

Rate Design and Pricing

March 17, 2021

Michigan Technological University



**Great Lakes
Environmental
Infrastructure Center**

Environmental Finance Center for EPA Region 5



Our Presenter



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WATER FINANCE
ASSISTANCE



Today's Agenda

- State that rates are the primary source of revenue for water utilities
- Describe elements of rate structures
- Identify approaches to pricing
- Discuss how water utility and community priorities can impact rate policy decisions



Poll Question

What type of organization do you represent?

- Utility serving 10,000 people or less
- Utility serving more than 10,000 people
- State or federal program
- Consultant or technical assistance
- Other



Miscellaneous Income





Drinking Water Revenue Comes Primarily from Rates

When It Comes to Rates...

- We often ask, “Are our rates low? Are they cheaper than our neighbors?”



When It Comes to Rates...

- We often ask, “Are our rates low? Are they cheaper than our neighbors?”
- Instead ask, “Do our rates bring in the appropriate level of revenue?”



Appropriate Level of Revenue

Cost of Operations

- + Cash Payments for Infrastructure
 - + Debt Service
 - + Contributions to Reserves
-



Expenses

- Withdrawal permit
- Water rights
- Electricity
- Water purchases
- Chlorine
- Softeners
- Membranes
- Filters
- UV bulbs
- Mortgage on treatment plant
- Cybersecurity
- Property insurance
- Liability insurance
- Uniforms
- PPE



- Testing supplies
- Training
- Certification

- Billing software
- Bank fees
- Credit card processing

Infrastructure

- Well or surface water
- Intake pump
- Pumphouse or well house
- Fencing
- Backup generator
- Chlorinator
- Filter tanks
- SCADA

- RO system/UV system
- Onsite energy generation

- Hydrants
- Manholes
- Valves

• Heavy machinery

Human Inputs

- Administrative
- Operations
- Electrician
- Construction
- Lawyers
- SCADA expertise
- Plumbing
- Laboratory
- Line repairs
- Traffic conducting

- Vehicle maintenance
- Heavy equipment maintenance
- Road repair
- Mapping/GIS
- Meter reading
- Billing
- Customer service
- Budgeting
- Board and management
- Human resources



3



Poll Question

Do you have targets for the amount of money you put into reserves every year?

- Yes
- No



The Magic Number

- There is a single number you can calculate that is the appropriate level of revenue for your water system in a given year. That's data.



The Magic Number

- There is a single number you can calculate that is the appropriate level of revenue for your water system in a given year. That's data.
- But how you get there is where you have choices



Your Big Decision Points

- How to structure your rates
- How to price your rates
- What water utility and/or community priorities do you want to incorporate into your rates



Rate Structures



Customer Classes

- Residential
- Commercial
- Industrial
- Institutional
- Governmental
- Bulk Purchase/Wholesale
- Negotiated Rate



Customer Classes

- Residential
- Commercial
- Industrial
- Institutional
- Governmental
- Bulk Purchase/Wholesale
- Negotiated Rate



Non-Residential



Poll Question

Do you charge different rates for residential and non-residential customers?

- Yes
- No



Structure Options

- Uniform—rates per unit of billing don't change based on usage level
- Increasing block—rate per unit of billing goes up as usage goes up
- Decreasing block—rate per unit of billing goes down as usage goes up



Poll Question

What type of rate structure do you have for residential customers?

- Uniform rates
- Increasing block rates
- Decreasing block rates
- Something else



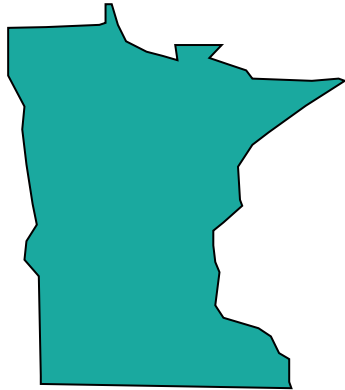
Poll Question

What type of rate structure do you have for non-residential customers?

