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Natural Outlook, Summer 2002

Turning Off the Tap

Conservation measures called the cheapest source of new water.

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In El Paso, green lawns are becoming a dwindling commodity, thanks to the city's campaign to replace turf grass with desert landscaping. San Antonio has built one of the largest recycled wastewater systems in the country. And Austin is reaping the benefits of having pioneered many of the conservation measures now commonplace in municipal programs.

These three cities have blazed a path in the increasingly important arena of municipal water conservation, according to Carole Baker, legislative chairman in Texas for the American Water Works Association. "El Paso and San Antonio have been very aggressive in their strategies to save water," she says. "And Austin made its name by being progressive. It was out there early, trying out conservation strategies."



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All three cities have demonstrated "just what can be done, that you can make substantial reductions in water use when you're willing to look across the board" at the possibilities, adds Baker.

With the state's booming population and industrial growth expected to continue, studies show that in just a few decades water needs will surpass water availability.

Baker, a longtime water activist, says that "we should bring a sense of urgency" to getting all municipalities on the conservation bandwagon, noting that El Paso, San Antonio, and Austin were able to raise the public's awareness and demonstrate that conservation is the most cost-effective strategy for expanding water supplies.

Natural Outlook looks at how these cities achieved success in their water conservation programs.

Life in the Desert

El Paso officials took time to pat themselves on the back when an analysis in 2001 showed water usage down by 1 billion gallons from the year before. Then it was back to the drawing board to find more ways to restrict water use.

In a continued push for water savings, the city has cracked down on formerly routine patterns of water consumption. A new era of strict conservation affects everything from charity car washes to some business practices. Planners also have evaluated strategies for future water resources.

Among the conservation requirements are year-round limits on outdoor watering: sprinklers may run only during certain hours and on designated days; washing sidewalks and driveways with a hose is prohibited; and swimming pools should be covered when not in use to reduce evaporation.

Scofflaws had best beware, because municipal "water cops" drive around looking for anyone watering on the wrong day, running sprinklers during the wrong time, or allowing water to run down the street. Inspectors have been known to issue citations at 4 a.m. when they see water being used illegally. The Class C misdemeanor can result in fines of up to \$500.

"If we catch you wasting water, we'll enforce the ordinance all the way to municipal court, if necessary," says Water Conservation Manager Anai Padilla. "We live in a desert, so we should not take water for granted."

In another step, the city has begun paying residents and businesses to dig up their turf and replace thirsty lawns with environmentally sensitive landscapes. Many El Pasoans are taking



up the city's offer to pay \$1 for every square foot of grass removed. The \$750,000 budgeted for this year's turf rebates is going quickly, Padilla says.

Anyone who wants to stick with green lawns faces new restrictions: It is illegal to plant grass on a slope because the runoff ends up in the gutter. Planting grass is limited to half the landscape of newly built homes, and one-third for new commercial sites. Builders must fill out the remainder with trees, shrubs, and groundcover that are adapted to the region.

Officials also have banned charity car washes, explaining that the worthwhile events use far more water than commercial car washes. Now fund-raisers must be held at a commercial car wash. Newly built car washes have their own restrictions: only 50 gallons may be expended per vehicle.

Dealing with water shortages is nothing new to El Paso, which only receives 8 to 9 inches of rain a year, on average. But rapid population growth is placing unprecedented demands on the existing water supplies.

"It's not that we're running out of water, we're running out of fresh, inexpensive water," explains Padilla.

El Paso's water comes from the Rio Grande and two aquifers: the Hueco and Mesilla bolsons. The Rio Grande, however, is not reliable during droughts, and the freshwater reserves in the bolsons, which are shared with New Mexico and Mexico, are being depleted at the current rate of pumping.

To ensure long-term water reserves, city leaders are pursuing strategies such as desalination and water importation. But the most cost-effective alternative is conservation. Padilla said the water conservation rebate and incentive programs have been popular and effective. For example, when the city began giving away 200,000 low-flow showerheads, so many recipients showed up that the El Paso Water Utilities had to call for assistance in handling traffic. The utility's "Cash for Commodes" program has persuaded many customers to swap old toilets for the ultralow-flow toilets that use only 1.6 gallons per flush—currently there is a three-month waiting list.

More recently, water utility officials have been encouraging residents to give up their old evaporative water coolers in favor of refrigerated air conditioners. Those rebates are available, as are incentives for buying water-efficient clothes-washing machines.

To further ease demands on the aquifers, El Paso has entered the business of water recycling, in which treated wastewater is provided to businesses and government agencies. Drinking the recycled water is off limits because it has only gone through secondary treatment, but it is of sufficient quality to be used for irrigation or industrial purposes.

Customers include parks, schools, golf courses, and some manufacturers, such as a local jeans maker.

About 30 miles of pipelines are providing 5,400 acre-feet of recycled water a year to customers, who pay only half of what they would for drinking-quality water. Another five miles of pipelines will be in operation next year when the zoo, a cemetery, and other clients join the water reclamation project. By the end of 2002, the recycling capacity will grow by another 1,200 acre-feet a year. Utility officials have spent \$30 million on infrastructure so far, a move that allows them to meet peak demands for some of their largest users.

