

2017

**ANNUAL SURVEY OF WHOLESALE CUSTOMERS:
SUMMARY OF RESULTS**

Consumption Data for 2016
Rates Data for 2017



Seattle
 Public
Utilities

December 2017

RESULTS OF THE 2017 SEATTLE SURVEY OF WHOLESALE CUSTOMERS

Each year, Seattle Public Utilities (SPU) asks its wholesale customers to provide information on their current water demand (both retail and wholesale), sources of supply (in addition to SPU), and their water rates. A complete set of this data by wholesale customer and by year is of critical importance in Seattle Public Utilities' efforts to better forecast wholesale demand. Wholesale customers often find the current and historical information provided in this report useful in their own analysis and planning. It also allows them to see how they compare to other wholesale customers and Seattle in a number of areas.

This report summarizes much of the data that was collected in the 2017 wholesale customer survey and is the 24th year the report has appeared in this format. *Seattle Public Utilities appreciates the time and effort each wholesale customer has taken in completing and returning the survey.* Comparative information is presented on water rates, bills and consumption patterns. Questions about this report or requests for data from the surveys should be directed to Bruce Flory at (206) 684-5859. Copies of current and past reports (back to 2005) can be downloaded from the Wholesale Customers page of SPU's [website](#).

Overview

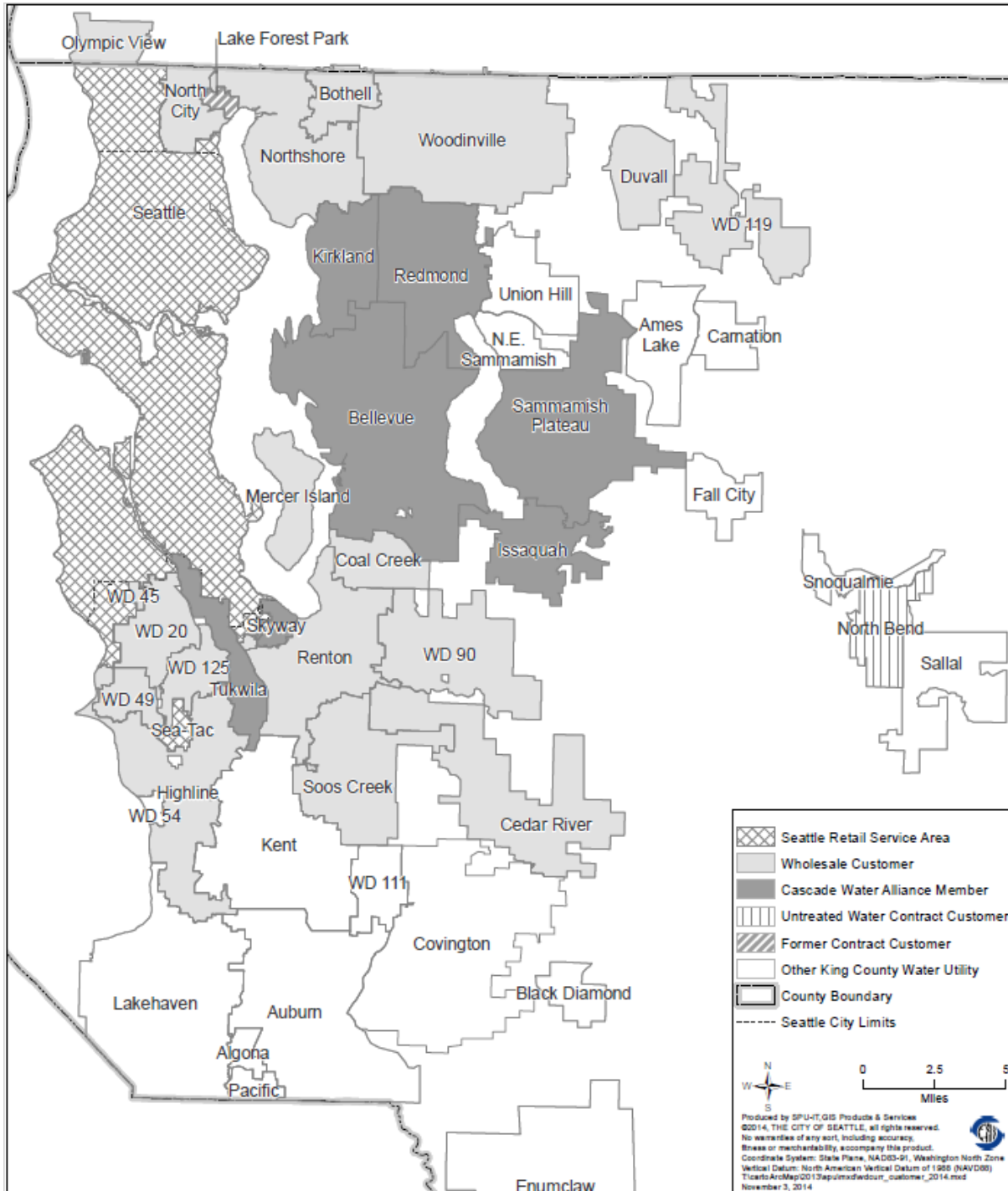
About half the water produced and treated by Seattle Public Utilities is sold directly to customers in Seattle's retail service area. The rest is sold wholesale to the Cascade Water Alliance and 18 neighboring cities and water districts. These wholesale customers are listed below.

Wholesale Customers of Seattle Public Utilities

<u>Cities</u>	<u>Water Districts</u>	<u>Cascade Water Alliance</u>
· Bothell	· Cedar River Water & Sewer District	· City of Bellevue
· Duvall	· Coal Creek Utility District	· City of Issaquah
· Mercer Island	· Highline Water District	· City of Kirkland
· Renton	· Northshore Utility District	· City of Redmond
	· North City Water District	· City of Tukwila
	· Olympic View Water & Sewer District	· Sammamish Plateau W & S District
	· Soos Creek Water & Sewer District	· Skyway Water & Sewer District
	· Woodinville Water District	
	· Water District No. 20	
	· Water District No. 45	
	· Water District No. 49	
	· Water District No. 90	
	· Water District No. 119	
	· Water District No. 125	

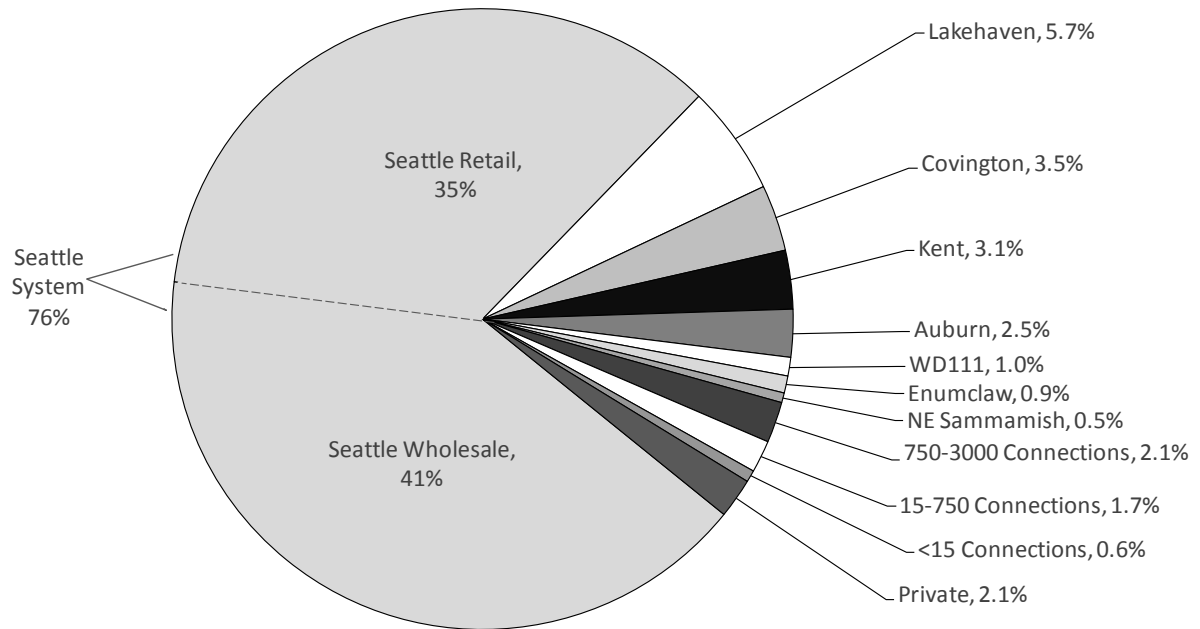
Note that the city of North Bend is not included in the survey though it has contracted with Seattle Public Utilities to receive untreated mitigation water from the Cedar River watershed.

Water Utilities in King County



While there are almost 1,500 public water systems in King County and an estimated fourteen thousand private systems, the 34 largest water utilities serve over 92% of the county’s population. Seattle and its wholesale customers alone provide water to about three quarters of the population of King County as well as 14,750 people in the southwest corner of Snohomish County.

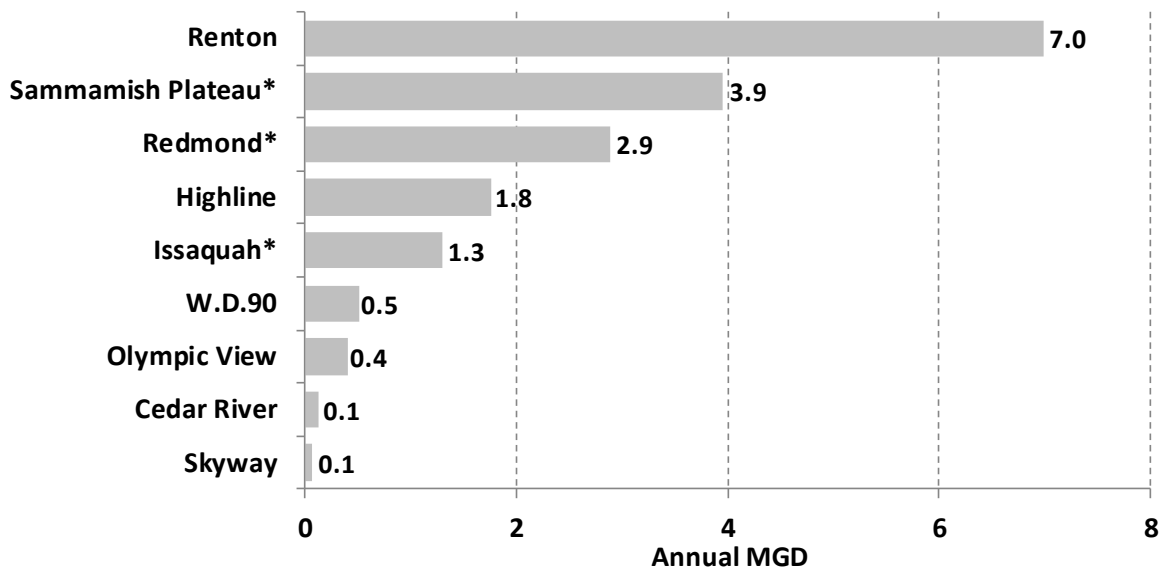
Percent of Population Served by Water Providers in King County



Supply: Seattle Public Utilities has two surface water sources and a small ground water source: the Cedar River system, the South Fork Tolt Reservoir, and the Seattle Well Field (used primarily for summer peaking). On average, the Cedar River system provides about 70 percent of total supply, the South Fork Tolt system delivers 29 percent, and the Seattle Well Field delivers 1 percent. Total annual average firm yield from the current system is estimated at 172 million gallons per day (mgd).

A number of Seattle’s wholesale customers have their own sources of supply, which reduces their demand from the SPU supply system. As shown in the table below, wholesale customers obtained a total of about 18 mgd from their own sources of supply.

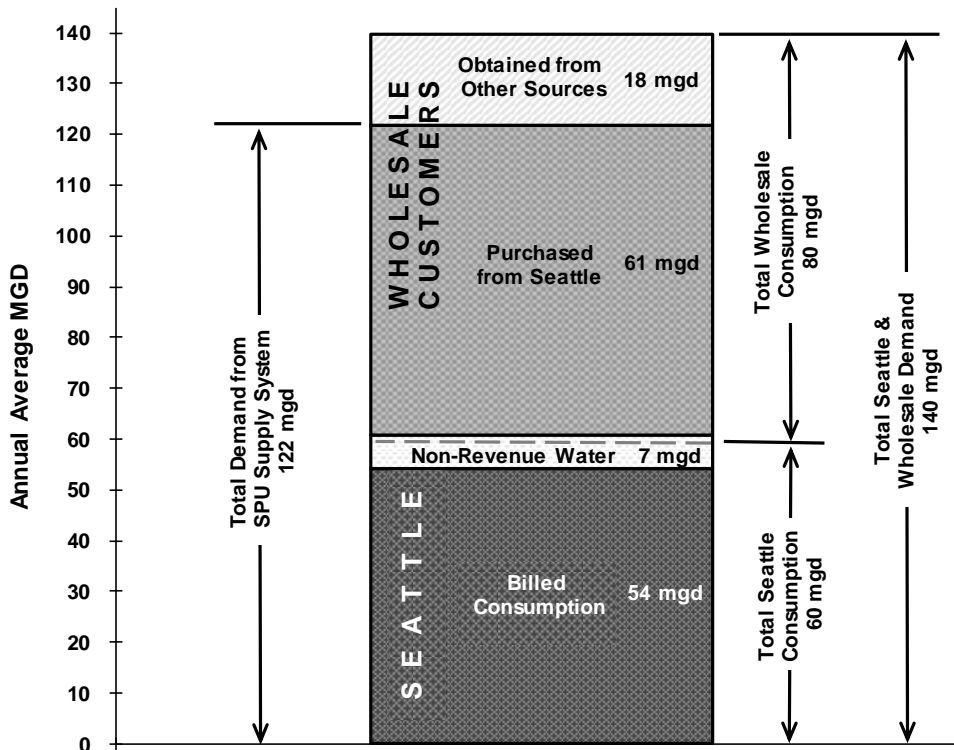
Water Obtained from Own Sources of Supply: 2016



* Members of Cascade Water Alliance

Demand: Seattle and wholesale water demand totaled 140 mgd in 2016, down 4 mgd from 2015 and it's record hot summer. Of the 140 mgd total, 122 mgd came from the SPU supply system and 18 mgd was obtained from wholesale customers' own sources of supply. Various components of Seattle and wholesale demand are shown in the chart, below¹. Seattle demand was 60 mgd including 6 mgd of non-revenue water. Total wholesale demand of 80 mgd consisted of 62 mgd from Seattle (61 mgd purchased and 1 mgd transmission losses) and 18 mgd obtained from other sources. Included in wholesale demand, but not shown separately on the chart, is almost 6 mgd of distribution system non-revenue water.