- Uniform rates
- Increasing block rates
- Decreasing block rates
- Something else



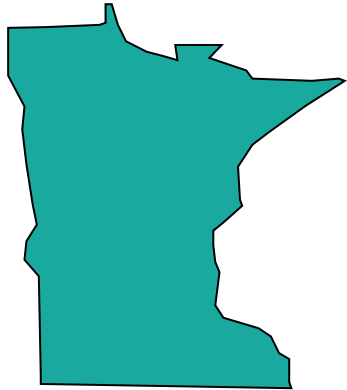
Interesting State Differences on Rate Structures



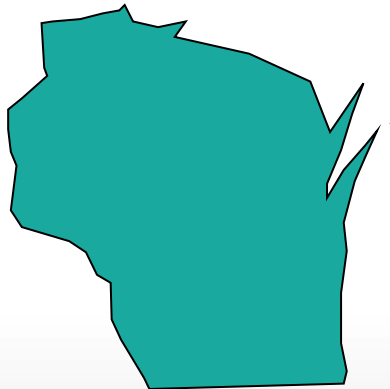
Mostly increasing block rates



Interesting State Differences on Rate Structures



Mostly increasing block rates



Mostly decreasing block rates *



Pricing



Base Charge

- Payment for access to the system. Everyone within a customer class pays the same amount regardless of usage
- Guaranteed revenue per billing period



Volumetric Charge

- Payment for volume of product received. The more you use, the higher your bill
- Fluctuates based on how much water passes through customer meters each billing period



Balancing Base and Volumetric



Balancing Base and Volumetric—One Option

- “Fixed” costs (that don’t change based on the volume of water treated and sold) go in the base charge
- “Variable” costs (that do change based on the volume of water treated and sold) go in the volumetric charge



Expenses Based on Volume of Water Produced

- Withdrawal permit
- Water rights
- Electricity
- Water purchases
- Chlorine
- Softeners
- Membranes
- Filters
- UV bulbs
- Mortgage on treatment plant
- Cybersecurity
- Property insurance
- Liability insurance
- Uniforms
- PPE
- Testing supplies
- Training
- Certification
- Professional dues
- Tools
- Safety equipment
- Traffic cones, etc.
- Auto parts
- Tires
- Fuel
- GIS
- Leak detection
- Lab testing
- Meter testing
- Office overhead
- Printing
- Postage
- Billing software
- Bank fees
- Credit card processing fees
- Website
- Computers
- Office supplies
- Annual financial audit
- Reporting
- Planning & analysis
- Contingencies
- Debt service
- Utility commission
- Salaries
- Benefits
- Contract services



