Rate Setting 101

Presented By:

Raftelis Financial Consulting, PA

George Raftelis
William Stannard
Harold Smith
# Presentation Schedule

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<td>Pricing Objectives</td>
<td>10:00-10:30</td>
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<tr>
<td>Break</td>
<td>10:30-10:45</td>
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<tr>
<td>Revenue Requirements</td>
<td>10:45-11:30</td>
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<tr>
<td>Cost of Service</td>
<td>11:30-12:15</td>
</tr>
<tr>
<td>Lunch</td>
<td>12:15-1:15</td>
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<tr>
<td>Rate Design</td>
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<tr>
<td>Break</td>
<td>2:00-2:15</td>
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<tr>
<td>Rate Assessment</td>
<td>2:15-2:45</td>
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<tr>
<td>Public Involvement</td>
<td>2:45-3:15</td>
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<tr>
<td>Questions/Discussion</td>
<td>3:15-4:00</td>
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</table>
Rate setting “is as much an art as it is a science”
Overall Utility Pricing Goal

Design rate structure:

- Consistent with industry practices
- Responsive to utility and stakeholder objectives
Who Are Utility Stakeholders?

- Employees
- Developers
- Suppliers
- Lending Institutions
- Policy Makers
- Regulators
- Rating Agencies
- Customers
How Do We Accomplish Our Overall Goal?
Introduction to Topics: “The Short Course”

Basic Steps in the Rate Setting Process
Rate Setting Process

1. Identify Financial and Pricing Objectives
2. Identify Revenue Requirements
3. Allocate Costs
4. Design Rate Structure
5. Assess Effectiveness of Addressing Pricing Objectives
Step 1: Identify Financial and Pricing Objectives

- Legality
- Financial Sufficiency
- Cost of Service Based Allocations
- Minimizing Customer Impacts
- Affordability to Disadvantaged Customers
- Conservation/Demand Management
Step 1:
Identify Financial and Pricing Objectives (continued)

- Equitable contributions from new customers
- Simple to understand and update
- Ease of implementation

- Revenue stability
- Rate Stability
- Economic Development
Step 2: Identify Revenue Requirements

Concept:

In providing adequate water service, every water utility must receive sufficient revenue to ensure:

- Proper operation & maintenance (O&M)
- Development and perpetuation of the system
- Preservation of the utility’s financial integrity

Source: AWWA M1
Determine Revenue Requirements

- Prepare Strategic Financial Plan and Vision
- Determine Capital Improvements Plan
- Develop Financing Plan
- Identify Capital Costs Recovered Through Rates
- Identify Operating and Maintenance Costs
- Determine Revenue Requirements
  - O&M
  - Capital
Key Revenue Requirement Considerations

- Selection of Test Year
- Projection Period
- Cash vs. Utility Approach
- Impact on Forecasted Demand
- Escalation Factors
Step 3: Allocate Costs

- Cost of Service Concept
- Cost of Service
  Alternatives
  - Base-Extra Capacity
  - Commodity Demand
  - Design vs. Function
- Allocate Costs of Service to Cost Components
- Functional Cost Allocations
- Categorization of Costs
- Customer Classes
- Units of Service
Sample Allocation of Water Costs

Net Water Revenue Requirements

Allocate Costs to Functions

Supply | Treatment | Storage | Transmission | Distribution | Meter & Service | Support & Admin.

Categorize Costs

Base | Max Day | Max Hour | Customer Service | Meter & Service | Private Fire Protection | Public Fire Protection

Allocate to Categories of Service

Base Service Costs | Customer Classes

Customer Charge per Customer | Meter Charge per Meter Equivalent

Commercial | Industrial | Multi-Family | Residential | Irrigation | Private Fire Protection

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Step 4: Design Rate Structure

- Recovery of Full Costs of Service
- Fixed vs. Variable Charges
  - Service Charges
  - Consumption Charges
  - High Strength Surcharges
- Evaluating Alternative Rate Structures

- Conservation vs. Traditional Rate Designs
  - Flat Rate
  - Declining Block Rates
  - Uniform Rates
  - Increasing Block Rates
  - Seasonal Rates
  - Individualized Rates
Step 5: Assess Effectiveness of Addressing Pricing Objectives

- Customer impact analysis
- Satisfied objectives
- Price elasticity of demand
- Comparison with other communities
- Affordability of service
Public Involvement Considerations

- Why is it important?
- Communication tools
- Ten steps to successful public involvement
Rate Setting Process

1. **Step 1 - Identify Financial and Pricing Objectives**
2. **Step 2 - Identify Revenue Requirements**
3. **Step 3 - Allocate Costs**
4. **Step 4 - Design Rate Structure**
5. **Step 5 - Assess Effectiveness of Addressing Pricing Objectives**

Public Involvement
Step 1: Identify Financial and Pricing Objectives

- Financial Sufficiency
- Cost of Service Based Allocations
- Minimizing Customer Impacts
- Economic Development
- Conservation/Demand Management
- Rate Stability
Identify Financial and Pricing Objectives (continued)

- Equitable contributions from new customers
- Simple to understand and update
- Ease of implementation
- Legality
- Revenue stability
- Affordability to disadvantaged customers
Identify Financial and Pricing Objectives (continued)

**Legality**

- Consistency with:
  - Accepted practice and industry standards
  - Local & state statutes, contractual obligations, etc.

- Potential for litigation

- Effective in meeting bond covenants
Identify Financial and Pricing Objectives (continued)

Financial Sufficiency

- Manage utility like a business
  - Accepted practice and industry standards
  - Local & state statutes, contractual obligations, etc.

