



Smart Management for
Small Water Systems

Funding Opportunities for Small Water Systems

09/27/2018

Portland, Maine

www.efcnetwork.org



New England
Environmental
Finance Center



American Water Works
Association

This program is made possible under a cooperative agreement with the U.S. EPA.



Martha Sheils

New England Environmental Finance Center

University of Southern Maine

207-228-8164

Martha.sheils@maine.edu

<http://neefc.org/>

The Small Systems Program Team

- Environmental Finance Center at The University of North Carolina at Chapel Hill
- Environmental Finance Center at Wichita State University
- EFC West
- New England Environmental Finance Center at the University of Southern Maine
- Southwest Environmental Finance Center at the University of New Mexico
- Syracuse University Environmental Finance Center
- Environmental Finance Center at the University of Maryland
- American Water Works Association (AWWA)



UNC
ENVIRONMENTAL
FINANCE CENTER



WICHITA STATE
UNIVERSITY
HUGO WALL SCHOOL
OF PUBLIC AFFAIRS
Environmental Finance Center



SOUTHWEST
ENVIRONMENTAL
FINANCE CENTER



Environmental
Finance
Center
Syracuse University



ENVIRONMENTAL
FINANCE CENTER



American Water Works
Association

Visit the EFCN Website – *www.efcnetwork.org*

for more information on upcoming events, funding, and resources.



The screenshot displays the EFCN website's homepage. At the top, the EFCN logo is accompanied by the tagline "Innovative Finance Solutions for Environmental Services". A navigation menu includes links for HOME, ABOUT, WORKSHOPS & WEBINARS, ASSISTANCE, RESOURCES, BLOG, and ARCHIVES, along with a search icon. The main banner features a blue background with yellow text and graphics. It includes a question mark icon, the heading "Get Free Help Now!", and a testimonial from a small water system. Below the banner, three small images are shown: a woman presenting, a globe with water droplets, and a person reviewing a bar chart.

EFCN Innovative Finance Solutions for Environmental Services

HOME ABOUT WORKSHOPS & WEBINARS ASSISTANCE RESOURCES BLOG ARCHIVES

Get Free Help Now!

Small water systems can request free technical assistance from our experts on finance and management challenges.

"The thing about working with the EFCN is availability; I can call anytime with a quick question or to get outside advice."



Preparing Winning Financing Applications



Grant v. Loans

Rate Setting & Billing

Benchmarking

Asset Management

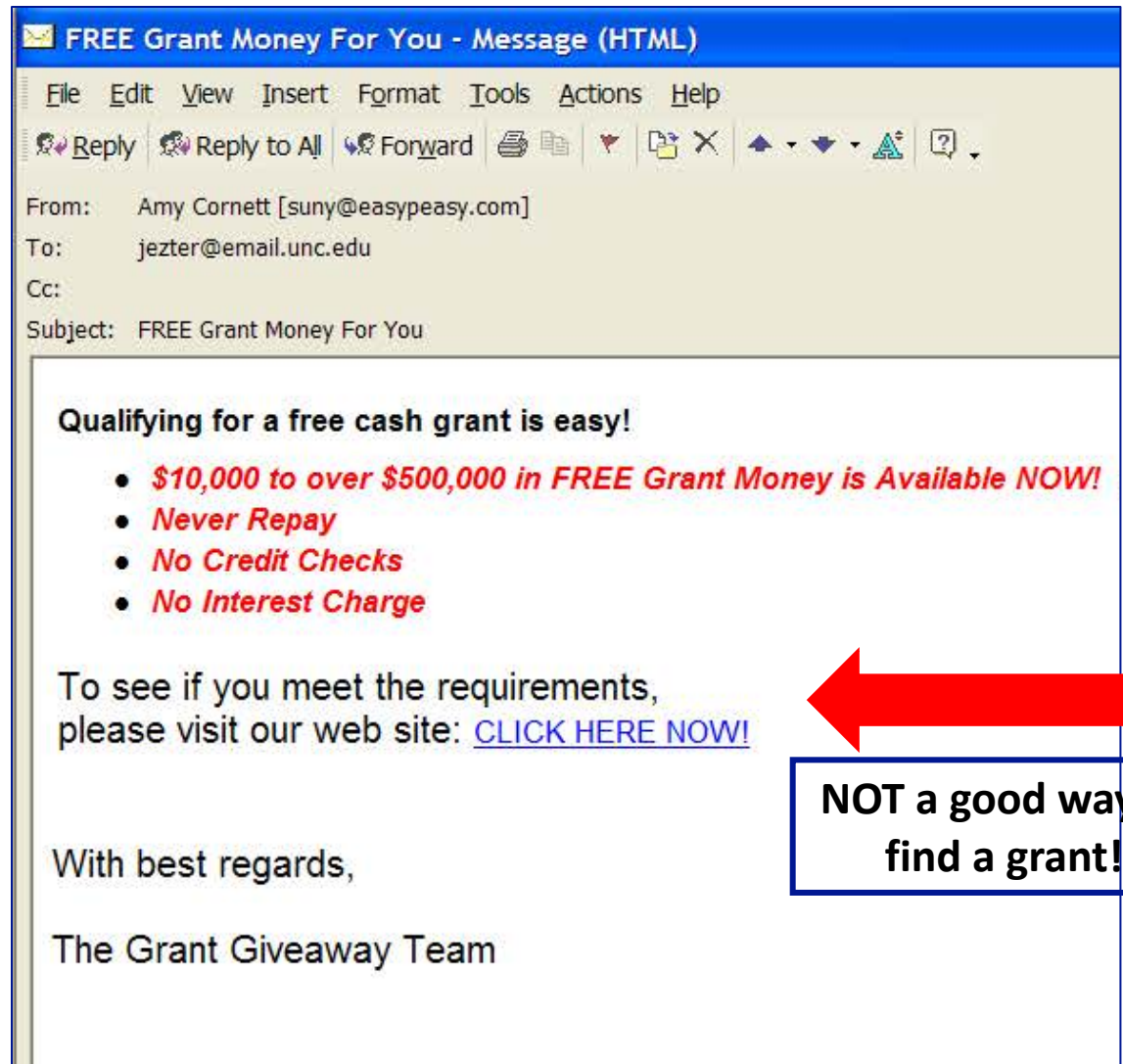
How the Payments are Made For Infrastructure Projects

