



# **WATER COST COMPARISON STUDY REPORT – 2016 ANALYSIS**

Mesa Water District

May 2018 - DRAFT



RAFTELIS





May 24, 2018

Mr. Paul Shoenberger, P.E.  
General Manager  
Mesa Water District  
1965 Placentia Avenue  
Costa Mesa, CA 92627

**Subject: Water Cost Comparison Study for 2016**

Dear Mr. Shoenberger,  
Raftelis Financial Consultants, Inc. (Raftelis) is pleased to provide this Mesa Water District Cost Comparisons - 2016 Analysis (Report), which summarizes key methods for measuring the operational efficiency of water districts.

It has been a pleasure working with you, and we wish to express our thanks to you and District staff for the support provided throughout the course of this study.

Sincerely,

***RAFTELIS FINANCIAL CONSULTANTS, INC.***

A handwritten signature in black ink, appearing to read 'Sanjay Gaur', written in a cursive style.

**Sanjay Gaur**  
Vice President

# ABBREVIATIONS

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CSO	California State Controller's Office
DF	Drought Factor
DOS	Days of Service
DWR	California Department of Water Resources
ETAF	Evapotranspiration Adjustment Factor
ETo	Evapotranspiration (inches of water)
ETWD	El Toro Water District
GPD	Gallons Per Day
hcf	Hundred cubic feet
IRWD	Irvine Ranch Water District
LA	Landscape Area (sqf)
LBCWD	Laguna Beach County Water District
Mesa Water	Mesa Water District
Met	Metropolitan Water District of Southern California
MNWD	Moulton Niguel Water District
MWDOC	Municipal Water District of Orange County
PPH	Persons Per Household
Raftelis	Raftelis Financial Consultants
SCWD	South Coast Water District
SMWD	Santa Margarita Water District
SWD	Serrano Water District
TCWD	Trabuco Canyon Water District
UWMP	Urban Water Management Plan
WY	Water Year
YLWD	Yorba Linda Water District

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# WATER COST COMPARISONS REPORT

## 1. Introduction

Mesa Water District (Mesa Water) commissioned Raftelis Financial Consultants (Raftelis) to develop a water cost comparison analysis to identify a methodology for measuring the operational efficiency of water districts. The Water Cost Comparison Report – 2016 Analysis (Report) is an update to the original 2009 analysis written in 2011. This is the eighth consecutive year Raftelis has performed this study for the District.

The Report utilizes data from the California State Controller’s Office (CSO) for Special Districts Water Enterprise - Revenues, Expenses and Changes in Fund Equity database and Special Districts Long-Term Debt database. The population data by water district is available from the Municipal Water District of Orange County (MWDOC) Water Rates & Financial Information reports and from the latest Urban Water Management Plans (UWMP) by water district. The report uses the California-Nevada Water Rate Survey, and in addition, Raftelis performed a rate survey among the agencies included in the survey to provide a basis for water rate comparison. This Report summarizes background information regarding water rates and identifies parameters for measuring the efficiency of water districts.

In order to better measure the operational efficiency of water districts we amended the 2009 Report methodology by subtracting pass-through/resale and similar expenses from total expenditures. Since the CSO database does not include a specific line item for expenses related to these types of water sales we assume the revenue from resales and other sales are a proxy for pass-through/resale expenses. This change is applied to all of the water districts included in the survey. Another amendment in the methodology is the exclusion of the defeased debt from the annual long-term debt service of the agencies included in the survey. Since these high payments result from financial policy decisions instead of changes in efficiency of the agencies, they are excluded in the survey.

## 2. Trends in Water Rates in California

Throughout California, water rates have increased significantly in the past several years. Below are some of the factors which affect rate trends and are likely contributors to the rate increases:

- » *Growing Infrastructure Needs:* Previously a significant portion of infrastructure was funded through Capacity Fees/Connection Charges for growth, grants and/or general taxes; presently, there is a greater move towards using rates to meet these costs. In addition, it is likely that such repair and replacement will be more expensive than developing comparable new infrastructure in underdeveloped areas. Such a factor is a major driver of rate increases as repair and replacement becomes necessary.
- » *State of Water:* Water year (WY) 2016 (October 1, 2015 – September 30, 2016). Although the impact of El Nino was significantly smaller than expected, water year 2016 represented an improvement compared to the previous four years of drought conditions. Air temperatures averaged lower than the record setting 2015 water year, but they were still well above the long-term average and the long-term data implies a continuing warming trend. According to the California Hydroclimate Report, statewide

snowpack in water year 2016 was 15 percent below the average. Also, the precipitation was at its average level for much of the Central Valley and northeastern part of the State, while the southeast experienced below average levels. However, the precipitation was enough to offset some of the large deficits in water storage reservoirs and the State Water Resources Control Board removed the mandatory 25 percent average cutback. In May 2016, the Department of Water Resources (DWR) announced the primary state reservoirs would increase their project deliveries to 60%. The prolonged drought and mandatory water conservation measures are expected to continue to have an impact on water demand. The main causes include increased consumer awareness as well as some permanent amendments to decrease water consumption through land cover change, turf removal, and smarter household irrigation. Although some amount of rebound was expected, water demand did not reach pre-drought levels (2013) in 2016.

