



**RCAC**

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**Rate Setting**

IACC Conference, Wenatchee, WA 2016

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**Rate Setting**



The process of determining how the revenue needs of a utility system will be divided among its various users.



**Board Members & Water Rates**

“Board Members have a **fiduciary duty** to assure that system revenues cover the **“true”** cost of water delivered.”

-- Ellen Miller  
“The Water Board Bible”



**Function of Water Rates**

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- Collect the “true” cost of water
- Fair distribution of costs
- Control water usage (conservation)
- Economic development



**“True” Cost of Water**

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- Operating and Maintenance Expenses
- Administration Expenses
- Reserves
  - Debt reserves
  - Operating reserves
  - Emergency reserves
  - Capital Improvements



### Overview of the Rate Analysis Process

1. Data Collection and Analysis
2. Asset Management Planning
3. Annual Operating Budget Development
4. Rate Analysis



Rate Analysis ties the entire process together!



### Rate Setting Theory!



***Customers should pay separately for utility access and usage.***

- Minimum, Base or Fixed Bill is calculated to cover fixed operating expenses and capital cost of utility access.
- Usage or Volume Bill is calculated to cover the variable cost of production.



### Types of Water Rates

- Flat Rate
- Uniform Block Rate
- Decreasing Block Rate
- Increasing Block Rate



### Uniform Block Rate Structure



Advantages

- Easy to Administer
- Simple – Only one rate.
- Fair – Volume based  
All gallons are equal.



Disadvantages

- May discourage high water consuming industries from locating or expanding in the service area.



### Decreasing Block Rate Structure



Advantages

- Attractive to large volume users.
- Good for business development.



Disadvantages

- Residential and small commercial customers often end up subsidizing large volume users.



### Increasing Block Rate Structure



Advantages

- Promotes conservation.
- Less water usage means less wastewater production.
- Preference to small volume residential sized customers. (Low Income/ Elderly)



Disadvantages

- Large volume users pay an extremely high percentage of utility cost.
- Strongly discourages commercial and industrial users from locating or expanding in the service area.



## Who is going to pay?

- How many customers use how much water in an average month?
- Water use history** needs to be documented for each User Classification.
- Large commercial and industrial customers should be tracked individually.
  - What would be the impact on the utility system if your largest customer were to discontinue operations?
  - Loss of revenue! Increased delinquency?



## Water Use History

### Residential Water Use History

| Water Usage Gallons /Month | Avg. Usage | Number of Customers in Usage Level | % Cust. | Average Water Usage | % Usage |
|----------------------------|------------|------------------------------------|---------|---------------------|---------|
| Under 1000                 | 500        | 8                                  | 1.8%    | 4000                | 0.2%    |
| 1001 to 2000               | 1500       | 20                                 | 4.4%    | 30000               | 1.3%    |
| 2001 to 3000               | 2500       | 45                                 | 10.0%   | 112500              | 4.8%    |
| 3001 to 4000               | 3500       | 75                                 | 16.7%   | 262500              | 11.2%   |
| 4001 to 5000               | 4500       | 110                                | 24.4%   | 495000              | 21.1%   |
| 5001 to 6000               | 5500       | 85                                 | 18.9%   | 467500              | 19.9%   |
| 6001 to 7000               | 6500       | 50                                 | 11.1%   | 325000              | 13.8%   |
| 7001 to 8000               | 7500       | 40                                 | 8.9%    | 300000              | 12.8%   |
| 8001 to 9000               | 8500       | 11                                 | 2.4%    | 93500               | 4.0%    |
| Total                      |            | 444                                | 98.7%   | 2090000             | 89.0%   |

### Commercial / Industrial Water Use History

| Company           | Avg. Usage | Number of Customers | % Cust. | Average Water Usage | % Usage |
|-------------------|------------|---------------------|---------|---------------------|---------|
| Widget World      | 150000     | 1                   | 0.2%    | 150000              | 6.4%    |
| School            | 45000      | 1                   | 0.2%    | 45000               | 1.9%    |
| Senior Apartments | 28000      | 1                   | 0.2%    | 28000               | 1.2%    |
| Restaurant        | 25000      | 1                   | 0.2%    | 25000               | 1.1%    |
| Post Office       | 6500       | 1                   | 0.2%    | 6500                | 0.3%    |
| Old Feed Mill     | 3500       | 1                   | 0.2%    | 3500                | 0.1%    |
| Total             |            | 6                   | 1.3%    | 258000              | 11.0%   |
| Grand Total       |            | 450                 | 100.0%  | 2348000             | 100.0%  |

## Base Rate Usage Adjustment

Utility systems who provide XXXX gallons of service in their base rate need to include the cost of this water in the Minimum Rate.

$$\begin{aligned} & \text{Monthly Fixed Cost per EDU} \\ & + \text{Variable cost of base level service} \\ & = \text{Monthly Minimum or Base Rate} \end{aligned}$$



## Usage (Volume) Charges

$$\begin{aligned} & \text{Total Variable Cost} \\ & \frac{\text{Gallons of Water Sold}}{1,000} \\ & = \text{Variable Cost per 1,000 gallons} \end{aligned}$$

Finished!!!



