

Are Your Utility Rates Defensible? Establishing Cost-Based Utility Rates

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Current Utility Rate Issues

- Hesitancy of governing bodies to adjust rates
 - “It’s the economy”
- Lack of adequate funding to fund the repair and replacement of existing utility infrastructure
- Declining water consumption
 - Revenue shortfalls
 - Places greater emphasis on establishing cost-based fixed charges

Your Last Public Rate Hearing?



There must be a better way!

Overview of Utility Rate Making



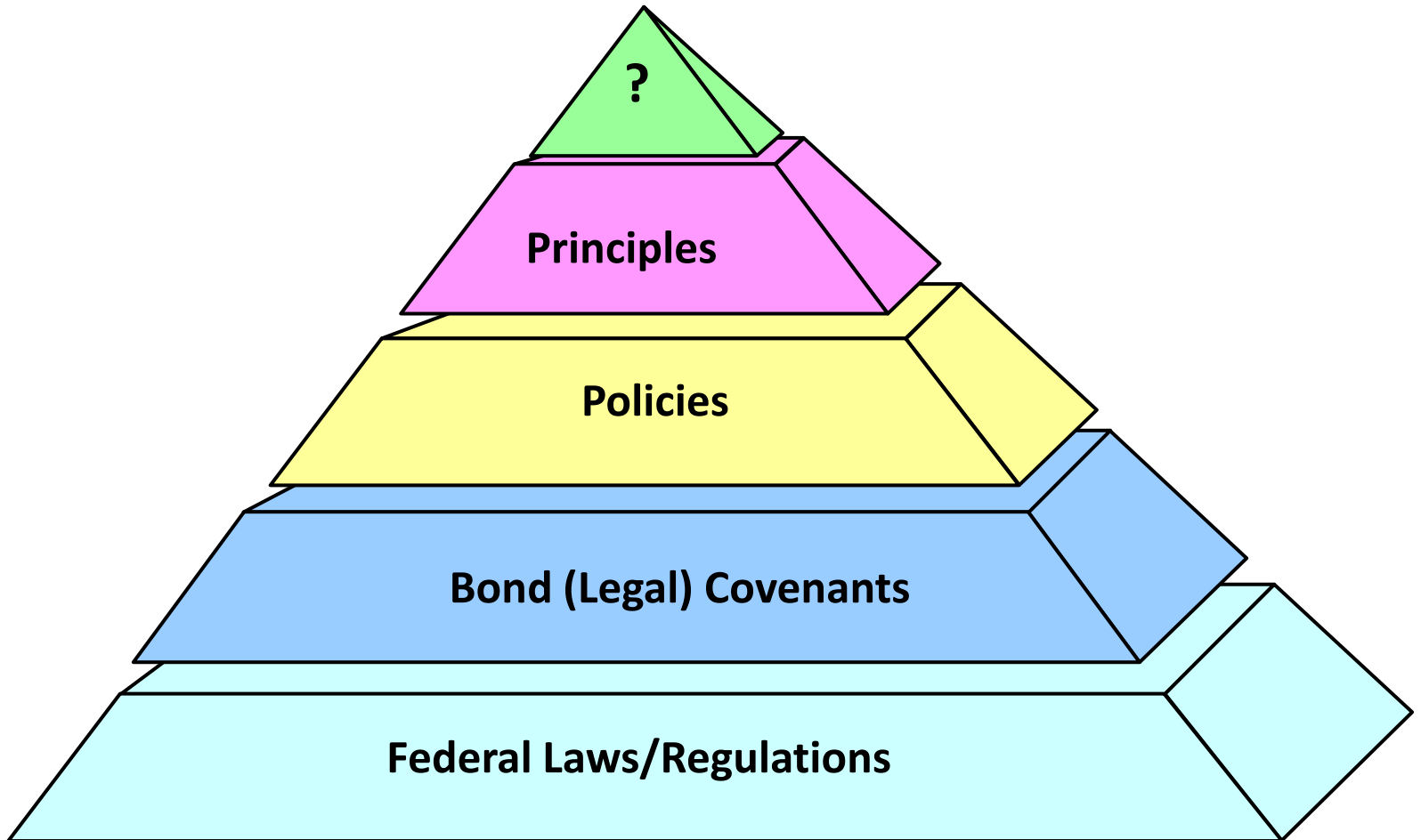
What is the Role of Rates?

- Customers Care About
 - Is the service on?
 - Is the service of acceptable quality?
 - Amount of their bill
- The Bill (Rates)
 - Primary communication with customers
 - Primary determinant of utility performance
 - Influence consumption (how and when) and efficient use
 - Social goals
 - Fair/equitable
- Financial Viability
 - Pays the bills
 - Revenue stability—matching cash inflows and outflows
 - Funding the future – O&M and Capital Needs

Review of the Global Rate Setting Principles

- Global Principles Around Which Rates Must (Should) be Set
 - Rates should be **cost based** and **equitable** and set at such a level that they meet the full revenue requirements of the utility (O&M and Capital)
 - Rates should be **easy to understand and administer**
 - Rates and the process of allocating costs should conform to **generally accepted** rate setting techniques
 - Rates should be **stable** in both their ability to provide adequate revenues to meet the utility's financial, operating and regulatory requirements and in the customer's perception of the rates from year to year

