Principles of Water and Wastewater Rate Setting

Rates Advisory Committee
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Rate setting “is as much an art as it is a science”
Rate Setting 101

M-1 Rate Manual

Comprehensive Guide to Water and Wastewater Finance and Pricing

Legal Decisions
Overall Utility Pricing Goal

Design a rate structure that:

- Generates revenue sufficient to support the continued provision of high quality service
- Is responsive to utility and stakeholder objectives
- Is consistent with industry practices
Who Are Utility Stakeholders?

- Customers
- Policy Makers
- Suppliers
- Regulators
- Rating Agencies
- Industry
- Lenders
- Employees
How Do We Accomplish Our Overall Goal?
Basic Steps in the Rate Setting Process

“The Short Course”
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
Step 1: Identify Financial and Pricing Objectives

- Financial Sufficiency
- Customer Equity
- Revenue Stability
- Minimize Customer Impacts
- Simple to Understand and Update
- Affordability
- Ease of Implementation
- Economic Development
- Rate Stability
- Conservation/Demand Management

Identify rate structures that meet objectives
Rate Setting Process

Step 1 - Identify Financial and Pricing Objectives

Step 2 - Identify Revenue Requirements

Step 3 - Allocate Costs

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Step 2: Identify Revenue Requirements

Concept:
In providing adequate water and wastewater service, every 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
Key Revenue Requirement Considerations

- Selection of Base Year for Projections
- Projection Period
- Utility vs. Cash Approach
- Escalation Factors
Determine Revenue Requirements

Revenue Requirements

- O&M
- Reserve Requirements
- “Pay-Go” Capital Costs
- Debt Service

Revenue Requirement Adjustments: Other Operating Revenues and Non-Operating Revenues
Developing Revenue Requirements

Financial Planning Considerations:

- Reserve levels
- Debt policy
- Low income discounts
- Growth policy
- Financing of capital projects
## Developing Revenue Requirements

**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

Normalize data to account for conditions not expected to continue during forecast period
Developing Revenue Requirements

“Utility/Accrual Basis” vs. “Cash Basis”

Utility Basis
- More consistent with accounting principles
- May generate insufficient or excessive revenues
- Less flexible and more difficult to explain to customers and policy makers
- Often used for wholesale rates
Developing Revenue Requirements

“Cash Basis” vs. “Utility/Accrual Basis”

Cash Basis

- Easier to understand as revenue is matched to cash needs
- Consistent with governmental budgeting and accepted by governmental utility industry
- May result in fluctuations with financials prepared according to typical accounting principles
- Typically used for retail rates
Cash Needs Approach

Reserves
- Operating
- Rate stabilization
- Capital replacement
- Capital expansion
- Emergency and Risk Management
Escalation Factors

- Historic Trends
- Expected Occurrences
  - New Assets online
  - Regulatory requirements
- Conservative by Nature
Common Problems Determining Revenue Requirements

- Inadequate operating cost detail
- Long-range Capital Plan
  - Incomplete
  - Unrealistic
  - Lack of capital financing policies
- Lack of clear financial objectives/policies
Rate Setting Process

Step 1 - Identify Financial and Pricing Objectives

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Cost of Service Concept

Best practices encourage cost of service as the fundamental benchmark used for establishing utility rates.
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 those customers.
Cost of Service Concept

**Rationale:**

- Different types of customers generate different costs because their patterns of use or demand characteristics are different.
- Cost of service analysis 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:

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.
Step 3: Allocate Costs

- Categorize Costs by Function
- Allocate to Cost Components
- Develop Unit Costs

Accepted Industry Approaches

**Water**
- Base-Extra Capacity vs. Commodity Demand

**Wastewater**
- Design vs. Function
Sample Allocation of Water Costs

Net Water Revenue Requirements

Categorize by Functions
- Supply
- Treatment
- Storage
- Transmission
- Distribution
- Meters
- Support & Admin.