Components of Seattle and Wholesale Water Demand in MGD: 2016

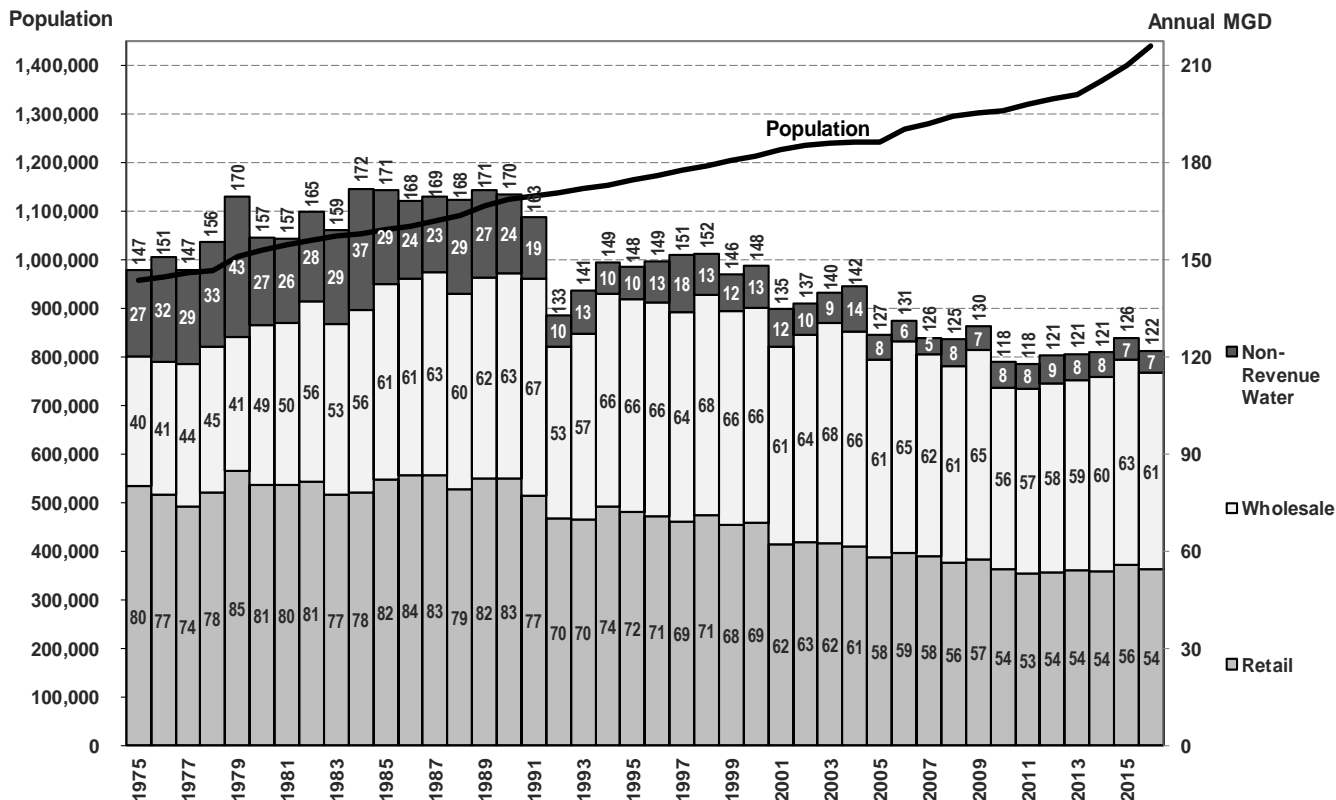


How Seattle system water consumption has changed over time can be seen in the graph below. While population has risen steadily since 1975, total water demand leveled off during the 1980s at about 170 mgd before dropping off sharply due to the 1992 drought. During the rest of the 1990s, the combined effects of higher water rates, the 1993 plumbing code, conservation, and improved system operations kept total consumption at or just under 150 mgd – well below pre-drought levels. Slow economic growth and two recessions since 2000, increasingly efficient appliances and fixtures, and the impact of the 1% Conservation Program (begun in 2000) and the Saving Water Partnership further extended the downward trend so that in recent years, water demand from the SPU supply system has dropped to about 121 mgd. The hottest summer on record pushed water consumption up to 126 mgd in 2015 from which it fell back down to 122 mgd in 2016. In percentage terms, total Seattle system water consumption has declined 28% since 1990 while population has *increased* 28%. As a result, total consumption *per capita* is 44% less than it was in 1990.

¹ Components may not add to total due to rounding.

Wholesale demand from the Seattle water system grew by two thirds from 40 mgd in 1975 to 67 mgd in 1991. Following the 1992 drought though, wholesale demand leveled off (averaging 66 mgd) for the next decade and a half before dropping to below and around 60 mgd the last seven years. Seattle retail demand was essentially flat between 1975 and 1991 (averaging 80 mgd) but has trended downward before leveling off after 2010. Finally, non-revenue water was cut by more than half due to actions taken by Seattle just before and during the 1992 drought.² Seattle’s now completed program to cover all its in-city reservoirs further reduced non-revenue water to an average of about 7 mgd (6%) since 2005.

**Population* and Components of Annual Water Demand in MGD
Seattle Regional System: 1975-2016**



* Population has been adjusted downwards to reflect that some wholesale customers have other sources of supply in addition to what they purchase from SPU. For example, only 67% of Olympic View’s population is counted, the proportion of its total water consumption that is provided by SPU.

Water Rates

Residential and commercial rates in effect during 2017 for each wholesale customer and Seattle are summarized in Tables 1.1 and 1.2. Quite a variety of rate levels and structures are evident. All wholesale customers levy a commodity charge and a fixed monthly charge or meter charge (which, in a few cases, also includes a minimum level of consumption per month). There are three basic commodity rate structures and one hybrid: uniform rates, seasonal rates, inclined block rates, and seasonal rates with blocks. Fixed monthly charges on

² These actions included reducing in-city reservoir overflows, eliminating regular flushing of Green Lake, relining leaky reservoirs, changing reservoir washing practices, and rehabilitating and replacing other reservoirs.

a ¾" meter, the usual size for residential meters, average \$20.21 per month with a range of \$13.39 per month to \$40.00 per month. The range of fixed monthly charges on 2" meters, typical of commercial accounts, is even greater: \$17.50 per month to \$233.23 per month. Note that several wholesale customers do not include the state utility tax and other taxes or fees that might be assessed on water sales in their published rates. In order to make rates and bills comparable between utilities, those taxes and fees have been added back into the rates as shown in Tables 1.1 and 1.2 and into the bill calculations.

Residential Rates: For more than 10 years, neither Seattle nor any of its *current* wholesale customers have had a uniform rate structure,³ i.e., a single rate per ccf for all volumes and times of the year. Only one wholesale customer (Tukwila) has straight seasonal rates: a single rate in the winter and a single higher rate in the 4-month summer season. Eighteen wholesale customers have simple inclined block rates with from two to five blocks. The size of the blocks is indicated in the "Break Points" column of the tables. For example, Water District 49 has three blocks: the first from 0 to 5 ccf per month, the second from 6 to 8 ccf per month and the last for 9 or more ccf per month. There is considerable variation in the number and size of the blocks and in the rates themselves. Finally, seven wholesale customers and Seattle use various combinations of seasonal and block rates. Olympic View, Woodinville, and Water Districts 90 and 119 have block structures that shift to higher rates in the summer. So does Soos Creek, except there is no higher summer rate in the first block. Similarly, Mercer Island has multiple blocks but no higher summer rates in the first two blocks. Seattle and Highline have single winter rates with blocks only in the summer.

The diversity of residential rate structures results in very different price signals to customers during the peak season. Residential customers of wholesale utilities face marginal summer rates ranging from \$2.73 to \$19.50 per ccf. The average summer end-block rate (including Seattle) is \$7.04 per ccf. two wholesale customer (Issaquah and Mercer Island) plus Seattle now have end-block rates exceeding \$10 per ccf. Issaquah has the highest summer end-block rate: \$19.50 per ccf for consumption exceeding 25 ccf per month.

Commercial Rates: About a third of wholesale customers (8) apply the same rates and rate structures to both their commercial and residential customers. Two wholesale customers (Northshore and Tukwila) change the rates charged but maintain the same structure. The remaining fifteen plus Seattle change the rates *and* the structure, usually shifting from inclined block and hybrid structures to uniform or seasonal rates, but occasionally just reducing the number of blocks. The highest rate is \$8.83 per ccf and the average summer end block rate (including Seattle and uniform and seasonal rates) is \$5.31 per ccf.

Customer Bills: Figures 1.1 through 1.4 and Tables 1.3 and 1.4 compare monthly residential bills across wholesale customers. Three consumption levels, defined below, are used throughout:

Monthly Consumption Levels Used in Calculating Bills

Level of Household Consumption	Winter	Summer	Average Annual
Low	3.5 ccf/mo	5 ccf/mo	4 ccf/mo
Medium	5.5 ccf/mo	10 ccf/mo	7 ccf/mo
High	12 ccf/mo	24 ccf/mo	16 ccf/mo

³ Two former wholesale customers, Lake Forest Park and Edmonds, still have uniform rates

Note that as of the 2016 survey, these consumption levels have been lowered from what had been used in all previous survey reports. Medium consumption had been defined as 8 ccf/mo in the winter and 12/ccf/mo or 9.33 ccf/mo on an average annual basis. This reflected typical residential consumption in the mid-1990s for wholesale customers. However, average consumption has declined significantly since then and appears to have leveled off at about 7 ccf/mo (see Table 2-4, page 29). The new low, medium, and high consumption levels used for bill comparisons are more representative of current consumption patterns.

Figures 1.1, 1.2 and 1.3 graphically display monthly residential bills by wholesale customer at low, medium, and high levels of consumption. The figures also rank wholesale customers (including Seattle) by the size of their bills revealing two interesting facts. One is that there are big differences in what households pay for water among different utilities. Monthly bills from utilities with the highest rates are as much as two and a half times as large as those from utilities with the lowest rates. Average monthly bills range from \$21.61 to \$52.99 at the low level of consumption and \$58.67 to \$131.39 at the high level of consumption.

A utility's average residential water bill is a function of both its rates *and* its average residential consumption. A problem with most comparisons of water bills across utilities (including the comparisons in Figures 1.1 through 1.3) is that the comparisons use a single level of consumption to calculate the bills. But if the chosen level of consumption is typical for one utility, it may not be for another. Consider two utilities having exactly the same rates. One could have higher average bills than the other because its average consumption is higher. To correctly compare average bills across utilities, each utility's bill should be calculated at its average level of consumption. This has been done in Figure 1.4. Average monthly residential consumption in 2016 ranged from 5.0 ccf per month in Skyway to 8.5 ccf per month in Sammamish Plateau. In Figure 1.4, Redmond has the lowest average residential bill while Water District 119 tops the list. Water District 119's volume rates are close to average but it had the highest per household consumption,⁴ with by far the highest residential meter charge.

There are many possible explanations for the wide variation in residential rates and bills. These include utilities having:

- different financial policies,
- different levels of investment in new and replacement infrastructure,
- different proportions of rate revenue, non-rate revenue, and debt,
- different proportions of residential and commercial customers,
- different cost allocations between customer classes,
- different customer densities,
- and different rates of customer and service area growth.

The other phenomenon revealed by the graphs is how much wholesale customer rankings can change at different levels of consumption, i.e., the wholesale customer with the highest bill at one level of consumption may be far from the highest at other levels of consumption. For example, Issaquah has the highest bill at high consumption, is right in the middle at medium consumption, and has the sixth *lowest* bill at low consumption, Sammamish Plateau is a good example of the opposite pattern, moving up from the third lowest bill at high consumption to fifth *highest* bills at low consumption. Finally others, such as Water Districts 45, 49 & 90 and Northshore, maintain their relative ranking at all levels of consumption. (Table 1.4 summarizes the different rankings from Figures 1.1 through 1.3.)

⁴ W.D. 119 did not provide consumption data for 2016; therefore its 2015 consumption was used here.

There are two factors that explain the shifts in relative rankings of wholesale customer bills at different levels of consumption. One is different rate structures. For example, a steeply inclined block structure tends to favor low volume users while a flatter rate structures favor high volume users. Perhaps even more important is the relative magnitudes of the fixed and variable components of the rates. Higher meter charges relative to volume charges result in higher bills for low volume users and proportionally lower bills for high volume users. The combined impact of these factors can be seen in Table 1.4. In general, wholesale customers with relatively high meter charges and relatively low volume charges move down in the rankings (their bills get smaller compared to other wholesale customers) as consumption increases. Wholesale customers with lower meter charges and higher or steeply inclining volume charges tend to move in the opposite direction, placing higher in the rankings as consumption increases. In many cases, the "meter charge effect" offsets the "rate structure effect" so that the wholesale customer maintains its ranking across all consumption levels. Table 1.3 displays monthly bills at the medium level of consumption (graphed in Figure 1.2) and the difference between winter and summer bills by wholesale customer. Note that the summer/winter differential is not the differential in *rates* but in *bills*. Many wholesale customers have a differential of less than 82% even though bills are calculated with 82% more consumption in summer than in winter. This means that the *average* rate charged *per ccf* by these wholesale customers is actually *less* in the summer than in the winter. This seemingly contradictory result is due to the impact of the meter charge which is spread over a greater number of ccf in the summer. This effect diminishes as the level of consumption rises and the meter charge represents a smaller and smaller proportion of the total bill. Only Issaquah has a differential of more than 82%, a sign that the *average* rate charged per ccf in the summer is greater than in the winter. This is because Issaquah has a relatively low monthly meter charge combined with a very steeply inclined block structure.

Consumption Patterns

Annual Consumption: Figures 2.1 and 2.2 display annual water purchases from SPU and annual retail water sales by wholesale customer for 2016. Note that annual purchases from SPU are often very different than wholesale customers' retail demands. Purchases from SPU are less than the actual demand of wholesale customers who have their own sources of supply or who buy from others. And while most Cascade members still obtain water directly from SPU's transmission system, they no longer purchase it directly from SPU. Instead, the Cascade Water Alliance pays SPU for what is owed and then bills its members. Some water purchased by Cascade is wheeled to members who may not have direct connections to the Seattle system such as Issaquah and Sammamish Plateau (for example, some of the water shown in Figure 2.1 as "purchased" by Bellevue ends up in Redmond, Issaquah, or Sammamish Plateau).