- Save in advance and pay
- Pay as you go (current receipts)
- **Pay afterwards (someone loans you money)**
- **Grants**



Compare and contrast grants vs loans: sustainable funding sources

About Grants



**NOT a good way to
find a grant!**

Grants Aren't Completely Free Money

- Application for the grant can be expensive – staff time and money
- Applications can take months to process
- Often lots of strings attached
- Often require a percentage match
- Lots of competition
- Difficult to sustain



In the Old Days...

- Water systems took advantage of the federal government's ambitious construction grants program of the 1970s and 1980s
- It seemed like “free” money

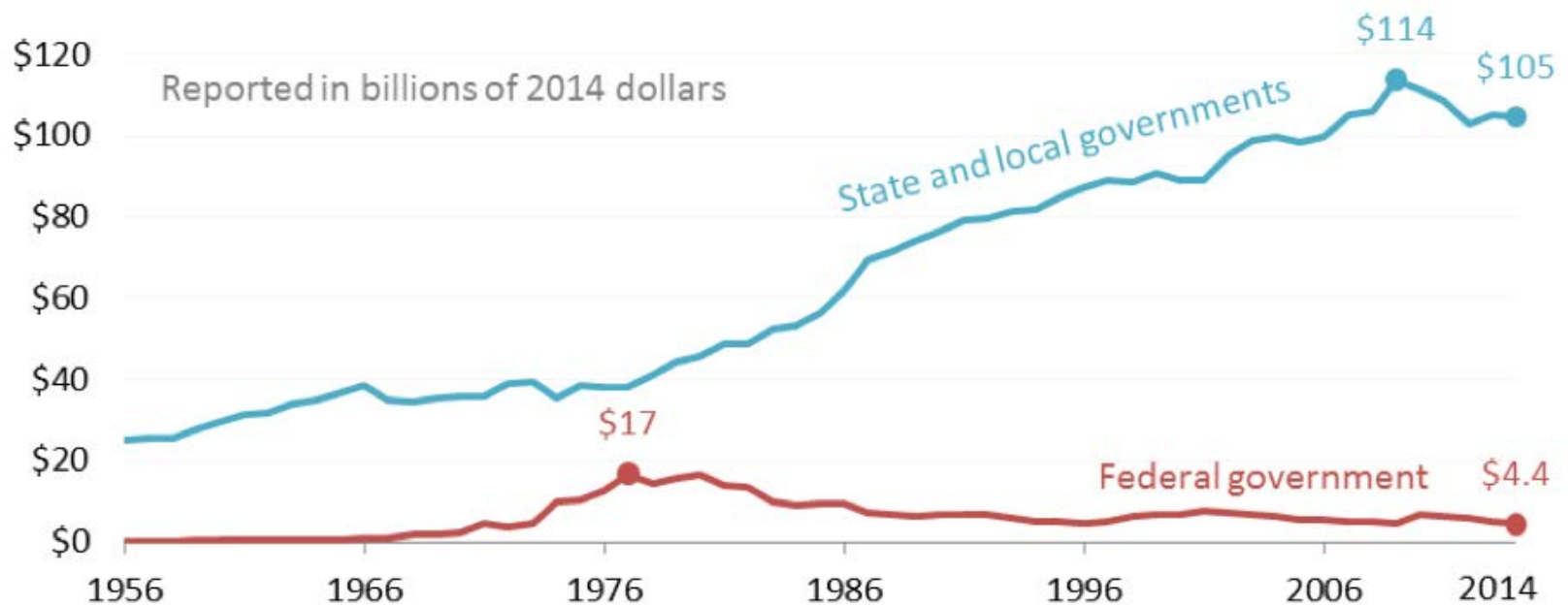


Capital Finance Today

- The money never really was “free” —it came from tax dollars
- Today, the financial burden has been shifted away from federal and state tax dollars (grants) to funds raised by the water system itself (customer sales and loans). For example...

State and local government spending on water and wastewater utilities continued to grow while federal spending declined since the 1980s

State and local governments spent 24 times as much as the federal government in 2014



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

Source: Congressional Budget Office supplemental data for the *Public Spending on Transportation and Water Infrastructure, 1956 to 2014* report (March 2015). Displays public spending on supply systems for distributing potable water as well as wastewater and sewage treatment systems and plants. Real spending is shown after adjusting nominal spending to their 2014 dollar equivalent using infrastructure-specific price indexes.



Loans

- Typically from a bank
- Can be from a government-sponsored program such as the Drinking Water State Revolving Fund



The Debt Market

- Why Borrow?
- Water infrastructure has a long useful life. You may wish to amortize the loan over the life of the equipment so that the people who benefit from the system pay for it

Bonds

- A written promise to repay borrowed money (on a defined schedule and usually at a fixed rate of interest for the life of the bond)
- Different types exist:
 - General Obligation (GO)
 - Revenue



Source: bettermondays.com



When You Need Cash Now: The Debt Market

- Lenders will look at your creditworthiness, your ability to repay the debt, in determining whether to loan to you and your interest rate
- Certain best practices can increase your chances of funding



Generating Needed Revenue – Rates & Billing

© 2004 Ted Goff



“This part of the plan will be funded with all the unused money we must have laying around someplace.”