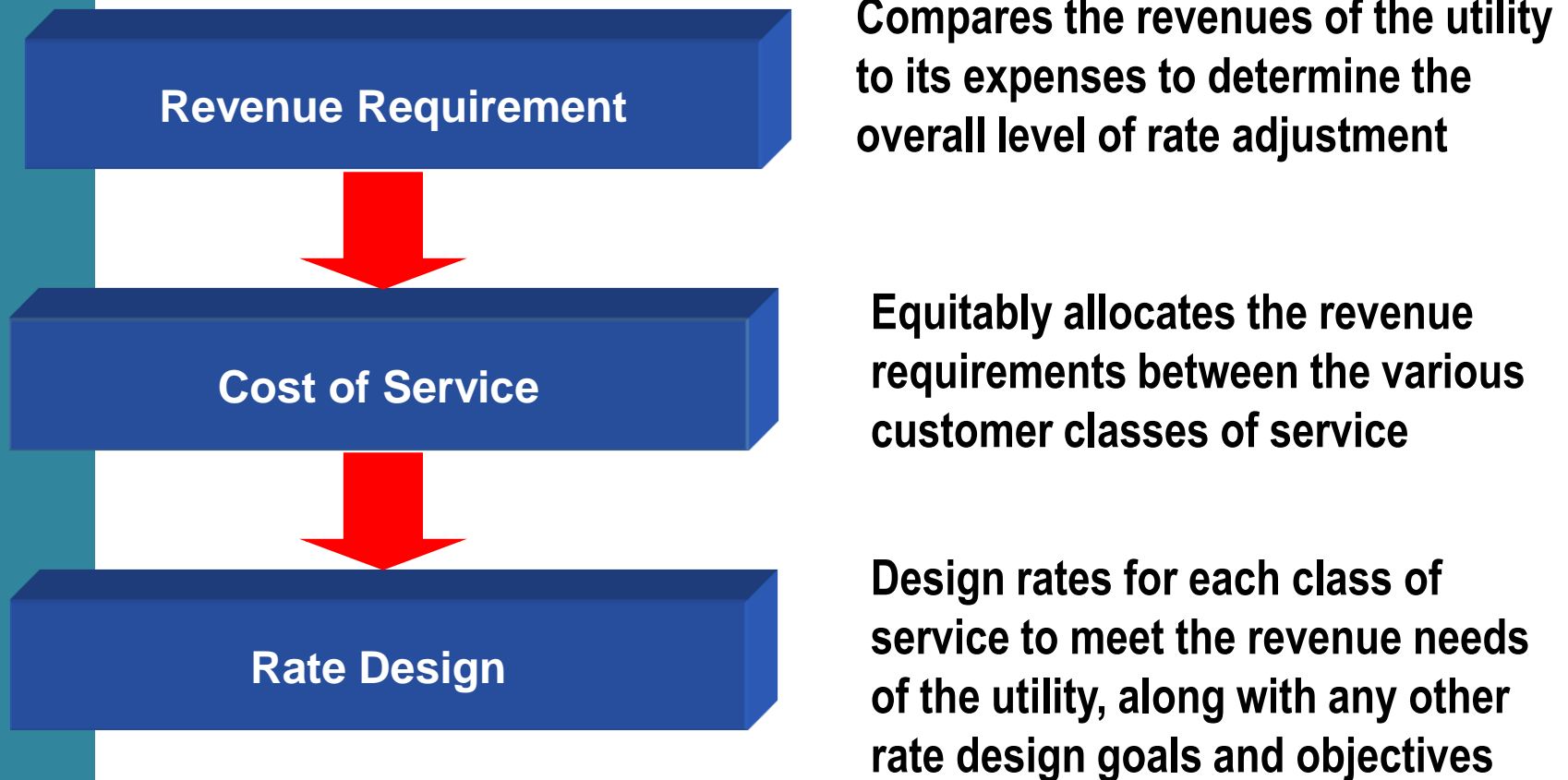
The Rate Setting Decision Pyramid



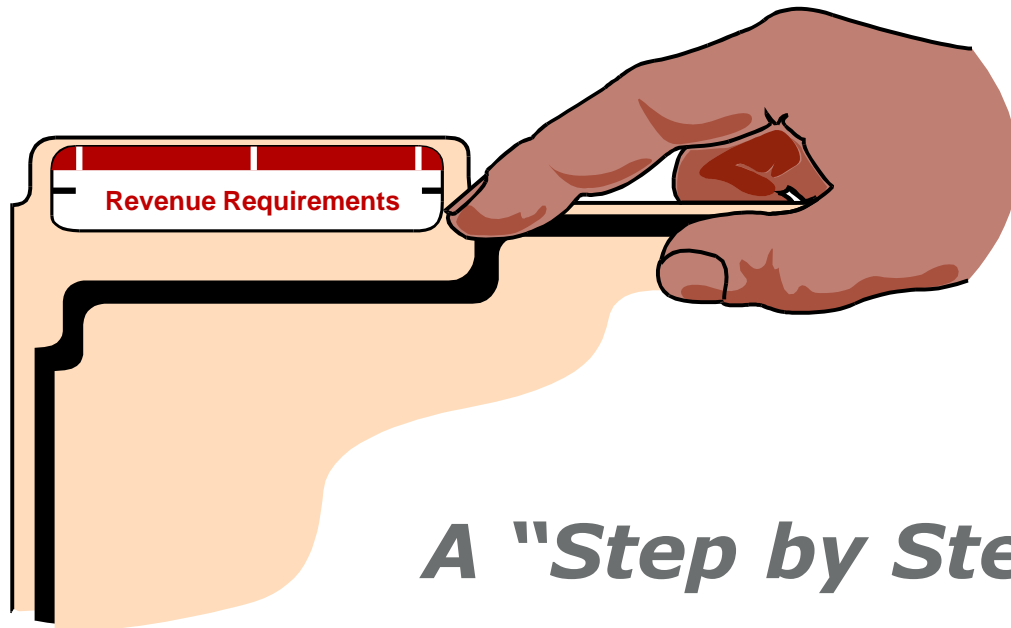
Establishing Written Financial Policies

- Few utilities have written policies concerning the financial planning and rate setting process
- Advantages of written policies
 - Written policies provide clear policy direction to management
 - For policy-makers – provides a consistent and business-based decision-making framework
 - Written policies help to move the financial planning and rate decisions from a political “tug of war” to prudent “business decisions”
 - Bond ratings (best management practice)
- Recommend establishing written financial and rate setting policies for each utility

Overview of the Rate Setting Process



Developing Revenue Requirements



A "Step by Step" Approach

Overview of Developing Revenue Requirements

- Compares Sources of Funds with Applications of Funds
- Test Periods—Establishing the method of determining revenue requirements
 - Historical—a recent “typical” year, accounting based
 - Projected—budgeted or forecasted
 - Pro forma—historical base year with adjustments for “known and measurable” changes
- “Cash Basis” versus “Utility/Accrual Basis”

