



# 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

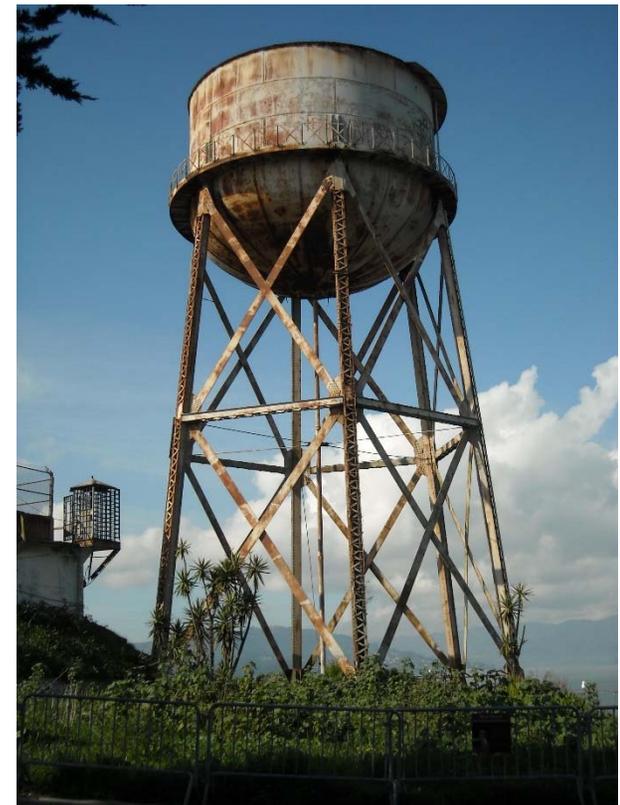
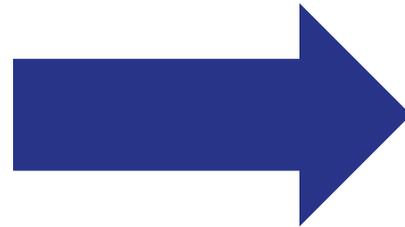