How much money do you need? Essential background information about rates

Determine critical characteristics of your utility and community

Design the most appropriate rate structure

Cost-of-Service Study

Compute the rates using projected costs and revenues

Re-evaluate/adjust rate structure to fit primary objectives

The Process of Setting Rates



Basic Principles

- Aim at full cost pricing
- Set equitable rates
- Share rate structure with customers
- Rate should be easy to understand
- Rates should be examined annually
- Consider fixed costs vs. variable costs
- Allow for reserve account(s)
- *Promote water conservation?*
- *Promote economic development?*





“Full Cost Pricing”

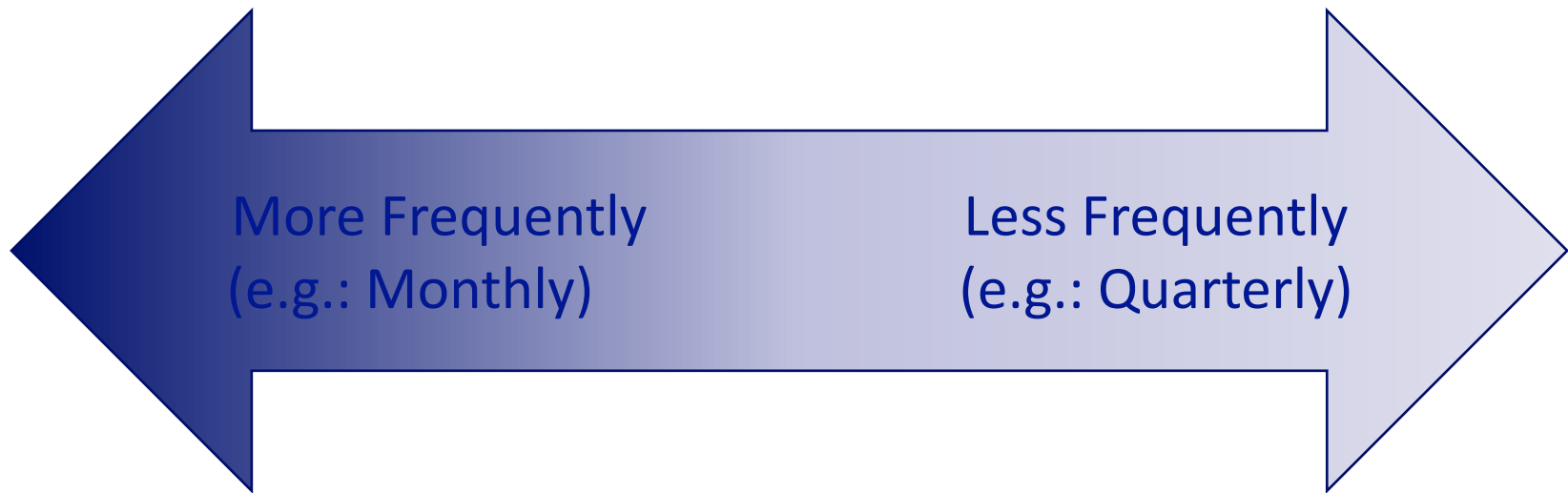
- Operations & maintenance expenditures
- Taxes and accounting costs
- Contingencies for emergencies
- Principal and interest on long-term debt
- Reserves for capital improvement
- Source water protection

A blue-tinted photograph of industrial machinery, possibly a water treatment plant, featuring large pipes and mechanical components.

Elements of Rate Structure Designs

1. Customer classes/distinction
2. Billing period
3. Base charge
4. Consumption allowance included with base charge
5. Volumetric rate structure
6. (If applicable) Number of blocks, block sizes and rate differentials
7. (Optional) Drought Rates
8. Frequency of rate changes

Billing Period

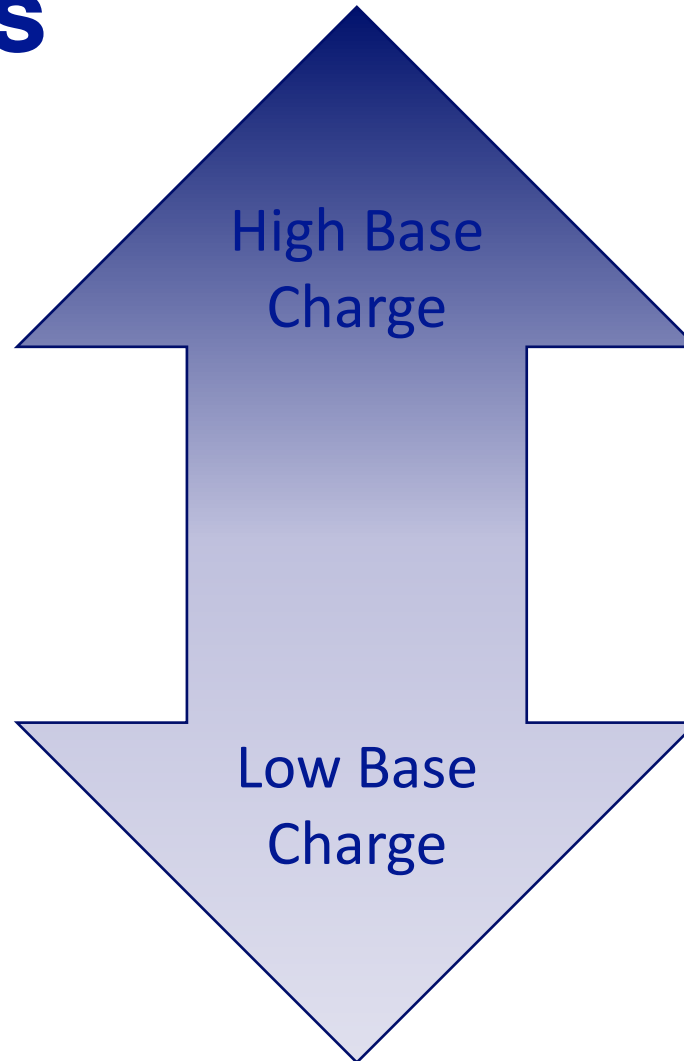


Suggestion: Use a monthly billing period if you can afford it



Base Charges

*Suggestion:
Smaller utilities
should lean
towards higher
base charges*



Consumption Allowance with Base Charge

Do not
include any
(0 gallons)