- Rates “should be” set to recover the “full cost” of utility operations

- Rates “should be” set to recover long-term financing of new facilities and water resources
Identify Financial and Pricing Objectives (continued)

Cost of Service Based Allocations

- Recovery of costs from customers and customers classes in proportion to cost of providing service
- “Level of Equity” tradeoff
Identify Financial and Pricing Objectives (continued)

Minimizing Customer Impacts

- Avoiding large cost increases
- Customer service implications
- Should rate increases be phased?
Identify Financial and Pricing Objectives (continued)

Affordability to Disadvantaged Customers

- Lifeline rates
- Percentage of income payment plans
- Rate discounts
Identify Financial and Pricing Objectives (continued)

Conservation/Demand Management

- Should the pricing structure encourage more efficient water use?
- Which demand is targeted?
- Which customer classes should be targeted?
Identify Financial and Pricing Objectives (continued)

Equitable Contributions From New Customers

- System development charges
- “Growth pays for growth”
- Intergenerational equity
Identify Financial and Pricing Objectives (continued)

Simple to Understand and Update

- Communication with customers and elected officials
- Customer service impacts
- Administration and updating
Ease of Implementation

- Impact on customer service staff
- Billing software capability
- Data requirements and costs
Identify Financial and Pricing Objectives (continued)

Revenue Stability

- Revenues are predictable and stable
- Cash flows matched with expenditures
Rate Stability

- Smooth program of rate adjustments is usually preferable
- Volatile swings should be avoided
Identify Financial and Pricing Objectives (continued)

Economic Development

- Water and sewer service as incentive for economic development
- Comparability with our neighbors?

Potential rate structures
- Interruptible rates
- Subsidized rates
- Marginal cost rates

Potential legal and political risks
# Ranking Main Objectives

Objectives will vary depending on specific situations.

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Stakeholders</th>
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<td>A</td>
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<tr>
<td>Legality</td>
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<td>Financial Sufficiency</td>
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<td>Cost of Service Based Allocations</td>
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<td>Minimizing Customer Impacts</td>
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<td>Affordability to Disadvantaged Customers</td>
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<tr>
<td>Conservation/Demand Management</td>
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<tr>
<td>Equitable Contributions-New Customers</td>
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<tr>
<td>Ease of Implementation</td>
<td>8</td>
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<tr>
<td>Rate Stability</td>
<td>10</td>
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<tr>
<td>Economic Development</td>
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Rate Setting Process

Step 1 - Identify Financial and Pricing Objectives

Step 2 - Identify Revenue Requirements

Step 3 – Allocate Costs

Step 4 – Design Rate Structure

Step 5 – Assess Effectiveness of Addressing Pricing Objectives

Public Involvement
Step 2: Identify Revenue Requirements

Topics Covered:

- Steps to determine revenue requirements
- Overview of developing revenue requirements
- Forecasting considerations
- Cash needs approach
- Utility approach basis
- Capital costs vs. operating costs
Steps to Determine Revenue Requirements

- Gather financial data
- Gather non-financial data
- Interview key staff
- Assemble data
- Determine key factors like inflation, interest rates, etc.
- Common problems
Steps to Determine Revenue Requirements (continued)

Financial Data:

- Audits, CAFRS
- Budget document
- Actual expenditures
- Monthly cash flows
- Bond Official Statements
- Debt service schedules
Steps to Determine Revenue Requirements (continued)

Non-Financial Data:

- Customer records
- Billed usage
- Functional breakdown of costs
- Design capacity and costs associated with peak demand
- Customer survey information
Steps to Determine Revenue Requirements (continued)

Common Problems:

- Inadequate operating cost detail
- Long-range Capital Plan
  - Incomplete
  - Unrealistic
  - Lack of capital financing policies
- Lack of clear financial objectives/policies
Overview of Developing Revenue Requirements

- Compare sources of funds with applications of funds
- Test Periods - Establishing the method of determining revenue requirements
  - Projected—budgeted or forecasted
  - Historical—a recent “typical” year
  - Pro forma—historical base year with adjustments for “known and measurable” changes
- “Cash Basis” vs. “Utility/Accrual Basis”
Steps to Determine Revenue Requirements (continued)

Financial Planning Considerations:

- Debt service coverage ratios
- Reserve levels
- Financing of capital projects
Forecasting Considerations

- Test year
- Generally from 3 to 10 years
- Important to provide a reasonable forecast
  - Avoid surprises in future years
  - Allows gradual “ramp up” of rates over years instead of spikes
- Should be considered living document and reviewed annually
Cash Needs Approach

Components:

- Operation and maintenance costs
- Indirect charges from General Fund
- Payment in lieu of taxes
- Franchise fees, etc.
- Capital costs
Cash Needs Approach

Operation and Maintenance Costs:

- Water production, distribution, etc.
- Sewer Collection and treatment
- Laboratory
- Meter reading and service
- Billing and collections
- Administrative
Cash Needs Approach

Capital Costs:

- Debt service
- Capital Improvements (rate funded)
  - Principal
  - Interest
  - Debt service coverage factor

Reserves

- Operating
- Capital projects
- Rate stability
- Capital replacement
Cash Needs Approach

Capital Improvements:

- Examples:
  - Routine replacement
  - Normal extensions and improvements
  - Major capital replacements and improvements

- How these affect rates depends upon funding policy agency has established

- Estimates of contributions received from developers and customers, grants and other non user fee sources

- Major capital usually funded by combination of long term debt, revenues, and rates
Cash Needs Approach

Methodology:

- Projections generally based on historical data adjusted for:
  - Inflation
  - Changes in conditions
  - Growth of demand affecting variable treatment costs