Tables 2.1 and 2.2 provide a historical perspective by displaying 14 years of data on annual retail consumption by wholesale customer and wholesale purchases from Seattle. Historical consumption data for years prior to 2008 have not been obtained from Issaquah and Sammamish Plateau.

Consumption Trends: Figure 2.3 shows the growth, or in most cases, the decline in total retail water consumption for Seattle and each of the wholesale customers over the 21 year

period 1995 to 2016. Eight utilities, most in expanding and faster growing areas, have experienced positive water demand growth since 1995 (though for two, W.D. 45 and Soos Creek, demand has been almost flat). The rest are using less water than they did 21 years ago. On average, wholesale customers have seen their water consumption decline by 4% over the period or 0.2% annually. The largest decreases have been in Seattle, North City (formerly Shoreline), Skyway, and Water Districts 20 and 49 where water demand has dropped by 21% to 25% (1.2% - 1.3% a year). This indicates that for Seattle and over half of its wholesale customers, the combined effect of conservation programs, fixture and appliance codes, and rising water rates has more than offset the impact of growth in the customer base. (Note that the apparent even larger decline for Coal Creek (46.3%) is due to the annexation of much of its service territory by Bellevue in 2003. The decline in demand for Coal Creek and Bellevue combined is just 6.3% over the last 2 decades.)

Non-Revenue Water: Figure 2.4 ranks wholesale customers by percent of non-revenue water in 2016, i.e., the percent of their total water purchases and production that is not sold. Percent non-revenue water for 2013, 2014, and 2015 is also shown. Table 2.3 shows annual distribution system percent non-revenue water by wholesale customer for the years 2002 through 2016 and the average for each wholesale customer for as many years as data is available – usually back to 1994. Percent non-revenue water is calculated as follows:

$$(PS + PO + OS - RS - WS) \div (PS + PO + OS)$$

where

- PS = Water Purchased from Seattle
- PO = Water Purchased from Others
- OS = Water obtained from Own Supply
- RS = Water Sold Retail
- WS = Water Sold Wholesale

There are many causes of non-revenue water. Some are necessary and/or beneficial such as water main flushing, reservoir cleaning and water taken from hydrants for fire-fighting, street cleaning and some construction projects. Others, however, are undesirable and represent wasted water or lost revenues. These include leaks from pipelines and reservoirs, inadvertent reservoir overflows, theft and slow customer meters. For a newer water system efficiently operated, the percentage of non-revenue water might be expected to creep down towards 5%. Non-revenue water above 10% should prompt some analysis of what might be the cause, and non-revenue water in excess of 15% is definitely a call to action.⁵

The average level of non-revenue water for wholesale customers was 6.8% in 2016⁶. Since 1994, average wholesale distribution system non-revenue water has varied from 5.3% to 9.9% averaging 7.4% over the whole period.

⁵ The state Water Efficiency Rule requires water utilities to report their Distribution System Leakage (DSL) to the Department of Health annually, and to take action if the 3-year moving average exceeds 10%. Note that non-revenue water is different than DSL. All water produced or purchased but not sold is considered non-revenue water. DSL starts with non-revenue water but subtracts out all authorized uses of water that do not generate revenue but can be measured or estimated. These include water used for reservoir cleaning and overflowing, main and hydrant flushing, firefighting, and other hydrant use such as construction and street sweeping. If measured, transmission losses can also be deducted in calculating DSL. A utility's estimate of DSL will be less than its non-revenue water to the extent that these non-revenue-generating but authorized uses are taken into account.

⁶ Seattle non-revenue water averaged 5.9% for 2005 through 2016. Percent of non-revenue water for Seattle is not included in Figure 2.3 because it is not directly comparable to wholesale non-revenue water. For wholesale customers, non-revenue

Measurement problems contribute to at least some of the year-to-year variation in non-revenue water evident in Table 2.3 and Figure 2.3. Billing lags and supply meter inaccuracies are two problems that make the precise measurement of non-revenue water difficult. Because of differences in the length of billing lags, the measure of annual wholesale water sales generally doesn't span the exact same period as the measure of annual purchases and production. These two measures of water consumption, the difference of which provides our estimate of non-revenue water, may be offset by as much as two months. Fortunately, these months are in the middle of winter when consumption tends to be relatively constant from month to month. The problem would be much worse if the end of the year coincided with the peak season.

Slow *wholesale* meters have represented a much more serious problem in measuring non-revenue water by reducing the apparent difference between the amount of water entering a wholesale customer's system and the amount of water sold by that wholesale customer. Extremely low levels of non-revenue water (under 3%) suggest that there is probably some kind of metering problem. Negative non-revenue water, i.e., when metering data implies that more water has been sold than was produced and/or purchased, is a sure sign that one or more meters measuring incoming water is slow. In 2016, there was just one wholesale customer – Bothell – with negative non-revenue water (-2.9%).

Per Household and Per Account Consumption: Figures 2.5 and 2.6 rank wholesale customers and Seattle on the basis of 2016 *single family* consumption *per household* and *total* consumption *per account*. The first measure is often used by wholesale customers in their analysis of current and projected water demand and in their calculation of Equivalent Residential Units (ERUs). The wholesale customer with the highest single family consumption per household is Sammamish Plateau at 208 gallons per day (gpd), followed by Mercer Island at 197 gpd and Woodinville at 191 gpd. The weighted wholesale average for 2016 was 171 gpd (7.0 ccf per month). Skyway reported the lowest consumption per household with 123 gpd. The variance in per household use between wholesale customers is due to more than just different attitudes towards water conservation. Wholesale customers at the top of the list (Sammamish Plateau, Woodinville, Mercer Island, etc.) tend to have some or all of the following characteristics associated with higher water use: larger lot sizes, higher household incomes, and higher average persons per household. Utilities (including Seattle) with consumption per household at the low end of the scale tend to have just the opposite characteristics: denser development with smaller lots, lower average household incomes, and fewer persons per household.

In addition to annual average consumption per single family household, Figure 2.5 also shows peak (4 month) season consumption per household.

There is much greater variation in total consumption per account across wholesale customers as can be seen in Figure 2.6. The weighted wholesale average is 310 gpd. Total consumption per account in Seattle is slightly less than the wholesale average at 287 gpd. This is *not* an

water is a distribution system concept. Water lost in transmission from Seattle's sources to wholesale meters is not part of the calculation. However, Seattle non-revenue water consists of both distribution and transmission losses to Seattle plus wholesale transmission losses. Comparing Seattle and wholesale non-revenue water would be misleading unless the distribution system component of Seattle non-revenue water could be isolated. Unfortunately, that is not possible with currently available data.

indication of the relative efficiency of water use among the different utilities. Rather, higher levels of total consumption per account are closely associated with higher proportions of non-residential and multifamily customers. Wholesale customers at the bottom of the list serve predominantly single family customers. Utilities at the top of the list with the highest consumption per account – Tukwila, Bothell, Bellevue, Redmond, Water District 125, and Renton – also have the highest proportions of non-residential and multifamily consumption, (50% or more of the total – Tukwila is 90%). Total consumption per account and percent of consumption that is *not* single family are highly correlated all the way down the line.

Finally, Table 2.4 provides some history on single family consumption per household by wholesale customer for the period 1994-2016. The overall downward trend in average consumption per household for both wholesale customers and Seattle is apparent in Figure 2.7. The average decline since 1994 has been over 30%. The range, from low to high, of wholesale consumption per household over time is also depicted in the graph. Like Figure 2.3, this graphically illustrates the impact on single family residential water demand of conservation programs, water efficiency codes for new fixtures and appliances, and rising water and sewer rates.

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Water Rates and Bills

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Figure 2.7	Single Family Residential Water Use per Household: 1994-2016

Table 1.1
A Comparison of 2017 Residential Rates

Purveyor:	3/4" mtr ch per month	Includes Minimum	Seasonal		Inclined Block					
			Winter	Summer*	1st	2nd	3rd	4th	5th	Break Points**
W.D. 20	\$21.25	0	-	-	\$2.14	\$2.73	\$3.25	-	-	5/15
W.D. 45	\$17.50	0	-	-	\$4.00	\$5.00	\$6.00	-	-	5/12.5
W.D. 49	\$17.72	0	-	-	\$3.41	\$4.20	\$5.78	-	-	5/8
W.D. 90	\$25.50	2.5	Block	Block	\$3.00/\$3.75***	\$3.45/\$4.20***	\$4.10/\$4.85***	-	-	7.5/12.5
W.D. 119***	\$40.00	0	Block	Block	\$2.46/\$3.65***	\$3.11/\$4.60***	\$4.07/\$6.03***	\$4.94/\$7.31***	-	3.5/7/14
W.D. 125	\$13.39	0	-	-	\$3.35	\$3.96	-	-	-	6
Bellevue ^T	\$24.54	0	-	-	\$3.85	\$4.88	\$6.42	\$9.16	-	5.5/8.5/22.5
Bothell ^T	\$14.77	0	-	-	\$2.83	\$4.15	\$5.03	\$6.82	\$7.79	5/10/15/25
Cedar River	\$16.55	1	-	-	\$2.52	\$4.39	\$5.10	\$7.68	-	5/15/25
Coal Creek	\$21.81	0	-	-	\$3.55	\$4.61	\$5.89	\$8.45	-	5/15/50
Duval	\$26.14	2	-	-	\$3.89	\$5.00	\$6.12	\$7.23	\$8.37	4/6/8/10
Highline***	\$14.40	0	\$3.55	Block	\$3.64	\$4.31	-	-	-	5
Issaquah ^T	\$14.58	0	-	-	\$1.89	\$4.48	\$8.32	\$13.56	\$19.50	2/7/15/25
Kirkland ^T	\$22.70	2	-	-	\$5.44	\$7.15	-	-	-	12
Mercer Island*** ^T	\$16.26	0	Block	Block	\$3.86	\$6.53	\$7.84/\$7.95***	\$10.54/\$10.86***	-	5/10/15
North City ^{S,T}	\$30.27	0	-	-	\$3.18	\$4.89	\$6.57	-	-	5/12
Northshore ^T	\$16.43	0	-	-	\$3.75	\$4.84	\$5.93	-	-	5/10
Olympic View*** ^T	\$19.60	0	Block	Block	\$2.20/\$2.45***	\$3.22/\$3.85***	-	-	-	20
Redmond	\$14.55	0	-	-	\$1.79	\$3.57	\$5.36	\$7.14	-	4/10/20
Renton	\$17.60	0	-	-	\$2.54	\$3.41	\$4.30	-	-	5/10
Sammamish Plateau	\$28.81	0	-	-	\$1.89	\$2.30	\$3.72	\$6.19	-	6/12/25
Skyway	\$18.50	0	-	-	\$4.11	\$5.20	\$6.56	\$8.36	-	4/6/12
Soos Creek***	\$14.37	0	Block	Block	\$1.81	\$3.71/\$4.45***	\$4.64/\$5.57***	\$5.25/\$6.30***	-	5/10/15
Tukwila	\$17.00	0	\$2.80	\$3.90	-	-	-	-	-	-
Woodinville	\$20.90	1	Block	Block	\$4.83/\$6.03***	\$7.27/\$8.47***	-	-	-	12.5
Seattle***	\$15.15	0	\$5.15	Block	\$5.29	\$6.54	\$11.80	-	-	5/18

* All utilities with seasonal rates use a 4 month peak season except Water District 119 (6 month).

** Break Points are the number of ccf per month at which the next rate block is attained. For example, W.D. 45 charges \$3.50 per ccf for the first 5 ccf consumed, \$4.50 per ccf for the next 7.5 ccf per month, and \$5.50 per ccf for all consumption in excess of 12.5 ccf per month.

*** WD 90, WD 119, Highline, Mercer Island, Olympic View, Soos Creek, Woodinville, and Seattle have both seasonal and block rates. For example, WD 90's 2nd block rate of \$3.45/ccf increases to \$4.20 during the peak season. Only Tukwila has simple seasonal rates with no blocks.

^S Base Service Charge for North City (formerly Shoreline) is based on both meter size and the square footage of buildings.

^T Taxes and fees not included in the published rates of these utilities (Bellevue, Bothell, Issaquah, Kirkland, Lake Forest Park, Mercer Island, North City, Northshore, Olympic View, and Water District 90) have been added to the rates shown in this table.

Table 1.2

A Comparison of 2017 Commercial Rates

Purveyor:	2" mtr ch per month	Includes Minimum	Seasonal		Inclined Block					
			Winter	Summer*	1st	2nd	3rd	4th	5th	Break Points**
W.D. 20	\$106.25	0	-	-	\$2.14	\$2.73	\$3.25	-	-	5/15
W.D. 45	\$17.50	0	-	-	\$4.00	\$5.00	\$6.00	-	-	5/12.5
W.D. 49 ^T	\$233.23	0	-	-	\$3.94	-	-	-	-	-
W.D. 90	\$65.95	2.5	-	-	\$4.10	-	-	-	-	-
W.D. 119***	\$70.00	0	Block	Block	\$2.46/\$3.65***	\$3.11/\$4.60***	\$4.07/\$6.03***	\$4.94/\$7.31***	-	3.5/7/14
W.D. 125	\$45.84	0	\$3.48	\$3.81	-	-	-	-	-	-
Bellevue ^T	\$112.93	0	\$4.84	\$6.61	-	-	-	-	-	-
Bothell ^T	\$121.23	0	\$3.40	\$5.81	-	-	-	-	-	-
Cedar River	\$64.79	1	-	-	\$2.52	\$4.39	\$5.10	\$7.68	-	5/15/25
Coal Creek	\$114.52	0	\$4.09	\$5.33	-	-	-	-	-	-
Duvall	\$26.14	2	-	-	\$3.89	\$5.00	\$6.12	\$7.23	\$8.37	4/6/8/10
Highline***	\$129.55	0	\$3.55	Block	\$3.64	\$4.31	-	-	-	5
Issaquah ^T	\$130.09	0	-	-	\$3.79	\$5.85	-	-	-	32
Kirkland ^T	\$80.58	0	-	-	\$5.56	-	-	-	-	-
Mercer Island ^T	\$130.11	0	\$3.55	\$8.83	-	-	-	-	-	-
North City ^{S T}	\$158.60	0	-	-	\$4.62	-	-	-	-	-
Northshore ^T	\$120.55	0	-	-	\$4.03	\$4.30	\$4.57	-	-	40/80
Olympic View*** ^T	\$71.30	0	Block	Block	\$2.20/\$2.45***	\$3.22/\$3.85***	-	-	-	160
Redmond	\$88.55	0	\$2.34	\$4.01	-	-	-	-	-	-
Renton	\$105.52	0	-	-	\$3.48	-	-	-	-	-
Sammamish Plateau	\$183.07	0	\$1.53	\$2.24	-	-	-	-	-	-
Skyway	\$211.15	0	-	-	\$5.92	-	-	-	-	-
Soos Creek***	\$57.13	0	Block	Block	\$1.81	\$3.71/\$4.45***	\$4.64/\$5.57***	\$5.25/\$6.30***	-	5/10/15
Tukwila	\$105.00	0	\$4.82	\$6.60	-	-	-	-	-	-
Woodinville	\$168.75	1	-	-	\$4.47	\$4.90	-	-	-	Prior winter avg
Seattle	\$26.65	0	\$5.15	\$6.54	-	-	-	-	-	-

* All utilities with seasonal rates use a 4 month peak season except Water District 119 (6 month) and Redmond (5 month).