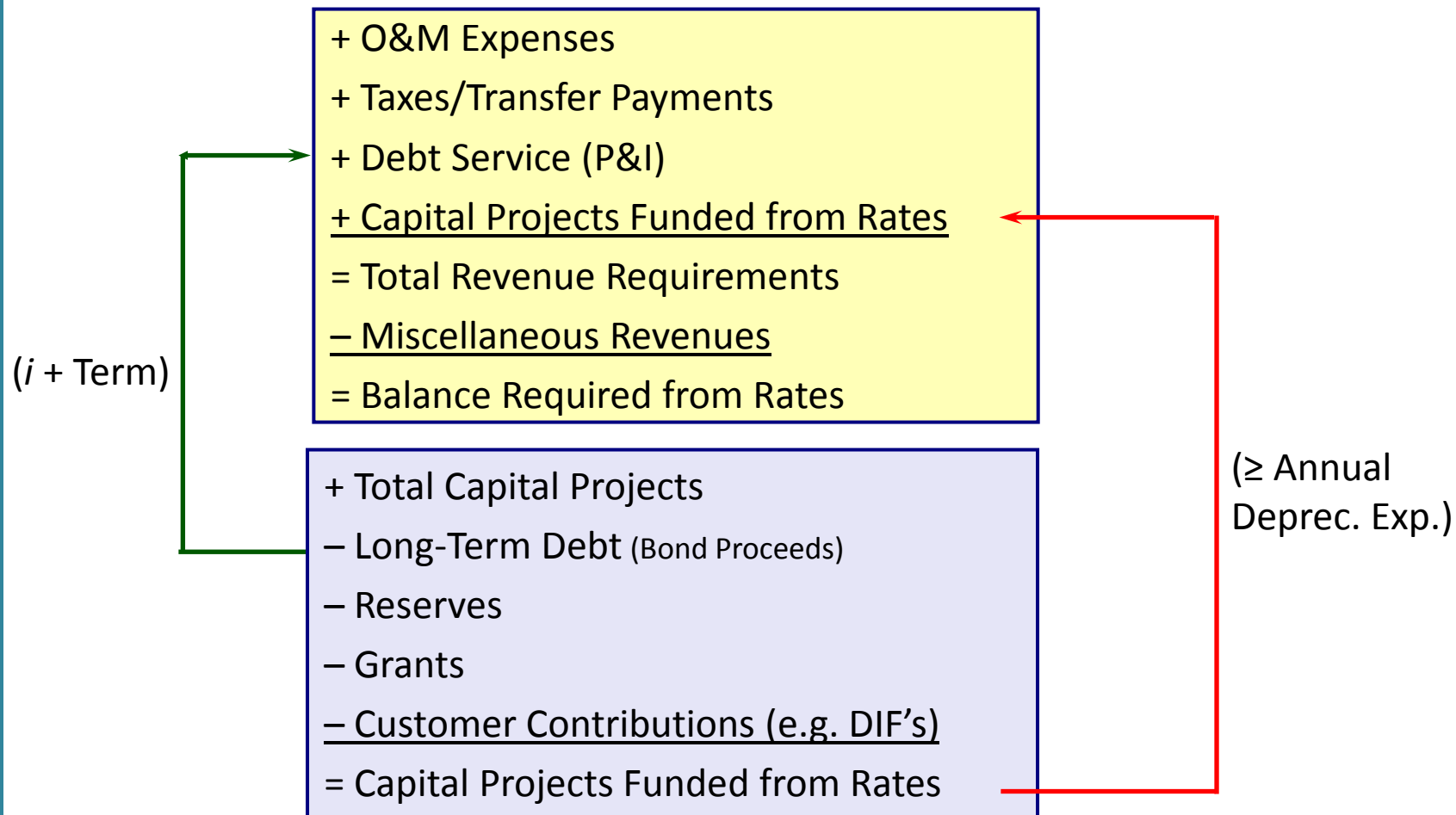
Comparison of “Cash Basis” and “Utility/Accrual Basis”

Cash Basis	Utility Basis
+ O&M Expenses	+ O&M Expenses
+ Taxes/Transfer Payments	+ Taxes/Transfer Payments
+ Debt Service (P&I)	+ Depreciation Expense
+ Capital Projects Funded from Rate Revenues	+ Return on Rate Base
<hr/>	<hr/>
Σ = Total Revenue Requirements	Σ = Total Revenue Requirements

Where: Rate Base =

$$\begin{aligned}
 &+ \text{Original Cost of Plant} \\
 &- \text{Accumulated Depreciation} \\
 &\hline
 &= \text{Net Plant in Service} \\
 &+ \text{Working Capital} \\
 &- \text{Contributions in Aid} \\
 &\hline
 &= \text{Rate Base}
 \end{aligned}$$

Detail of the “Cash Basis” Approach



Simple Layout For Capital Infrastructure Planning Purposes

	Year 1	Year 2	Year 3
Capital Project 1	\$500,000	\$500,000	\$500,000
Capital Project 2	0	3,000,000	1,000,000
Capital Project 3	250,000	400,000	600,000
Total Capital Projects	\$750,000	\$3,900,000	\$2,100,000
Less: Outside Funding Sources			
Reserve Funds	\$0	\$650,000	\$350,000
Revenue Bonds	0	2,500,000	1,000,000
Connection Fees	50,000	50,000	50,000
Total Outside Funding	\$50,000	\$3,200,000	\$1,400,000
Net Balance Funded From Rates	\$700,000	\$700,000	\$700,000

Capital Infrastructure Funding

- Lack of adequate and prudent funding to maintain existing facilities is a major industry issue
 - U.S. has billions in deferred maintenance projects
- Failure to adequately repair, replace or improve a utility's infrastructure simply leads to higher overall costs
- The need to establish a policy or philosophy for consistent and adequate funding within rates for repair and replacement (R&R) activities



Methods to Establish Minimum Repair and Replacement Rate Funding Levels

- Minimum rate funding is generally a function of current plant investment or future capital plans
 - \geq Annual Depreciation Expense
 - Currently \$750,000/year
 - Depreciation expense is not the same as replacement cost
 - Replacement Cycle (Average Useful Life)
 - \$25 M in plant and 50 year replacement cycle = \$500,000/year
 - Replacement Cost/Replacement Cycle
 - \$50 M in replacement value and 50 year replacement cycle = \$1 M per year funding needs
- Current plant is \$25 M with \approx \$250,000 in annual rate funding = 100 year replacement cycle (at replacement cost may be \approx 150 to 200 years)