Meanwhile, to discourage waste of fully treated potable water, the city has raised water rates twice since 1997. Under the theme "the more you use, the more you pay," the per-gallon cost escalates with the volume used.

The city also has moved to more than double its water treatment capacity and has approved plans to go into the desalination business with Fort Bliss. It has bought two ranches overlying West Texas aquifers and has an option to buy water in adjoining Hudspeth County. The goal is to be in a position by 2010 to no longer need freshwater from the Hueco Bolson and to leave that underground source as a reserve during times of drought.

San Antonio Expands Water Options

When summers are unusually dry, all eyes in San Antonio stay focused on the underground water levels in the Edwards Aquifer. Well levels are posted daily, and when the levels dip, residents prepare to go into graduated stages of water restrictions.

That's because San Antonio and several surrounding cities rely on a primary source of drinking water: the Edwards Aquifer, which runs under six counties and provides chlorine-free drinking water to more than 1.7 million people. In San Antonio alone, 92 wells pump 136 million gallons of water a day to homes and businesses. If the aquifer gets too low, endangered species are threatened.

The Edwards Aquifer is rechargeable, thanks to a complex series of faults and underground caves that receive rainfall. But no one knows how much



usable water it contains. Meanwhile, the aquifer continues to serve growing daily demands for municipal drinking water, commercial, agricultural, and recreational interests.

Due to increased needs, limitations of permitted withdrawal rights, and periodic droughts, the San Antonio Water System (SAWS) has been working to develop additional sources of water.

Serving one of the fastest growing areas in the country, the city-owned utility began long-range water planning in 1996, when a severe drought led to a temporary doubling of water bills.

"That raised the intensity around water issues for everyone," recalls Calvin Finch, SAWS water conservation manager. Since then, San Antonio has been in drought conditions every other year, he notes, and the whole community has become aware of the need for new attitudes and behaviors.

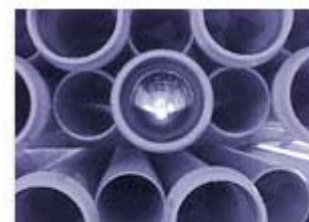
"You hear there's a negative attitude in some communities about conservation programs, but not here," says Finch. "Our residents have been very responsive to our incentives, low-flow devices, and water restrictions. It just shows that everybody needs to be on the conservation team."

Finch said one of the biggest water savers has been the conversion to the low-flow toilets, which he estimates saves 11,000 gallons a year on each unit installed. SAWS did 24,000 conversions last year. The utility also offers free residential and commercial conservation audits and incentives for conversions to Xeriscape landscaping. Businesses can benefit financially by installing water-saving equipment.

A major component of conservation is recycling treated wastewater. SAWS has completed the first phase of a project to provide 35,000 acre-feet of reused water a year for irrigation and industrial uses. That amount represents 20 percent of the city's current annual demand on the Edwards Aquifer, leaving that portion available for potable purposes. Recycled water also ensures business and industry a reliable water supply.

San Antonio's four water recycling centers and 74 miles of pipelines make it one of the country's largest water recycling operations. Built at a cost of \$125 million, the system supplies about 7 billion gallons of treated water a year from wastewater treatment plants.

As for costs, new and existing SAWS customers pay \$320 an acre-foot for recycled water, but are exempt from several fees, which makes the



Installing purple pipelines has been an ongoing project for the San Antonio Water System as it completes phase one of a project to distribute treated effluent for irrigation purposes. / Photo by San Antonio Water System

recycled water less expensive than fully treated water. Exchange customers who trade their Edwards Aquifer pumping rights for recycled water pay \$85 an acre-foot for recycled water.

SAWS is looking at other means to supplant aquifer water. Last year, San Antonio opened its first surface water treatment plant, a \$30 million computerized ultrafiltration facility that produces 10 million gallons of drinking water a day.

This year, San Antonio signed an agreement with the Lower Colorado River Authority to explore the feasibility of a long-term water contract. After a seven-year study to analyze estimated costs and environmental impact, San Antonio will decide whether to accept an 80-year water deal that includes building reservoirs on the Colorado River. The city would receive as much as 150,000 acre-feet of water a year through a pipeline starting near Bay City.

Also, SAWS and the Guadalupe-Blanco River Authority (GBRA) have agreed to divert surface water from the Guadalupe River—about 70,000 acre-feet a year initially—at a point in the Lower Guadalupe River Basin about 133 miles from San Antonio.

A companion agreement between SAWS and the San Antonio River Authority (SARA) will divide the rights and responsibilities of the purchases of this water supply with GBRA. This allows SARA water users to participate in the water supply from the Lower Guadalupe River.