- Normalize historical data to account for conditions not expected to continue during forecast period
Utility Basis Approach

Components:

- Operation & maintenance
- Depreciation
- Return on investment
Utility Basis Approach

Approach Generally Used By Investor Owned Utilities

- Includes:
  - Private investors organized as Sole Proprietor, Partnership, or Corporation
  - Non-Profit Organizations, POA/HOA, Church, Camps, etc.
  - For-Profit Mobile Home Communities

- Rate Increase must be approved by Public Service Commission
Utility Basis Approach

For Municipal Water Utility Serving Outside Its Corporate Boundary

- Compensation for rights and risks of ownership or other costs
- May want to charge more to outside customers than in-city
- For policy or political reasons
Utility Basis Approach

For Municipal Water Utility Serving Outside Its Corporate Boundary

- If not regulated or by agreement, sometimes charge outside customer a multiple of in-city rate
- Normally, some cost justification required, particularly where rates to outside customers are regulated
- Common method is to use combination of cash and utility bases
Utility Basis Approach

For Municipal Water Utility Serving Outside Its Corporate Boundary

- Does owning municipality truly bear risk?
  - Risk of loss due to injuries, damages, catastrophic event
  - Financial risk

- Are incremental costs incurred to serve outside city?
  - Location of supplies
  - Economies of scale
Utility Basis Approach

Issues and Pitfalls That Can Arise

- Availability of necessary data such as net plant investment and depreciation
- Determination of appropriate rate of return
- High cash capital outlay requirements can cause rates to reverse
  - Must be prepared to accept results
  - Can’t just switch back and forth
## Advantages of Cash-Needs vs. Utility Basis Approach

<table>
<thead>
<tr>
<th>Cash-Needs</th>
<th>Utility Approach</th>
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<tbody>
<tr>
<td>Consistent with government budgeting practices</td>
<td></td>
</tr>
<tr>
<td>Less subjective</td>
<td></td>
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<tr>
<td>Easier to understand</td>
<td></td>
</tr>
<tr>
<td>More flexibility</td>
<td></td>
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<tr>
<td>Matches cost of service with beneficiary use</td>
<td></td>
</tr>
<tr>
<td>Consistent with CAFR</td>
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<tr>
<td>Consistent with bond covenant requirements</td>
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</table>
# Comparison of Cash-Needs vs. Utility Basis Approaches

<table>
<thead>
<tr>
<th></th>
<th>Cash-Needs</th>
<th>Utility</th>
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<tbody>
<tr>
<td>O&amp;M</td>
<td>$21,000</td>
<td>$21,000</td>
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<tr>
<td>Depreciation</td>
<td>3,200</td>
<td>19,200</td>
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<tr>
<td>Allowable Return</td>
<td>19,200</td>
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<tr>
<td>Debt Service</td>
<td>19,900</td>
<td></td>
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<tr>
<td>Rate Funded Capital Projects</td>
<td>1,800</td>
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<tr>
<td>Reserve Fund Contribution</td>
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<tr>
<td>Operating</td>
<td>500</td>
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<td>Replacement</td>
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<td>Expansion</td>
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<tr>
<td>Insurance</td>
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<tr>
<td>Rate Stability</td>
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<tr>
<td>Debt Service</td>
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<tr>
<td>Total Revenue Requirements</td>
<td>$47,200</td>
<td>$43,400</td>
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Capital Costs vs. Operating Costs
Capital Costs vs. Operating Costs
Operations and Maintenance
+ Capital Requirements
= Total Revenue Requirement

Which cost goes where?
- Minor costs vs. major costs
- Ongoing vs. one-time costs
- Must do today vs. sooner or later
Types of Capital Costs:

- **Rehabilitation** – expenditures for repair due to damage, wear, or decay to restore facilities to normal or optimum condition.

- **Replacements** – expenditures for components replacing existing units.

- **Improvements** – betterments or upgrades to increase value, quality, or usefulness.

- **Expansion** – expenditures to enlarge capacity of facilities or extend system to new areas.
Capital Costs vs. Operating Costs

Definition of O&M Costs:

- **Operating costs** includes those system costs required during the process of providing water or wastewater service.

- **Maintenance costs** are those expenditures “required to maintain the system in good operating condition, and include repairs or replacements of minor property components less than the size of a retirement unit.” *

*AWWA M29, 1st ed.*
Rate Setting Process

Step 1 - Identify Financial and Pricing Objectives

Step 2 - Identify Revenue Requirements

Step 3 – Allocate Costs

Step 4 – Design Rate Structure

Step 5 – Assess Effectiveness of Addressing Pricing Objectives

Public Involvement
Step 3: Allocate Costs

Topics Covered:

- Cost of Service Concept
- Cost of Service Alternatives
- Allocate Cost of Service to Cost Components
- Categorization of Costs
- Functional Costs Allocations
- Classes of Customers
- Units of Service
Cost of Service Concept

Cost of service is the fundamental benchmark used for establishing utility rates in the United States.
Cost of Service Concept

A cost-based process of converting revenue requirements into unit costs
Cost of Service Concept

What Is Cost of Service?

- Cost of service is the total annual revenue requirements to be derived from utility revenues.