Balancing Base and Volumetric—One Option

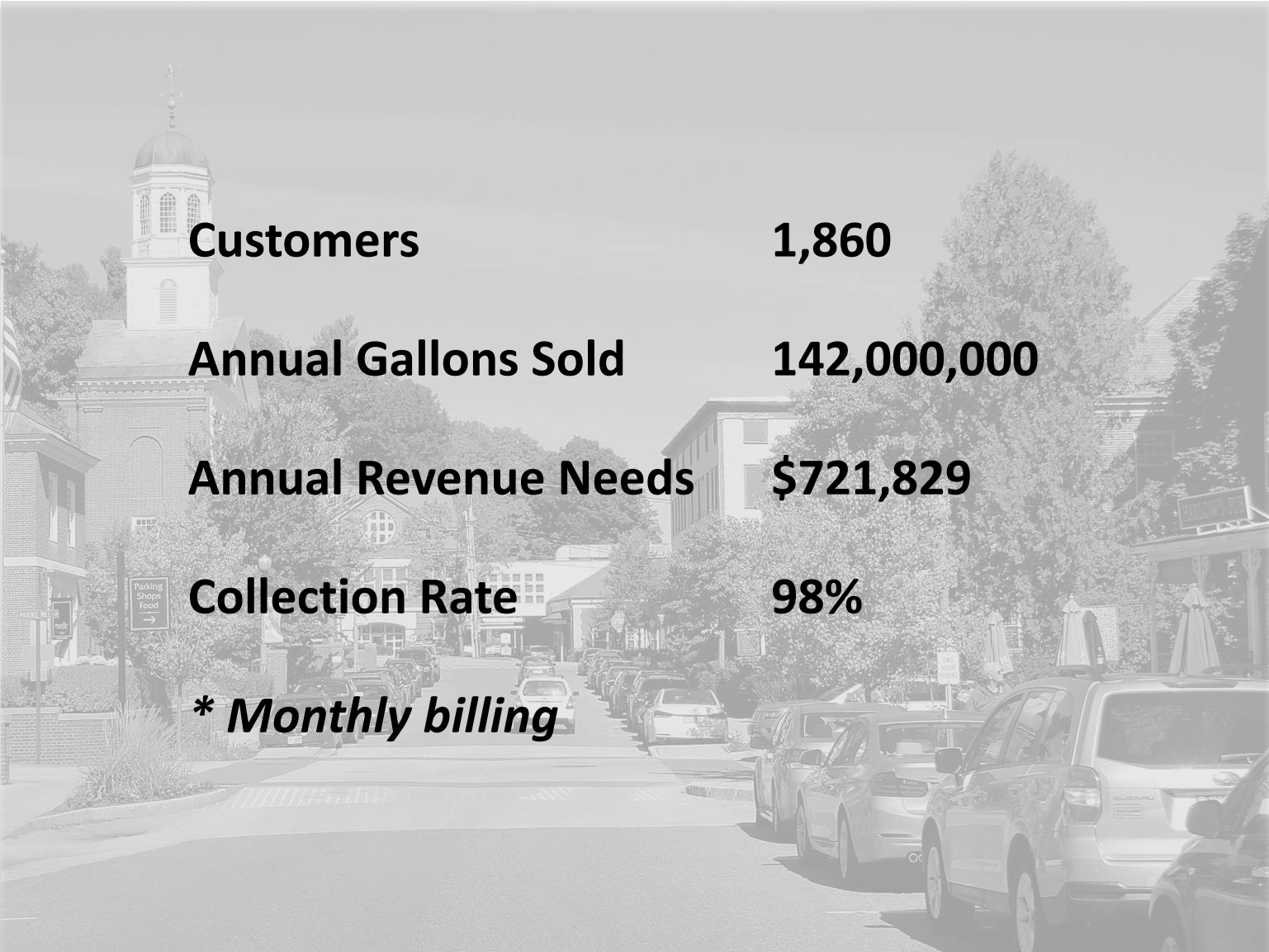
- Putting all fixed costs into the base charge often leads to a very high base charge and a very low volumetric charge
- This option is often not attractive to utilities or their boards
- Utilities want more flexibility



Typical Small Town



Typical Small Town



Customers	1,860
Annual Gallons Sold	142,000,000
Annual Revenue Needs	\$721,829
Collection Rate	98%

*** *Monthly billing***



Base Charge and Volumetric Charge Pairs

Base	Vol	Base	Vol	Base	Vol
\$0.00	\$5.19	\$12.00	\$3.30	\$24.00	\$1.41
\$1.00	\$5.03	\$13.00	\$3.14	\$25.00	\$1.26
\$2.00	\$4.87	\$14.00	\$2.99	\$26.00	\$1.10
\$3.00	\$4.72	\$15.00	\$2.83	\$27.00	\$0.94
\$4.00	\$4.56	\$16.00	\$2.67	\$28.00	\$0.79
\$5.00	\$4.40	\$17.00	\$2.51	\$29.00	\$0.63
\$6.00	\$4.24	\$18.00	\$2.36	\$30.00	\$0.47
\$7.00	\$4.09	\$19.00	\$2.20	\$31.00	\$0.31
\$8.00	\$3.93	\$20.00	\$2.04	\$32.00	\$0.16
\$9.00	\$3.77	\$21.00	\$1.89	\$33.00	\$0.00
\$10.00	\$3.62	\$22.00	\$1.73		
\$11.00	\$3.46	\$23.00	\$1.57		



So, which one do we choose?

Which one is **right**?



Priorities



Water Utility & Community Priorities

- Appropriate Revenue
(aka revenue sufficiency or full-cost pricing)



Water Utility & Community Priorities

- Appropriate Revenue
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Water Utility & Community Priorities

- Appropriate Revenue
(aka revenue sufficiency or full-cost pricing)

**Any Base &
Volumetric Pair
Will Work!***



Water Utility & Community Priorities

- Appropriate Revenue
(aka revenue sufficiency or full-cost pricing)
- Revenue stability
- Conservation
- Fairness