- » *Increasing Regulatory Stringency:* As the ability to measure water quality and technology for treating water improves, more stringent regulations will invariably follow. The need for utilities to spend greater resources to meet regulations will play a factor in driving rates higher.
- » *Decreasing per Capita Consumption:* Decreased per capita consumption is likely to be driven by the use of higher water efficiency technology. In addition, persistent conservation messages have been internalized by customers and more widely accepted due to strong public outreach, which contributes to decreasing per capita consumption as well.

Factors that could push toward lower water rates are mostly related to technological improvements especially in the field of water and wastewater treatment as well as more effective management which optimizes the operation process and improves efficiency of the water utility.

Based upon the 2015 California-Nevada Water Rate Survey, water rates in the Southern California region increased from an average of \$58.29 in 2013 to \$62.39 in 2015 per month, an increase of approximately 7%. Water rates in the other California regions experienced varying degrees of rate increases: in the Northern Region, it was about 10% and the Central Coast region it was about 6%.

### **3. Water Rates Comparison for Counties within California**

The California-Nevada Water Rate Survey provides a comparison of average county water rates for 42 different counties within California. The CA-NV Rate Survey is conducted every other year, with the most recent one being conducted in 2015. Of the 42 counties compared, Orange County has the 19th lowest average water rate<sup>1</sup> (the survey assumes an average monthly usage of 15 hundred cubic feet (hcf) – equivalent to 11,220 gallons – when determining average variable costs). The survey suggests that Orange County is able to maintain lower water rates relative to other counties throughout California. The water rate comparisons can be seen in *Figure 3-1* on the following page.

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<sup>1</sup> The conclusions based on the results from the biennial California-Nevada Rate Survey should be done after carefully considering limitations of the survey. Rates may be influenced by variety of factors including demography, climate, subsidies, taxes and grants. Hence, the rates do not necessarily reflect the true cost of service and the efficiency of the utilities. In addition, the results may be affected by the response rate within the different counties as well.

**Figure 3-1 Average Monthly Water Rates Comparison in 2015**

**Average Monthly Water Charges Comparison by Counties - 2015**



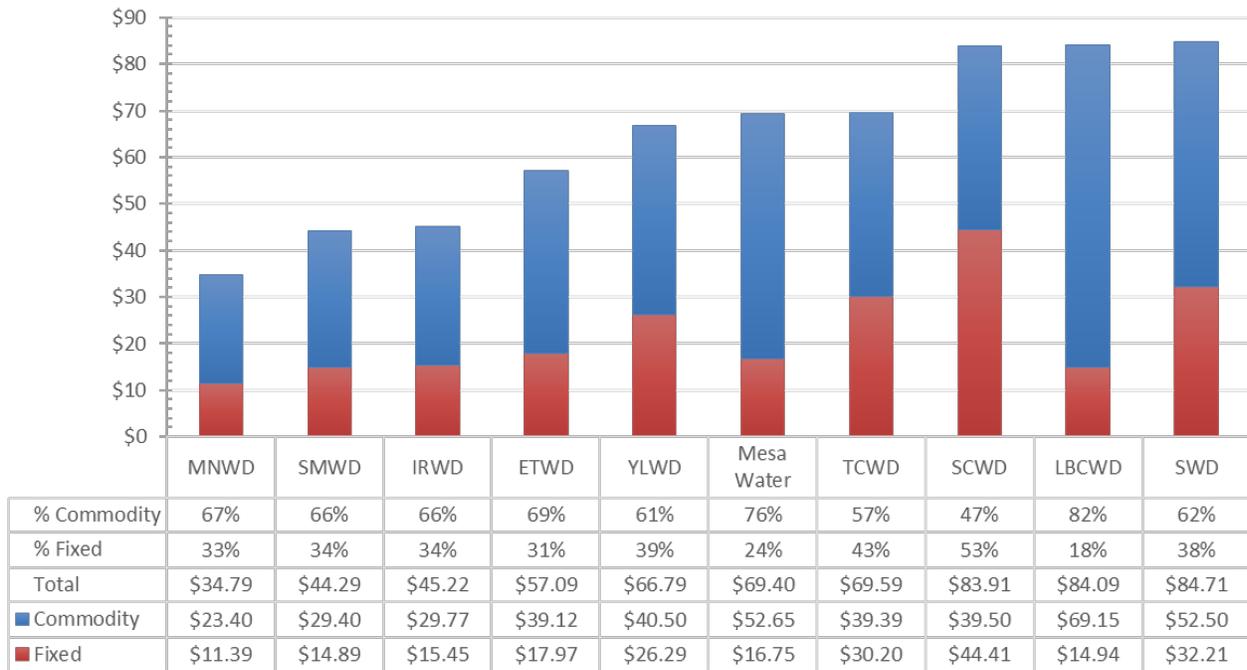
Source: 2015 California-Nevada Water Rate Survey

## 4. Water Rates as a Measure of Operational Efficiency

One approach to measure the operational efficiency of different water utilities is to compare water rates amongst agencies. *Figure 4-1* compares water rates between water districts within the Municipal Water District of Orange County (MWDOC) service area. Raftelis conducted a thorough rate survey to collect the effective rates in FY 2016 and estimate the bill for each water utility included in the present cost comparison survey. The representative charges assume a single family residential customer using a ¾" meter and an average monthly usage of 15 hcf per month. Of the surveyed agencies, three had uniform water rates, five had water budgets and the remaining two charged water consumption based on inclining block rates. Details on the effective dates and the assumptions underlying the water budgets by utility are presented in the appendix.