- That is, the cost of providing service to the utility’s customers must be recovered from the utility’s revenues.
Cost of Service Concept

Rationale

- Different types of customers generate different costs because their patterns of use or characteristics are different.
- Cost of service allows the matching of rates charged to each group to the cost of serving them.
- Each group “pays its own way”; no subsidies.
Cost of Service Concept

Bottom Line

Achieve Equity:

The attempt to recover costs from users in proportion to their use of the system, and by recognizing the impact of each class on system facilities and operations.
Cost of Service Alternatives

- O&M Allocation
- Capital Cost Allocation
  - Cash Basis
  - Utility Basis (Depreciation and Rate Base/Return)

Allocation Methodologies

- Water
  - Base-extra capacity
  - Commodity-demand

- Wastewater
  - Design basis allocation
  - Functional based allocation
Allocate Cost of Service to Cost Components

- Recognize Cost Causation (Design Basis)
- Cost Components

- Commodity costs
  - Volume
  - Strength
- Demand costs
  - Maximum day
  - Maximum hour
- Customer costs
  - Meters & services
  - Billing (Meter reading, billing, collection)
- Other
  - Fire protection
  - Customer specific
Allocate Cost of Service to Cost Components (Continued)

- **Capital related costs (debt service, other)**
  - Allocate rate base (plant investment) to cost components
  - Allocate capital related costs in proportion to rate base

- **Operation & maintenance expense**
  - Similar allocation to rate base
  - Power (commodity/demand)
  - Chemicals (commodity)
Sample Allocation of Water Costs

Net Water Revenue Requirements

Allocate Costs to Functions

Allocate to Categories of Service

Base Service Costs
- Customer Charge per Customer
- Meter Charge per Meter Equivalent

Customer Classes
- Commercial
- Industrial
- Multi-Family
- Residential
- Irrigation
- Private Fire Protection

Categorize Costs

Base
- Max Day
- Max Hour

Customer Service
- Meter & Service

Private Fire Protection
- Public Fire Protection

Support & Admin.

Supply

Treatment

Storage

Transmission

Distribution

Meter & Service
Sample Allocation of Wastewater Costs

Net Wastewater Revenue Requirements

Allocate to Functions


Allocate to Functions

Categorize Cost

Volume  Capacity  Suspended Solids  BOD  Industrial Monitoring  Customer Service

Allocate to Categories of Service

Base Service Costs

Uniform Charge Per Customer  Meter Charge per Meter Equivalent  Commercial  Industrial  Multi-Family  Residential  Water Reuse

Customer Classes
Classes of Customers

Distribute Costs to Customer Classes

- Determine unit cost of service by cost component
  - Operation & maintenance expense
  - Capital cost
- Apply unit costs to customer class units of service
Classes of Customers

Indicative Revenue Increase by Class

- Overall system revenue increase required
- Indicated increases by class to meet allocated cost of service
- Provides decision makers with basis for:
  - Establishing defensible rates
  - Identifying levels of subsidy if rates vary from cost of service
- May require phase-in to achieve full cost of service
Units of Service

Sources of Data

**Billing Records**
- Number of meters by size
- Number of meters by class
- Annual metered use by class
- Monthly variation in metered use by class
- Wastewater pollutant strengths

**Operational Records**
- System water demand (annual, max day, max hour)
- Treated wastewater volumes and strengths (customers, infiltration/inflow)
**Issue**

Should allocations use coincident peaking demands, non-coincident peaking demands, or some combination of both?
Coincident vs. Non-Coincident Peaking Factors - Arguments & Implications

- Benefits of Coincident:
  - Cost allocations are to reflect cost causation; costs are incurred due to coincident peaking

- Benefits of Non-Coincident:
  - Benefits of diversity of customer demands should be spread to all customers
Rate Setting Process

1. Identify Financial and Pricing Objectives
2. Identify Revenue Requirements
3. Allocate Costs
4. Design Rate Structure
5. Assess Effectiveness of Addressing Pricing Objectives
Step 4: Design Rate Structure

Topics Covered:

- Recovery of full costs
- Fixed charges vs. variable charges
- Evaluating alternative rate structures
- Conservation vs. traditional rate designs
Recovery of Full Costs

Goal is to recover costs of service from each customer class
Fixed Charges vs. Variable Charges

- **Fixed Charges**
  - Invariant with customer water usage
  - Cost-of-service fixed charges reflect customer related costs
  - Fixed charges may include portion of capital costs

- **Variable Charges (‘Consumption’ Charges)**
  - Vary with amount of water used
  - Recover utility costs that vary with customer usage patterns
Summary of Water Utilities with Charges for No Consumption
2000 Survey of 174 Water Utilities

All Surveyed Water Utilities
(174 Sampled)

- Fixed Charge: 98%
- No Fixed Charge: 2%

Large Water Utilities
(42 Sampled)

- Fixed Charge: 95%
- No Fixed Charge: 5%

Medium Sized Water Utilities
(52 Sampled)

- Fixed Charge: 98%
- No Fixed Charge: 2%

Small Water Utilities
(80 Sampled)

- Fixed Charge: 99%
- No Fixed Charge: 1%

Notes: Large systems sold over 75 mgd, Medium sized systems sold between 20 and 75 mgd, and Small systems sold less than 20 mgd.

# Fixed Charges vs. Variable Charges (continued)

## Examples of Fixed Charges

<table>
<thead>
<tr>
<th>Meter Size</th>
<th>Billing and Collecting</th>
<th>Meters and Services</th>
<th>Meter Charge</th>
<th>Total</th>
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</thead>
<tbody>
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<td>5/8 - inch</td>
<td>$2.00</td>
<td>$2.25</td>
<td>$4.20</td>
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<td>3/4 - inch</td>
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<td>6-inch</td>
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<td>46.80</td>
<td>48.80</td>
<td>97.60</td>
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</table>
Fixed Charges vs. Variable Charges (continued)

Historical Perspectives/Policy Considerations for Fixed Charges

- Variable charges not possible prior to availability of metering
- Fixed charges above customer costs remain prevalent
- Revenue recovery often cited as basis for “high” fixed charges
- Special considerations for resort communities (e.g., part-time residents)
Fixed Charges vs. Variable Charges (continued)

- Certain costs are recovered as a fixed component of a customer’s bill:
  - Customer service, billing & collection
  - Meter reading and meter maintenance
  - Portion of debt service – “readiness to serve” component

- These costs are incurred by the utility regardless of usage.

