



WATER DEPARTMENT MEMORANDUM

DATE: August 20, 2014

TO: Water Supply Advisory Committee

FROM: Toby Goddard

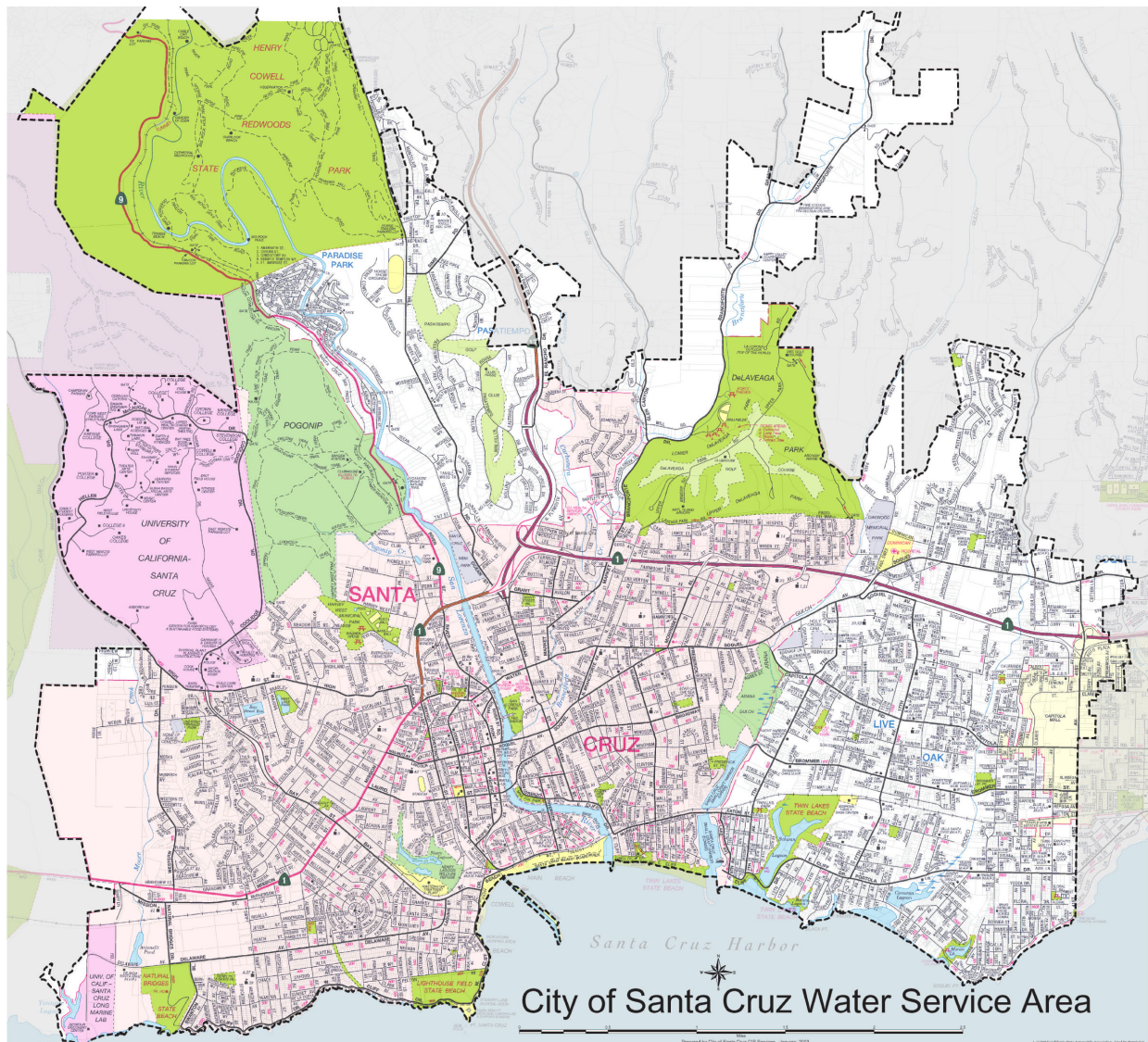
SUBJECT: Historic Water Demand Related to Growth

BACKGROUND: Growth and development in the City of Santa Cruz water service area is guided by a number of local and regional planning documents and policies, including City and County General Plans, housing elements, local coastal zone programs, University long-range development plans, and others. These planning documents not only shape land use and development; they express the values and desires of the community about the area's future physical, social, economic, cultural, and environmental character. By establishing the location, intensity, and type of land use in the region, they also have the potential to influence and shape the demand for water in the community, directly or indirectly.

This staff report is the first two parts exploring community growth and development in Santa Cruz. It provides a brief profile of the service area, describes how the Water Department currently tracks growth, and presents information on recent trends in growth and in water use. It will be followed by a subsequent report describing future growth projections in the service area and the water demand that could potentially be generated by ongoing growth.

