Water and Sewer Affordability in 10 US Cities

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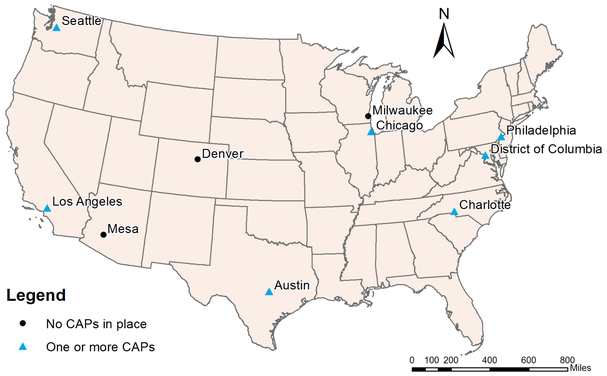
Re-Inventing the Nation's Urban Water Infrastructure (ReNUWIt)

Introduction

Water and sewer rates have risen faster than inflation in the last 20 years. Utilities have increased rates due to a wide variety factors, including decreasing per capita water use, deterioration of water infrastructure, and increasingly stringent water and wastewater regulations. As rates continue to increase, concern over the ability of customers to consistently pay monthly water and sewer bills, known as **water and sewer affordability**, has increased on the local, state, and national level[1]. Many utilities have implemented **customer assistance programs** (CAPs) to assist at-risk customers such as low income households, seniors, and permanently disabled ratepayers. To date, no national standards exist to measure the effectiveness of CAPs or the potential impact of CAPs on utility finances[2]. This study assessed the affordability of water and sewer services and examined the impact of CAPs on utilities in ten US cities

Test Beds

This project uses the following study cities:
Austin
Charlotte
Chicago
Denver
Los Angeles
Mesa
Milwaukee
Philadelphia
Seattle
Washington D.C.



Map of study cities

Objectives

1. Establish water, sewer, and combined rate trends
2. Assess the affordability of water, sewer, and combined rates in 2010
3. Determine the impact of existing CAPs on utilities with one or more programs
4. Determine the potential impact of CAPs on utilities with no programs

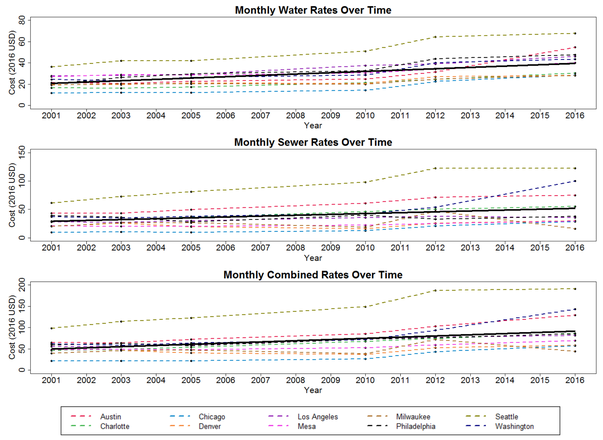
Methods

Objective	Method	Data Source
Track rates over time	Find trends in water, sewer, and combined rates over time	2001-16 Black and Veatch
Assess affordability	Use rates to calculate an acceptable minimum income based on UN guidelines*	2001-16 Black and Veatch, 2010 Census and ACS, USGS
Determine existing CAP impact	Gather qualification criterion and calculate how many households qualify	Utilities, 2010 Census and ACS
Determine proposed CAP impact	Create hypothetical qualification criteria and calculate how many households qualify	Utilities, 2010 Census and ACS

*Affordability was measured using United Nations Development Programme guidelines, which suggest that water and sewer expenses should not exceed certain percentages of any household's income: **3% or less for water, 2% or less for sewer, and 5% or less for combined rates**.

Results

Rate Trends – 2016 Inflation Dollars



Water and sewer rates rose steadily from 2001 to 2016 as shown by the black trendline. Sewer rates tended to be more expensive than water rates throughout the analysis years. Additionally, the variability in sewer rates between cities increased over time.

