



Smart Management for  
Small Water Systems

# Webinar: DEVELOPING AND FINANCING A CAPITAL PLAN FOR A WATER SYSTEM

Tuesday, May 5<sup>th</sup>, 2015

Presenter: Stacey Isaac Berahzer – EFC at UNC



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



# UNC

## ENVIRONMENTAL FINANCE CENTER



UNC SCHOOL of GOVERNMENT

*Dedicated to enhancing the ability of governments and other organizations to provide environmental programs and services in fair, effective, and financially sustainable ways through:*

- Applied Research
- Teaching and Outreach
- Program Design and Evaluation



*How you pay for it matters*



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<http://efc.sog.unc.edu>

 @EFCatUNC



## About the Environmental Finance Center Network (EFCN)

The Environmental Finance Center Network (EFCN) is a university-based organization creating innovative solutions to the difficult how-to-pay issues of environmental protection and improvement. The EFCN works with the public and private sectors to promote sustainable environmental solutions while bolstering efforts to manage costs.

## The Smart Management for Small Water Systems Program

This program is offered free of charge to all who are interested. The Project Team will conduct activities in every state, territory, and the Navajo Nation. All small drinking water systems are eligible to receive free training and technical assistance.

### What We Offer

Individualized technical assistance, workshops, small group support, webinars, eLearning, online tools & resources



## Areas of Expertise

- Asset Management
- Fiscal Planning and Rate Setting
- Energy Use and Efficiency
- Financial Regulatory Compliance
- Communications and Decision-making
- Multi-funding Coordination
- Water Loss Reduction
- Partnering with Other Water Systems
- Managing Small Systems in Drought



