This presentation premiered at WaterSmart Innovations

watersmartinnovations.com
Truth be Told:
Explaining the Real Relationship Between Conservation and Rates in Your Community
Speakers

- Mary Ann Dickinson, Alliance for Water Efficiency
- Peter Mayer, Water DM
- Candice Rupprecht, Tucson Water
Introduction
Isn’t this a Success Story?

- Yes, but with side effects
- Lowered demand means reduced sales revenue
- Reduced sales revenue can mean not fully collecting fixed costs
  - Short-run variable costs (water, pumping energy, chemicals)
  - Long-run capacity costs (supply, transmission, storage, treatment)
- Revenue stability therefore becomes an issue – and conservation is often blamed
- Left untreated, long-term unstable revenue collection can affect bond ratings
“The losses have prompted credit ratings agencies to look closer at the finances of public utilities in Texas. One agency, Fitch, downgraded some of Fort Worth’s water and sewer debt last year, and last week the firm downgraded the debt of the city’s wholesale water supplier. Fort Worth lost $11 million last year because of water conservation.”
Conservation is Part of the Solution

- It is a long-term cost reducer to the utility
- Revenue loss is often due to other drivers
- Every gallon saved is water that does not have to be pumped, treated and delivered
- Conservation is an investment and short-term effects must be planned for
- Reduced utility costs generally mean reduced customer rates in the long-term due to avoided infrastructure capacity increases
What is Financing Sustainable Water?

- **Building Better Rates in an Uncertain World:** A Handbook to explain key concepts, provide case studies and implementation advice
- **AWE Sales Forecasting and Rate Model:** Innovative, user-friendly tool to model scenarios, solve for flaws, and incorporate uncertainty into rate making
- **FinancingSustainableWater.org:** Web-based resources to convene the latest research and information in one location
Communicating the Value of Water

- **Water: What You Pay For**
  - Explains water service and cost
  - Pipes, plants, power and people that keep water flowing
  - Free for utility use!

- **Water Rates Messaging**
  - Consumer-friendly language
  - Explain that conservation keeps rates DOWN in the long term
  - Use for speeches, talking points, press releases, etc.

“Every gallon saved is a gallon that doesn’t need to be pumped, treated or delivered – those savings are reflected in your water bill. **Conservation helps slow the rise of water rates over the long-term.**”
Financial Instruments to Manage Revenue Risk

A new white paper explores opportunities for utilities to use financial instruments - such as derivatives, insurance and bonds - to manage weather-related revenue risk in an increasingly volatile climate.

Rates. Revenue. Resources.

Financing Sustainable Water is an initiative of the Alliance for Water Efficiency. It was created to provide practical information to guide utilities from development through implementation of rate structures that balance revenue management, resource efficiency and fiscal sustainability. This website will be updated frequently with new content and we encourage visitors to return often for additional information and resources. The Alliance serves as a North American advocate for water efficient products and programs, and provides information and assistance on water conservation efforts. Learn More
A WILD WEST TALE: DEBUNKING THE MYTH THAT CONSERVATION INCREASES RATES

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WATER CONSERVATION MANAGER
TUCSON WATER

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AWE AVOIDED COST STUDY

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- Building on previous work by WaterDM and City of Westminster Study in 2013
- Tucson, AZ and Gilbert, AZ selected to participate
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M&I WATER USE IN THE US, 1900 - 2010

Source: USGS and Pacific Institute 2015
**RESIDENTIAL INDOOR GPCD**

<table>
<thead>
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<th>Indoor Average Gallons Per Capita Per Day (gpcd)</th>
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<tr>
<td>REU1999</td>
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<td>REU2015</td>
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<td>High-Efficiency (Aquacraft 2011d)</td>
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1999 vs. 2016 = 15.4% reduction

2016 vs. HE = 37.4% reduction

TUCSON WATER
ANNUAL PRODUCTION (1940-2016)
SINGLE FAMILY AVG. ANNUAL WATER USE
1985 - 2015

42% reduction 1989-2015

1960s & 1970s
Typical landscape

Present-day
Typical landscape

SF Household Avg. Annual Use (CCF)

0 20 40 60 80 100 120 140 160 180

Historically, outdoor water use was 45% of single-family use.