Base Charge and Volumetric Charge Pairs

Base	Vol	Base	Vol	Base	Vol
\$0.00	\$5.19	\$12.00	\$3.30	\$24.00	\$1.41
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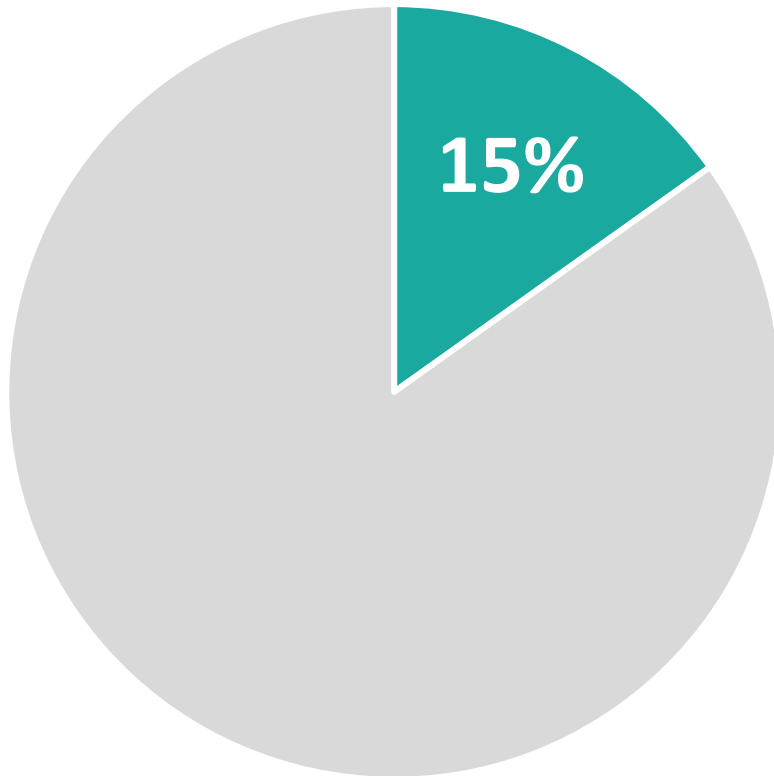