Better Yet – Asset Management Plans

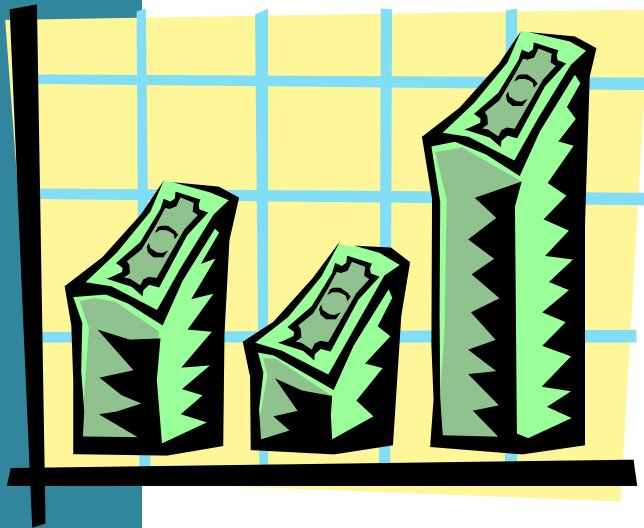
- Depreciation expense is an accounting convention
 - Useful life vs. service life
 - Actual service life is a function of many issues
- Asset management plans provide a systematic method of assessing replacements
 - Condition assessments
 - Financial plan
- An asset management plan provides the framework for prudent and sustainable infrastructure decisions



Types of Capital Infrastructure Projects and Methods of Funding

- “Renewal and Replacement” Projects
 - Need for adequate funding from rates/debt
- “Legally Mandated” Projects
 - Grants
 - Low-Interest Loans
 - Bond Funding (Typically Revenue Bonds)
- “Growth Related” Projects
 - System Development Charges/Rates/Debt

Other Key Financial Planning Considerations



- Financial Planning Considerations
 - Debt service coverage ratios
 - Planning target vs. minimum rate covenant
 - Reserve levels
 - Types of reserves and establishing minimum levels

Interrelationship Between Rate Funded Capital and Debt Service Coverage

Calculating Debt Service Coverage

+ Total Revenues
 – O&M Expenses
 – Taxes

 = Balance Available for Debt Service

$\frac{\text{Balance Available for Debt Service}}{\text{Debt Service Payment}} = \text{DSC}$

Source of Coverage Above 1.00 DSC

+ O&M Expenses
 + Taxes
 + Debt Service = 1.00
 + Balance After Debt Pmt/CIP from Rates > 1.00
 = Total Revenue Requirements

Note: Refer to your specific bond covenants for purposes of calculating debt service coverage ratios

Examples of the Interrelationship Between Rate Funded Capital & DSC

	<u>Example 1</u>		<u>Example 2</u>		<u>Example 3</u>	
	<u>Rev. Requir.</u>	<u>DSC</u>	<u>Rev. Requir.</u>	<u>DSC</u>	<u>Rev. Requir.</u>	<u>DSC</u>
Total Revenues	\$4,000,000		\$4,300,000		\$5,000,000	
O&M Expenses	2,000,000		2,000,000		2,000,000	
Taxes	<u>1,000,000</u>		<u>1,000,000</u>		<u>1,000,000</u>	
Balance Avail for Debt Service	\$1,000,000	1.00	\$1,300,000	1.30	\$2,000,000	2.00
Debt Service Payment	1,000,000		1,000,000		1,000,000	
Balance for CIP (Rate Funded)	\$0		\$300,000		\$1,000,000	

Note: In financing capital projects, there is a trade-off between debt funded capital and rate funded capital

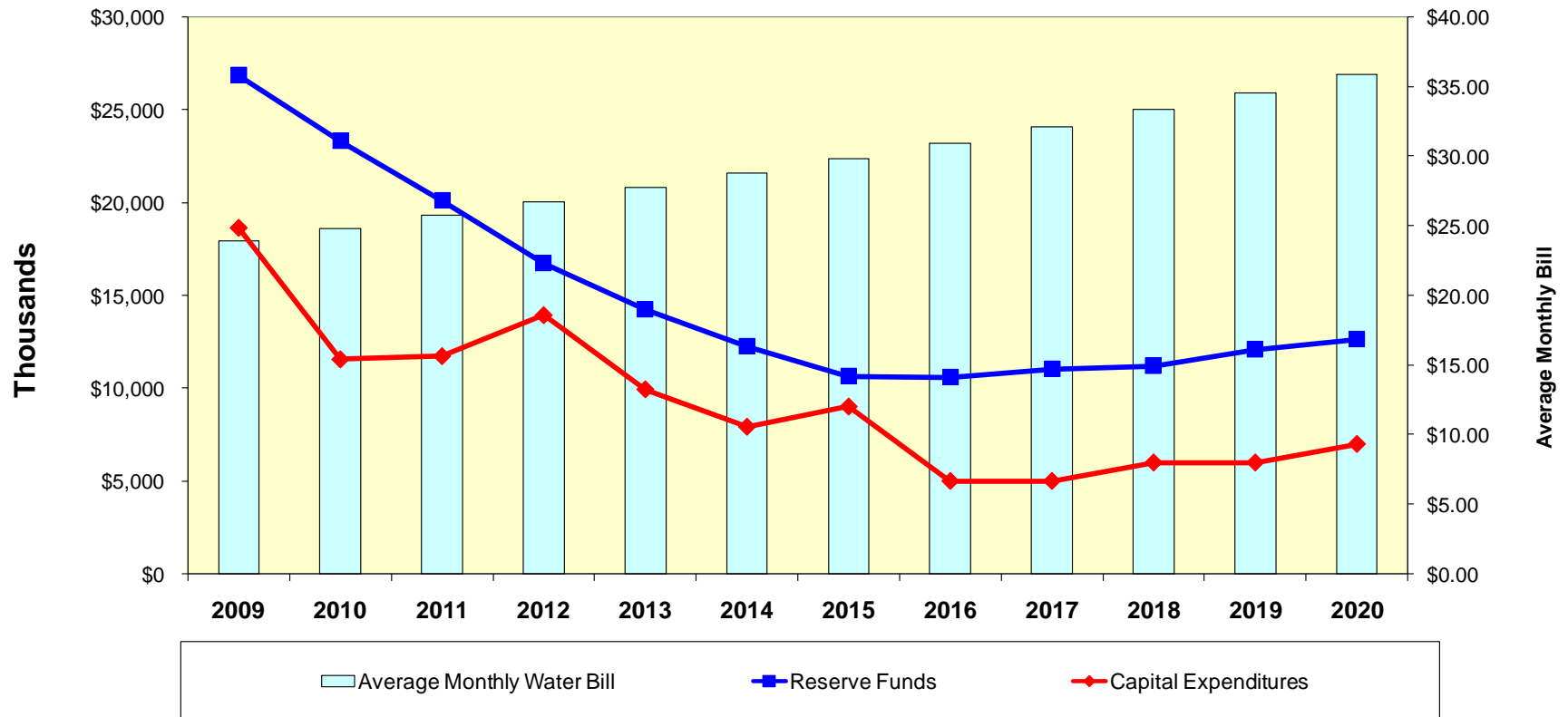
Example of the Summary of the Water Revenue Requirement (\$000)

