



Long Term Capital Planning

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Session Objectives

- Learn about two aspects of long-term system planning: asset management and capital planning
- Figure out how to pay for the future needs



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

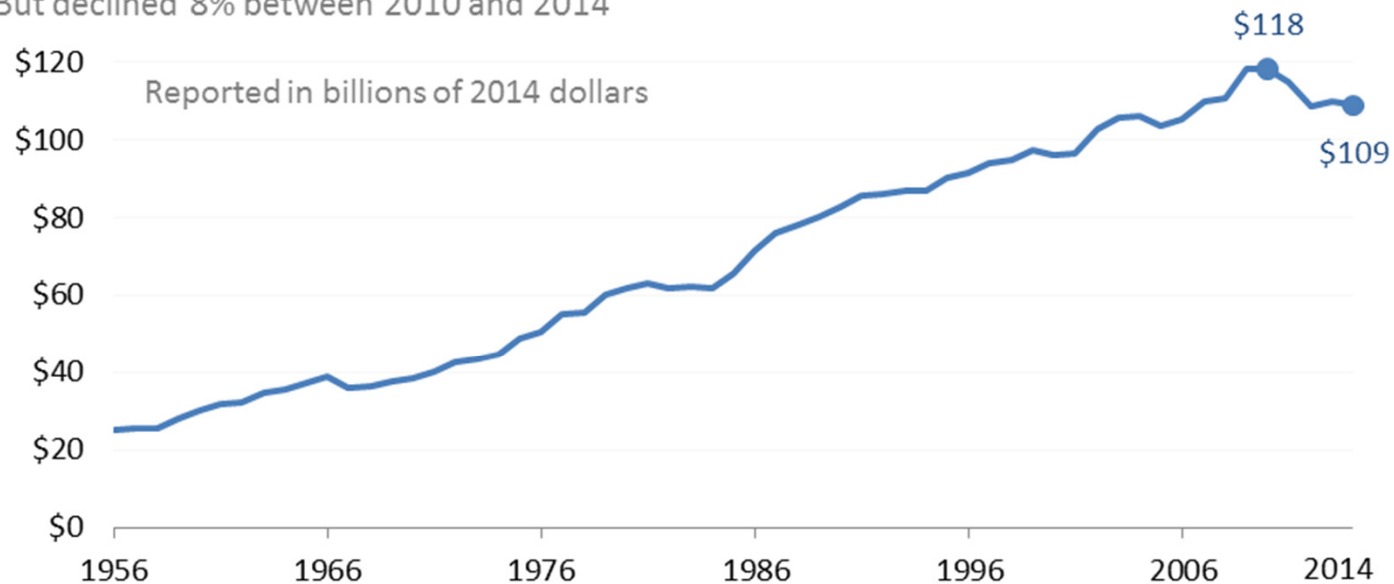
- The money never really was “free”—it came from tax dollars
- Today, the financial burden has been shifted away from federal and state tax dollars (grants) to funds raised by the water system itself (customer sales and loans). For example...



Total Public Spending Has Grown...

Total federal, state and local government spending on water and wastewater utilities grew steadily over time

