



# Determine the Cost of Water Service

Glenn Barnes

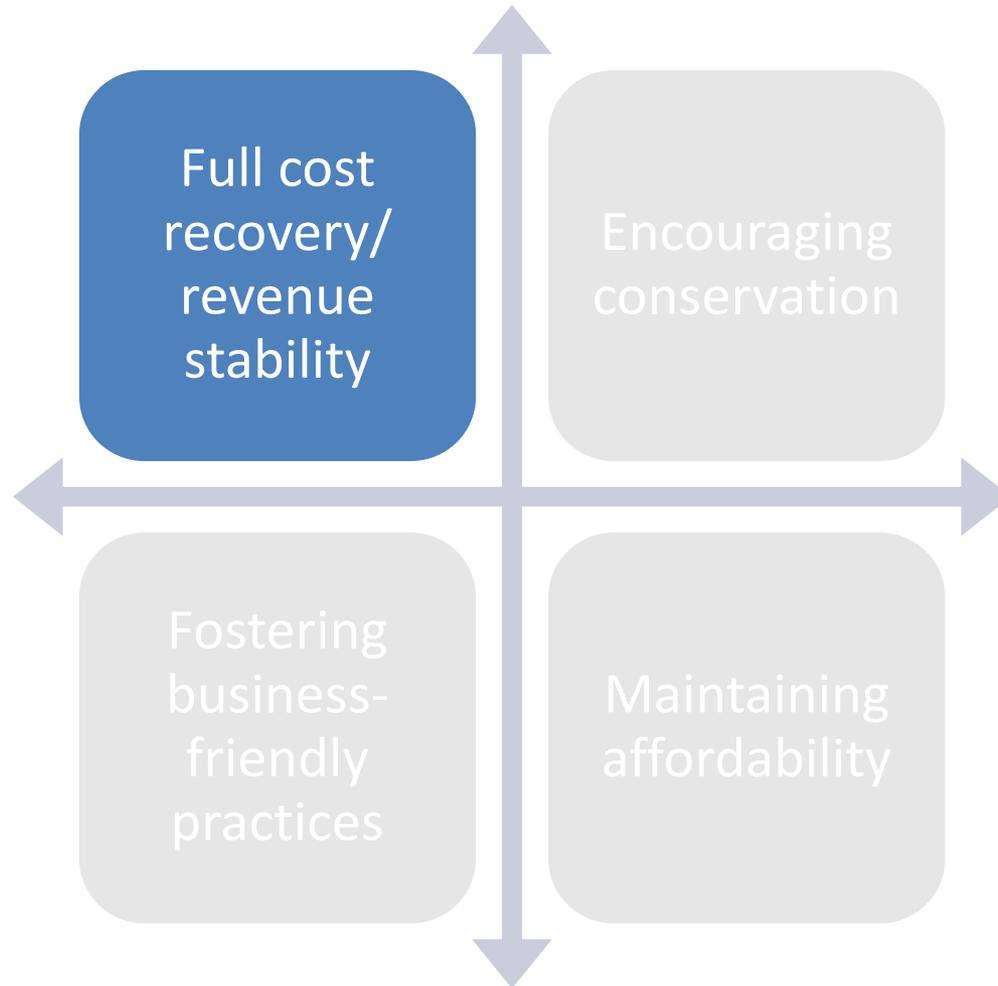
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# Rate Setting Objectives





# Session Objectives

- Understand different types of costs for water systems
- Learn which costs change based on the volume of water produced vs. those that do not change
- Examine a water system budget