Profile of the Service Area

The City provides water service to an area approximately 20 square miles in size, including the entire City of Santa Cruz, adjoining areas of Santa Cruz County, a small part of the City of Capitola and to selected parcels on agricultural lands north of the City. The general geographic area served by the City water system (not including the north coast) is shown in the figure below.



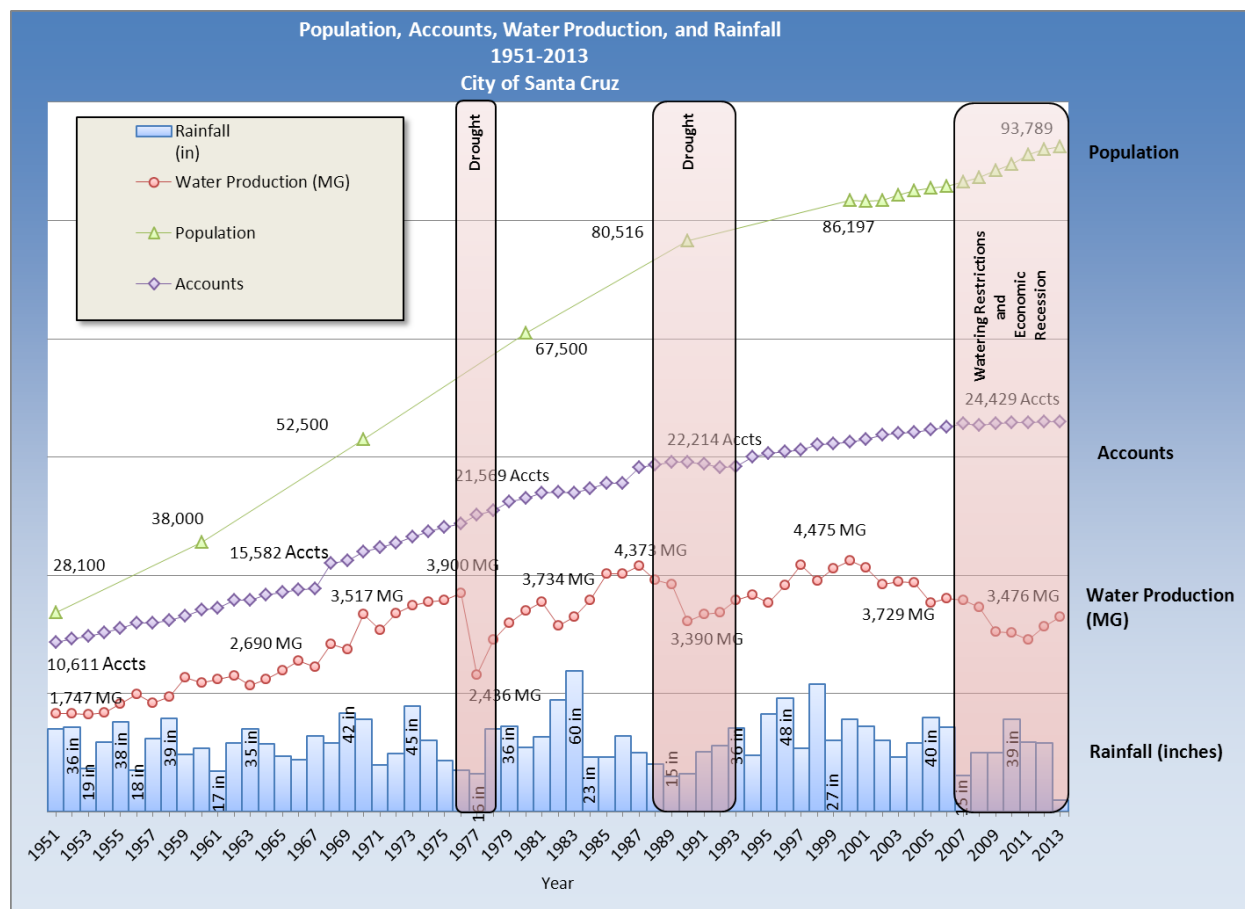
In terms of the service area boundary, the size of the service area has remained relatively fixed over time due to a long-standing prohibition against new water connections along the north coast, the acquisition of open space lands which created a greenbelt around the City, and the County's urban services boundary, all of which have served to inhibit urban sprawl. Within the City's water service area, vacant land is increasingly scarce.

Population: The present population of the service area is estimated to be 94,880, with 63,440 or 67 percent of the total population residing in the City of Santa Cruz (California Department of Finance, 2014).

Housing Units: The 2010 U.S. Census reported a total of 23,316 housing units in the City of Santa Cruz. Outside the City, it was estimated that there are another 14,500 housing units in the unincorporated area, and another 255 in the City of Capitola (City of Santa Cruz, 2010). Accordingly, the total housing units served by the City number about 38,000.

How the Water Department Tracks Growth

Population, account growth, and water production are the primary metrics the Water Department has traditionally used to track service area growth over time. The chart below shows long-term changes in these parameters going back to the early 1950s.



Beginning in 1996, the Department developed new utility billing system reports to better understand the actual water demands associated with new development.

