Cost Allocation and Rate Design for Water

Regulatory Studies Program - Fundamentals

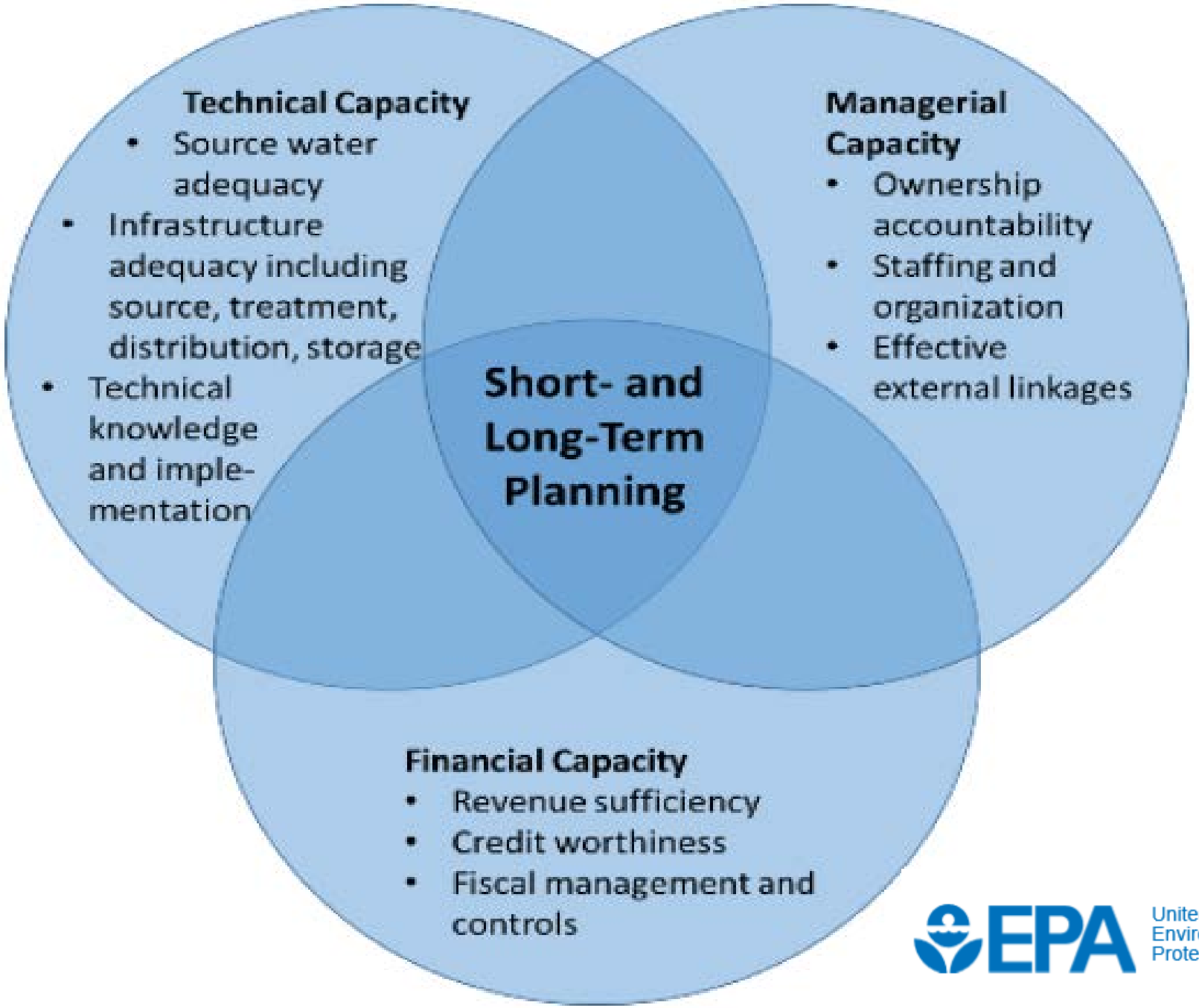
August 8, 2019

Denise Schmidt, Administrator

Division of Water Utility Regulation and Analysis

Public Service Commission of Wisconsin

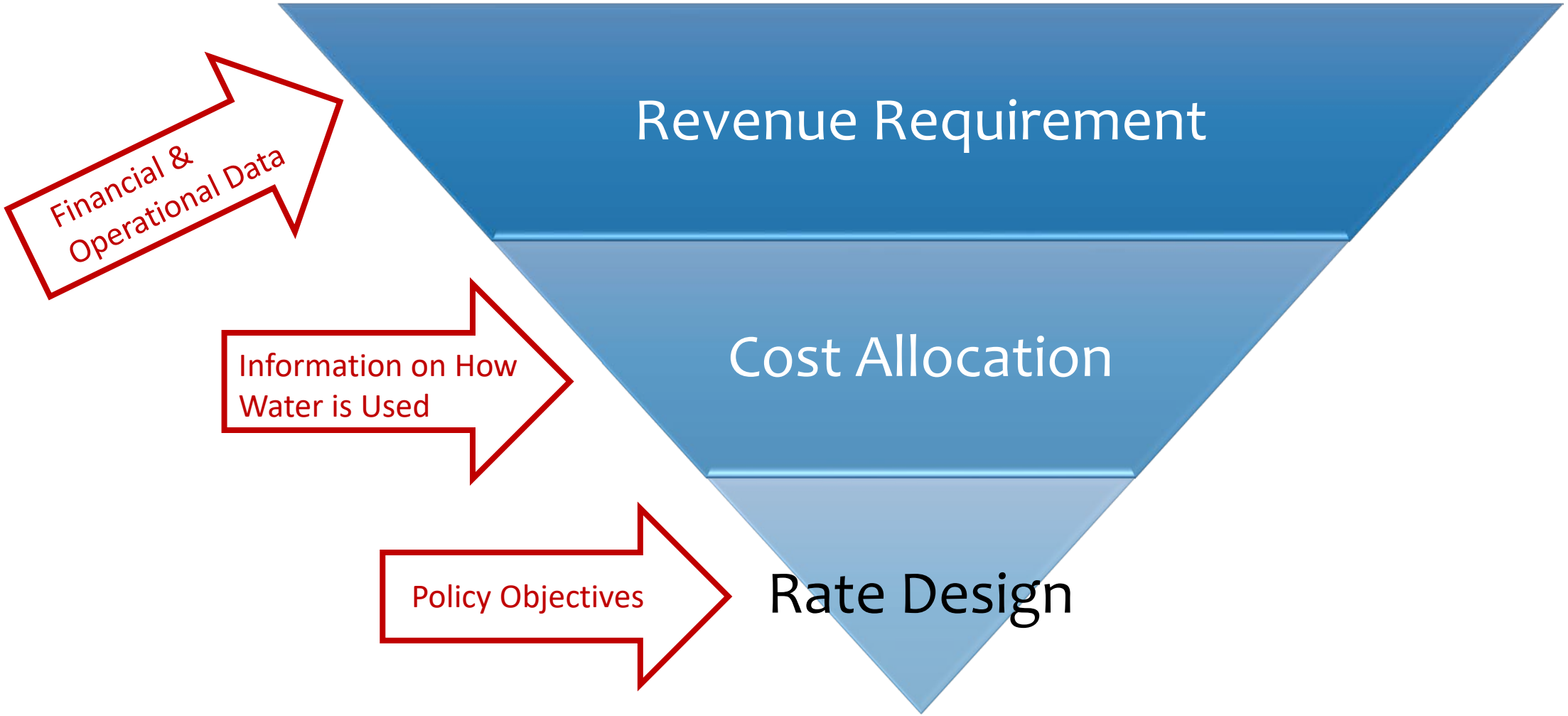
Financial Sufficiency and Revenue Requirement Considerations



PSC of WISCONSIN

EPA United States Environmental Protection Agency

Ratemaking Overview



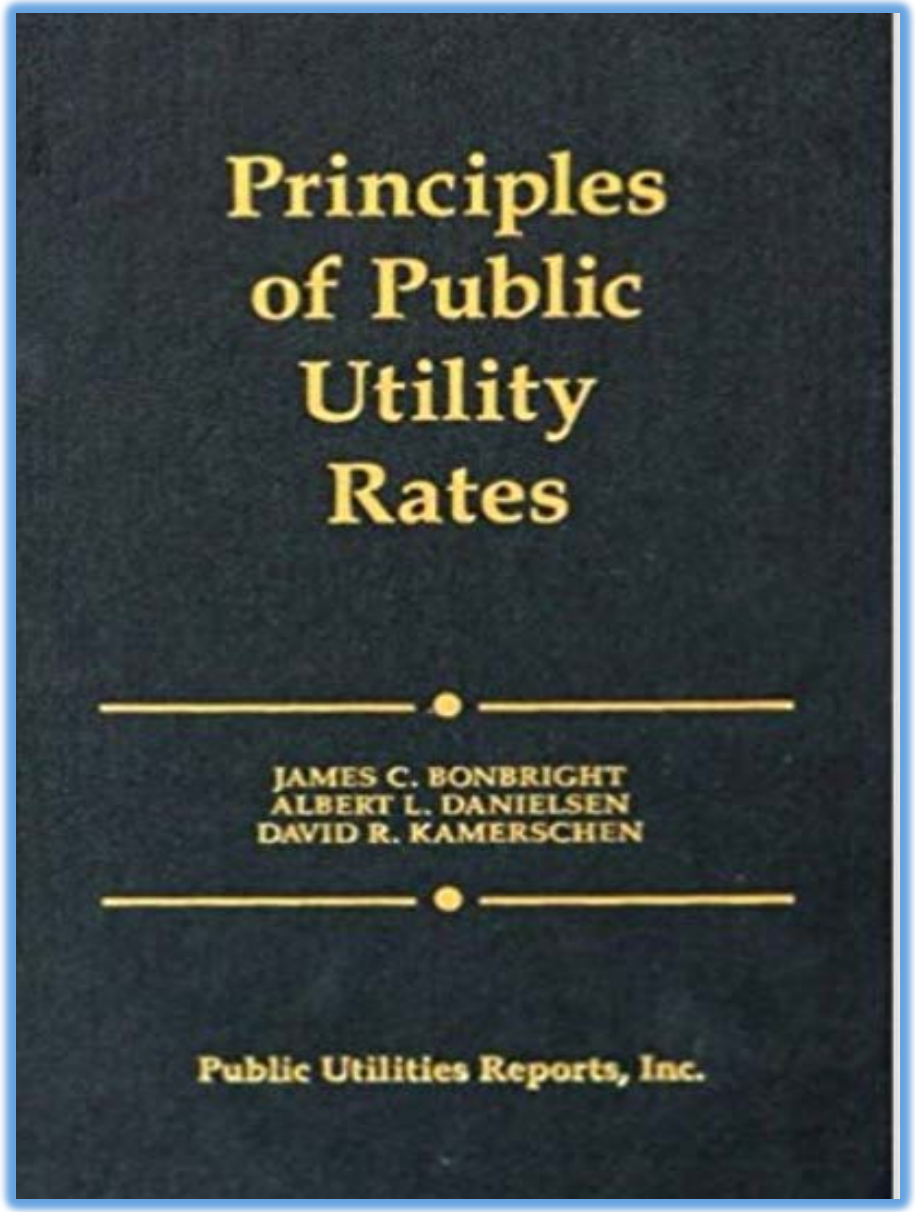
NARUC
National Association of Regulatory Utility Commissioners

RATE CASE AND AUDIT MANUAL

Prepared by:

NARUC Staff Subcommittee on Accounting and Finance

Summer 2003



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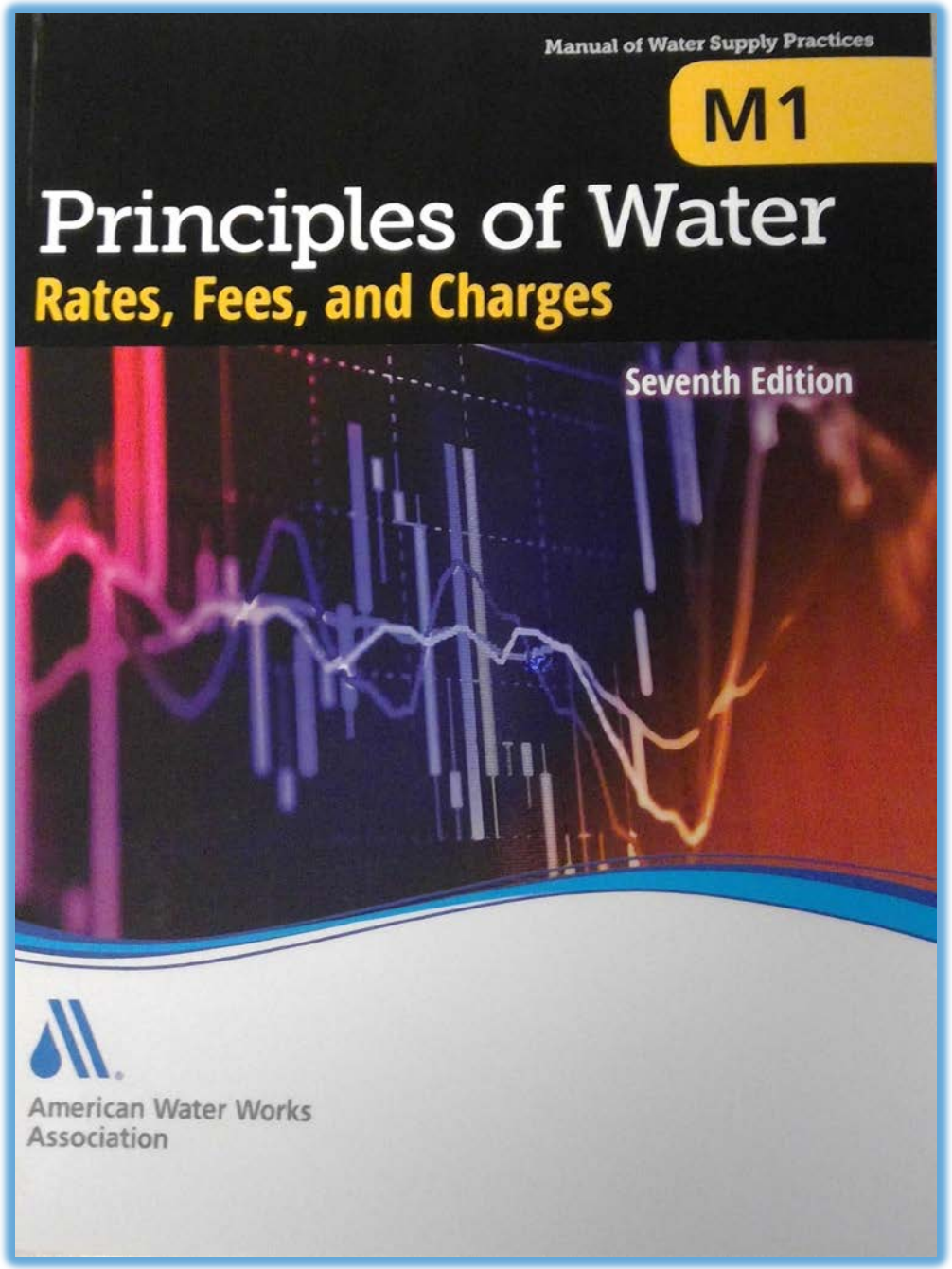


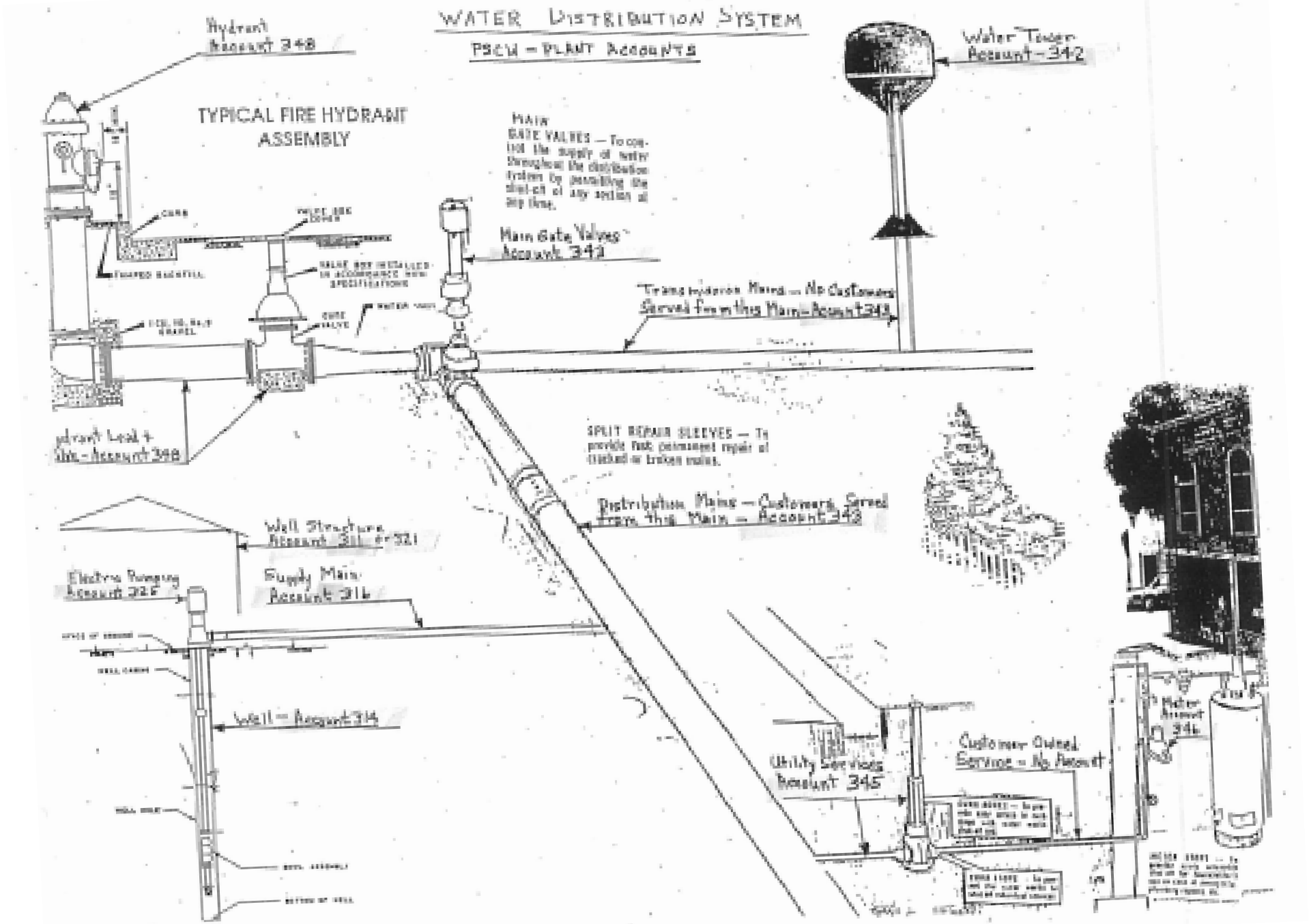
American Water Works Association

- AWWA is the largest organization of water professionals in the world
- Founded in 1881
- AWWA Activities
  - Provide education to professionals
  - Advocate for safe, sustainable water
  - Collect and share knowledge
  - Create volunteer opportunities
- National Rates and Charges Committee is responsible for updating the M1 Manual

AWWA's Financial Sufficiency Policy

Water Utilities Should:

- Track and report costs according to a Uniform System of Accounts (ex: NARUC Standard Chart of Accounts)
- Collect sufficient revenues to finance all operating/maintenance expenses and capital costs
- Not divert revenues for unrelated purposes
- Establish rates that are based on cost and avoid subsidizing customers


WATER DISTRIBUTION SYSTEM
PSCW – PLANT ACCOUNTS
Hydrant
Account 348
TYPICAL FIRE HYDRANT
ASSEMBLY
Water Tower
Account – 342
Main
GATE VALVES – To control the supply of water throughout the distribution system by permitting the shut-off of any section at any time.
Main Gate Valves
Account 343
Trans-hydrant Mains – No Customers Served from this Main – Account 343
SPLIT REPAIR SLEEVES – To provide fast, permanent repair of cracked or broken mains.
Distribution Mains – Customers Served from this Main – Account 343
Well Structure
Account 311 or 321
Supply Main
Account 316
Electric Pumping
Account 326
Well – Account 314
Utility Services
Account 345
Customer Owned
Service – No Account
Meter
Account
346

Ex: Utility Plant Accounts
Account 342 Distribution Reservoirs and Standpipes

- Bridges and culverts
- Clearing land
- Dams
- Embankments
- Fences
- Foundations
- Gates and gate houses
- Landscaping
- Lighting systems
- Piping system within reservoirs
- Retaining walls
- Roads and paths
- Rust-proofing apparatus
- Spillways and channels
- Standpipes
- Tanks
- Towers
- Valves and appurtenances
- Valve vaults and houses
- Water level control apparatus

Revenue Requirement: What is fair, just, and reasonable?

- Sufficient to support safe, reliable service
- Fair to investors
- Not unduly burdensome on ratepayers
- Need to consider legal limits on Commission's jurisdiction

Revenue Requirement Components: economically regulated utilities

Reasonable O&M expenses: maintenance, billing, customer service, etc.

+

Depreciation as a way to recover capital investment

+

(Reasonable rate of return) **x** (Rate Base)

+

Property, income taxes

=

Revenue Requirement

Revenue Requirement and Debt Service

- In the regulatory rate model, cash flow is generated by depreciation expense and ROR

- Cash flow is used for:
  - Principal and interest payments
  - Minor plant additions
  - Unexpected expenses
  - Savings for the future

Revenue Requirement Components: most municipal, other unregulated utilities

Reasonable O&M expenses: maintenance, billing, customer service, etc.

+

Debt service payments

+

Payment in lieu of taxes (for some utilities)

=

Revenue Requirement

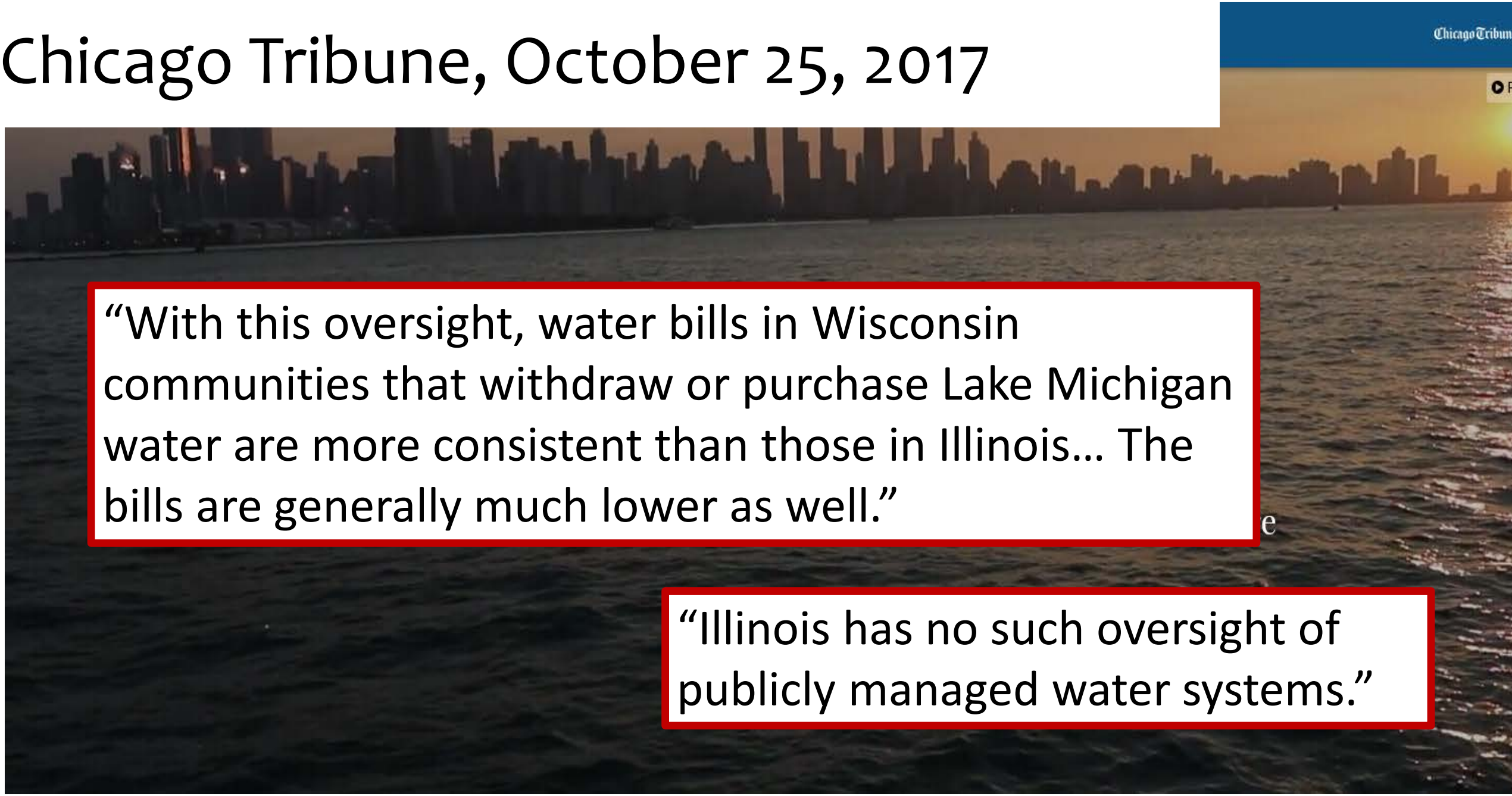
Regulatory Commission Jurisdiction

Table 1. "Do you Regulate Rates for Municipal Water Utilities?"

	Number of Public Utility Commissions	States
Yes, Regulate Rates for All Municipal Water Utilities	1	WI
Yes, Regulate Rates for Certain Types of Municipal Water Utilities and/or Under Certain Conditions	9	AK, IN, ME, MD, MS, NJ, PA, RI, WV
No, Does Not Regulate Rates for Municipal Water Utilities	40	Remaining States

Source: "Investigation Into the Methods Used by Wisconsin's Water Utilities in Allocating Public Fire Protection (PFP) Costs," Staff Report, Docket 5-WI-104

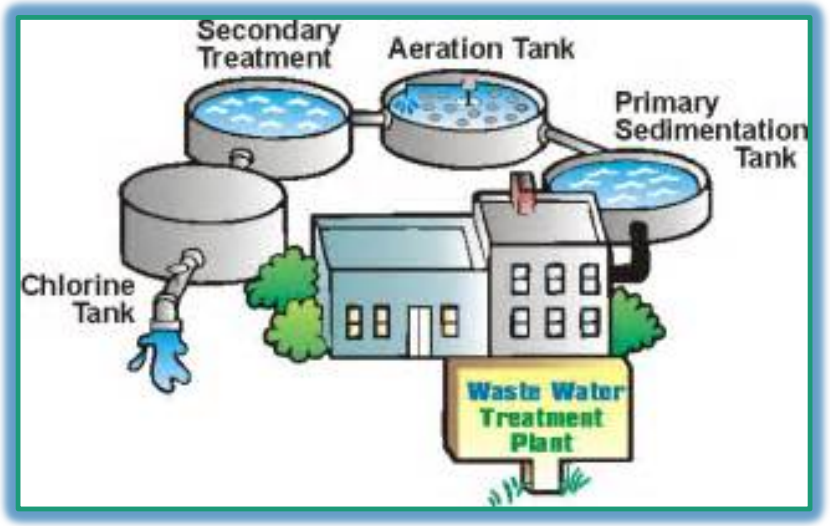
Chicago Tribune, October 25, 2017



"With this oversight, water bills in Wisconsin communities that withdraw or purchase Lake Michigan water are more consistent than those in Illinois… The bills are generally much lower as well."

"Illinois has no such oversight of publicly managed water systems."

Revenue Requirement: Example of disallowed expenses



- Promotional advertising
- Lobbying
- Executive bonuses
- Club memberships
- Costs incurred to benefit non-water utility purposes
- Any expense determined to be unreasonable
  - Ex: Work on property for which a private owner is responsible
  - Ex: Excessive cost overruns on a construction project
- Charitable donations (financial or in-kind)
- Consulting, legal fees imprudently incurred

Dollars recovered through rates

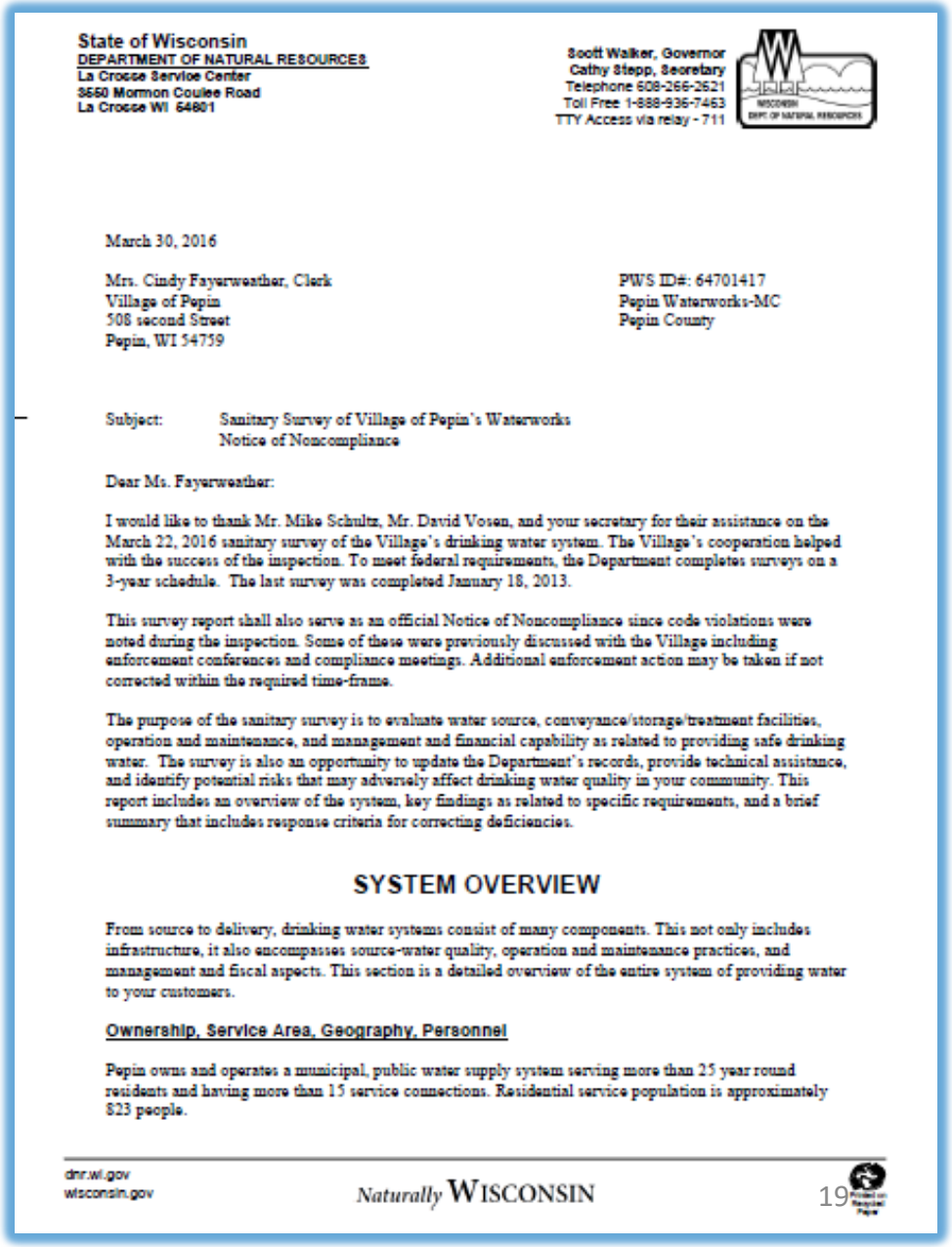
Revenue Requirement	$10,500,000
Less fee and other revenues collected for capital projects (ex: impact fees, assessments)	(500,000)
Less costs related to contributed plant (ROR and depreciation)	(2,000,000)
Less other revenue (ex: private fire protection fees, service line insurance, grants, etc.)	(50,000)
Rate Revenue Needed	**$7,950,000**

Review of Utility Construction Projects

- Commission review and approval of projects helps ensure utility has technical capacity with a rate base that is reasonable
- Did the utility evaluate a reasonable number of alternatives?
  - Design alternatives
  - Was conservation and efficiency considered as a way to delay or eliminate the need for the project?
  - Could a less expensive alternative achieve the same project objectives?
- Is the project excessive from a future demand perspective?
- Does the project impair the efficiency of the utility?
  - Is the utility prioritizing its projects appropriately?
  - Are operating and maintenance activities accounted for (net positive or net negative?
- Does the utility have reasonable cost controls in place?