**Figure 4-1 Raftelis Water Rate Survey 2016**

**Sample Water Rates - ¾" SFR Customer 15 hcf Usage  
2016**

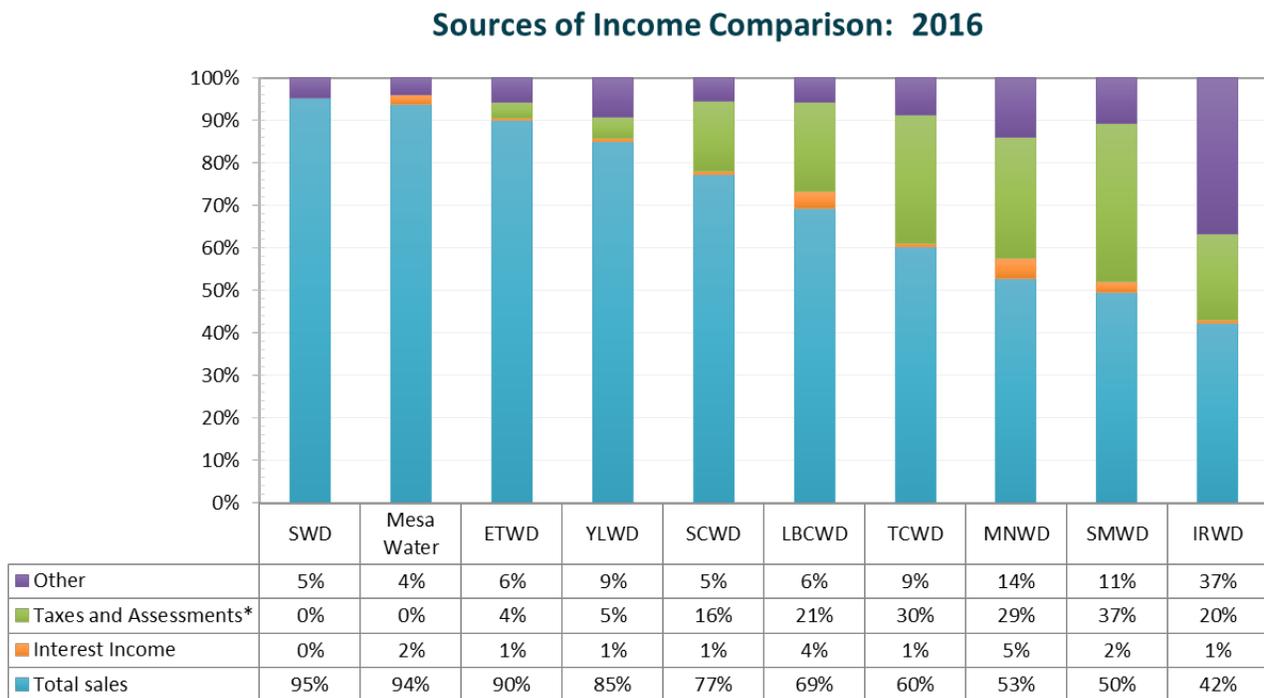


Source: Raftelis Rates Survey 2016

The challenge in using water rates as a measure of efficiency is that a wide range of factors have a significant effect on rates. These factors could include but are not limited to: size of the agency, geographic location, overall demand, customer constituency, level of treatment, additional funding (via grants or general fund subsidization), age of system, differences in water sources, and rate-setting methodology. For instance, many agencies have different sources of supply, such as groundwater, which possibly offsets an agency's total water costs from imported water and thus affects their water rates. From *Figure 4-1* above, we see that Moulton Niguel (MNWD), Santa Margarita (SMWD) and Irvine Ranch (IRWD), offer the lowest total water rates, whereas Serrano (SWD), Laguna Beach County (LBCWD), and South Coast (SCWD) offer the highest total water rates.

One of the challenges in comparing water rates in Orange County is that many agencies receive funding from non-rate revenue sources (such as property tax), which offsets the cost of delivering water and thus affects water rates. *Figure 4-2* provides a breakdown of various revenues generated by each MWDOC water district through rates, investment income, property taxes, and other revenues. The three agencies that collect the highest percentage of revenue from rates are Serrano (SWD), Mesa Water and El Toro (ETWD) with 95%, 94%, and 90% revenue from rates respectively. The three agencies that collect the lowest percentage of revenue from rates are Moulton Niguel (MNWD), Santa Margarita (SMWD) and Irvine Ranch (IRWD) with 53%, 50% and 42% respectively.