- Revenues are generated regardless of usage.
**Fixed Charges vs. Variable Charges (continued)**

**Typical Fixed Charges**

- **Customer or Base Charge**
  - Included costs are recovered on a per account basis (example: billing, collection, etc.)
  - Charges are not differentiated by meter size

- **Service Charge by Meter Size**
  - Included costs are recovered proportionately based on meter size (example: meter installation & maintenance)

- **Minimum Charge**
  - Includes an allowance for a minimum level of consumption
**Variable Charges**

- Recovers all costs not recovered from the service charges
  - Water production, treatment & delivery
  - Wastewater collection, treatment & disposal
- Customer costs vary depending on customer usage characteristics (volume - demands)
- Typically measured through water meter readings
- Wastewater consumption is frequently based off a percentage of water consumption
## Fixed Charges vs. Variable Charges

### Advantages vs. Disadvantages

<table>
<thead>
<tr>
<th>Fixed Charges</th>
<th>Variable Charges</th>
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<tbody>
<tr>
<td><strong>Advantages</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Recover volume-related costs based on usage</td>
</tr>
<tr>
<td></td>
<td>Address policy objectives including conservation</td>
</tr>
<tr>
<td><strong>Disadvantages</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Administrative costs associated with metering consumption / advance rate designs</td>
</tr>
</tbody>
</table>

**Fixed Charges**

- **Advantages**
  - Contributes to revenue stability
  - May reflect customer related costs

- **Disadvantages**
  - Limits customer control of bill / conservation incentives
Rate structure typically reflects variable charges
Evaluating Alternative Rate Structures

Considerations in Evaluating Alternatives

- Level of effort
- Availability of resources and data
- Public involvement
- Pricing objectives
- Elements of rate structure
  - Defining customer classes
  - Frequency of billing
  - How much to charge (fixed charges and consumption charges)
Evaluating Alternative Rate Structures (continued)

Common Elements of Rate Structure

- **Defining customer classes**
  - Who will be charged

- **Frequency of billing**
  - How often customers are charged

- **How much to charge (fixed charges and consumption charges)**
  - What rates apply
  - Most of the time is spent here
Evaluating Alternative Rate Structures (continued)

One Size Does Not Fit All

Rate designs vary by utility and by region

Rate levels vary by utility
  - Generally a function of the utility’s costs and the customers demands

Rates reflect diverse and competing objectives
Conservation Rates vs. Traditional Rate Designs
Conservation Rates vs. Traditional Rate Designs

**CONSERVATION**
- Uniform
- Inverted Block
- Seasonal
- Individualized Rates

**TRADITIONAL**
- Flat
- Declining
Conservation Rates vs. Other Rate Designs (continued)

Conservation Pricing Objectives

I. Demand Management Objectives

- **Primary**
  - Reduce peak usage
  - Reduce season usage
  - Reduce system demand

- **Secondary**
  - Reward economically efficient water users
  - Surcharge nonessential and non-efficient water use
  - Communicate conservation consciousness
Conservation Rates vs. Other Rate Designs (continued)

Conservation Rate Design

Conservation

Flat

Declining

Block

Uniform

Inverted

Seasonal

Individualized/Goal
Conservation Rates vs. Other Rate Designs (continued)

Factors Affecting Conservation Rate

- Frequency of billing
- Billing format
- Fixed vs. variable
- Message sent
- Consumer’s ability to react
Conservation Rates vs. Other Rate Designs (continued)

Flat Rate

**Major Advantages**
- Revenue stability
- Easy to understand
- Seen as favorable by bond investors

**Major Disadvantages**
- Does not equitably recover costs from different user classes
- Does not promote efficient use of water resources
Conservation Rates vs. Other Rate Designs (continued)

Uniform Rate

Definition: Single rate for all units of consumption, for all customers and customer classes; each unit of product is valued and priced the same.

Example:
Usage: All units of consumption
Rate: $2.74 per 1,000 gallons
Conservation Rates vs. Other Rate Designs (continued)

Uniform Rates

Major Advantages
- Are generally easy to implement, administer, and update
- Are understandable and accepted by most customers

Major Disadvantages
- Does not fully allocate system costs associated with peak/seasonal demand to usage which creates the peaks.
- May only marginally achieve conservation objectives
Conservation Rates vs. Other Rate Designs (continued)

**EXAMPLE ONLY**

Inverted Block Rate

<table>
<thead>
<tr>
<th>Rate per 1,000 gallons</th>
<th>Block 1 (Essential Use)</th>
<th>Block 2</th>
<th>Block 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>$3.50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$3.25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$3.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$2.74</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$2.50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$2.25</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Uniform Rate**

Definition: Unit rate increases with consumption.

---

**Example:**

<table>
<thead>
<tr>
<th>Usage</th>
<th>Rate (per 1,000 gallons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>First 10,000 gallons</td>
<td>$2.60</td>
</tr>
<tr>
<td>Next 15,000 gallons</td>
<td>$2.85</td>
</tr>
<tr>
<td>Over 25,000 gallons</td>
<td>$3.50</td>
</tr>
</tbody>
</table>
Conservation Rates vs. Other Rate Designs (continued)

Inverted Rates

**Major Advantages**
- Can be highly conservation oriented
- Are generally understandable by customers

**Major Disadvantages**
- May result in revenue instability
- Pose challenges in developing appropriate block cutoffs and unit rates
- May have substantial impact on high volume customers
EXAMPLE ONLY

Definition: Unit rate increases with consumption relative to a customer’s average consumption.