Each year, one report is generated that identifies all new water accounts that were added during the previous year. Because these accounts are activated at different times of the year, it is not until the following year that the full annual demand associated with these accounts is available. Therefore, another, companion report was developed to look back at these same accounts one year later and add up the water they used over the first full year in service.

It is important to clarify what these billing reports represent and what they do not represent. Most major development that occurs in the service area requires a new water account and these new development projects are captured on the report. However the

changes in water use associated with remodels, additions, or tenant improvements on existing properties with an existing water service are not captured, unless the project triggers the need for a new water account. It also does not capture changes in use or occupancy that might require a larger meter to serve the property, but not a separate, new water meter. As a result, while the report gives a reasonably good approximation of how much water is associated with new development, it is acknowledged that it gives a somewhat incomplete picture of all the various types of building improvements and construction projects that are occurring throughout the community. Ultimately, the change in water use associated with these smaller construction projects is captured, whether higher or lower, and reflected in the sales reports for the existing customer base.

Another possible approach to track added water demand from growth would be to use building permit reports. However, the Water Department has found building permits are not an effective mechanism for this purpose. For one, there can be a long time lag between permit issuance, construction, final inspection, and occupancy. Second, it would be a challenging job to separate all the different types of building permits issued in each jurisdiction to assess what constitutes new development, and then try to match it to the Water Department's account classification system.

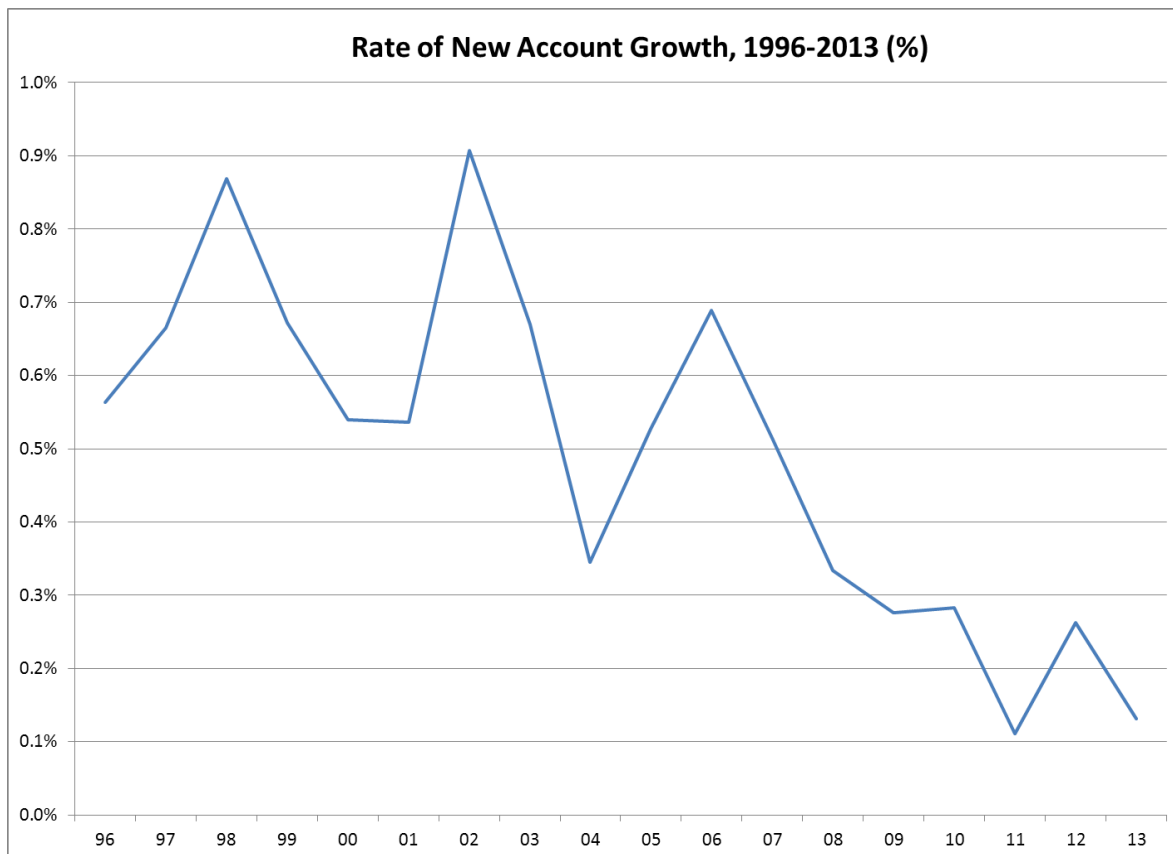
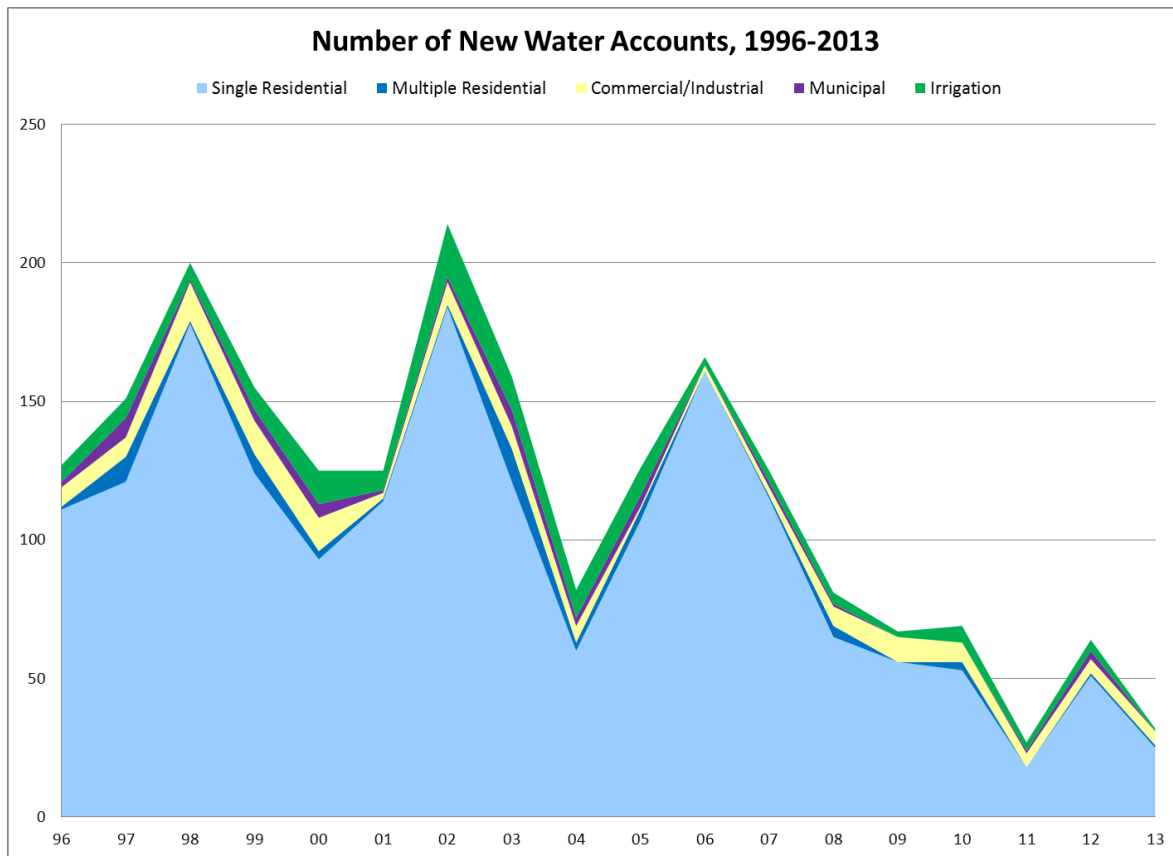
Number of New Accounts And Associated Water Demand