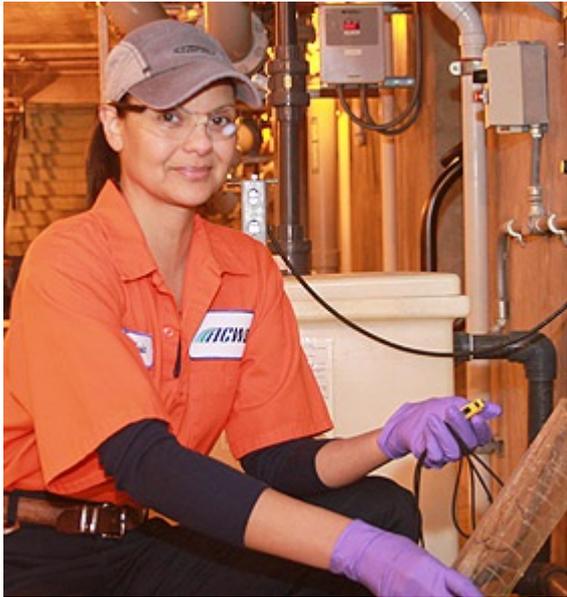


# “Full Cost Pricing”

- Charges for water cover the entire cost of running the water system today and into the future



# Types of Costs



Operating Costs



Capital Costs



Debt Service



Fixed  
Cost

vs.

Variable  
Cost

- Some costs for a water system are **fixed** regardless of the volume of water treated. Others **vary** based on the amount of water treated
- Why “treated” vs. “sold”?

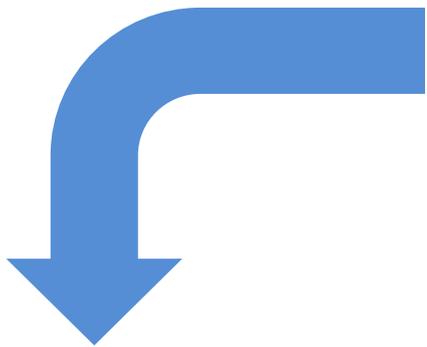


# Operating Costs

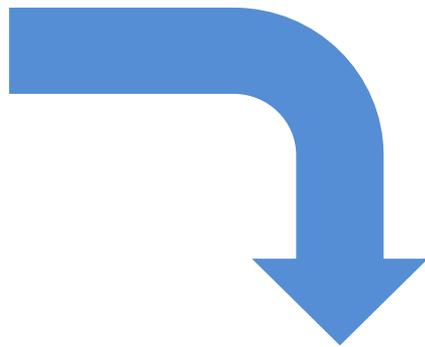
- What you need to run the system day in and day out
- Some of these costs vary depending on the amount of water treated. But others are fixed regardless of the volume of water treated



Operating Costs



Personnel Costs



Non-Personnel Costs

# Personnel Costs: Salaries & Wages



- Management
- Operations and Maintenance
- Engineering
- Administrative staff
- Meter reading
- Mailing bills
- Processing returns
- Enforcement

Fixed  
Cost

# Personnel Costs: Salaries & Wages



- Government/Business manager
- Budget and finance staff
- Legal staff
- HR
- Governing board

Fixed  
Cost

# Personnel Costs: Benefits



- Medical insurance
- Payroll taxes/FICA
- Vacation time
- Sick time
- Retirement
- Others?

Fixed  
Cost

# Personnel Costs: Special



- Overtime
- Bonuses
- Employee Screening
- Staff Functions
- Others?

Fixed  
Cost



# Note on Contracted Services

- If you contract with third parties for any of these services, those are considered non-personnel expenses

# Non-Personnel Costs: Insurance



- Property
- General
- Liability
- Vehicle
- Worker's compensation
- Hospital

Fixed  
Cost

# Non-Personnel Costs: Professional Services



- Accounting
- Legal
- Engineering
- Other Contracted Services

Fixed  
Cost

# Non-Personnel Costs: Treatment & Distribution System



- Supplies used in the day-to-day operations of the system and maintenance of the system (not including major capital purchases)
- Cost of regular maintenance and repair of equipment (not including major repairs)

Fixed  
Cost

# Non-Personnel Costs: Treatment & Distribution System



- Utilities for the operation of the system, including electricity

Variable  
Cost

# Non-Personnel Costs: Other Buildings/Offices



- Annual principal and interest payments on building mortgages, or annual rent payments
- Utilities needed for buildings, including electricity, telephone, and internet
- Computer software
- Office supplies