**Figure 4-2 Comparison of Revenue Sources for Water Districts in the MWDOC Service Area**



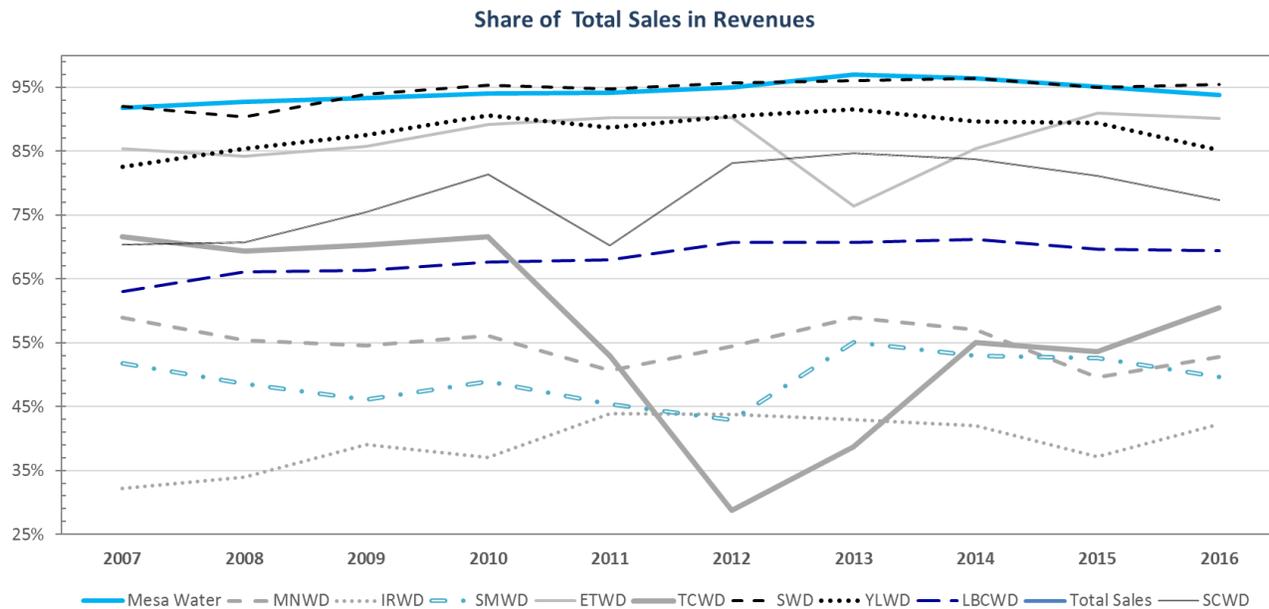
*Data Source: California State Controller's Office, Special Districts Water Enterprise – Revenues, Expenses and Changes in Fund Equity Database*

Trabuco Canyon (TCWD), Moulton Niguel (MNWD) and Santa Margarita (SMWD) are able to offset a significant portion of revenues through property taxes (30%, 29% and 37%, respectively). Because of property tax revenue, these agencies are less dependent on water rates as a source of revenue; thus, agencies with supplemental property tax revenue can maintain lower rates than agencies which are more heavily dependent on rates as a source of revenue, such as Mesa Water, which is almost entirely dependent on rates for its revenues. From the information above, we conclude that the percentage of total revenues recovered through water rates has a significant impact on increasing or decreasing total rates within MWDOC agencies; to say that more efficient utilities have lower water rates would neglect this consideration.

The structure of revenues over a long period of time suggests that property tax revenues provide some financial comfort to water agencies allowing them to keep lower rates. The 10-year graph below (*Figure 4-3*) shows that rate revenues as percent of total revenues remained roughly unchanged, with the exception of

Trabuco Canyon (TCWD). In TCWD, special assessment revenues were generated in 2012-2014<sup>2</sup> and in 2015 the property assessment revenues were increased. This implies that TCWD will likely retain a relatively low share of rate revenues. In Mesa Water District, water rate revenues have remained the single largest source of income throughout the period, while Irvine Ranch (IRWD) continues to rely heavily on property tax and assessment revenues.

**Figure 4-3 Share of Rate Revenues in Total Revenues**



Data Source: California State Controller's Office, Special Districts Water Enterprise – Revenues, Expenses and Changes in Fund Equity Database

## 5. Total Expenditures per Capita as a Measure of Operational Efficiency

An alternative to using rates to measure the operational efficiency of a district is to consider the Total Expenditures per Capita. Although using Total Expenditures per Capita shares many of the same challenges present when using water rates (such as size of the agency, geographic location, sources of supply), using this metric allows us to avoid the significant difficulties presented through non-rate revenues, and thus is a viable methodology for measuring operational efficiency.