Revenue Stability—Revenue from Base Charge

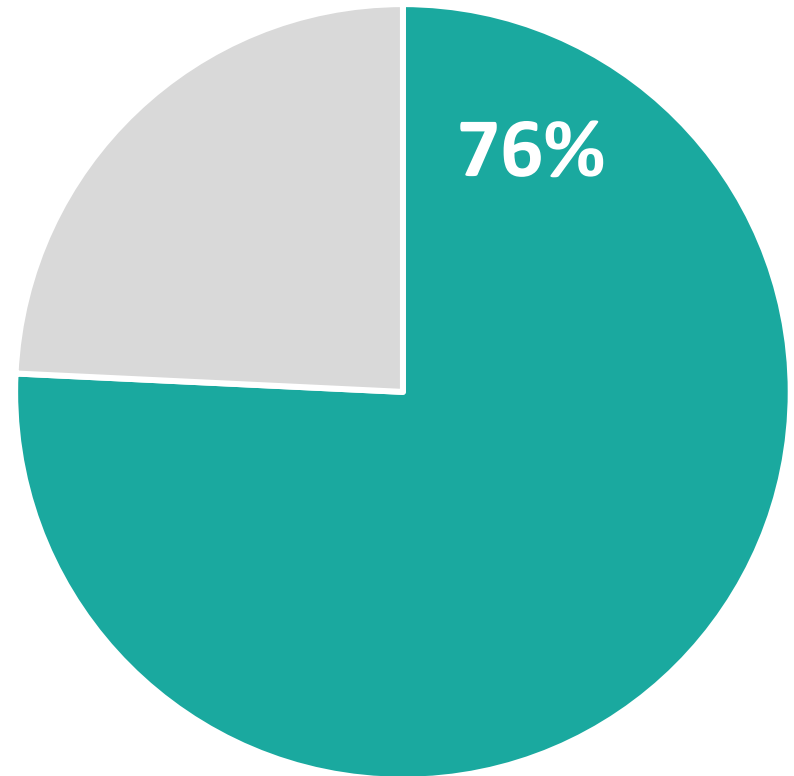


Revenue Stability—Revenue from Base Charge

\$5 base; \$4.40 volumetric



\$25 base; \$1.26 volumetric



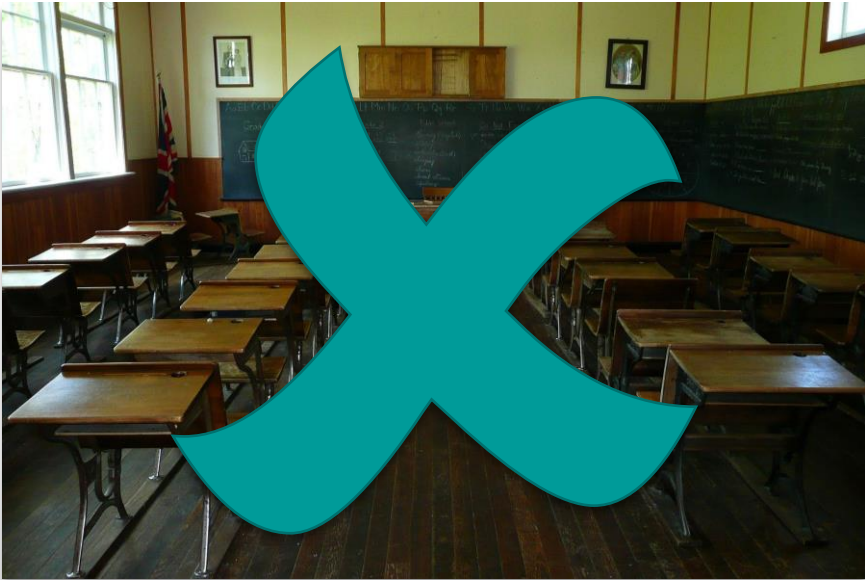
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Revenue Stability—Revenue from Base Charge