Sanitary Survey Reports

- Summary of system "check-ups" prepared by state's Safe Drinking Water Act (SDWA) primacy agency for
- Include system description, water quality test
- May include list of significant deficiencies and deficiencies
- May include list of action items, deadlines for correcting deficiencies
- Action items may include new construction projects, hiring additional staff, etc.



State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
La Crosse Service Center
3550 Mormon Coulee Road
La Crosse WI 54601

Scott Walker, Governor
Cathy Stepp, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

March 30, 2016

Mrs. Cindy Fayerweather, Clerk
Village of Pepin
508 second Street
Pepin, WI 54759

PWS ID#: 64701417
Pepin Waterworks-MC
Pepin County

Subject: Sanitary Survey of Village of Pepin's Waterworks
Notice of Noncompliance

Dear Ms. Fayerweather:

I would like to thank Mr. Mike Schultz, Mr. David Vosen, and your secretary for their assistance on the March 22, 2016 sanitary survey of the Village's drinking water system. The Village's cooperation helped with the success of the inspection. To meet federal requirements, the Department completes surveys on a 3-year schedule. The last survey was completed January 18, 2013.

This survey report shall also serve as an official Notice of Noncompliance since code violations were noted during the inspection. Some of these were previously discussed with the Village including enforcement conferences and compliance meetings. Additional enforcement action may be taken if not corrected within the required time-frame.

The purpose of the sanitary survey is to evaluate water source, conveyance/storage/treatment facilities, operation and maintenance, and management and financial capability as related to providing safe drinking water. The survey is also an opportunity to update the Department's records, provide technical assistance, and identify potential risks that may adversely affect drinking water quality in your community. This report includes an overview of the system, key findings as related to specific requirements, and a brief summary that includes response criteria for correcting deficiencies.

SYSTEM OVERVIEW

From source to delivery, drinking water systems consist of many components. This not only includes infrastructure, it also encompasses source-water quality, operation and maintenance practices, and management and fiscal aspects. This section is a detailed overview of the entire system of providing water to your customers.

Ownership, Service Area, Geography, Personnel

Pepin owns and operates a municipal, public water supply system serving more than 25 year round residents and having more than 15 service connections. Residential service population is approximately 823 people.

dnr.wi.gov
wisconsin.gov

Naturally WISCONSIN

Ex: Estimating the rate impact of construction projects

Estimated % increase in rates due to construction project =

$$\frac{(\mathbf{UP})(0.13)^* + (\mathbf{CP})(0.03)^*}{\textbf{Annual Sales of Water}}$$

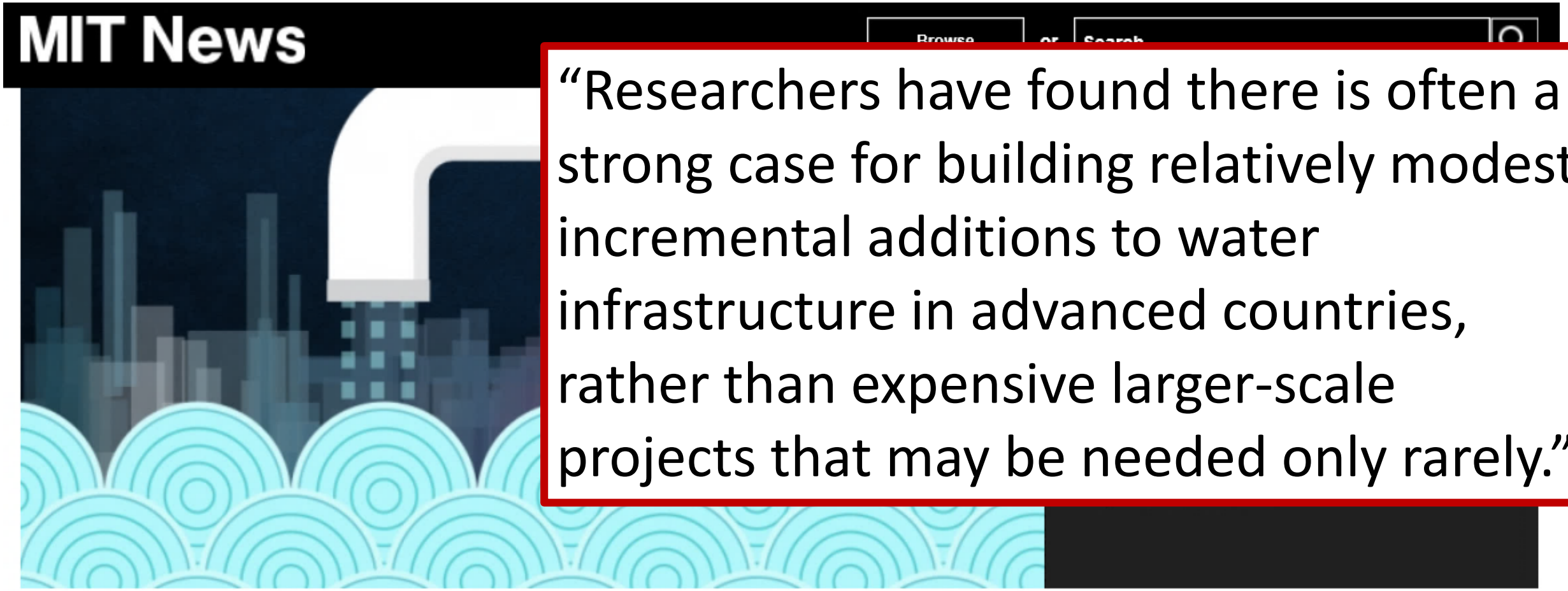
Where:

UP = Utility financed project costs in dollars (loans or funds)

CP = Contributed project costs in dollars (grants, etc.)

Annual Sales of Water = the utility's annual "total sales of water" in dollars from most recent annual report to the regulatory commission

* Multipliers are based on historical data on project costs and rates



"Researchers have found there is often a strong case for building relatively modest, incremental additions to water infrastructure in advanced countries, rather than expensive larger-scale projects that may be needed only rarely."

Case study suggests new approach to urban water supply

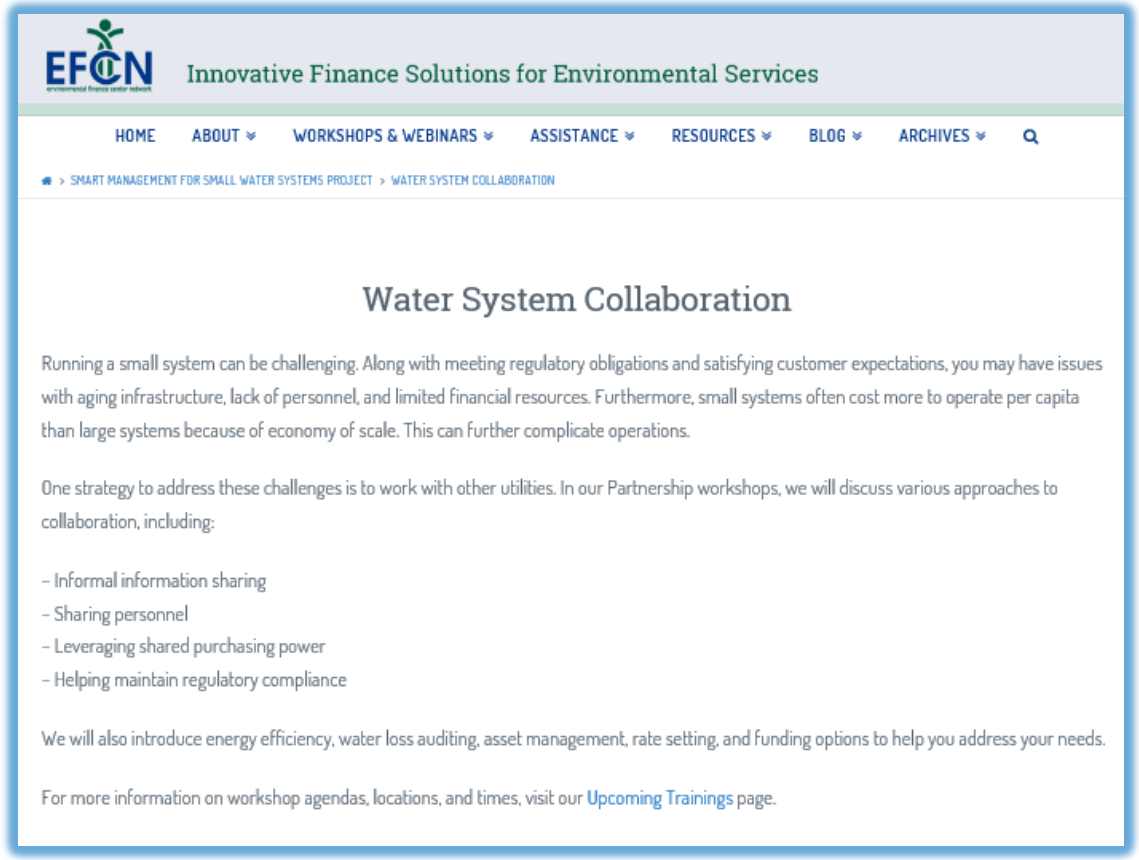
One drought remedy: Keep infrastructure fast, cheap, and under control.

Source: http://news.mit.edu/2017/drought-remedy-keep-infrastructure-fast-cheap-under-control-0814

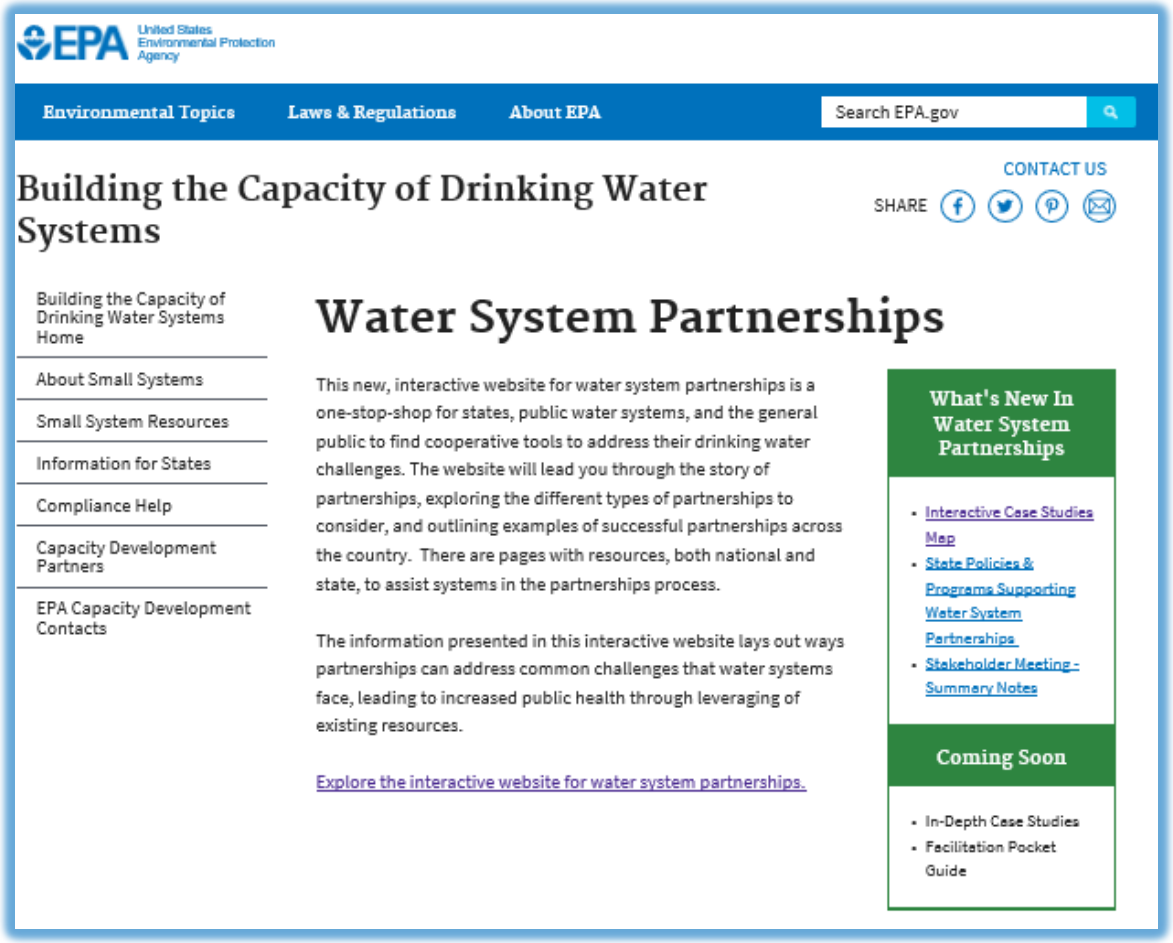
How can a utility mitigate the rate impact of a project?

- Delay spending/phase spending on new plant
- Add customers
- Partner with a neighboring utility - take a regional approach
- Grants
- Other contributions from customers, municipality (impact fees, assessments)
- Favorable financing terms
- If municipal utility, limit PILOT

Evaluate Alternatives - Partnerships



Source: https://efcnetwork.org/small-systems-project/water-system-collaboration/



Source: https://www.epa.gov/dwcapacity/water-system-partnerships

Cost of Service

Cost Allocation Basics

- Many costs are incurred to benefit all customers; other costs benefit only specific customers.
- The consumption patterns of different types of customers differ.
- While it may cost more to serve some customers than others, utilities do not track costs on a customer class basis, so allocations require some assumptions, averaging
- Most widely accepted measure of reasonable rates is whether they incorporate **cost of service** principles.

Cost of Service Principles

- Allocate costs to functional categories
  - Base or average use costs
  - Extra-capacity or peak demand costs (how variable are the demands?)
  - Customer costs
  - Fire protection costs

- Group customers with similar usage characteristics

- Allocate costs to customer classes proportionate to their demands on the system

Cost of Service Study (COSS) or Cost of Service Analysis

- COSS is a detailed analysis intended to allocate a utility's revenue requirements to its customers in an equitable manner
- Horizontal equity: Customers with similar burdens on the system pay similar rates
- Vertical equity: Customers with dissimilar burdens on the system pay different rates

Step 1: Select Cost Allocation Method

Base-Extra Capacity (Industry Standard)

- Fixed and Volume Charges
- Base Costs
  - Power
  - Chemicals
  - Waste Disposal (treatment costs)
- Extra Capacity Costs
  - Costs incurred to meet excess of average day demand (Maximum Day Demand, Maximum Hour Demand)

Commodity-Demand

- Fixed and Volume Charges
- Commodity Costs
  - Most Power
  - Chemicals
  - Purchased Water
- Demand Costs
  - Capital costs on peak plant
  - Associated O&M

Allocating Costs

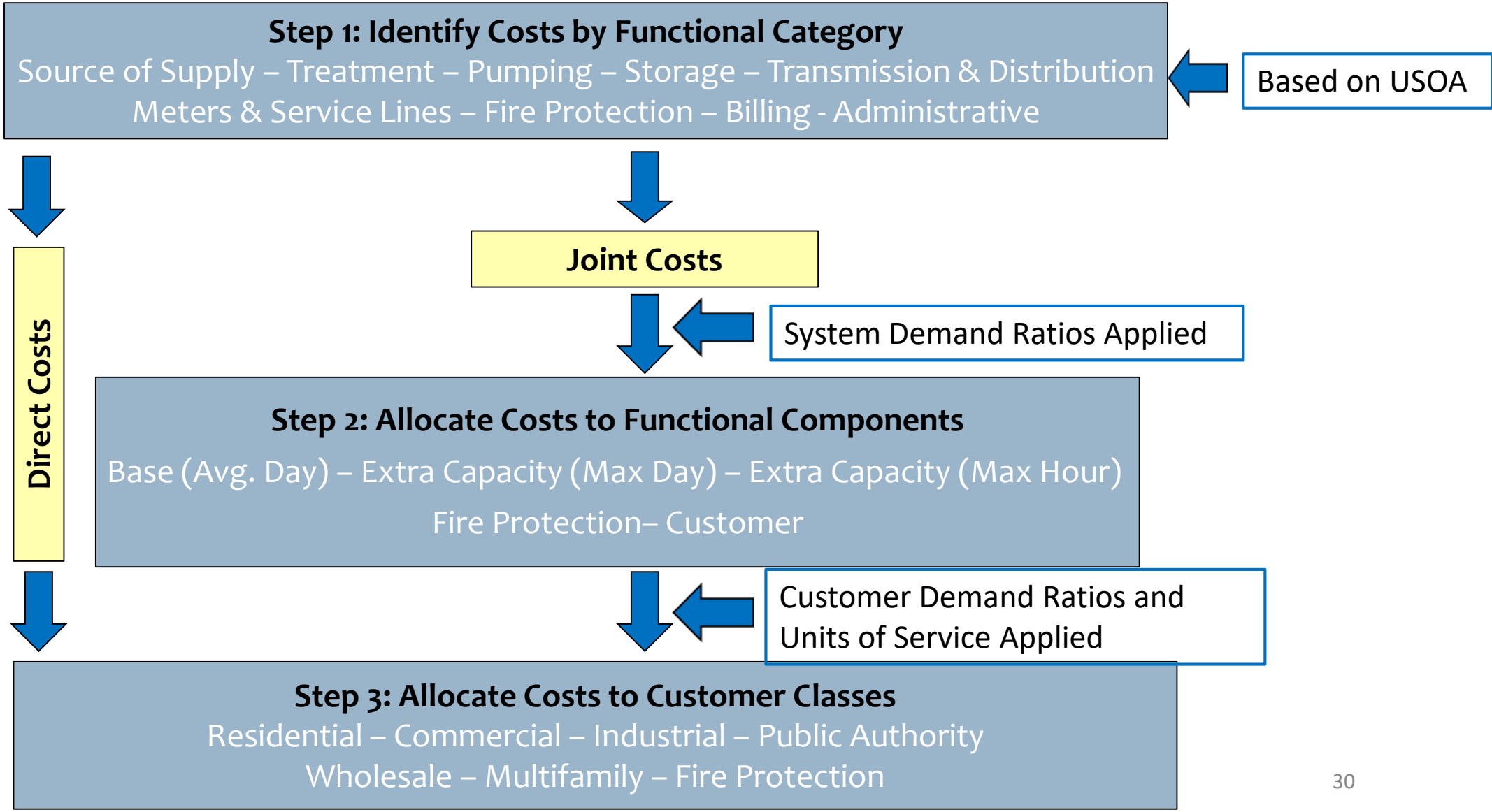
Direct Costs

- 100% of costs benefit one customer class
- Do not need to split costs
- **Ex:** 100% of hydrant costs are allocated to Fire Protection class
- **Ex:** costs of new well benefitting one large customer is allocated to that customer as a separate customer class

Joint Costs

- Costs benefit 2 or more customer classes
- Need to split costs
- **Customer Costs:** all customer classes benefit from portion of these costs
- **Base Costs:** all customer classes benefit from portion of these costs
- **Extra Capacity Costs:** customer classes benefit based on proportion of demand above base level use

Cost Allocation Under Base-Extra Capacity Method



Step 1: Identify costs by functional category (O&M)

Listing of Accounts

1. Source of Supply Expenses

Operation

600	Operation Supervision and Engineering
601	Operation Labor and Expenses
602	Purchased Water
603	Miscellaneous Expenses
604	Rents

Maintenance

610	Maintenance Supervision and Engineering
611	Maintenance of Structures and Improvements
612	Maintenance of Collecting and Impounding Reservoirs
613	Maintenance of Lake, River and Other Intakes
614	Maintenance of Wells and Springs
616	Maintenance of Supply Mains
617	Maintenance of Miscellaneous Water Source Plant

- Data and information collection are important
- Can be simple or complex
  - Ex: May require less detailed reporting standards for smaller utilities
  - Ex: May require more detailed reporting for performance tracking

System Demand Basics

- **Maximum Day Demand**
  - The maximum volume used during a 24 hour period within a given year
  - On the maximum day, the utility relies on a combination of source of supply and storage to meet demand.

- **Maximum Hour Demand**
  - The maximum hour volume used during a 1 hour period within a given year
  - The utility meets maximum hour demand by maintaining a minimum psi, typically required by the state SDWA primacy agency.

Step 2: Allocate costs to functional categories: system demand ratios (example)

MAXIMUM DAY SYSTEM DEMAND

Annual report data (3-5 year average)

TOTAL ANNUAL GAL PUMPED	10,950,000,000		Gallons		
AVERAGE DAY	40,000,000		Gallons		
MAXIMUM DAY	57,200,000		Gallons		
			40,000,000 /		
RATIOS:	BASE	=	57,200,000	=	**70%**
	MAX DAY	=	100 - (BASE)	=	**30%**

On max day, 70% of this system's demand is comprised of base needs

On max day, 30% of this system's demand is comprised of extra demand associated with conditions

Step 2: Allocate costs to functional categories: system demand ratios (example)

MAXIMUM HOUR SYSTEM DEMAND

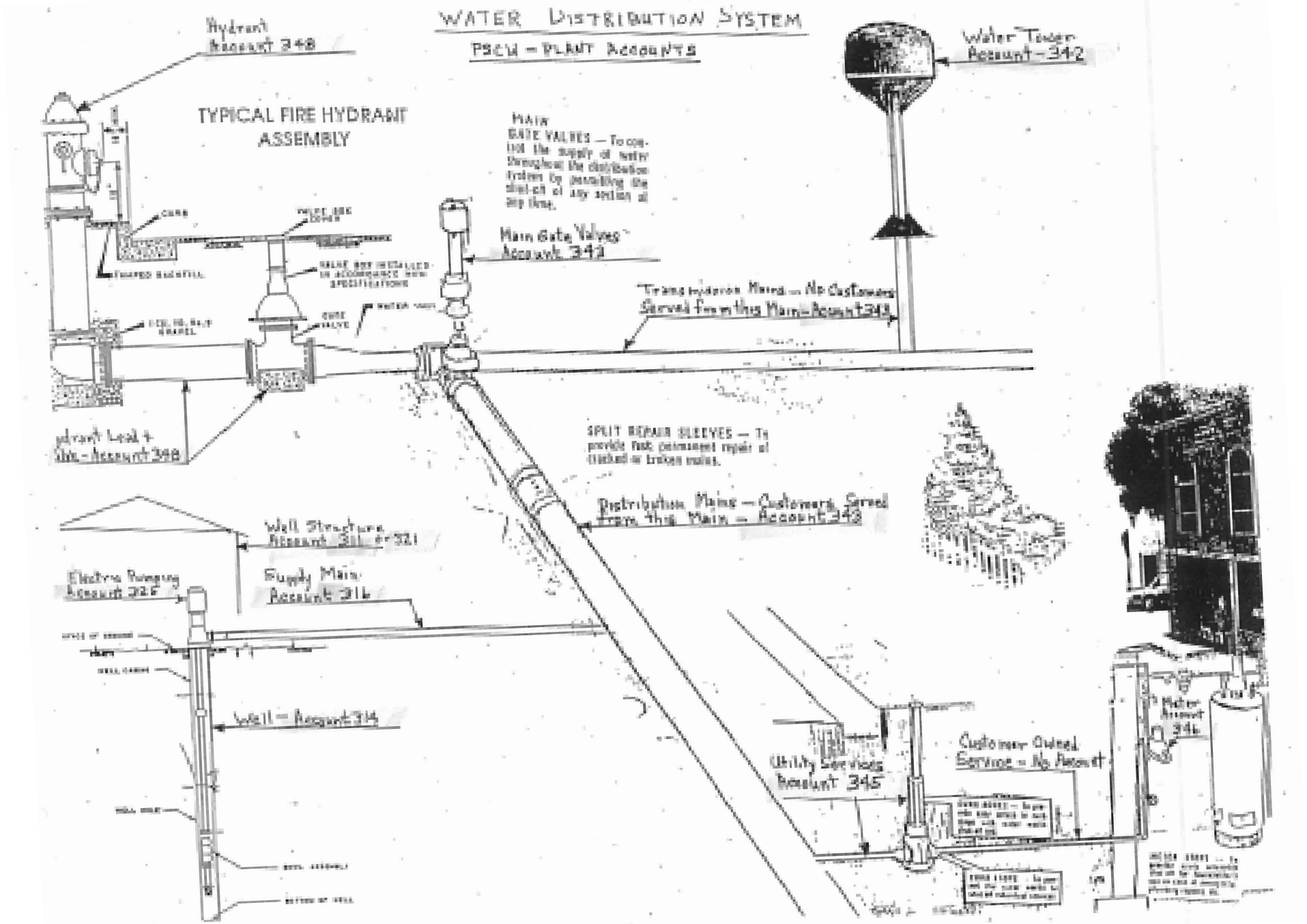
AVERAGE HR ON MAX DAY			2,383,333	Gallons		
MAXIMUM HOUR			3,750,000	Gallons		
AVERAGE HOUR						
PLUS ONE HOUR FIRE FLOW			1,786,667	Gallons		
RATIOS:	BASE	=	AVG DAY /	40,000,000/	=	**44%**
			MAX HR OR AVG HR + 1 HR FFLOW	90,000,000		
	MAX HOUR	=	100 - (BASE)		=	**56%**

= Maximum Day / 24

Example: Allocation factors

Allocation Factor

"A"	100% to Base
"B"	70% to Base, 30% to Extra-Capacity (Max Day)
"C"	44% to Base, 56% to Extra-Capacity (Max Hour)
"D"	100% to Customer
"E"	100% to Fire Protection
"F"	Proportion of all plant costs already allocated
"G"	Proportion of all O&M costs already allocated
"H"	General Transmission and Distribution (T&D) allocator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Exercise:
Assign allocators to O&M expense categories

Expense Category	Alloc Factor
Source of Supply	B
Water Treatment	
Operation supervision and engineering	B
O&M	B or G
Chemicals & Supplies	A
Pumping	
Operation supervision and engineering	B
Fuel or power purchased	A
Pumping labor and expenses	G or B
Maintenance of pumping equipment	B
Customer Accounts	D
Administrative and General	G

Expense Category	Alloc Factor
Transmission and Distribution	
Operation supervision and engineering	A
Storage facilities expenses	C
Trans. line expenses	B
Dist. line expenses	C
Meter expenses	D
Customer installations expenses	D
Maint. of distr. reservoirs and standpipes	C
Maint. of services	D
Maint of meters	D
Maint of hydrants	E
Miscellaneious Expenses	H

Example:
Apply allocators to utility plant categories

	Expenses (000$)					
Utility Plant	**Test Year**	**Alloc Factor**	**Base Costs**	**Extra Capacity Costs**	**Customer Costs**	**Fire Protection**
Source of Supply						
Land and Land Rights	$ 700	A	$ 700	$ -	$ -	$ -
Wells and Springs	4,000	B	2,800	1,200	-	-
Collecting & Impounding Reservoirs	6,000	B	4,200	1,800	-	-
Structures and Improvements	50	B	35	15	-	-
Total Source of Supply	**$ 10,750**		**$ 7,735**	**$ 3,015**	**$ -**	**$ -**
Transmission & Distribution						
Distribution Reservoirs and Standpipes	$ 20,000	C	$ 8,800	$ 11,200	$ -	$ -
Transmission mains	60,000	B	42,000	18,000		
Distribution mains	130,000	C	57,200	72,800	-	-
Services	45,000	D	-	-	45,000	-
Meters	20,000	D	-	-	20,000	-
Hydrants	25,000	E				25,000
Total Transmission & Distribution	**$ 300,000**		**$ 108,000**	**$ 102,000**	**$ 65,000**	**$ 25,000**

Example:
Allocate plant to service cost functions

ACCOUNT DESCRIPTION	TOTAL ($)	BASE COSTS		EXTRA-CAPACITY					CUSTOMER COSTS			
				MAX DAY		MAX HOUR						
		System ($)	Distribution ($)	System ($)	Distribution ($)	System ($)	Distribution ($)	Storage ($)	Billing ($)	Equivalent Meter ($)	Equivalent Service ($)	Fire Protection ($)
TRANSMISSION & DISTRIBUTION PLANT												
Land and Land Rights	653,553	102,836	128,769	42,751	0	0	160,961	21,668	0	43,111	99,779	53,679
Structures and Improvements	668,923	105,254	131,797	43,756	0	0	164,746	22,178	0	44,125	102,125	54,941
Distribution Reservoirs and Standpipes	17,418,884	7,741,726						9,677,158				
Transmission mains	57,277,324	38,184,882		19,092,441								
Distribution mains	129,393,462		57,508,205				71,885,257					
Services	44,561,220										44,561,220	
Meters	19,253,392									19,253,392		
Hydrants	23,973,118											23,973,118
Other Transmission and Distribution Plant	0	0	0	0	0	0	0	0	0	0	0	0

Step 3: Allocate Costs to Customer Classes

Customer Classes

- Residential – Single Family
- Residential – Multifamily
- Commercial
- Industrial
- Public Authority
- Irrigation
- Raw Water
- Individual Customer (typically for a large industrial customer with either very high or very low peak demands)
- Public Fire Protection
- Wholesale

Basis of Allocation to Customer Classes

Functional Cost Category	Unit of Service
Base Costs	Gallons
Extra Capacity (Max Day)	Max Day Customer Demand Ratio
Extra Capacity (Max Hour)	Max Hour Customer Demand Ratio
Customer Billing	Number of Bills
Customer Metering	Number of Equivalent Meters
Customer Services	Number of Equivalent Services
Fire Protection	Direct Allocation

Customer Demand Ratios

Max Day	Current Case	Past Case	Average
Res	1.60	1.77	1.60
MF Res	1.40	1.66	NA
Com	1.74	1.82	1.30
Ind	1.66	1.73	0.80
PA	1.83	2.38	1.30