## 6. Water Cost Comparisons Results

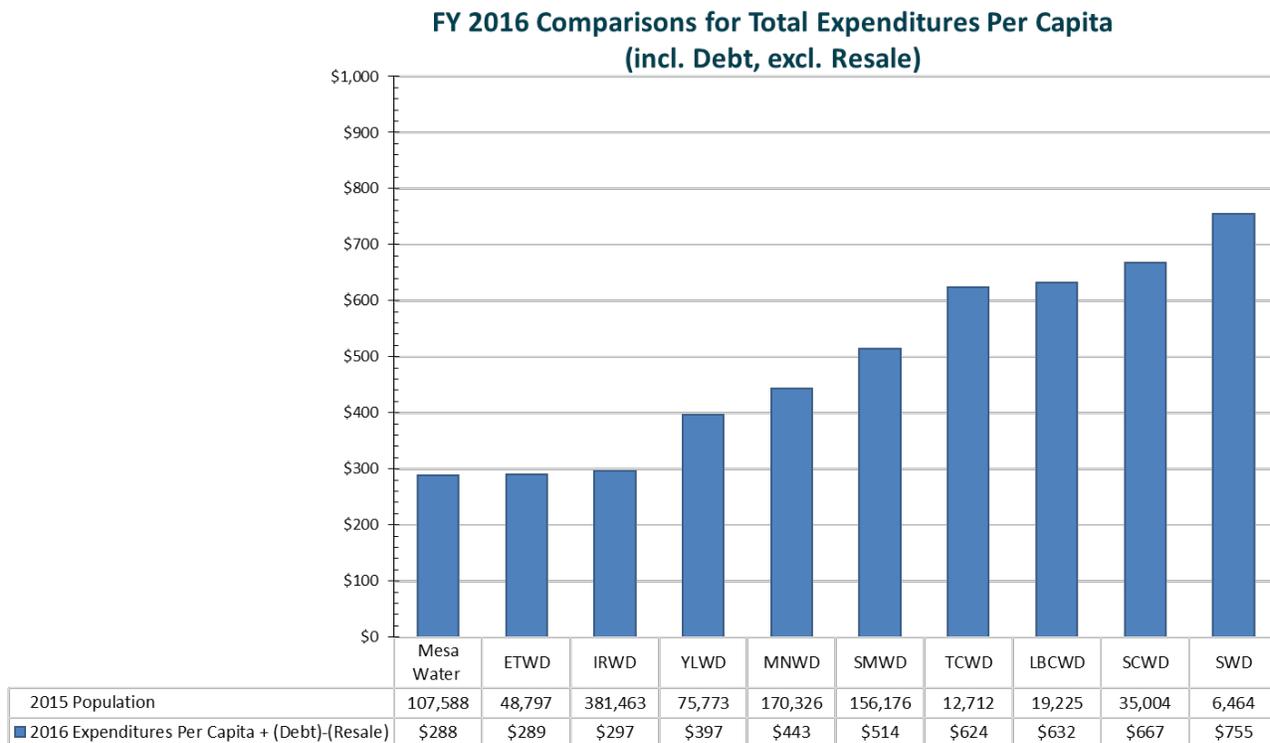
Figure 6-1 compares total expenditures per capita for several water districts within MWDOC. Total expenditure levels were collected using data<sup>3</sup> from the California State Controller's Office, Special Districts Water

<sup>2</sup> Those are revenues for payments of bonds related to Mello-Roose and Mark-Roose bond acts

<sup>3</sup> In order to eliminate the expenses which are not directly related to providing water to the district's population, total expenditure levels are reduced by expenses related to pass-through and similar water sales. Since the database does not include those type of expenses we used revenue from "Sales for Resale" and revenue from "All Other Sales".

Enterprise – Revenues, Expenses and Change in Fund Equity Database and long-term principal debt payments<sup>4</sup> come from Special Districts Long-term Debt Database.

**Figure 6-1 Comparison of Total Expenditures per Capita for Water Districts in the MWDOC Service Area**



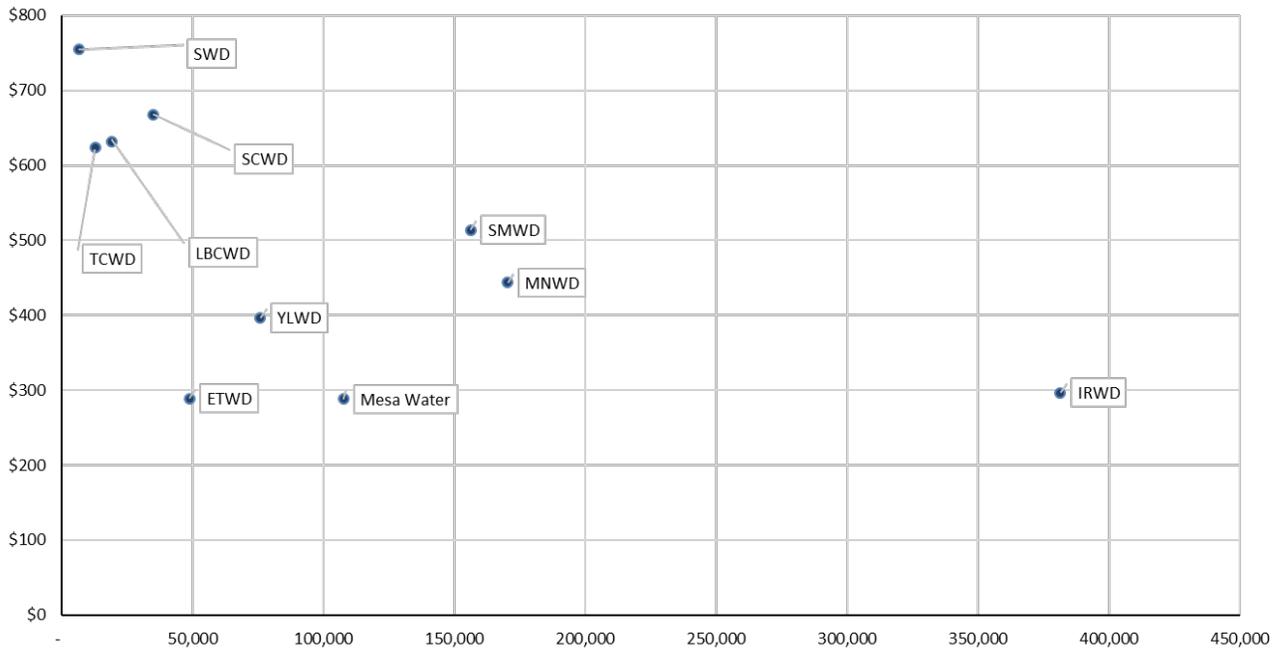
Data Sources: California State Controller’s Office, Special Districts Water Enterprise – Long-Term Debt Database  
 California State Controller’s Office, Special Districts Water Enterprise – Revenues, Expenses and Changes in Fund Database  
 Special District Population Data – Raftelis’ Population Survey