Include some
amount
(e.g. 1,000 gal/mo)

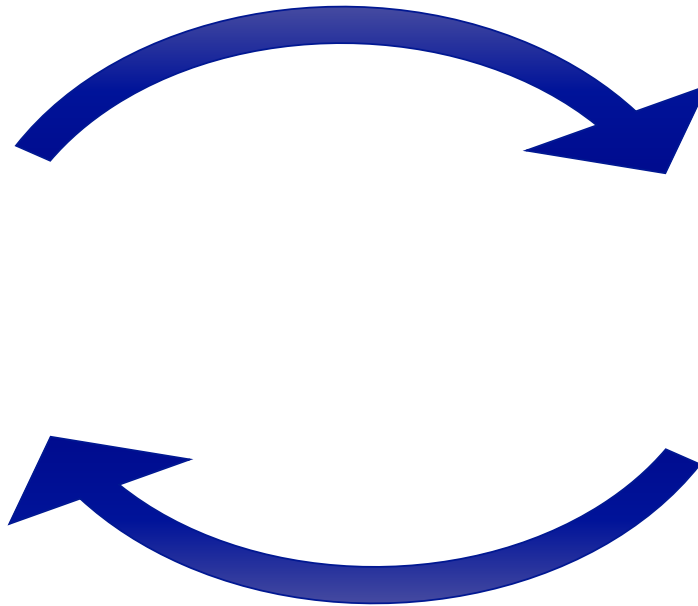
Include high
amount
(e.g. 3,000 gal/mo)

Suggestion: For systems with low base charges, do not include any consumption allowance. For systems with high base charges but wish to encourage conservation, keep consumption allowance low, if any.



How Rates and Usage Interact

Set rates based on projected water use



Raising rates lowers water use

Rule of thumb: water use declines ~2-6% as rates increase 10%





Frequency of Rate Changes

- Always review your rates annually (recommended)
- Review your financial health indicators annually, and then review your rates if any of the indicators reflect poor financing
- Perhaps less politically charged option: Raise rates each year automatically based on inflation



Frequency of Rate Changes

- *Important: Avoid maintaining low rates at the expense of your utility's financial health. It will either lead to a sudden, massive rate increase in the future or to failing systems and endangering public health.*



Benchmarking

Why Care About This?

- Funders and ratings agencies care about this
- As you think about the future needs of your system, you have to know where you are starting from

Can You Sleep at Night?

Is your system self sufficient?

Operating Ratio

Are you able to cover your debt service after paying for your day to day operations?

Debt Service
Coverage Ratio

If your customers stop paying their bills, how long can you maintain operations?

Days Cash on
Hand

Can your system meet its short term obligations?

Current
Ratio

How much of your system's expected life has already run out?

Asset
Depreciation



Whiteboard Video: Financial Benchmarking for Water Utilities

https://www.youtube.com/watch?v=pfs0brT_jkU





So....

- Now that we know where we are, let's decide where we are going...
- How do we estimate the future costs and revenues?



Quick overview of Asset Management

What is Asset Management?

Working **smarter** *not harder* is the essence of Effective Management. Asset Management is the first step to help you.





**Asset Management
Helps You Have the
Most Impact in Your
System By Spending
Your Limited Dollars in
the Best Way Possible**



What you want to do....

Replace all
the assets



New tank
New pipe
New pump
New filter



\$5 Million

Elected Officials/
Decision-Makers Say No



Second Choice: \$3 M

Replace

Some of the

Assets

Elected Officials/
Decision-Makers Still Say No

W Pump

Now What?

Repair and
Rehabilitate



Rehab Option: \$1 M

Rehab
Assets



Reduced
risk almost
as low as
new assets
for 1/5 the
cost





What does this type of analysis take?

- Nothing more than following a systematic approach for managing the assets
- 5 core components of Asset Management
 - Current State of the Assets
 - Level of Service
 - Asset Criticality
 - Life-cycle costing
 - Long-term funding

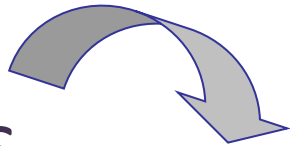


Current State of the Assets

- What do I own?
- Where are the assets?
- What condition are they in?
- How much useful life is remaining?
- What is the replacement value?

Level of Service

Involve
Customers



Measurable
Goals: Internal
and External



Track Progress
Towards
Meeting Goals

Involve
Staff



What would my customers want?

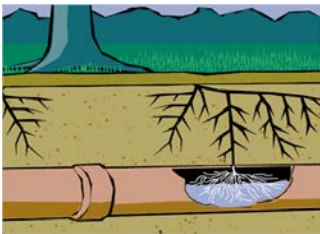


Asset Criticality

What is the probability or likelihood that a given asset will fail?

How do my assets fail?

What's the condition of my assets?



Asset Criticality

What is the consequence if the asset does fail?