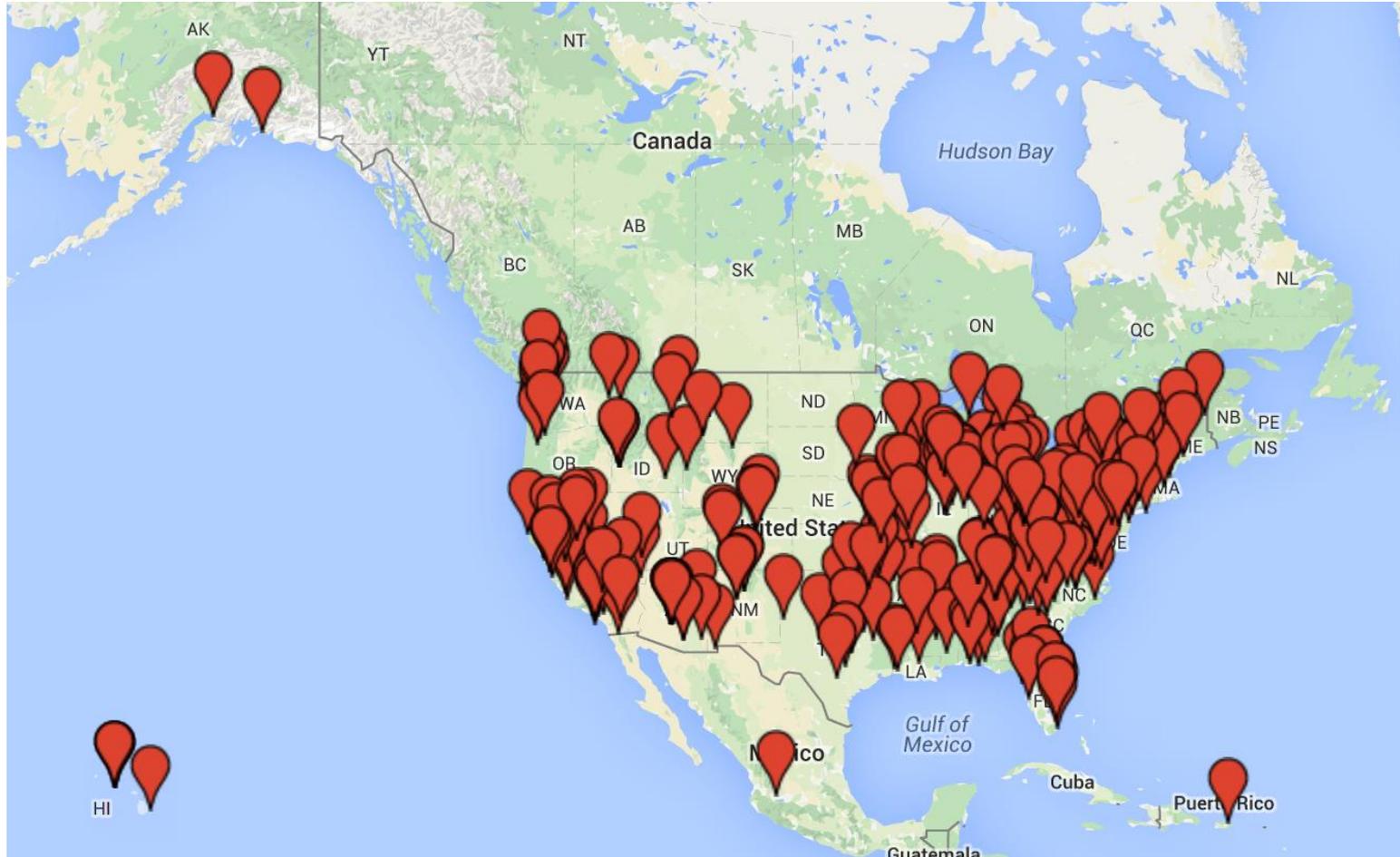
## Project Team

- Environmental Finance Center at University of North Carolina at Chapel Hill
- Southwest Environmental Finance Center
- Syracuse University Environmental Finance Center
- Environmental Finance Center at Wichita State University
- EFC West
- Environmental Finance Center at University of Maryland, College Park
- Environmental Finance Center at University of Louisville
- Great Lakes Environmental Finance Center at Cleveland State University
- New England Environmental Finance Center at University of Southern Maine
- American Water Works Association





# Map of Today's Participants





# Workshop Objectives

- Understand the spectrum of financing options for water infrastructure needs
- Learn about creating a capital plan for your water system
- Demonstrate some tools on creating a Capital Plan
- Compare and contrast grants versus loans and other more sustainable funding sources



# Agenda

START	END	#	TOPIC
1:00 pm	1:30 pm	I	Understand the spectrum of financing options for water infrastructure needs
1:30 pm	2:00 pm	II	Learn about creating a capital plan for your water system
2:00 pm	2:30 pm	III	Demonstrate tools on creating a Capital Plan
2:30 pm	2:45 pm	IV	Compare and contrast grants versus loans and other more sustainable funding sources
2:45 pm	3:00 pm	V	Q&A Session



# INTRODUCTION



[www.efcnetwork.org](http://www.efcnetwork.org)



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# Background

- There are **several** potential funding sources for water projects
- It can be hard for small systems to navigate all these different programs
- Applying for funding for one project from multiple programs can be complicated
- Some states have developed unified funding committees to help small water systems in navigating the process
- Certain Best Management Practices may increase an applicant's chances of funding



# General Coordination Benefits

- *For Funders* - Support funding program goals and efforts
- *For applicants*- Improved customer service experience
- *For citizens* - Stretches public funding dollars



Funding Coordination at the State Level

# THE SPECTRUM



[www.efcnetwork.org](http://www.efcnetwork.org)



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# The “Universe” of Funding Coordination

- ~ 34 states report some level of coordination
- In ~ 27 states, federal funders participate
- In ~ 6 states applicant **MUST** apply to coordinating body
- ~ 5 states have staff positions for coordinating
- ~ 3 states have a distinct budget for coordination efforts

*Source: EFC at UNC research from 2007*



# The Small Community Water Infrastructure Exchange

- A network of water funding officials
- Under the auspices of the Council of Infrastructure Financing Authorities (CIFA)
- <http://www.scwie.org/>
- Lists “Contacts by State”



# Funding Coordination Practices

## Common

- Structured
- Committed participants
- USDA participation
- Strong leadership
- Focus on a few services

## Uncommon

- Require funders to fund projects contrary to their funding objectives
- Significant staff resources
- Comprehensive
- Resemble neighboring states