** Break Points are the number of ccf per month at which the next rate block is attained. For example, W.D. 45 charges \$3.50 per ccf for the first 5 ccf consumed, \$4.50 per ccf for the next 7.5 ccf per month, and \$5.50 per ccf for all consumption in excess of 12.5 ccf per month.

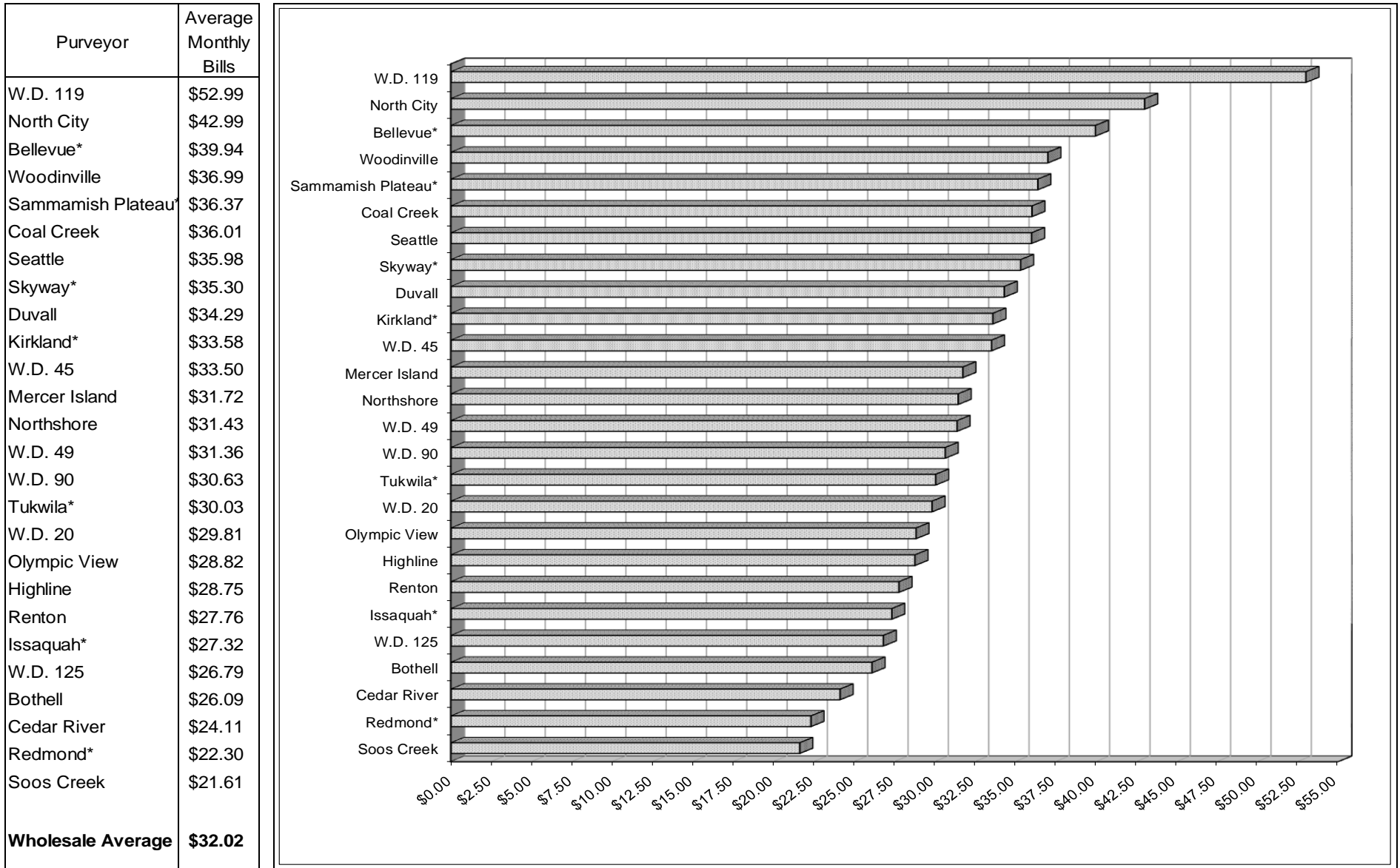
*** WD 119, Highline, Olympic View, and Soos Creek have both seasonal and block rates. For example, WD 119's 2nd block rate of \$3.02/ccf increases to \$3.95 during the peak season.

^S Base Service Charge for North City (formerly Shoreline) is based on both meter size and the square footage of buildings.

^T Taxes and fees not included in the published rates of these utilities (Bellevue, Bothell, Issaquah, Kirkland, Lake Forest Park, Mercer Island, North City, Northshore, Olympic View, and Water District 90) have been added to the rates shown in this table.

Figure 1.1

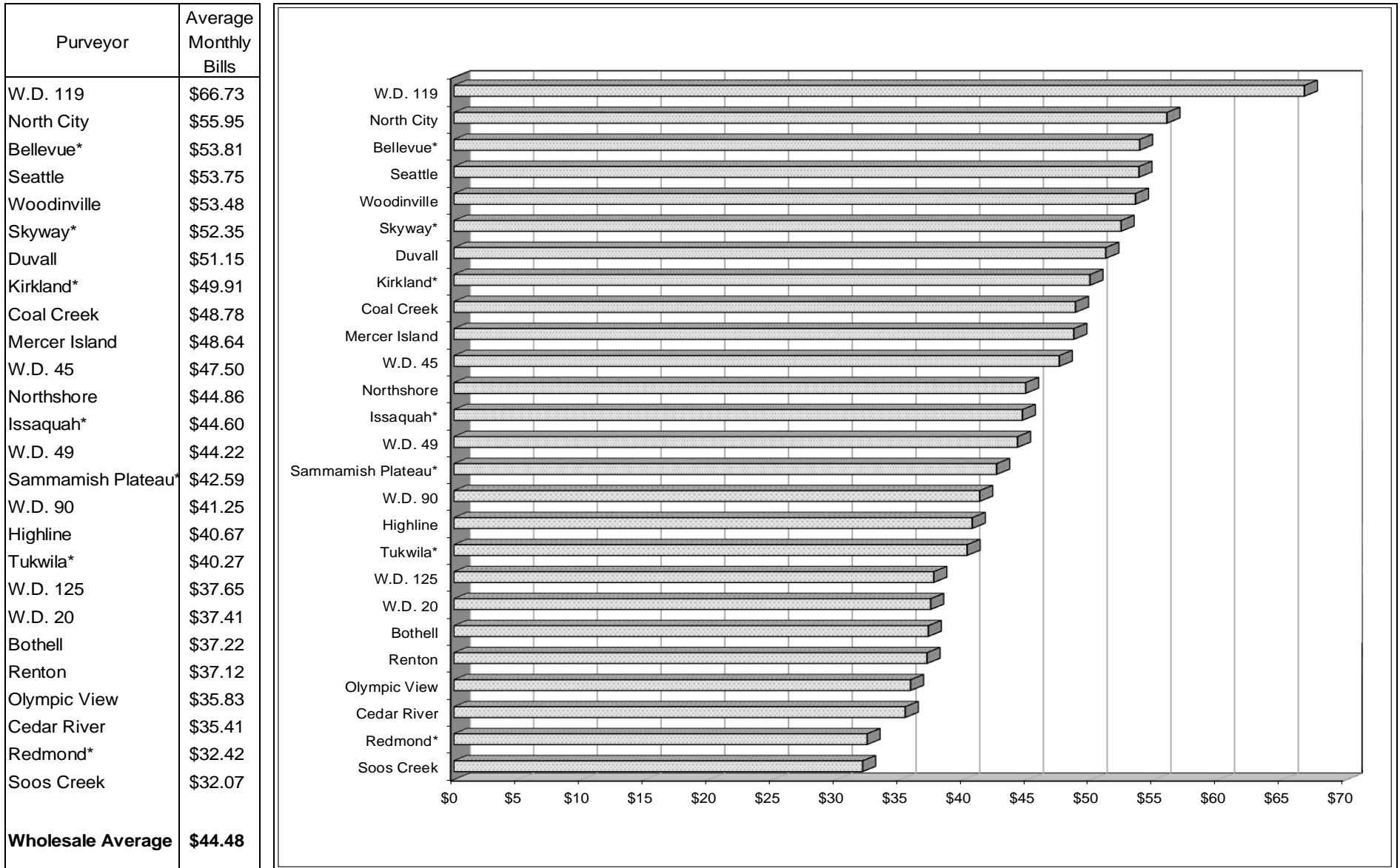
Average Monthly Residential Bills at 2017 Rates and LOW Consumption (3.5ccf/mo Winter and 5 ccf/mo Summer Consumption)



* Member of Cascade Water Alliance

Figure 1.2

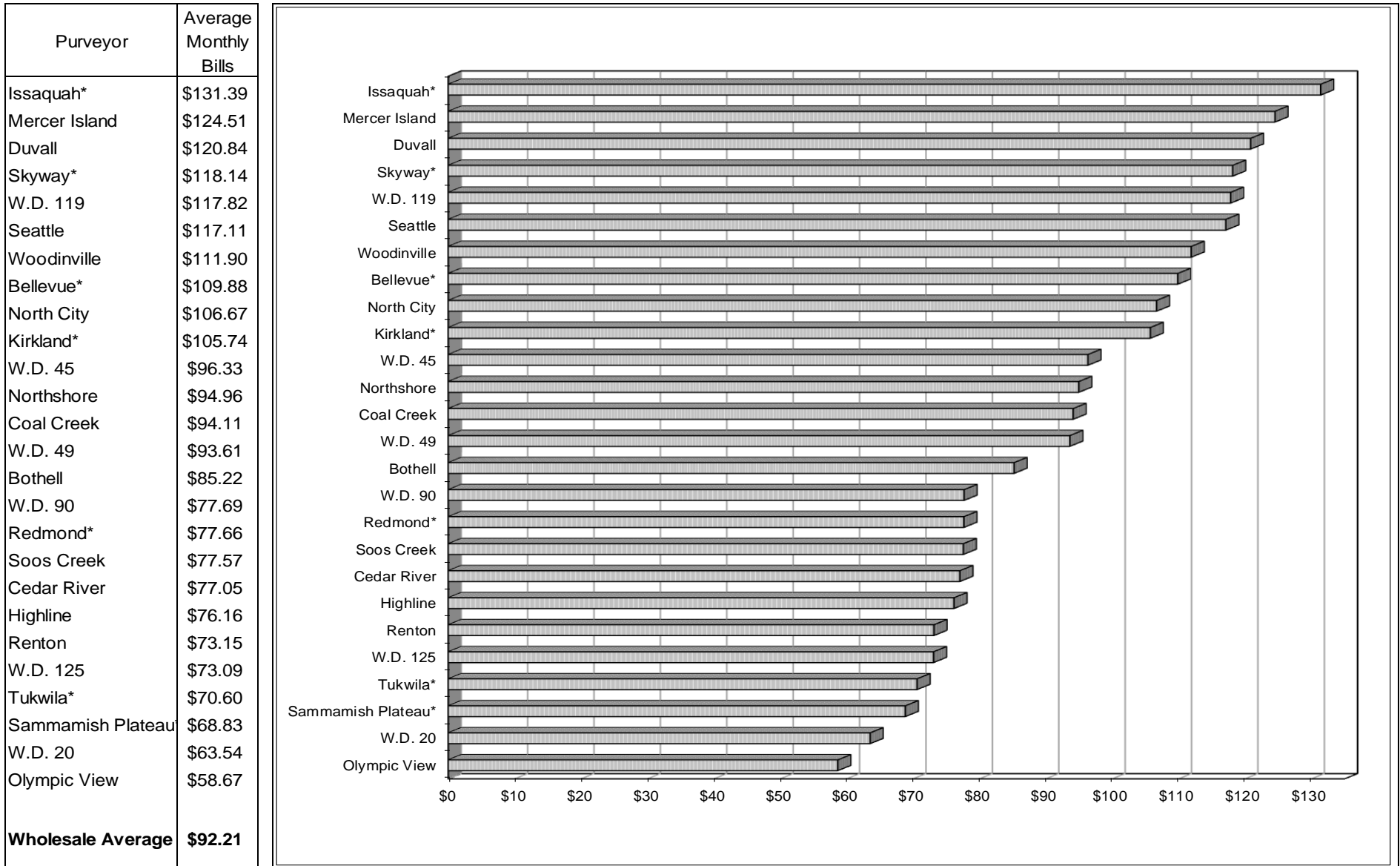
Average Monthly Residential Bills at 2017 Rates and MEDIUM Consumption (5.5 ccf/mo Winter and 10 ccf/mo Summer Consumption)