Usage Blocks
B1 - 110% of Average Winter Consumption
B2 - 111-250% of AWC
B3 - > 250% of AWC

Rate (per 1,000 gallons)
B1: $2.25
B2: 2.50
B3: 3.00
Conservation Rates vs. Other Rate Designs (continued)

**Excess Usage Rates (Individualized)**

**Major Advantages**
- Produces the most equitable conservation structure
- Highly rewards conservation-minded customers
- Places more cost burden on non-efficient water users

**Major Disadvantages**
- Can be more difficult to calculate rates
- Imposes billing system challenges
- May have the most dramatic differentials in customer bills
- May be difficult for the customer to understand
Conservation Rates vs. Other Rate Designs (continued)

**Seasonal Rate**
Definition: Higher unit rate(s) for consumption during a peak period than at other times during the year.

**Non-seasonal Rate**

*EXAMPLE ONLY*

<table>
<thead>
<tr>
<th>Usage (in 1,000 gallons)</th>
<th>Rate per 1,000 gallons</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>$3.25</td>
</tr>
<tr>
<td>100</td>
<td>$3.00</td>
</tr>
<tr>
<td>1,000</td>
<td>$2.75</td>
</tr>
<tr>
<td>10,000</td>
<td>$2.50</td>
</tr>
</tbody>
</table>

Example:
Specific Rate Approach Non-Seasonal Seasonal
All units of consumption $2.40 $2.90
## Conservation Rates vs. Other Rate Designs (continued)

### Seasonal Rates

**Major Advantages**
- Are based upon cost of service allocation concepts
- Are generally understandable and accepted by customers

**Major Disadvantages**
- May have substantial impact on high volume customers
- May have less predictable impact on demand, and therefore revenue
Hybrid Approach

- Rate structure varies by customer class
- Any combination of rate structures may be used
- Addresses implementation issues for each customer class
Conservation Rates vs. Other Rate Designs (continued)

Design Features Affecting Conservation Aggressiveness of Rate Structure

- Block cutoffs
- Number of blocks
- Magnitude of unit charges
- Definition of “season”
## Conservation Rate Structure Evaluation Matrix (Example)

<table>
<thead>
<tr>
<th>Demand Management Goals</th>
<th>Uniform</th>
<th>Inverted Block</th>
<th>Excess Use</th>
<th>Seasonal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Primary Goals</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduce Peak Usage</td>
<td>C</td>
<td>B-</td>
<td>A-</td>
<td>B-</td>
</tr>
<tr>
<td>Reduce Seasonal Usage</td>
<td>C</td>
<td>B</td>
<td>A-</td>
<td>B+</td>
</tr>
<tr>
<td>(Maximum Seasonal Demand)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduce System Demand</td>
<td>C</td>
<td>B+</td>
<td>B+</td>
<td>B-</td>
</tr>
<tr>
<td>(Average Day Demand)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Overall</strong></td>
<td>C</td>
<td>B</td>
<td>A-</td>
<td>B</td>
</tr>
<tr>
<td><strong>Secondary Goals</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reward Economically Efficient Water User</td>
<td>C</td>
<td>B-</td>
<td>A-</td>
<td>B+</td>
</tr>
<tr>
<td>Surcharge Non-essential and Non-efficient Water Use</td>
<td>C</td>
<td>B</td>
<td>C</td>
<td>B</td>
</tr>
<tr>
<td>Communicating Conservation Consciousness</td>
<td>C</td>
<td>A-</td>
<td>A</td>
<td>A-</td>
</tr>
<tr>
<td><strong>Overall</strong></td>
<td>C</td>
<td>B+</td>
<td>A-</td>
<td>B+</td>
</tr>
</tbody>
</table>
Rate Setting Process

Step 1 - Identify Financial and Pricing Objectives

Step 2 - Identify Revenue Requirements

Step 3 – Allocate Costs

Step 4 – Design Rate Structure

Step 5 – Assess Effectiveness of Addressing Pricing Objectives

Public Involvement
Step 5: Assess Effectiveness of Addressing Pricing Objectives

Topics Covered:

- Customer impact analysis
- Competing objectives
- Price elasticity of demand
- Comparison with other communities
- Affordability of service
Customer Impact Analysis

- Impact on individual customers
  - Typical single family residential
  - Typical commercial

- System impact
  - Sample of residential/non-residential accounts
  - All accounts
## Competing Objectives

### General Rate Structure Evaluation Matrix

<table>
<thead>
<tr>
<th></th>
<th>Uniform</th>
<th>Inverted Block</th>
<th>Excess Use</th>
<th>Seasonal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General Pricing Goals</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Encourage Cost of Service Equity</td>
<td>B-</td>
<td>B-</td>
<td>A-</td>
<td>A-</td>
</tr>
<tr>
<td>Minimize Litigation Potential</td>
<td>A-</td>
<td>B-</td>
<td>B-</td>
<td>B</td>
</tr>
<tr>
<td>Minimize Negative Impact on Rates</td>
<td>A</td>
<td>B-</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td><strong>Overall</strong></td>
<td>B+</td>
<td>B-</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td><strong>Related Goals</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lifeline Rates</td>
<td>C</td>
<td>B-</td>
<td>A-</td>
<td>B+</td>
</tr>
<tr>
<td>Enhance Implementation</td>
<td>A-</td>
<td>B-</td>
<td>C</td>
<td>B</td>
</tr>
<tr>
<td>Encourage Simplicity</td>
<td>A-</td>
<td>B-</td>
<td>C+</td>
<td>B</td>
</tr>
<tr>
<td>Encourage Use of Reclaimed Water</td>
<td>C</td>
<td>B+</td>
<td>B+</td>
<td>B+</td>
</tr>
<tr>
<td><strong>Overall</strong></td>
<td>B</td>
<td>B-</td>
<td>B-</td>
<td>B</td>
</tr>
</tbody>
</table>
Price Elasticity of Demand Defined

Price elasticity is a measure of the price sensitivity of consumption by consumer.