## Usage or Volume Bill

- In theory, the Base or Minimum Rate usage should be zero. Marketing, however often requires that we provide some quantity of service for base level pricing. The amount of base usage should be relatively small.
- Many systems set the Minimum bill to include the first XXXX gallons of water (Typically 1,000 / 2,000 / 3,000 gallons). This volume charge must be included in the Base or Minimum bill.
- Revenue generated varies seasonally (Summer vs. Winter) and from year-to-year (Drought Conditions).

Customers grouped by Consumption Blocks.



## Consumption Blocks

A preset quantity of service delivered at a corresponding price. Consumption Block pricing structures typically begin with a base or minimum charge for service availability (User Classification Charge).

- \$ \_\_\_ Base or Minimum Bill
- \$ \_\_\_ per thousand gallons from zero to 6,000 gallons
- \$ \_\_\_ per thousand gallons from 6,001 to 10,000 gallons
- \$ \_\_\_ per thousand gallons for everything over 10,000 gallons



## Proportional-to-Usage Rates

- Rates are based upon level of utility usage. Recommended because of customer fairness. Encourages conservation.
- Customers are broken into groups based upon the type and amount of service required.
  - Residential Customers
  - Commercial Customers
  - Industrial Customers
  - Institutional (Hospitals / Funeral Homes / Schools) Customers
  - Wholesale and Bulk Customers.
- Proportional-to-usage customer billing can be complicated.



## User Classification

- A customer group with similar usage characteristics.
  - Residential Customers
  - Commercial Customers
  - Industrial Customers
  - Institutional (Hospitals / Funeral Homes / Schools) Customers
  - Wholesale and Bulk Customers.
- User Classifications are often defined in terms of **Equivalent Dwelling Units (EDU)**. Definition on next slide.
- Communities often uses **meter sizes** to reflect the amount of system capacity devoted to a particular customer or group of customers.



## Equivalent Dwelling Units (EDU)

- Provides a method to quantify different types of utility customers in terms of their equivalence to a single-family residential housing unit.
- Fixed and Capital Cost are typically distributed on an EDU basis. Minimum, Base or Fixed Bills to commercial and industrial customers are often expressed in terms of residential equivalency.
- In unmetred systems guidelines can be found in "Ohio EPA Guidelines for Design of Small Public Ground Water Systems" (Green Book).



## EDU's may be based upon size of the water meter.



| Meter Size          | Max. Flow Limit | = | EDU              |
|---------------------|-----------------|---|------------------|
| 5/8 inch meter      | 20 GPM          | = | 1.0 EDU          |
| 3/4 inch meter      | 30 GPM          | = | 1.5 EDU          |
| 1 inch meter        | 50 GPM          | = | 2.5 EDU          |
| 1 1/2 inch meter    | 100 GPM         | = | 5.0 EDU          |
| <b>2 inch meter</b> | <b>160 GPM</b>  | = | <b>8.0 EDU</b>   |
| <b>3 inch meter</b> | <b>350 GPM</b>  | = | <b>17.5 EDU</b>  |
| <b>4 inch</b>       | <b>1000 GPM</b> | = | <b>50.0 EDU</b>  |
| <b>6 inch</b>       | <b>2000 GPM</b> | = | <b>100.0 EDU</b> |
| <b>8 inch</b>       | <b>3500 GPM</b> | = | <b>175.0 EDU</b> |
| <b>10 inch</b>      | <b>5500 GPM</b> | = | <b>275.0 EDU</b> |

Meter information based upon AWWA Max. Flow Limit using data from badgermeter.com, jerman.com (Kent/ABB/AMCO) and sensus.com.