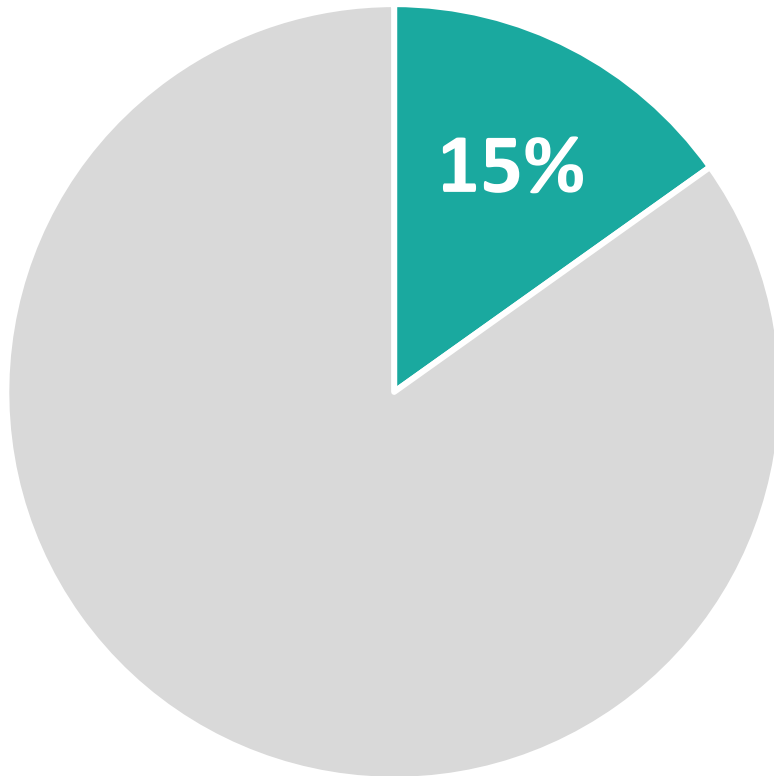


Revenue Stability—Revenue from Base Charge

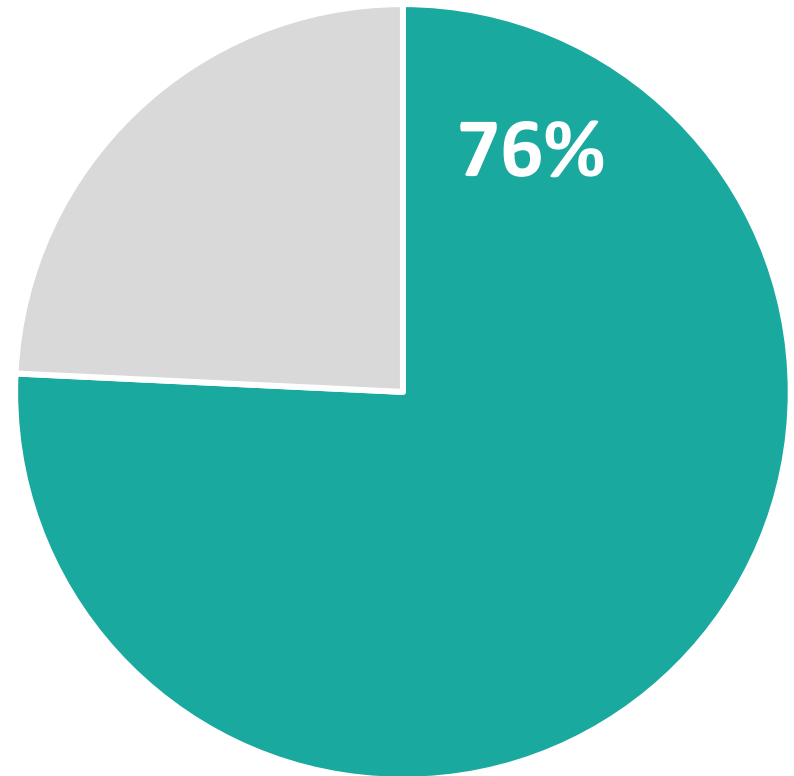


Revenue Stability—Revenue from Base Charge

\$5 base; \$4.40 volumetric



\$25 base; \$1.26 volumetric



Conservation—Limiting Discretionary Water Use



Conservation—Limiting Discretionary Water Use



Conservation—Limiting Discretionary Water Use



\$5 base

\$4.40 volumetric

\$25 base

\$1.26 volumetric

10,000 gallons

15,000 gallons



Conservation—Limiting Discretionary Water Use



\$5 base
\$4.40 volumetric

\$25 base
\$1.26 volumetric

10,000 gallons \$49.00

15,000 gallons \$71.00



Conservation—Limiting Discretionary Water Use



\$5 base
\$4.40 volumetric

\$25 base
\$1.26 volumetric

10,000 gallons

\$49.00

\$37.60

15,000 gallons

\$71.00

\$43.90



Conservation—Limiting Discretionary Water Use



	\$5 base \$4.40 volumetric	\$25 base \$1.26 volumetric
10,000 gallons	\$49.00	\$37.60
15,000 gallons	\$71.00	\$43.90



Which Promotes Conservation?

Rate #1: Uniform

- \$85 base rate
(does not include any usage)
- At all levels of usage:
\$20.00 per 1,000 gallons

Rate #2: Increasing Block

- \$36.47 base rate
(includes 5,000 gallons of usage)
- 5,000 to 10,000 gallons:
\$1.85 per 1,000 gallons
- 10,001 to 20,000 gallons:
\$1.95 per 1,000 gallons
- 20,001 gallons and up:
\$2.04 per 1,000 gallons



Poll Question

Which rate structure do you think is more likely to promote conservation?

- Rate #1
- Rate #2
- Equally



Fairness



Fairness

- Does the monthly bill reflect the level of service that the customer has received?
- Are customers paying a bill that appropriately reflects their burden on the system?