Exterior use has decreased 53%

Interior use has decreased 23%
WATER EFFICIENCY IS NOT ONE, BUT MANY APPROACHES

• Utility-sponsored conservation & education programs
  • Rebates, Youth & Professional Education

• Community outreach campaigns: Pete the Beak; Water Reliability

• Increasing block rate structures
  • 4-Tier structure: $1.55, 1-7 ccf; $3.00, 8-15 ccf; $7.48, 16-30 ccf; $11.75 > 30 ccf


• International Plumbing Code → Tucson Plumbing Code

• National Policy that drives Innovation & technology improvements
TOTAL WATER SYSTEM GPCD
1980 - 2015

31% reduction
1989-2015
POPULATION AND PER CAPITA WATER AND WASTEWATER USE

- Gallons per Capita Per Day
- Population

1989: System Per Capita Water Use = 512,000 gallons/day, Population = 188,000
2015: System Per Capita Water Use = 717,875 gallons/day, Population = 78,000

System Per Capita Wastewater Use:
1989: 105 gallons/day
2015: 130 gallons/day
HYPOTHETICAL, NON-CONSERVING WATER & WASTEWATER DEMANDS

Daily Water Production & Wastewater Flows:
- 1989 actual
- 2015 actual
- 2015 hypothetical

1989: 188 / 105 gpcd
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2015: 130 / 78 gpcd
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“WHY ARE MY RATES GOING UP AGAIN WHEN I KEEP CONSERVING WATER?!”

- Due to conservation, per capita water use in Tucson has dropped 45% and wastewater by 35% since 1989.
- Yet…. costs to customers continue to increase.
- Some customers are confused and frustrated.
- What is the impact on water and wastewater rates due to conservation?
WATER SYSTEM
AVOIDED COSTS

• Water Treatment Infrastructure
  • $140,000,000 for new Avra Valley Transmission Main CIP
  • $15,400,000 for new 7 MGD recycled water facility

• Operating Costs
  • Additional $22 million per year for water system O&M

• Water Resources
  • None because of CAP supply

How much additional cost to meet the non-conserving, hypothetical demand of 134 mgd? Or an extra 41.1 mgd?
WASTEWATER SYSTEM AVOIDED COSTS

• Wastewater Treatment Infrastructure
  • Current System Max. Treatment Ability ~ 95 MGD
  • Capacity increased to 107 MGD to meet Hypothetical Non-Conserving Daily Flow
  • $195,000,000 for additional 12 MGD of wastewater capacity, financed over time

• Operating Costs
  • Additional $6,400,000 per year for wastewater treatment O&M

What additional wastewater system infrastructure and costs to meet 80 mgd avg. daily flow?

$4,066 single-family connection fee or $16.02 million/MGD
HOW ARE CUSTOMER RATES AFFECTED?

• Current avg. single-family, water customer uses 74,000 gal/year, and pays for 63,000 gal/year of wastewater treatment.

• At current rates, the avg. single-family customer pays $847 per year for water and wastewater service.

• Under the non-conserving scenario (assuming 188 gpcd/105 gpcd) the average single-family customer would pay $959 per year for water and wastewater.

Due to water efficiency, rates today are at least 11.7% LOWER than otherwise necessary.
Impact to an Average Single-Family Customer - Tucson, AZ

Annual Water and Wastewater Use (kgal)

Annual Water & Wastewater Bill - $

- 2015 Actual
  - Water Use (kgal): 74.0
  - Wastewater Discharge (kgal): 63.0
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- Non-Conserving Hypothetical
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Legend:
- Water Use (kgal)
- Wastewater Discharge (kgal)
- Annual Water & Wastewater Bill - $
Today, Tucson Water rates are 15% lower and Pima County RWRD rates are 8.6% lower than otherwise necessary if per capita water demand had not been reduced.

Total avoided costs: $350,862,732
STRENGTH OF SEWER FLOWS
LOWER FLOW IMPACTS TO THE CONVEYANCE PIPES

- Scour velocities may take longer to attain in newer developments with lower flows
- Flushing of pipes may be required
- Potential for more odors in pipes
- Potential for corrosion in pipes
- Terminal ends may require steeper slopes
- Cost goes up for deeper sewers
• Water and wastewater rates have increased because of the increasing costs of providing 24/365 service, while maintaining and improving infrastructure to meet regulatory treatment requirements.

• Decreasing demands are a balancing act: Revenue v. Resources

• The typical Tucson single-family customer pays at least 11.7% less for water and wastewater service today, than if water efficiency had not been achieved.

Bottom Line: When Everyone Conserves, Everyone Saves
EVER WONDER WHY your water rates are going up, even though YOU’RE USING LESS?

Tucson, Arizona
Water Conservation Over 30 Years Reduced Costs For Customers

1989
Population 512,000
188 Gallons Per Person/day

2015
Population 717,875
130 Gallons Per Person/day

Population increased by 40%, while per person water use declined by 31%

Because the community conserved, the same family’s bill is 11.7% lower

Why?