But declined 8% between 2010 and 2014



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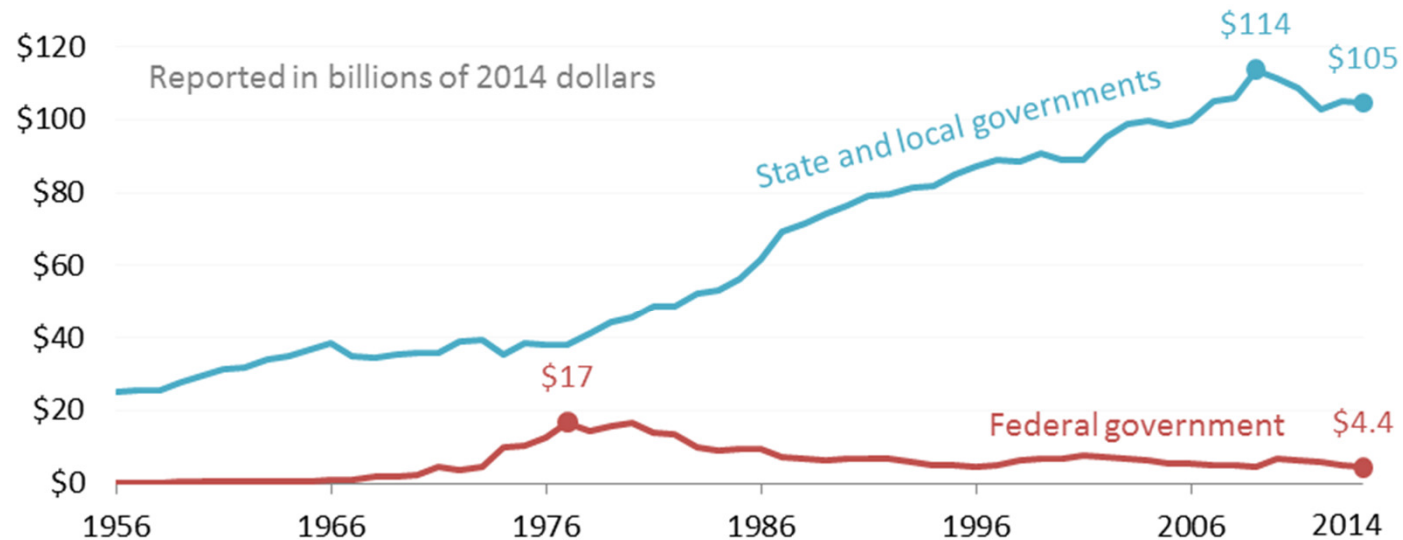
Source: Congressional Budget Office supplemental data for the *Public Spending on Transportation and Water Infrastructure, 1956 to 2014* report (March 2015). Displays public spending on supply systems for distributing potable water as well as wastewater and sewage treatment systems and plants. Real spending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



...Mostly from States and Locals

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



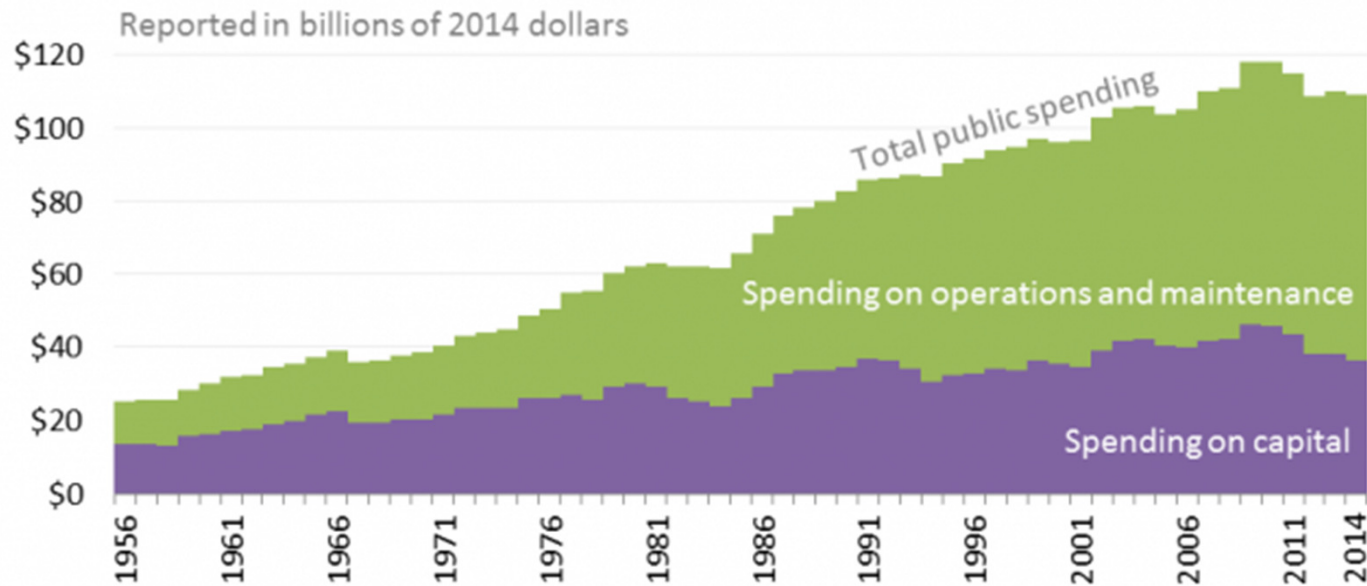
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...And Mostly for O&M, not Capital