	CY 2009	CY 2010	CY 2011	CY 2012	CY 2013
Sources of Funds					
Rate Revenues	\$33,982	\$33,982	\$33,982	\$34,152	\$34,323
Miscellaneous Revenues	\$4,107	\$3,719	\$3,909	\$3,936	\$3,961
<hr/>					
Total Source of Funds	\$38,090	\$37,701	\$37,891	\$38,088	\$38,283
Application of Funds					
Total Operations & Maintenance	\$25,687	\$26,625	\$27,596	\$28,603	\$29,504
Taxes and Transfers	8,767	8,747	8,757	8,801	8,845
<i>CIP From Rates</i>					
CIP From Rates Capital Plan	\$3,225	\$3,225	\$3,225	\$3,242	\$3,258
CIP From Rates Ops. Complex	0	0	0	0	0
Total CIP from Rates	\$3,225	\$3,225	\$3,225	\$3,242	\$3,258
Debt Service	\$1,070	\$1,147	\$1,111	\$1,050	\$1,037
Additional Capital Improvement Funding	(660)	(1,024)	(722)	(418)	(6)
TOTAL REVENUE REQUIREMENT	\$38,090	\$38,720	\$39,967	\$41,278	\$42,639
Balance/(Deficiency) of Funds Before Added Tax	\$0	(\$1,019)	(\$2,077)	(\$3,190)	(\$4,355)
Plus: Additional Taxes with Rate Increase	\$0	\$255	\$520	\$798	\$1,090
Balance/(Deficiency) of Funds With Added Tax	\$0	(\$1,274)	(\$2,596)	(\$3,988)	(\$5,445)
Balance as a % of Rate Adjustment Required	0.00%	3.75%	7.64%	11.68%	15.87%
Proposed Rate Adjustment	0.00%	3.75%	3.75%	3.75%	3.75%

Example of a Summary of a Rate Transition Plan

Year	Present Average Monthly Bill	Proposed Rate Increase	Customer Bill on Proposed Rate Increase	Monthly Bill Difference	Cumulative Bill Difference
Present					
2009	\$23.93				
Projected					
2010		3.75%	\$24.82	\$0.90	\$0.90
2011		3.75%	\$25.75	\$0.93	\$1.83
2012		3.75%	\$26.72	\$0.97	\$2.79
2013		3.75%	\$27.72	\$1.00	\$3.80
2014		3.75%	\$28.76	\$1.04	\$4.84
2015		3.75%	\$29.84	\$1.08	\$5.91
2016		3.75%	\$30.96	\$1.12	\$7.03
2017		3.75%	\$32.12	\$1.16	\$8.19
2018		3.75%	\$33.32	\$1.20	\$9.40
2019		3.75%	\$34.57	\$1.25	\$10.65
2020		3.75%	\$35.87	\$1.30	\$11.94

Example of a Summary of Capital Improvement and Reserve Funding



Summary of the Revenue Requirement Analyses



- Developed based upon overall utility objectives
- Should be developed and based upon “prudent” financial planning criteria
- The revenue requirement analysis determines adequate funding for the utility to operate on a financially stable basis

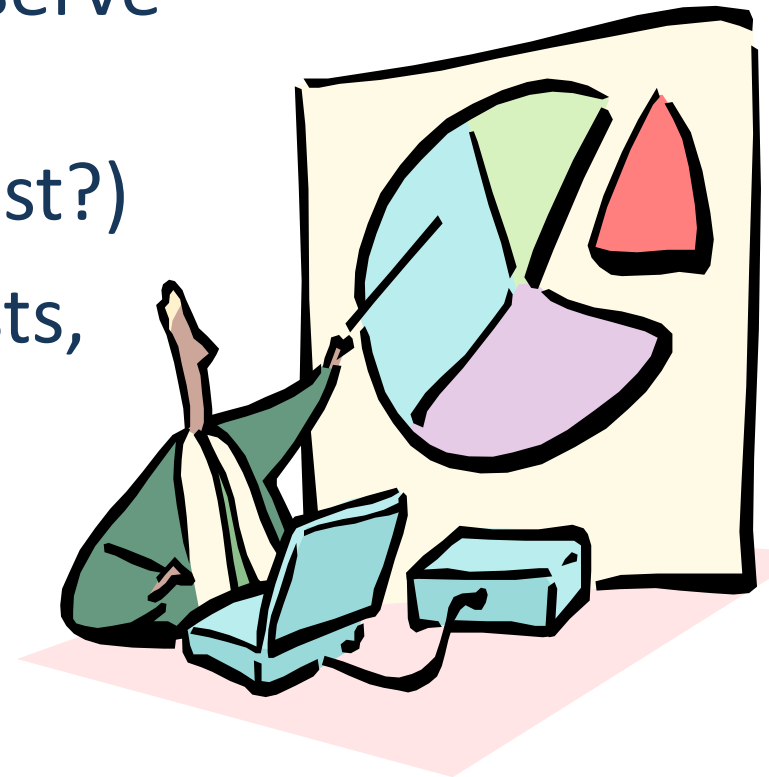
Cost of Service Studies



"Splitting the Pie"