From *Figure 6-1* we conclude that population size has a significant influence on total expenditures per capita for each water district. We used the latest available population data (2015) by water district. IRWD has the largest population of all the MWDOC agencies included in the survey (381,463) and is able to provide some of the lowest total expenditures per capita. Further, Serrano (SWD) and Trabuco Canyon (TCWD) have the smallest population size (6,464 and 12,712) and consequently have relatively high total expenditure per capita. *Figure 6-1* shows that, from a cost per capita basis, Mesa Water is able to provide the most cost-efficient water service among the water districts included in the survey. From the results, it is possible to conclude that larger agencies, including Mesa Water, benefit from economies of scale and thus provide more efficient service, and as a result are able to drive down their total expenditures per capita. These conclusions are borne out by the data in *Figure 6-2* on the following page. There is a clear trend in agencies with lower population sizes of having higher expenditures per capita.

<sup>4</sup> Defeased debt is not included in the long-term principal debt payments.

**Figure 6-2 Comparison of Total Expenditures per Capita for Water Districts in the MWDOC Service Area**

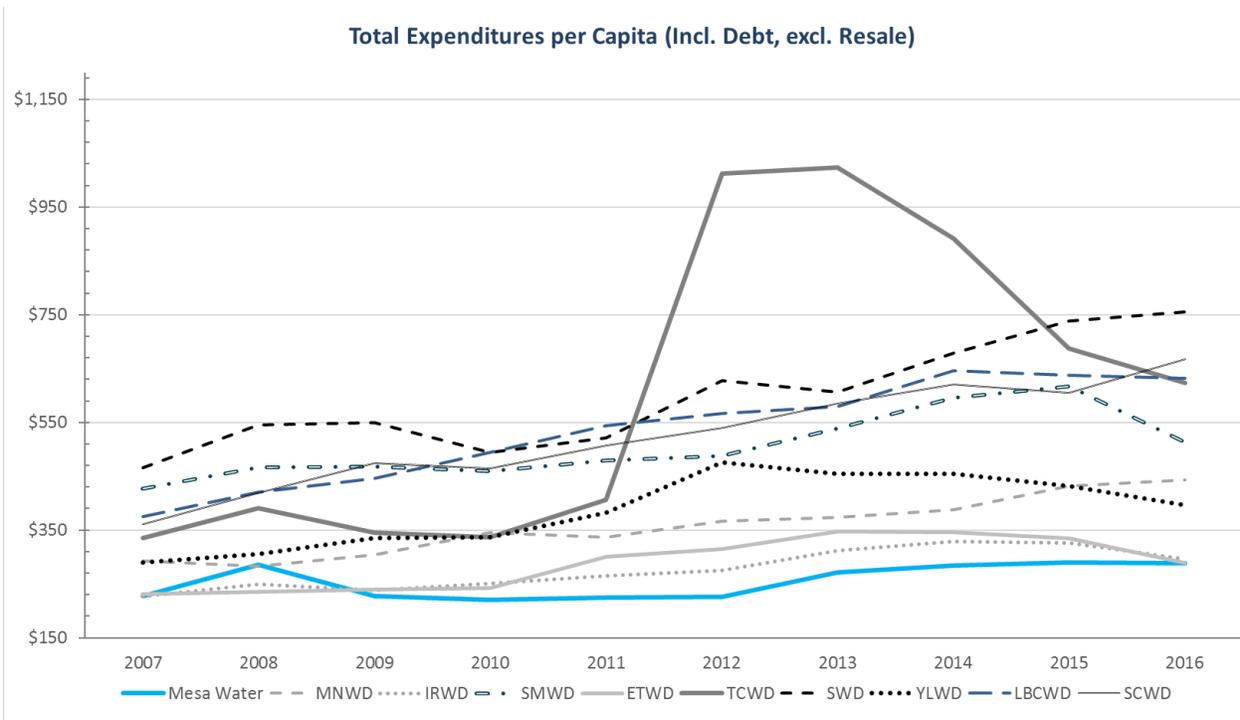
**Comparisons for Total Expenditures Per Capita (Includes Debt, excl. Resales)  
2016**



Data Sources: California State Controller's Office, Special Districts Water Enterprise – Long-Term Debt Database  
 California State Controller's Office, Special Districts Water Enterprise – Revenues, Expenses and Changes in Fund Database  
 Special District Population Data – Raftelis' Population Survey

Information on expenditures over a ten-year period is indicative of the efforts made by the water agencies to keep their expenses low (figure 6-3). The jump in the TCWD series is due to principal debt payments in 2012-2014. Mesa Water has retained its position among the agencies with the lowest expenses per capita throughout the survey period. The ten-year cumulative increase of this indicator for Mesa Water is only 27%, among the lowest in the group. SMWD and ETWD have lower cumulative increase of 21% and 25% respectively and the average cumulative increase for all water districts included in the analysis was 49% over the period. The highest increases of 86% and 85% were registered for TCWD and SCWD, respectively. SWD, which has the highest expenses per capita, registered a 10-year increase of 62%.