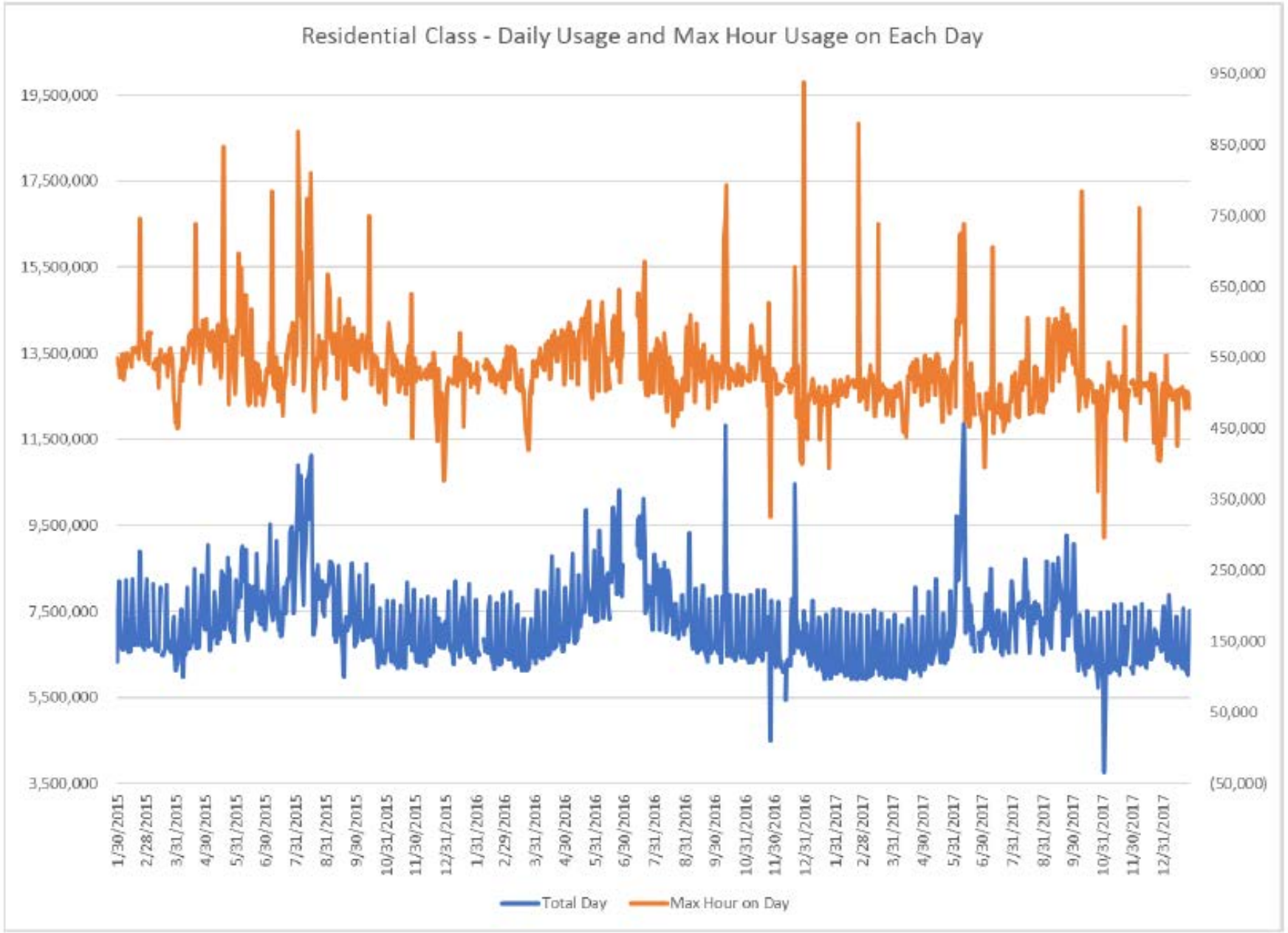
Max Hour	Current Case	Past Case	Average
Res	1.97	2.20	3.80
MF Res	1.33	2.24	NA
Com	1.91	1.77	3.40
Ind	1.34	1.93	1.60
PA	2.36	4.28	3.50

Non-Coincident/ Coincident Ratio		Preferred Range	
Max Day	0.93	1.1	1.4
Max Hour	1.08	1.4	1.7

Options

- Use demand ratios from previous rate case
- Compare with demand ratios from similar system (size, customer mix, etc.)
- If available, use actual data from data loggers, advanced meter systems

Example: AMI Data



Example: Calculate Demand Ratios Based on AMI Data

Residential Class Analysis

Starting Month	Ending Month	Average Day	Max Day	MD:AD	Max Hour	MH:AD
Feb-15	Jan-16	7,375,100	11,121,250	1.51	868,996	2.83
Mar-15	Feb-16	7,353,926	11,121,250	1.51	868,996	2.84
Apr-15	Mar-16	7,325,207	11,121,250	1.52	868,996	2.85
May-15	Apr-16	7,325,118	11,121,250	1.52	868,996	2.85
Jun-15	May-16	7,335,837	11,121,250	1.52	868,996	2.84
Jul-15	Jun-16	7,374,661	11,121,250	1.51	868,996	2.83
Aug-15	Jul-16	7,380,352	11,121,250	1.51	868,996	2.83
Sep-15	Aug-16	7,275,163	10,322,769	1.42	749,332	2.47
Oct-15	Sep-16	7,236,168	10,322,769	1.43	749,332	2.49
Nov-15	Oct-16	7,241,335	11,825,728	1.63	792,382	2.63
Dec-15	Nov-16	7,231,319	11,825,728	1.64	792,382	2.63
Jan-16	Dec-16	7,239,170	11,825,728	1.63	937,827	3.11
Feb-16	Jan-17	7,205,508	11,825,728	1.64	937,827	3.12
Mar-16	Feb-17	7,174,762	11,825,728	1.65	937,827	3.14
Apr-16	Mar-17	7,150,814	11,825,728	1.65	937,827	3.15
May-16	Apr-17	7,106,772	11,825,728	1.66	937,827	3.17
Jun-16	May-17	7,029,426	11,825,728	1.68	937,827	3.20
Jul-16	Jun-17	6,994,860	11,858,164	1.70	937,827	3.22
Aug-16	Jul-17	6,931,069	11,858,164	1.71	937,827	3.25
Sep-16	Aug-17	6,910,736	11,858,164	1.72	937,827	3.26
Oct-16	Sep-17	6,963,237	11,858,164	1.70	937,827	3.23
Nov-16	Oct-17	6,925,960	11,858,164	1.71	937,827	3.25
Dec-16	Nov-17	6,903,744	11,858,164	1.72	937,827	3.26
Jan-17	Dec-17	6,888,195	11,858,164	1.72	880,336	3.07
Feb-17	Jan-18	6,900,913	11,858,164	1.72	880,336	3.06
Average				1.61		2.98

Customer Cost Allocation: Equivalent Meters

NUMBER OF METERS

Meter size (inches):	5/8	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4	6	8	10	12	TOTAL METERS	PERCENT
Residential	102	0	0	0	0	0	0	0	0	0	0	0	0	102	74%
Multifamily Residential	4	0	3	0	0	0	0	0	0	0	0	0	0	7	5%
Commercial	15	0	3	0	1	0	0	0	0	0	0	0	0	19	14%
Industrial	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1%
Public Authority	6	0	3	0	1	0	0	0	0	0	0	0	0	10	7%
TOTALS	128	0	9	0	2	0	0	0	0	0	0	0	0	139	100%

EQUIVALENT METERS

ALLOCATION FACTOR:														TOTAL	
Meter size (inches):	5/8	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4	6	8	10	12	EQUIV. METERS	PERCENT
Equiv. meters ratio:	1.0	1.0	2.5	3.7	5.0	8.0	12.5	15.0	25.0	50.0	80.0	120.0	160.0		
Residential	102	0	0	0	0	0	0	0	0	0	0	0	0	102	64%
Multifamily Residential	4	0	8	0	0	0	0	0	0	0	0	0	0	12	7%
Commercial	15	0	8	0	6	0	0	0	0	0	0	0	0	28	18%
Industrial	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1%
Public Authority	6	0	8	0	3	0	0	0	0	0	0	0	0	16	10%
TOTALS	128	0	23	0	9	0	0	0	0	0	0	0	0	159	100%

- Equivalent meters typically based on 5/8” meter
- Used to develop fixed monthly charge
- Recognizes greater potential for instantaneous demand generated by larger meters

Customer Cost Allocation: Equivalent Services

ALLOCATION FACTOR:	EQUIVALENT SERVICES													TOTAL	
Meter size (inches):	5/8	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4	6	8	10	12	EQUIV.	
Equiv. services ratio:	1.0	1.0	1.3	1.7	2.0	3.0	3.5	4.0	5.0	6.0	7.0	8.0	9.0	SERVICES	PERCENT
Residential	102	0	0	0	0	0	0	0	0	0	0	0	0	102	72%
Multifamily Residential	4	0	4	0	0	0	0	0	0	0	0	0	0	8	6%
Commercial	15	0	4	0	3	0	0	0	0	0	0	0	0	21	15%
Industrial	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1%
Public Authority	6	0	4	0	1	0	0	0	0	0	0	0	0	11	8%
TOTALS	**128**	**0**	**12**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**143**	**100%**

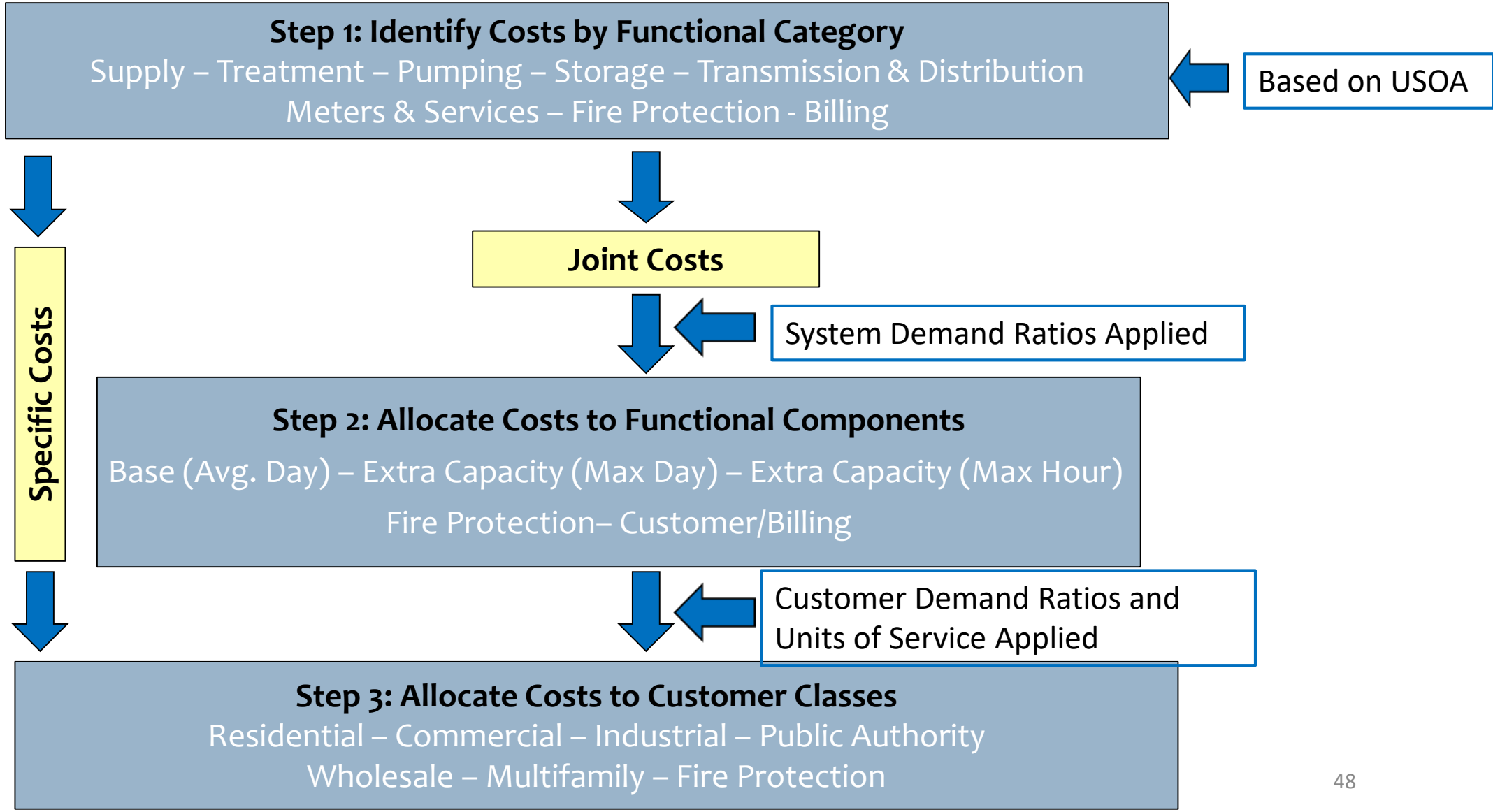
- Equivalent services typically based on 5/8” service line
- Used to develop fixed monthly charge
- Recognizes greater potential for instantaneous demand generated by larger service lines

Step 3: Allocate Costs to Customer Classes

ALLOCATION OF SERVICE COST FUNCTIONS TO CUSTOMER CLASSES

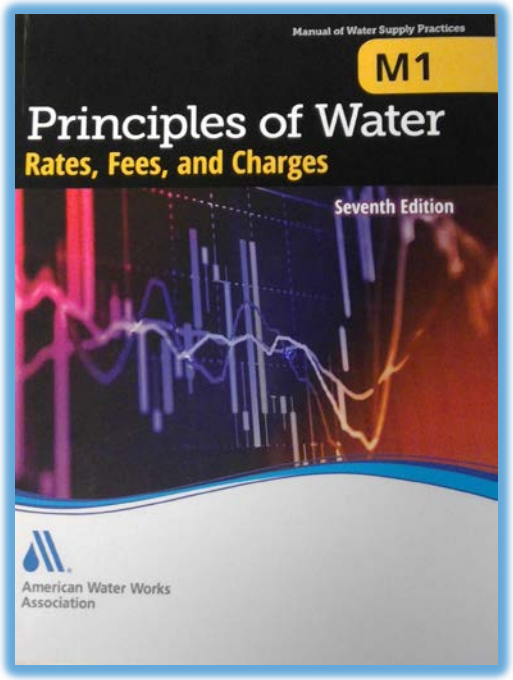
	TOTAL ($)	Residential ($)	Multifamily Residential ($)	Commercial ($)	Industrial ($)	Public Authority ($)	Public Fire Protection ($)
BASE COSTS:							
SYSTEM	215,676	138,943	14,076	44,009	665	15,827	2,157
DISTRIBUTION	11,504	7,411	751	2,347	35	844	115
EXTRA-CAPACITY COSTS:							
MAXIMUM-DAY SYSTEM	271,590	105,807	9,240	25,424	384	9,144	121,591
MAXIMUM-DAY DISTRIBUTION	0	0	0	0	0	0	0
MAXIMUM-HOUR SYSTEM	0	0	0	0	0	0	0
MAXIMUM-HOUR DISTRIBUTION	103,535	36,711	3,206	8,621	130	3,100	51,768
MAXIMUM-HOUR STORAGE	58,613	8,313	726	1,952	29	702	46,890
CUSTOMER COSTS:							
BILLING	36,502	31,230	753	3,632	133	753	
EQUIVALENT METERS	24,998	16,932	1,001	4,206	179	2,681	
EQUIVALENT SERVICES	33,573	27,112	875	3,981	150	1,455	
FIRE PROTECTION	27,707						27,707
TOTAL COST	783,697	372,459	30,628	94,172	1,705	34,506	250,228

Cost Allocation Under Base-Extra Capacity Method



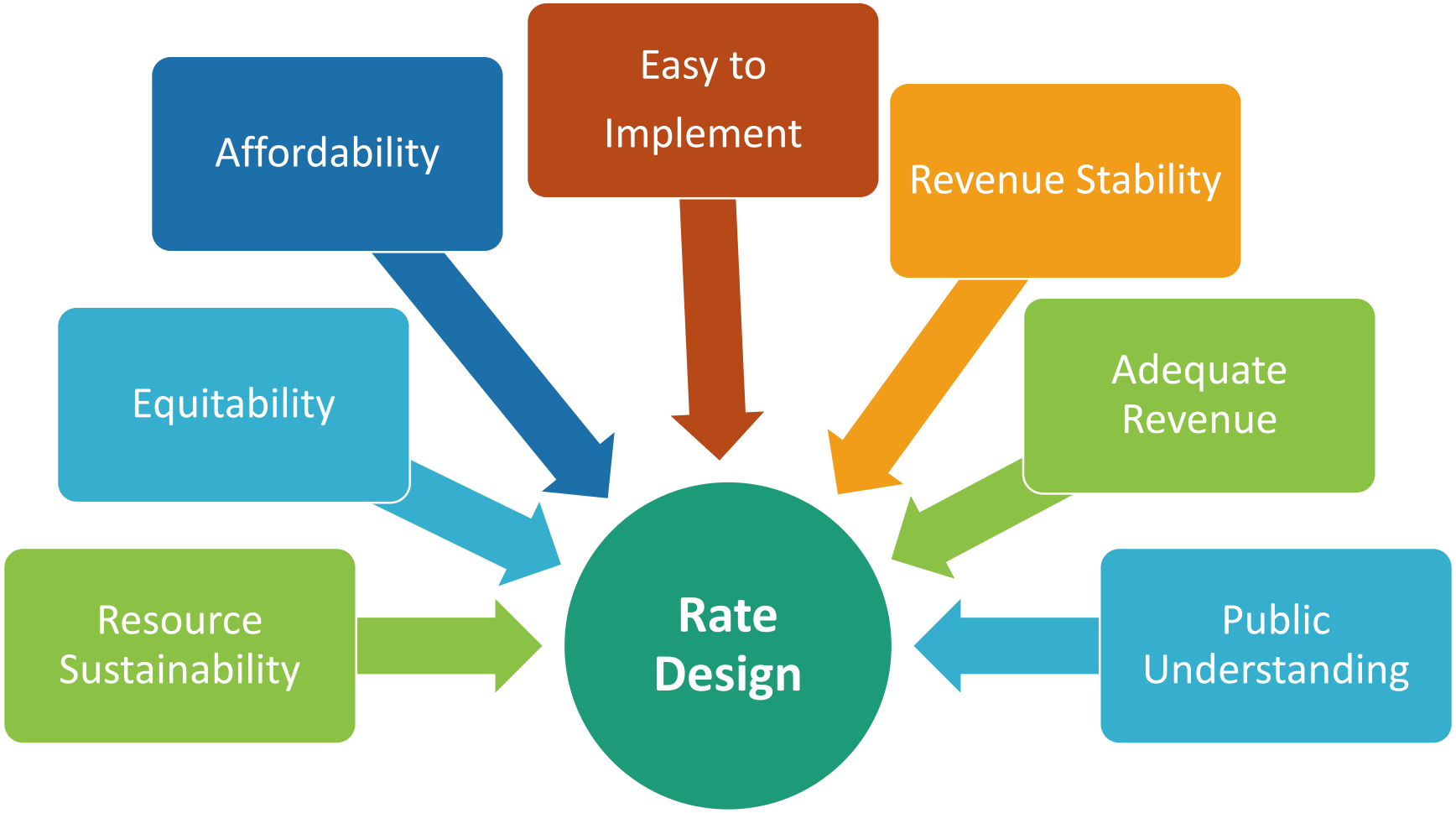
COSS Results

- Revenue level to be recovered from each customer class
- Average unit costs for each customer class
  - Fixed customer charges ($ per billing period)
  - Variable volumetric charges ($ per volume)
  - Fixed fire protection charges (PFP)



Rate Design

Water Rate Design – Policy Considerations



U.S. Water Rate Design

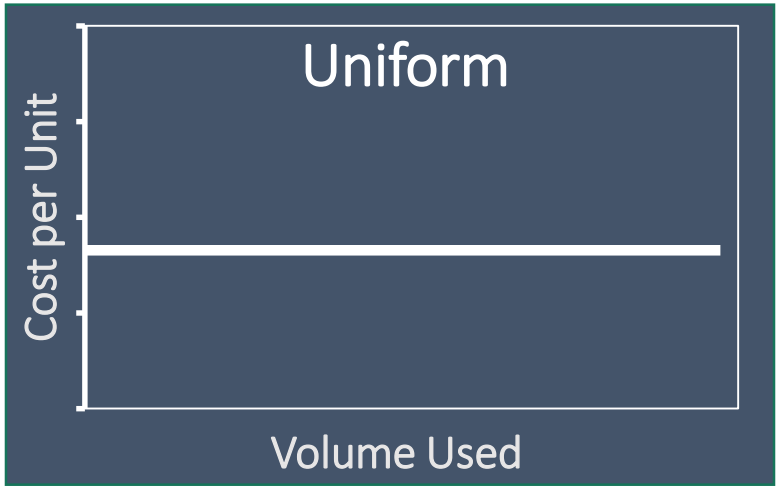
Traditional

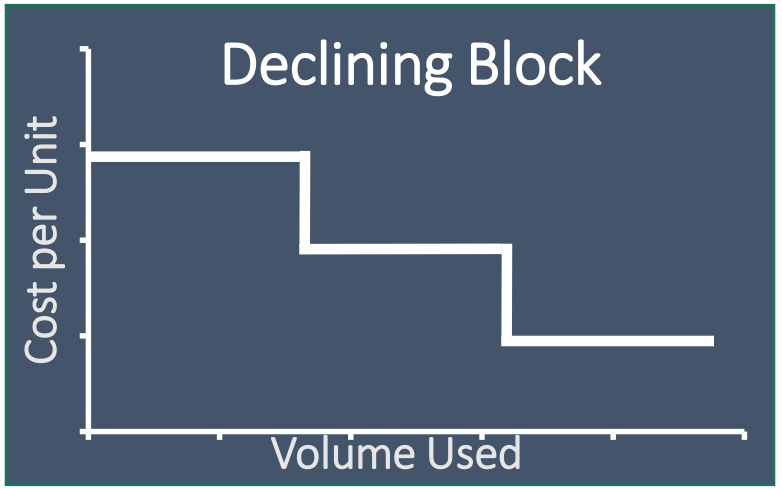
- Volumetric rates (uniform, block)
- Fixed service charges (with and without quantity allowance)
- Fixed public fire protection (extra capacity) charge

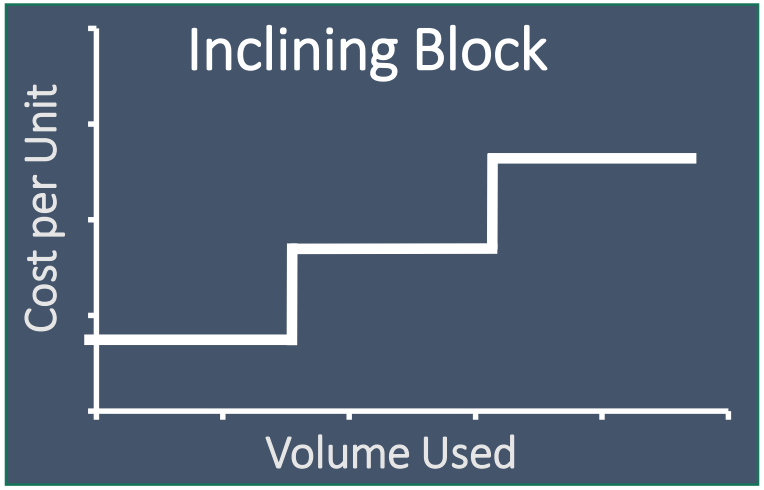
Non-Traditional/Emerging

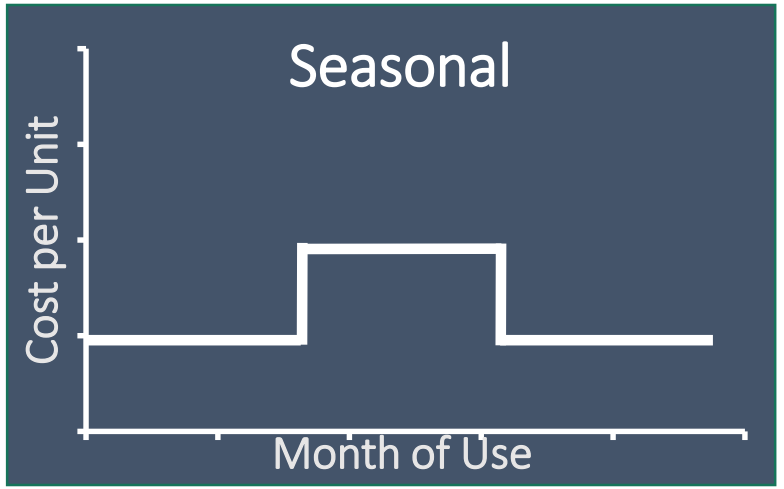
- Water budget rates
- Tailored fixed charges
- Alternative fixed charges (peak-set-base)
- Life-Line
- Economic development
- Off-Peak or interruptible
- Marginal cost

Traditional Water Rate Design Options









Uniform Rate Structure

BY CUSTOMER CLASS

Advantages
- Cost-of-Service based
- Public acceptance

Disadvantages
- Administrative complexity
- Customers using same volumes can be in different classes
- Need to keep up with changes in use

SYSTEMWIDE

Advantages
- Administrative simplicity
- Public understanding

Disadvantages
- Not Cost-of Service based unless use customer class based rates

Example: Class-Based, Uniform Rates

Customer Class	Extra Capacity Ratios Max Day	Max Hour
Residential	2.50	5.45
Multifamily	2.25	5.00
Commercial	1.75	4.00
Industrial	1.15	2.50
Public Authority	1.75	4.00
Ace Ethanol, LLC	0.425	0.791

Plus Volume Charges:

Residential Customers

All water used per quarter -$6.69 per 1,000 gallons

Multifamily Customers

All water used per quarter -$7.08 per 1,000 gallons

Commercial Customers:

All water used per quarter -$6.01 per 1,000 gallons

Industrial Customers:

All water used per quarter -$5.16 per 1,000 gallons

Public Authority Customers:

All water used per quarter -$6.74 per 1,000 gallons

Ace Ethanol, LLC:

All water used per quarter -$4.87 per 1,000 gallons

Block Rate Structures

Advantages

- Support conservation (inclining), or support economic development (declining)
- Simplifies billing (declining)

Disadvantages

- Administrative complexity (inclining)
- Perceived as encouraging wasteful use (declining)
- Public perception with regard to equity

Conservation Rates

Inclining Block

- Typically used to encourage conservation
- Focused on managing summer outdoor use
- Recover Extra-Capacity costs in 2nd block
- Non-discriminatory if customer class is fairly uniform

Seasonal

- Determine what % of Extra Capacity costs are associated with summer peak demands
- Months included in summer quarter based on location
- Determine what % of total sales are in summer quarter

Irrigation Rate

- COSS incorporates Extra Capacity, low volume use of this customer class

Ex: Inclining Block Rate

Monthly Service Charges (All Customer Classes):

⅝ -inch meter - $	11.00	3 -inch meter - $	86.00
¾ -inch meter - $	11.00	4 -inch meter - $	140.00
1 -inch meter - $	19.00	6 -inch meter - $	258.00
1¼ -inch meter - $	26.00	8 -inch meter - $	404.00
1½ -inch meter - $	33.00	10 -inch meter - $	535.00
2 -inch meter - $	51.00	12 -inch meter - $	705.00

Plus Volume Charges:

Residential Customers:

First	2,000	gallons used monthly - $5.40 per 1,000 gallons
Next	8,000	gallons used monthly - $7.00 per 1,000 gallons
Over	10,000	gallons used monthly - $9.50 per 1,000 gallons

Multifamily Residential Customers:

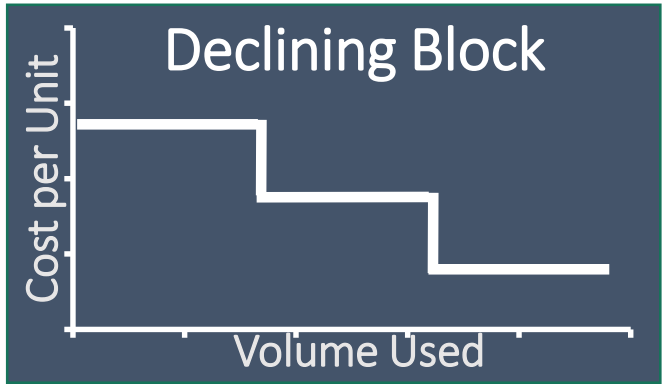
All water used monthly - $6.80 per 1,000 gallons

Nonresidential Customers:

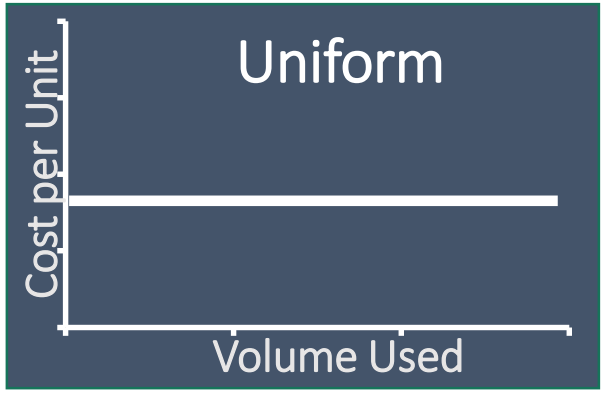
All water used monthly - $6.80 per 1,000 gallons