Federal, state and local government spending on water and wastewater utilities, 1956 - 2014



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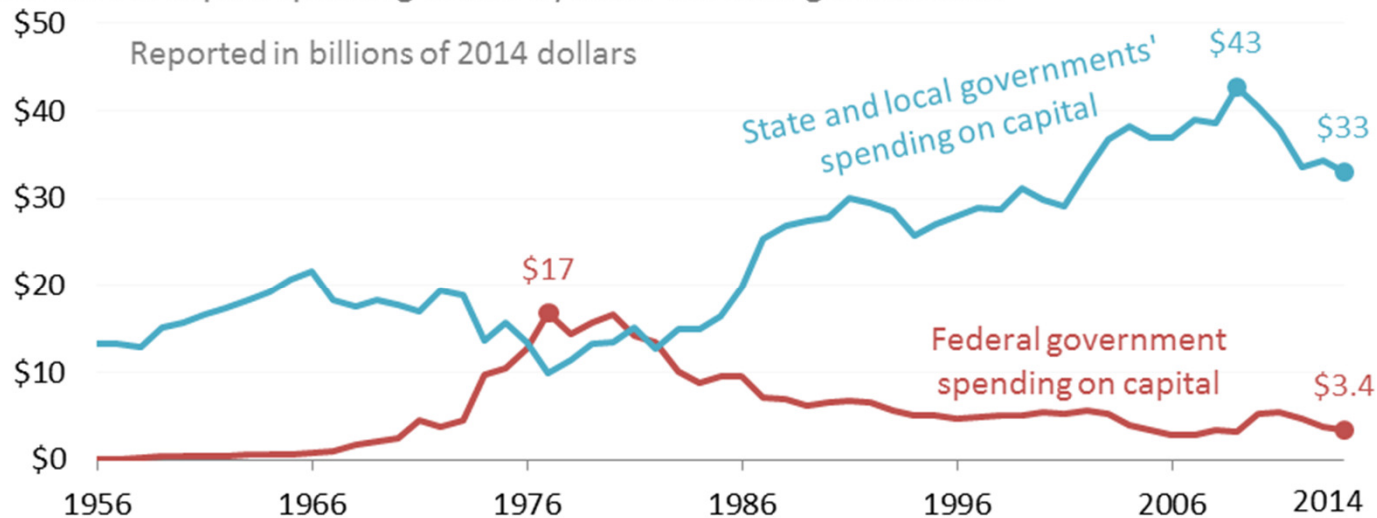
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Feds Used to Spend More on Capital

Spending on capital infrastructure for water and wastewater utilities has increasingly been provided by **state and local governments** while **federal spending on capital infrastructure** declined since the 1980s

Over 90% of capital spending occurs by state and local governments



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.



Capital Finance Today

- In other words, you pay (no sense in sugar-coating this)
- The harsh reality is that water and wastewater infrastructure is expensive, regardless of the size of your system. Smaller or poorer systems will likely have a hard time paying for capital improvements



Poor Investment → Poor Infrastructure

2013 REPORT CARD for AMERICA'S INFRASTRUCTURE

ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

LAUNCH THE REPORT CARD > HOME GRADES STATES NEWS TAKE ACTION

EXPLORE ASCE'S 2013 REPORT CARD FOR AMERICA'S INFRASTRUCTURE ONLINE!

- > GRADES
- > STATE
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LAUNCH THE REPORT CARD >

AMERICA'S GPA: D⁺

The American Society of Civil Engineers is committed to protecting the health, safety, and welfare of the public, and as such, is equally committed to improving the nation's public infrastructure. To achieve that goal, the Report Card depicts the condition and performance of the nation's infrastructure in the familiar form of a school report card—assigning letter grades that are based on physical condition and needed investments for improvement.