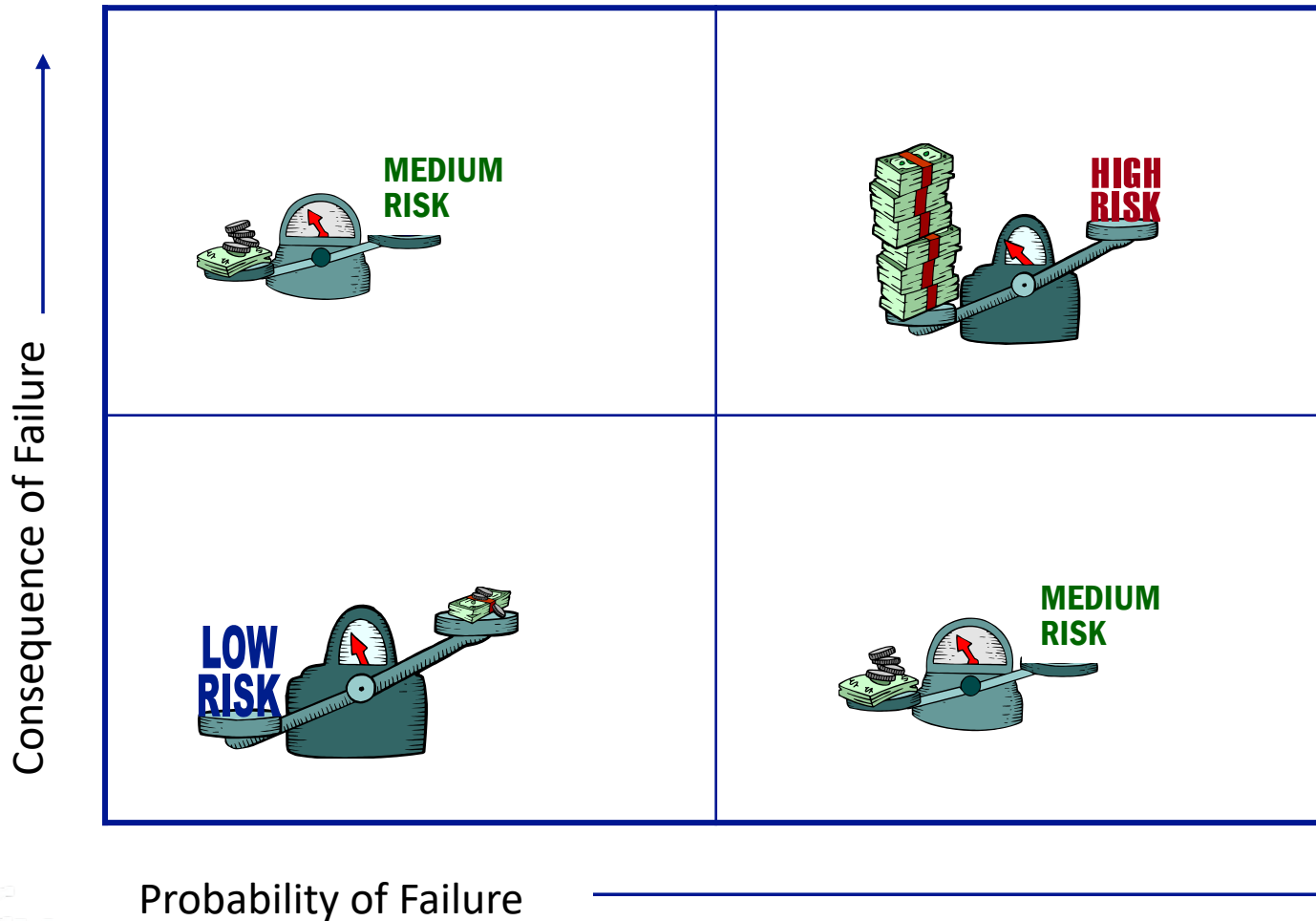
What is the cost of the repair?

Are there legal consequences,
environmental consequences,
social consequences?

Are there redundant assets?

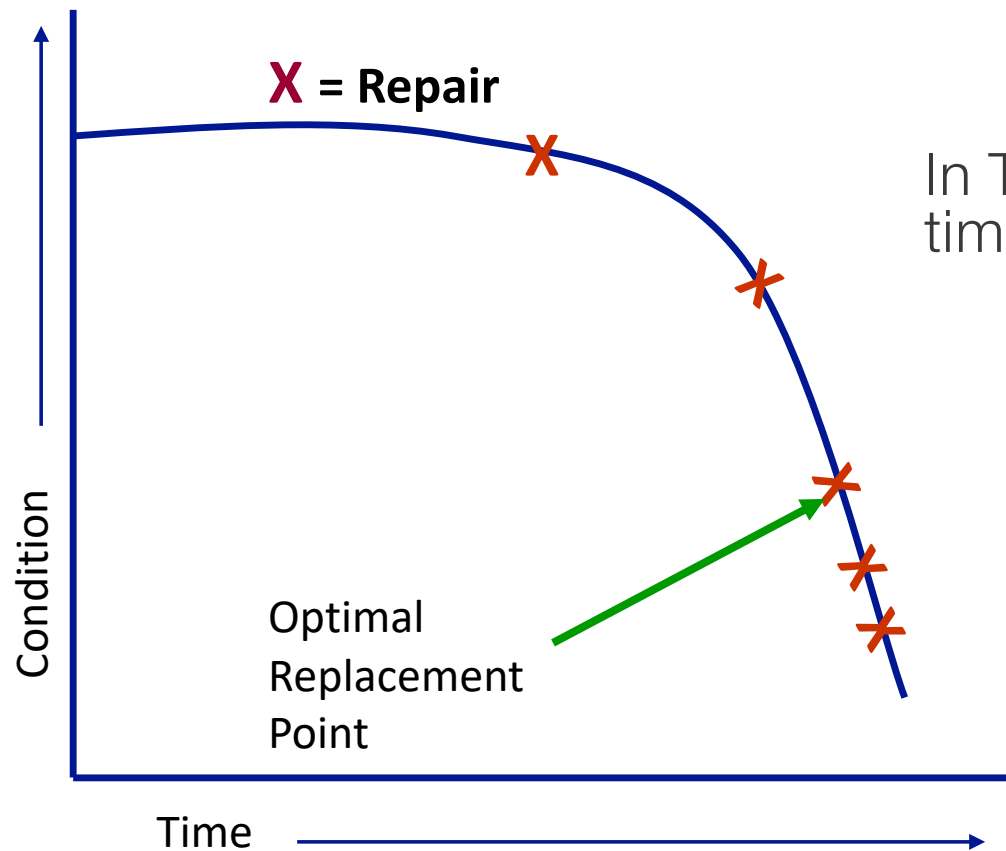


Asset Criticality



Which category of assets do I care the most about? The least?