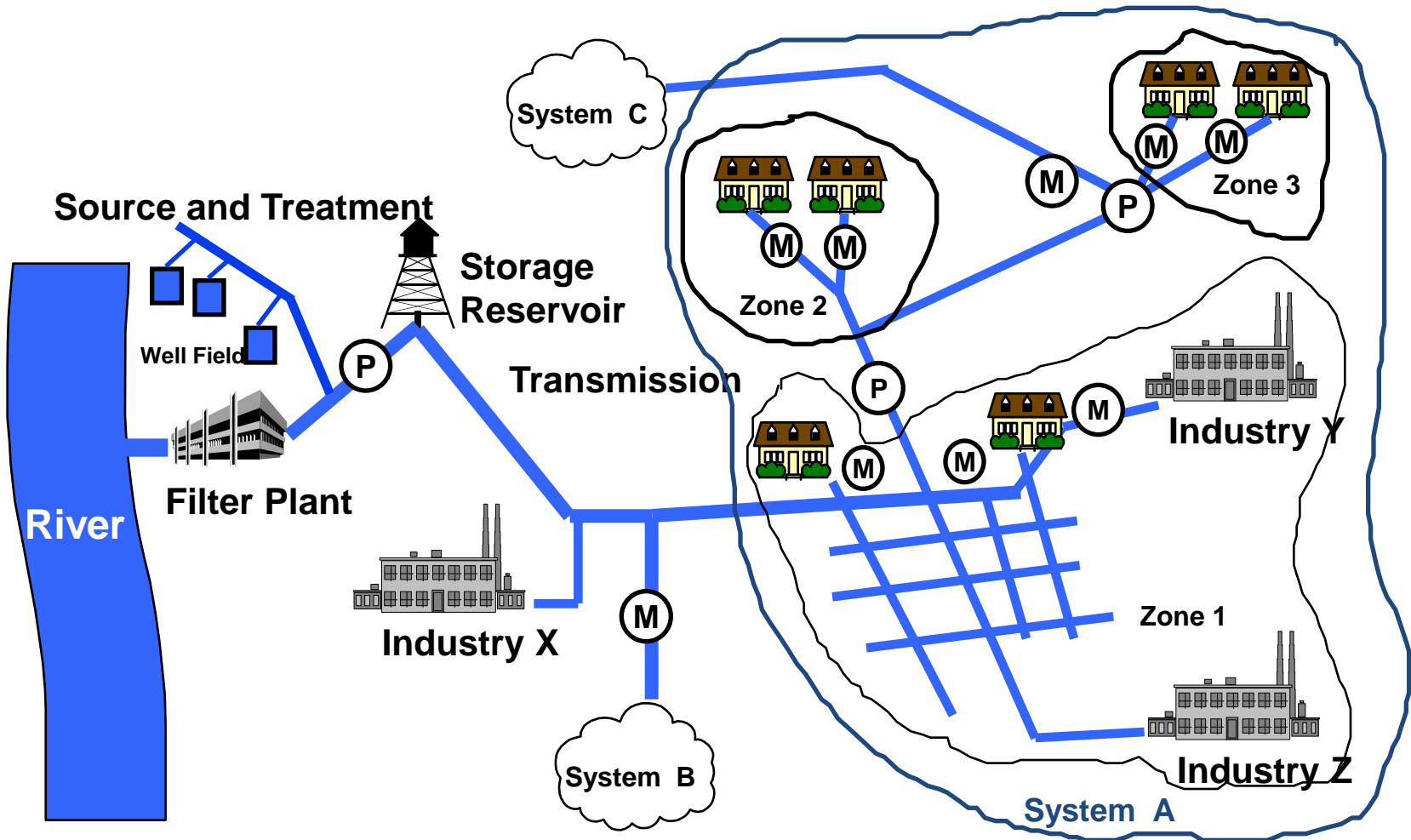
The Two Main Objectives of a Cost of Service Study

- Determine the cost to serve each class of service (Do cost differences exist?)
- Derive average unit costs, which are useful for rate design purposes



*A cost of service provides the cost-basis
for an equitable allocation of costs*

Water System Network



Rate Differentials for Inside vs. Outside City Customers

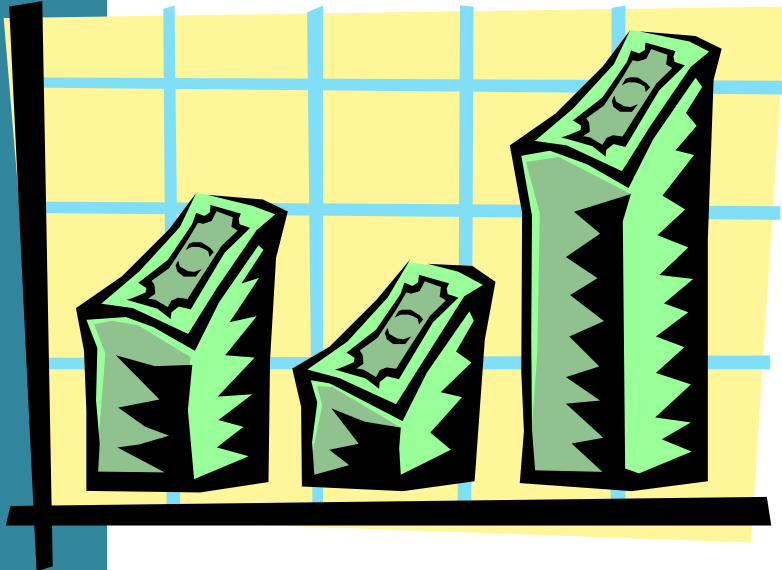
- Most municipal utilities have a rate differential for inside vs. outside City customers
 - Typical range of differentials - 0% to 100%
- Basis for the differential
 - Ownership
 - Risk
 - Fair return on investment
 - Other??
- Cost Allocation Issues –
 - Can you demonstrate a 50% or 100% cost differential between inside and outside customers?

Example of a C-O-S Summary Table and Average Unit Cost Table

	<u>Total</u>	<u>Residential</u>	<u>Commercial</u>	<u>Industrial</u>
Revenue at Present Rates	\$2,269,610	\$1,258,040	\$785,220	\$226,350
Allocated Costs	<u>2,383,100</u>	<u>1,336,455</u>	<u>799,865</u>	<u>246,780</u>
\$ Difference	\$113,490	\$78,415	\$14,645	\$20,430
% Difference	5.0%	6.2%	1.9%	9.0%

	<u>Total</u>	<u>Residential</u>	<u>Commercial</u>	<u>Industrial</u>
Commodity Costs - \$/1,000 gal.	\$1.26	\$1.26	\$1.26	\$1.26
Capacity Costs - \$/1,000 gal.	\$0.73	\$0.92	\$0.63	\$0.44
Total Costs - \$/1,000 gal.	\$1.99	\$2.18	\$1.89	\$1.70
Customer Costs - \$/Cust./Mth.	\$13.53	\$9.75	\$15.32	\$457.68

Results of the Cost Allocation Process



- An equitable allocation of costs that considers:
 - Usage characteristics
 - Facility requirements
- Average unit costs
 - Cost-based rate designs