ESTIMATED INVESTMENT NEEDED BY 2020: \$3.6 TRILLION



REPORT CARD

Aviation	D	Ports	C
Bridges	C+	Public Parks	C-
Dams	D	Rail	C+
Drinking Water	D	Roads	D
Energy	D+	Schools	D
Hazardous Waste	D	Solid Waste	B-
Inland Waterways	D-	Transit	D
Levees	D-	Wastewater	D

<http://www.infrastructurereportcard.org/>



ASCE Gives Drinking Water a **D**

- Bad news: ... much of our drinking water infrastructure is nearing the end of its useful life. ... estimated 240,000 water main breaks per year in the US. Assuming every pipe would need to be replaced, the cost ... could reach more than \$1 trillion, according to AWWA.



ASCE Gives Drinking Water a **D**

- Good news: The quality of drinking water in the United States remains universally high. Even though pipes and mains are frequently more than 100 years old and in need of replacement, outbreaks of disease attributable to drinking water are rare. (ASCE)



Two Related Concepts:

Asset Management & Capital Planning



Working **smarter** *not harder* is
the essence of Effective
Management / Asset
Management

Let's hear from a practitioner...



Asset management helps you have the most impact in your system by spending your limited dollars in the best way possible



What does this type of analysis take?

- Nothing more than following a systematic approach for managing the assets
- 5 core components of Asset Management



Five Core Components of AM



Current State of the Assets



Level of Service



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?

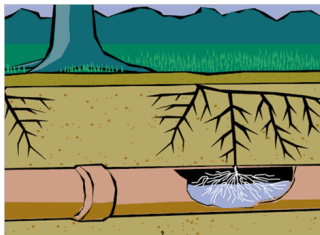


Asset Criticality

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?