Fixed  
Cost

# Non-Personnel Costs: Taxes



- Taxes on annual profits
- Franchise fees
- Payments made in lieu of taxes

Variable  
Cost

# Non-Personnel Costs: Bulk Water



- Purchase of treated and untreated water that is resold to customers

Variable  
Cost

# Non-Personnel Costs: Chemicals



Variable  
Cost

# Non-Personnel Costs: Compliance



- Permits
- Certification and training of staff
- Removal or disposal of waste residuals from water treatment
- Testing associated with water quality monitoring
- Fines & Penalties

Fixed  
Cost

# Non-Personnel Costs: Security & Safety



- Security equipment like locks and video

Fixed  
Cost

# Non-Personnel Costs: Vehicle Use



- Fuel and other regular expenses on vehicles
- Maintenance of vehicles including oil changes, tires, tune-ups, basic repairs, etc.

Fixed  
Cost

# Non-Personnel Costs: Leases



- Annual expenses on equipment leased to operate the system

Fixed  
Cost

# Non-Personnel Costs: Billing



- Postage
- Banking
- Online Payment Service Fees

Fixed  
Cost

# Non-Personnel Costs: Employee Support



- Uniforms
- Professional Dues
- Subscriptions

Fixed  
Cost

# Non-Personnel Costs: System Planning



- System studies such as rate studies, leak detection studies, etc.

Fixed  
Cost



# Depreciation is an Operating Cost

- This is an accounting solution to the problem of things getting old
- You have a “cost” every year of your infrastructure wearing out, a percentage of its value

Fixed  
Cost

# Capital Costs



- Rehabilitation and replacement of existing infrastructure and new infrastructure

Fixed  
Cost

# Capital Assets



# Debt Service



- What you owe on loans and bonds

Fixed  
Cost

# Contributions to Reserves



- Whatever revenue is left over at the end of the year once all expenses are paid can be put into reserves (or towards profit)
- But you can set targets for what this amount will be



# General Fund Transfers



- For governmental systems, funds often flow from the water system (an enterprise fund) to and from the rest of government operations (general fund). Is this okay?
- Depends on what the transfer is for...

# General Fund Transfers



- Cover some of the time for the board, manager, budget staff, HR staff, etc.
- Reimburse the vehicle pool
- Because sales tax revenues were short this year
- For a new police cruiser
- Fancy retirement party for the mayor
- So we don't raise property taxes





# Setting Small Drinking Water System Rates for a Sustainable Future

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





# Annual Budget

- All of these costs become part of the annual budget for our water system
- That budget can be helpful as we figure out what to charge for water service, so it is important that the budget be both accurate and complete