Fairness



Fairness

\$5 base
\$4.40 volumetric

\$25 base
\$1.26 volumetric



\$27.00

\$31.30



Fairness

\$5 base
\$4.40 volumetric

\$25 base
\$1.26 volumetric



\$11.60

\$26.89



\$27.00

\$31.30



Fairness

\$5 base
\$4.40 volumetric

\$25 base
\$1.26 volumetric



\$11.60

\$26.89



\$27.00

\$31.30



\$181.00

\$75.40



Fairness

% of Usage
3%



11%

86%

\$5 base
\$4.40 volumetric

\$25 base
\$1.26 volumetric

\$11.60

\$26.89

\$27.00

\$31.30

\$181.05

\$75.30



Fairness

% of Usage

3%



11%



86%



\$5 base
\$4.40 volumetric

\$25 base
\$1.26 volumetric

\$11.60 5%

\$26.89 20%

\$27.00 12%

\$31.30 23%

\$181.00 82%

\$75.40 56%

% of Revenue



Fairness

% of Usage
 3%



\$11.60

\$26.89

20%

11%



\$27.00

\$31.30

23%

86%

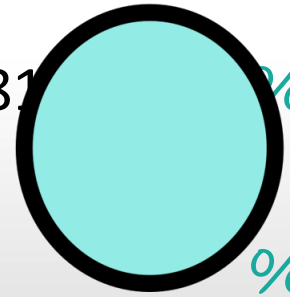
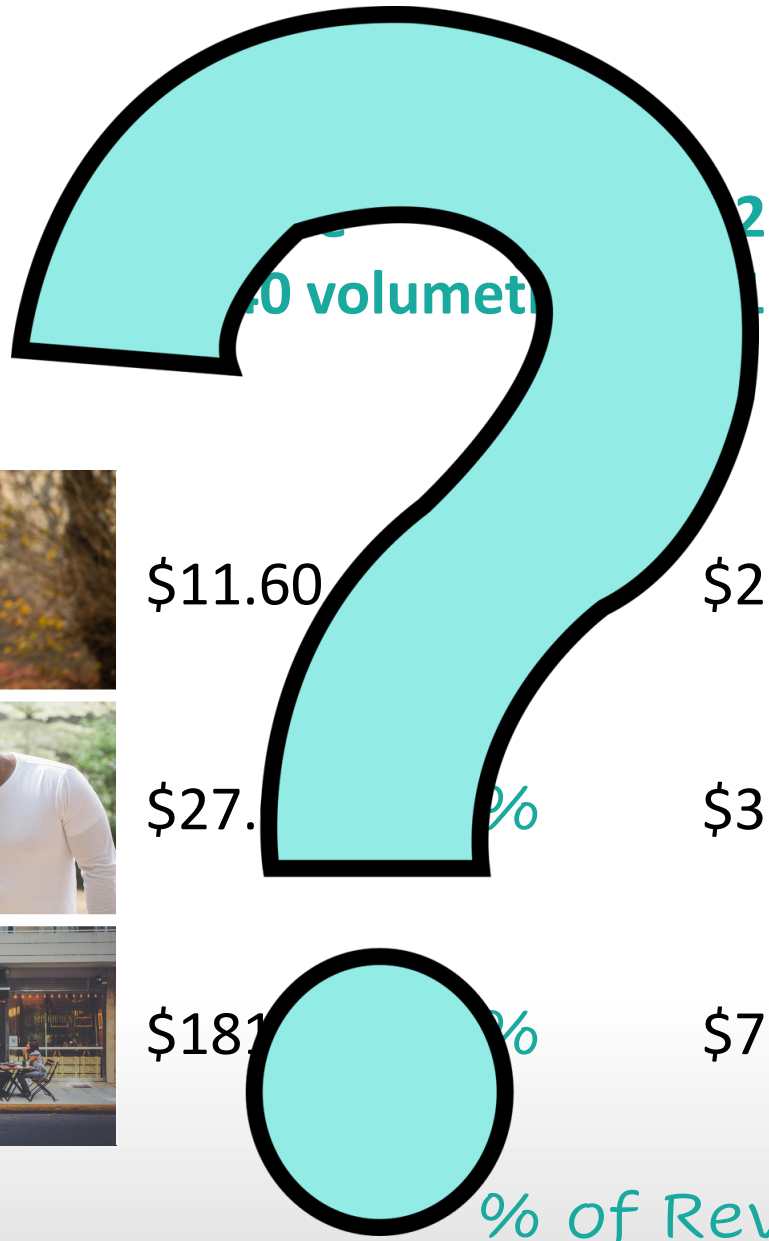


\$181.00

\$75.40

56%

% of Revenue



25 base
 .26 volumetric



Available Resources





WI Water Rates Dashboard
Rates as of August, 2020
Dashboard updated: September 1, 2020



Abbotsford

Rates Comparison

Financial Benchmarks

Characteristics

Links

Select residential bill and monthly consumption amount

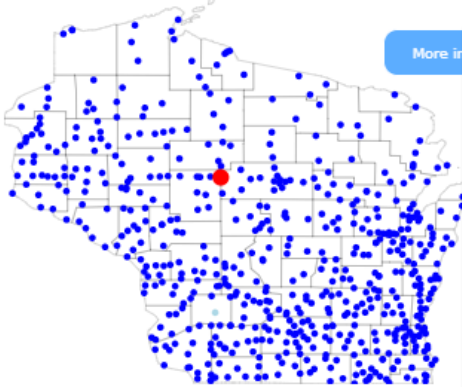


Monthly Water Bill: \$65.95

Inc fire protection fee: \$22.29 (15.09 + 7.2 Property Tax)