Monthly rates over time at 7500 gal/month adjusted for inflation to 2016

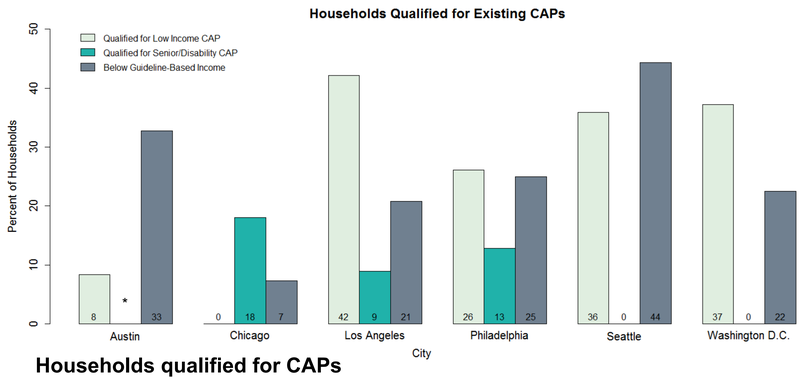
2010 Affordability Assessment

The proportion and number of households below the guideline-based income varied greatly between cities. The proportion of households varied widely depending on the magnitude of rates in the city. Sewer rates dominated the guideline-based income calculations; all of the scenarios normalized to water use were dominated by sewer rates and 29 out of all 30 city and water use scenarios were dominated by sewer rates.

Households below affordability guidelines in 2010

CAP Analysis: Existing

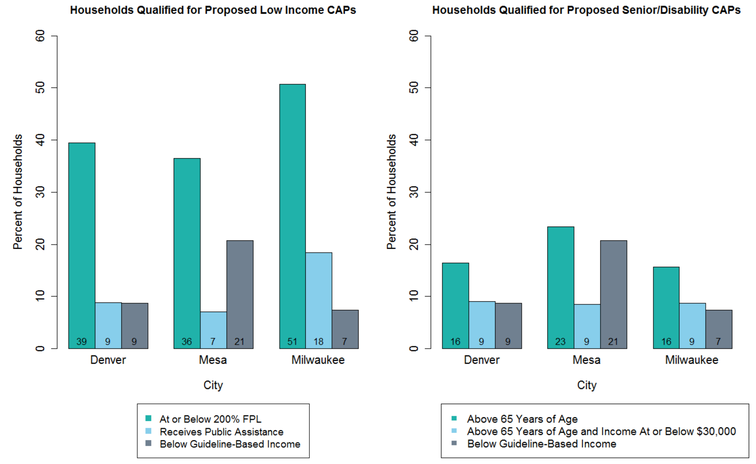
CAPs were grouped into five general categories: emergency funding, free fixture replacement, low income discount, modified billing, and senior citizen/disability discount. The low income and senior citizen/disability criteria were compared to Census and ACS data to determine the eligible households.



Households qualified for CAPs

CAP Analysis: Proposed

To analyze the effect of CAPs on cities with no existing programs, hypothetical criteria for low income and senior/disability CAPs were created based on the information gathered from existing CAPs. These proposed CAPs were compared to Census and ACS data to determine the number and percent of eligible households.



Future Work

- Track when CAPs were implemented
- Examine eligibility vs enrollment in CAPs
- Perform affordability and CAP analysis for more cities
- Examine CAPs in rural and suburban areas

Relevance and Implications

As water and sewer rates continue to increase, at-risk customers will struggle to pay for these necessary services. Using readily available Census data, utilities can perform basic analyses to assess the performance of existing CAPs. Additionally, utilities without CAPs can use these methods to identify at-risk populations and assess the feasibility of implementation.

Stakeholder Group	Important Takeaways
Subsidized Rate Payers	• Many CAPs have accessible enrollment criteria • Cities with no CAPs can use other cities as models and adjust to customer needs
Unsubsidized Rate Payers	• Certain CAPs apply to all users • CAPs help vulnerable populations such as low income, senior, and disabled customers
Utility Managers	• Importance of including sewer in affordability studies • Eligibility vs enrollment • Cities without CAPs have many working examples
Academics	• Census and ACS data can be used to analyze CAPs on a national and local level • Many opportunities for further analysis

References

(1) Rubin S. (2002). Affordability of Water Service, Rural Water Partnership Fund.
(2) USEPA. (2016). Drinking Water and Wastewater Customer Assistance Programs.

This research will be used in projects funded by EPA National Priorities: Life Cycle Costs of Water Infrastructure Alternatives (RFP: EPA-G2015-ORD-D1)