The chart below shows the number of new accounts added annually to the City's water system since 1996, by type of account. It reveals a number of noteworthy trends:

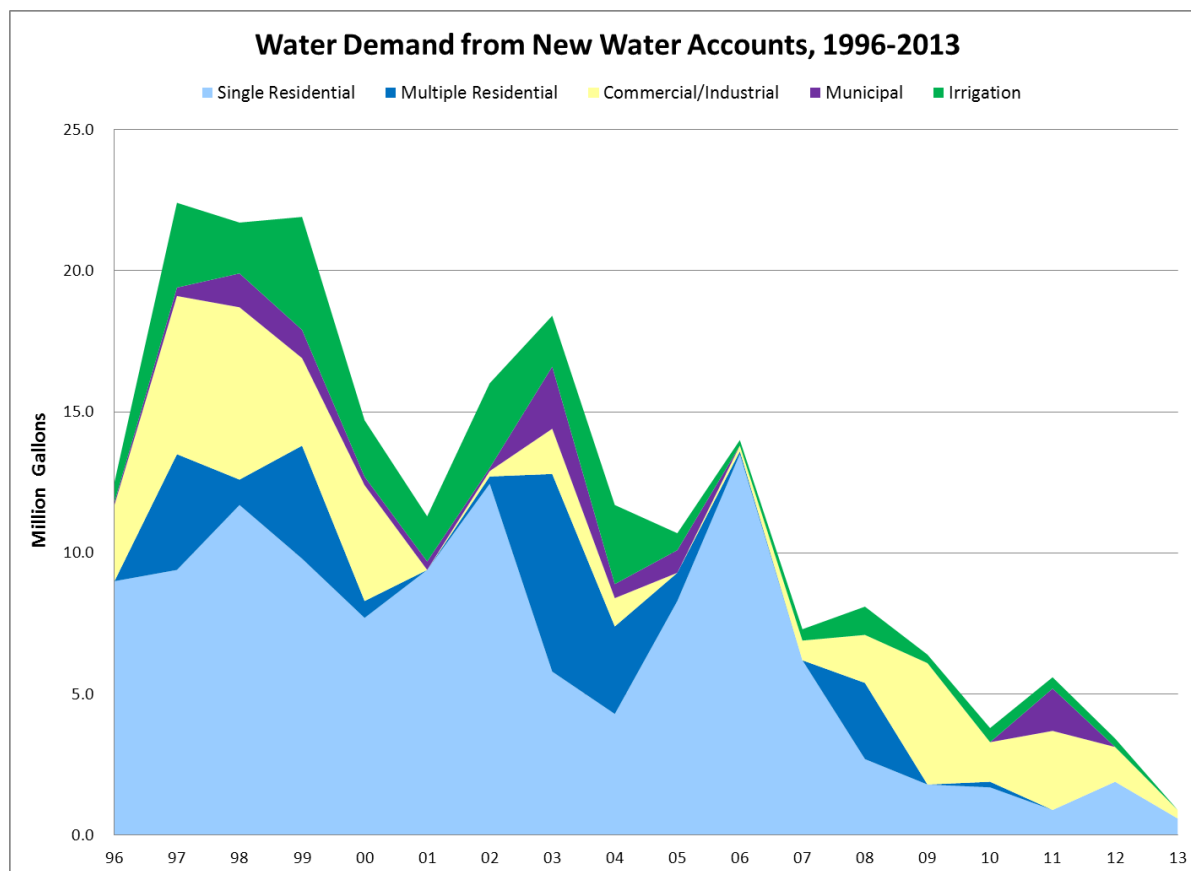
- The overwhelming majority of new accounts being added are single family residential accounts.
- There is substantial variation in the number of accounts added from year to year.
- The number of new accounts dropped significantly in 2008 and has remained low ever since.