* Member of Cascade Water Alliance

Figure 1.3

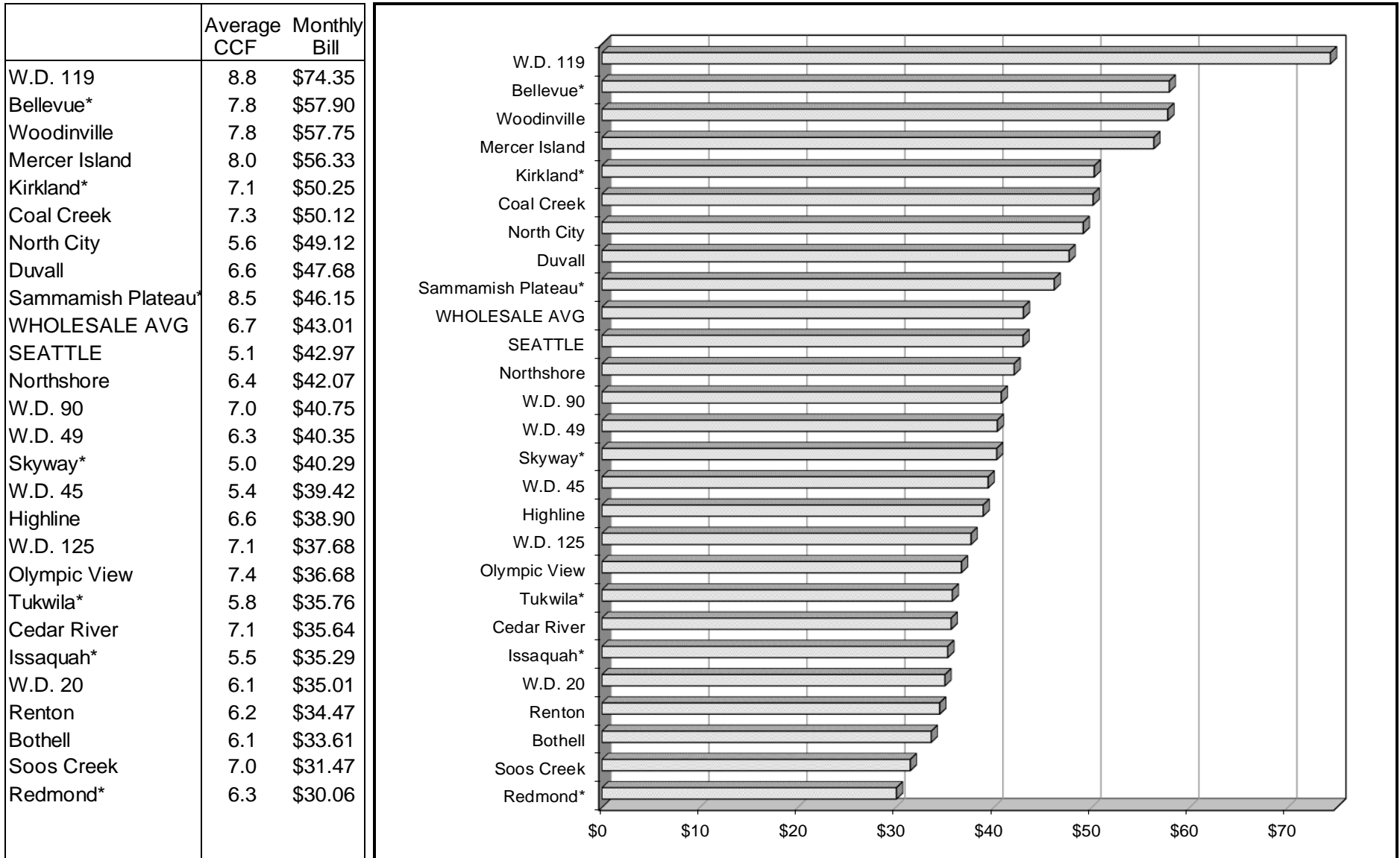
Average Monthly Residential Bills at 2017 Rates and HIGH Consumption (12 ccf/mo Winter and 24 ccf/mo Summer Consumption)



* Member of Cascade Water Alliance

Figure 1.4

Average Monthly Residential Water Bills at Each Utility's Average Consumption



* Member of Cascade Water Alliance

Table 1.3

AVERAGE ANNUAL, WINTER, AND SUMMER RESIDENTIAL BILLS
with 2016 Rates & Medium Consumption: 5.5 ccf/mo Winter, 10 ccf/mo Summer
Ranked from Highest to Lowest

Rank	Purveyor	Monthly Residential Bills			Summer/Winter Differential**
		Avg. Annual	Winter	Summer	
1	W.D. 119	\$66.73	\$54.83	\$86.97	58.6%
2	North City	\$55.95	\$48.62	\$70.61	45.2%
3	Bellevue*	\$53.81	\$45.72	\$69.99	53.1%
4	Seattle	\$53.75	\$43.48	\$74.30	70.9%
5	Woodinville	\$53.48	\$42.64	\$75.17	76.3%
6	Skyway*	\$52.35	\$42.74	\$71.58	67.5%
7	Duvall	\$51.15	\$41.42	\$70.62	70.5%
8	Kirkland*	\$49.91	\$41.75	\$66.24	58.7%
9	Coal Creek	\$48.78	\$41.86	\$62.61	49.6%
10	Mercer Island	\$48.64	\$38.85	\$68.23	75.6%
11	W.D. 45	\$47.50	\$40.00	\$62.50	56.3%
12	Northshore	\$44.86	\$37.60	\$59.38	57.9%
13	Issaquah*	\$44.60	\$34.04	\$65.73	93.1%
14	W.D. 49	\$44.22	\$36.87	\$58.93	59.8%
15	Sammamish Plateau*	\$42.59	\$39.21	\$49.35	25.9%
16	W.D. 90	\$41.25	\$34.50	\$54.75	58.7%
17	Highline	\$40.67	\$33.93	\$54.15	59.6%
18	Tukwila*	\$40.27	\$32.40	\$56.00	72.8%
19	W.D. 125	\$37.65	\$31.82	\$49.33	55.1%
20	W.D. 20	\$37.41	\$33.32	\$45.60	36.9%
21	Bothell	\$37.22	\$31.00	\$49.67	60.3%
22	Renton	\$37.12	\$32.01	\$47.35	47.9%
23	Olympic View	\$35.83	\$31.70	\$44.10	39.1%
24	Cedar River	\$35.41	\$28.83	\$48.58	68.5%
25	Redmond*	\$32.42	\$27.07	\$43.13	59.4%
26	Soos Creek	\$32.07	\$25.28	\$45.67	80.7%
WHOLESALE AVERAGE					
		\$44.48	\$37.12	\$59.05	59.1%

* Member of Cascade Water Alliance

** Note that the summer/winter differential is not the differential in rates but in bills. Almost all utilities have a differential of less than 82% even though bills are calculated with 82% more consumption in summer than in winter. This means that the average rate charged per ccf by these utilities is actually less in the summer than in the winter. This seemingly contradictory result is due to the impact of the meter charge which is spread over a greater number of ccf in the summer.

Table 1.4

Ranking of Purveyor Bills from High to Low at Different Levels of Consumption

Ranking at Low Consumption	Ranking at Medium Consumption	Ranking at High Consumption
1 W.D. 119	1 W.D. 119	1 Issaquah*
2 North City	2 North City	2 Mercer Island
3 Bellevue*	3 Bellevue*	3 Duvall
4 Woodinville	4 Seattle	4 Skyway*
5 Sammamish Plateau*	5 Woodinville	5 W.D. 119
6 Coal Creek	6 Skyway*	6 Seattle
7 Seattle	7 Duvall	7 Woodinville
8 Skyway*	8 Kirkland*	8 Bellevue*
9 Duvall	9 Coal Creek	9 North City
10 Kirkland*	10 Mercer Island	10 Kirkland*
11 W.D. 45	11 W.D. 45	11 W.D. 45
12 Mercer Island	12 Northshore	12 Northshore
13 Northshore	13 Issaquah*	13 Coal Creek
14 W.D. 49	14 W.D. 49	14 W.D. 49
15 W.D. 90	15 Sammamish Plateau*	15 Bothell
16 Tukwila*	16 W.D. 90	16 W.D. 90
17 W.D. 20	17 Highline	17 Redmond*
18 Olympic View	18 Tukwila*	18 Soos Creek
19 Highline	19 W.D. 125	19 Cedar River
20 Renton	20 W.D. 20	20 Highline
21 Issaquah*	21 Bothell	21 Renton
22 W.D. 125	22 Renton	22 W.D. 125
23 Bothell	23 Olympic View	23 Tukwila*
24 Cedar River	24 Cedar River	24 Sammamish Plateau*
25 Redmond*	25 Redmond*	25 W.D. 20
26 Soos Creek	26 Soos Creek	26 Olympic View

Definition of Consumption Levels:**

	Winter	Summer	Average
Low	3.5 ccf/mo	5 ccf/mo	4 ccf/mo
Medium	5.5 ccf/mo	10 ccf/mo	7 ccf/mo
High	12 ccf/mo	24 ccf/mo	16 ccf/mo

* Member of Cascade Water Alliance

** Note that consumption levels have been revised downwards to reflect the long term decline in average consumption per single family household from 9.3 ccf/mo in the mid-1990s to about 7.0 ccf/mo currently.

Figure 2.1
WHOLESALE CUSTOMERS RANKED BY 2016 ANNUAL DIRECT PURCHASES FROM SPU

Wholesale Customer	Purchases
Bellevue	8,872,628
Kirkland	2,849,305
Northshore	2,526,863
Highline	2,331,523
Soos Creek	1,963,028
Woodinville	1,830,139
W.D. 20	1,172,367
Mercer Island	1,060,012
Tukwila	961,845
Cedar River	853,281
North City	807,225
Bothell	708,236
W.D. 49	631,025
Coal Creek	595,446
W.D. 90	592,318
W.D. 125	533,392
Olympic View	428,769
Redmond	389,216
Duvall	249,931
Skyway	163,683
W.D. 119	111,629
W.D. 45	110,107
Renton	47,067
TOTAL	29,789,035