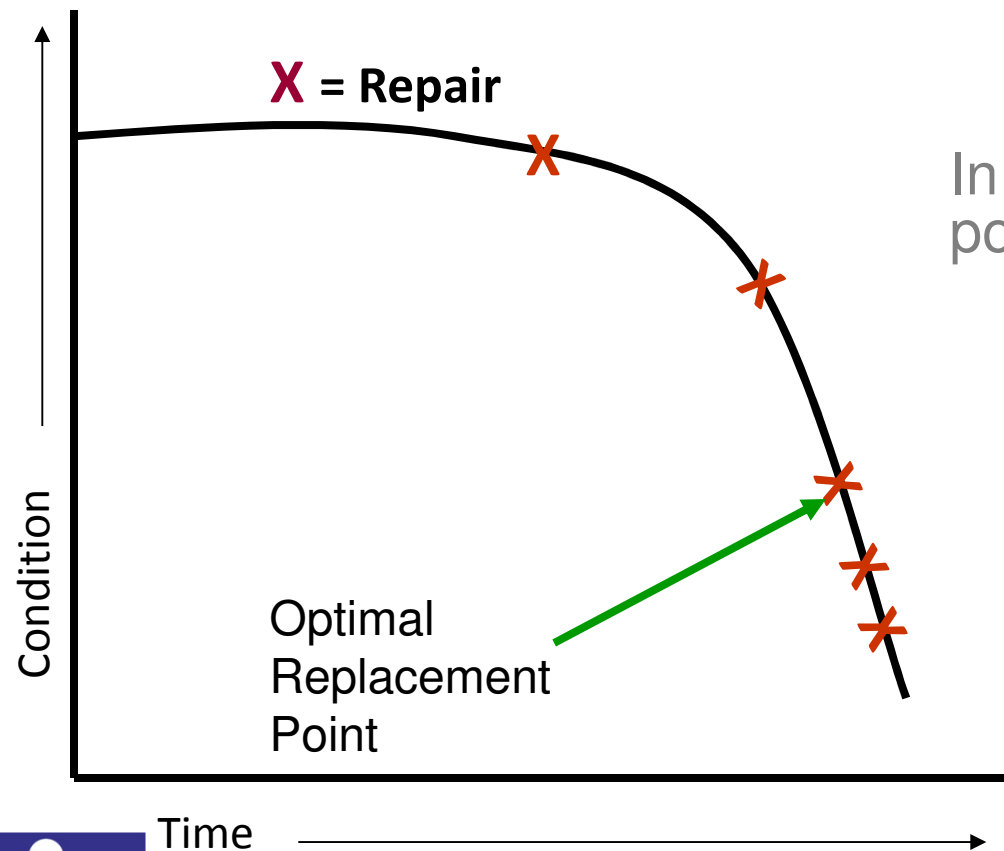


Asset Criticality





Life Cycle Costing: Replacement of Assets



In theory, there is an exact right point at which to replace an asset

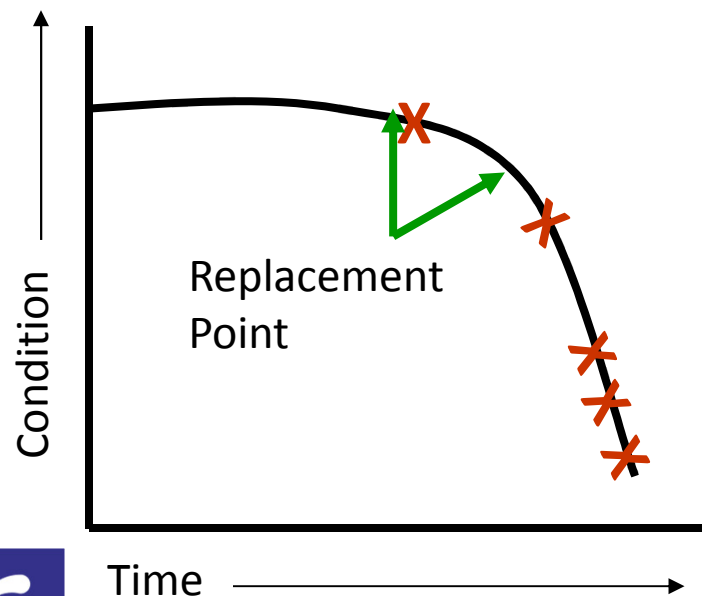
Not possible to know the optimal time to replace every asset

So... need to use the concept of risk

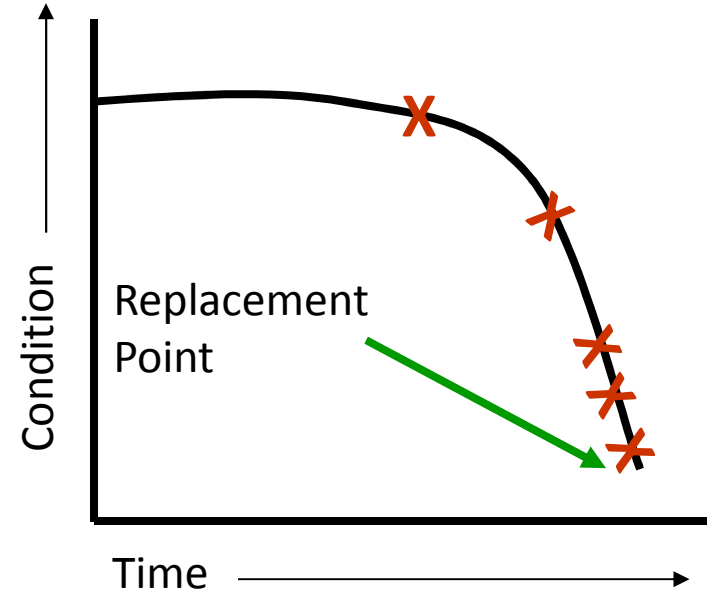


Life Cycle Costing & Risk

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 related to asset management
- An official multi-year document that identifies and prioritizes capital projects, identifies funding sources, and sets timelines



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.