**Figure 6-3 Total Expenditure per Capita 2007 - 2016**



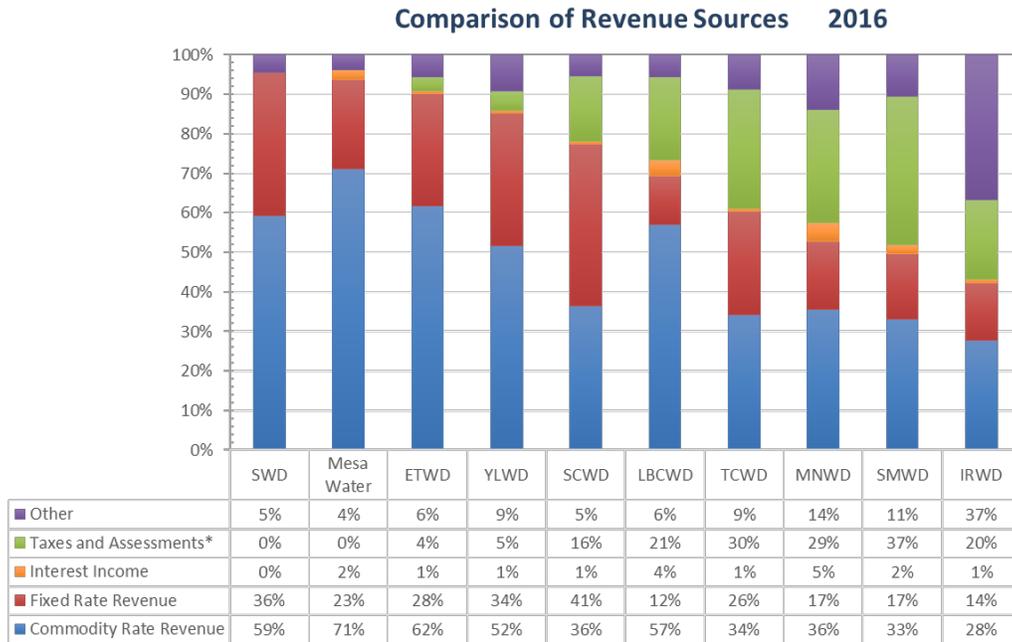
Data Sources: California State Controller's Office, Special Districts Water Enterprise – Long-Term Debt Database  
 California State Controller's Office, Special Districts Water Enterprise – Revenues, Expenses and Changes in Fund Database  
 Special District Population Data – MWDOC Population from Orange County Water Suppliers - Water Rates & Financial Information and Raftelis' Population Survey

## 7. Value of Water and Water Conservation

The need to educate customers regarding the value of water and to promote water conservation in Southern California is critical. Climatologists predict that Southern California will face more frequent and intense cyclical drought conditions. Given such challenges, water agencies must educate customers on the value of water to promote greater conservation. One simple and proven way to achieve this is by collecting a significant portion of total revenue from commodity rates. A higher percentage of revenue from commodity rates is more likely to motivate customers to educate themselves on the cost of pumping, treating, and delivering water while promoting reduced water use.

The California State Controller's Office (CSO) – Revenues, Expenses and Changes in Fund Equity database provides operating and non-operating revenues and expenses. *Figure 4-1* includes a percentage breakdown of the total sample water bill into its fixed and commodity components. By taking these fixed and commodity component percentages and multiplying them by the percentage of revenues generated by rates given in *Figure 4-2*, it is possible to obtain an estimate for the percentage of total water district revenues generated from fixed and commodity components of their rates. Such an estimate is based on the assumption that the majority of rates for each water district are collected from SFR customers with ¾" meters, with a monthly usage of 15 hcf (which tends to hold true for most water districts). The estimated results are shown in *Figure 7-1* below.