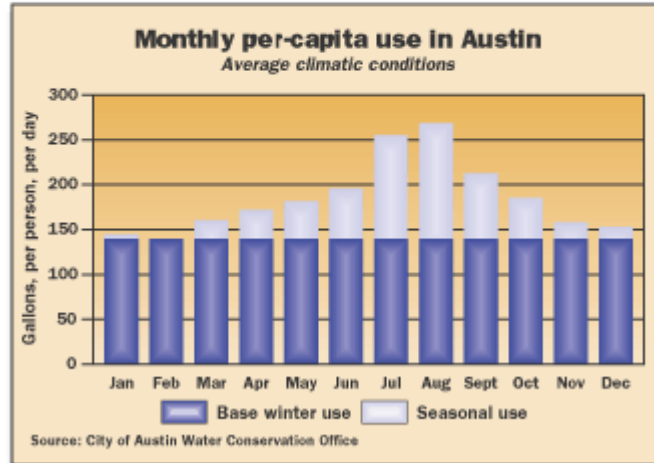
Much of the financing for expansion plans comes from the San Antonio City Council's agreement in 2000 to raise water rates over a five-year period to buy water from new sources.

Capital City Achieves Water Savings

Austin's ground-breaking experience in water conservation goes back almost two decades. The city was the first in Texas to pioneer a number of comprehensive water savings measures.

Demand Peaks in Hot Weather

Like most cities, Austin's water consumption soars with the temperatures as residents turn the hoses on parched lawns, shrubs, and trees. That's why many municipalities are urging residents to landscape with drought-tolerant plants and to water only when necessary.



In the early 1980s, the city began to tout Xeriscaping, a puzzling new term at the time that meant designing landscapes with low-maintenance plants, shrubs, and trees that were native to the area and made low water demands. In 1991, Austin changed its plumbing code to require the use of ultralow-flow toilets. The city gave away the new models to motivate the public to make the switch from the existing high water-use toilets.

Since then, Austin's rebate program has expanded from low-flow toilets and showerheads to include efficient front-loading clothes washers, drought-tolerant native plants and buffalo grass, and rain barrels to catch runoff from rooftops.

Of late, rainwater harvesting has received special emphasis as the city has sold—below cost—thousands of rain barrels to residents who hook up the 75-gallon plastic containers to their down spouts, and it pays \$500 rebates to homeowners and companies installing tanks that hold up to 20,000 gallons of rainwater. Some of Austin's largest employers are capturing storm water for irrigation purposes.

Recently, the city instituted free irrigation audits—aimed at users of more than 20,000 gallons a month—to help owners of automatic underground watering systems develop more



Plastic barrels are becoming a fixture at more and more Austin households, thanks to the city's promotion of rainwater harvesting. Rainwater captured from the roof is used to irrigate a homeowner's lawn and garden. / Photo by city of Austin

efficient watering schedules.

"All this began out of necessity," recalls Tony Gregg, the city's water conservation manager. "In the mid-1980s, our drinking water treatment plants could not keep up with the rapid population growth. Summertime water rationing soon became necessary so that the demand from customers would not exceed the daily capacity of our water treatment plants."

One of the most ambitious measures has been the use of financial incentives to address high-volume water use by business and industry. Austin firms can receive \$1 for every gallon saved per day, up to \$40,000. The offer has been popular among several high-tech companies that used the rebate to substantially boost the water efficiency of their manufacturing processes.

The payoff for these conservation efforts, Gregg estimates, is a savings of 8 million gallons a day, on average.

Still, he says, education efforts must continue to reinforce the message that "water is a valuable resource that should be used wisely and carefully.

"A lot of people have gotten this message," he says, but the fact that Austin and many Texas cities attract a large number of affluent families will put more demand on water supplies.

"Affluence leads to more water usage as people buy Jacuzzis, build swimming pools, and purchase larger lots they think need to be watered. Even as water becomes more expensive to use, if some people can afford to pay \$1,000 a month, they'll use all the water they want. That's why we have to continue our education program, so conservation becomes the community norm and everybody knows water is not something to waste."

With Austin's continued population growth, the city is not betting on conservation alone to see it through the coming decades. It, too, has signed a long-range agreement with the Lower River Colorado Authority to purchase water through 2050, if not longer.

Looking Ahead

As the state looks to future water needs, conservation is going to be a vital component of long-range planning.

The Texas Water Development Board is overseeing the compilation of a statewide master water plan, in response to legislation requiring long-term water planning. Regional groups have examined all areas of the state and assessed water needs over the next five decades, including drought-of-record conditions.

The TWDB's 2002 State Water Plan says conservation measures are "an important factor in limiting total water demand in the state."

To highlight conservation efforts, the TNRCC is surveying certain municipal suppliers. The agency is contacting more than 500 entities that hold a municipal surface water right issued by the TNRCC for more than 1,000 acre-feet of water per year or that have obtained financial assistance from the TWDB. All suppliers must have an approved water conservation plan on file with either agency. The water suppliers, most of which are cities, are being asked when they implemented their conservation plans and how successful they have been in achieving conservation goals.

The survey results will play a part in crafting the direction of the state's water conservation programs.

Also the TNRCC has scheduled a series of workshops aimed at providing technical assistance to small and mid-size water utilities. See [Water Conservation Workshops](#).

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