Rate Design



Goals of Rate Design

- Yield the Total Revenue Requirements
- Easy to Understand
- Easy to Administer
- Continuity in Philosophy
- Equitable and Non-Discriminating (Cost-Based)
- Provide Revenue Stability
- Promote Efficient Allocation of Resources

Key Issues With Rate Design

- Level vs. Structure
- Price elasticity (sensitivity)
- In theory, all rate designs should collect the same level of revenue
- Customer bill impacts and bill comparisons
- Affordability

Types of Rate Design

- Declining Block

0 – 10 CCF @ \$1.90/CCF

11 – 100 CCF @ 1.80/CCF

101 – 1,000 CCF @ 1.70/CCF

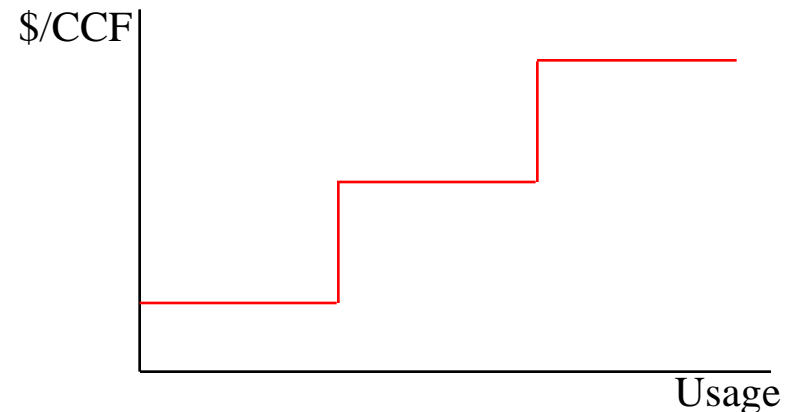
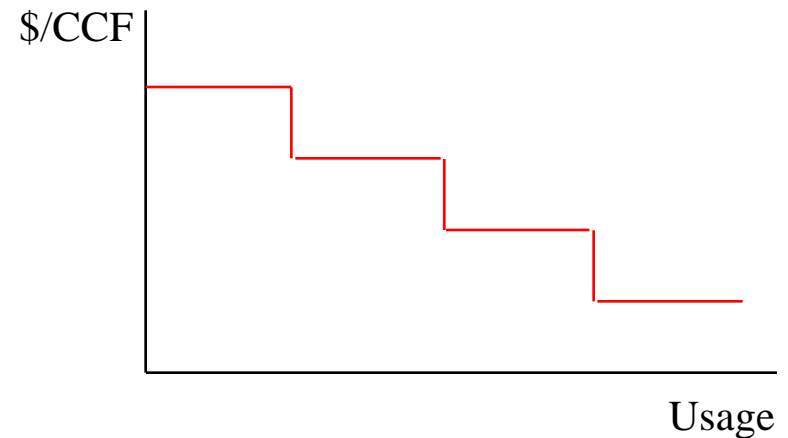
1,001 – CCF @ 1.60/CCF

- Inverted (Increasing) Block

0 – 10 CCF @ \$1.50/CCF

11 – 50 CCF @ 1.75/CCF

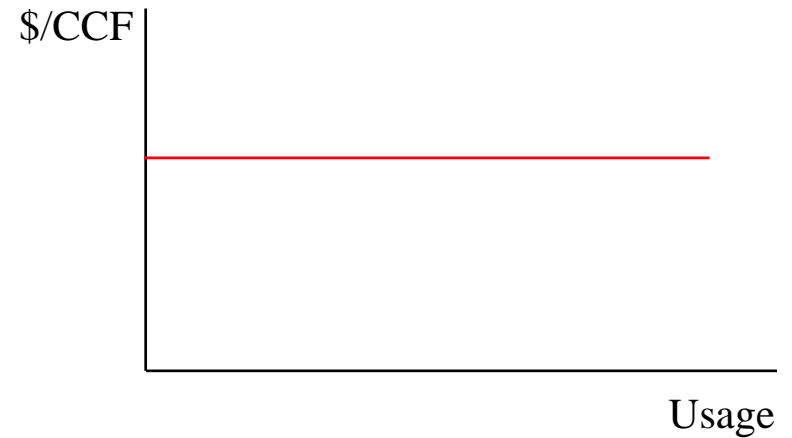
51 – CCF @ 2.25/CCF



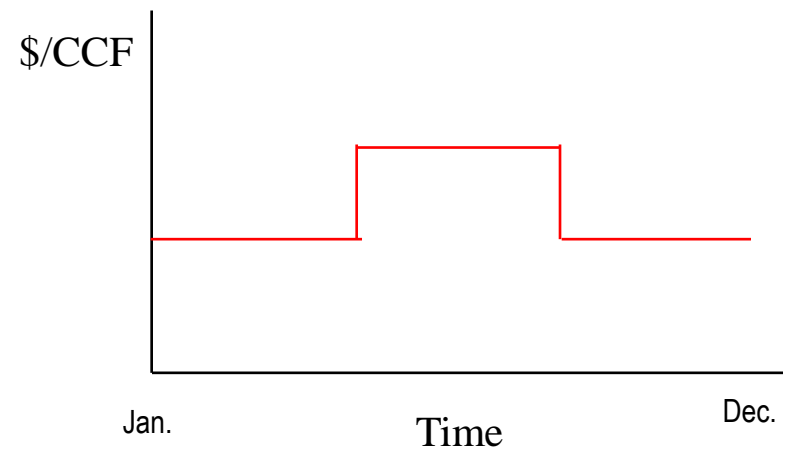
Note: May also be called a “tiered” rate structure

Types of Rate Designs (continued)