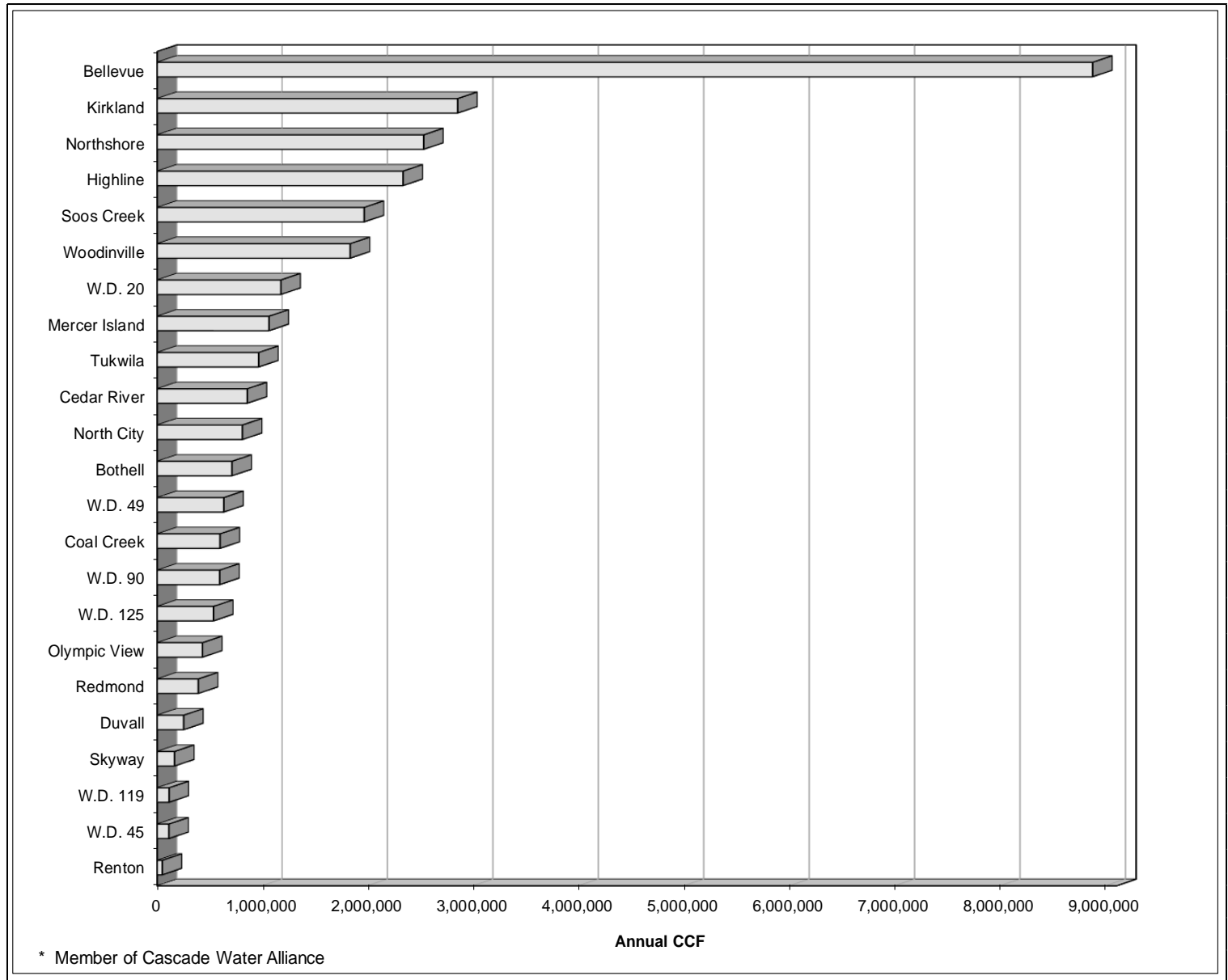


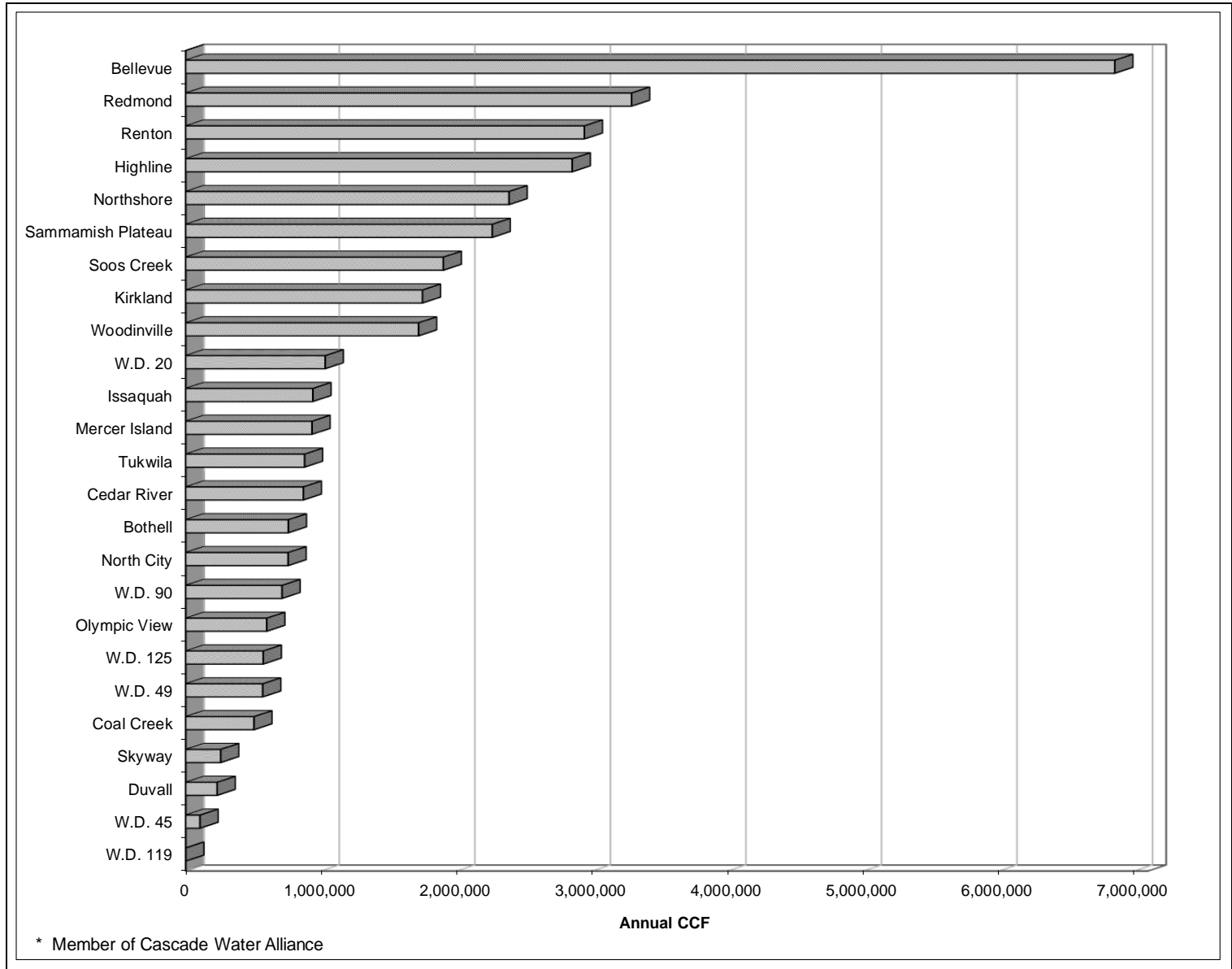
Table 2.1
Annual Direct Water Purchases from SPU by Wholesale Customer in CCF: 2003-2016

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Bellevue*	8,124,609	8,525,078	7,864,907	8,474,731	8,336,308	8,314,028	8,573,043	7,714,349	7,912,285	8,440,512	8,671,870	8,468,924	9,056,491	8,872,628
Bothell	783,847	790,903	710,804	791,591	745,144	725,123	732,256	640,359	637,415	656,581	670,069	751,608	724,782	708,236
Cedar River	980,516	989,535	985,386	1,071,615	947,745	872,814	924,524	800,755	758,691	701,387	809,005	827,277	910,094	853,281
Coal Creek	1,237,310	607,964	525,361	598,753	526,420	516,395	597,952	485,859	493,533	525,773	521,259	555,475	602,575	595,446
Duvall	257,645	244,321	236,868	242,851	230,852	222,695	253,521	224,298	233,390	232,947	235,508	243,416	260,014	249,931
Highline	3,233,149	2,964,590	2,559,715	2,565,923	2,517,632	2,473,927	2,351,174	2,143,580	2,126,929	2,105,391	1,900,457	2,159,022	2,401,204	2,331,523
Kirkland*	3,238,310	3,044,835	2,833,027	3,150,078	2,954,510	2,980,975	3,009,442	2,670,036	2,660,037	2,658,078	2,664,624	2,834,762	3,008,403	2,849,305
Mercer Island	1,165,501	1,219,866	1,072,336	1,139,931	1,087,304	1,039,660	1,032,966	855,678	924,062	992,386	1,003,892	1,041,934	1,080,492	1,060,012
North City	968,906	936,967	866,334	917,711	871,042	850,414	860,299	771,973	650,376	669,971	838,799	848,588	831,093	807,225
Northshore	2,983,637	2,838,343	2,556,349	2,698,337	2,555,901	2,441,109	2,574,352	2,394,673	2,463,963	2,451,174	2,486,656	2,541,588	2,623,056	2,526,863
Olympic View	475,345	462,990	414,859	549,538	406,617	406,802	496,479	361,712	348,497	374,499	385,411	402,010	427,550	428,769
Redmond*	364,646	461,140	471,211	668,574	452,805	504,742	1,242,852	499,676	705,173	652,641	473,834	474,702	553,274	389,216
Renton	62,364	64,549	51,841	48,314	51,959	38,125	42,490	59,904	88,749	51,086	43,815	47,775	54,951	47,067
Skyway*	326,364	235,574	226,417	212,135	201,841	177,990	185,047	165,814	174,797	146,535	157,344	167,003	172,648	163,683
Soos Creek	2,296,099	2,336,428	2,126,144	2,205,083	2,126,508	1,981,264	2,119,629	1,873,183	2,008,295	1,945,924	1,922,452	1,949,246	2,002,945	1,963,028
Tukwila*	1,092,216	1,136,059	1,069,148	1,068,642	1,060,170	993,747	986,705	920,469	942,999	943,018	952,619	967,875	1,001,737	961,845
Woodinville	2,371,019	2,243,238	1,873,605	2,032,328	1,996,289	1,956,618	2,184,773	1,781,785	1,759,518	1,740,966	1,915,528	1,922,760	1,987,587	1,830,139
W.D. 20	1,427,155	1,346,869	1,325,298	1,416,165	1,339,902	1,358,086	1,386,645	1,237,668	1,233,990	1,215,151	1,245,419	1,264,750	1,240,865	1,172,367
W.D. 45	133,350	127,217	116,943	105,832	95,913	94,013	95,912	100,229	106,783	107,679	111,838	112,930	113,495	110,107
W.D. 49	611,986	640,512	587,490	599,956	636,898	585,791	589,113	556,683	638,260	610,235	562,840	606,746	625,497	631,025
W.D. 90	496,043	503,774	452,581	539,675	542,270	550,935	521,397	433,468	493,819	536,673	540,180	594,651	621,453	592,318
W.D. 119	139,875	133,744	126,416	131,697	121,176	117,871	132,998	115,579	110,073	111,287	108,192	150,749	122,240	111,629
W.D. 125	560,331	646,969	603,604	623,262	597,401	549,107	587,539	514,478	495,650	495,315	481,332	458,505	495,718	533,392
Total	33,330,239	32,501,465	29,656,646	31,852,728	30,402,609	29,752,240	31,481,128	27,322,218	27,967,343	28,365,209	28,702,943	29,392,493	30,918,362	29,789,035

* Members of Cascade Water Alliance. Water shown as "purchased" by individual Cascade members reflects consumption measured through their meters with SPU. However, individual Cascade members are not billed directly by SPU.

Figure 2.2
WHOLESALE CUSTOMERS RANKED BY 2016 ANNUAL RETAIL BILLED SALES

Wholesale Customer	Retail Sales
Bellevue	6,853,901
Redmond	3,288,969
Renton	2,940,561
Highline	2,850,950
Northshore	2,384,959
Sammamish Plateau	2,260,752
Soos Creek	1,899,834
Kirkland	1,746,056
Woodinville	1,717,238
W.D. 20	1,028,520
Issaquah	937,721
Mercer Island	930,888
Tukwila	876,305
Cedar River	867,497
Bothell	756,659
North City	754,789
W.D. 90	709,933
Olympic View	597,300
W.D. 125	571,481
W.D. 49	567,597
Coal Creek	502,896
Skyway	257,206
Duvall	231,285
W.D. 45	104,755
W.D. 119	NA**
TOTAL**	35,638,051



** Water District 119 did not provide retail billed consumption data for 2016. Total excludes Water District 119.

Table 2.2
Annual Retail Water Sales by Wholesale Customer in CCF: 2003-2016

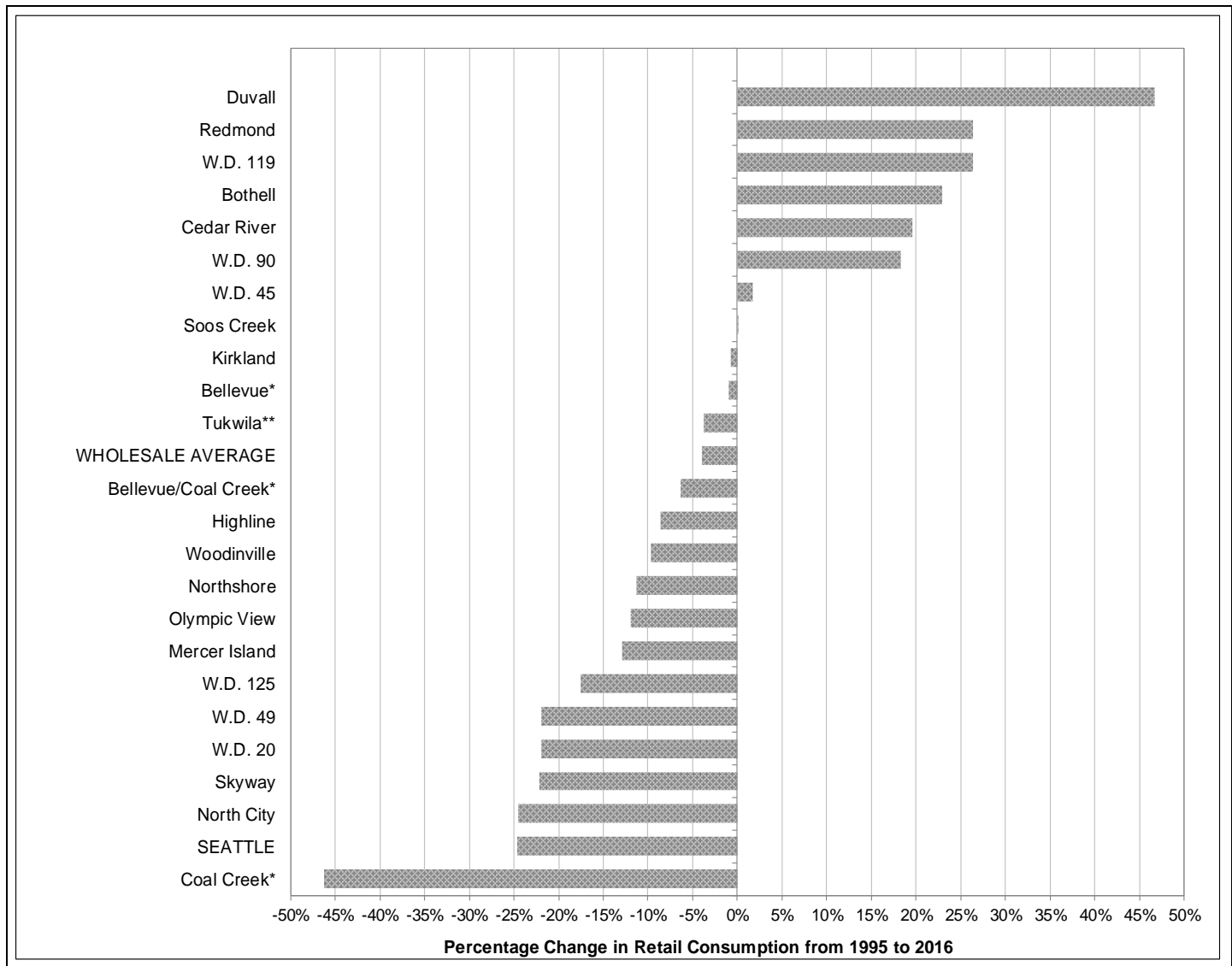
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Bellevue*	7,055,800	7,078,453	6,783,981	No Data	6,851,810	6,612,399	6,908,439	6,276,954	No Data	6,652,102	6,622,564	6,776,081	7,068,290	6,853,901
Bothell*	760,131	No Data	577,806	656,619	693,484	711,427	726,962	681,145	627,483	645,746	663,539	715,943	738,030	756,659
Cedar River	949,620	925,955	855,114	964,037	904,362	855,210	941,306	816,633	791,574	845,321	837,278	856,402	920,373	867,497
Coal Creek	1,219,567	543,762	488,466	563,705	491,502	473,088	554,686	439,423	443,453	479,094	472,781	491,909	560,980	502,896
Duvall	231,577	218,230	205,341	223,653	220,032	216,704	239,872	200,987	215,895	216,172	213,225	229,374	228,157	231,285
Highline	3,302,253	3,149,274	3,029,761	3,066,659	2,976,073	2,840,910	2,920,652	2,661,812	2,644,611	2,659,258	2,703,065	2,779,089	2,847,534	2,850,950
Issaquah*	No Data	No Data	No Data	No Data	No Data	806,842	892,875	809,031	821,652	881,251	872,886	984,285	973,085	937,721
Kirkland*	1,906,772	1,739,111	1,833,509	1,843,186	1,729,375	1,657,408	1,801,406	1,574,869	No Data	1,566,695	1,698,294	1,773,444	1,804,311	1,746,056
Mercer Island	1,149,546	1,155,137	984,570	996,235	978,013	931,806	1,000,468	866,165	891,529	897,230	900,575	966,483	959,114	930,888
North City	914,477	886,232	815,594	849,559	813,161	856,562	843,675	746,571	709,027	731,780	746,917	754,150	750,242	754,789
Northshore*	2,808,235	2,676,062	No Data	2,630,374	2,501,954	2,394,514	2,512,510	2,334,511	2,266,068	2,362,615	2,427,789	2,452,293	2,505,023	2,384,959
Olympic View	703,425	699,541	627,376	659,836	612,943	600,568	683,135	585,617	575,861	558,421	586,950	603,319	618,309	597,300
Redmond*	3,254,994	No Data	No Data	No Data	No Data	3,085,835	3,165,854	2,969,511	2,832,871	2,996,495	3,005,475	3,105,651	2,967,794	3,288,969
Renton*	No Data	No Data	No Data	No Data	3,083,313	2,900,725	3,035,983	2,789,845	2,830,862	2,955,165	2,867,155	2,859,392	3,007,726	2,940,561
Sammamish Plateau*	No Data	No Data	No Data	No Data	No Data	2,113,475	2,310,814	1,976,398	1,984,468	2,070,994	2,053,303	2,150,767	2,386,234	2,260,752
Skyway	329,497	309,832	280,643	292,983	285,914	275,432	277,182	257,760	257,921	252,642	252,760	268,745	273,221	257,206
Soos Creek	2,191,349	2,023,063	1,870,978	2,003,456	1,972,069	1,832,233	1,903,844	1,693,450	1,737,069	1,867,566	1,861,518	1,896,792	1,903,748	1,899,834
Tukwila*	938,989	1,000,684	1,043,575	No Data	918,957	883,576	888,759	843,254	836,866	869,865	884,564	914,889	932,015	876,305
Woodinville	2,232,174	2,077,734	1,867,062	2,044,244	1,884,117	1,789,966	1,987,478	1,679,587	1,696,919	1,724,180	1,739,578	1,848,832	1,897,607	1,717,238
W.D. 20	1,216,998	1,200,605	1,144,053	1,196,913	1,141,240	1,099,170	1,115,278	1,034,602	1,005,816	1,013,874	994,177	1,035,187	1,029,163	1,028,520
W.D. 45	132,207	121,307	108,416	99,325	90,092	89,336	90,799	97,857	100,065	105,855	104,627	107,942	111,737	104,755
W.D. 49	645,016	610,845	616,020	620,546	602,572	576,403	586,525	549,063	548,355	548,241	537,628	558,191	572,646	567,597
W.D. 90	656,449	665,985	602,173	694,640	664,617	652,558	720,856	634,419	638,859	667,072	694,406	706,094	764,579	709,933
W.D. 119*	124,407	113,288	105,277	126,326	109,394	109,449	116,871	102,606	No Data	113,957	112,750	No Data	127,510	No Data
W.D. 125	678,557	652,703	611,276	636,882	637,662	616,905	654,841	574,180	559,617	570,319	555,828	573,455	582,314	571,481
TOTAL*	M I S S I N G D A T A					34,982,501	36,881,070	33,196,250	Missing Data	34,251,910	34,409,632	Missing Data	36,529,742	Missing Data
Seattle	30,422,909	29,994,131	28,340,298	29,114,620	28,490,213	27,538,310	28,015,569	26,561,023	25,824,242	26,279,721	26,429,190	26,190,327	27,150,842	26,539,995