Since 1996, a total of 2,095 new accounts have been added to the water system. During this time, the number of new accounts has ranged from as many as 214 in 2002 to as few as 27 in 2011 and averaged 116 new accounts per year. On average, there have been 98 new single residential accounts, 3 multifamily residential accounts, and 16 other (commercial, industrial, municipal, or irrigation) accounts added to the system annually since 1996.

The annual growth rate in new accounts, expressed as a percent of total accounts, has averaged from a high of 0.9 percent per year to a low of 0.1 percent per year, and has averaged 0.5 percent per year over the last 18 years.



The chart below illustrates the corresponding amount of water demand added to the system by new accounts since 1996. Over this time, new accounts have added between 22 million gallons per year in 1997 to 3 mgy in 2012, averaging just under 12 mgy¹. Like the number of new accounts, the amount of water added annually is not uniform but varies widely over time and has decreased substantially in recent years.

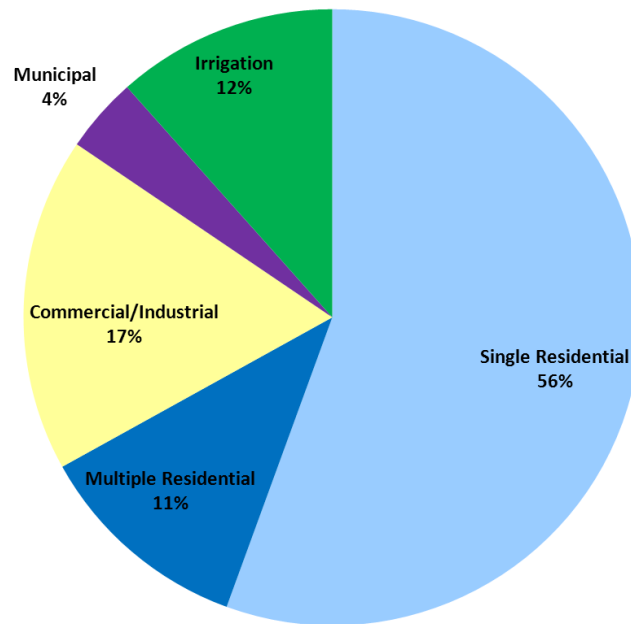


As can be seen above, even though new multifamily residential, commercial, and irrigation accounts are been relatively few in number, they tend to use more water per account than do single family accounts. As a result the distribution of new water use by customer category is different than the distribution of new water accounts. The pie chart below shows the aggregate water demand used by new accounts from 1996 through 2012, by customer category. Overall, the proportion of water used by each major customer category for these new accounts is not altogether unlike that of the service area as a whole. Roughly two-thirds of the new account consumption goes to residential uses, and the remaining one-third going to commercial, irrigation and municipal uses.