# Polling Questions 1 and 2



# Additional Resources

- EPA Handbook of Coordinating Water and Wastewater Funding  
[http://www.epa.gov/ogwdw000/dwsrf/pdfs/guide\\_dwsrf\\_funding\\_infrastructure.pdf](http://www.epa.gov/ogwdw000/dwsrf/pdfs/guide_dwsrf_funding_infrastructure.pdf) (2003)
- EFC at UNC Funding Coordination Resource Page  
<http://www.efc.sog.unc.edu/project/water-infrastructure-funding-coordination> or search for “funding coordination” (2007)



# What are the Funding Programs in Your State?

<http://efcnetwork.org/resources/funding-sources-by-state/>



# APPLYING TO A FUNDING PROGRAM



[www.efcnetwork.org](http://www.efcnetwork.org)



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# Background



# 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**

# About Grants

**FREE Grant Money For You - Message (HTML)**

File Edit View Insert Format Tools Actions Help

Reply Reply to All Forward Print X

From: Amy Cornett [suny@easypeasy.com]  
To: jezter@email.unc.edu  
Cc:  
Subject: FREE Grant Money For You

**Qualifying for a free cash grant is easy!**

- ***\$10,000 to over \$500,000 in FREE Grant Money is Available NOW!***
- ***Never Repay***
- ***No Credit Checks***
- ***No Interest Charge***

To see if you meet the requirements, please visit our web site: [CLICK HERE NOW!](#)