Example: Local priorities inform rate design

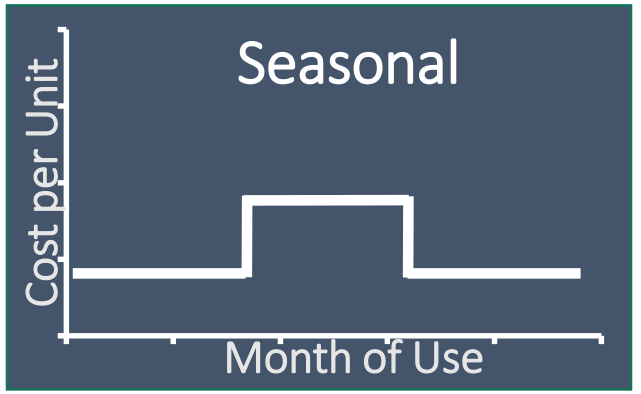
Prior to 2008



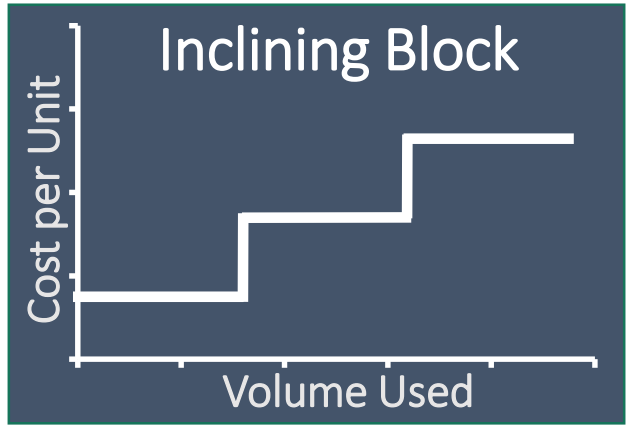
2008



2015: Rate Structure Requested by Utility Staff

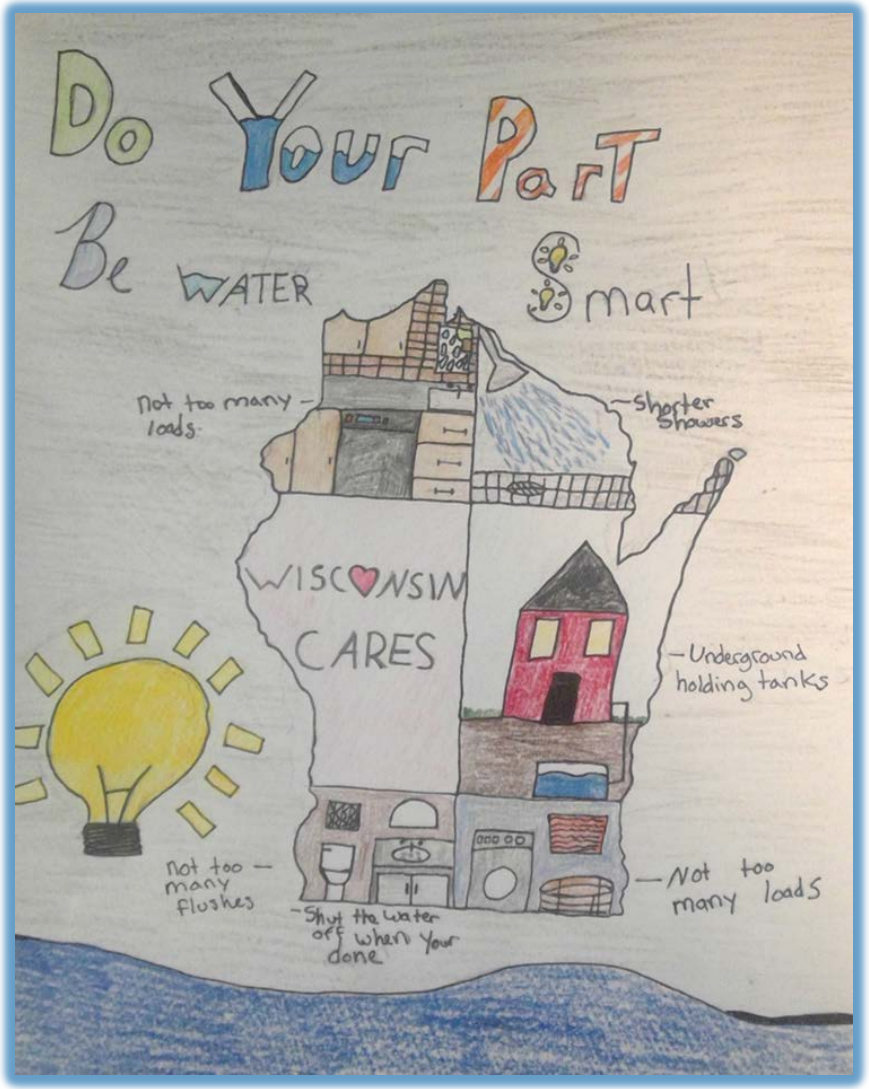


Rate Structure Approved by Utility Board

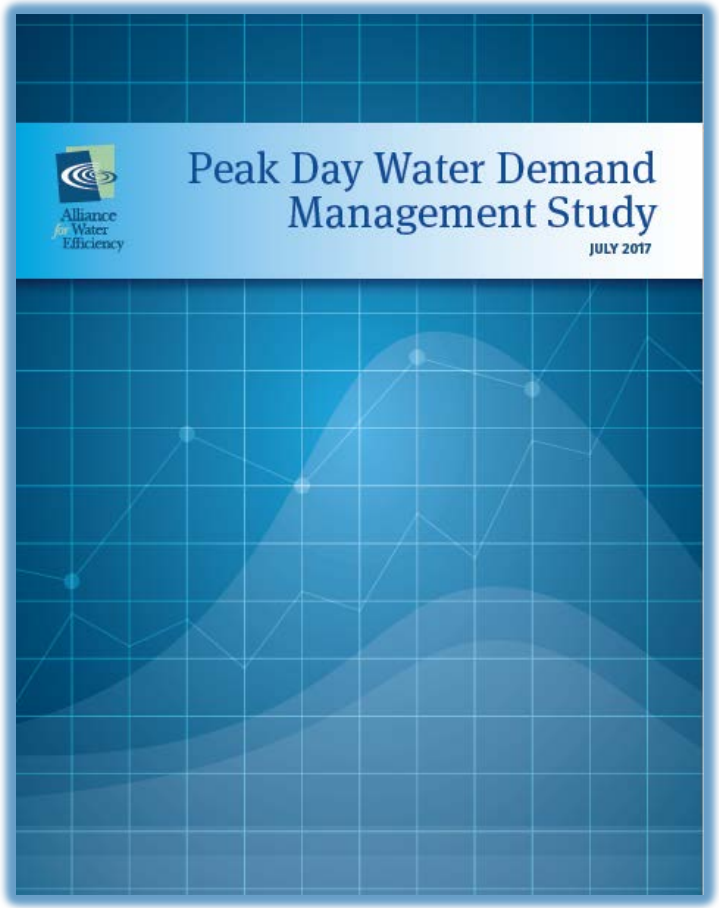


Sending a conservation price signal

- Rate structure
- Billing frequency
- Reduce portion of customer's bill that is fixed
- Full cost pricing
- Customer outreach and education help ensure conservation will be achieved



Adopting conservation measures can reduce peak demand and reduce capital needs



City of Waukesha's Annual Sprinkling Ordinance
May 1st - October 1st

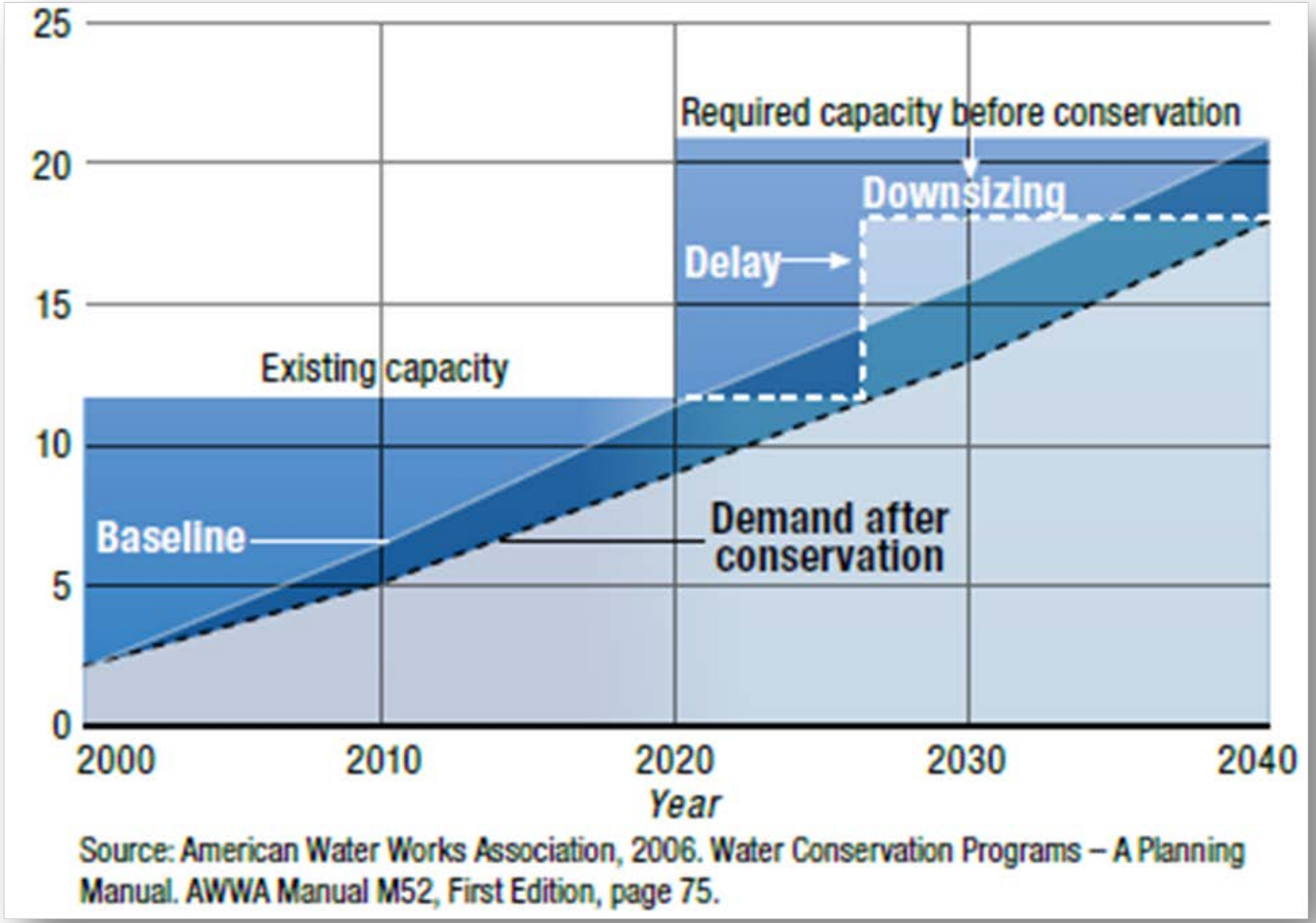
Addresses Ending With An	May Water On The Following Days	During These Hours
Odd Number	Tuesdays & Saturdays	Before 9 am or After 5 pm
Even Number	Thursdays & Sundays	Before 9 am or After 5 pm

Hand watering may be done any day at any time.

Enforcement: Warnings will be given for the first watering violation. Subsequent offenses will result in fines as per Ordinance. Violations may be reported anonymously at (262) 521-5272.

Save Money & Mow Less: Join "My Brown Lawn is GREEN" campaign. Since established lawns go dormant in the summer and turn green again with the autumn rain, watering the grass is unnecessary.

Source:
http://www.allianceforwaterefficiency.org/peakdayreport.aspx



Source: American Water Works Association, 2006. Water Conservation Programs – A Planning Manual. AWWA Manual M52, First Edition, page 75.

Avoided/downsized infrastructure reduces rates in the long-term

- Utilities reduced costs by:
  - Avoiding purchase of additional water supply
  - Deferring large-scale infrastructure projects
  - Reducing size of new facilities

- Reports available at:
  www.financingsustainablewater.org

Utility conservation programs enhance customer service, help address affordability concerns

In summary, conservation…

- Reduces short-term operating costs
- Helps stretch supply, reducing long-term capital costs
- Helps stabilize water use and revenues across time
- Makes demand and revenue forecasting easier
  - Weather variations become less important
  - Rate structure and price become less important
- Can enhance communication with customers
- Helps achieve community goals

Example: Declining Block Rate

Quarterly Service Charges (All Customer Classes):

⅝ -inch meter - $	21.75	3 -inch meter - $	123.00
¾ -inch meter - $	21.75	4 -inch meter - $	180.00
1 -inch meter - $	36.75	6 -inch meter - $	276.00
1¼ -inch meter - $	48.00	8 -inch meter - $	393.00
1½ -inch meter - $	60.00	10 -inch meter - $	672.00
2 -inch meter - $	90.00	12 -inch meter - $	1,140.00

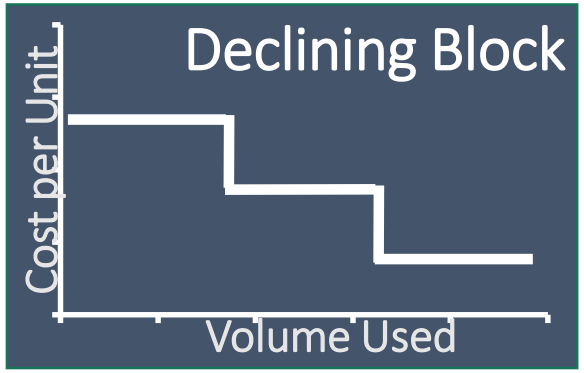
Plus Volume Charges:

All Customer Classes Excluding Irrigation Class:

First	30,000	gallons used quarterly - $2.44 per 1,000 gallons
Next	70,000	gallons used quarterly - $2.22 per 1,000 gallons
Over	100,000	gallons used quarterly - $1.35 per 1,000 gallons

Irrigation Class Customers:

All water used per quarter - $2.90 per 1,000 gallons



Declining block rate structures can result in one rate for all customer classes

Ex: Alternative rate design blocks based on peaking factors

Water, Sewer & Stormwater Rates

Effective July 1, 2015 Ann Arbor water bills will be charged according to the following rate structure, based on water meter readings.

	Residential 1 Rate is based on a single water meter used in a home	**Residential 2** Rate when a second Water-Only[2] meter is also used in a home	**Water Only**** Rate for the second meter for non sewer water uses, such as for irrigation	**Commercial Rate** (Locations may also have a second, Water Only** meter)
1-7 CCFs*	$1.45 per CCF	$1.45 per CCF	$5.31 per CCF	Tier 1 = $ 3.45 (peaking factor <=5)
8-28 CCFs*	$3.09 per CCF	$3.09 per CCF	$5.31 per CCF	Tier 2 = $ 6.58 (peaking factor >5<8)
29-45 CCFs*	$5.31 per CCF	$3.09 per CCF	$5.31 per CCF	Tier 3 = $ 11.27 (peaking factor >=8)
Over 46 CCFs*	$5.31per CCF	$3.09 per CCF	$5.31 per CCF	
Water Customer Charge	$11.25/quarter for 5/8th inch standard residential meter; charge varies by meter size	$11.25/quarter for 5/8th inch standard residential meter; charge varies by meter size	Residential: No charge ---------- Commercial: Charge varies by size of meter	Customer charge varies by size of water meter

Ex: Alternative rate design blocks based on peaking factors

Commercial Rate (Locations may also have a second, Water Only** meter)
Tier 1 = $ 3.45 (peaking factor <=5)
Tier 2 = $ 6.58 (peaking factor >5<8)
Tier 3 = $ 11.27 (peaking factor >=8)
Customer charge varies by size of water meter

Public Fire Protection Charge

- **PFP Charge:** Recovers costs associated with building and maintaining capacity to provide high pressures and flows to hydrants for the purpose of fire suppression
- Portion of wells, pumps, storage facilities, water mains, and hydrants
- It is not simply a “hydrant rental” fee

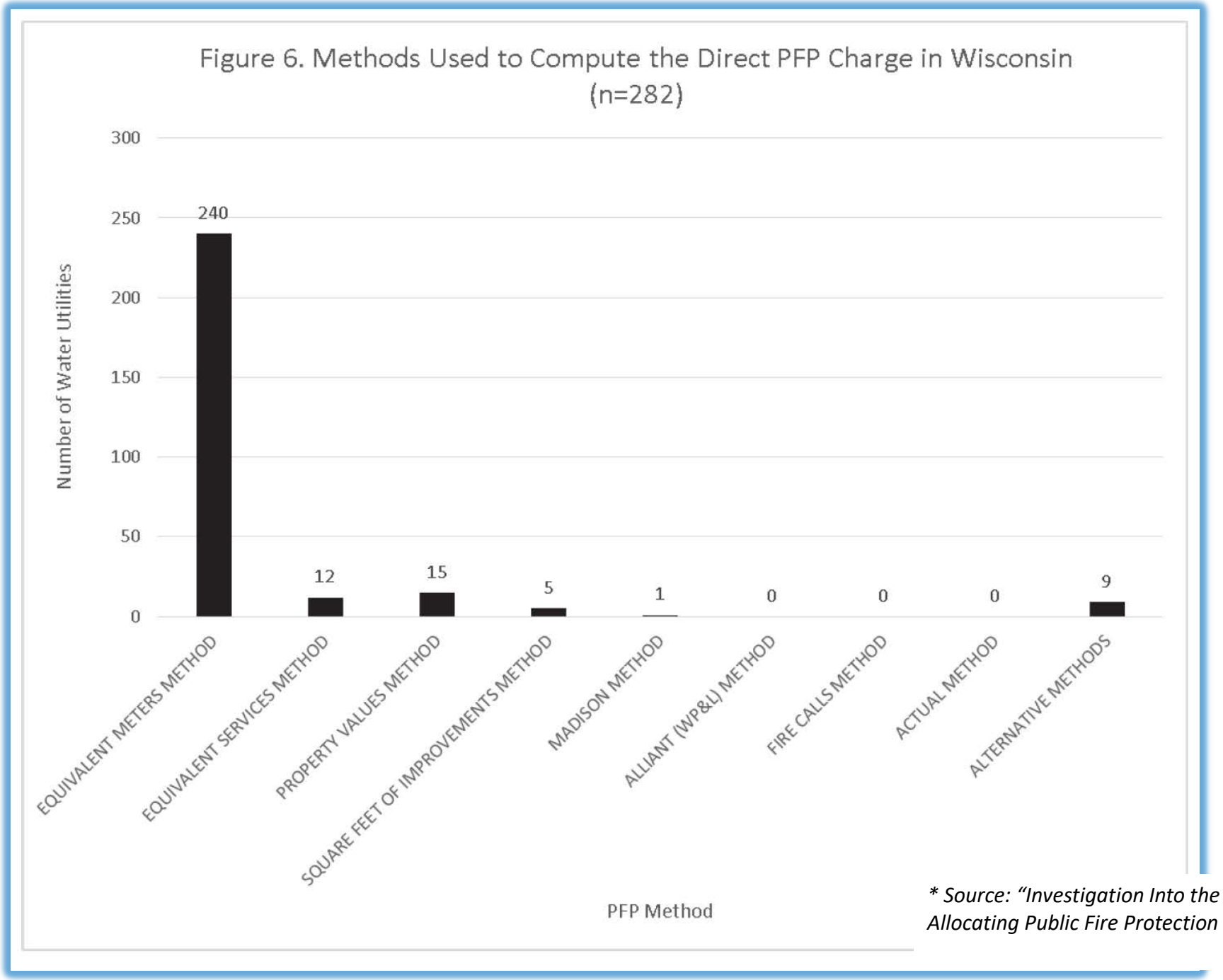
Exploring Public Fire Protection Charges in Wisconsin

MARCH 7, 2018 / EVAN KIRK / 0 COMMENTS

Print PDF

In addition to Rates Dashboards, the Environmental Finance Center at the University of North Carolina at Chapel Hill regularly publishes tables of water rates and rate structures of various states. Last month, in addition to tables of water and wastewater rates, the EFC at UNC also published tables of public fire protection charges in Wisconsin as of January 2018. These data tables are one of several products created from data for water rates and rate structures of 575

Source: UNC Environmental Finance Center blog



** Source: "Investigation Into the Methods Used by Wisconsin's Water Utilities in Allocating Public Fire Protection (PFP) Costs," Draft Staff Report, Docket 5-WI-104*

Example Direct Public Fire Protection Charges

Based on Meter Size

Quarterly Public Fire Protection Service Charges:

⅝ - inch meter - $	9.25	3 - inch meter - $	138.71
¾ - inch meter - $	9.25	4 - inch meter - $	231.18
1 - inch meter - $	23.11	6 - inch meter - $	462.36
1¼ - inch meter - $	23.11	8 - inch meter - $	739.79
1½ - inch meter - $	46.24	10 - inch meter - $	1,109.67
2 - inch meter - $	73.97	12 - inch meter - $	1,479.56

Based on Property Value

Quarterly Public Fire Protection Service Charges:

Fair Market Value of Improvements			Quarterly Charge
$ 0	-	$ 99,999	$ 8.40
$ 100,000	-	$ 199,999	$ 12.60
$ 200,000	-	$ 499,999	$ 27.00
$ 500,000	-	$ 999,999	$ 70.50
$ 1,000,000	-	$ 2,999,999	$ 190.50
$ 3,000,000	-	$ 5,999,999	$ 376.20
$ 6,000,000	-	$ 11,999,999	$ 769.20
$ 12,000,000	-	$ 25,000,000	$ 1,620.00

Example: Public Fire Protection Charge Collected on Property Tax Bills

Public Fire Protection Service

Public fire protection service includes the use of hydrants for fire protection service only and such quantities of water as may be demanded for the purpose of extinguishing fires within the service area. This service shall also include water used for testing equipment and training personnel. For all other purposes, the metered or other rates set forth, or as may be filed with the Public Service Commission, shall apply.

The annual charge for public fire protection service to the Village of Baldwin shall be $182,103. The utility may bill for this amount in equal quarterly installments.

Billing: Same as Schedule Mg-1.

PFP Assessment Methods

1. Equivalent Meters Method - Based on ratios of meter size

- Simple to administer
- Not perfectly equitable

2. Equivalent Services Method - Based on ratios of meter size, but uses different ratios

- Simple to administer
- Not perfectly equitable
- Compared to the equivalent meters method this method results in relatively higher charges to small meters and lower charges to large meters

3. Property Values Method - Based on property value

- Equitable; charges closely reflect benefits received
- Provides continuity for utilities moving the PFP charge from municipal charge to direct charges
- Property value data may not be readily available to the utility

4. Square Feet of Improvements Method - Based on square feet of improvements

- Equitable; charges reflect benefits received
- Some continuity with municipal charge
- The data may not be readily available to the utility

Final step: Assess the end result

- Calculate sample bills for multiple use levels and all customer classes
- Consistency with cost allocation basis is key
- Test for unreasonable impacts
  - To particular customer class
  - To individual customers
- Does the rate design achieve the utility's/community's objectives?

Cost of Service Comparison:

Centuria Municipal Water and Sewer Utility
Comparison of Revenue
at
Present Rates, Cost of Service and Proposed Rates

		Cost of Service		Proposed Rates		
Customer Class	Revenue at Present Rates	Revenue Required	Increase over Present Rates	Revenue	Increase over Present Rates	Percent of Cost of Service
Residential	$45,576	$66,560	46.04%	$66,814	46.60%	100.38%
Multifamily Residential	$11,291	$13,831	22.50%	$15,056	33.34%	108.85%
Commercial	$23,756	$33,732	41.99%	$32,480	36.72%	96.29%
Public Authority	$1,481	$1,393	-5.96%	$1,847	24.72%	132.63%
Public Fire Protection	$39,459	$49,353	25.08%	$49,353	25.08%	100.00%
Total	$121,563	$164,869	35.62%	$165,549	36.18%	100.41%

How close is each class to 100%?

Bill Comparison:

- Is any one customer group impacted heavily compared to others?
- Does the impact make sense, given the group's burden on the system?
- Are the impacts aligned with rate-making objectives?

Quarterly

Customer Type	Meter Size	Volume (1000 Gallons)	Bills at Old Rates	Bills at New Rates	Percent Change
Small Residential	5/8"	4	$ 37.22	$ 51.00	37.02%
Average Residential	5/8"	8	$ 48.98	$ 72.00	47.00%
Large Residential	5/8"	15	$ 69.56	$ 108.75	56.34%
Large Residential	5/8"	30	$ 113.66	$ 187.50	64.97%
Large Residential	5/8"	45	$ 152.96	$ 238.50	55.92%
Multifamily Residential	1 1/2"	60	$ 262.28	$ 355.50	35.54%
Multifamily Residential	1 1/2"	220	$ 636.48	$ 854.50	34.25%
Multifamily Residential	2"	70	$ 342.59	$ 443.50	29.46%
Multifamily Residential	2"	190	$ 626.99	$ 821.50	31.02%
Commercial	1"	230	$ 606.76	$ 832.50	37.20%
Commercial	1 1/2"	70	$ 288.48	$ 389.50	35.02%
Commercial	2"	195	$ 637.59	$ 836.00	31.12%
Commercial	2"	900	$ 2,132.19	$ 2,880.50	35.10%
Public Authority	5/8"	1	$ 28.40	$ 35.25	24.12%
Public Authority	2"	35	$ 250.89	$ 324.50	29.34%
Public Fire Protection (Annual charge)			$ 39,459	$ 49,353	25.08%

Comparing Rates: What makes sense?

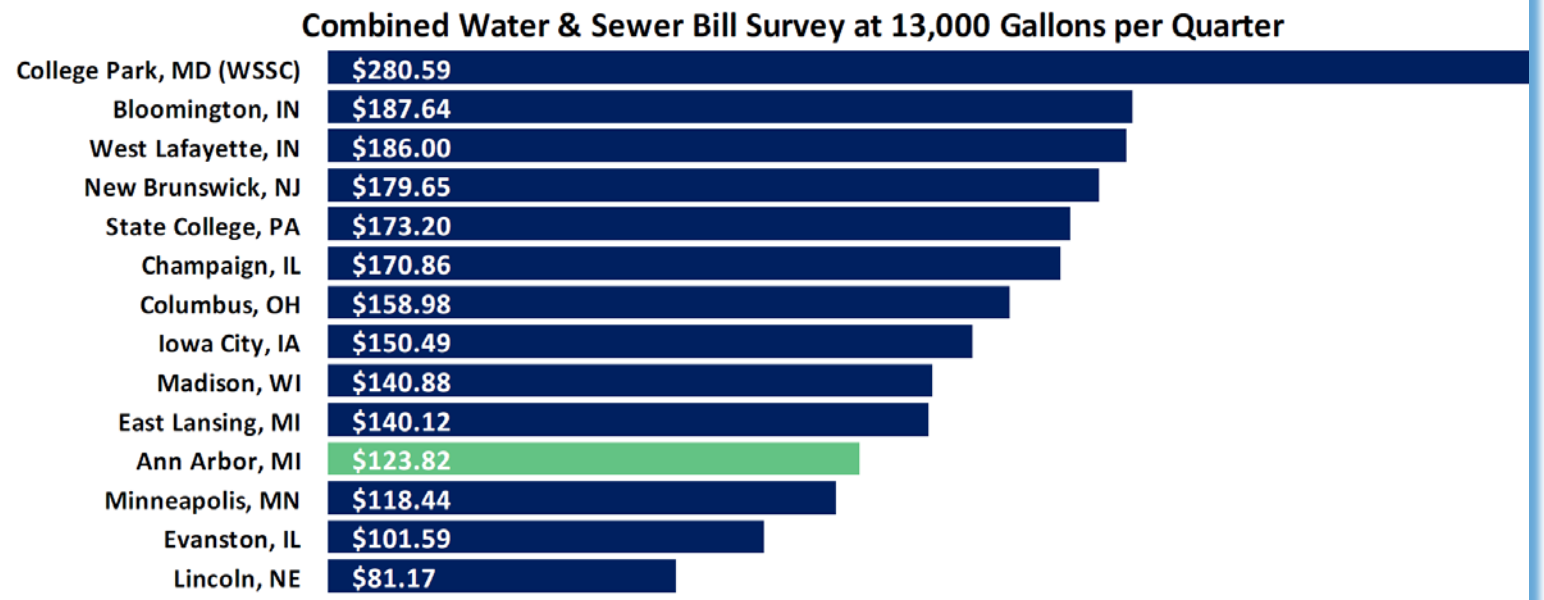
CITY OF ANN ARBOR
WATER & SEWER RATE STUDY
ADVISORY COMMITTEE DISCUSSION

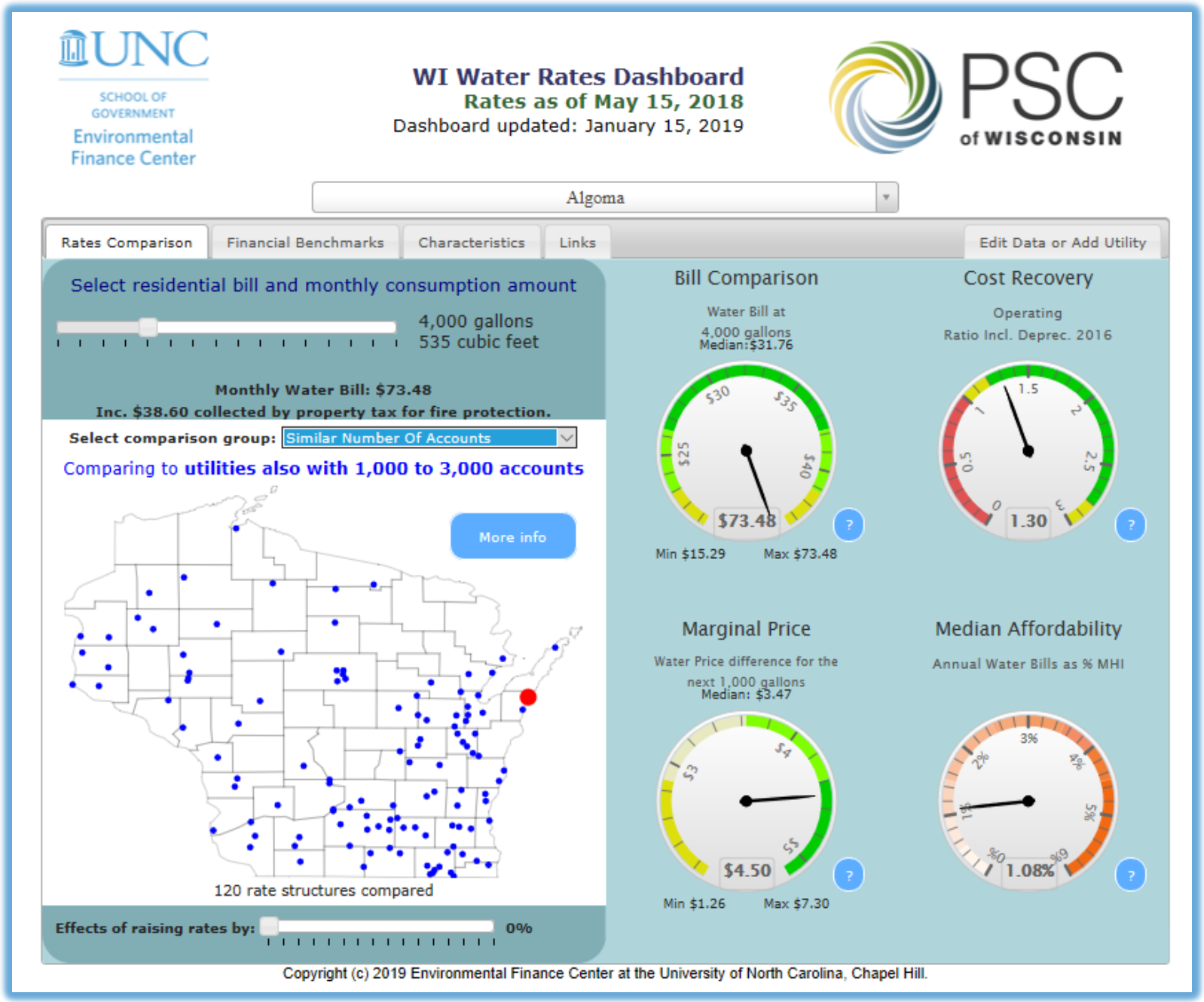
7.11.2017

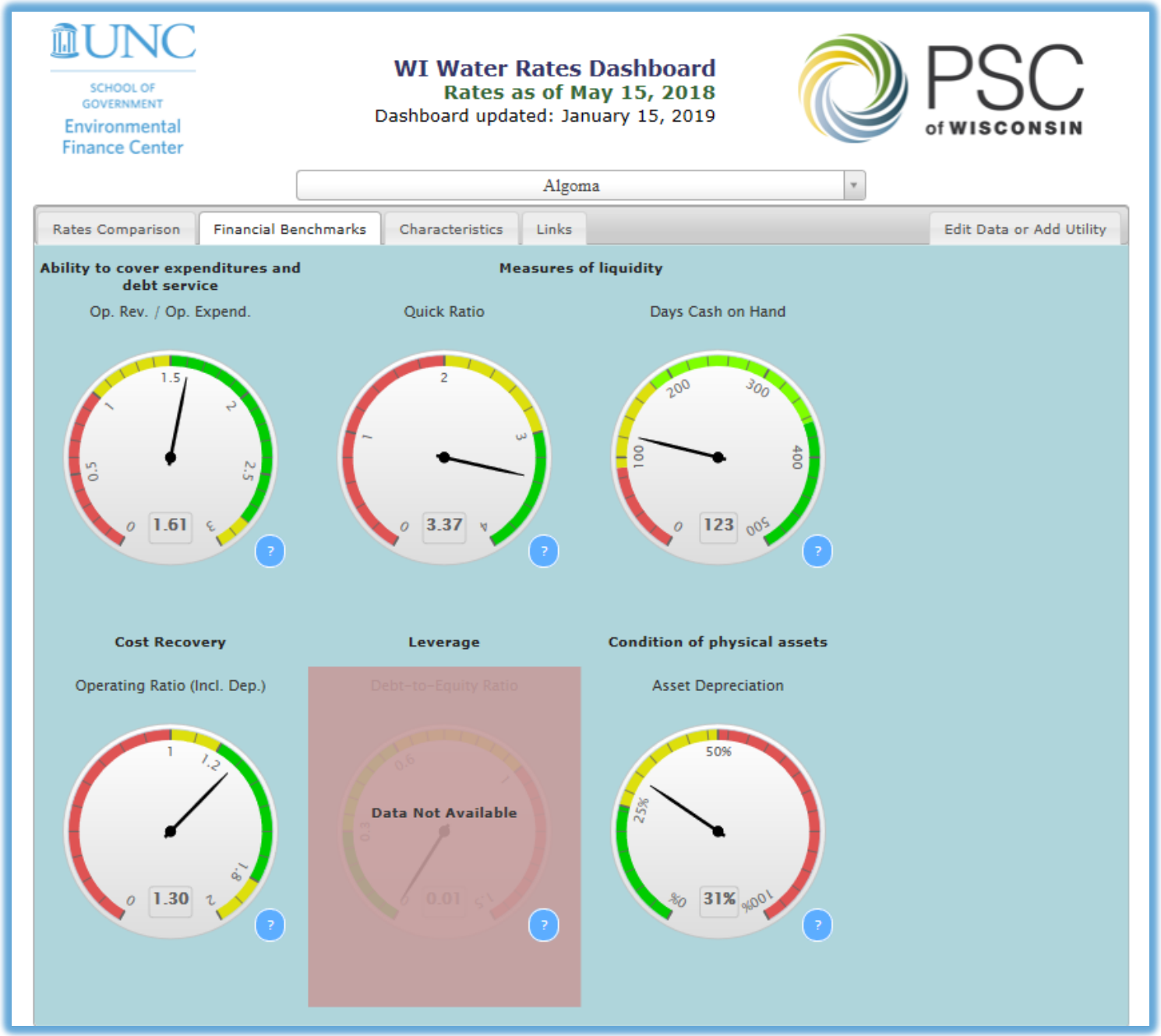
Quarterly Residential Fee Survey

(Based on publicly available data as of May 2017)