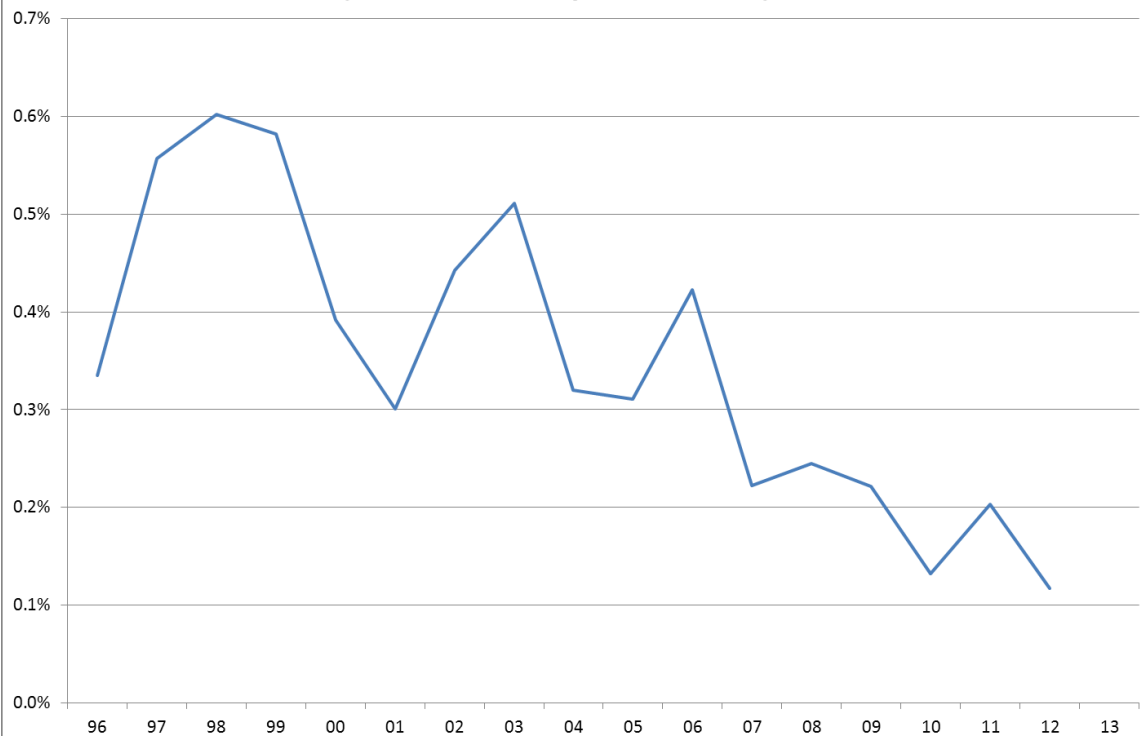
The amount of new water demand, expressed as a percent of total system demand ranges from 0.6 to 0.1 percent and averages 0.3 percent over the last 18 years.

¹ Consumption data for 2013 are incomplete and are included only as a placeholder to be updated later in 2015.