- Elasticity = \( \% \text{ change in consumption} \)
  \( \% \text{ change in real price} \)

- Elasticity is usually expressed as a decimal percentage number. For example, given an elasticity of -0.1, and a 60% upward price change, the resulting consumption change is a downward 6% or (-0.1 x 60).

- Challenges to determine or estimate price elasticity.
Price Elasticity of Demand

- Price effects can be small if little change in real prices.
- Other demand parameters are strong: temperature, rain, income.
- Timing and lags.
- Fixed and Wastewater charges affect price elasticity.
- Consumers react to average bill, not final block rate.
- Each user class responds differently.

- Residential summer usage is more sensitive than winter usage.
- Peak usage is more sensitive than off peak usage.
- Southwest tends to be more price sensitive than other areas.
- Consumer education affects price elasticity.
- Literature reviews are imperfect for specific areas.
Price Elasticity of Demand Impact on Rates

- Existing rates are $1.00 per thousand gallons
- New costs to be recovered are $110 thousand
- Demands are 100 thousand gallons

- New rate equal: $110,000 / 100 thous. gal. = $1.10 per thousand gal (10% increase)
- Price elasticity of demand is -0.3; therefore expected decrease in demand is 3%
- Revised rates equal: $110,000 / 97 thous. gal. = $1.13 per thousand gal (13% increase)
<table>
<thead>
<tr>
<th>Community</th>
<th>Water</th>
<th>Wastewater</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austin</td>
<td>$15.59</td>
<td>$31.69</td>
<td>$47.28</td>
</tr>
<tr>
<td>Fort Worth</td>
<td>$19.50</td>
<td>$23.10</td>
<td>$42.60</td>
</tr>
<tr>
<td>Tulsa</td>
<td>$17.71</td>
<td>$18.95</td>
<td>$36.66</td>
</tr>
<tr>
<td>Dallas</td>
<td>$12.89</td>
<td>$23.59</td>
<td>$36.48</td>
</tr>
<tr>
<td>Average</td>
<td>$15.32</td>
<td>$19.28</td>
<td>$34.60</td>
</tr>
<tr>
<td>Albuquerque</td>
<td>$16.70</td>
<td>$16.85</td>
<td>$33.55</td>
</tr>
<tr>
<td>San Antonio</td>
<td>$14.34</td>
<td>$14.83</td>
<td>$29.17</td>
</tr>
<tr>
<td>Denver</td>
<td>$13.52</td>
<td>$13.56</td>
<td>$27.08</td>
</tr>
<tr>
<td>El Paso</td>
<td>$12.32</td>
<td>$11.66</td>
<td>$23.98</td>
</tr>
</tbody>
</table>
Affordability of Service

- Ability of Consumers to Pay Charges
- Ways to Improve Ability to Pay
  - Change Bill Frequency
  - Budget Billing
  - Target Usage Reduction
  - Third Party Programs
  - Life Line Rates
  - Percentage of Income Payment Plans
  - Rate Discounts
What is Affordability?

- **Ability** of consumers to pay the charges for water service in a timely fashion.
- Not the same as **willingness** to pay.
Customers Who May Experience Ability-to-Pay Problems

- Fixed incomes
  - TANF recipients
  - Unemployed
  - Elderly
  - Disabled

- Low incomes
  - Welfare-to-work households
  - Single parent headed household with children
Conditions that Can Exacerbate Affordability Problems

- High summer bills
  - May be result of increased consumption unrelated to outdoor usage (e.g., children home all day)
  - Come at same time that energy bills peak

- Extraordinary expenses in other areas
  - May create a temporary inability to pay (e.g., medical bills)
Ways to Improve Ability to Pay:

Non-Rate Changes
Change Bill Frequency

- Many low-income households find it easier to pay smaller monthly bills than larger bills delivered bimonthly or quarterly.
- Does not require changing to monthly billing for all customers (can be an option available to customer).
- Bill should be delivered on the same day each month.
Budget Billing

- Levelizes high seasonal bills
- Improves ability of household to budget
- Improves cash flow to utility
Targeted Usage Reduction

- Plumbing fixture replacement
- Leak repair
- Education
- Joint funding may be available from energy provider for hot water savings
Third Party or Voluntary Programs

- Utilities can create fund to which customers (and utility) contribute to assist low-income consumers
- Piggyback on energy funds
- Third-party charitable organizations can administer fund
Ways to Improve Ability to Pay:

Rate Changes
Lifeline Rates

- Below-cost rate for meter charge and water needed for minimum sanitary requirements.
- Should be targeted to households in need.
- Amount of water may vary with household size.
Percentage of Income Payment Plans

- Water bill set to a percentage of household income.
- Percentage may vary with income level.
- Timely bill payment a condition of remaining in plan.
Rate Discounts

- Fixed percentage discount applicable to customers that meet certain criteria
  - Entire bill or just a portion

- Applications
  - All elderly heads of household
  - All low-income households
  - All households in certain locations
Rate Setting Process