## Washington State

| METER Size | Meter Size Equivalents in ERUs |                                |                     |
|------------|--------------------------------|--------------------------------|---------------------|
|            | AWWA                           | DOH Financial Viability Manual | Carbonado (Ord 411) |
| 5/8        | 1 \$ 57.83                     | 1 \$ 57.83                     | 1 \$ 57.83          |
| 3/4        | 1 \$ 57.83                     | 1 \$ 57.83                     | 1.008646 \$ 58.33   |
| 1          | 2.5 \$ 144.58                  | 1.67 \$ 96.58                  | 1.017465 \$ 58.84   |
| 1-1/2      | 5 \$ 289.15                    | 3.33 \$ 192.57                 | 1.061387 \$ 61.38   |
| 2          | 8 \$ 462.64                    | 5.33 \$ 308.23                 | 1.149058 \$ 66.45   |
| 3          | 15 \$ 867.45                   | 10 \$ 578.30                   | 1.236901 \$ 71.53   |
| 4          | 22 \$ 1,272.26                 | 16.67 \$ 964.03                | 1.272004 \$ 73.56   |



## Theoretical Rate Structure

|  |                 |
|--|-----------------|
| Variable Cost  | \$ 94,058       |
| Gallons Sold / 1000                                    | 28,176          |
| Suggested Usage Rate / 1,000 gallons                   | 3.34            |
| <br>   |                 |
| Total Fixed Cost                                       | \$ 125,043      |
| Number of EDU  | 523             |
| Fixed Cost per EDU                                     | \$ 19.92        |
| <br>   |                 |
| Fixed Cost per EDU                                     | \$ 19.92        |
| Variable Cost for 2,000 gallons (Minimum Bill Usage)   | \$ 6.68         |
| Minimum or Base Bill for 2,000 gallons of Usage        | \$ 26.60        |
| <br>   |                 |
| <b>Minimum or Base Bill for 2,000 gallons of Usage</b> | <b>\$ 26.60</b> |
| <b>Usage Rate / 1,000 gallons</b>                      | <b>\$ 3.35</b>  |



### Proposed Rate Structure #1 Uniform Block Rate Schedule

|              |          |           |               |          |
|--------------|----------|-----------|---------------|----------|
| Minimum Bill | 5/8 inch | 20.00 for | 2000 gallons  | 1.0 EDU  |
|              | 1 inch   | 60.00     | 6000 gallons  | 2.5 EDU  |
|              | 2 inch   | 200.00    | 20000 gallons | 8.0 EDU  |
|              | 3 inch   | 400.00    | 40000 gallons | 17.5 EDU |
|              | 6.00 per |           | 1000 gallons  |          |

In order to improve fairness the base rate was reduced from \$26.60 to \$20.00 for the first 2000 gallons. The usage rate was increased from \$3.35 to \$6.00 per 1000 gallons of water sold.



### Equity

If your proposed rate structure spreads the cost of utility service equitably, then the percentage revenue and percentage usage will be approximately equal.




### Equity (Fairness) Check Theoretical Rate Structure

| Residential Water Use History |           | Average | Number       | Annual     | %       | %     | Equity |
|-------------------------------|-----------|---------|--------------|------------|---------|-------|--------|
| Gallons/ Month                | Avg Usage | Bill    | of Customers | Revenue    | Revenue | Usage |        |
| Under 1000                    | 100       | 20.00   | 20           | 2,000.00   | 2.0%    | 0.2%  | 1.0%   |
| 1001 to 2000                  | 1500      | 20.00   | 20           | 3,000.00   | 2.9%    | 1.2%  | 1.6%   |
| 2001 to 3000                  | 2500      | 20.00   | 40           | 6,000.00   | 5.9%    | 4.8%  | 2.1%   |
| 3001 to 4000                  | 3500      | 31.83   | 75           | 28,462.50  | 12.8%   | 11.2% | 1.6%   |
| 4001 to 5000                  | 4500      | 34.88   | 118          | 46,157.68  | 29.7%   | 21.1% | -6.3%  |
| 5001 to 6000                  | 5500      | 39.33   | 85           | 38,090.50  | 17.0%   | 18.9% | -2.2%  |
| 6001 to 7000                  | 6500      | 41.66   | 50           | 20,900.00  | 11.2%   | 13.8% | -2.6%  |
| 7001 to 8000                  | 7500      | 45.03   | 40           | 21,812.00  | 9.7%    | 12.8% | -3.1%  |
| 8001 to 9000                  | 8500      | 48.38   | 11           | 5,365.58   | 2.5%    | 4.0%  | -1.1%  |
| Total                         |           |         | 444          | 190,928.68 | 85.8%   | 89.0% |        |