Life Cycle Costing: Replacement of Assets



In Theory, there is an exact right time to replace an asset

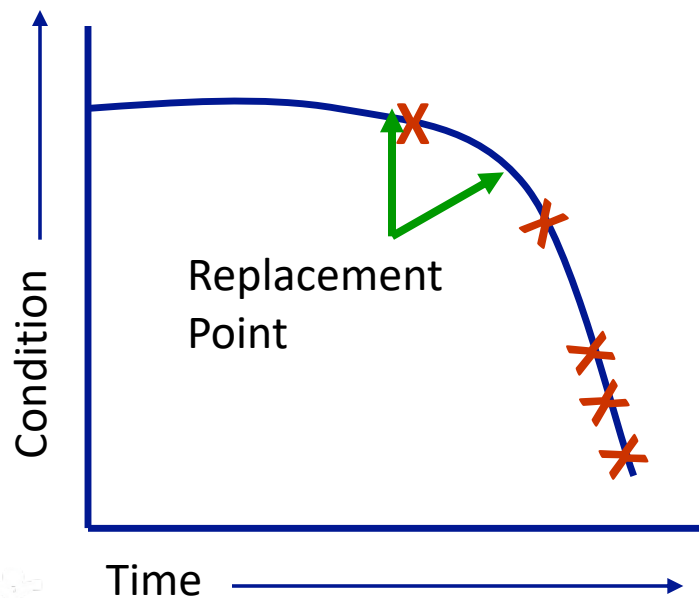
Not possible to know the optimal time to replace every asset

So... need to use the concept of risk

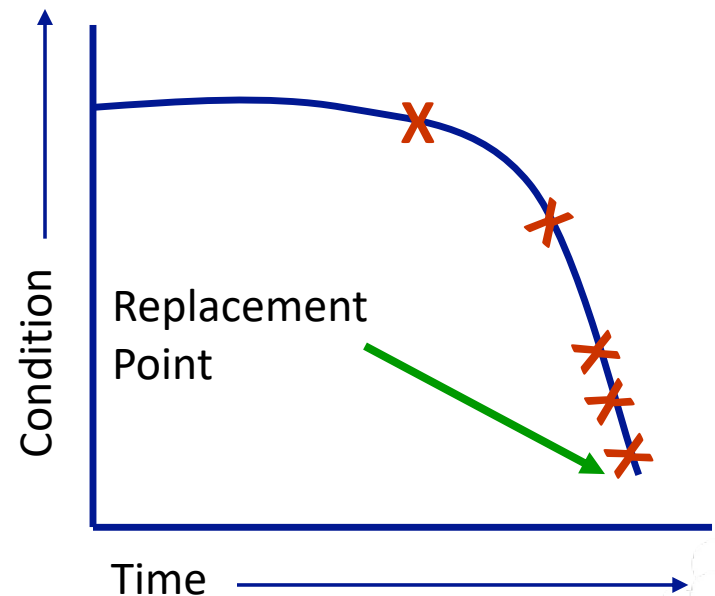


Life Cycle Costing & Risk

High risk : replace assets early, before failure



Low risk assets: run to failure and replace afterwards





Long Term Funding

- This is where capital planning comes in
- Once you figure out how to get the longest life out of your assets, plan to have the money you need to replace them when necessary



Long Term Capital Planning

- This is strongly influenced by asset management
- An official multi-year document that identifies and prioritizes capital projects, identifies funding sources, and sets timelines



Capital Improvement Program

- Identify regulatory deficiencies (discuss with regulatory agencies, look at proposed regulations, talk to consultants), in a 10-20 year window
- Identify growth needs, expansion



Capital Improvement Program

- Identify deferred maintenance problems or where current service is inadequate
- Prioritize based on need realizing that “hidden” infrastructure tends to be ignored



Capital Improvement Program - Timelines

- Use **Asset Management Plan** to plan for capital expenses in the long term (~20 years)
- Create a **Capital Improvement Plan** with a narrower timeline (~5 years) in more detail. Specify the projects and accurate estimates of cost. Plan where money will come from.

Example Capital Improvement Plan (CIP)

Project Name	Planning Years (Values in 000s)					Future	Total
	FY 02	FY 03	FY 04	FY 05	FY 06		
Water Supply & Treatment							
Water Treatment Objective							
Lime pumps and slakers	740						740
Chemical Enclosures		500					500
Filter 7-18 Control			330				330
Filter Gallery Rehab	1,140						1,140
High Service Pumps		1,500					1,500
Upgrade or Replace Reclaim System Drier	200						200
New Membrane Skids				5,700			5,700
Sodium Hypochlorite Plant	2,000						2,000
Additional Storage Tanks					5,000	3,300	8,300
Repair R/O Capacity		150					150
Filter Gallery Mech Parts	300						300
MMIS						150	150
VFDs - HSP		344					344
Membrane Replacement		1,600					1,600
Painting of Water Plant						3,000	3,000
Phase II Emergency Power Generator						1,500	1,500
Portable Generator - South Well Field				150			150
Replacement of Fuel Tanks			170				170
Upgrade of Existing Control System @ WTP						580	580
Water Treatment Total	4,380	4,094	500	5,850	5,000	8,530	28,354

A blue-tinted photograph of industrial machinery, possibly a large pipe or valve, serves as the background for the top portion of the slide.

Capital Improvement Program - Timelines

- Create a **Capital Improvement Budget** with an even narrower timeline (1 – 2 years) committing funds for the planned capital projects. Get it approved/adopted.