7




UNC
SCHOOL OF GOVERNMENT
Environmental Finance Center
WI Water Rates Dashboard
Rates as of May 15, 2018
Dashboard updated: January 15, 2019
PSC of WISCONSIN
Algoma
Rates Comparison
Financial Benchmarks
Characteristics
Links
Edit Data or Add Utility
Select residential bill and monthly consumption amount
4,000 gallons
535 cubic feet
Monthly Water Bill: $73.48
Inc. $38.60 collected by property tax for fire protection.
Select comparison group: Similar Number Of Accounts
Comparing to utilities also with 1,000 to 3,000 accounts
More info
120 rate structures compared
Effects of raising rates by: 0%
Bill Comparison
Water Bill at 4,000 gallons
Median:$31.76
$73.48
Min $15.29
Max $73.48
Cost Recovery
Operating Ratio Incl. Deprec. 2016
1.30
Marginal Price
Water Price difference for the next 1,000 gallons
Median: $3.47
$4.50
Min $1.26
Max $7.30
Median Affordability
Annual Water Bills as % MHI
1.08%
Copyright (c) 2019 Environmental Finance Center at the University of North Carolina, Chapel Hill.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Dashboard updated: January 15, 2019
PSC of WISCONSIN
Algoma
Rates Comparison
Financial Benchmarks
Characteristics
Links
Edit Data or Add Utility
Ability to cover expenditures and debt service
Op. Rev. / Op. Expend.
1.61
Measures of liquidity
Quick Ratio
3.37
Days Cash on Hand
123
Cost Recovery
Operating Ratio (Incl. Dep.)
1.30
Leverage
Debt-to-Equity Ratio
Data Not Available
Condition of physical assets
Asset Depreciation
31%

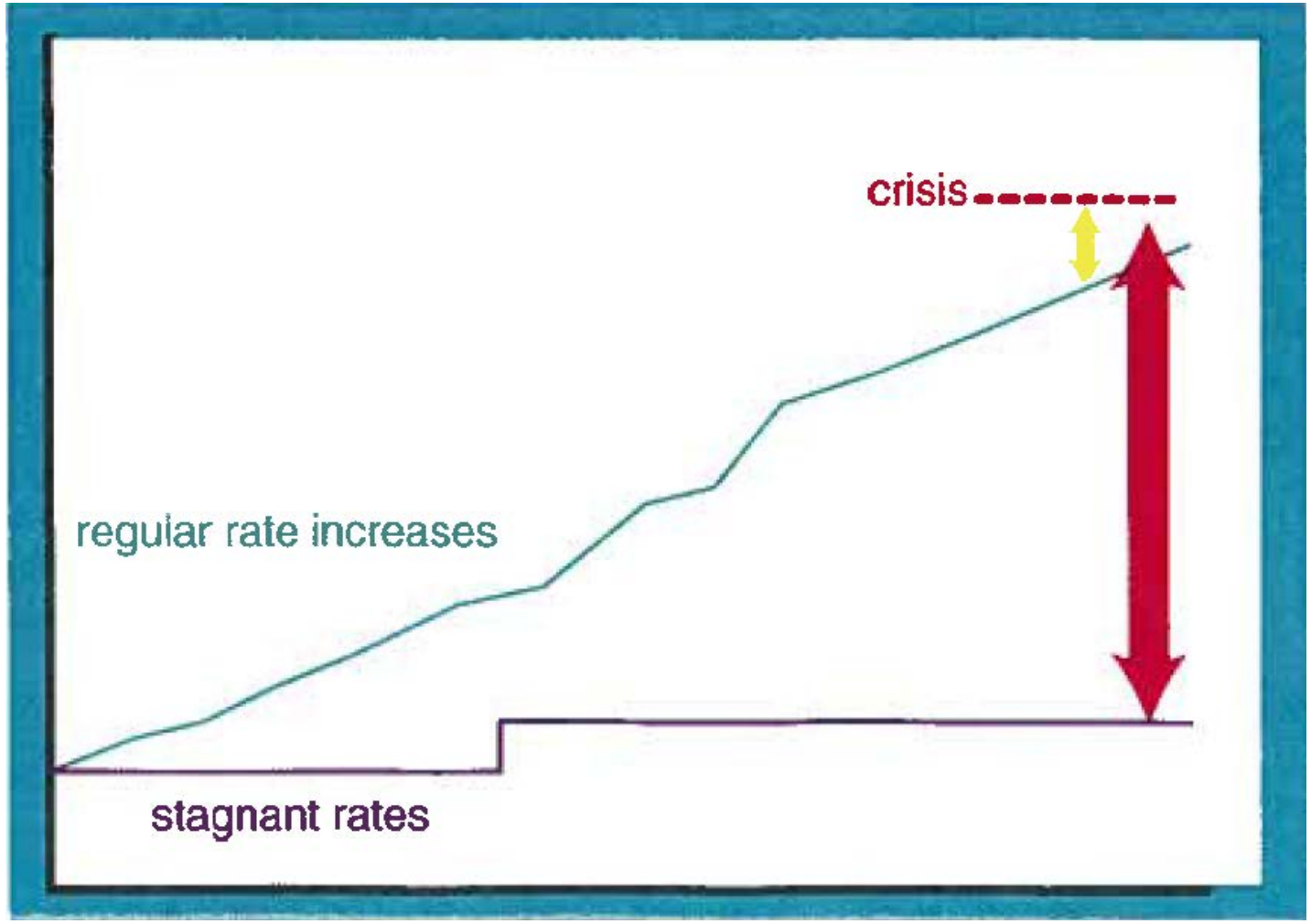
Are Utilities that Need to Raise Rates Actually Raising Rates?

MARCH 2, 2017 / SHADI ESKAF / 0 COMMENTS

Print PDF

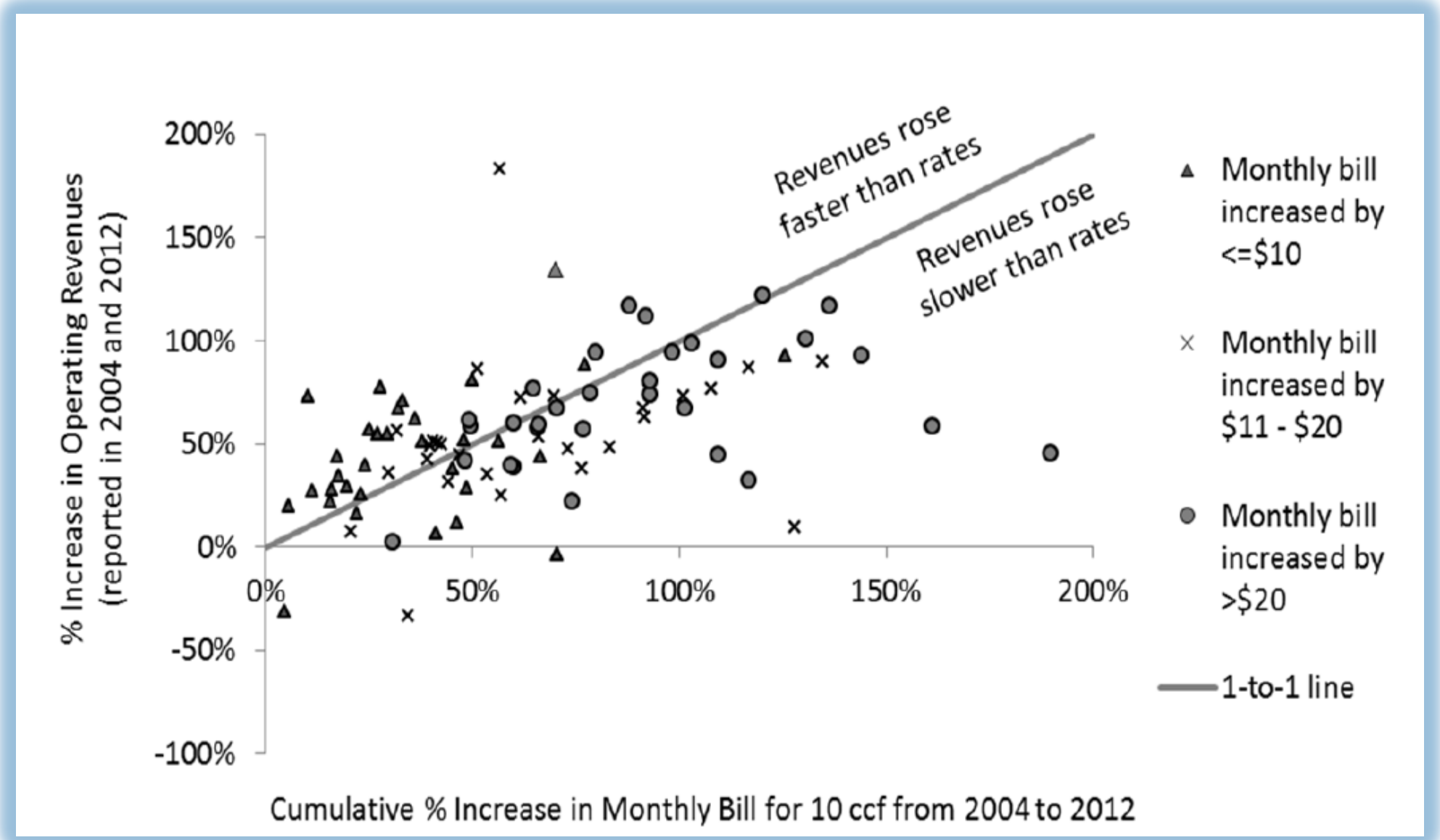
What happens if a water utility collects less in revenues than it pays in expenditures in one year? It will raise some alarms, but some utilities might be able to weather that shortfall by dipping into their reserves and bounce back the following year. But what happens if a water utility collects less in revenues than it pays in expenditures in *three consecutive years*? That is probably a strong indication that the rates it is charging its customers are too low. Assuming that expenses cannot be significantly reduced, a rate increase is almost certainly necessary. So are utilities in this position raising rates the following year, or are

Strategy: More Frequent, Smaller Rate Increases



Source: AWWA, "Avoiding Rate Shock: Making the Case for Water Rates"

Impact of Infrequent, Higher Rate Increases



Source: "Defining a Resilient Business Model for Water Utilities," Water Research Foundation

You can innovate with rates!

- Plan for more frequent, smaller rate increases
- Use a forward-looking test year
- Recognize and account for demand suppression
- Take advantage of adjustment mechanisms
  - Purchased water and fuel adjustments (pass-through charges)
  - Inflationary adjustments
  - Two-step rates
  - Multi-year rates
- Consider alternative rate structures
- Combine cost-indexed rates with performance incentives

Ex: Rate Case Options

Conventional/Base Rate Case

- Revisit cost allocation, rate design, billing frequency, tariff provisions
- Recover construction or extraordinary O&M expenses on timely basis
- Requires a hearing
- Average processing time: 180 days
- Most large utilities file every 3-5 years

Indexed Rate Case

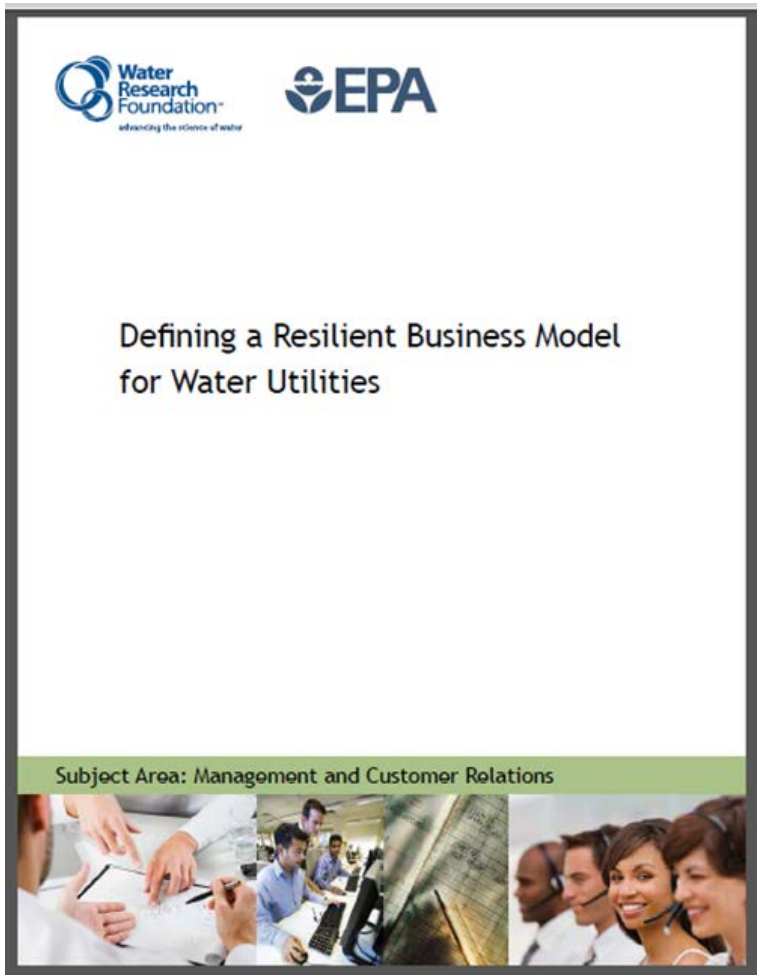
- Keeps existing cost allocation and rate design
- Allows financially healthy utility to keep pace with inflation
- No hearing required
- Short, simple application
- Processed within 30 days

Improve communication about rates

- Build relationships with decision makers
- Educate customers about water use decisions
- Continuous communication, not just during rate case
- Public Information vs. Public Relations?
- Rate increase percentages get headlines, but customers are ultimately concerned about their bills

Water Bill Calculation
10,000 gallons @ $2.00/1,000 gallons = $20
8,000 gallons @ 2.50/1,000 gallons = $20

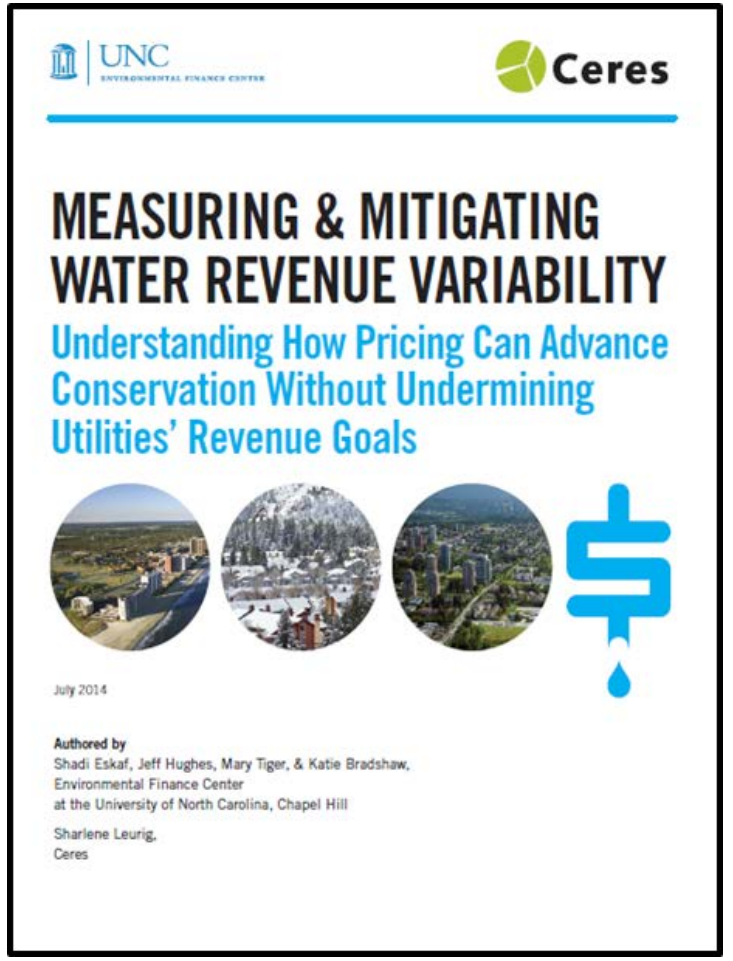
Rate Design Resources



FINANCING SUSTAINABLE WATER

Rates. Revenue. Resources.

http://www.financingsustainablewater.org/



Emerging Issues

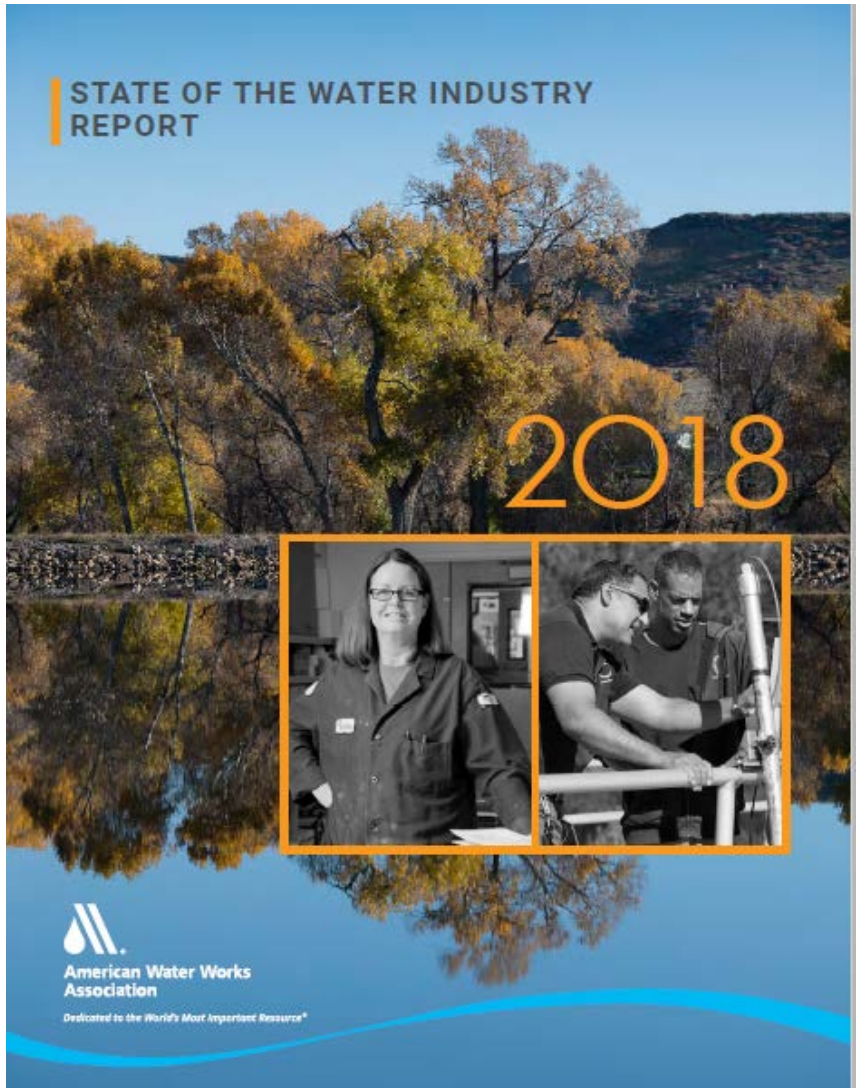


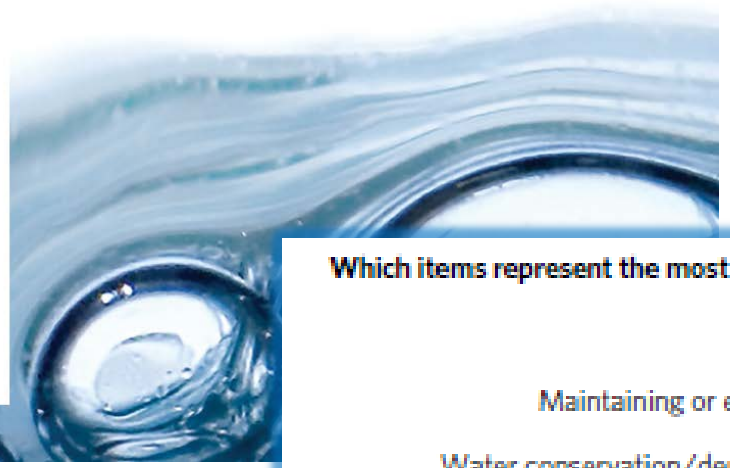
Table 1. Issues facing the water industry in 2018 as ranked by all respondents (*n* = 821)

Ranking	Category	Weighted Average	% Ranked Critically Important
1	Renewal and replacement of aging water and wastewater infrastructure	4.59	64
2	Financing for capital improvements	4.44	55
3	Public understanding of the value of water systems and services	4.37	50
4	Long-term water supply availability	4.30	50
5	Public understanding of the value of water	4.26	44
6	Watershed / source water protection	4.17	41
7	Aging workforce / anticipated retirements	4.16	43
8	Public acceptance of future water and wastewater rate increases	4.12	35
9	Emergency preparedness	4.10	34
10	Governing board acceptance of future water and wastewater rate increases	4.09	35
10	Cost recovery (pricing water to accurately reflect its true cost)	4.09	32

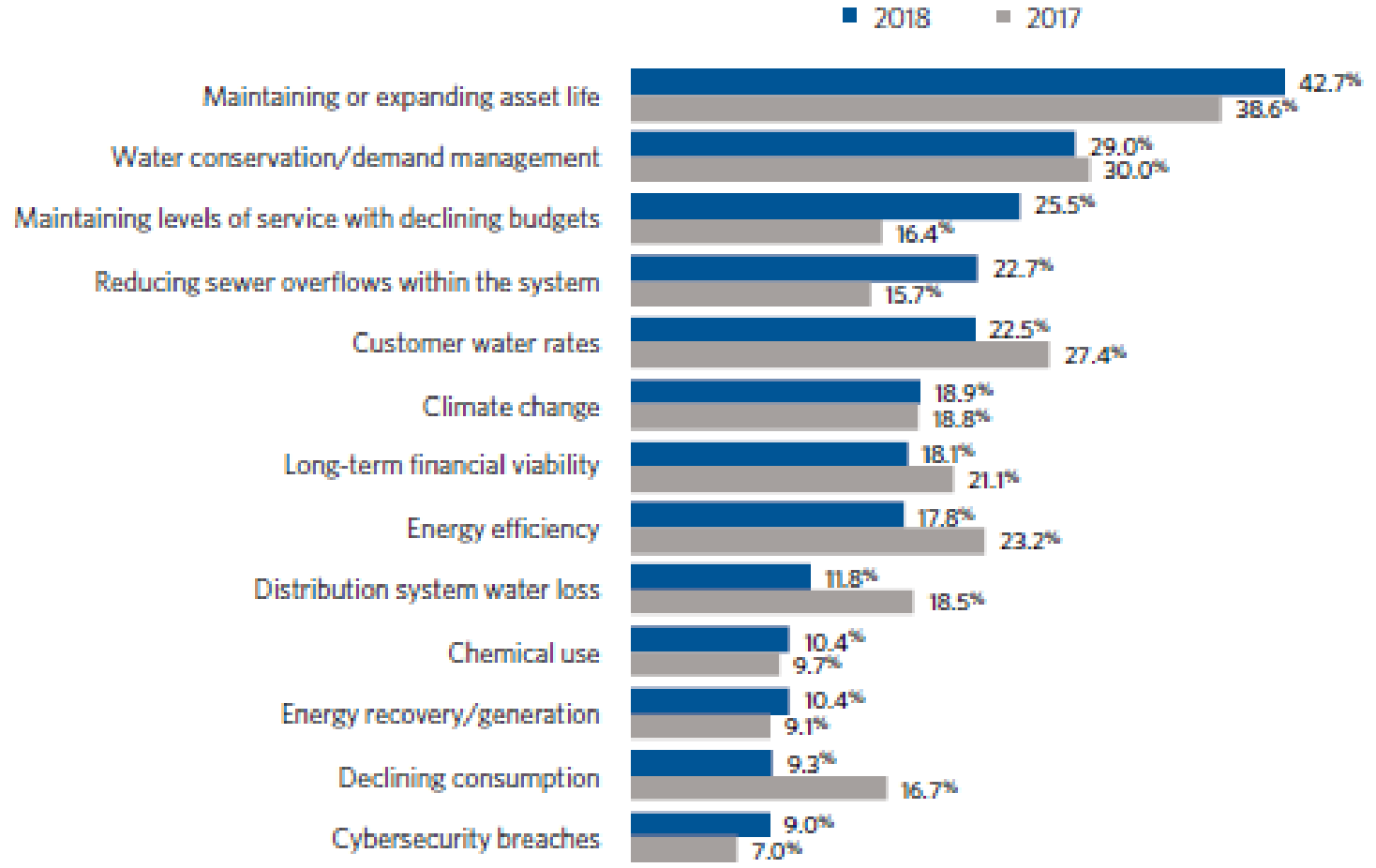
https://www.awwa.org/resources-tools/water-and-wastewater-utility-management/state-of-the-water-industry.aspx

2018
Black & Veatch
Strategic Directions

WATER REPORT



Which items represent the most significant sustainability issues for water utilities? (Select top three choices)