Select comparison group: All Utilities

Comparing to all utilities in survey



576 rate structures compared

Effects of raising rates by: 0%

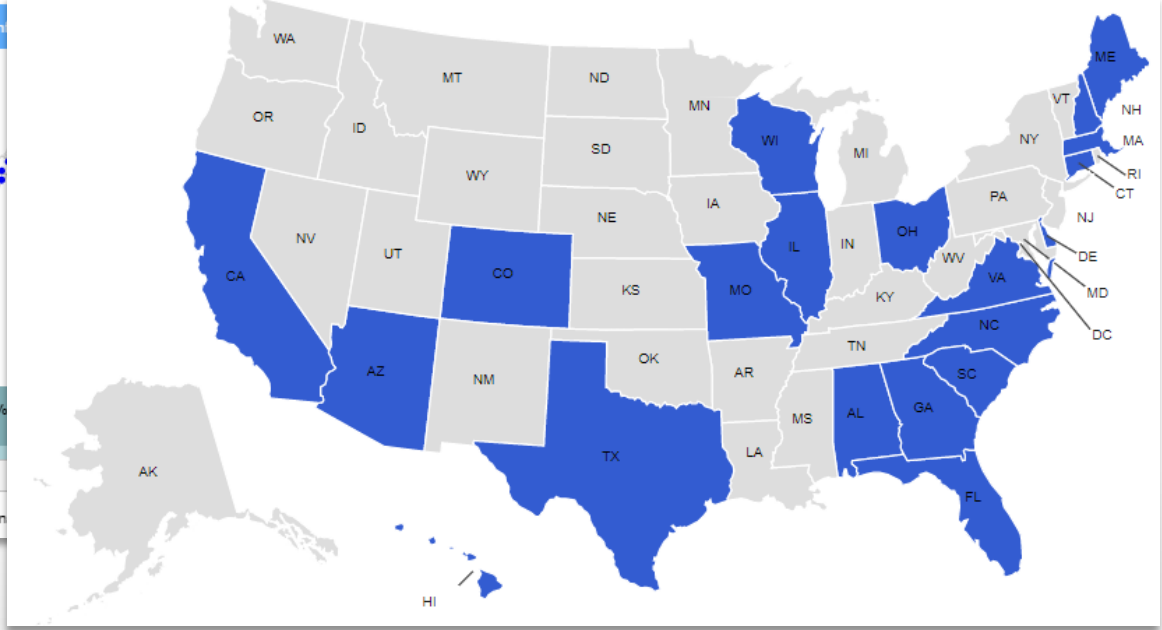
Bill Comparison

Water Bill at
4,000 gallons
Median: \$34.06



Cost Recovery

Operating
Ratio Incl. Deprec.



Tools To Assist Water Utilities With Financial Decision Making





Funded By:

Water Research Foundation, United States Environmental Protection Agency, North Carolina Department of Environmental Quality,
Georgia Environmental Finance Authority

Program: Drinking Water and Wastewater

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Summary


Resources



The EFC at UNC has created several free tools to assist water utilities in addressing the challenges and questions we commonly see in our teaching and advising. These tools cover a broad range of finance and management topics, including rates and revenue, financial benchmarking, affordability, capital finance, communicating with the board, and evaluating loans and grants.

Rates and Revenue





Setting Small Drinking Water System Rates for a Sustainable Future

One of the Simple Tools for Effective Performance (STEP) Guide Series



Rate Communication Resources

The Value of Water Campaign from the US Water Alliance:

<http://thevalueofwater.org/>

Rate Approval Process Communication Strategy And Toolkit
from the UNC Environmental Finance Center:

<https://efc.sog.unc.edu/project/rate-approval-process-communication-strategy-and-toolkit>

Rogue Water Lab:

<https://roguewaterlab.org/>



Poll Question

Did you learn something new and useful on today's webinar?

- Yes
- No



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