With best regards,

The Grant Giveaway Team

**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
- Everybody loved their “free” money



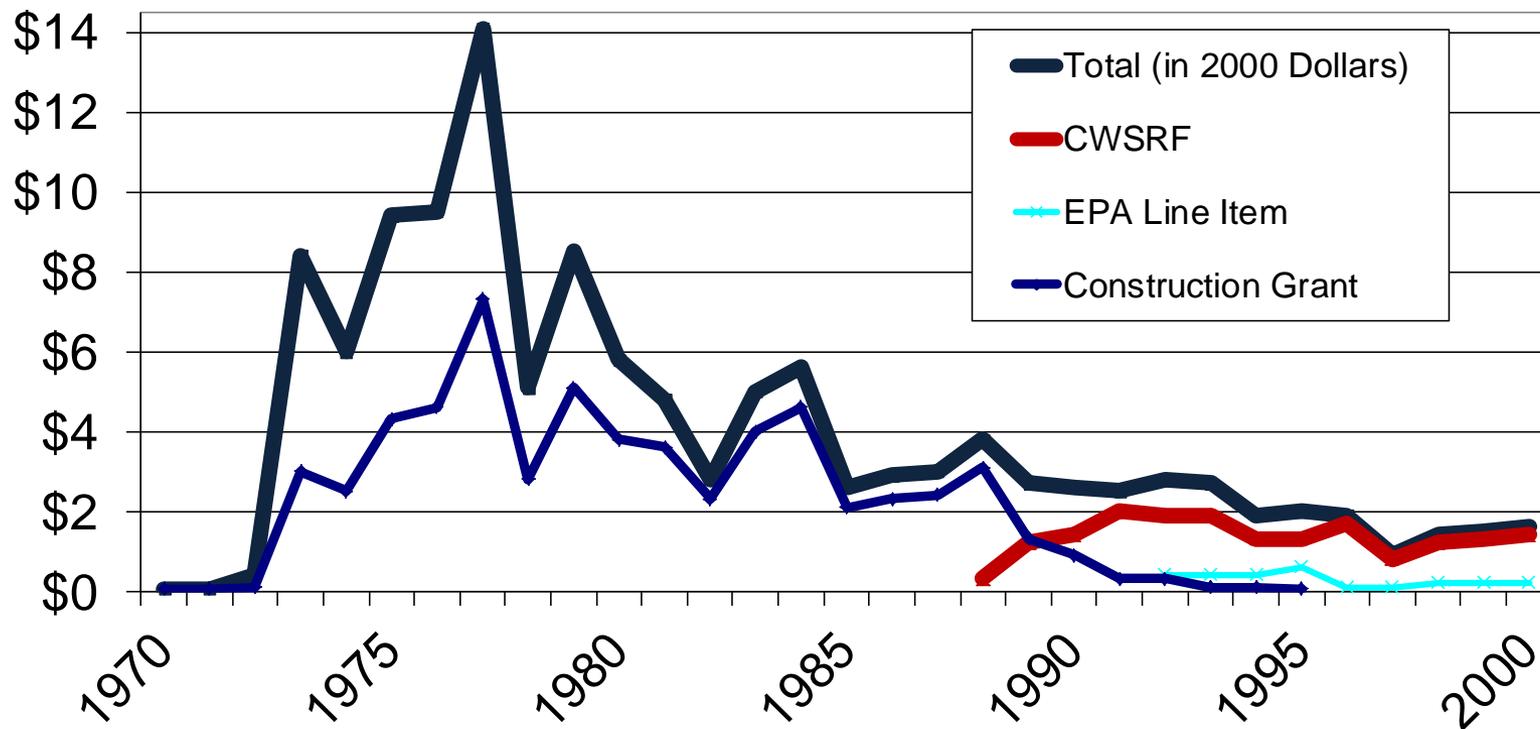
# Capital Finance Today

- 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...



# Grants Have Been Replaced by Loans

EPA Wastewater Spending by Type (billions of dollars)





# 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 definite 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
- Having a CIP can increase your chances of funding



Best Practices when applying for funding

# DEVELOPING A CAPITAL PLAN



[www.efcnetwork.org](http://www.efcnetwork.org)



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# Session Objectives

- Understand the benefits of capital planning
- Understand the components of a Capital plan



# How much money do you need?



# Three Types of Costs

- **Operating Costs**—what you need to run the system day in and day out
- **Capital Costs**—repair and replacement of existing infrastructure and new infrastructure
- **Debt Service**—what you owe on loans and bonds



# Two Types of Revenues

- **System Revenues** — Money from **rates**, tap fees, impact fees, grants, other sources
  - Note: To be a true enterprise fund, not taxes!
- **Debt** — Money from bonds and loans



# Many Types of Reserve Funds

- **Capital Reserve Fund**—Infrastructure rehabilitation and replacement
- **Repair Fund**—Known, ongoing maintenance issues
- **Emergency Fund**—Unknown, unanticipated maintenance issues
- **Rainy Day Fund**—Unexpected revenue shortfalls



# How Much Do You Need In Your Reserves?

- It depends
- Enough to pay for your most expensive piece of equipment?
- Enough to cover your costs if you had no revenue for two months?
- Enough to cover the projects in your capital improvement plan?



# 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 Plan

- 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)



# Capital Improvement Program - Timelines

- 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.



# 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.



# Example Capital Improvement Plan (CIP)

Project Name	Planning Years (Values in 000s)					Future	Total
	FY 02	FY 03	FY 04	FY 05	FY 06		
<b>Water Supply &amp; Treatment</b>							
<b>Water Treatment Objective</b>							
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
<b>Water Treatment Total</b>	<b>4,380</b>	<b>4,094</b>	<b>500</b>	<b>5,850</b>	<b>5,000</b>	<b>8,530</b>	<b>28,354</b>