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

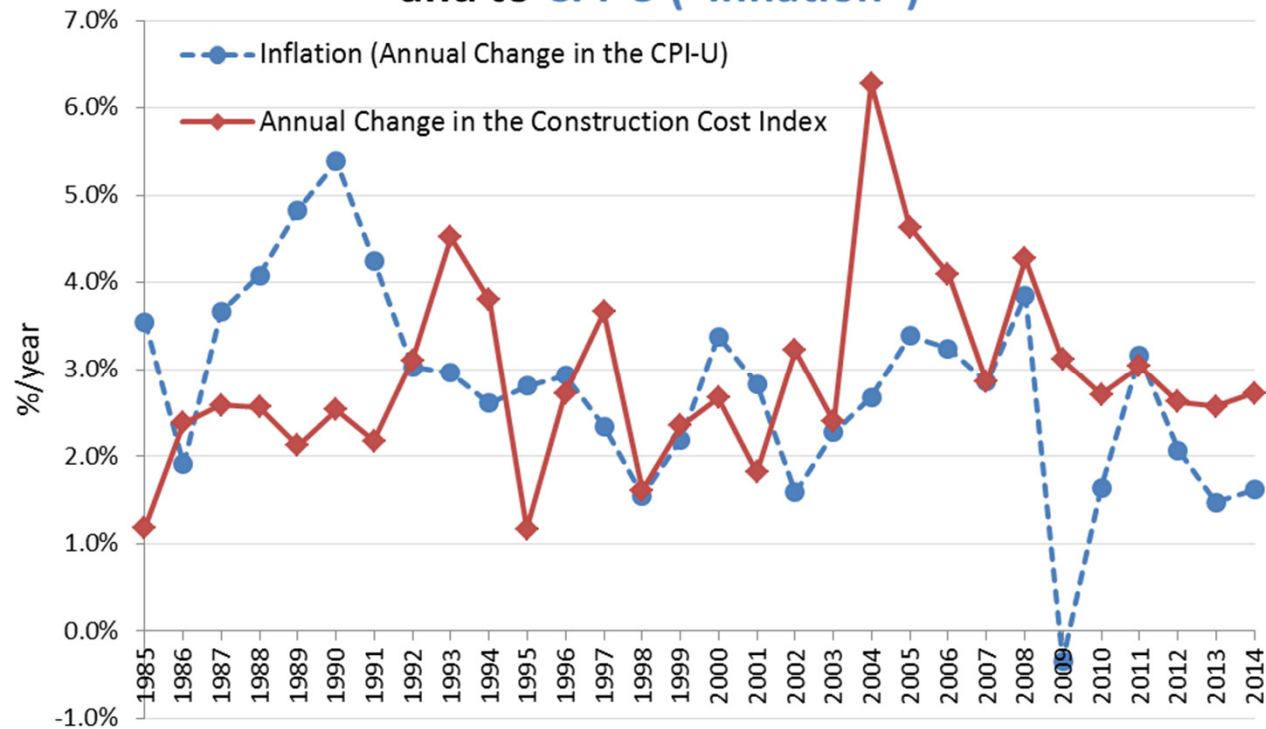


Measures of Inflation

- **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/>

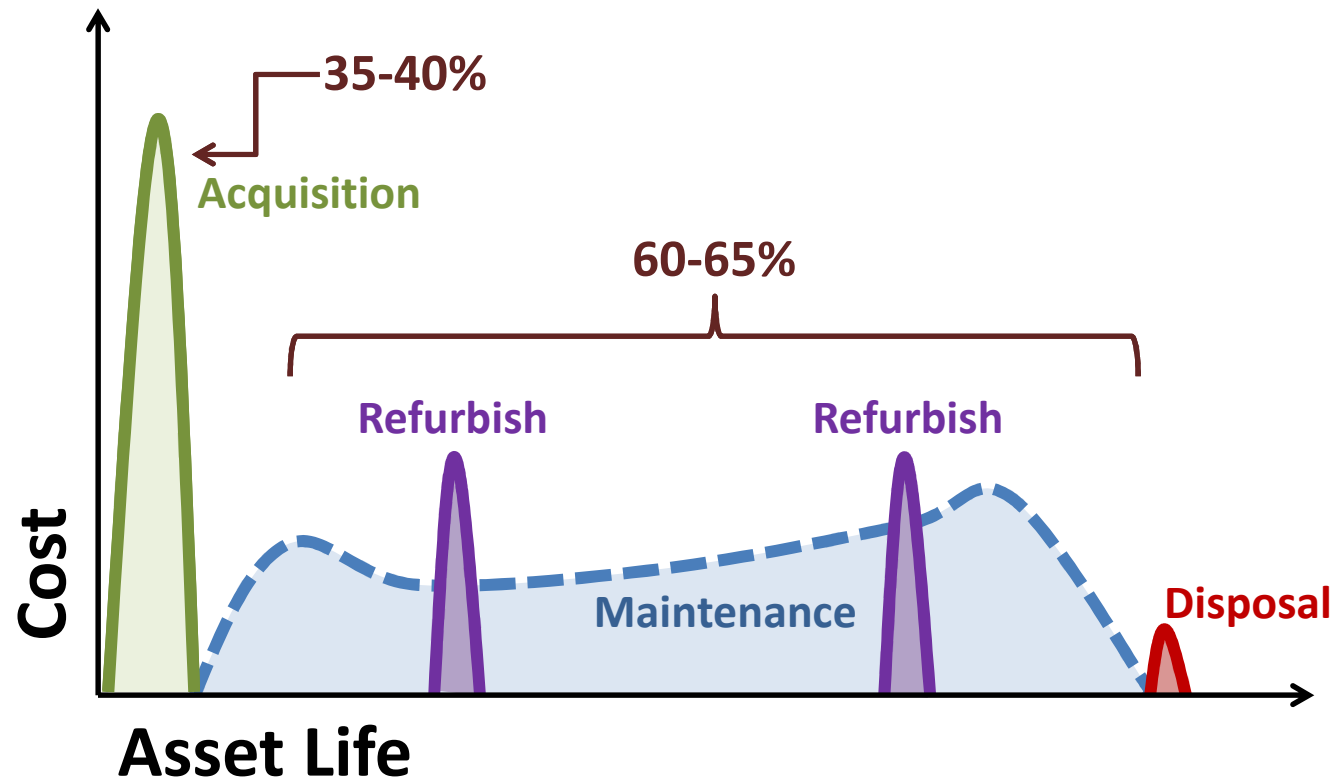


Drive Down the CIP Cost

- 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.



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



Source: Adapted from Steve Allbee, USEPA



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

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

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

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

Capital Improvement Projects - 20 Years

Project	Project Construction Period (Years)	Estimated Construction Cost (\$)	Annual Construction Cost Inflation Factor (%)	Estimated Cost in the Start Year	Cost of Ex
Project 1 - Sewer main replacement	FY22	1,000,000	2.0%	2,000,000	
Project 2 - Capital reserves (Sewer main)	FY23	2,000,000	2.0%	2,000,000	
Project 3 - Capital reserves (Sewer main)	FY24	3,000,000	2.0%	3,000,000	
Project 4 - Immediate project (Sewer main)	FY25	4,000,000	2.0%	4,000,000	
Project 5 - Immediate project (Sewer main)	FY26	5,000,000	2.0%	5,000,000	

Financial Reserves (End of Year)

Rate Increases

Total Capital Expenses

