



**WESTERN RESOURCE
ADVOCATES**

Arizona Water Meter

A Comparison of Water Conservation Programs in 15 Arizona Communities

Executive Summary

Water supplies in Arizona are already a precious resource. Given estimates that the state will almost double in population over the next 45 years, water supply challenges are only going to become more difficult. Western Resource Advocates (WRA) supports urban water conservation as a no-regrets strategy to increasing water supplies—one that is often cheaper, faster, and smarter than “traditional” water supply approaches. Maximizing water conservation efforts and programs across the state will allow Arizona to do more with less.

This report highlights the water conservation programs of 15 Arizona communities and evaluates their programs by seven important water conservation criteria. The communities are Buckeye, Casa Grande, Chandler, Clarkdale, Lake Havasu City, Mesa, Payson, Peoria, Phoenix, Prescott, Safford, Scottsdale, Sierra Vista, Tucson, and Yuma. These communities represent a diverse cross-section of municipal water providers, and are varied with respect to size, budget, geographic location, ownership structure, and regulatory program. By presenting a broad sample of current conservation practices, utilities, researchers, policy makers, and local communities can make informed decisions about the possibilities that exist for improvement in their own programs. Everyone benefits when we learn from one another.

Per Capita Water Use

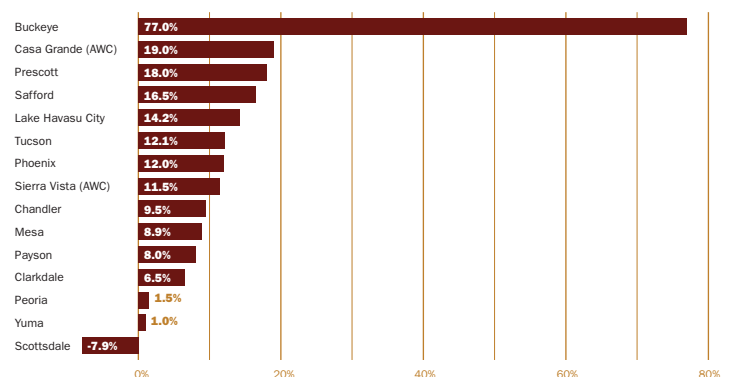
One of the most common measures of a utility’s water use is how much water is used by each person in the service area each day, often described in gallons per capita per day (GPCD). Several communities in Arizona are currently using

less than 100 GPCD in the single-family residential (SFR) sector, including Buckeye, Payson, Clarkdale, Prescott, and Casa Grande. Extensive turf landscaping is not the norm in these communities, and several are predominantly composed of newer homes that were built with more water-efficient appliances and fixtures than what was available even 10 years ago.

Land use planning policies that limit the amount of high-water-use landscaping or ensure that plantings come from a desert-appropriate list are a few of the ways these communities are achieving low water use in the SFR sector. In Arizona, the vast majority of SFR water use goes to outdoor irrigation, so methods and practices that target and reduce outdoor use can be very effective at improving water use efficiency.

Trends in system-wide water use are also important because they show how cities are becoming more water-efficient overall. The majority of communities evaluated in this

FIGURE ES-1. REDUCTION IN SYSTEM-WIDE PER CAPITA WATER USE (2003-2008)





report reduced system-wide water use by more than 10% between 2003 and 2008 (Figure 1)—a notable achievement. Interestingly, communities with the lowest SFR rates in 2008 are not necessarily the same ones that achieved the greatest reductions in system-wide use, pointing to the variable effectiveness of different water conservation approaches.

Water Rate Structures

Water rate structures play an essential role in communicating the value of water to utility customers. They are also one of the most powerful conservation tools. There are a number of ways to structure water rate consumption charges, including uniform (flat), seasonal, and inclining block rates—all of which are used in Arizona.

Inclining block rates are generally the most effective at communicating the value of water, but they are not the only factor affecting the price paid by consumers. A customer's bill includes volumetric consumption charges, fixed service fees, and, sometimes, additional service charges. All of these charges are reflected in the average price of water, the total bill divided by the total gallons used. Conservation-oriented rate structures have an average price curve that slopes upwards, communicating that the more water a customer uses, the more expensive each gallon of water becomes.