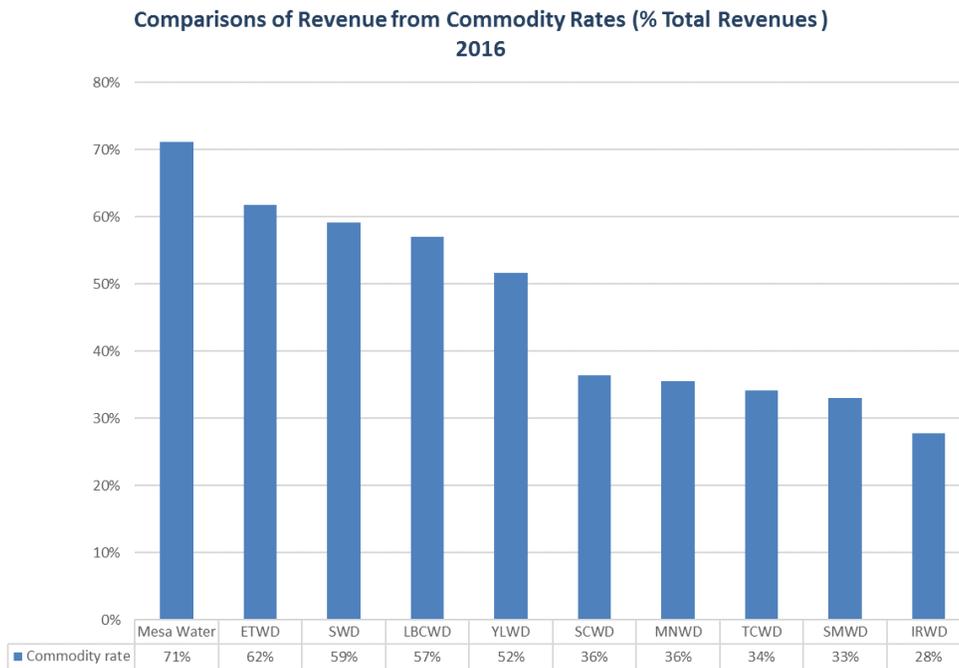
**Figure 7-1 Comparison of Revenue Sources for Water Districts in the MWDOC Service Area (Includes Separation of Rates into Fixed and Commodity Components)**



Data Sources: California State Controller’s Office, Special Districts Water Enterprise – Revenue, Expenses and Changes in Fund Equity Database For Rate Structure – Raftelis rate survey 2016

Figure 7-2 takes only the commodity revenue portion (blue bars in Figure 7-1 above) and shows it separately, ranked from greatest to least.

**Figure 7-2 Comparison of Revenue from Commodity Rates, as a Percentage of Total Revenues**



Data Sources: California State Controller’s Office, Special Districts Water Enterprise – Revenues, Expenses and Changes in Fund Equity Database For Rate Structure – MWDOC Survey, discontinued in 2013

Agencies such as Moulton Niguel (MNWD), Trabuco Canyon (TCWD), Santa Margarita (SMWD) and Irvine Ranch (IRWD) are able to collect only a small portion of total revenues through commodity rates (only 36%, 34%, 33 and 28% of total revenues generated through commodity rates, respectively) due to the fact they collect a significant portion of revenues through fixed charges, property tax, and other revenue. Such agencies will continue to receive these sources of revenue irrespective of demand and thus maintain greater revenue stability; however, the commodity rates for these agencies are less likely to educate customers about the value of water and less likely to promote water conservation.

On the other hand, agencies such as Mesa Water and El Toro (ETWD) are highly dependent on commodity rates for revenue (71% and 62% of total revenue generated through commodity rates, respectively). While these agencies are exposed to greater fluctuations in revenue due to the fact that commodity rates are directly dependent on water sales, these agencies are also achieving the goal of promoting the value of water and conservation. These rate structures, which are highly dependent on commodity rates for total revenues, send a strong *price signal* to their customers about the value of water.

## **8. Limitations of the Study**

A key limitation of the study is that the conclusions drawn in the cost comparison analysis are strictly based on available data. The SCO does not collect data for capital expenditures of water districts but they are implicitly included in total operating expenses through the long-term interest payments. In addition, agencies may have higher total expenditures as a result of capital expenditures financed by cash also known as PAYGO. Lastly, an agency's total expenditures may be low due to the inadequate funding of repair and replacement costs, which would not reflect operational efficiency. It is recommended that this study should be updated on an annual basis to determine trends.

## APPENDIX A

# Water budget assumptions by water district

ETWD - Rates effective Jul/2015; Water Budget PPH=4, GPD=55, DOS=30, WF =4.3, DF =0.5, ETAF =0.8, LA=4000

IRWD - Rates effective Jul/2015; Water Budget PPH=4, GPD=50, DOS=30, WF =4.3, DF =0, ETAF =0.75, LA=1300

LBCWD - Rates effective Nov/2015; Water Budget PPH=3, GPD=60, DOS=60, WF =4.3, DF =0.7, ETAF =0.8, LA=4000

Mesa Water - Rates effective Jan/2016; Uniform Rate

MNWD - Rates effective Jan/2016; Water Budget PPH=4, GPD=60, DOS=30, WF =4.3, DF =0, ETAF =0.7, LA=4000

SMWD - Rates effective Jan/2016; Water Budget PPH=4, GPD=55, DOS=30, WF =4.3, DF =0, ETAF =0.8, LA=4000

SWD - Rates effective Aug/2015; Uniform Rate

SCWD - Rates effective Jul/2016; Inclining Block, Peak demand charge included

TCWD - Rates effective Jan/2016; Inclining Block, Temp. revenue adjustment charge and Reliability charge included

YLWD - Rates effective Oct/2015; Uniform Rate

## APPENDIX B

# Population by water district

Water District	Population	Source
Mesa Water	107,588	UWMP - 2015
IRWD	381,463	UWMP - 2015
ETWD	48,797	UWMP - 2015
MNWD	170,326	UWMP - 2015
YLWD	75,773	UWMP - 2015
SWD	6,464	UWMP - 2015
LBCWD	19,225	UWMP - 2015
SCWD	35,004	UWMP - 2015
SMWD	156,176	UWMP - 2015
TCWD	12,712	UWMP - 2015