



Cover photos by Jeff Widen.

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SMART
Water

A Comparative Study
of Urban Water Use
Efficiency Across
the Southwest

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Why is it needed?

Municipal water use is skyrocketing as millions of new residents flock to the Southwest. Cities and suburbs in Arizona, Colorado, Nevada, New Mexico, and Utah are expected to add 7 million new residents in the next twenty years. This growth drives the region's thirst for water, endangering the cornerstone of our quality of life here—our natural river systems. In some areas, the regional drought adds even more pressure for large water development projects that are slow to construct, costly, environmentally damaging, and controversial.



The Arkansas River.
Photo by Brian Holmes.

Fortunately, improved urban water use efficiency can meet much of the growth in water demand. However, western water policy, which has not yet adopted efficiency alternatives, is hampered by a lack of comparative data on water use and efficiency options. Residents and water providers are not always aware of cutting-edge approaches and levels of use compared to other cities in the region.

Lawn watering in a city park.
Photo by American Water Works Association.



The frog does not drink up
the pond in which it lives.
—Incan Proverb

How can it be used?

Smart Water provides, for the first time, a detailed snapshot of current water use in major cities across the Southwest, as well as recent trends in water uses, conservation and efficiency programs, water system leaks, water rate structures, and unmet potential in over a dozen cities. *Smart Water* highlights gaps in levels of water efficiency across the region and offers specific recommendations to realize serious water savings through efficiency measures.

We hope *Smart Water* will serve as a helpful decision-making tool for water district managers, policy makers, interested organizations, and citizens across the Southwest to help refine a focus on the role of efficiency as a faster, safer, and relatively inexpensive means to stretch existing water supplies farther. We believe better efficiency will be as important to water management in the 21st Century as the Hoover Dam and other engineering marvels were to the 20th Century. Copies of the report are available in electronic and paper formats. Please contact Don Wojcik, 303 444 1188 x247, don@westernresources.org, for more information.

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Report Summary

Rivers at Risk

Chapter 1 establishes the direct link between growing urban demand and impacts (current and future) to some of our most treasured rivers—including the Bear, Colorado, Gunnison, and Rio Grande.

State of the Art

Chapter 2 brings some light at the end of the tunnel, exploring the “state-of-the-art” measures in municipal water efficiency, and how to implement them. The chapter’s menu of rates, rebates, retro-fits, regulations, and alternative supply options may soon become the norm throughout the region.

Comparative Use

Chapter 3 provides a detailed analysis of where many southwestern cities stand today in water consumption and water conservation efforts. Dozens of figures and tables provide comparative data on per capita water use, water system losses, conservation programs, rate structures, and more. Related appendices include city-by-city data and descriptions of existing efficiency programs, water systems, and alternative sources of supply.

Water & Sprawl

Chapter 4 takes a close look at the connection between urban sprawl and water use. Case studies from Las Vegas and Tucson highlight the effect of smaller housing lot sizes and the results and potential of water-efficient design strategies that rely on Xeriscape standards, reclaimed water distribution systems, and higher density development.

Recommendations

Chapter 5 highlights the overall conclusions of the *Smart Water* study and proposes recommended actions for water providers, policy-makers, and citizens to help guide us toward a more efficient future.

The Colorado River.
Photo by Jeff Widen.

Smart Water identifies serious opportunities to improve water use efficiency in the Southwest, including conservation and alternative supply options. Here are just a handful of *Smart Water*’s findings and recommendations:

Findings and Recommendations



Xeriscaped yard.
Photo by David Winger, Denver Water.

Water Rate Structures and the Price of Water

Cities with low water use typically have rate structures that send an effective “conservation message” to customers. Increasing block rate structures tend to be fair if they charge high-volume a higher unit rate and reward low-volume users with lower unit rates.

Smart Water recommends that providers:

- Adopt increasing block rate structures that send a clear, consistent conservation message.
- More effectively incorporate costs for infrastructure, new supplies, and environmental mitigation into water rates.
- Use increasing block rate structures in all years (not just during drought).