There is tremendous variation in the design of water rate structures for communities in this report, and

a commensurate variation in their effectiveness at communicating the value of water. In general, water consumption charges across Arizona are cheap, with some utilities charging as little as \$1.00 per thousand gallons. Tucson, Prescott, and Buckeye have exemplary water rate structures for incentivizing conservation, which all could serve as a model for how to price water in Arizona.

Conservation Measures

Conservation measures raise community awareness and motivate residents to use water more efficiently. These measures are often the most publicly recognized form of water conservation implemented by a utility and are an integral part of the community's water management strategy.

The most popular water conservation measures used by communities in this report are messaging and youth education programs. Special events, adult education and training programs, and residential audit programs are also widely employed. Outdoor-specific conservation measures, such as a Xeriscape demonstration garden, landscape consultations, and smart irrigation, are appropriate for Arizona, given the large quantity of water used for outdoor watering; however, less than a third of the communities in this report sponsor this type of conservation measure. Large landscape programs and commercial and industrial conservation measures also appear to be suitable for, and underutilized by, Arizona water providers.



Conservation Ordinances

Well-designed and properly enforced ordinances can impact 100% of a utility’s customer base and thus play a unique role in establishing water use rules and appropriate behavior. In Arizona, state and local statutes and regulations have been critical in promoting wise water use, protecting utility infrastructure, and assuring that municipalities have adequate water supply to support population growth.

The most enacted type of ordinance for communities in this report prohibits water waste, which generally bars people from allowing excess water to escape from their property and create a hazardous condition. Ordinances restricting water features or water-intensive landscapes and those that describe the proper time to irrigate are also popular, with more than two-thirds of municipalities implementing some type of ordinance in these categories. These measures are appropriate for Arizona.

Payson, Sierra Vista, and Clarkdale use ordinances to establish appropriate water use more than any of the other communities. Yuma and Safford rely the least on ordinances.

Funding

To operate a successful water conservation program, it is essential to adequately fund and staff the program. Without money and time, conservation efforts cannot decrease per capita water use.

The town of Payson spends \$7.07 on conservation programming for each person in its service area—nearly \$3.00 more than the next big spender (Figure 2). Payson, coincidentally or not, also has the second-lowest rate of single-family residential water use out of all the utilities

examined in this report. The majority of providers examined spend in the range of \$1.00 to \$2.00 on water conservation for each person in their service area. Major exceptions include the cities of Casa Grande and Sierra Vista, which are supplied water by the private utility, Arizona Water Company (AWC).

Water Loss

While much of this report is focused on conservation programs that encourage efficient use by customers, studies have shown that the amount of water providers can save by improving supply efficiency, such as reducing leaks, can eclipse the quantity of water saved by individual customers.

Water providers are implementing a number of different measures to reduce water loss, as shown in the “Supply-Side Efficiency Measures” section of the utility summaries (Appendix B). In turn, these measures influence the percentage of water loss recorded by each utility, which realistically ranges between 2.5% and 12% for the providers studied.

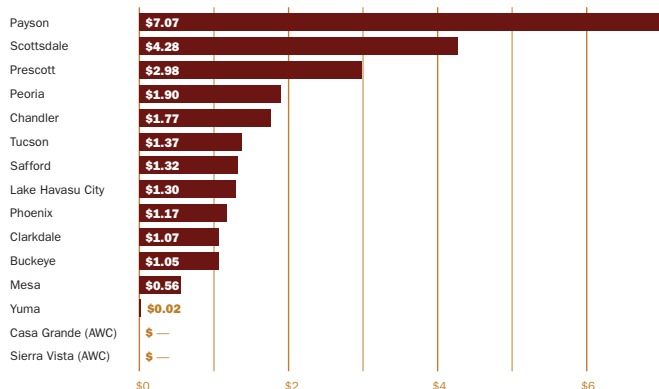
An active leak detection and repair program is a crucial conservation measure for any utility. Casa Grande, Chandler, Lake Havasu City, Mesa, Peoria, Phoenix, and Sierra Vista have implemented this type of program. Meter replacement programs are another important method for reducing system losses because meters wear out over time and then under-report water use. For example, Scottsdale has replaced 27,300 meters over the past four years, recovering as much as \$5.6 million in revenues from what would have been lost using leaky meters.

