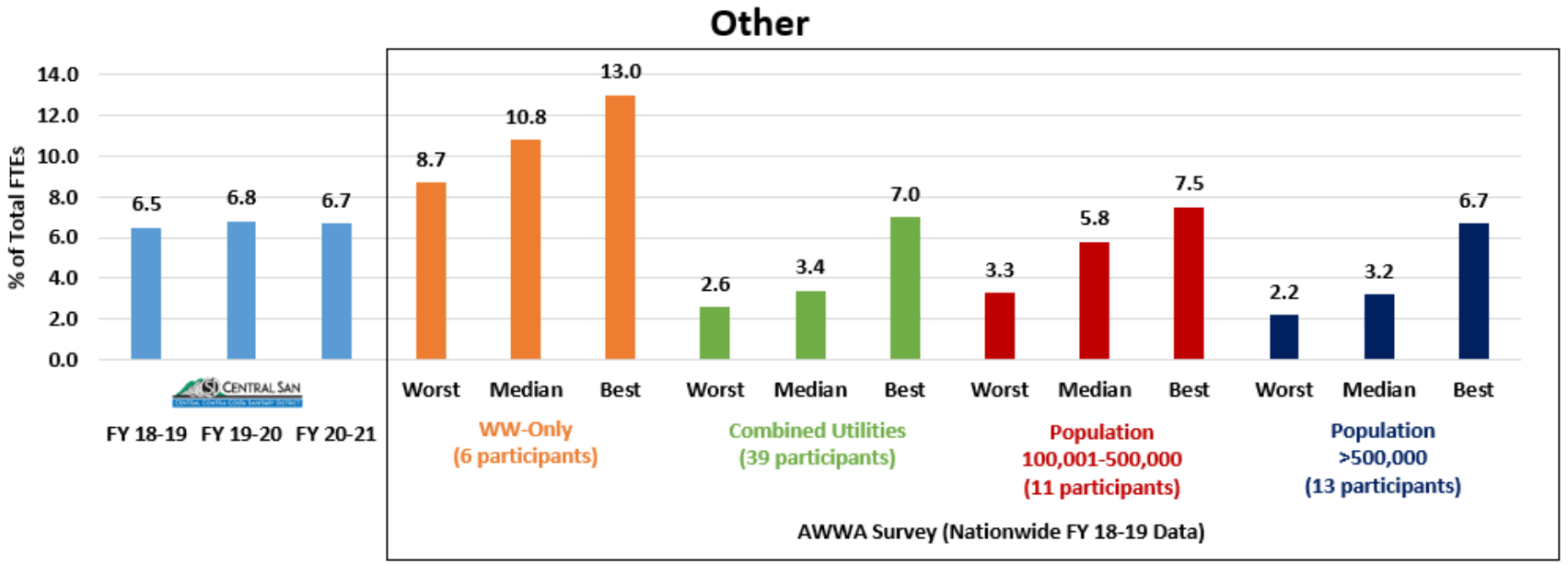

Safety
% of Total FTEs
6.0
5.0
4.0
3.0
2.0
1.0
0.0
1.2
1.2
1.1
FY 18-19
FY 19-20
FY 20-21
0.5
0.6
0.9
1.5
4.1
5.4
0.5
0.6
0.9
0.4
0.5
0.7
Worst
Median
Best
WW-Only
(11 participants)
Combined Utilities
(75 participants)
Population
100,001-500,000
(23 participants)
Population
>500,000
(18 participants)
AWWA Survey (Nationwide FY 19-20 Data)