# 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

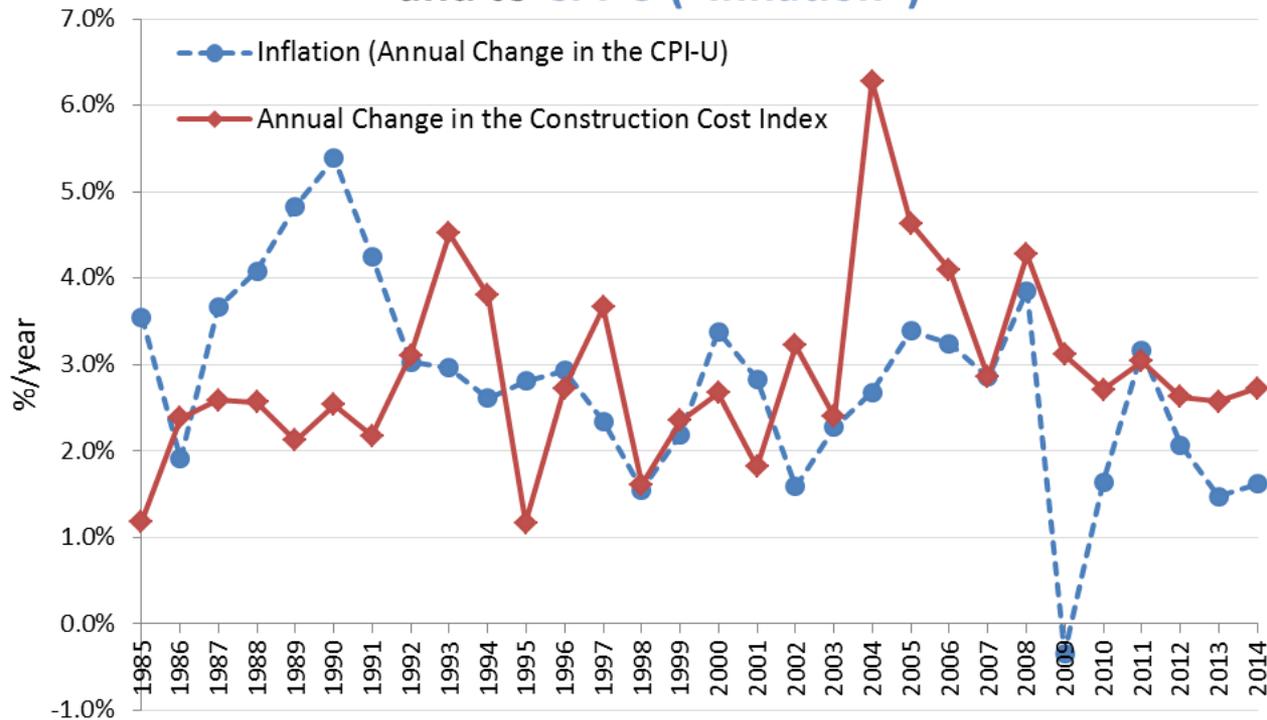


# Measures of Inflation

- **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.