**Exercise:**

**Budgeting for the full cost of  
water service**



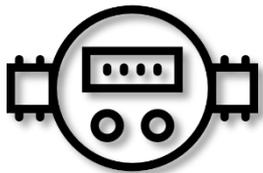


# Irwindale, USA Exercise

Small town with a water and wastewater system



Population: 1,100



Service Connections: 450



MHI: \$24,432



# Irvindale, USA Exercise

1. Match up Irvindale's expenses with the proper budget categories
2. Determine what is missing from the budget



# Understanding how costs change

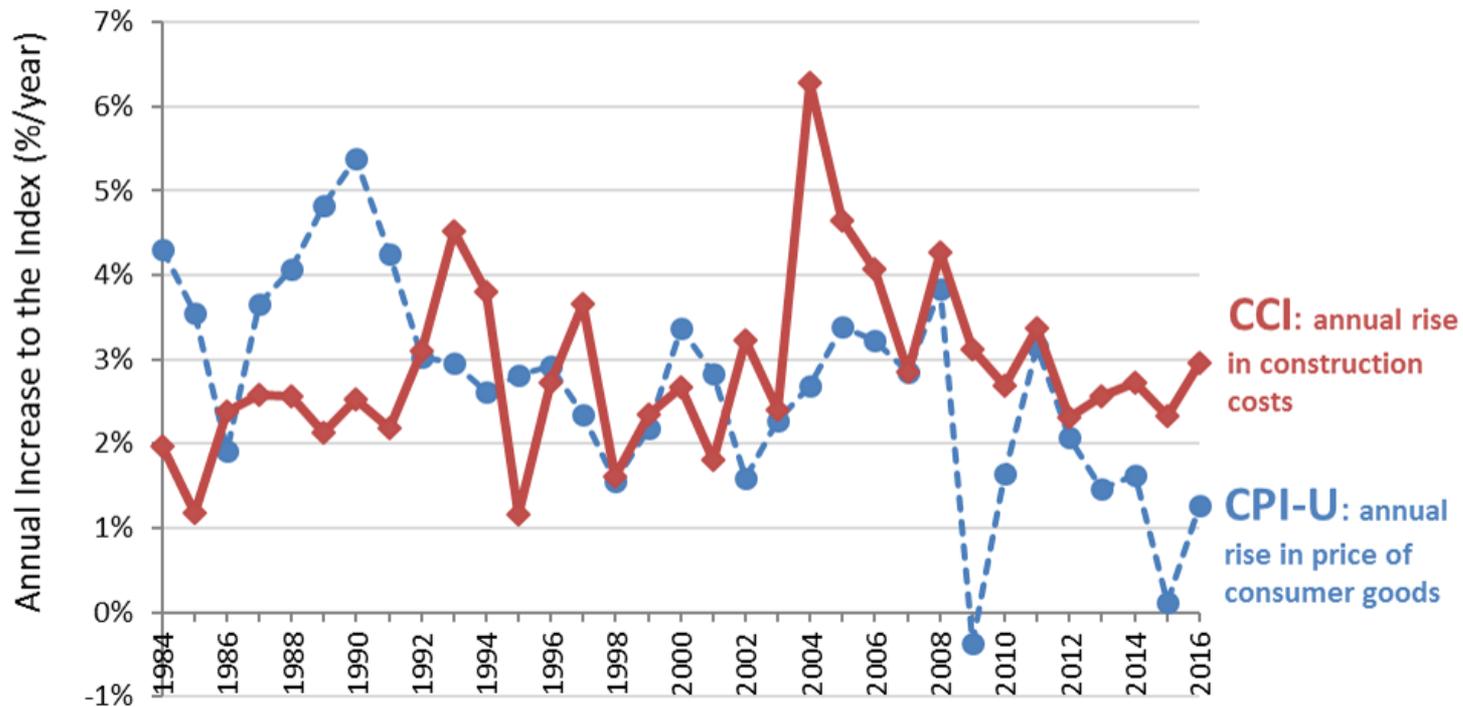


# Measures of Inflation

- **Consumer Price Index (CPI)**—measure of the average change over time in the prices paid by urban consumers for a market basket of consumer goods and services
- **Construction Cost Index (CCI)**—average prices for labor and key construction materials from 20 cities across the United States

## The **Construction Cost Index (CCI)** has been rising faster than the **Consumer Price Index-Urban (CPI-U)** in recent years

Construction costs (CCI) rose on average of **2.6%/year** in the last five years, while consumer goods (CPI-U) only rose an average of **1.3%/year** in the same period



Data graphed by the Environmental Finance Center at the University of North Carolina, Chapel Hill.

Data Sources: Bureau of Labor Statistics (CPI-U), Engineering News-Record ENR.com (CCI), InflationData.com (CPI-U), USDA Natural Resources Conservation Services (spreadsheet containing CCI and CPI-U).

# Linear Projections

- Assume that costs go up by a fixed percentage per year over the course of several years
- Excel is your friend!