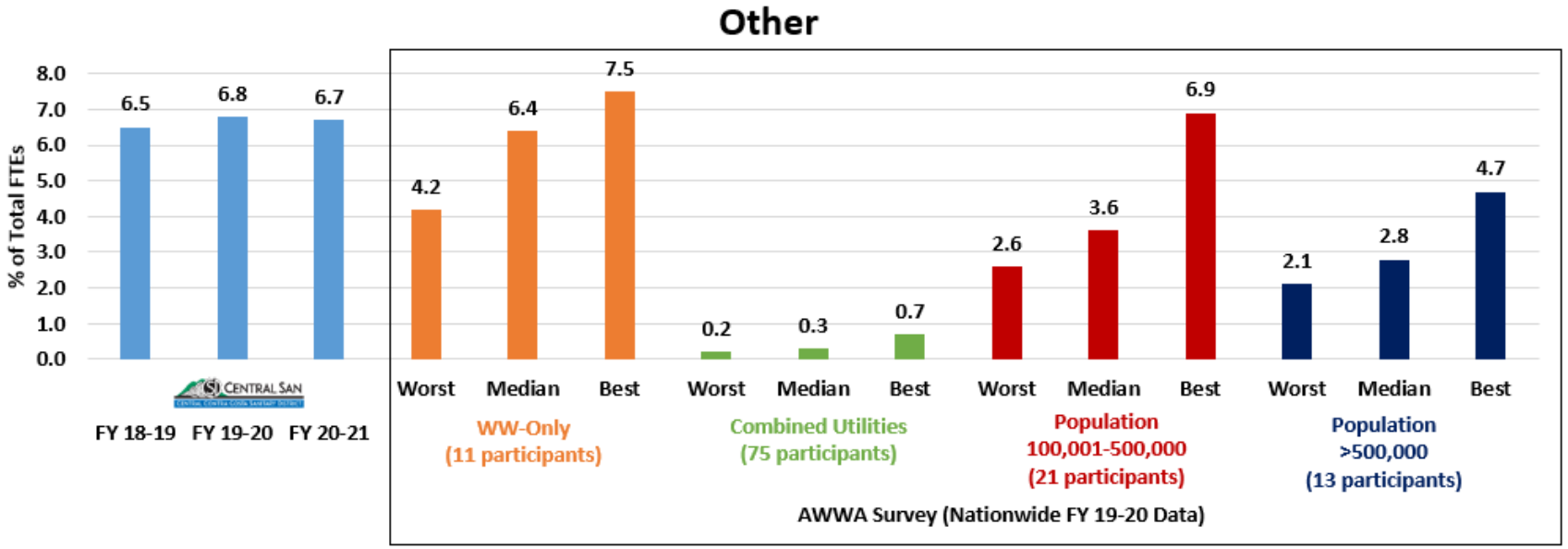

Risks / Claims
% of Total FTEs
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.6
0.6
0.6
FY 18-19
FY 19-20
FY 20-21
0.6
0.6
0.7
0.2
0.3
0.8
0.4
0.8
0.9
0.1
0.2
0.4
Worst
Median
Best
WW-Only
(6 participants)
Combined Utilities
(39 participants)
Population
100,001-500,000
(9 participants)
Population
>500,000
(10 participants)
AWWA Survey (Nationwide FY 18-19 Data)


Risks / Claims
% of Total FTEs
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.6
0.6
0.6
FY 18-19
FY 19-20
FY 20-21
0.4
0.8
2.8
0.4
0.6
1.0
0.1
0.3
0.7
0.1
0.2
0.2
Worst
Median
Best
WW-Only
(11 participants)
Combined Utilities
(75 participants)
Population
100,001-500,000
(13 participants)
Population
>500,000
(9 participants)
AWWA Survey (Nationwide FY 19-20 Data)


Security
% of Total FTEs
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.2
0.2
0.2
FY 18-19
FY 19-20
FY 20-21
0.4
0.4
0.5
0.3
0.4
0.9
0.3
0.4
0.5
0.3
0.5
0.9
Worst
Median
Best
WW-Only
(6 participants)
Combined Utilities
(39 participants)
Population
100,001-500,000
(5 participants)
Population
>500,000
(12 participants)
AWWA Survey (Nationwide FY 18-19 Data)


Security
% of Total FTEs
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.2
0.2
0.2
FY 18-19
FY 19-20
FY 20-21
0.4
0.5
2.6
0.1
0.2
0.5
0.1
0.3
0.4
0.2
0.6
0.9
Worst
Median
Best
WW-Only
(11 participants)
Combined Utilities
(75 participants)
Population
100,001-500,000
(7 participants)
Population
>500,000
(12 participants)
AWWA Survey (Nationwide FY 19-20 Data)


Other
% of Total FTEs
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
6.5
6.8
6.7
FY 18-19
FY 19-20
FY 20-21
8.7
10.8
13.0
2.6
3.4
7.0
3.3
5.8
7.5
2.2
3.2
6.7
Worst
Median
Best
WW-Only
(6 participants)
Combined Utilities
(39 participants)
Population
100,001-500,000
(11 participants)
Population
>500,000
(13 participants)
AWWA Survey (Nationwide FY 18-19 Data)


Other
% of Total FTEs
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
6.5
6.8
6.7
FY 18-19
FY 19-20
FY 20-21
4.2
6.4
7.5
0.2
0.3
0.7
2.6
3.6
6.9
2.1
2.8
4.7
Worst
Median
Best
WW-Only
(11 participants)
Combined Utilities
(75 participants)
Population
100,001-500,000
(21 participants)
Population
>500,000
(13 participants)
AWWA Survey (Nationwide FY 19-20 Data)

ACRONYMS AND ABBREVIATIONS

Acronym	Definition
AWWA	American Water Works Association
BTU	British Thermal Unit
CA	California
CCI	Construction Cost Index
CIWQS	California Integrated Water Quality System Project
CMMS	Computerized Maintenance Management System
CSO	Collection System Operations
EAP	Emergency Action Procedures
EUM	Effective Utility Management
FASB	Federal Accounting Standards Board
FTE	Full-Time Equivalent
FY	Fiscal Year
GASB	Governmental Accounting Standards Board
HCF	Hundred Cubic Feet
HHW	Household Hazardous Waste
HHWCF	Household Hazardous Waste Collection Facility
HR	Human Resources
ICI	Institutional, Commercial, and Industrial
IT	Information Technology
MCE	Marin Clean Energy
MGD	Million Gallons per Day
MHI	Median Household Income
O&M	Operations & Maintenance
PG&E	Pacific Gas and Electric
PRA	Public Records Act
R&R	Renewal and Replacement
RUE	Residential Unit Equivalent
S&P	Standard & Poor's
SSC	Sewer Service Charge
UAAL	Unfunded Actuarial Accrued Liability
U.S.	United States
WW	Wastewater