**Percentage of Water Demand in New Accounts, 1996-2013
by Customer Category**

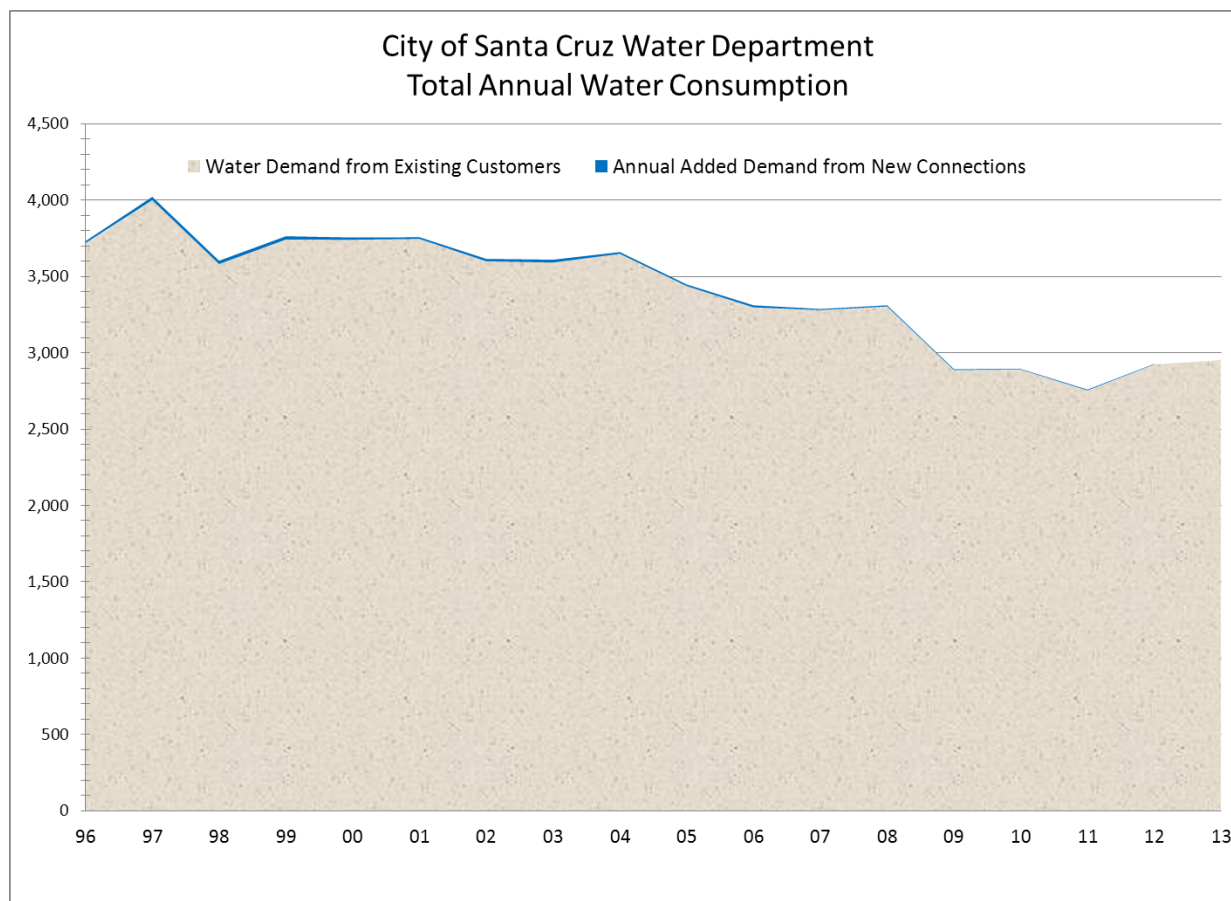


**Water Demand Associated with New Account Growth, 1996-2013
(Percent of Total System Demand)**

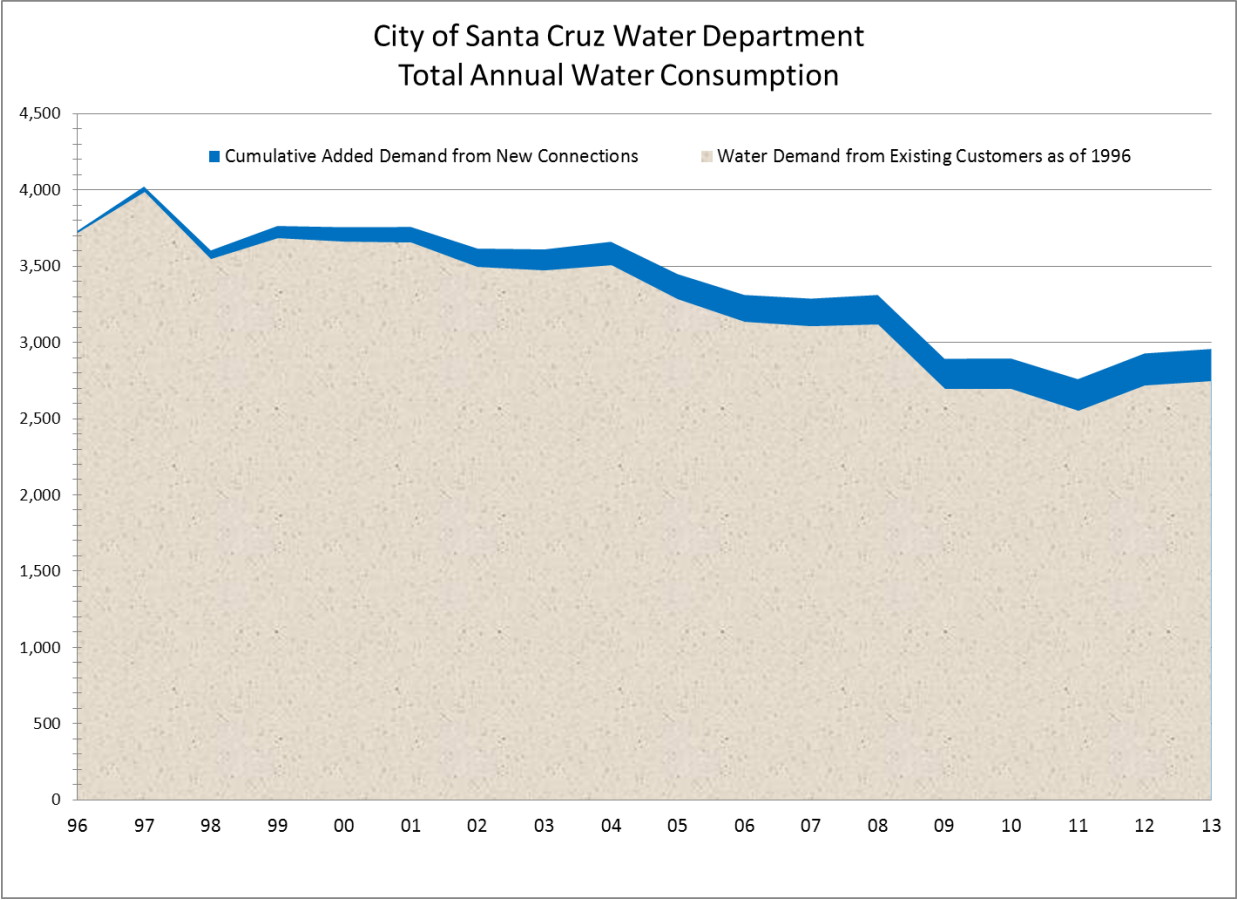


Water Demand from New Accounts Relative to Overall System Demand

Finally, it is of interest to examine how the amount of water demand associated with new accounts compares to the overall level of consumption on the system as a whole. On an annual basis, the amount of water from new connections is negligible relative to the amount of water used by all other customers, especially in recent years.