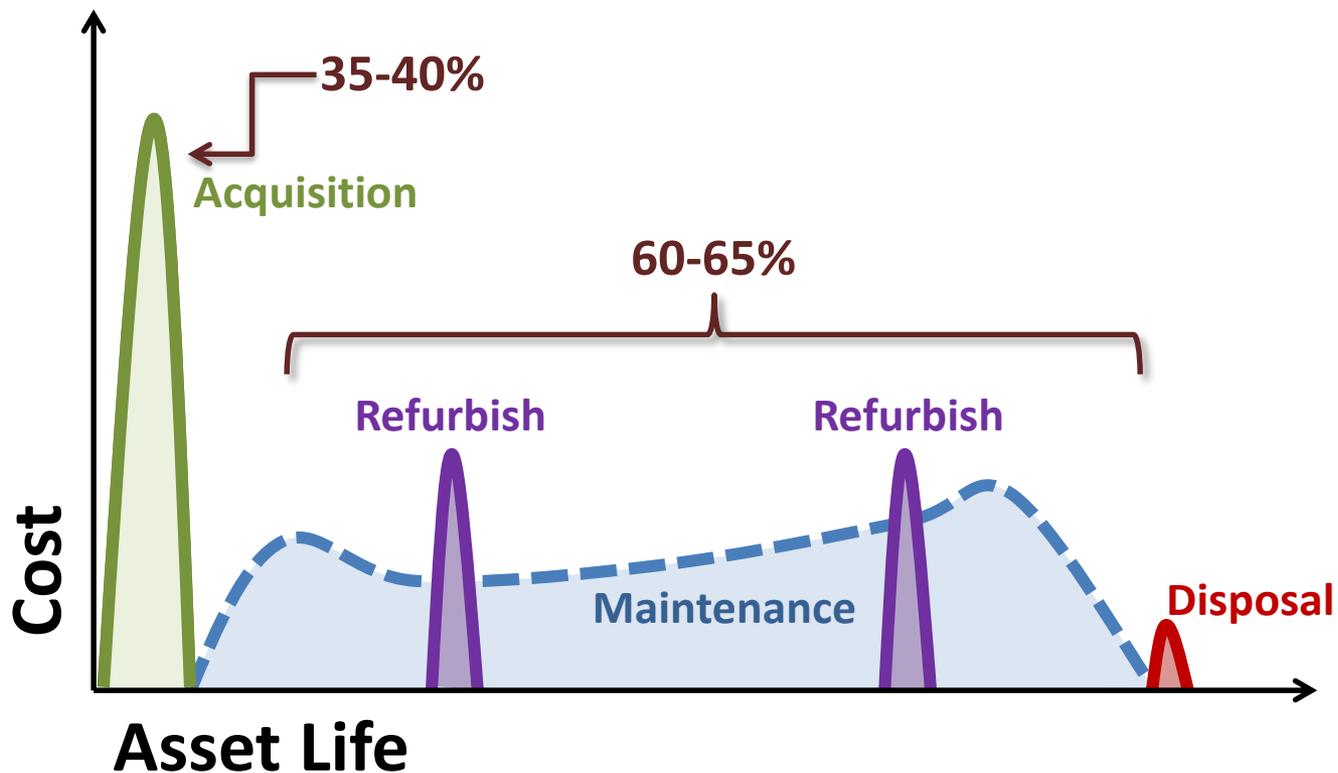


# Reminder: Life Cycle Costing

- Purchase Price  $\neq$  Total Price



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



Source: Adapted from Steve Allbee, USEPA

# Resource Webpage for Capital Planning

UNC SCHOOL of GOVERNMENT

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



search this site

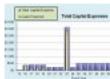
About Services Programs Resources Events

## 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, supported by the Department of Environment and Natural Resources, brings together many water and wastewater professionals in the creation of a Capital Management Plan.

### Blog Post on "Using an Index to Measure the 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 2011

Categories	EPA's "Asset Management: A Handbook for Small Water Systems"	Nack Vaght (DGO Facility's) "Capital Budgeting and Finance Guide"	DEHM PWS Capacity Development Program	DEHM PWS Loans and Grants	DEHM DMWL Construction Grants and Loans	G.S. 159B-23	USDA Loans and Grants	NC Rural Economic Development Center	Local Government Commission (LGC) Form	EPA Drinking Water Needs Survey	DEHM DMWL Local Water Supply Plans	EPA Software: CIPSS
Goal statement/Introduction to your capital plan	<input checked="" type="checkbox"/>											<input checked="" type="checkbox"/>
Date of documentation of capital plan	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>							<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Capital planning time period	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Description of systems		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Existing capacity and demand		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Description of customers		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Inventory of existing assets (details on each asset)	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Condition of systems			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Project-specific details (complete for each project in every year)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Financial planning (complete for each year in time period)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Long-term planning descriptions (may be not project-specific)			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Approvals		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Updating the capital plan	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Ties or links to other studies	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>

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

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



[www.efcnetwork.org](http://www.efcnetwork.org)



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# EFC C.I.P. Tool

<http://efc.sog.unc.edu/>

Free, simplified CIP tool using only MS Excel (EFC @ UNC)

Tool developed by **UNC ENVIRONMENTAL FINANCE CENTER**

## User-friendly Capital Improvement Plan (CIP) for Water and Wastewater Utilities

Version 2.0 (Created September 2012)

20-year capital planning | Debt and/or capital reserve financing options | Guided data inputs | Simple data needs

Financial dashboard outputs | Estimates necessary rate increases over time to pay for capital projects

**Start**

Next: Enter C.I.P. Projects | View Fund Balance | View Dashboard

- 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.

**INSTRUCTIONS**

**FINANCED**

Financed	\$ 950,000
et	\$ 750,000

**Pre-Exist**

Input annu incurred for

**Water and Sewer Rates in FY16**

Minimum Fund Balance Not Allocated to Future Projects	\$50,000
Existing Capital Reserves by End of FY16	\$20,000
Minimum Non-Allocated Reserves Fund Balance Target	\$70,000
Average Annual Interest on Reserves (%/year)	8.00%

**Expected Revenues and Expenses - FY16**

Annual Operating and Non-operating Revenues	\$ 3,016,000
Annual Non-Capital Expenditures (O&M, Admin, etc.)	\$ 4,525,000
Expected Annual Inflation of Expenditures (%/year)	2.7%

**Usage Billed to Customers in FY16**

Number of Customers	Residential	Non-residential
	18,000	2,000
Total Monthly Use (1,000's of gallons)	10,000	20,000
Annual Customer Base Growth (%/year)	0.5%	0.2%