* Consumption data is missing for Bothell in 2004 and Northshore in 2005. Redmond did not provide data for 2004, 2005, 2006, and 2007. Bellevue and Tukwila did not provide data for 2006. Historical data is not available for Renton prior to 2007 nor available for Issaquah and Sammamish Plateau prior to 2008. Bellevue, Kirkland and WD 119 did not provide data for 2011, and WD 119 did not provide data for 2014 and 2016.

Figure 2.3

PERCENT GROWTH (OR DECLINE) IN RETAIL DEMAND BY UTILITY FROM 1995 TO 2016

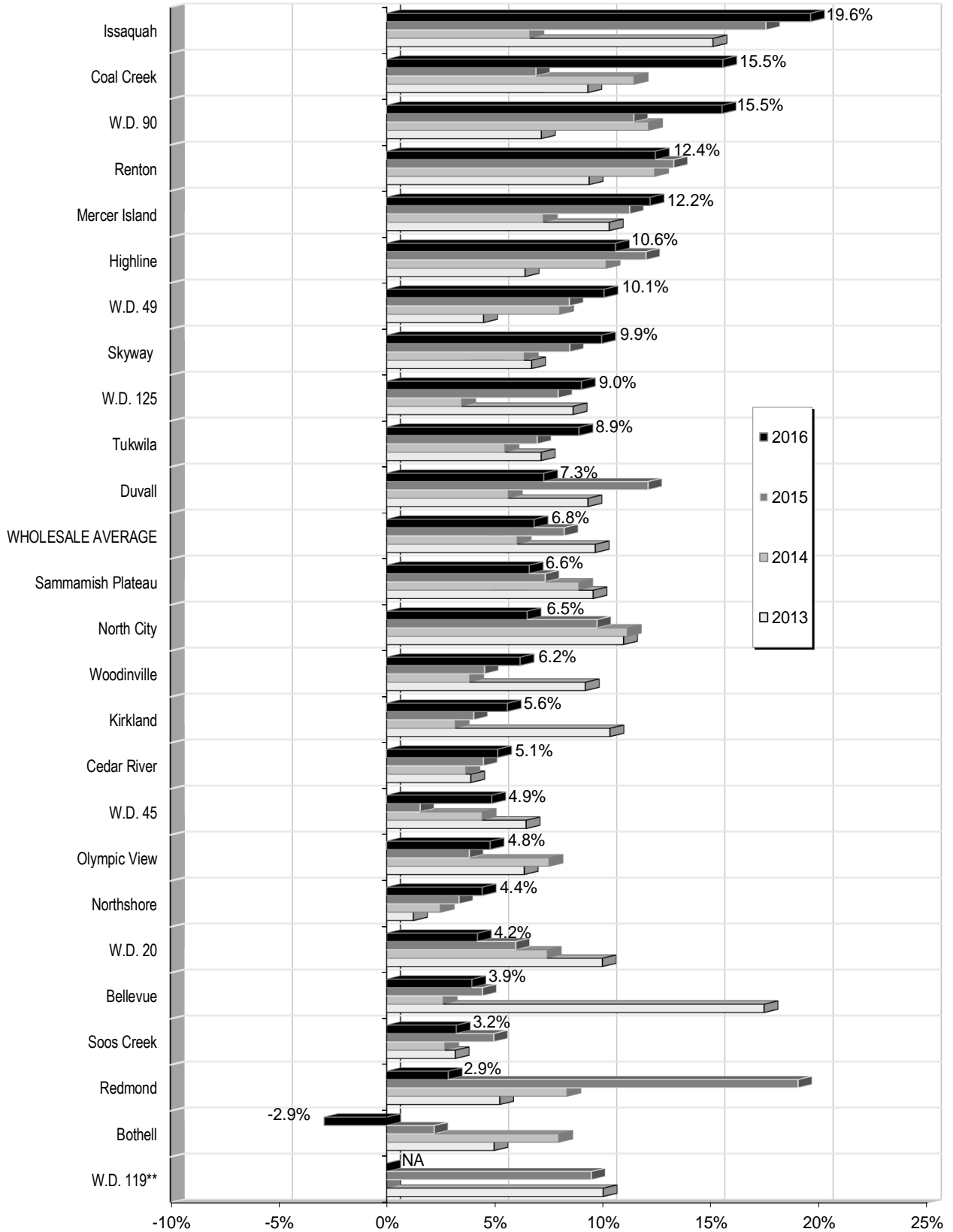
Utility	Percent Change	
	1995-2016	Average Annual
Duvall	46.7%	1.8%
Redmond	26.3%	1.1%
W.D. 119	26.3%	1.1%
Bothell	22.9%	1.0%
Cedar River	19.6%	0.9%
W.D. 90	18.3%	0.8%
W.D. 45	1.8%	0.1%
Soos Creek	0.2%	0.0%
Kirkland	-0.7%	0.0%
Bellevue*	-0.9%	0.0%
Tukwila**	-3.8%	-0.2%
WHOLESALE AVERAGE	-4.0%	-0.2%
Bellevue/Coal Creek*	-6.3%	-0.3%
Highline	-8.6%	-0.4%
Woodinville	-9.7%	-0.5%
Northshore	-11.3%	-0.6%
Olympic View	-12.0%	-0.6%
Mercer Island	-12.9%	-0.7%
W.D. 125	-17.6%	-0.9%
W.D. 49	-21.9%	-1.2%
W.D. 20	-22.0%	-1.2%
Skyway	-22.2%	-1.2%
North City	-24.5%	-1.3%
SEATTLE	-24.6%	-1.3%
Coal Creek*	-46.3%	-2.9%



* Growth rates for Bellevue and Coal Creek reflect the impact of the annexation of a large portion of Coal Creek by Bellevue in 2003. Much of the 46% decline in Coal Creek's consumption is due to their transferring more than half their customers to Bellevue. The change in demand for the combined Bellevue/Coal Creek service area is also shown.

** Growth rate for Tukwila is measured from 1996, the year after a large area, including Boeing, was transferred from Seattle's retail service area to Tukwila.

Figure 2.4
2016 Wholesale Customer Non-Revenue Water as a Percentage of Total Water Use
 (2013, 2014 & 2015 Non-Revenue Shown in Gray)



* Members of Cascade Water Alliance

** Water District 119 did not provide consumption data for 2016

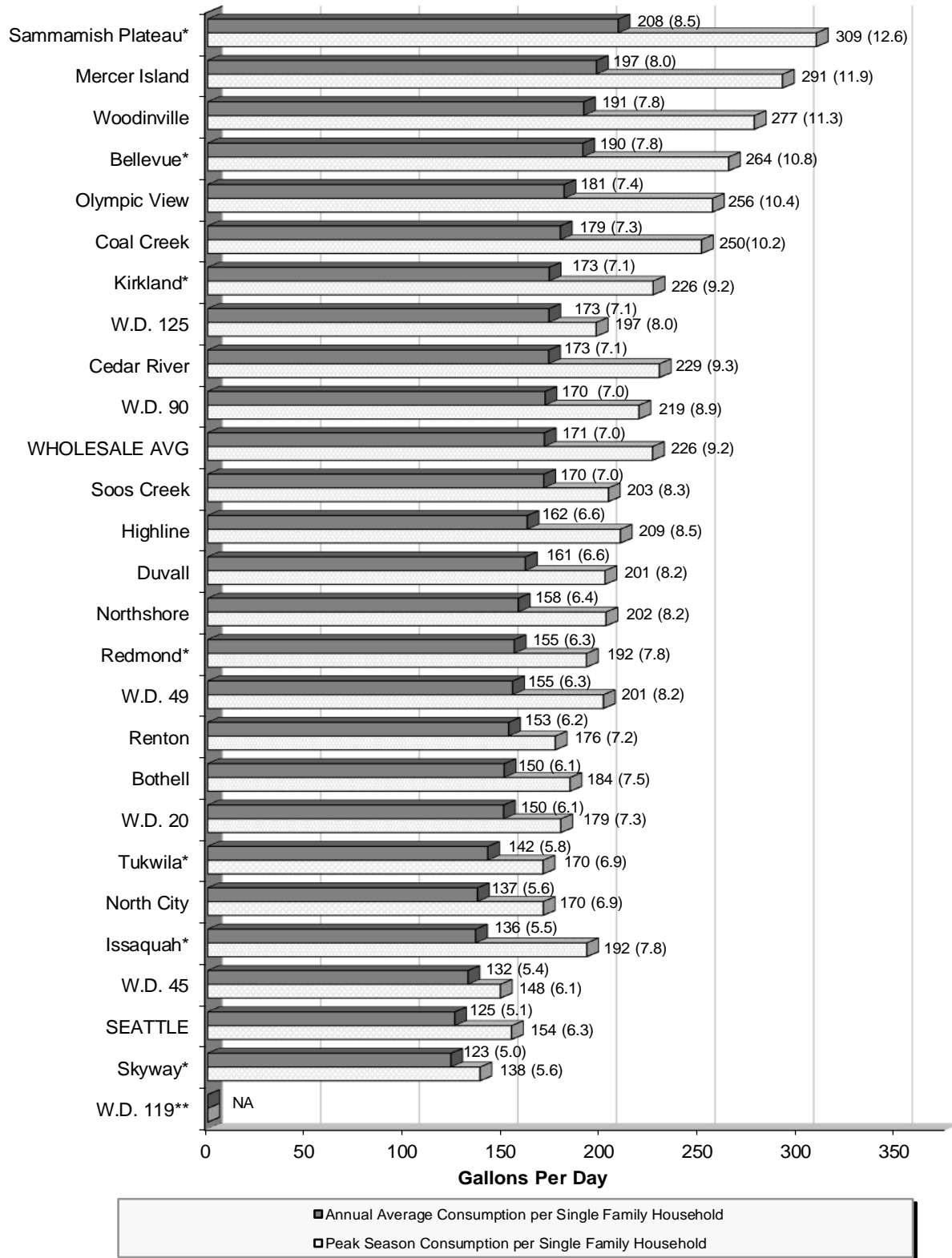
Table 2.3
Wholesale Customer Distribution System Non-Revenue Water: 2002-2016