# Linear Projections

- Annual cost: \$10,000
- Expected annual increase: 2.5%



# Linear Projections

- Annual cost: \$10,000
- Expected annual increase: 2.5%

~~\$10,000~~  
~~\$10,250~~  
~~\$10,506~~  
~~\$10,769~~  
~~\$11,038~~

$\frac{\$10,250}{\times 0.025}$   
 $\$256$

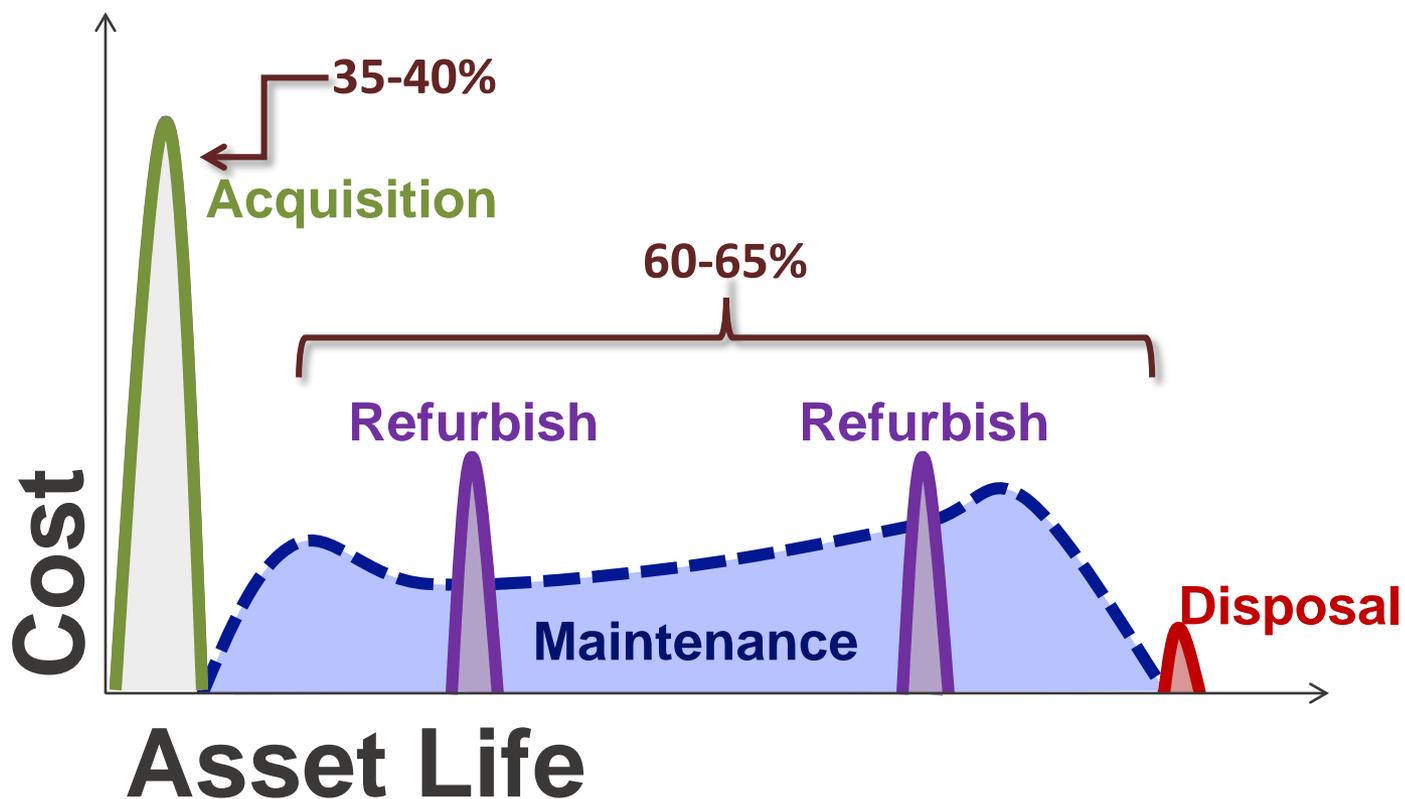




# Reminder: Life Cycle Costing

- Purchase Price  $\neq$  Total Price

# Capital Investments are Just the Tip of the Iceberg...





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