Source: Black & Veatch

2018
Black & Veatch
Strategic Directions

WATER REPORT

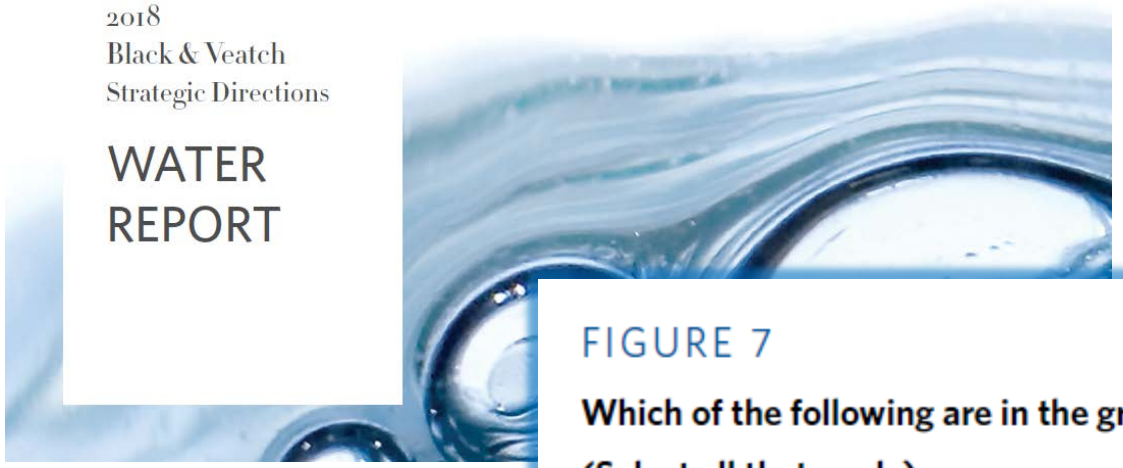
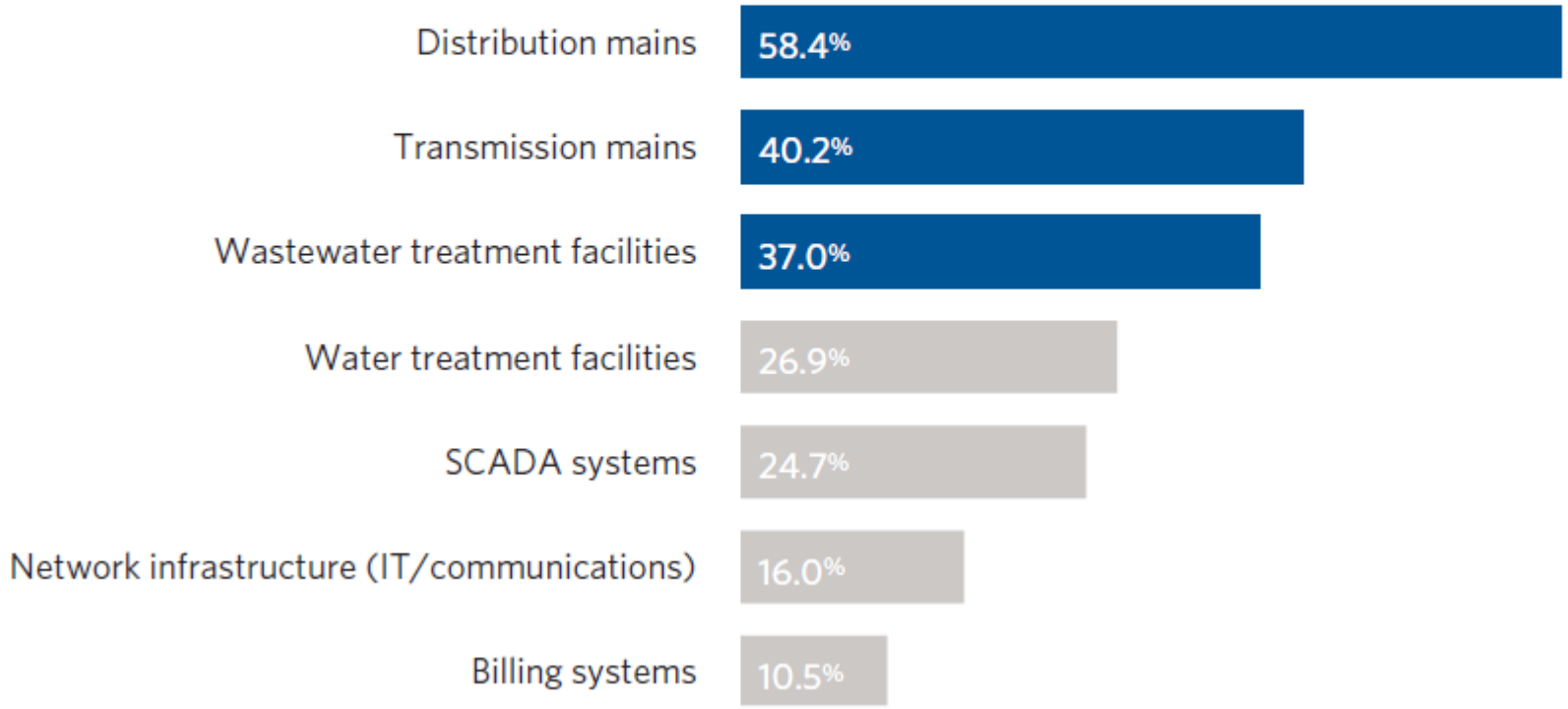
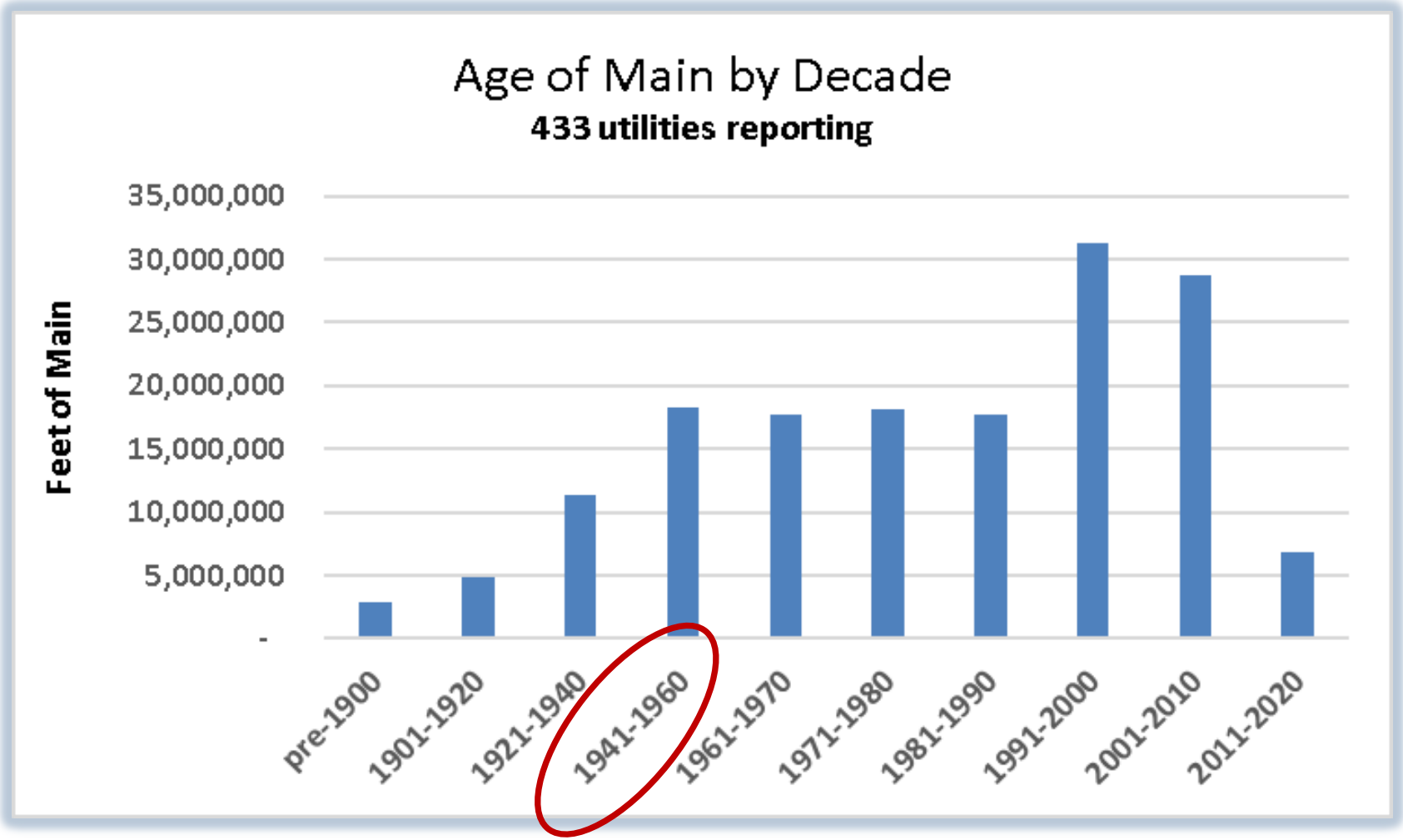


FIGURE 7

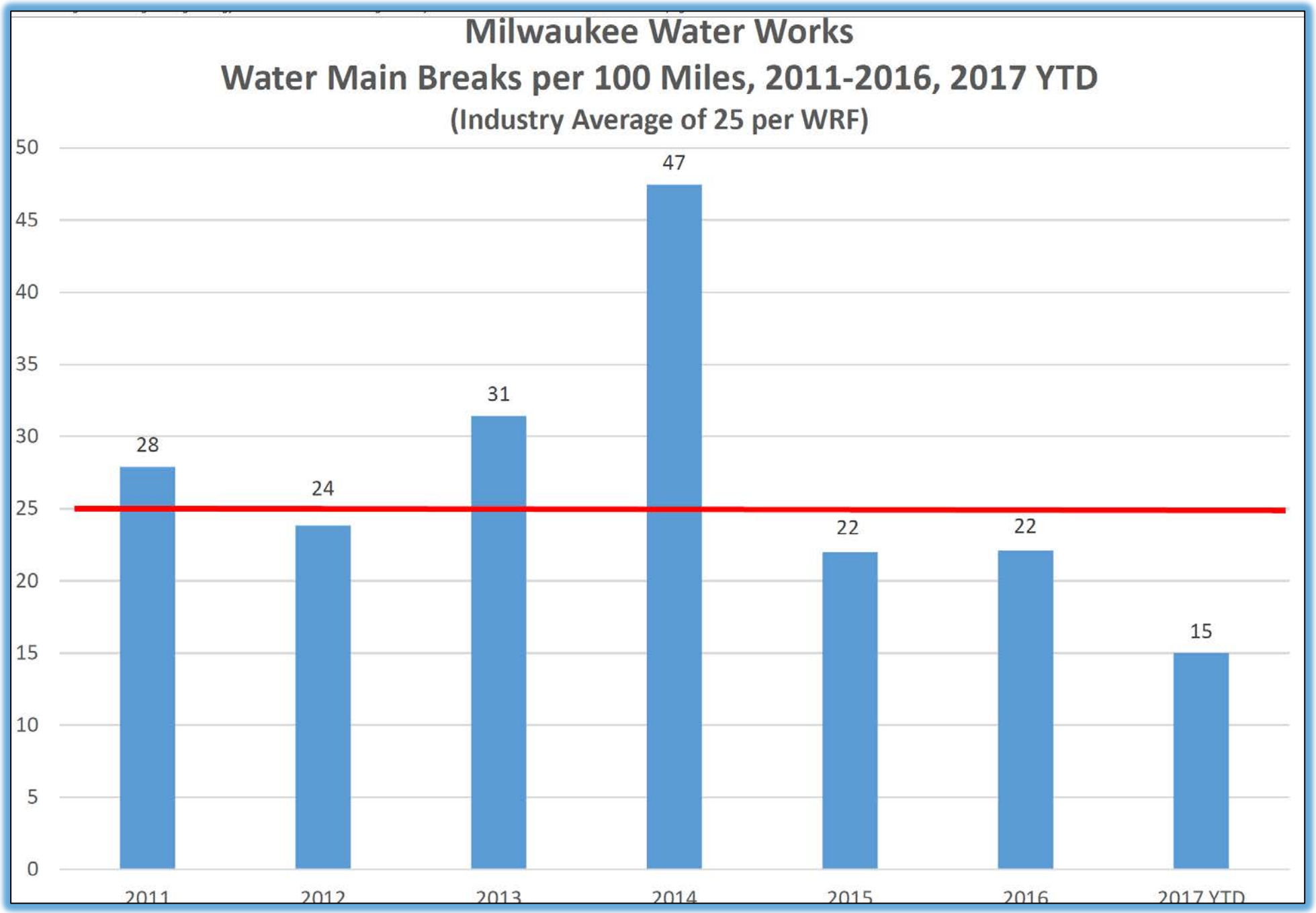
Which of the following are in the greatest need of repair and/or replacement due to age within your organization? (Select all that apply)





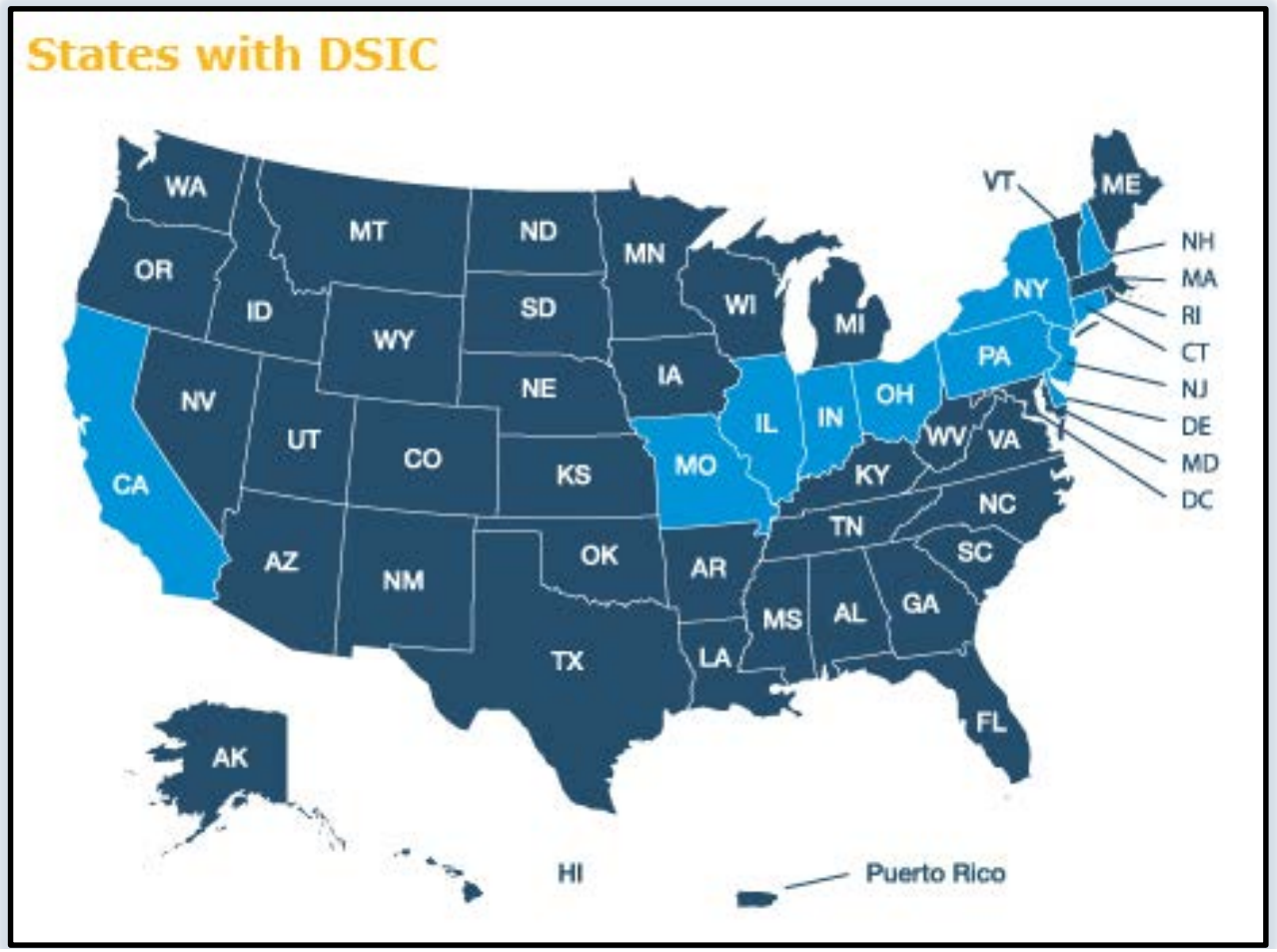
Issues

- Main replacement costs are significantly higher than original cost
- Utilities may not have enough rate base to fund projects up front (before they are "used and useful")
- Municipal utilities may be under political pressure to not take on debt


Milwaukee Water Works
Water Main Breaks per 100 Miles, 2011-2016, 2017 YTD
(Industry Average of 25 per WRF)
50
45
40
35
30
25
20
15
10
5
0
28
24
31
47
22
22
15
2011
2012
2013
2014
2015
2016
2017 YTD

Alternative Infrastructure Replacement Financing Mechanisms

- Allow for rate increases outside of a general rate proceeding for non-revenue producing investments to replace aging infrastructure
- Programs may include limits on the amount of incremental revenues that can be collected as well as true-up mechanisms



Source: http://www.nawc.org/state-utility-regulation/regulatory-practices/distribution-system-investment-charge.aspx

Alternative Funding Mechanisms in Wisconsin

Mechanism	Availability
• Funding Annual Water Infrastructure Replacement Programs (FIRM)	• Available since 1997; not used
• Two (or more) Step rate increase	• Available since 2013; not used
• Expense Depreciation	• 2016; approved in Docket 3420-WR-106

Advantages of alternative funding mechanisms for main replacement

- Minimize future borrowing costs
- Help maintain a balanced capital structure
- Avoids rate shock (debt) and potentially large swings in rates (pay-as-you-go)
- Encourages investment in water infrastructure
- Reduces non-revenue water
- Reduces maintenance costs

Disadvantages of alternative funding mechanisms for main replacement

- Cost increases: rate increases are in addition to, not instead of, base rate increases
- DSIC revenue rolls into rate base – double recovery
- Standard base rate offsets (accrued depreciation, deferred taxes on plant) aren't always factored in
- Shifts risk to ratepayers rather than shareholders without reduction in ROR
- Not used and useful – review of plant is after-the-fact
- Increased tracking requirements for regulatory commission staff

EPA looks to Madison as leader on lead pipe issue

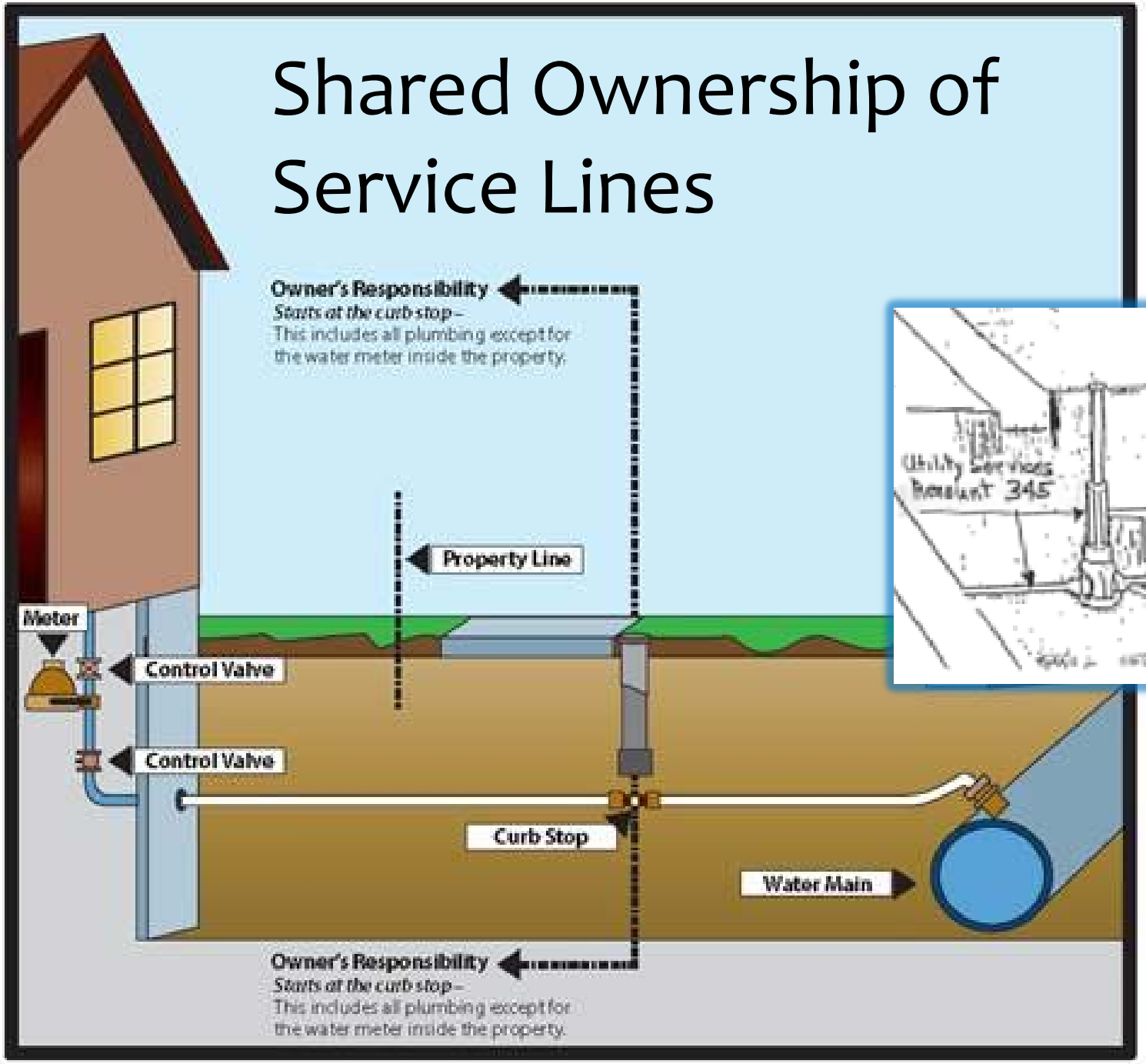
Posted on Monday, January 4, 2016 - 11:04am

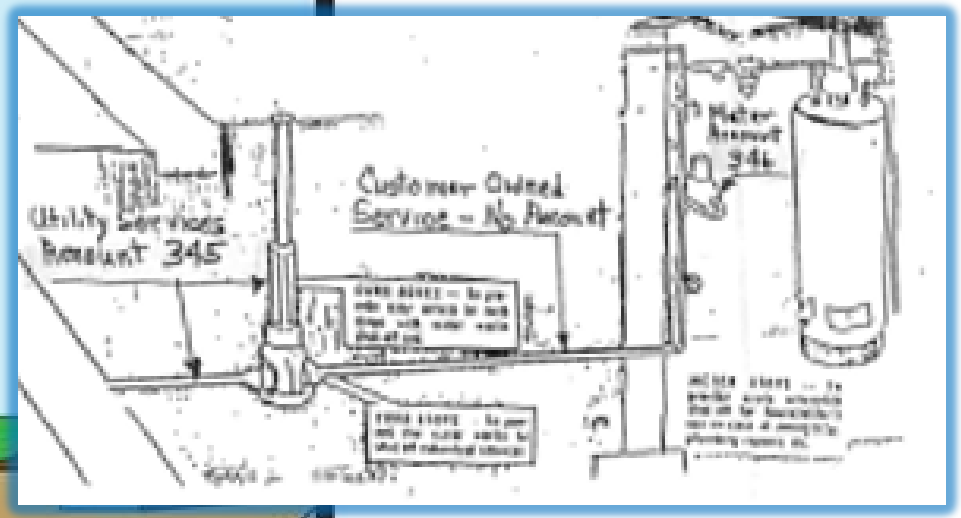
Madison's once-controversial Lead Service Replacement Program now becoming a model for other cities

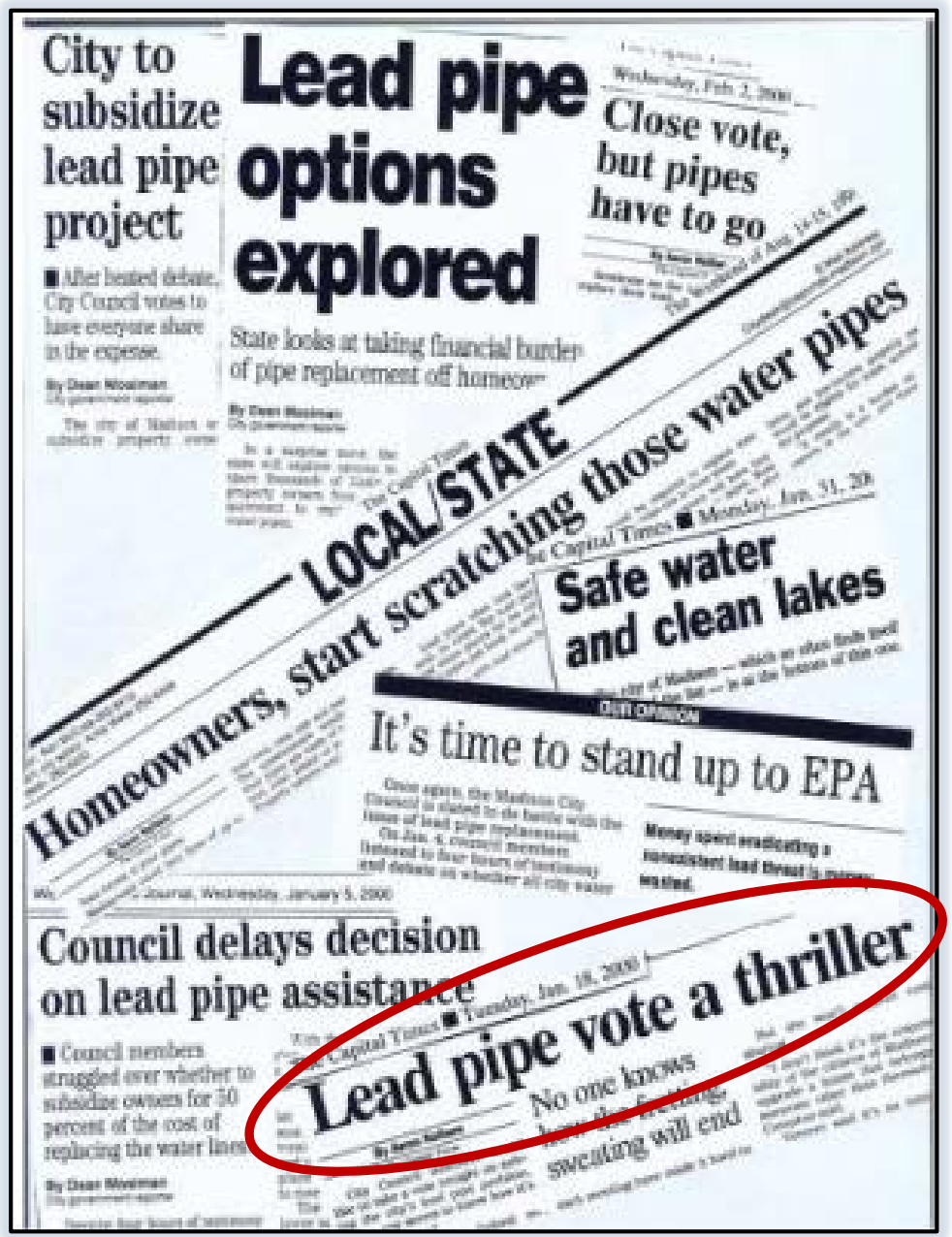
Avoiding A Future Crisis, Madison Removed Lead Water Pipes 15 Years Ago

March 31, 2016 · 5:27 PM ET
Heard on All Things Considered

Shared Ownership of Service Lines






City to subsidize lead pipe project
Lead pipe options explored
Close vote, but pipes have to go
LOCAL/STATE
Homeowners, start scratching those water pipes
Safe water and clean lakes
It's time to stand up to EPA
Council delays decision on lead pipe assistance
Lead pipe vote a thriller


So how much will taxpayers shell out for landlords' pipes?
Private pipes don't need public money
Lead pipes may still be in use
Council can't decide who'll pay for pipe repairs
Lead pipe removal could prove costly for homeowners
Meeting goes for nearly nine hours
It's lead pipe decision time
Council agenda lengthy tonight
Lead pipe risk rings hollow
Council OKs lead pipe replacement
Readers react to lead-pipe controversy

Madison's Application to WPSC Docket # 3280-WR-106

- Utility estimated the annual cost of replacement would be less than that of chemical treatment, and replacement would be completed within ten years.

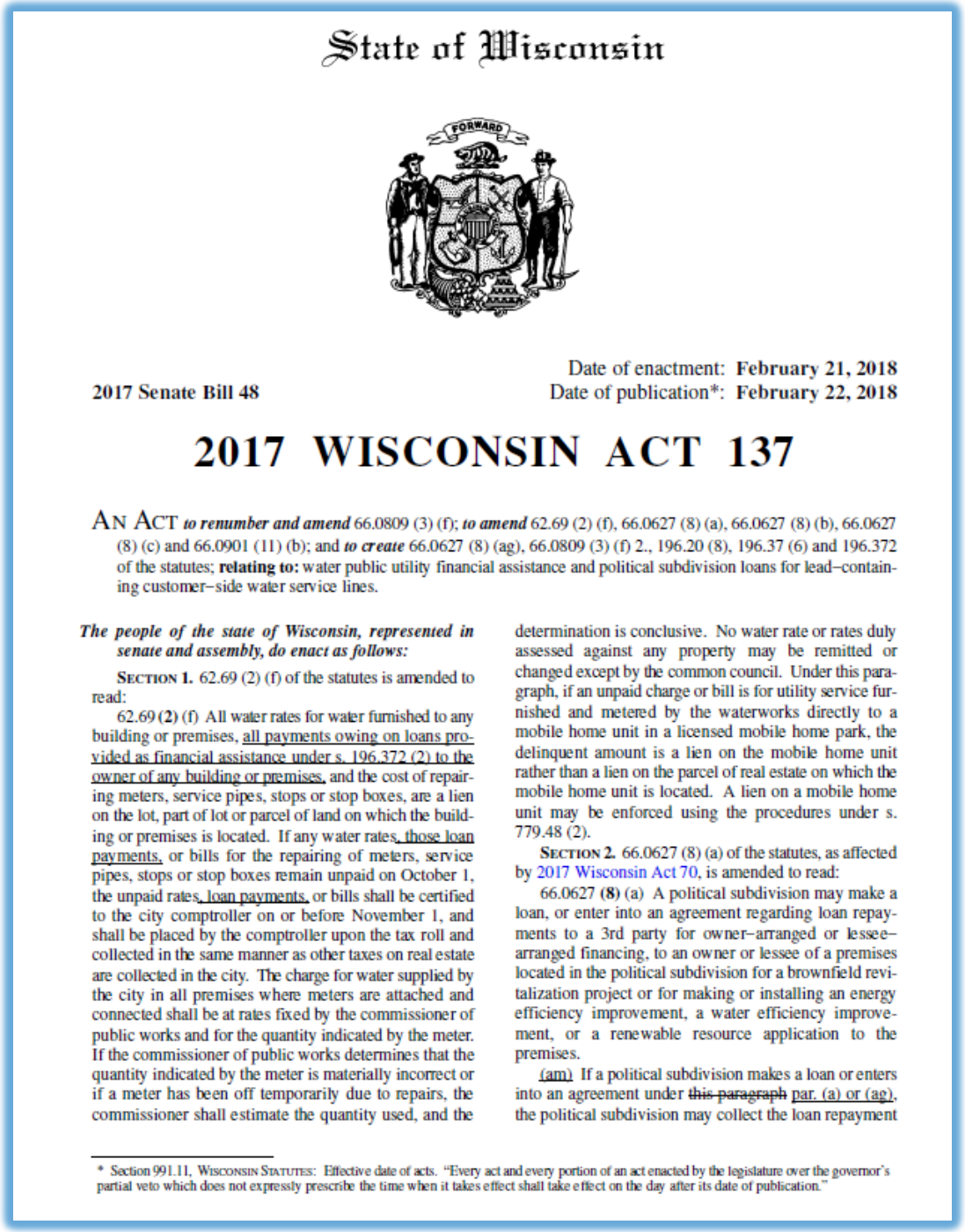
- Requested costs of both utility and private side LSL replacement be included in rates.

Commission's Decision Docket # 3280-WR-106

- **Commission determined utility funds should not be used to provide a direct benefit to "… an exclusive group of private property owners that have lead laterals."**

- 2002: decision upheld in court.

- Ultimately, municipal funds were used for replacement activities on private property.



State of Wisconsin

2017 Senate Bill 48

Date of enactment: **February 21, 2018**
Date of publication*: **February 22, 2018**

2017 WISCONSIN ACT 137

AN ACT ***to renumber and amend*** 66.0809 (3) (f); ***to amend*** 62.69 (2) (f), 66.0627 (8) (a), 66.0627 (8) (b), 66.0627 (8) (c) and 66.0901 (11) (b); and ***to create*** 66.0627 (8) (ag), 66.0809 (3) (f) 2., 196.20 (8), 196.37 (6) and 196.372 of the statutes; **relating to:** water public utility financial assistance and political subdivision loans for lead–containing customer–side water service lines.

The people of the state of Wisconsin, represented in senate and assembly, do enact as follows:

SECTION 1. 62.69 (2) (f) of the statutes is amended to read:

62.69 **(2)** (f) All water rates for water furnished to any building or premises, all payments owing on loans provided as financial assistance under s. 196.372 (2) to the owner of any building or premises, and the cost of repairing meters, service pipes, stops or stop boxes, are a lien on the lot, part of lot or parcel of land on which the building or premises is located. If any water rates, those loan payments, or bills for the repairing of meters, service pipes, stops or stop boxes remain unpaid on October 1, the unpaid rates, loan payments, or bills shall be certified to the city comptroller on or before November 1, and shall be placed by the comptroller upon the tax roll and collected in the same manner as other taxes on real estate are collected in the city. The charge for water supplied by the city in all premises where meters are attached and connected shall be at rates fixed by the commissioner of public works and for the quantity indicated by the meter. If the commissioner of public works determines that the quantity indicated by the meter is materially incorrect or if a meter has been off temporarily due to repairs, the commissioner shall estimate the quantity used, and the determination is conclusive. No water rate or rates duly assessed against any property may be remitted or changed except by the common council. Under this paragraph, if an unpaid charge or bill is for utility service furnished and metered by the waterworks directly to a mobile home unit in a licensed mobile home park, the delinquent amount is a lien on the mobile home unit rather than a lien on the parcel of real estate on which the mobile home unit is located. A lien on a mobile home unit may be enforced using the procedures under s. 779.48 (2).

SECTION 2. 66.0627 (8) (a) of the statutes, as affected by 2017 Wisconsin Act 70, is amended to read:

66.0627 **(8)** (a) A political subdivision may make a loan, or enter into an agreement regarding loan repayments to a 3rd party for owner–arranged or lessee–arranged financing, to an owner or lessee of a premises located in the political subdivision for a brownfield revitalization project or for making or installing an energy efficiency improvement, a water efficiency improvement, or a renewable resource application to the premises.