Where Can You Find the Prices?

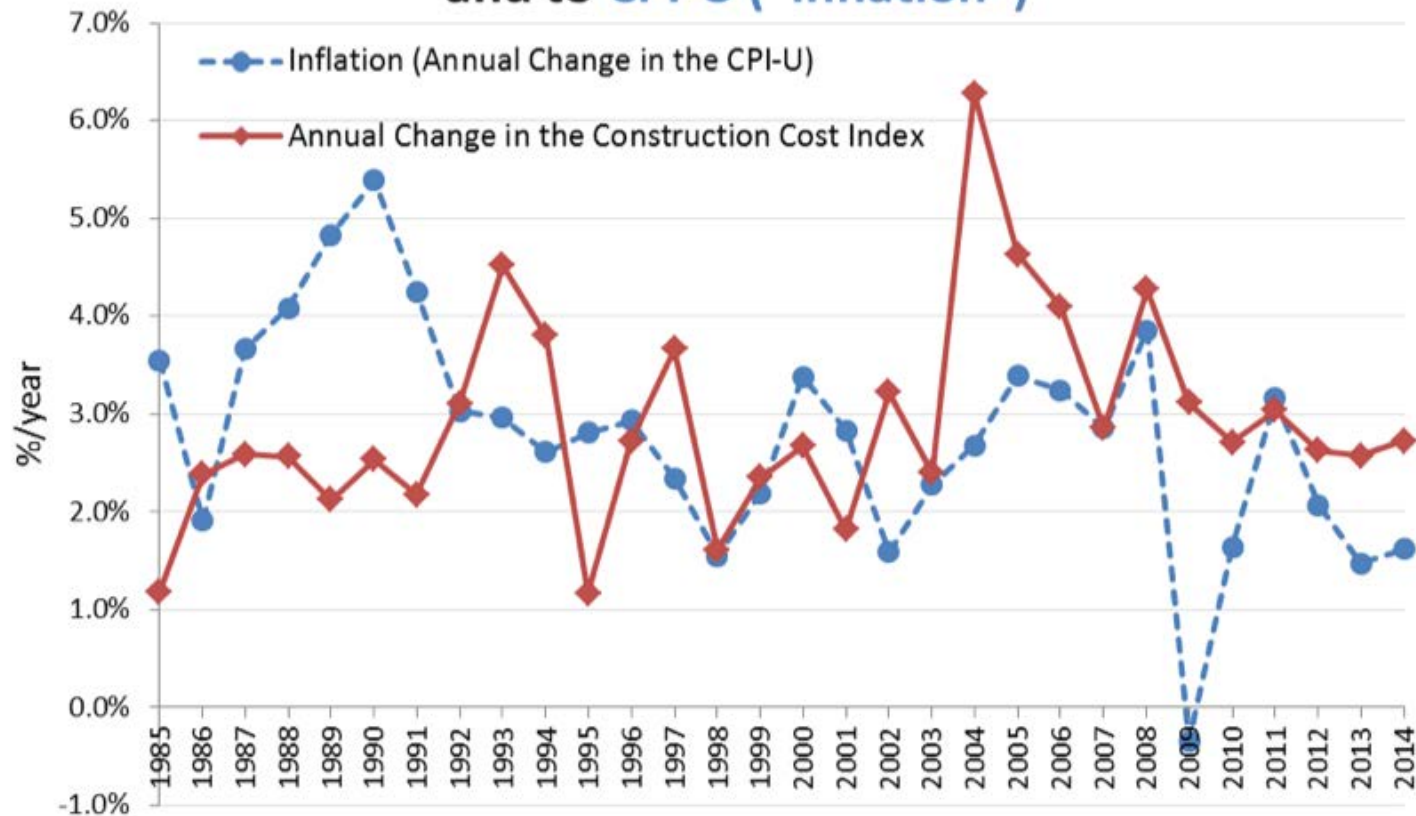
- Call a vendor. Actually, call a few.
- Ask other systems
- Look at past expenses but adjust for increases in costs



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

Annual Changes to the Construction Cost Index and to CPI-U ("Inflation")



Data analyzed by the Environmental Finance Center at the University of North Carolina, Chapel Hill.
 Data Sources: Bureau of Labor Statistics, Engineering News-Record ENR.com, InflationData.com,
 USDA Natural Resources Conservation Services.

<http://efc.web.unc.edu/2012/09/26/using-an-index-to-help-project-capital-costs-into-the-future/>




Drive Down the CIP Cost

- Is it possible to
 - Eliminate projects?
 - Defer projects?
 - Repair or refurbish instead of replace?
 - Find a non-asset solution?
 - Find collaboration/partnerships alternatives with neighboring systems?
 - Improve balance of cash vs. debt-financed?
- Re-evaluate water demands of your customers.
Many systems are now noticing that *total* demand is *decreasing* over time.

Resource Webpage for Capital Planning

UNC SCHOOL of GOVERNMENT

About the School | Courses and Resources | Library | MPA | Publications



search this site

About Services Programs Resources Etc

Mission Statement

We work to enhance the ability of governments and other organizations to provide environmental programs and services in fair, effective and financially sustainable ways.


Project Tools

User-friendly Capital Improvement Plan (CIP) Tool for Water & Wastewater Utilities

Calculator, 03/20/2014 (MS Excel, 802 Kb)
Enter in all capital projects and this tool will project your fund balance (revenues, expenses and reserves), and necessary rate increases for the next 20 years, and more!