| Commercial / Industrial Water Use History |           | Average | Number       | Annual     | %       | %      | Equity |
|---|-----------|---------|--------------|------------|---------|--------|--------|
| Company                                   | Avg Usage | Bill    | of Customers | Revenue    | Revenue | Usage  |        |
| Water (1000) ("water meter)               | 150000    | 847.30  | 1            | 10,167.60  | 4.6%    | 6.4%   | -1.8%  |
| School ("water meter)                     | 45000     | 495.85  | 1            | 5,948.60   | 2.7%    | 1.9%   | 0.8%   |
| Senior Apartments ("water meter)          | 28000     | 253.00  | 1            | 3,036.00   | 1.4%    | 1.2%   | 0.2%   |
| Restaurant ("water meter)                 | 25000     | 242.95  | 1            | 2,915.40   | 1.3%    | 1.1%   | 0.3%   |
| Post Office ("water meter)                | 6500      | 71.83   | 1            | 858.30     | 0.4%    | 0.3%   | 0.1%   |
| City Feed Mill ("water meter)             | 3500      | 478.80  | 1            | 5,745.60   | 2.8%    | 0.1%   | 2.8%   |
| Total                                     |           |         | 6            | 28,669.50  | 13.1%   | 11.0%  |        |
| Grand Total                               |           |         | 450          | 219,598.18 | 100.0%  | 100.0% |        |



### Affordability Test



| MHI       | 1.00%    | 1.50%    | 2.00%    | 2.50%     | 3.00%     |
|-----------|----------|----------|----------|-----------|-----------|
| \$ 28,000 | \$ 23.33 | \$ 35.00 | \$ 46.67 | \$ 58.33  | \$ 70.00  |
| \$ 30,000 | \$ 25.00 | \$ 37.50 | \$ 50.00 | \$ 62.50  | \$ 75.00  |
| \$ 32,000 | \$ 26.67 | \$ 40.00 | \$ 53.33 | \$ 66.67  | \$ 80.00  |
| \$ 34,000 | \$ 28.33 | \$ 42.50 | \$ 56.67 | \$ 70.83  | \$ 85.00  |
| \$ 36,000 | \$ 30.00 | \$ 45.00 | \$ 60.00 | \$ 75.00  | \$ 90.00  |
| \$ 38,000 | \$ 31.67 | \$ 47.50 | \$ 63.33 | \$ 79.17  | \$ 95.00  |
| \$ 40,000 | \$ 33.33 | \$ 50.00 | \$ 66.67 | \$ 83.33  | \$ 100.00 |
| \$ 42,000 | \$ 35.00 | \$ 52.50 | \$ 70.00 | \$ 87.50  | \$ 105.00 |
| \$ 44,000 | \$ 36.67 | \$ 55.00 | \$ 73.33 | \$ 91.67  | \$ 110.00 |
| \$ 46,000 | \$ 38.33 | \$ 57.50 | \$ 76.67 | \$ 95.83  | \$ 115.00 |
| \$ 48,000 | \$ 40.00 | \$ 60.00 | \$ 80.00 | \$ 100.00 | \$ 120.00 |

Communities charging less than 1.5% of MHI for utility service should not feel remorseful about raising rates.



### Implementation

Customers need to.....

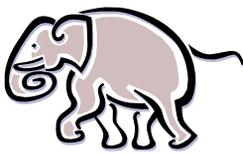
1. Have a clear understanding of **how** the rate change will be implemented. **How much and when!**
2. Understand **why** the rate increase is necessary to operate the system on a financially sound basis.
3. Believe that each customer group is paying its fair share of the cost.



### Think Small



Small rate adjustments are easier to implement and collect than one large increase made necessary by years of neglect.




## Defending Rate Decisions

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- There will always be people that argue against rate increases.
- If necessary time and effort have been put into preparing an asset management plan, a budget and rate analysis, you should feel confident in your conclusions.
- Make sure your calculations are written down. Offer to have neigh-sayers review your figures.
- Think about the objections you are likely to hear and be prepared to defend your position




## Required Information

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1. Most current comparative Statement of Financial Position (Balance Sheet).
2. Most current comparative Statement of Activities (Income Statement). Make sure the ending period of the Income Statement is the same as the date of the Balance Sheet.
3. Most current audited financials.
4. Two years of budgets with comparison to actuals (again same time period and time periods should be the same as the financial statements above.)



## Required Information

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5. Depreciation schedules for plant and equipment
6. Capital Improvement Plan
7. Any information available regarding current rate structure
8. If there is debt, debt schedules and/or copies of loan agreements
9. To do a rate study, I use customers water use data for the most current 12 to 18 months, assuming the system is metered. We prefer the information to be in an electronic format (excel spreadsheet), and show the water usage for each customer by month.



|            | Jan | Feb | Mar |
|------------|-----|-----|-----|
| Customer 1 | 220 | 240 | 200 |
| Customer 2 | 345 | 300 | 330 |

And so on for all customers through at least 12 months of usage. There is also the need to know which accounts are commercial versus residential, and have the full rate schedule, including information on misc fees like hookup fees, disconnect penalties, etc.




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# QUESTIONS??

Thanks for the  
Great Participation!!!