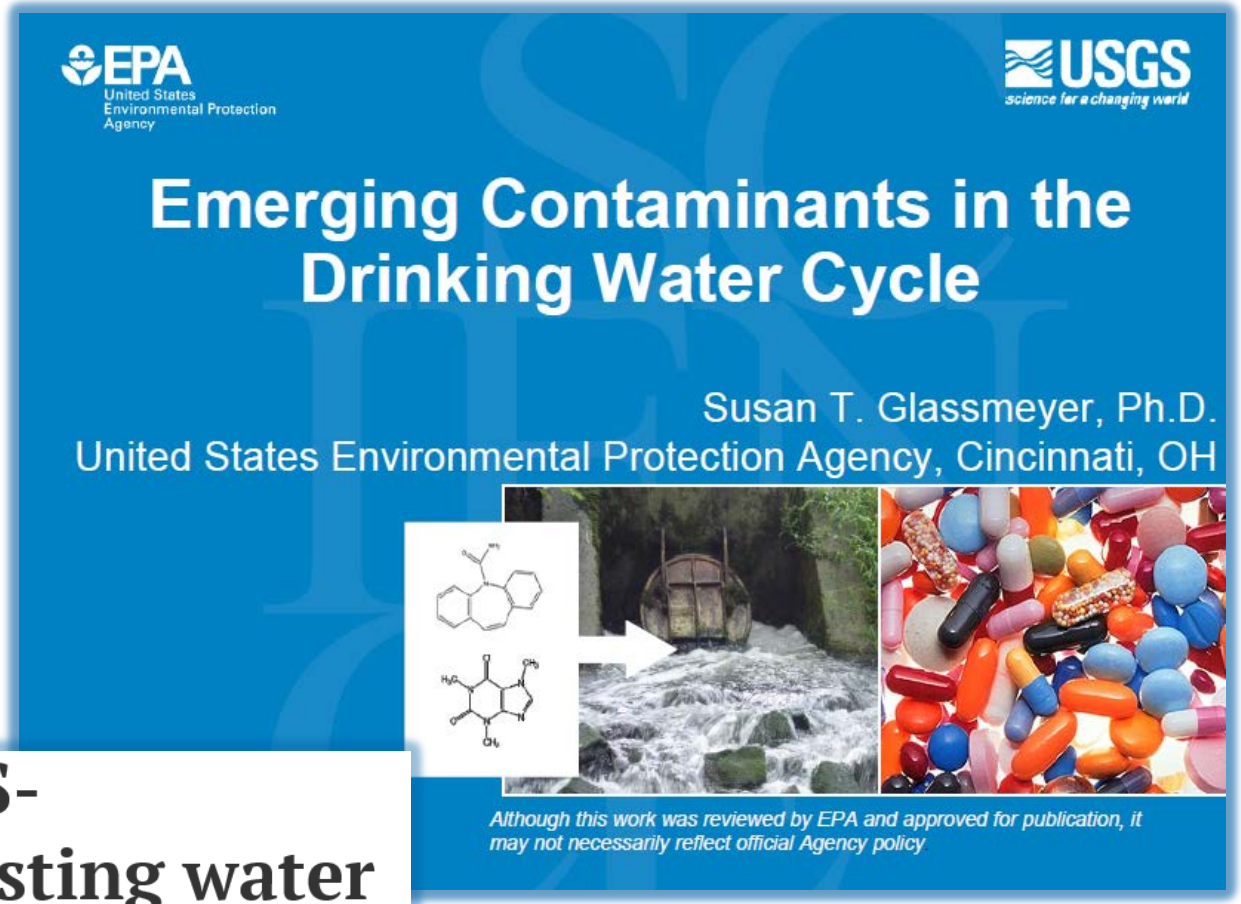
(am) If a political subdivision makes a loan or enters into an agreement under ~~this paragraph~~ par. (a) or (ag), the political subdivision may collect the loan repayment

* Section 991.11, WISCONSIN STATUTES: Effective date of acts. "Every act and every portion of an act enacted by the legislature over the governor's partial veto which does not expressly prescribe the time when it takes effect shall take effect on the day after its date of publication."

- **Wisconsin Stat. § 196.372(2):** "A water public utility may provide financial assistance to the owner of a property to which water utility service is provided for the purpose of assisting the owner in replacing customer-side water service lines containing lead…"

Challenge: Regulatory Requirements

- Changes to existing regulations (ex: revisions to Federal Lead and Copper Rule)
- Health advisories on contaminants not currently regulated under Safe Drinking Water Act



Madison shutting down PFAS-contaminated well while insisting water is safe

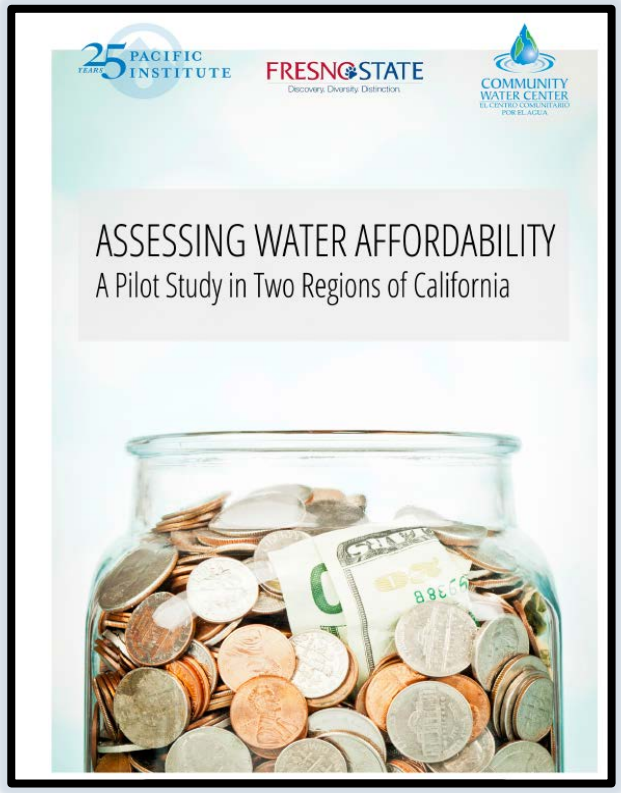
STEVEN VERBURG sverburg@madison.com Mar 5, 2019

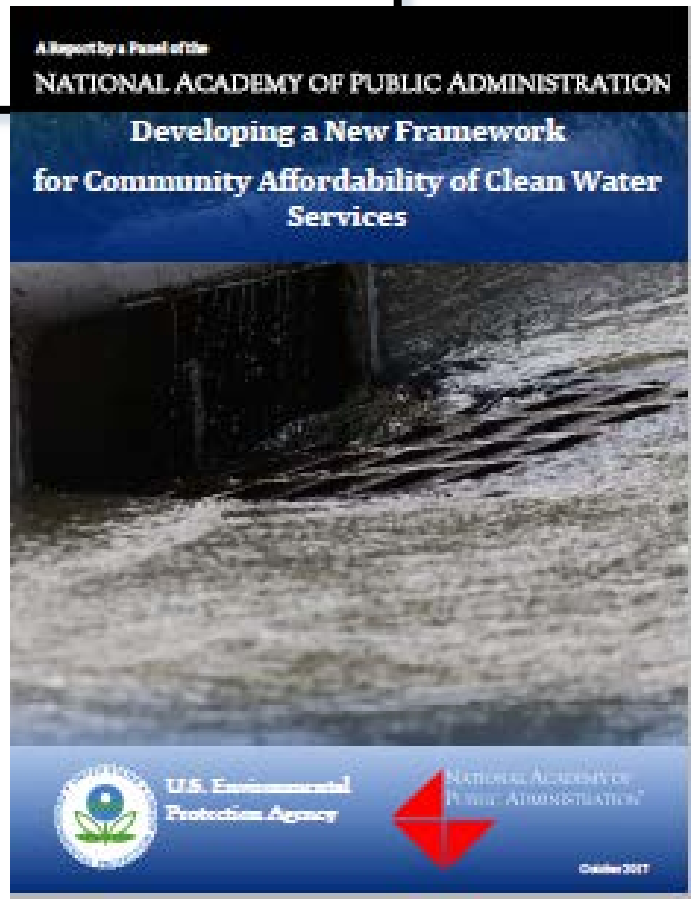
Are Rates Affordable?

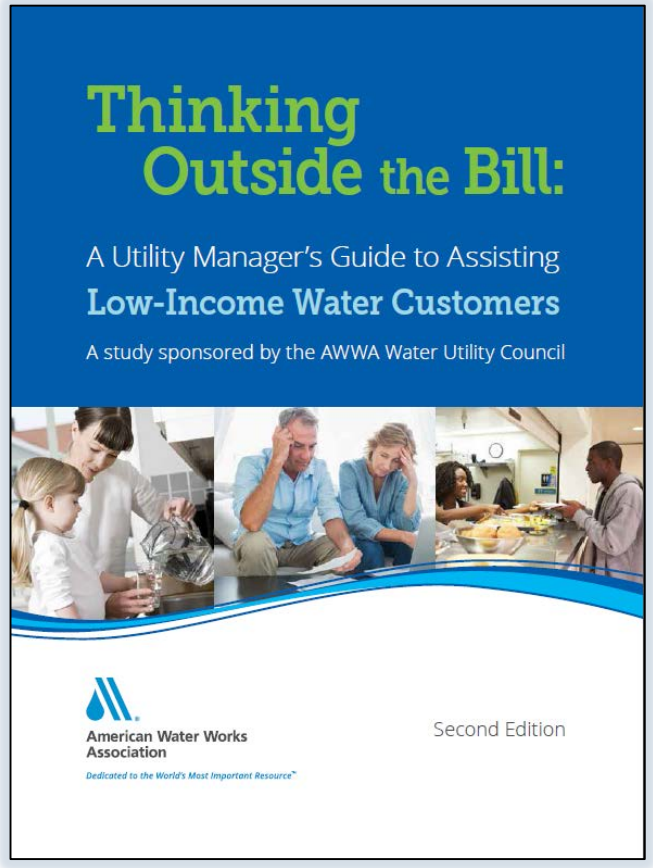
The Cost of Water Is Rising. Philadelphia Has an Unprecedented Plan to Make It More Affordable.

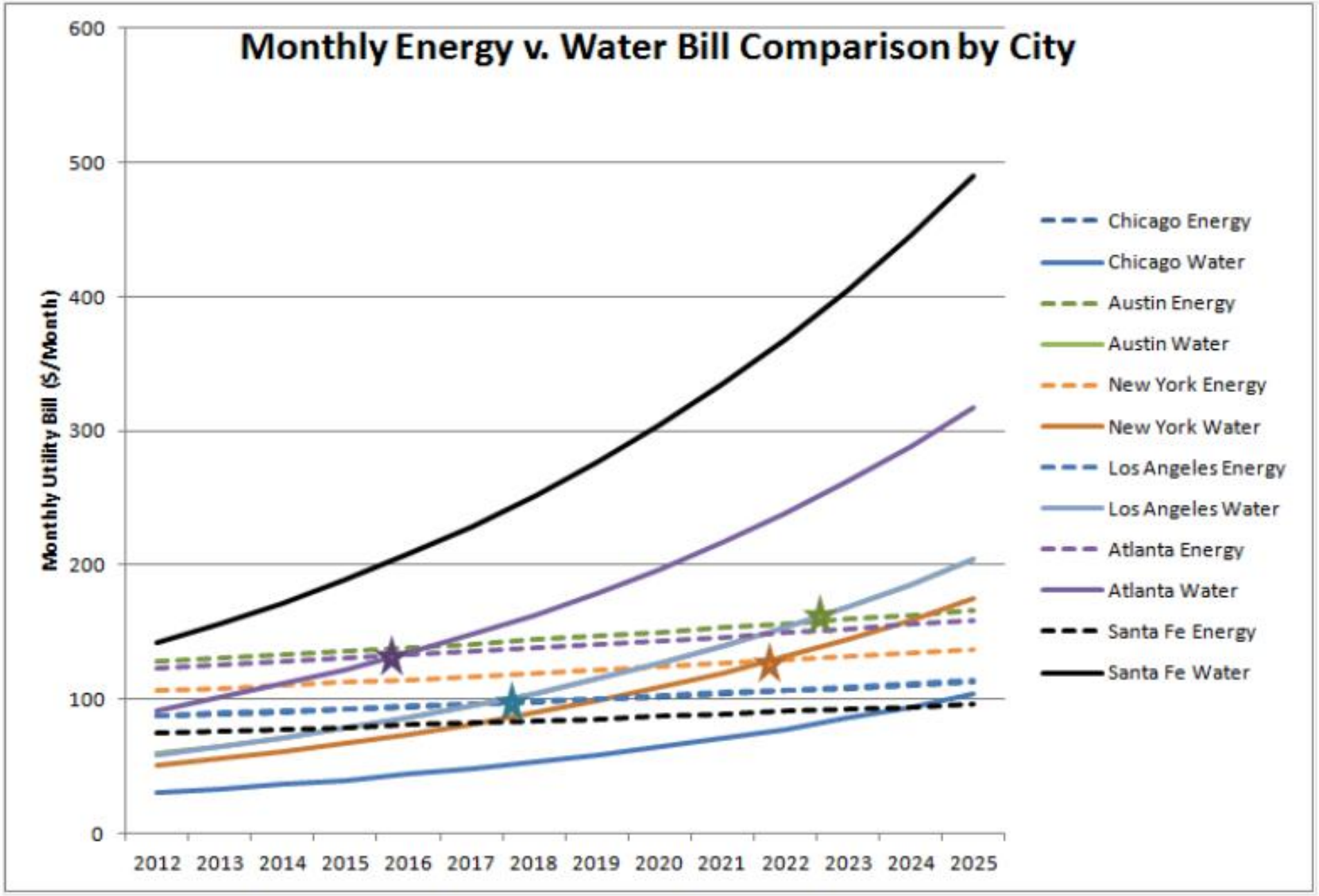
It's the first city to set water rates based on income.

BY J.B. WOGAN | JULY 5, 2017









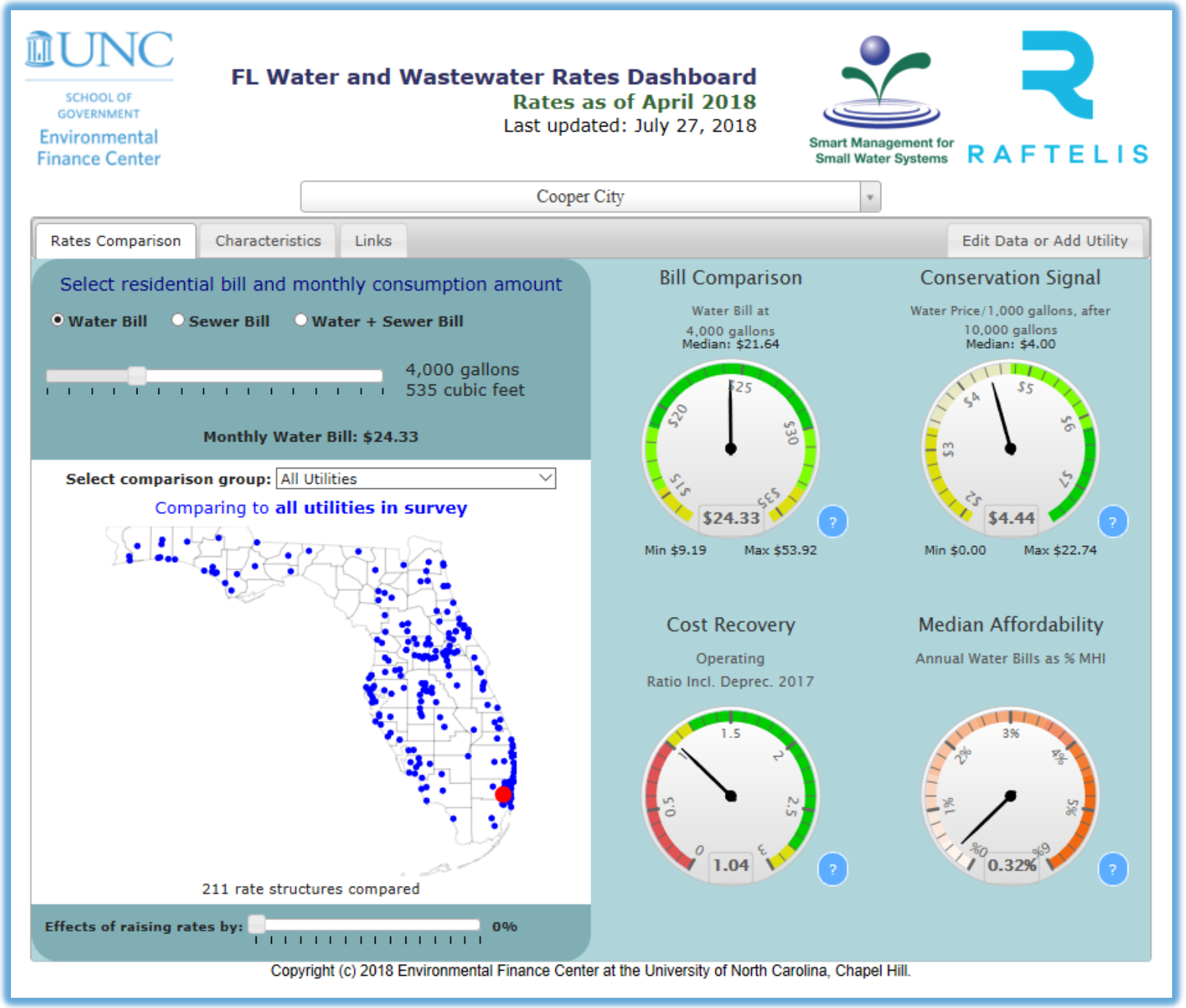
Source: Circle of Blue

EPA Guidance on Affordability

Financial Capability Matrix

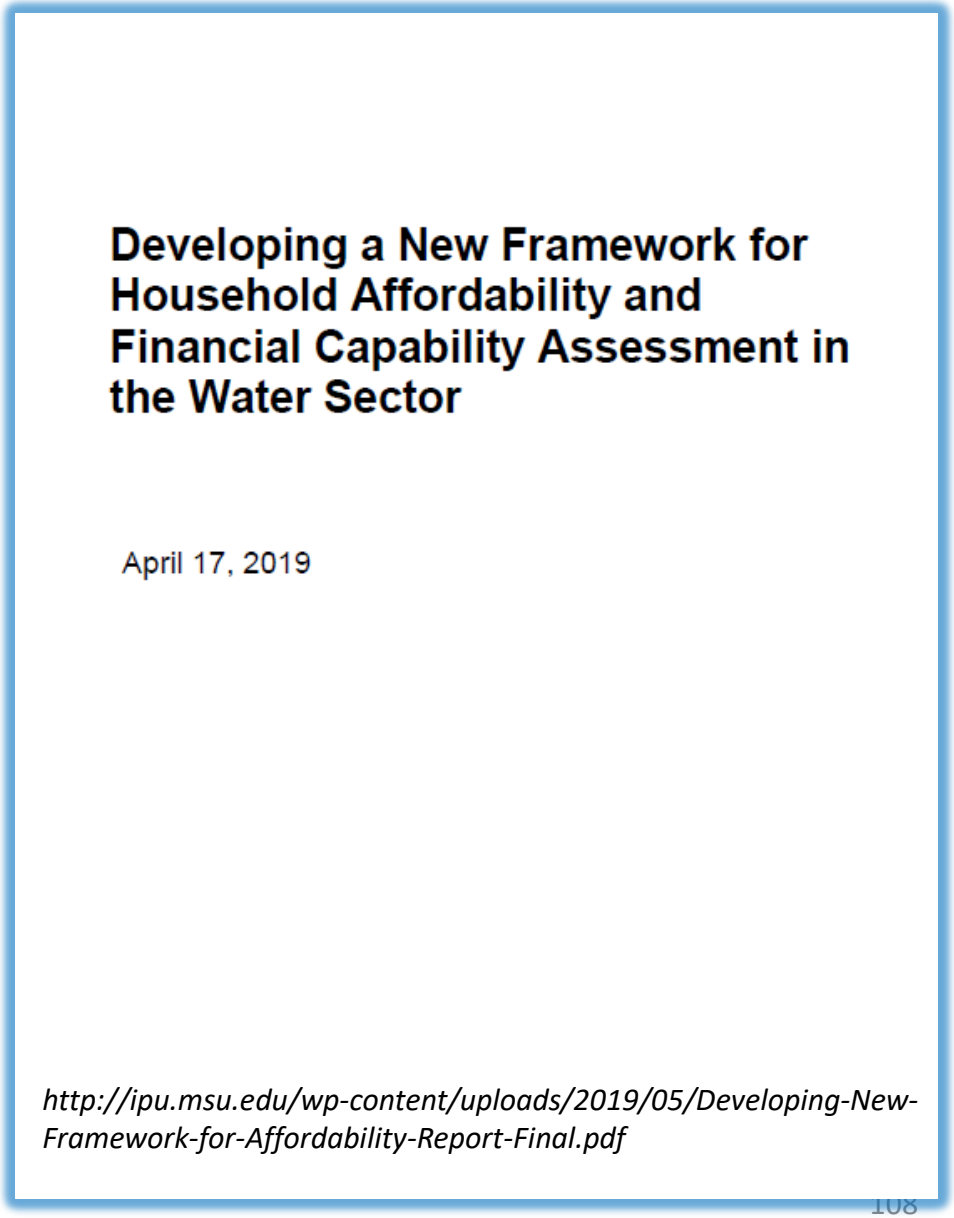
(Table 3, p.41 – EPA Guidance for Financial Capability Assessment and Schedule Development)

	Residential Indicator (Cost Per Household as a Percent of Median Household Income)		
Permittee's Financial Capability Indicators Score	Low (Below 1 %)	Medium (Between 1% and 2%)	High (Above 2.0%)
Weak(Below 1.5)	Medium Burden	High Burden	High Burden
Mid- Range (Between 1.5 and 2.5)	Low Burden	Medium Burden	High Burden
High (Above 2.5)	Low Burden	Low Burden	Medium Burden

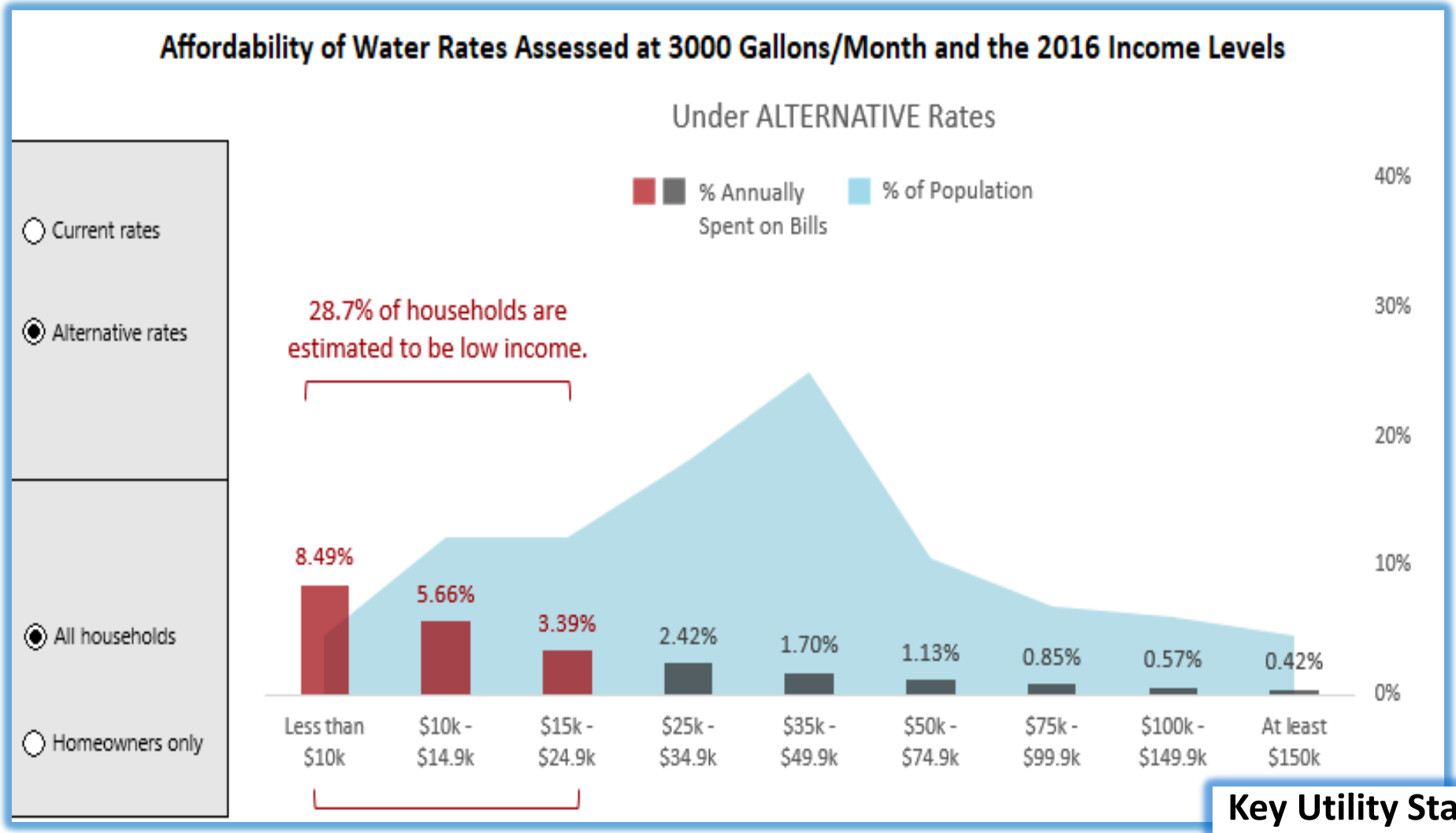


Defining Affordability

- **Safe Drinking Water Act** established variances for small systems
  - Those for whom new technologies would raise average bill to threshold level (determined by states)
- **USDA loan program** makes grants to systems where residential bills are below a certain % of MHI (ex: 1.5% in GA)
- **Water Research Foundation** "*Report on Water Affordability Programs*" suggests programs based on measure of 2% of income for poor households instead of MHI
- **National Association of Clean Water Agencies** reiterates that MHI measure is inadequate



http://ipu.msu.edu/wp-content/uploads/2019/05/Developing-New-Framework-for-Affordability-Report-Final.pdf



Source: http://www.efc.sog.unc.edu/reslib/item/water-wastewater-residential-rates-affordability-assessment-tool

Key Utility Statistics

- 133 customers
- Nearest system > 6 mi. away
- Cash on hand: -121 days
- 16 deficiencies and 11 recommendations noted in DNR sanitary survey report

Options for Addressing Customer Affordability

- Increase billing frequency
- Allotments for minimal amount of water in first block at relatively low cost to **all** customers
- Low income rates or bill payment assistance (CAPs) for customers who qualify
- Programs:
  - Customer conservation assistance (ex: the City of Atlanta's Care and Conserve program provides plumbing repairs as part of its affordability program)
  - Private service line assistance
  - Partner with local charity to provide assistance
- Change percentage of bill that is fixed versus variable

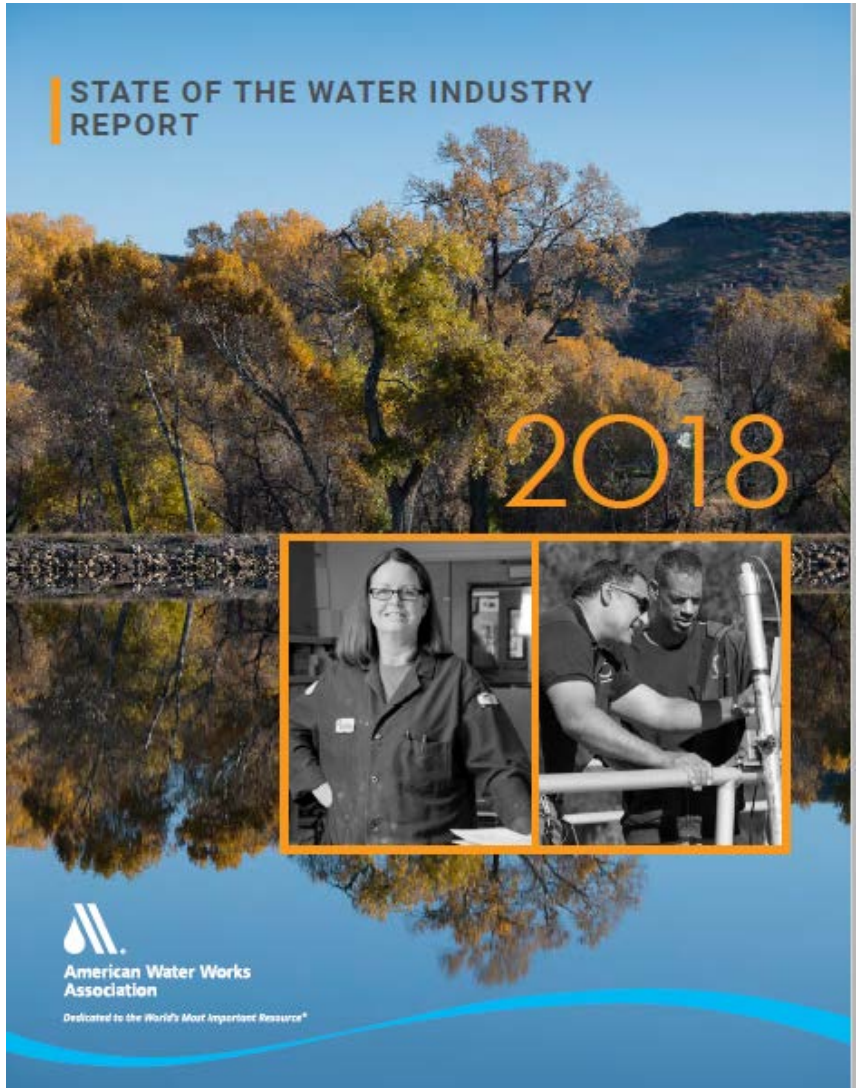
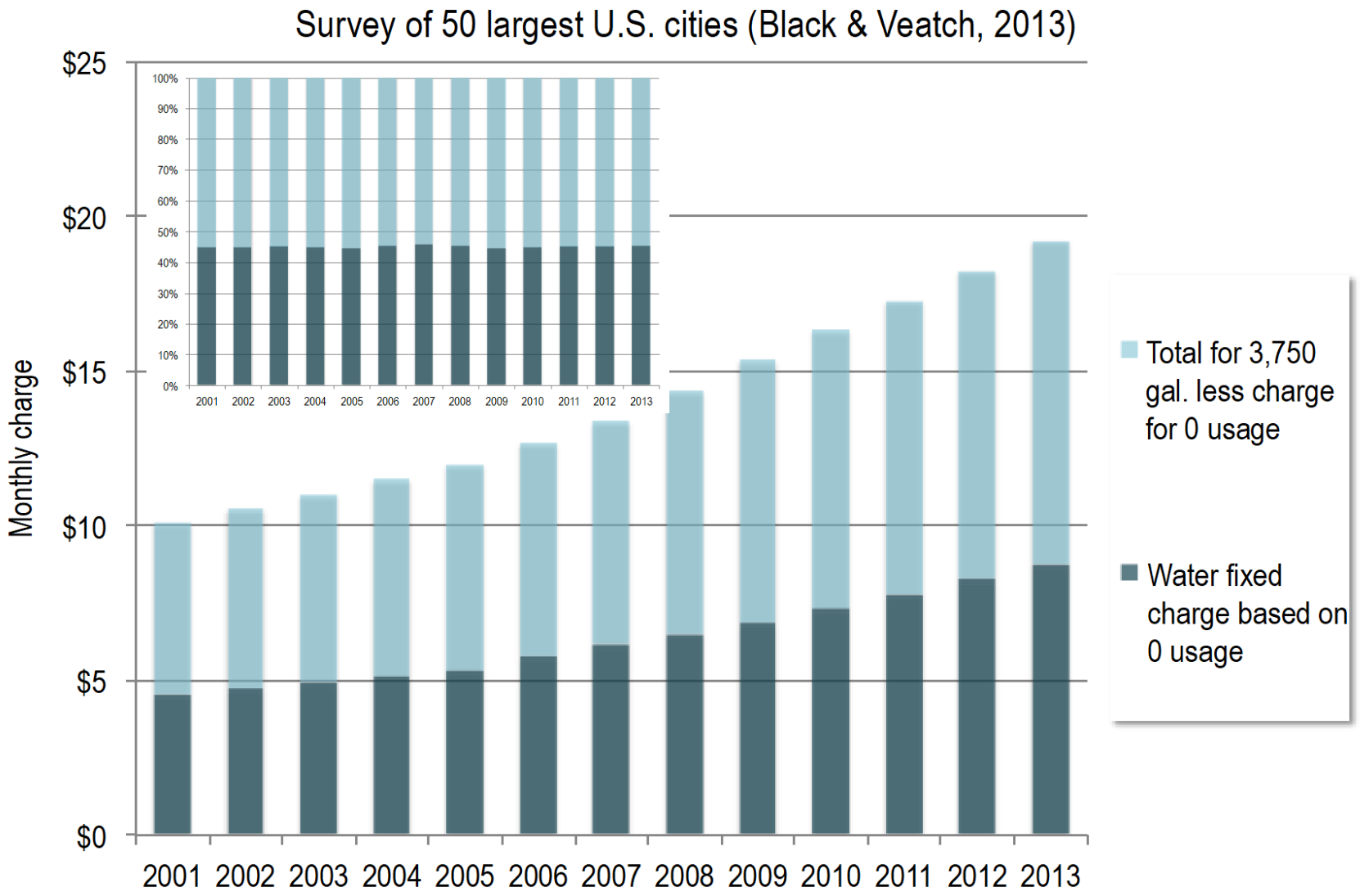