**CAPITAL IMPROVEMENT PROJECTS - 20 YEARS**

Project Name	Project Construction Start Year	Project Construction Period (Years)	Estimated Construction Cost	Annual Construction Cost Inflation Factor (%/year)	Estimated Cost as of the Start Year	Est. Cost of C
Project 1 - Sewer Collection	FY17	1	\$ 2,000,000	2.0%	\$ 2,000,000	\$
Project 2 - Water Treatment	FY17	2	2,500,000	2.0%	2,500,000	\$
Project 3 - Capital reserves - financial problem	FY16	2	500,000	2.0%	500,000	\$
Project 4 - Intermediate project - Start next year	FY16	1	200,000	2.0%	200,000	\$
Project 5 - Another CIP	FY15	1	3,000,000	2.0%	4,113,162	\$

**Estimated Rate Changes Needed to Maintain the Fund Balance**

	FY16	FY17	FY18	
Yearly Increase (Decrease) in Rates (Base and Volumetric)	N/A	0.0%	5.1%	2.6%
Increase (Decrease) in the Monthly Bill for 5,000 Gallons	N/A	\$0.00	\$1.51	\$0.79
Increase (Decrease) in the Monthly Base Charge	N/A	\$0.00	\$0.64	\$0.34
Monthly Base Charge ("Minimum Charge")	\$12.34	\$12.34	\$12.98	\$13.31
Volumetric Rate at 5,000 gallons/month (\$/1000 gallons)	\$5.67	\$5.67	\$5.96	\$6.11
Volume Included with the Base Charge (1,000's of gallons)	2	2	2	2
Approximate Monthly Charge for 5,000 gallons (\$)	\$29.35	\$29.35	\$30.86	\$31.65

**Projected Fund Balance**

	FY16	FY17	FY18	
Total Revenues	\$ 3,013,000	\$ 3,063,589	\$ 3,238,247	\$ 3,254,400
Base Charges	\$ 1,776,900	\$ 1,796,322	\$ 1,907,269	\$ 1,976,733
Usage Charges	\$ 3,129,840	\$ 3,094,595	\$ 3,216,568	\$ 3,281,742
Interest Earned from Previous Year's Positive Balance	\$ -	\$ 9,655	\$ 9,567	\$ 9,697
Revenues from Other Sources Besides Charges	\$ 103,200	\$ 104,286	\$ 106,344	\$ 106,433

**Financial Reserves (End of Year)**

**Rate Increases**

**Total Capital Expenses**

**Total Cumulative System Investment**





# Demonstration of 2 CIPs tools



# Other Best Practices that Impress Funders

- Asset Management - <http://efcnetwork.org/webinar-asset-management-iq/>
- Benchmarking - <http://efcnetwork.org/webinar-8-22/>



A reminder, to repay loans and fund a CIP ...

# RATES ARE KEY



Will it provide sufficient cost recovery?

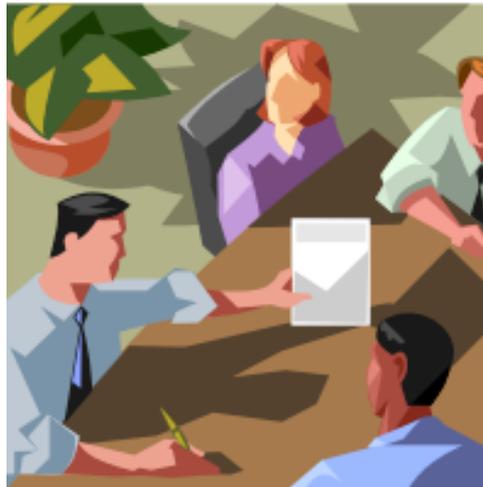
What exactly does this include?

Are we following the applicable laws?

Will revenues be resilient to changing water demands?

Are we allocating the costs to the right customers?

Do these rates send the right signals to our customers, based on our objectives?



Will our customers understand these rates?

Will our customers be able to pay these rates?



# **POLL QUESTIONS 4 AND 5; AND EVALUATION SURVEY LINK**



# QUESTIONS