Effluent Use

In an arid state such as Arizona, it is vital to maximize the use of water supplies. Highly treated wastewater (known as effluent, reclaimed water, or recycled water) is appropriate to use for many non-potable purposes. Every gallon of effluent that is used displaces the need for a gallon of scarce and valuable drinking water.

Every provider studied is utilizing its effluent for some purpose, and the majority are putting all of their effluent to beneficial use. The two most common uses for effluent are to recharge groundwater supplies and irrigate high-water-use landscapes, such as golf courses.

FIGURE ES-2. PER CAPITA FUNDING FOR WATER CONSERVATION IN 2008





Scoring

Based on WRA’s decade-long experience in evaluating water conservation practices, we developed a rating for each water utility’s conservation program. Our 100-point scoring system uses the seven criteria described above: per capita water use, water rate structures, conservation measures, conservation ordinances, funding, water loss, and effluent use.

Although comparative analysis of multiple water providers can be difficult because providers track and report information differently, we made every effort possible to ensure that the data presented compares equivalent information from each of the 15 utilities. Furthermore, this report represents a true “snapshot” of water conservation activities and data from a select group of years. Conservation programs and results are constantly evolving over time, and we make no assumption that scoring results in this report would be the same if it were redone next year.

According to our scoring methodology, Prescott maintains the most comprehensive water conservation program out of the water providers in this report, with Tucson, Phoenix, and Payson rounding out the top four (Table 1). Several of the conservation measures these providers are implementing can be useful models for how to improve programs in lower-scoring communities.

WRA’s scoring system substantively compares water conservation programs; it is systematic and transparent. However, our rankings should not be used to penalize any water provider. Instead, we hope that water providers will learn from each other. It is WRA’s intent to present a sample of conservation practices, regulations, and programs that can be used by researchers, policy makers, and local communities in enhancing their water conservations programs. We will use the information in this report as a stepping-stone that leads towards the improvement of water conservation efforts across Arizona. We hope others will do the same.

This report was prepared by Drew Beckwith, WRA’s Water Policy Analyst; and Jorge Figueroa, Water Program Researcher. It was funded through a grant from the Walton Family Foundation.

Download the full report, at: www.westernresources.org/azmeter

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Western Resource Advocates’ mission is to protect the West’s land, air, and water. Our lawyers, scientists and economists:

- 1) advance clean energy to reduce pollution and global climate change; 2) promote urban water conservation and river restoration; and 3) defend special public lands from evergy development and unauthorized off-road vehicle travel.

We collaborate with other conservation groups, hunters and fishermen, ranchers, American Indians, and others to ensure a sustainable future for the West.



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TABLE ES-1. ARIZONA WATER METER SCORING

	Maximum Points	Prescott	Tucson	Phoenix	Payson	Clarkdale	Sierra Vista (AWC)	Lake Havasu City	Chandler	Scottsdale	Mesa	Peoria	Buckeye	Safford	Casa Grande (AWC)	Yuma
Per Capita Water Use	[25]															
SFR GPCD	10	8	8	6	10	10	8	6	4	0	6	4	0	4	6	6
System-Wide Trend	15	12	12	9	9	9	9	12	6	3	12	3	3	15	3	9
Rate Structure	[25]															
Slope	20	20	20	15	10	10	0	10	5	5	5	5	15	0	0	0
Thresholds	5	3	2	0	3	0	0	2	2	2	0	0	2	0	3	0
Conservation Measures	[15]															
Number of Measures	8	5	6	5	5	1	5	3	5	7	3	5	2	1	1	1
Assessment of Measures	7	6	5	7	2	1	0	1	7	6	3	5	3	0	3	1
Conservation Ordinances	15	10	6	7	13	12	15	6	8	8	8	5	7	4	5	2
Funding for Conservation	5	5	3	3	5	3	0	3	4	5	2	4	3	3	0	1
Water Loss	10	2	0	8	1	10	7	0	1	5	4	9	6	0	3	1
Effluent Use	5	5	3	5	3	4	5	5	5	5	2	4	2	5	2	5
Total Points	100	76	65	65	61	60	49	48	47	46	45	44	43	32	26	26