When viewed on a cumulative basis, however, the amount of water from new connections appears to be more noticeable. During the past 18 years, a total of about 211 million gallons in water demand has been added to the system from 2,095 new water accounts. This does not necessarily imply, however, that overall water demand is higher today than it was in 1996. Over that same time period, overall metered water consumption has declined from 3.7 billion gallons in 1996 to less than 3.0 billion gallons in 2013, even with new water demand. There are a number of reasons that have contributed to this decline, including loss of industry, rate and rate structure changes, water restrictions, economic downturn, plumbing code changes, and long-term conservation effects. But because the influence from new accounts is still relatively small compared the existing customer base, it is larger changes on the base, and not water demand new accounts, that determines the overall direction of water use, which has been generally downward in recent years.



Attachment:

- 1. Data Table

Attachment 1. Data Table for Historic Water Demand Related to Growth

Year	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total	Average	Percent
New Service Connections	127	151	200	155	125	125	214	159	82	126	166	125	81	67	69	27	64	32	2,095	116	
New Water Demand (mgd)	12.5	22.4	21.7	21.9	14.7	11.3	16.0	18.4	11.7	10.7	14.0	7.3	8.1	6.4	3.8	5.6	3.4	0.9	210.8	11.7	
New Service Connections																					
Single Residential	111	121	178	124	93	114	184	121	60	107	161	115	65	56	53	18	51	25	1,757	98	83.9%
Multiple Residential	1	9	1	7	3	1	1	12	3	4	0	1	4	0	3	0	1	1	52	3	2.5%
Commercial/Industrial	7	7	14	12	12	2	8	8	6	1	2	3	7	9	7	5	5	5	120	7	5.7%
Municipal	2	7	1	4	5	1	2	6	3	4	0	2	1	0	0	1	3	0	42	2	2.0%
Irrigation	6	7	6	8	12	7	19	12	10	10	3	4	4	2	6	3	4	1	124	7	5.9%
Total	127	151	200	155	125	125	214	159	82	126	166	125	81	67	69	27	64	32	2,095	116	100.0%
New Water Demand (mgd)																					
Single Residential	9.0	9.4	11.7	9.8	7.7	9.4	12.5	5.8	4.3	8.3	13.5	6.2	2.7	1.8	1.7	0.9	1.9	0.6	117.2	6.5	55.6%
Multiple Residential	<0.1	4.1	0.9	4.0	0.6	<0.1	0.3	7.0	3.1	1.0	0.1	0.0	2.7	0.0	0.2	0.0	<0.1	<0.1	24.0	1.3	11.4%
Commercial/Industrial	2.7	5.6	6.1	3.1	4.1	<0.1	0.2	1.6	1.0	0.0	0.2	0.7	1.7	4.3	1.4	2.8	1.2	0.3	37.0	2.1	17.5%
Municipal	0.1	0.3	1.2	1.0	0.3	0.3	0.1	2.2	0.5	0.8	0.0	0.0	<0.1	0.0	0.0	1.5	<0.1	0.0	8.3	0.5	3.9%
Irrigation	0.7	3.0	1.8	4.0	2.0	1.6	3.0	1.8	2.8	0.6	0.2	0.4	1.0	0.3	0.5	0.4	0.3	<0.1	24.4	1.4	11.6%
Total	12.5	22.4	21.7	21.9	14.7	11.3	16.0	18.4	11.7	10.7	14.0	7.3	8.1	6.4	3.8	5.6	3.4	0.9	210.8	11.7	100.0%
Existing water accounts																					
Growth Rate (%)	22,557	22,694	23,024	23,061	23,170	23,310	23,590	23,724	23,799	23,924	24,096	24,305	24,228	24,310	24,351	24,357	24,425	24,429			0.5%
	0.6%	0.7%	0.9%	0.7%	0.5%	0.5%	0.9%	0.7%	0.3%	0.5%	0.7%	0.5%	0.3%	0.3%	0.3%	0.1%	0.3%	0.1%			
Annual Water Demand																					
Growth Rate (%)	3,731	4,022	3,603	3,763	3,755	3,757	3,615	3,602	3,659	3,447	3,311	3,287	3,311	2,893	2,874	2,759	2,928	3,042			0.3%
	0.3%	0.6%	0.6%	0.6%	0.4%	0.3%	0.4%	0.5%	0.3%	0.3%	0.4%	0.2%	0.2%	0.2%	0.1%	0.2%	0.1%				