- Uniform Block
All Usage @ \$1.60/CCF



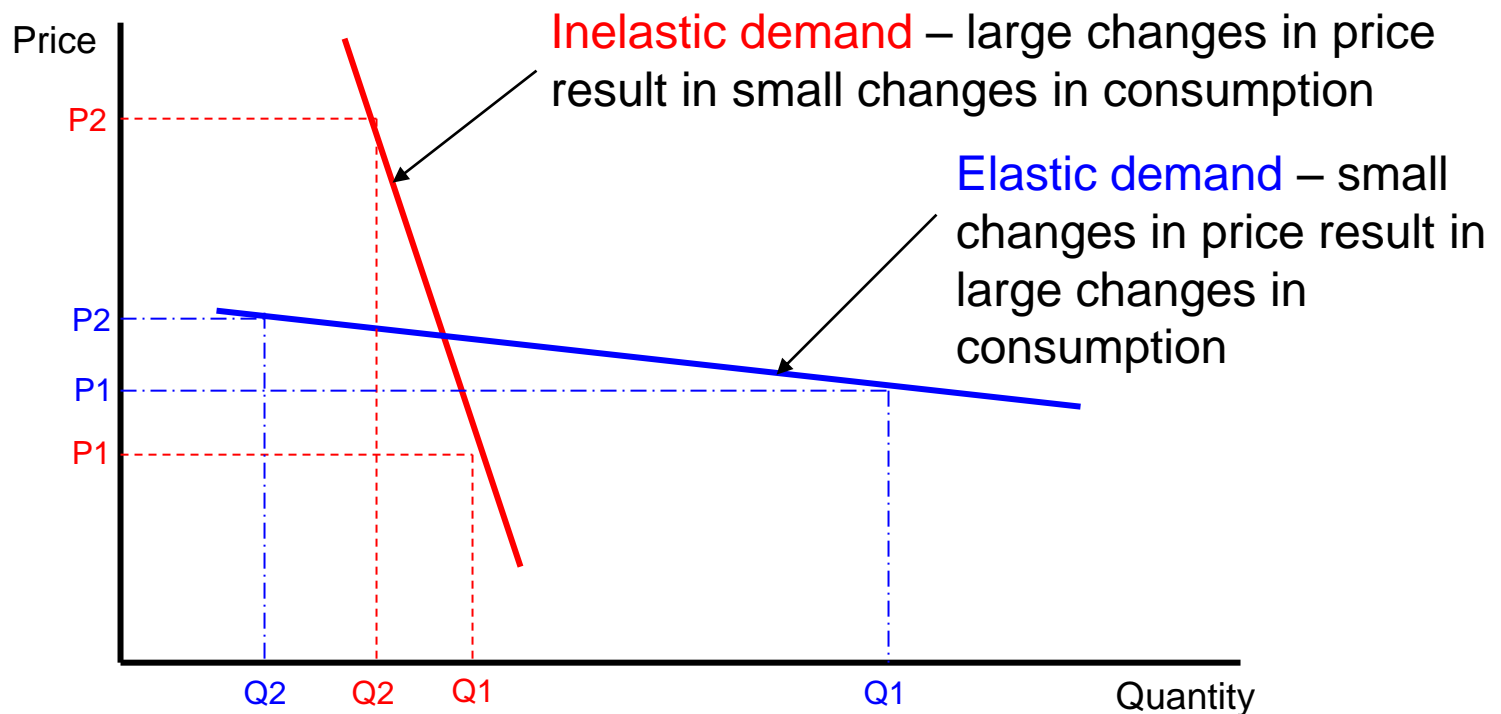
- Seasonal Rate
Summer - \$1.90/CCF
Winter - \$1.60/CCF



Types of Rate Designs (continued)

- Variable Meter Charge, with Flat Volume Charge
 - 5/8" x 3/4" meter \$10.00/month
 - 1 inch meter 25.00/month
 - 1-1/2 inch meter 50.00/month
 - 2 inch meter 80.00/month
 - 3 inch meter 150.00/month
 - All usage \$1.65/CCF

Understanding the Price Elasticity of Demand



Determining “Affordability”

- Generally based upon a percentage of median household income
 - Percentage ranges from 1.5% to 2.5% per utility (water/wastewater)
 - Affordability measure is a community-wide measure and not an individual measure
 - Even if rates are “affordable” the utility may still want to address low income customers

Summary of Rate Design

- Setting cost-based and justified rates is a complex process
- Final Adopted Rate Designs Should:
 - Collect the desired level of revenues
 - Reflect the way costs are incurred (fixed vs. variable)
 - Reflect the balance of policy objectives against the desire for cost-based rates

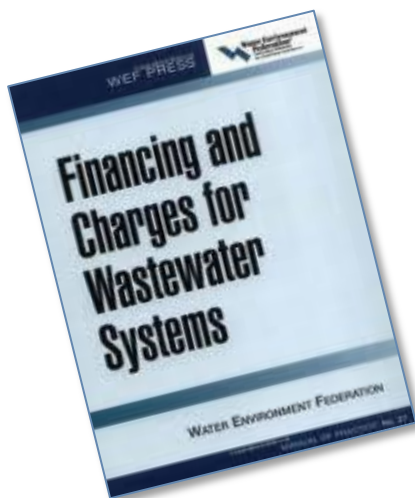
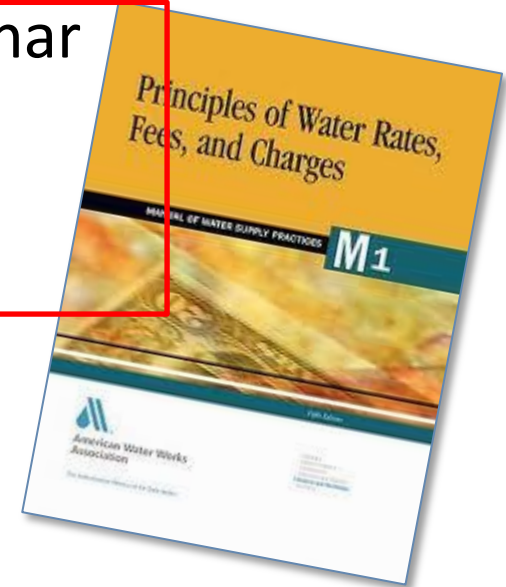
If You Want to Learn More!

- American Water Works Association (AWWA)

- 3 Day Financial Management Seminar

- September 19 – 21st, Orlando, Florida
- Earn CEU's
- www.awwa.org

- AWWA M-1 Manual; Principles of Water Rates, Fees and Charges



- Water Environment Federation; Manual of Practice No. 27, Financing and Charges for Wastewater Systems

Overview of the Speaker

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Background and Experience:

Tom has over 32 years of consulting experience working primarily with public utilities in the specialized area of financial planning, cost of service and rates for water, wastewater, electric, solid waste and natural gas utilities. Tom has worked with utilities across the U.S. and Canada.

He is an instructor for the American Water Works Association Financial Management Seminar. He is a member of the AWWA Rates and Charges Committee. He is a contributing author to the AWWA M-1 Manual, Principles of Water Rates and Charges, and the AWWA M-34 Manual, Water Rate Structures and Pricing.