Allocate to Cost Components
- Base
- Max Day
- Max Hour
- Customer Service
- Meter & Service
- Public Fire Protection
- Private Fire Protection

Develop Unit Costs
- Commodity Costs
- Customer Classes

Service Costs
- Customer Charge
- Meter Charge
- Public Fire Protection
- Private Fire Protection

Customer Classes
- Commercial
- Industrial
- Multi-Family
- Single Family
- Irrigation
Sample Allocation of Wastewater Costs

Net Wastewater Revenue Requirements

Categorize by Functions
- Collection
- Treatment
- Disposal
- Industrial Pretreatment
- CSO
- Meter & Service
- Support & Admin.

Allocate to Cost Components
- Volume
- Capacity
- BOD
- TSS

Develop Unit Costs
- Variable Costs
  - Customer Classes
    - Commercial
    - Industrial
    - Multi-Family
    - Single Family
    - Water Reuse
- Service Costs
  - Customer Charge
  - Meter Charge
Rate Setting Process

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

Topics Covered:

- Fixed charges vs. variable charges
- Conservation vs. traditional rate designs
- Evaluating alternative rate structures
Fixed Charges vs. Variable Charges

- **Fixed Charges**
  - Invariant with customer water usage
  - Cost of service fixed charges typically recover customer related costs
  - Fixed charges may include recovery of a portion of capital costs and other fixed costs

- **Variable Charges ("Consumption" Charges)**
  - Vary with amount of water used
  - Recover utility costs that vary with customer usage patterns
  - Recover some portion of utility’s fixed costs
Use of Fixed Charge

All Surveyed Water Utilities (256 Sampled)

96% Have a Fixed Component

4% No Fixed Charge

Source: RFC/AWWA 2006 Rate Survey Data
Fixed Charges vs. Variable Charges (continued)

Typical Fixed Charges

- **Customer Charge**
  - Recovers costs per account basis (ex: billing, collection, etc.)
  - Charges not differentiated by meter size

- **Service Charge by Meter Size**
  - Recovers costs proportionately based on meter size (ex: meter cost & maintenance)

- **Capacity Charge by Meter Size**
  - Recovers costs proportionately based on meter flow capacity (ex: capital and demand related costs)

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

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Fixed Charges vs. Variable Charges (continued)

**Variable Charges**

- Recover all costs not recovered from the service charges
  - Water production, treatment & delivery
  - Wastewater collection, treatment & disposal
- Wastewater consumption is frequently based off a percentage of water consumption
Rate structures typically emphasize variable charges, especially when conservation is an issue.
Conservation Rates vs. Traditional Rate Designs

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

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

Conservation Rate Design

- Flat
- Declining Block
- Uniform
- Inverted
- Seasonal
- Individualized/Goal

Conservation
Evaluating Alternative Rate Structures

Considerations in Evaluating Alternatives

- Pricing objectives
- Revenue Generation Risks
- Availability of resources and data
- Public involvement
- Level of implementation effort
- Elements of rate structure
  - Defining customer classes
  - Frequency of billing
  - How much to charge (fixed charges and consumption charges)
Rate Setting Process

Step 1 - Identify Financial and Pricing Objectives
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Step 5 – Assess Effectiveness of Addressing Pricing Objectives
Step 5: Factors to Consider in Assessing Effectiveness of Rate Structures

**Topics Covered:**

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

With any Rate Structure Change

- Winners and Losers
- Magnitude of Impacts
- Consider phase-in to mitigate impacts
Price Elasticity

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

- Elasticity = \( \frac{\% \text{ change in consumption}}{\% \text{ change in real price}} \)
- Challenging to determine or estimate price elasticity.
Price Elasticity

- Consumers react to average bill, not final rate
- Each user class responds differently
- Peak usage is more sensitive than off peak usage
- Fixed charges affect price elasticity
- Consumer education affects price elasticity
- Timing and lags
- Other demand parameters are strong: temperature, rain, income
What is Affordability?

- Ability of consumers to pay the charges for water service in a timely manner.
- Not the same as willingness to pay.
Affordability of Service

Typical Affordability Measures

- Change Bill Frequency
- Budget Billing
- Target Usage Reduction
- Third Party Programs

- Lifeline Rates
- Percentage of Income Payment Plans
- Rate Discounts
Affordability Programs

- Who benefits
  - Low income
  - Senior Citizens
  - All Customers

- Magnitude of benefit

- Who funds shortfall
  - Internally funded by other customers
  - Externally funded
Discussion