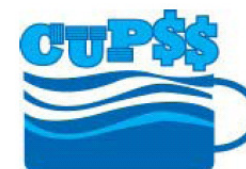
Total Cumulative System Investment



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Development of this tool was funded by the NC Department of Environment and Natural Resources and the U.S. Environmental Protection Agency
[Download this tool at www.efc.unc.edu/tools](http://www.efc.unc.edu/tools)



Software: CUPSS (EPA)



<http://www.epa.gov/cupss/>

Check Up Program for Small Systems
Set-up | Switch Utility | Create User | Help | Training | Exit

My Home
 My Inventory
 My O & M
 My Finances
 My Check up
 My CUPSS Plan

Welcome Back Helen, Beauty View Acres Subdivision - DW

What would you like to do today?

[Do Some Training](#)
[Enter a New Task or Work Order](#)
[Create or Update My Schematic](#)
[Search Asset and Maintenance](#)
[Create or Update My Inventory](#)
[Enter My Finances](#)
[Print My Check Up Reports](#)
[Work on My CUPSS Plan](#)

My Calendar

April 2008						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
30	31	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	1	2	3
4	5	6	7	8	9	10

My Messages and Alerts

Popup Messages Are Off. Click To Turn On.

Reminder - Today's Tasks	8
Tasks Currently Past Due	160
Assets Needing Update	0
Number of High Risk Assets	2