

Hannah Hansen and Dr. Bonnie Colby

INTRO

- We examine incentive-based programs to promote water conservation implemented in major cities in major cities located in Colorado River Basin states

RESEARCH PROCESS

- Completed a review of programs offered by large municipalities
- Information often collected from the city websites
- Compared similar programs and pricing schemes
- Performed a literature review of water demand studies to determine effectiveness of policies

MAJOR PROGRAMS EXAMINED

- Municipal Rate Structures
- Rebates for high efficiency appliances and irrigation systems
- Gray Water and Effluent Use
- Turf Retirement and Xeriscape Incentives
- Conservation Fees
- Infrastructure improvements

DISCUSSION

- There are a wide variety of incentive-based policy tools available for cities to reduce their urban water demand and improve water efficiency
- Conservation programs in the Colorado River Basin have lowered per capita water demand

The adoption of a variety of Incentive-Based Policies can lead to Urban Water Conservation amid population growth and drought

hannahhansen@email.arizona.edu

Municipal Water Rate Structure

Cities	Tier 1		Tier 2		Tier 3		Tier 4	
	Volume (Gallons)	Price (per 1,000 gallons)	Volume (Gallons)	Price (per 1,000 gallons)	Volume (Gallons)	Price (per 1,000 gallons)	Volume (Gallons)	Price (per 1,000 gallons)
Albuquerque	All Units	\$2.70						
Cheyenne	0-6000	\$4.42	6,000-24,000	\$5.46	24,000-42,000	\$6.78	42,000+	\$8.44
Denver	0-Average Winter Consumption (AWC)	\$2.36	AWC + 15,000	\$4.25	Greater than AWC + 15,000	\$5.66		
Las Vegas	0-167	\$1.34	167-334	\$2.39	334-667	\$3.55	667+	\$5.27
Phoenix	0-4,488 Oct-May & 0-7,480 June-Sept	\$1.04 Oct-May & \$0.62 June-Sept	All Usage above Tier 1	\$4.29 Dec-Mar, \$5 Apr, May, Oct, Nov, & \$5.48 Jun-Sept				
Salt Lake City	748-7,480	\$1.84	8,228-22,440	\$2.51	23,118-44,880	\$3.47	44,880+	\$3.70
Santa Fe	0-7,000 Sept-April & 0-10,000 May-Aug	\$6.06	All usage above Tier 1	\$21.72				
Tucson	748-5,236	\$2.77	5,984-11,220	\$5.11	11,968-22,440	\$11.10	23,188	\$17.32

Municipal Pricing

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Notes: 1.) AWC is the average monthly water consumption for January, February, and March. Minimum is 5,000 gallons and maximum is 15,000, 2.) Las Vegas Valley Thresholds are different for meter size. The thresholds included in the table are for a 5/8" meter, 3.) Phoenix includes a base allotment of water as part of the Monthly Service Charge which varies based on meter size. The prices included are for a 5/8" meter, and 4.) All Salt Lake City usage is charged at Tier 1 November thru March.

Municipal Rate are one of the most diverse incentive-based policy tools. There may be provisions for:

- Block pricing – to distinguish between necessary indoor and extra outdoor usage
- Seasonal Provisions – discounts or increased prices in Summer or Winter
- Flat fees – cover infrastructure and delivery costs
- Additional charges – payments for environmental programs or conservation efforts
- Units of measure – typically cities either charge by the 1,000 gallons, or 100 cubic feet (748 gallons)
- Raw or treated wastewater service – for irrigation. May even be unmetered

Urban Water Demand Studies and Trends

- Mayer et al (2017) found between 2005-2015 Tucson Water's production declined 23% from decreased overall demand
- Price, Chermak, and Felardo (2014) reported a 16% reduction in Albuquerque water demand from 1996-2009 resulting from conservation programs
- Garcia and Islam (2018) and Brelford and Abbott (2017) attribute per capita water use reduction in Las Vegas from 1990-2012 to technological changes, and new policy standards
- Richter et al (2020) found 19% average water use reduction despite 21% average population growth across 20 Western US cities