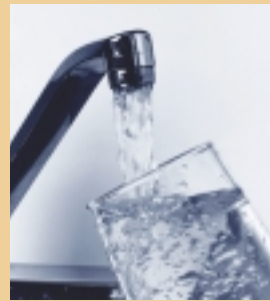


Photo by the American Water Works Association.

Indoor Efficiency

Indoor water efficiency is important, too. Converting a “typical” American home to a “conserving” home (with readily available low-flow fixtures and appliances) can drop average per person use from 69 gallons per day to 45 per day. *Smart Water* recommends that providers and governments:

- Offer indoor appliance rebate programs and indoor water use audits to all customers.
- Enact ordinances that require water-efficient indoor appliances/fixtures in all new development as well as in all building upgrades.
- Encourage appliance upgrades at the time of sale for residential and commercial property.

Outdoor Efficiency

Outdoor use (primarily landscape irrigation) accounts for most residential use and provides the greatest potential for conservation savings. Outdoor use levels vary dramatically across the region, and landscaping choices play a greater role in this discrepancy than climate does.

Smart Water recommends that water providers and governments:

- Offer Xeriscape™ and irrigation controller rebate programs.
- Enact landscaping ordinances that regulate use of high water-use vegetation.
- Enforce landscape irrigation in early morning and evening hours.
- Provide landscape irrigation audits to identify water waste by customers in all sectors.

2001 Estimated Single-Family Residential Outdoor Use, Represented as Daily per capita Use

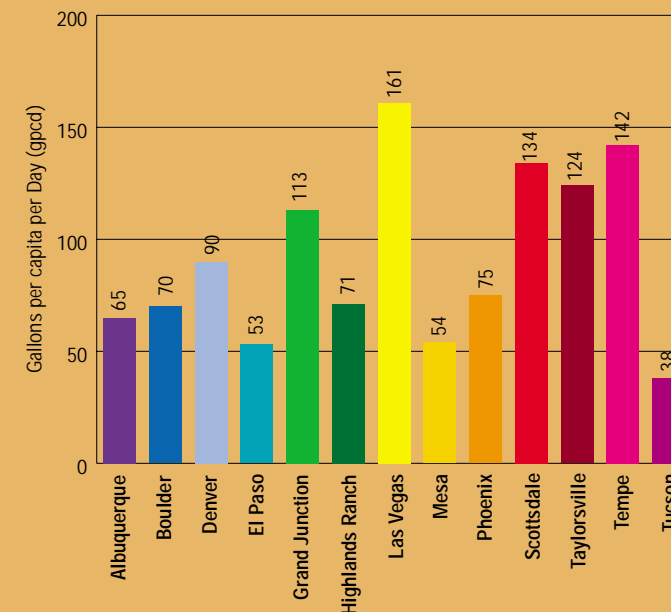


Photo by Jeff Widen.

Supply-Side Water Use Efficiency

Many innovative supply-side measures are not yet commonplace, including: water reuse and recycling systems; aquifer storage and recovery projects; system integration and coordination; and market-based water transfers. Hundreds of thousands of acre-feet (tens of billions of gallons) are lost or “unaccounted for” in our water collection and distribution systems each year.

Smart Water recommends that providers:

- Aggressively reduce the amount of lost or Unaccounted For Water.
- Pursue market-based water transfers, including: temporary dry-year leases with farmers and ranchers, and water-banking transfers with other water providers.
- Create more reuse and recycling systems (for landscape irrigation and other uses).
- Use aquifers as a storage alternative (aquifer storage and recovery).

Education and Awareness

Many water customers are not aware of programs/opportunities offered by their water providers, or aware of how they can improve their water use efficiency. *Smart Water* recommends that water providers and governments:

- More actively promote and advertise water conservation programs.
- Educate people on our region’s “collision course” of population growth and water supply.
- Promote comprehensive water use audit programs to all municipal water customers to provide personalized education and direction on how to become water efficient.