What to Include in your Capital Plan:

PROJECT CAPITAL PLANNING AND WASTEWATER



This project, p Support project Department of together many water and was creation of a C Management P

Blog Post on "Using an Index to Future"

Read a short blog post on selecting an appropriate

Summary of "What to Include in Your Capital Plan: A Reference Guide for NC Water and Wastewater Utilities"

Last updated: February 2013

Categories	Water & Wastewater Management: A Handbook for Local Water Agencies	Local Water CIP (2004-10-2013)	Capital Planning and Financial Modeling	Local Water Capacity Development Program	Local Water Loans and Grants	Local Water Construction Grants and Loans	Local Water Loans and Grants	Local Water Construction Grants and Loans	Local Water Construction Grants and Loans	Local Water Construction Grants and Loans	Local Water Construction Grants and Loans
Executive Statement/Introduction to your capital plan											
Date of documentation of capital plan											
Capital planning time period											
Description of systems											
Existing capacity and demand											
Description of customers											
Inventory of existing assets (details on each asset)											
Condition of systems											
Project-specific details (complete for each project in every year)											
Financial planning (complete for each year in time period)											
Long term planning descriptions (may be project-specific)											
Approvals											
Updating the capital plan											
Files or links to other studies											

For updates and to view details in each category, go to: <http://www.efs.unc.edu/projects/capitalplanning.html>

Created by the Environmental Finance Center at the UNC School of Government

User-Friendly Capital Improvement Plan (C.I.P.) for Water & Wastewater Utilities Tool

Free, simplified CIP tool using only MS Excel,
developed by the Environmental Finance Center at UNC.

Download the latest
version at
<http://efc.sog.unc.edu>.
Find it in Resources /
Tools.

Tool development was funded by
the
Public Water Supply Section of
DWR/ NCDENR
and partly by the USEPA.

User-friendly Capital Improvement Plan (CIP) for Water and Wastewater Utilities
Version 2.5 (Updated March 2014)

30-year capital planning
Debt and/or capital reserves financing options
Guided data inputs
Simple data needs

Start

1) Use tabs at bottom of screen and buttons to navigate to different pages.

2) In "Data Input 1", enter utility characteristics, rates and usage information in blue cells:

3) In "Data Input 2", enter details on capital improvement projects in the light blue cells. Each row is a different project.

4) In "20-Year Projections", view your fund balance projections for 20 years and observe the estimated rate increases needed each year to pay for your Capital Improvement. No data entry required on this page.

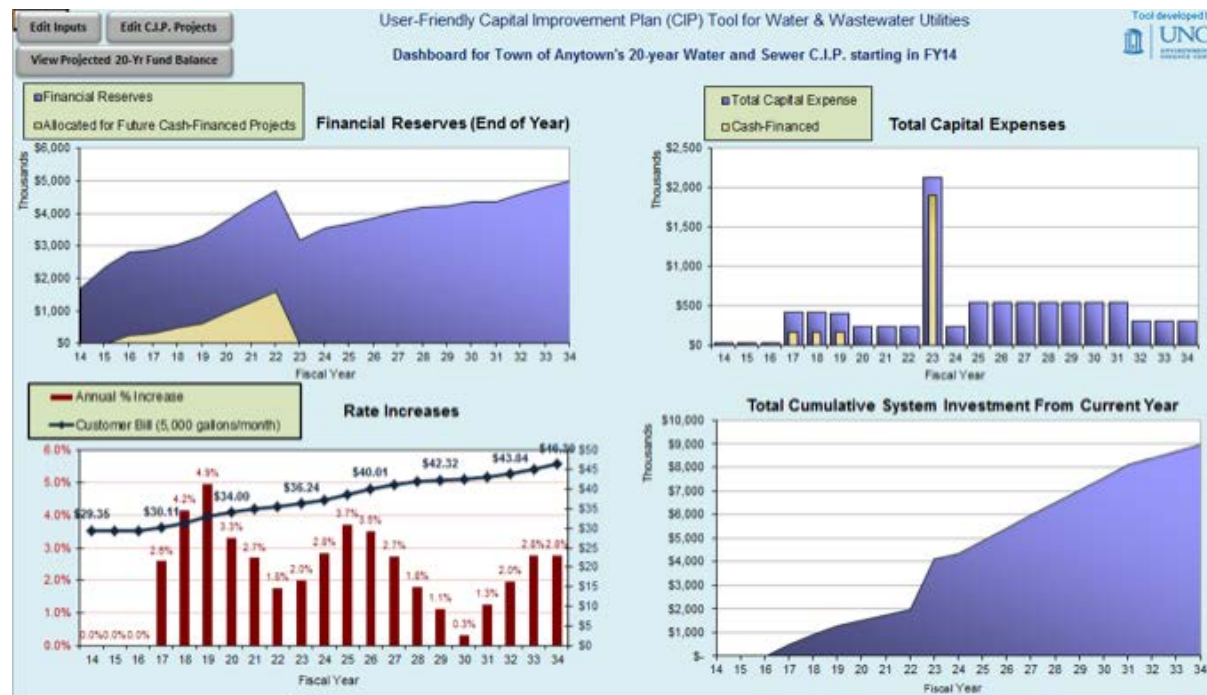
5) After all your utility information and capital improvement project details are entered, go to the "Dashboard" to view long term trends in your financial reserves, rate increases and average bills, and capital investments.

Copyright © 2013 Environmental Finance Center at the University of North Carolina. Development of this tool was funded by the NC Department of Environment and Natural Resources (Public Water Supply Section) and the U.S. Environmental Protection Agency. Download the latest version of this tool at efc.sog.unc.edu. Find it in Resources / Tools.



What the Tool Does

Summarizes your utility's capital needs in the next 20 years, and estimates rate increases needed to fully fund the capital projects, based on debt and/or cash funding requirements





Review

Grant v. Loans
Rate Setting & Billing
Benchmarking
Asset Management

A blue-tinted photograph of industrial machinery, likely a large pump or valve, serves as the background for the top portion of the slide.

Thank You!

And please let us know if you have any questions.

Martha Sheils

New England Environmental Finance Center

Martha.sheils@maine.edu

<http://neefc.org/>