# Infrastructure or Capital Assets



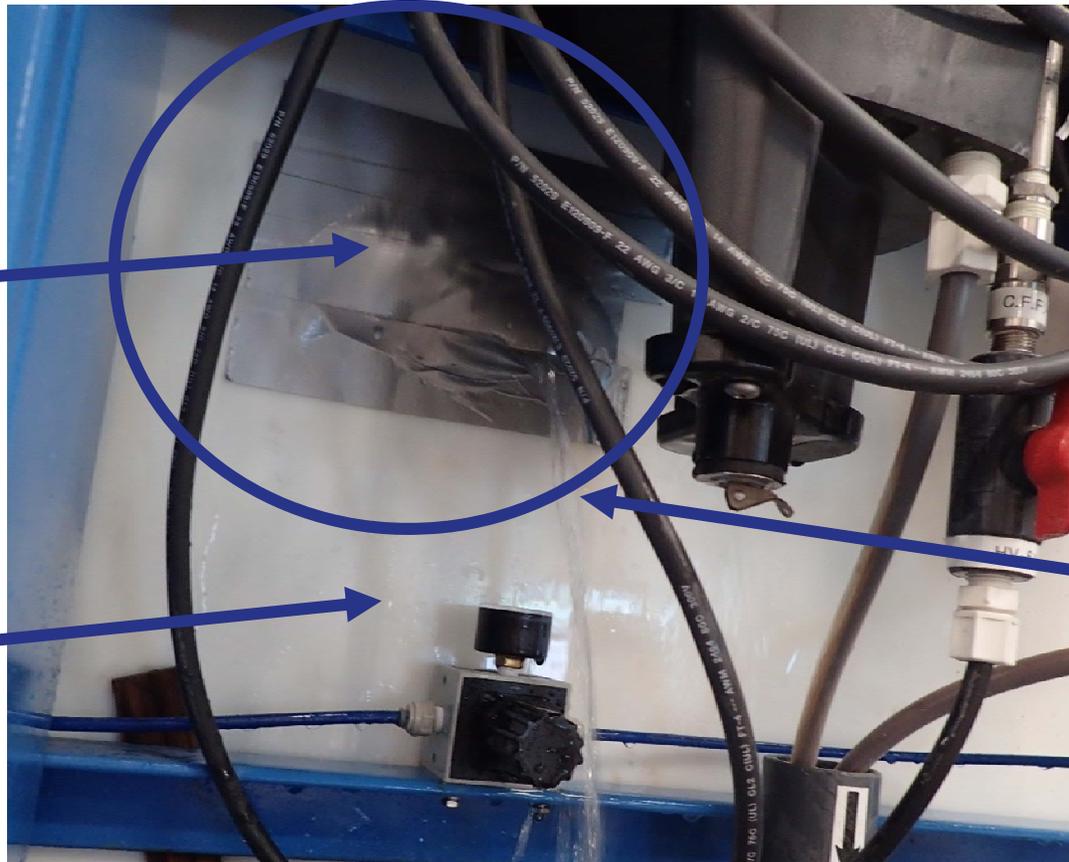


# Infrastructure Wears Out





# Infrastructure Wears Out



Water  
Tank

Leak



## 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

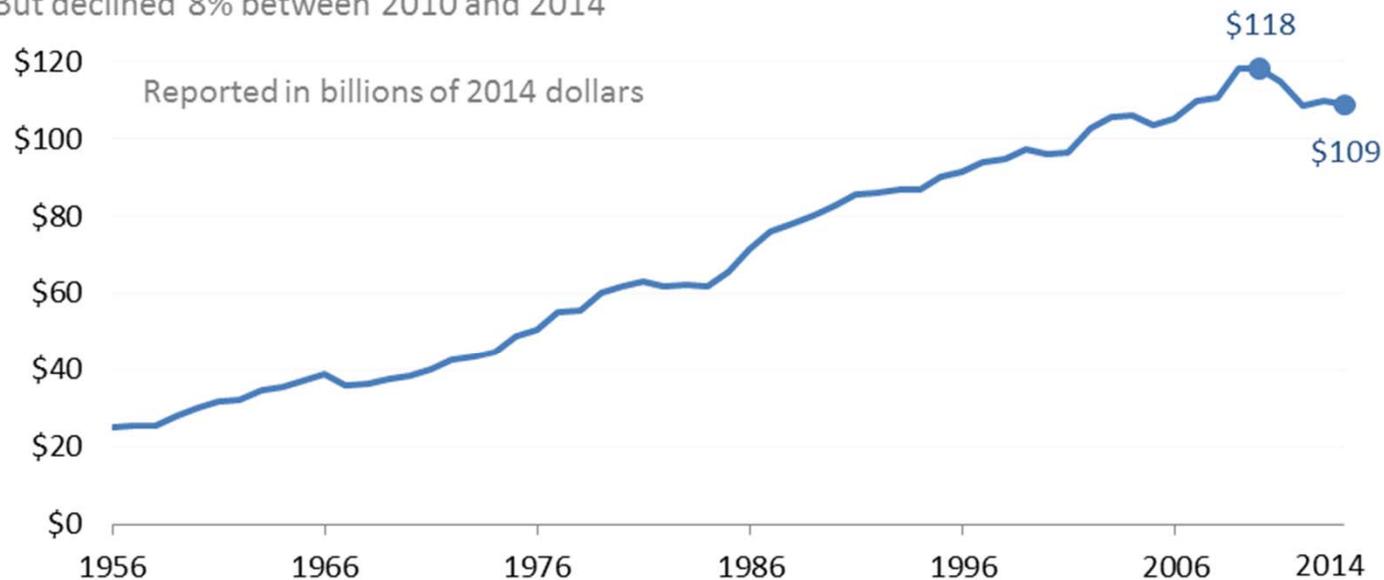
- The money never really was “free”—it came from tax dollars
- Today, there is a different philosophy of how to pay for water system capital improvements