Step 1 - Identify Financial and Pricing Objectives

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Step 3 - Allocate Costs

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Step 5 – Assess Effectiveness of Addressing Pricing Objectives

Public Involvement
Public Involvement Considerations

Topics Covered:
- Why Is It Important?
- Communication Tools
- Ten Steps to Successful Public Involvement
Rate Issues Are the Most Difficult to Communicate

<table>
<thead>
<tr>
<th>Issue</th>
<th>Frequency of Responses</th>
<th>Percent of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rates</td>
<td>29</td>
<td>17</td>
</tr>
<tr>
<td>Drought, Conservation, Supply</td>
<td>26</td>
<td>15</td>
</tr>
<tr>
<td>Specific Contaminants</td>
<td>22</td>
<td>13</td>
</tr>
<tr>
<td>Water Quality</td>
<td>20</td>
<td>11</td>
</tr>
<tr>
<td>Projects</td>
<td>19</td>
<td>11</td>
</tr>
<tr>
<td>Management</td>
<td>19</td>
<td>11</td>
</tr>
<tr>
<td>Consumer Confidence Reports</td>
<td>18</td>
<td>10</td>
</tr>
<tr>
<td>Regulations</td>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td>Fiscal</td>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td>Pollution</td>
<td>10</td>
<td>6</td>
</tr>
</tbody>
</table>

Source: Bishop, B.; Journal AWWA 95:1; Jan. 2003
Most Difficult Audiences

1. Residential Customers
2. Citizens’ Groups
3. Media
4. Business Customers
5. Regulators
6. Elected Officials
7. Employees

Source: Bishop, B.; Journal AWWA 95:1; Jan. 2003
Why Are Rates So Difficult?

- Complex Concepts
- Conflicting Priorities
Sample Allocation of Water Costs

Net Water Revenue Requirements

Allocate Costs to Functions

Supply | Treatment | Storage | Transmission | Distribution | Meter & Service | Support & Admin.

Categorize Costs

Base | Max Day | Max Hour | Customer Service | Meter & Service | Private Fire Protection | Public Fire Protection

Allocate to Categories of Service

Base Service Costs
- Customer Charge per Customer
- Meter Charge per Meter Equivalent

Customer Classes
- Commercial
- Industrial
- Multi-Family
- Residential
- Irrigation
- Private Fire Protection
Conflicting Priorities

- **Residential**
  - Customer Impacts
  - Affordability
  - Conservation

- **Citizens’ Groups**
  - Customer Impacts
  - Conservation
  - Legality

- **Media**
  - Customer Impacts
  - Simplicity
  - Economic Development

- **Business**
  - Customer Impacts
  - Economic Development
  - Rate Stability

- **Regulators**
  - Legality
  - Cost of Service
  - Financial Sufficiency

- **Elected Officials**
  - Customer Impacts
  - Financial Sufficiency
  - Simplicity

- **Employees**
  - Financial Sufficiency
  - Ease of Implementation
  - Revenue Stability
Tools for Fostering Understanding

**Informational**
- Press releases
- Bill stuffers
- Messages on bills
- TV and radio PSAs
- Annual reports
- Website
- Newsletters
- Posters
- Billboards

**Participatory**
- Focus groups
- Advisory committees
- Workshops

**Official**
- Board and Council meetings
- Rate study reports
Rate Structure

Water Supply Fee
Effective December 3, 2002

The new component of the rate structure that will be added to all customer bills is the Water Supply Fee. This new fee will directly fund the acquisition of new water supplies to reduce San Antonio’s dependence on the Edwards Aquifer. The Water Supply Fee in 2003 is $0.0644 per hundred gallons of consumption. The rate is the same for all customers and all types of usage.

The Water Supply Fee assessed on all octable water service for water usage in every instance of service for each month in isolation thereof shall be as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Maximum Fee To Be Assessed (per 100 gallons)</th>
<th>Actual Fee Assessed</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>$0.0359</td>
<td>$0.0356</td>
</tr>
<tr>
<td>2002</td>
<td>$0.0708</td>
<td>$0.0708</td>
</tr>
<tr>
<td>2003</td>
<td>$0.0938</td>
<td>$0.0844</td>
</tr>
<tr>
<td>2004</td>
<td>$0.1120</td>
<td>TBD</td>
</tr>
<tr>
<td>2005</td>
<td>$0.1378</td>
<td>TBD</td>
</tr>
</tbody>
</table>
Rates Advisory Committee

- **ROLE:** Advise the SAWS Board of Trustees.
- **COMPOSITION:** Area citizens who represent the range and diversity of SAWS customers.
- **FOCUS:** SAWS Rates and Rate Structure.
- **OUTCOME:** To provide SAWS with information to be used to make decisions, by the Board of Trustees, about rates and rate structure.
Rates Advisory Committee

Basic Tasks:

- Review design of structure of rates and charges within the framework of SAWS policies.
- Help maintain fair and equitable rates with consideration of service area demographics.
- Evaluate cost allocations.
- Review pricing objectives outlines by previous Rates Advisory Committee.
Rate Study Report

Rate Impact Analysis

Rate Comparisons

Water Charges for Texas Cities
(Data presented is as of the 2002 Water survey, rates may have changed)
Ten Steps For Successful Public Involvement

- Frame the problem
- Identify the constraints
- Identify & describe decision steps and project milestones
- Identify & understand potentially affected stakeholders
- Determine vulnerabilities and must resolve issues
Ten Steps For Successful Public Involvement (continued)

- Determine appropriate level of public involvement.
- Select processes and techniques.
- Develop a work plan.
- Implement and monitor the work plan.
- Manage change.