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	1994-2016 Average
Bellevue*	6.0%	5.0%	8.6%	4.3%	NA	9.2%	12.5%	10.3%	10.9%	NA	3.5%	17.4%	2.6%	4.4%	3.9%	7.5%
Bothell	7.1%	6.6%	NA	18.7%	18.8%	4.6%	5.5%	4.7%	0.1%	6.6%	5.8%	5.0%	8.0%	2.2%	-2.9%	6.6%
Cedar River	6.3%	4.1%	7.3%	14.1%	10.0%	4.6%	1.9%	3.0%	3.9%	2.1%	-11.0%	3.9%	3.7%	4.5%	5.1%	5.1%
Coal Creek	3.3%	1.4%	10.6%	7.0%	5.9%	6.6%	8.4%	7.2%	9.6%	10.1%	8.9%	9.3%	11.4%	6.9%	15.5%	6.2%
Duvall	2.9%	10.1%	10.5%	13.1%	7.7%	4.5%	2.5%	5.2%	10.2%	7.3%	7.0%	9.3%	5.6%	12.1%	7.3%	6.5%
Highline	5.0%	5.7%	10.7%	7.8%	3.2%	7.2%	10.1%	8.2%	8.8%	8.1%	8.8%	6.4%	10.1%	12.0%	10.6%	8.5%
Issaquah*	NA	NA	NA	NA	NA	NA	13.0%	10.9%	11.8%	12.7%	9.9%	15.1%	6.6%	17.5%	19.6%	13.0%
Kirkland*	2.5%	5.0%	9.1%	0.7%	0.9%	4.5%	10.3%	7.0%	5.9%	NA	8.6%	10.3%	3.2%	4.0%	5.6%	4.7%
Lk Forest Pk	13.9%	15.4%	21.0%	6.0%	14.3%	19.4%	39.8%	24.3%	13.7%	7.5%	16.3%	19.5%	25.3%	24.3%	0.0%	13.3%
Mercer Island	0.1%	1.4%	5.3%	8.2%	7.4%	10.1%	10.4%	3.1%	-1.2%	3.5%	9.6%	10.3%	7.2%	11.2%	12.2%	6.4%
North City	0.8%	5.6%	5.4%	5.9%	7.4%	6.6%	-0.7%	1.9%	3.3%	-13.2%	-9.2%	11.0%	11.1%	9.7%	6.5%	4.7%
Northshore	6.4%	4.8%	5.0%	NA	2.5%	1.9%	0.8%	1.2%	0.9%	6.7%	2.4%	1.2%	2.5%	3.3%	4.4%	2.7%
Olympic View	-1.4%	-6.2%	2.6%	7.8%	8.5%	7.0%	5.8%	4.4%	6.1%	8.3%	8.5%	6.4%	7.5%	3.8%	4.8%	5.6%
Redmond*	6.5%	3.4%	NA	NA	NA	NA	7.2%	19.1%	26.1%	-2.5%	5.0%	5.2%	8.3%	19.0%	2.9%	5.1%
Renton	13.2%	12.1%	13.1%	14.3%	17.0%	20.2%	18.6%	16.9%	14.7%	13.0%	6.2%	9.4%	12.4%	13.3%	12.4%	13.8%
Samm Plateau*	NA	NA	NA	NA	NA	NA	9.5%	3.2%	7.8%	-1.9%	6.9%	9.5%	8.9%	7.3%	6.6%	6.4%
Skyway*	2.7%	4.3%	13.9%	20.0%	7.6%	5.1%	0.7%	4.4%	2.0%	8.1%	3.8%	6.7%	6.4%	8.5%	9.9%	7.2%
Soos Creek	10.7%	4.6%	13.4%	12.0%	9.1%	7.3%	7.5%	10.2%	9.6%	13.5%	4.0%	3.2%	2.7%	5.0%	3.2%	7.3%
Tukwila*	20.0%	14.8%	11.9%	2.4%	NA	13.3%	11.1%	9.9%	8.4%	11.3%	7.8%	7.1%	5.5%	7.0%	8.9%	12.4%
Woodinville	3.3%	5.9%	7.4%	0.3%	-0.6%	5.6%	8.5%	9.0%	5.7%	3.6%	1.0%	9.2%	3.8%	4.5%	6.2%	3.5%
W.D. 20	NA	7.6%	3.1%	5.5%	7.6%	5.4%	7.1%	10.2%	7.1%	9.6%	6.4%	10.0%	7.4%	6.0%	4.2%	6.7%
W.D. 45	-0.2%	0.9%	4.6%	7.3%	6.1%	6.1%	5.0%	5.3%	2.4%	6.3%	1.7%	6.4%	4.4%	1.5%	4.9%	2.8%
W.D. 49	1.7%	-5.4%	4.6%	-4.9%	-3.4%	5.4%	1.6%	0.4%	1.4%	14.1%	10.2%	4.5%	8.0%	8.4%	10.1%	3.6%
W.D. 90	9.3%	9.2%	11.3%	11.4%	7.7%	7.0%	11.0%	7.9%	8.6%	6.8%	12.7%	7.2%	12.1%	11.4%	15.5%	13.3%
W.D. 119**	16.0%	11.4%	15.5%	17.0%	4.4%	10.0%	7.4%	12.4%	11.5%	NA	7.4%	10.0%	NA	9.5%	NA	8.3%
W.D. 125	6.5%	15.4%	13.5%	14.4%	12.7%	12.7%	13.8%	8.5%	8.8%	7.6%	7.9%	8.6%	3.5%	7.9%	9.0%	11.0%
Wholesale Avg	6.8%	6.1%	9.4%	7.3%	7.0%	8.6%	9.7%	9.0%	9.9%	7.9%	5.3%	9.6%	6.3%	8.2%	6.8%	7.4%

* Members of Cascade Water Alliance. No history available for Issaquah, and Sammamish Plateau prior to 2008.

** Water District 119 did not provide consumption data for 2016 .

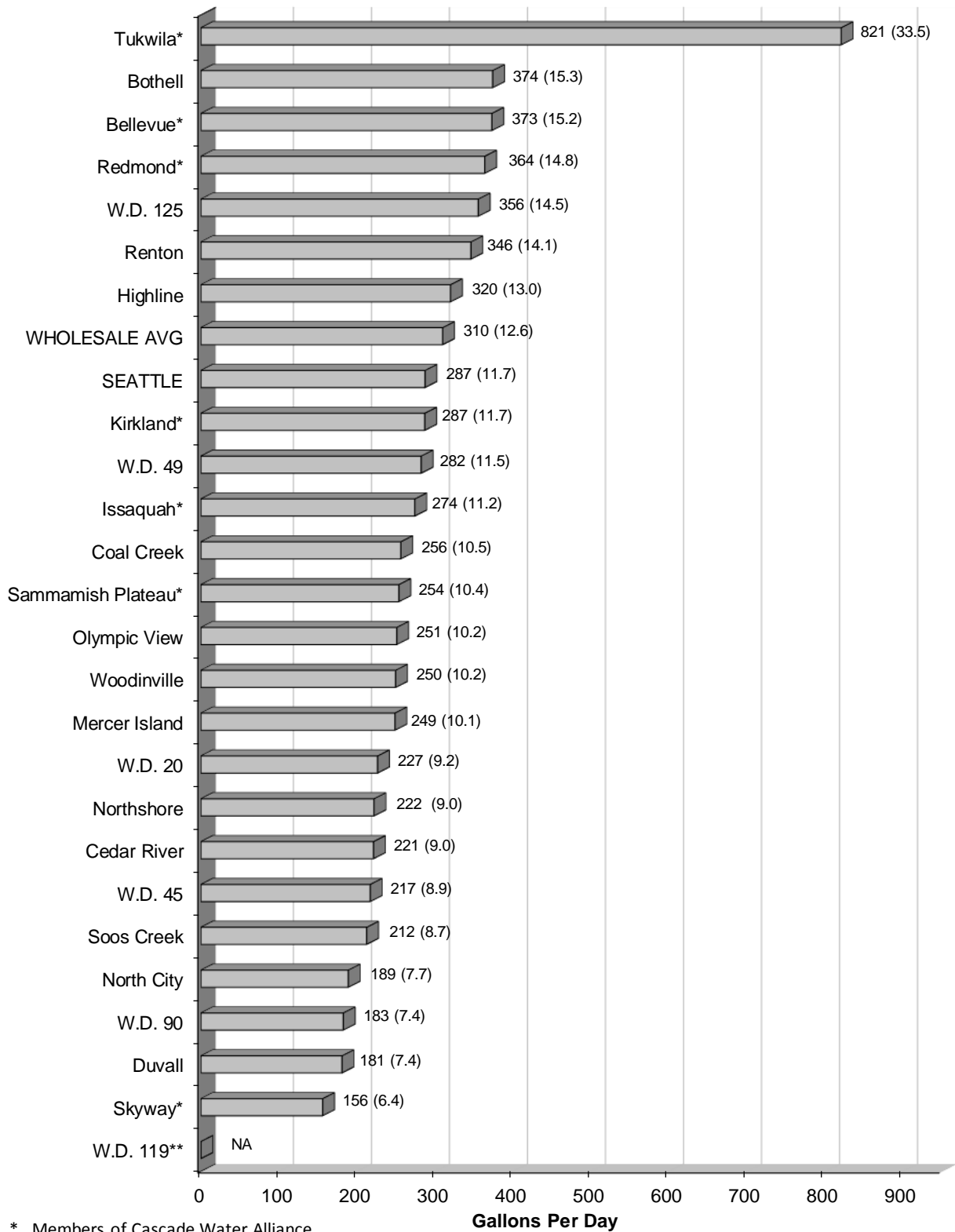
Figure 2.5
2016 Single Family Consumption per Household
in Gallons per Day (CCF per Month)



* Members of Cascade Water Alliance

** W.D. 119 did not provide data for 2016.

Figure 2.6
2016 Total Consumption per Account
in Gallons per Day (CCF per Month)



* Members of Cascade Water Alliance

**W.D. 119 did not provide data for 2016

Table 2.4

Single Family Residential Consumption per Household by Wholesale Customer: 1994-2016 (in CCF per Household per Month)

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Bellevue*	10.4	10.0	9.8	9.4	10.0	9.6	9.7	8.9	9.1	9.7	10.4	8.5	NA	8.5	7.5	8.6	7.6	NA	7.7	7.6	7.8	8.1	7.8
Bothell	8.5	7.9	8.1	7.9	8.4	7.6	8.0	7.5	7.6	8.0	NA	5.7	5.7	9.1	7.2	7.3	7.2	6.1	6.3	6.4	7.2	6.4	6.1
Bryn Mawr	NA	NA	NA	NA	NA	7.5	Merged with Skyway																
Cedar River	9.9	9.7	9.7	9.1	9.6	8.9	9.5	8.0	8.6	9.1	8.6	7.8	8.5	7.9	7.4	8.3	7.1	6.8	7.2	7.1	7.1	7.6	7.1
Coal Creek	10.1	9.5	9.4	9.2	9.9	9.1	9.1	8.0	8.6	9.3	9.4	8.2	8.9	7.9	7.7	8.5	7.1	7.0	7.2	7.3	7.3	7.7	7.3
Duvall	NA	8.6	8.3	8.9	9.7	8.1	8.8	7.1	7.2	8.4	7.6	6.8	7.4	6.4	6.9	7.6	6.6	6.7	6.1	6.1	6.5	6.6	6.6
Highline	9.2	9.0	8.6	9.0	8.8	8.3	8.5	7.6	8.1	8.2	7.9	7.5	7.6	7.3	7.0	7.5	6.6	6.5	6.5	6.4	6.5	6.7	6.6
Issaquah*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.7	6.1	5.5	5.4	5.7	5.2	5.7	5.9	5.5
Kirkland*	8.8	8.6	8.5	8.5	8.6	8.2	9.3	7.5	8.0	8.9	7.8	10.4	7.8	7.8	7.3	7.8	6.8	NA	6.9	7.0	7.5	7.3	7.1
Mercer Island	NA	10.7	9.9	9.8	11.0	10.0	10.5	9.2	10.0	10.6	10.5	9.9	9.8	8.9	8.5	9.0	7.8	8.0	8.0	7.9	8.4	8.5	8.0
North City	8.3	7.9	7.8	7.5	7.9	NA	7.7	6.7	7.0	7.4	7.0	6.5	6.5	6.3	6.8	6.7	5.8	5.7	5.7	5.8	5.7	5.9	5.6
Northshore	9.6	9.2	9.0	8.6	9.8	8.7	8.5	8.1	8.4	8.9	8.4	NA	8.4	7.6	6.9	7.4	6.8	6.5	6.8	6.7	6.2	6.8	6.4
Olympic View	9.9	9.8	9.5	8.9	9.5	9.0	9.3	8.1	9.0	9.7	9.2	8.3	9.0	8.4	8.0	8.7	7.5	7.5	7.3	7.6	7.7	7.7	7.4
Redmond*	9.4	9.0	9.1	8.7	9.1	8.6	8.3	7.7	7.7	8.2	NA	NA	NA	NA	6.5	6.6	6.4	6.1	6.3	6.2	6.3	5.2	6.3
Renton	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6.8	7.0	6.4	6.6	6.4	6.5	6.3	6.6	6.2
Sammamish Plateau*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	8.7	9.7	8.2	8.1	8.3	8.1	8.4	9.2	8.5
Skyway*	7.5	7.2	7.3	7.0	7.2	6.8	7.8	6.3	7.0	7.1	6.7	6.0	6.3	6.0	5.9	5.9	5.4	5.3	5.2	5.1	5.2	5.3	5.0
Soos Creek	8.7	8.4	8.4	7.7	8.2	7.8	7.8	7.0	7.5	8.5	8.1	6.8	6.9	7.2	7.0	7.2	6.5	6.6	7.1	7.1	7.0	6.7	7.0
Tukwila*	7.5	6.4	7.7	7.4	7.4	7.2	7.0	6.7	6.9	7.2	6.2	5.8	NA	6.6	6.2	6.7	6.1	5.8	5.9	6.0	6.1	6.1	5.8
Woodinville	12.0	11.1	11.3	10.5	11.7	10.7	11.1	10.8	10.4	11.6	10.4	9.1	10.2	8.9	8.6	9.5	7.9	7.9	8.1	8.2	8.9	8.7	7.8
W.D. 20	8.3	8.2	8.0	7.7	8.5	8.1	7.9	7.0	7.1	7.7	7.4	6.9	7.2	6.8	6.7	6.8	6.3	6.0	6.1	6.0	6.2	6.1	6.1
W.D. 45	NA	8.9	NA	NA	NA	6.8	7.5	6.8	7.6	6.9	6.4	6.2	6.4	6.3	6.0	6.2	5.9	5.7	5.7	5.5	5.5	5.6	5.4
W.D. 49	9.1	9.6	8.7	8.5	8.4	8.2	7.9	7.2	7.7	8.1	7.7	7.2	8.0	7.1	6.8	7.3	6.6	6.5	6.5	6.2	6.3	6.4	6.3
W.D. 85	NA	NA	NA	NA	NA	9.9	9.7	6.9	7.2	Merged with WD 20													
W.D. 90	NA	NA	NA	NA	NA	8.4	9.5	8.5	8.8	8.7	8.5	7.5	8.2	7.7	7.4	8.0	6.8	6.9	7.0	7.1	7.1	7.5	7.0
W.D. 119	NA	NA	NA	NA	NA	8.1	8.2	7.7	8.1	9.1	8.2	7.5	9.0	7.6	7.6	8.1	7.1	NA	7.9	7.8	NA	8.8	NA
W.D. 125	8.4	8.3	8.3	8.2	8.3	8.1	8.3	8.5	9.4	8.5	8.1	7.8	8.0	8.0	7.5	7.9	7.1	7.0	7.0	6.9	7.1	7.4	7.1
Wholesale Average	9.7	9.4	9.2	8.9	9.5	8.9	9.1	8.1	8.4	9.0	8.7	7.9	8.0	7.8	7.3	7.9	6.9	7.0	7.0	7.0	7.1	7.2	7.0
Seattle	7.9	7.6	7.4	7.1	7.1	7.1	7.3	6.5	6.7	6.6	6.4	6.0	6.2	5.9	5.7	5.9	5.4	5.2	5.3	5.3	5.3	5.3	5.1

* Members of Cascade Water Alliance. No history is available for Issaquah, and Sammamish Plateau prior to 2008.

No history is available for Renton prior to 2008. More recently, Bellevue and Kirkland did not provide data for 2011 and WD 119 did not provide data for 2011, 2014 and 2016.

Figure 2.7

Single Family Residential Consumption per Household