# 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



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

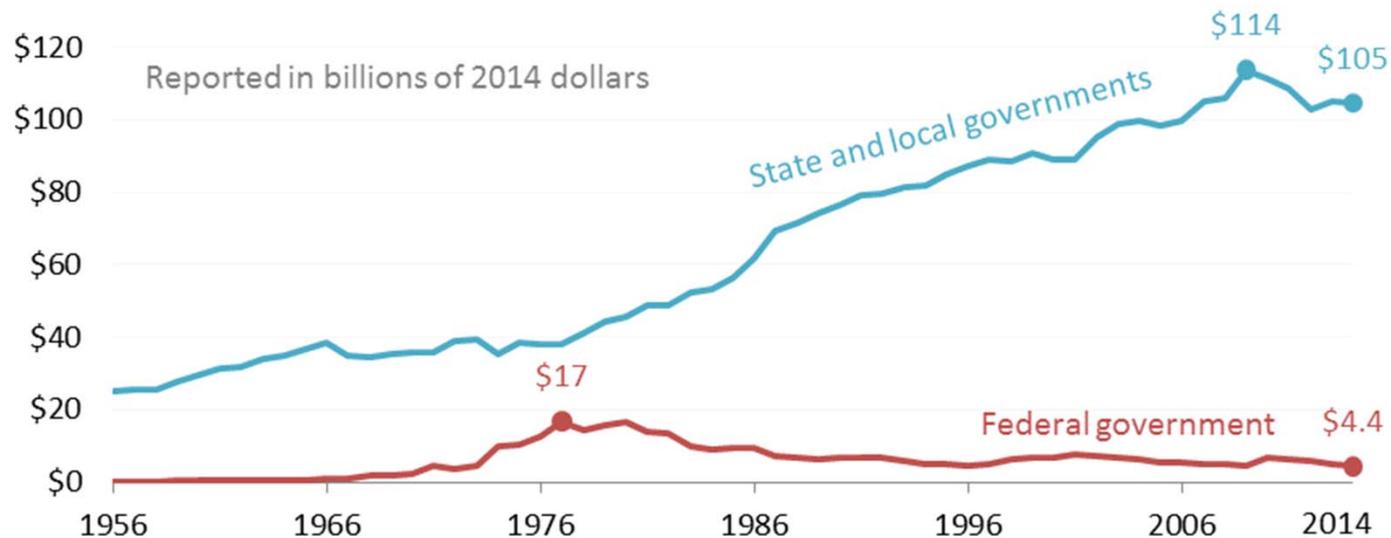
Source: Congressional Budget Office supplemental data for the *Public Spending on Transportation and Water Infrastructure, 1956 to 2014* report (March 2015). Displays public spending on supply systems for distributing potable water as well as wastewater and sewage treatment systems and plants. Real spending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



# ...Mostly from State and Local Governments

**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



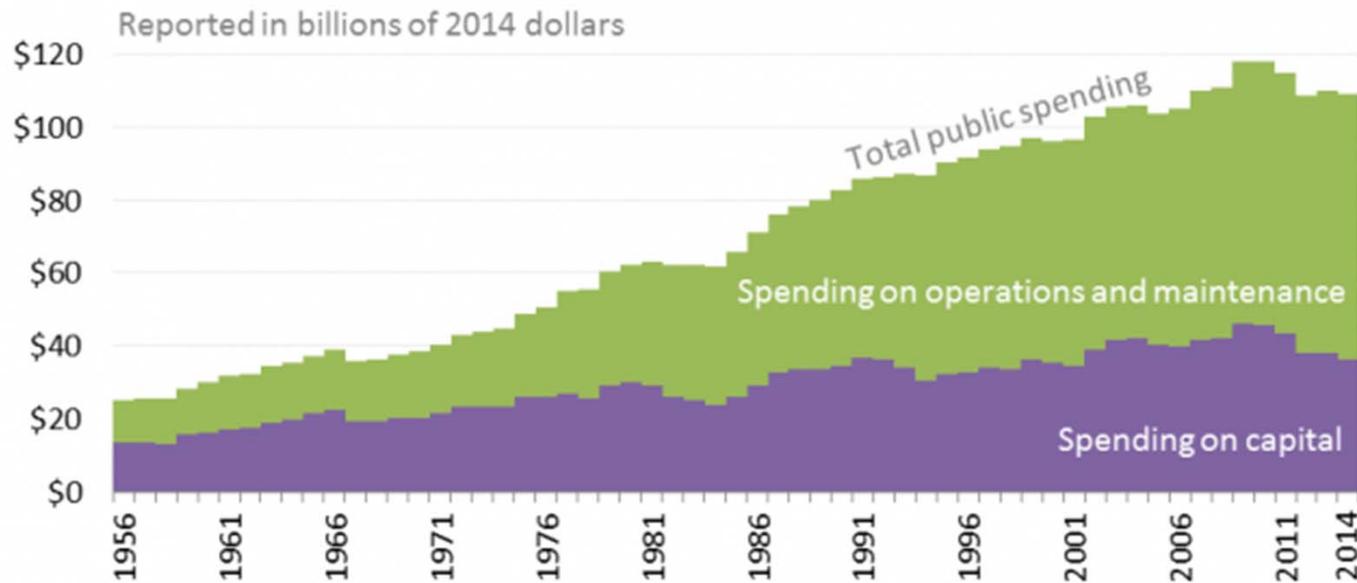
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# ...And Mostly for O&M, not Capital