Table 5. Responses (as % of total) from utility personnel regarding how their utilities are responding to cost recovery needs (*n* = 706)

Rank (based on number of responses)	Category	Response (%)
1	Shifting more of the cost recovery from consumption-based fees to fixed fees within the rate structure	33
2	Changes in growth-related fees (i.e., system development charges, impact fees, or capacity charges)	25
3	Shifting rate design to increasing-block rate structure	16
4	Increasing financial reserves	14
5	No changes needed	11
5	Implementing rate stabilization reserves	11
6	Revenue diversification	6
7	Incorporating seasonal rates	5
8	Shifting rate design to decreasing-block rate structure	2

https://www.awwa.org/resources-tools/water-and-wastewater-utility-management/state-of-the-water-industry.aspx

Fixed and Variable Charges (Top 50 Cities)



Fixed vs. Variable Charges

Higher Fixed Charges

Advantages

- Revenue stability
- Many costs are fixed in the short run
- Administrative simplicity

Disadvantages

- Not Cost of Service-based (peak demand costs are in the fixed component)
- Creates low income affordability concerns
- Mutes price signal (creates resource efficiency concerns)

Higher Variable Charges

Advantages

- In the long run, all costs are variable
- Cost of Service-based (peak demand costs in the variable component)
- More affordable for low income customers
- Enhanced price signal (addresses resource efficiency concerns)

Disadvantages

- Increased revenue risk
- Administratively complex

Example: Monthly Bill for Residential Customer (5/8” meter) Using 4,000 Gallons

	Wausau Water Utility	Marshfield Utilities	Cottage Grove Water and Sewer Utility
Number of Connections	16,240	8,209	2,330
Most Recent Rate Case	**8/1/2017**	**6/1/2017**	**1/1/2017**
Monthly General Service Charge	$ 5.36	$ 9.20	$ 10.87
Monthly Public Fire Protection Charge	$ 3.29	$ 8.85	$ 8.20
Total Fixed Charge	**$ 8.65**	**$ 18.05**	**$ 19.07**
Volume Charge	**$ 11.94**	$ 21.06	$ 15.28
TOTAL BILL	**$ 20.59**	**$ 39.11**	**$ 34.35**
Fixed as Percentage of Total Bill	**42%**	**46%**	**56%**

Ex: Gallon Allotment in First Block

Quarterly Service Charges:

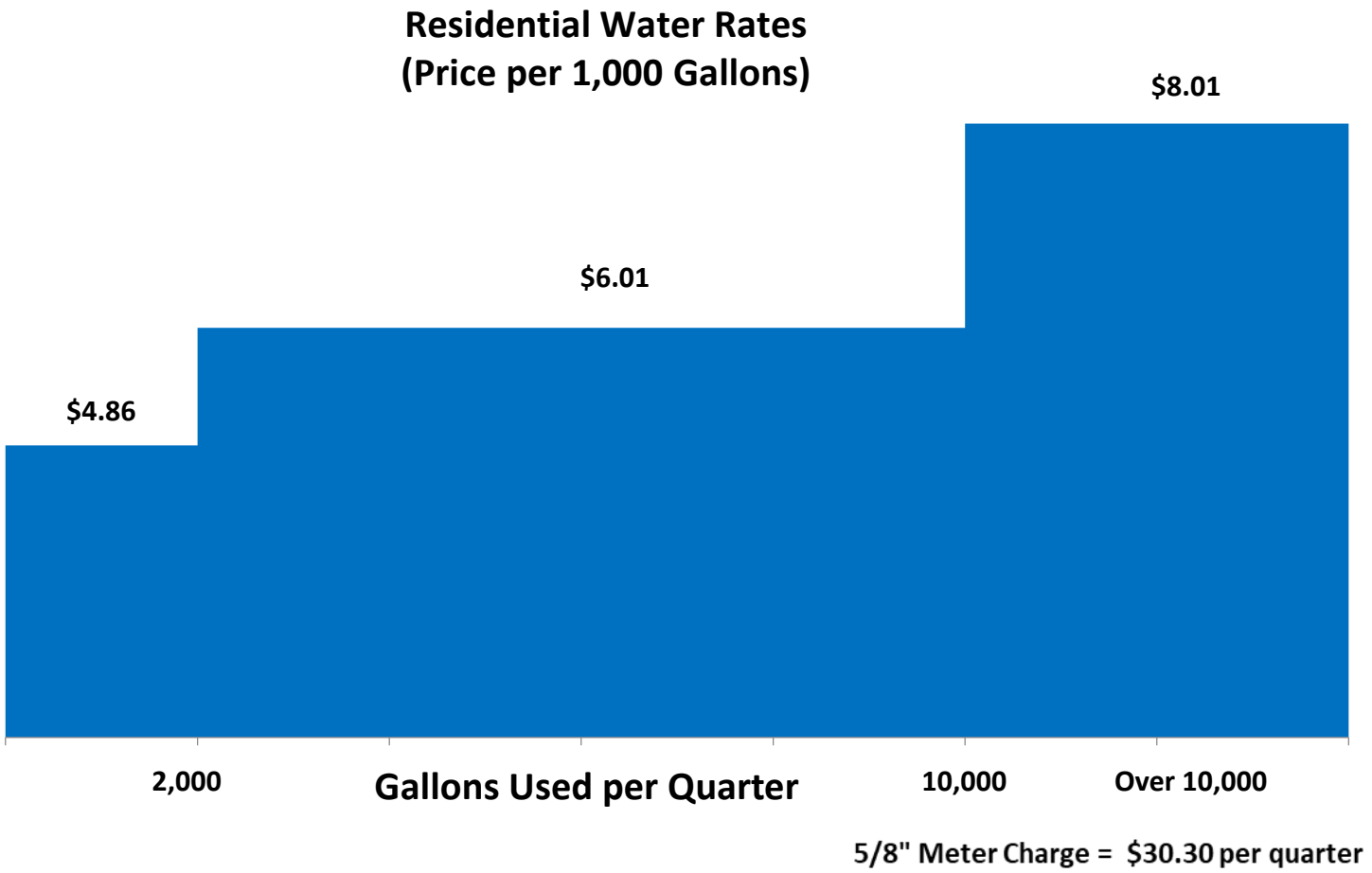
⅝ - inch meter - $	36.07	3 - inch meter - $	63.65
¾ - inch meter - $	36.07	4 - inch meter - $	84.87
1 - inch meter - $	40.31	6 - inch meter - $	116.70
1¼ - inch meter - $	42.44	8 - inch meter - $	148.53
1½ - inch meter - $	47.74	10 - inch meter - $	190.96
2 - inch meter - $	53.05	12 - inch meter - $	233.40

For PSC use only: base 5/8-inch meter charge for SRC purpose - 34.00

Plus Volume Charges:

First	5,000	gallons used each quarter - Service Charge
Next	13,000	gallons used each quarter - $3.72 per 1,000 gallons
Next	18,000	gallons used each quarter - $2.91 per 1,000 gallons
Over	36,000	gallons used each quarter - $1.60 per 1,000 gallons

Example: Addressing conservation and affordability objectives



Lifeline Rates

- Criteria
  - Income-based
  - Should not promote waste beyond amount considered necessary
  - Minimum sanitary use of 250 gal/day?
- Adjust bills to meet a targeted percent of income
- Determine maximum allowable bill
- Adjust metered rate or service charge

Customer Affordability Programs

Advantages

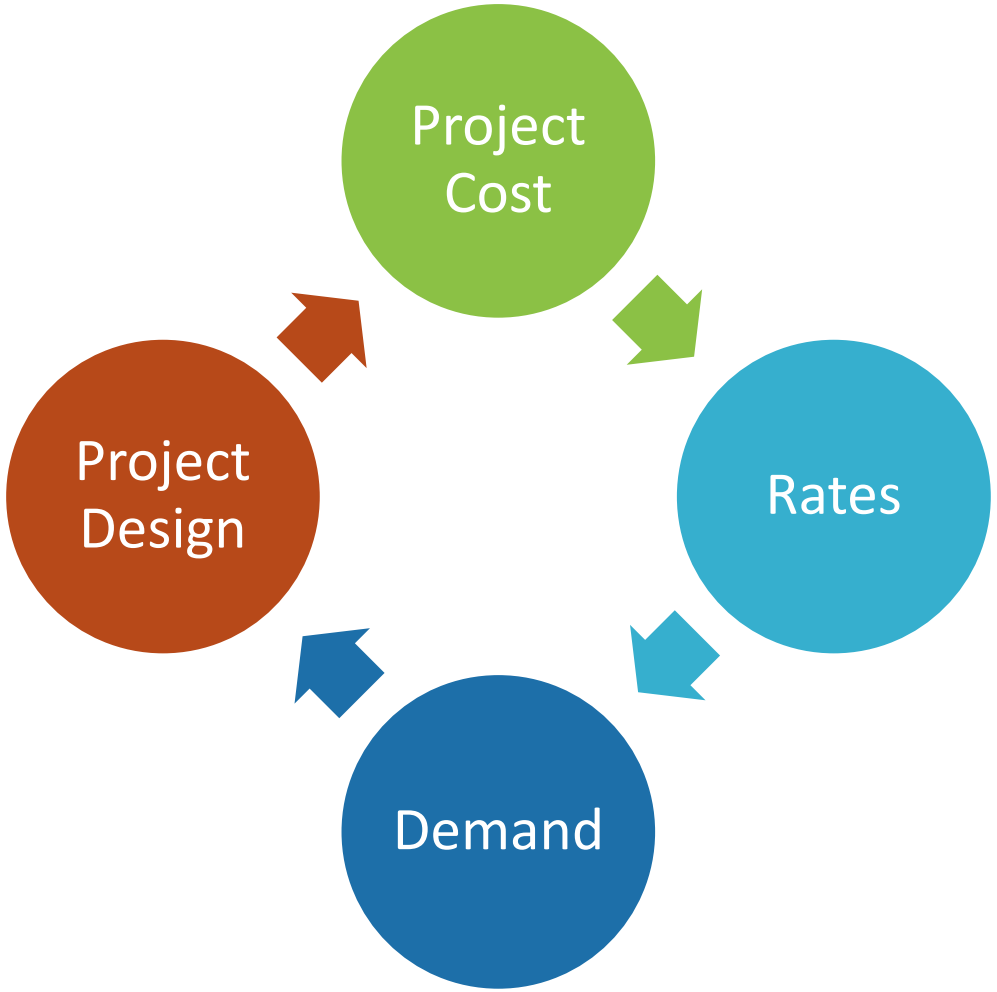
- Help ensure low-income customers remain connected and are able to pay future bills
- Reduce administrative costs (collections)
- Reduce bad debt expenses
- Enhance utility's image and community engagement
- Help meet efficiency goals

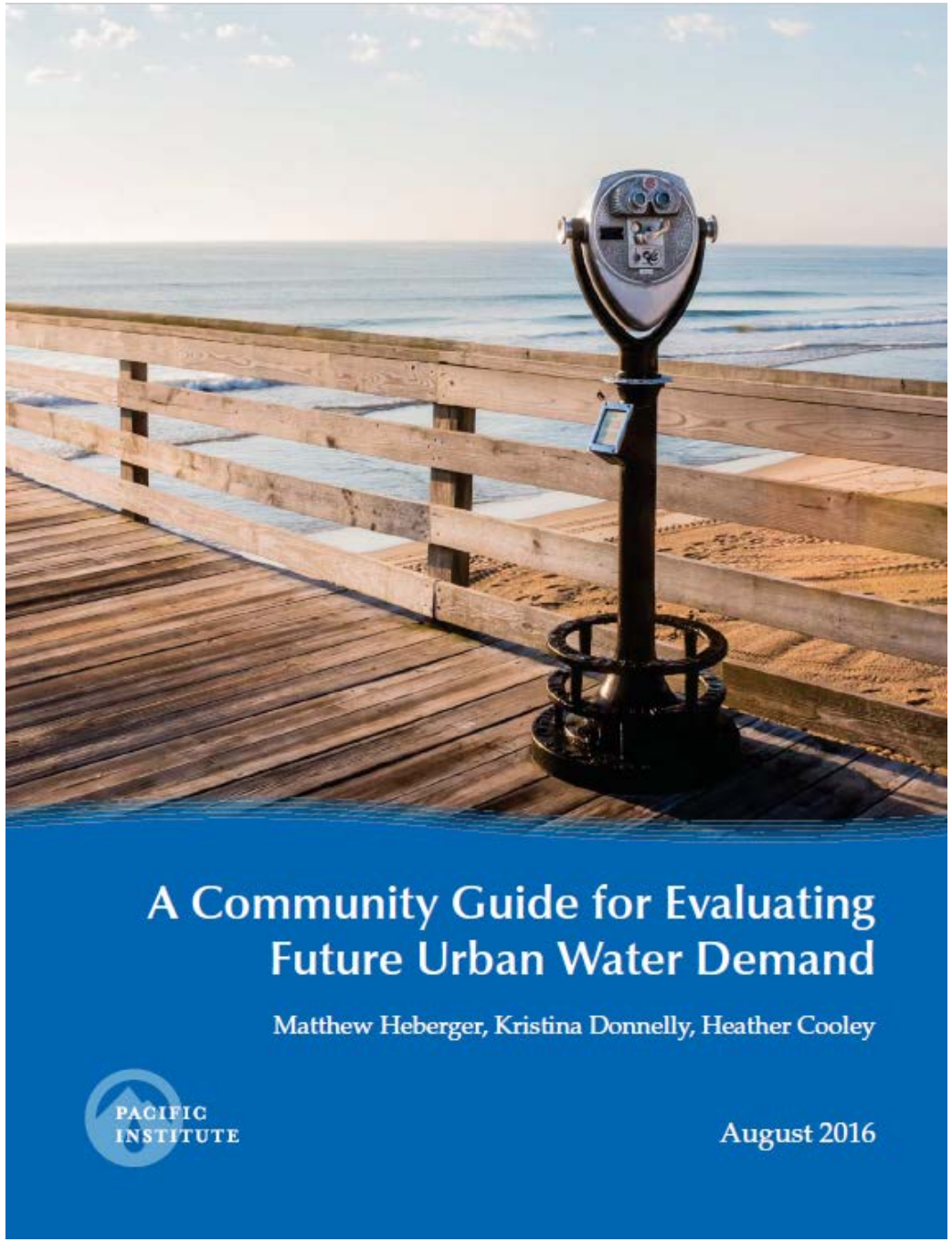
Disadvantages

- May be considered "discriminatory" rates
- Assistance may be considered a "gratuity"
- Water utilities are not social service agencies
- Restrictions on uses of public funds and/or bond covenant restrictions
- Program costs may run counter to cost minimization directives

Improved capital planning can help address affordability challenges

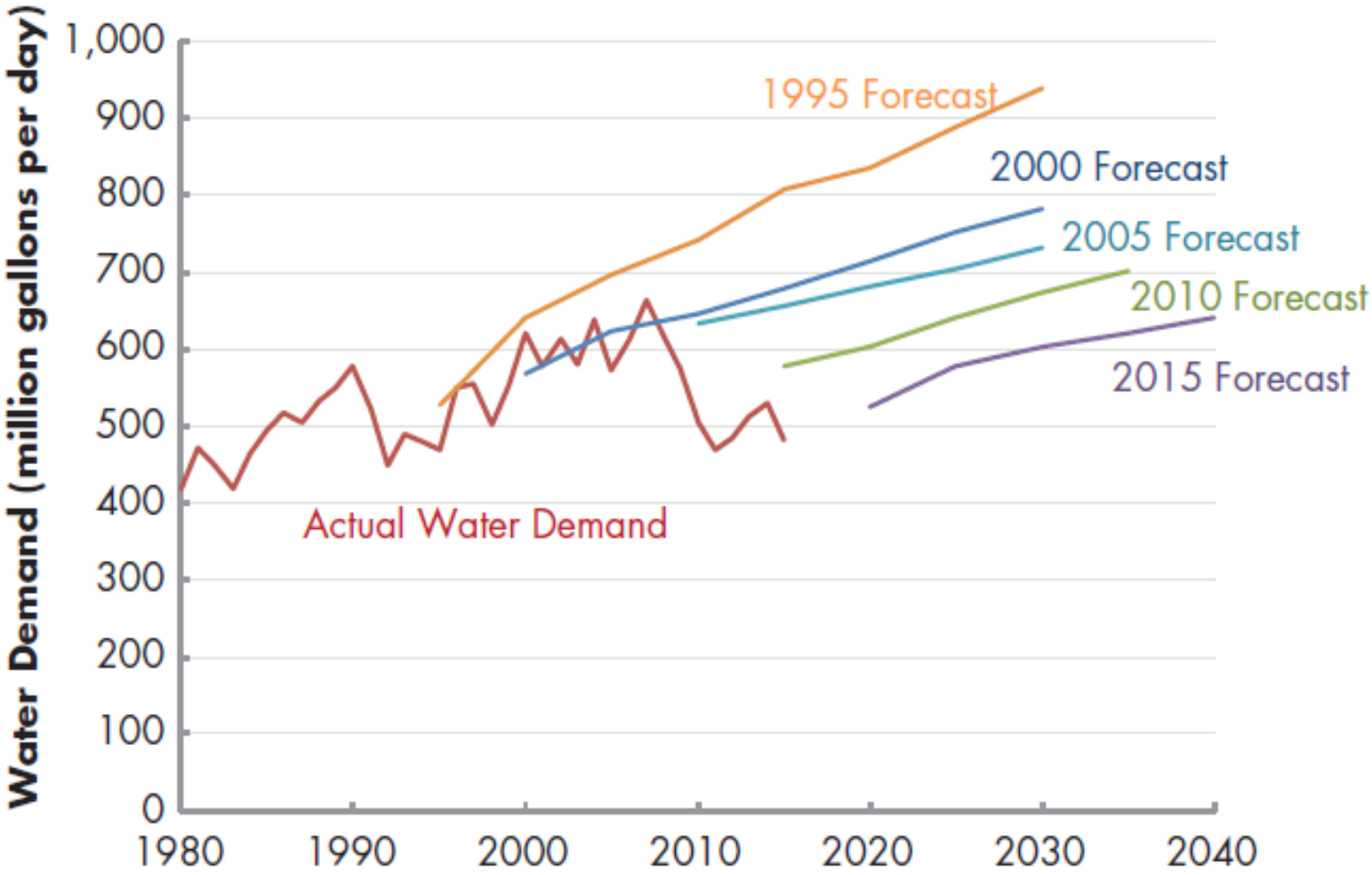
- Requires accurate, reliable demand forecasting
- Financial, capital, and strategic planning are integrated – use the good forecasts!
- May require a new way of thinking about "shortage"





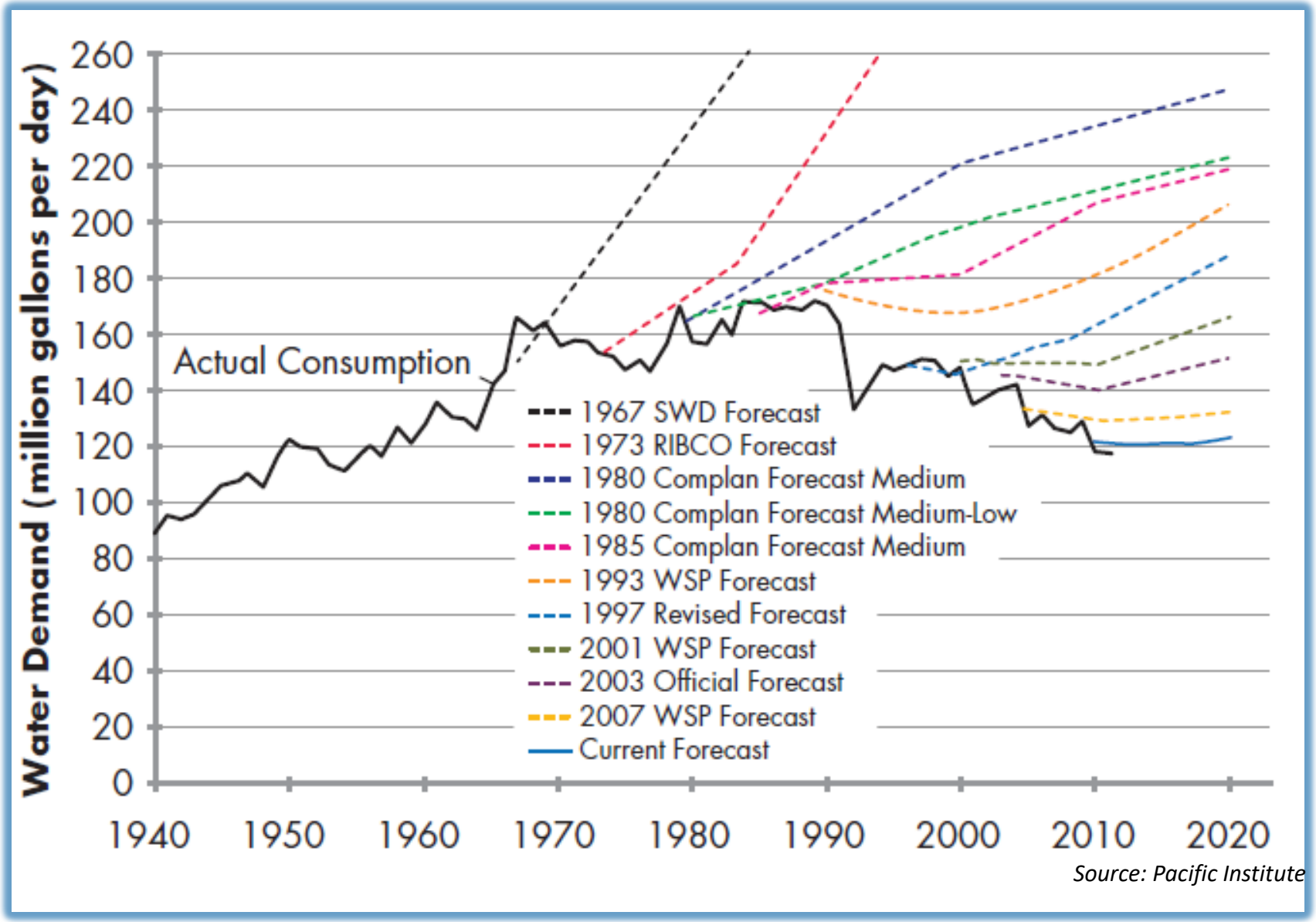
"The reality is that many water suppliers consistently overestimate actual water demand."

Example: San Diego County



Source: Pacific Institute

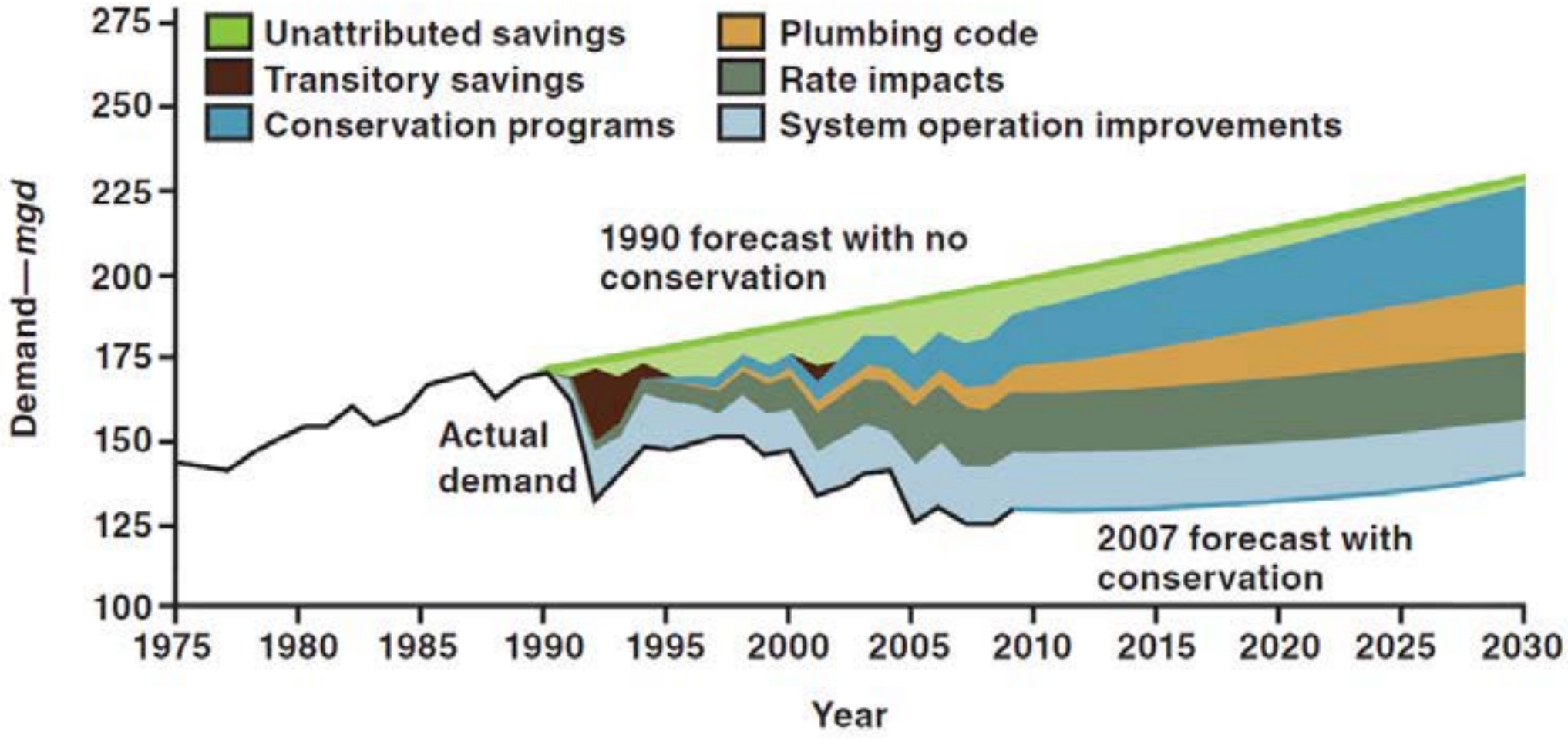
Demand Forecasting: Seattle, Washington



Source: Pacific Institute

Demand Forecasting: Seattle, Washington

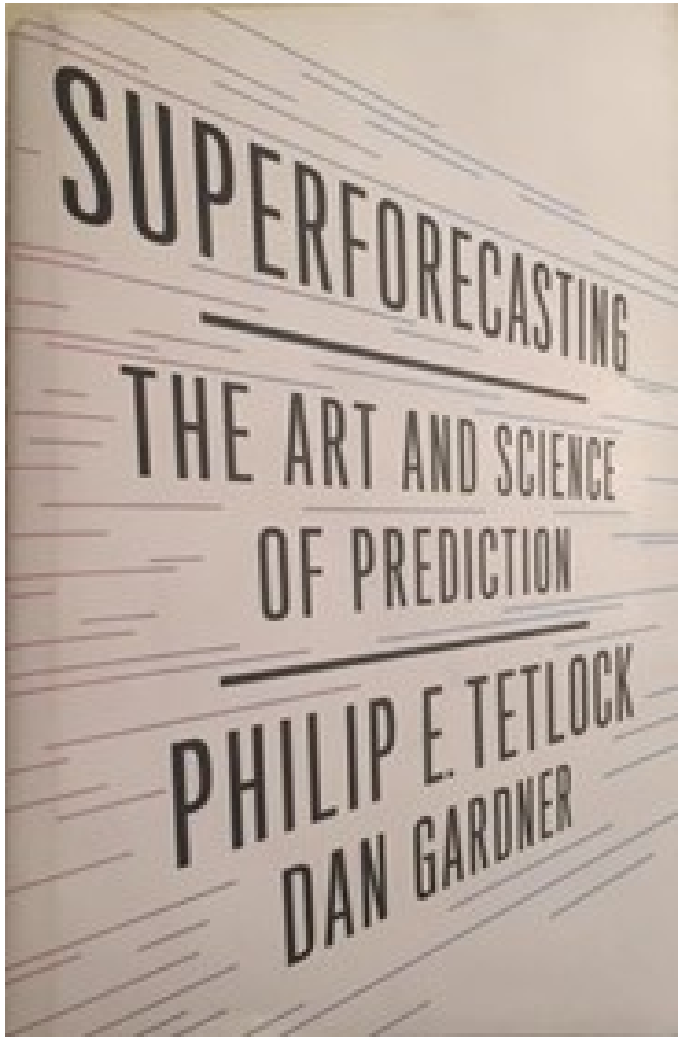
FIGURE 2 Demand forecasts with and without conservation



Source: Graphic courtesy of Bruce Flory, Seattle Public Utilities (2009)

Demand Forecasting

- Allow efficiency improvements to succeed and therefore reduce capital costs
- Recognize when a system is experiencing the “new normal”
- Don’t ignore zero growth trends
- Integrate improved demand forecasts in project design
- Use improved demand forecast to inform revenue projections
- Use demand repression adjustments to account for price elasticity effects
- Beware of “If you build it, they will come.”
- “All models are wrong, but some are useful” – George Box



Final Thoughts