If per person use had not decreased, Tucson would have needed to invest $350 million in new water and wastewater infrastructure to pump more water through the water system and treat more wastewater.

Primary conservation drivers:
- Conservation programs (indoor and outdoor), youth and homeowner education, efficiency-oriented rates, national plumbing codes, equity

Primary water challenges:
- Rising costs of water, rising costs of infrastructure maintenance, Public awareness of the value of water

So What Did We Learn?
When Everyone Conserves, Everyone Saves.

Water rates are rising, but when communities conserve, they don’t go up nearly as much.

Each water and wastewater customer has avoided the costs of acquiring, delivering, and treating additional water supplies that would have been necessary had they not conserved.

Individual actions add up! When everyone does their part to conserve, the entire community benefits from lower rates in the long-term, sustainable water supplies, and healthier watersheds.

To learn more, visit www.FinancingSustainableWater.org
Ward 2 Council Member Paul Cunningham provides a perspective on water rates, usage and the long term benefits of conservation and using water efficiently. He explains how conservation has helped to temper utility capital and operating costs and to keep rates low, as detailed in an independent study by the Alliance for Water Efficiency released in June.

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In today’s dollars, that comes out to twenty-one cents a gallon. Tucson Water doesn’t sell water by the gallon, but by the Ccf, which is 100 cubic feet of water or nearly 750 gallons. You’d be paying the equivalent of $1.5897 per Ccf in the 1870s.

Which brings me to present time: as of July 3, we are paying a bit more for water.

The average single family household that uses 8 Ccfs per month will see an increase of $2.84 or about $35 per year. I have a young family myself, so I know what even a modest price increase can mean for a tight budget. Still, I supported the rate increase.

Despite the fact that it is a part of city government, Tucson Water is self-funded and receives no money from taxpayers. Tucson Water is a public utility meaning it is owned by you and other citizens. The utility runs safely, efficiently, and in the public interest and, even with this rate increase, at rates below the average for other water utilities in Arizona.

Tucson Water has done a good job keeping costs low while maintaining council mandated conservation and low-income programs. Still, the reality is that many of the utility’s expenses continue to increase.

Which leads to a question that I get from constituents: Why am I going out of my way to cut down on water use if you are going to raise my rates anyway?

It’s a valid question. Community members have done a lot to save water and use it more efficiently than many other southwest towns and cities.

After hitting its peak last decade, total water use by Tucson Water customers is now at the same level it was in 1985 when we had 200,000 fewer people. But what’s the reward if water bills keep going up? Well, there is something called avoided costs.

There are expansions that Tucson Water has avoided because of lower water use, efficiency and conservation. A study by the Alliance for Water Efficiency estimates that Tucson Water’s maintenance and operation costs would be 30% higher than they are now if old usage trends had continued. That’s almost $23 million.

Tucson Water has also managed to avoid having to build some expensive new infrastructure. Plans for an Avra Valley transmission facility were shelved because of the lack of need. That is $140 million that Tucson Water didn’t spend because use is down so much. Pima County Regional Wastewater Reclamation Department collaborated on this study. Lower water use has helped avoid nearly $200 million in wastewater system expansion costs.

These savings are passed on to customers through lower water and wastewater rates. In all, your bill is 11.7% lower than it would have been, had we not been conserving.

The reality is that the cost of everything is going up, and that’s reflected in our water bill. Still, much of what you’ve done as conscientious and efficient water users has kept those costs from increasing even more.


Ward 2 Council Member Paul Cunningham provides information about how conserving water saves millions of dollars, backed by a recent study by the Alliance for Water Efficiency.

(See Working with Water, pg. 4-7)
QUESTIONS?
THANK YOU!

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ANNUAL PRODUCTION (1940-2016)

Water Production for TW Service Area (Acre-Feet)

Year


Total Potable Water Use at 1985 Level

Groundwater
CAP Production
TARP Production
Reclaimed Production
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Typical landscape

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- **System Per Capita Water Use (gallons/day)**
- **System Per Capita Wastewater Use (gallons/day)**
- **Service Area Population**

**Gallons per Capita Per Day**

- 1989: 512,000, 188
- 2015: 717,875, 130

**Service Area Population**

- 1989: 100,000
- 2015: 200,000

Legend:
- **Gallons per Capita Per Day**
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**WATER CONSERVATION OVER 30 YEARS REDUCED COST FOR CUSTOMERS**

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<tr>
<th></th>
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<tr>
<td>Annual Bill</td>
<td>$959</td>
<td>$847</td>
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<tr>
<td>Population</td>
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