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



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

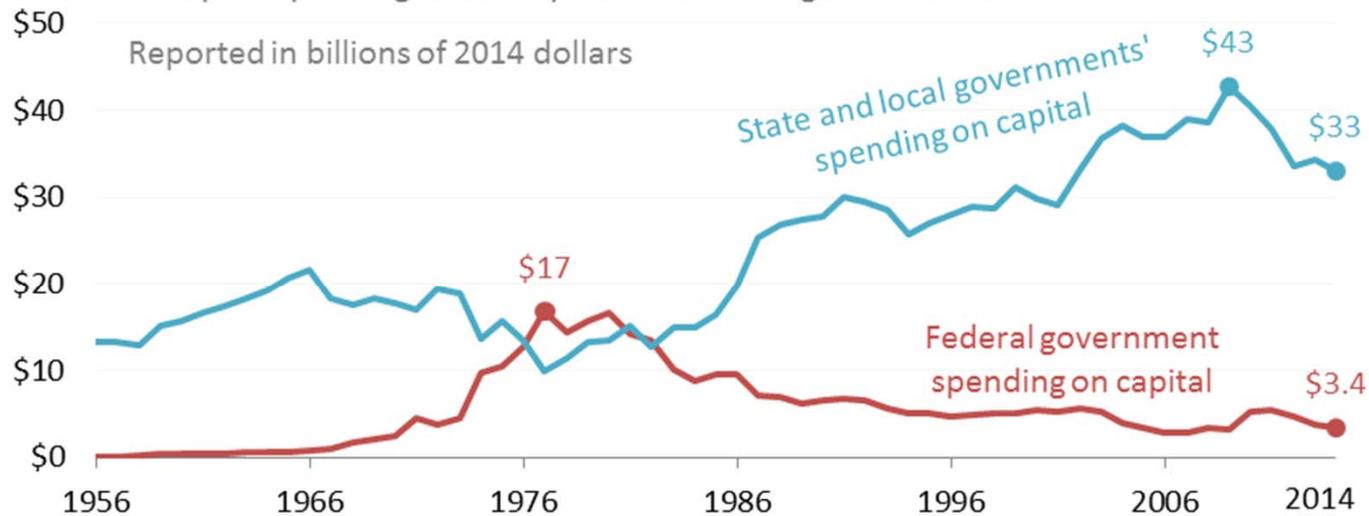
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# Feds Used to Spend More on Capital

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 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

2017  
INFRASTRUCTURE  
REPORT CARD

MAKING THE GRADE AMERICA'S GRADES STATE BY STATE SOLUTIONS THE IMPACT GET INVOLVED

ASCE



America's Infrastructure Scores a

# D+

GET THE FULL STORY





So what can we do?

Two options...



# Hope for Divine Intervention



## Pope Francis Lays Hands On Ailing U.S. Infrastructure

NEWS IN BRIEF

September 25, 2015

VOL 51 ISSUE 38

News · Religion · World  
Leaders · Pope



NEW YORK—Treating the frail, long-overlooked structures with an unparalleled display of compassion, Pope Francis reportedly inspired a crowd of onlookers Friday by laying his hands upon the ailing United States infrastructure. “My heart just melted when I watched the pope



ONION VIDEO





Or... we can figure out how to work **smarter**, *not harder* - the essence of effective asset management

Let's hear from a practitioner...



Mike Daly, White Cliffs, NM **Video Profile**



**Two Related Concepts:**

**Asset Management  
&  
Capital Planning**



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



# Asset Management?

- A. We're doing it!
- B. Heard of it but not doing it
- C. What now?



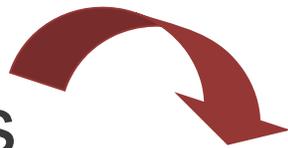
# Current State of the Assets

- 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

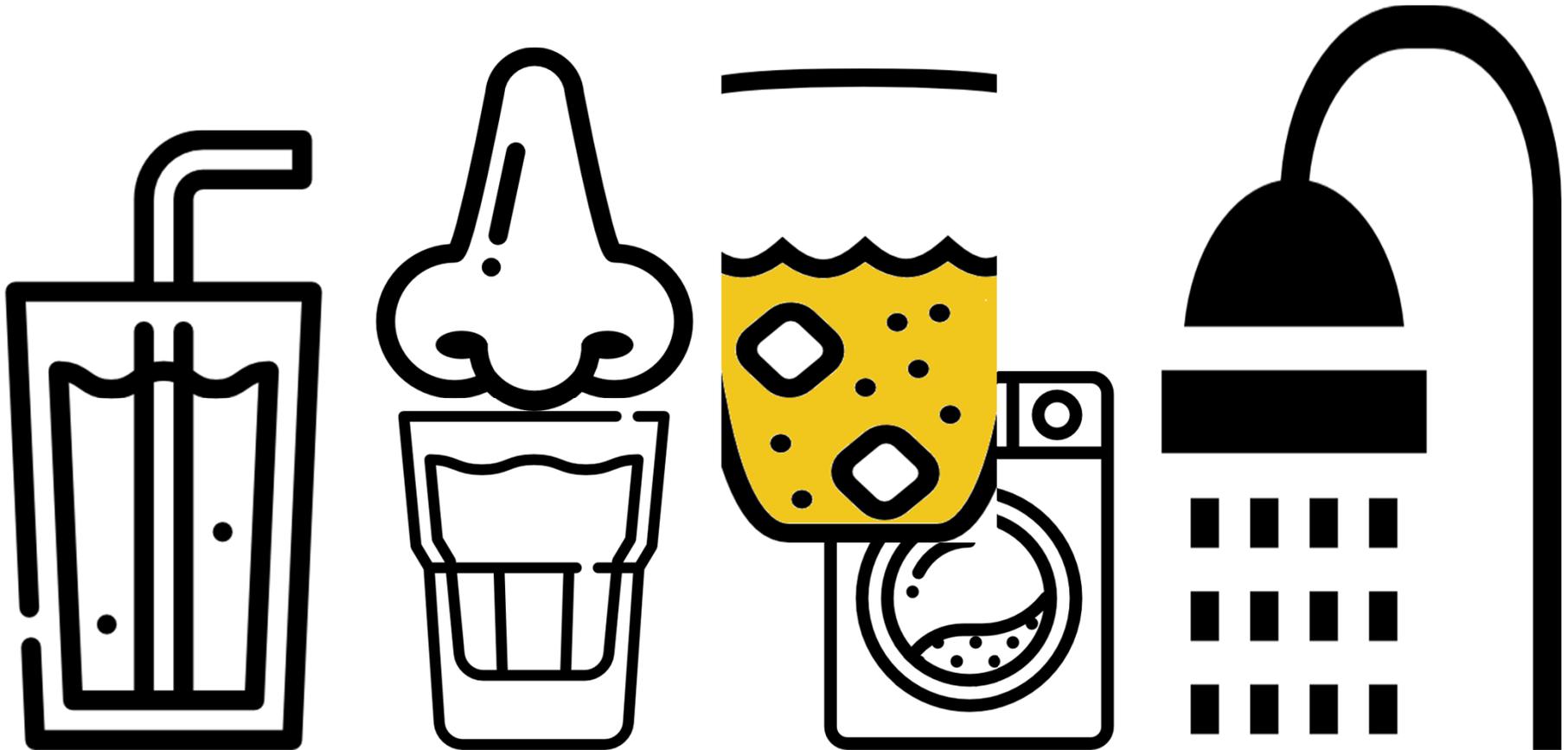
Involve  
Staff



What would my customers want?



# What do customers care about?





# Level of Service



## EPA Releases Annual List Of Cities Where Tap Water Probably Fine To Drink But Tastes Kinda Off



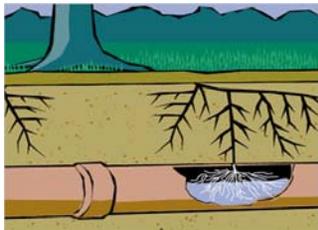


# Asset Criticality

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





# Quick Exercise—4 Assets

1. Brand new overhead storage tank
2. Aging booster pumps that serve a hospital and neighborhood
3. 20 year old lines on Forest Drive, a typical residential neighborhood
4. 20 year old meters

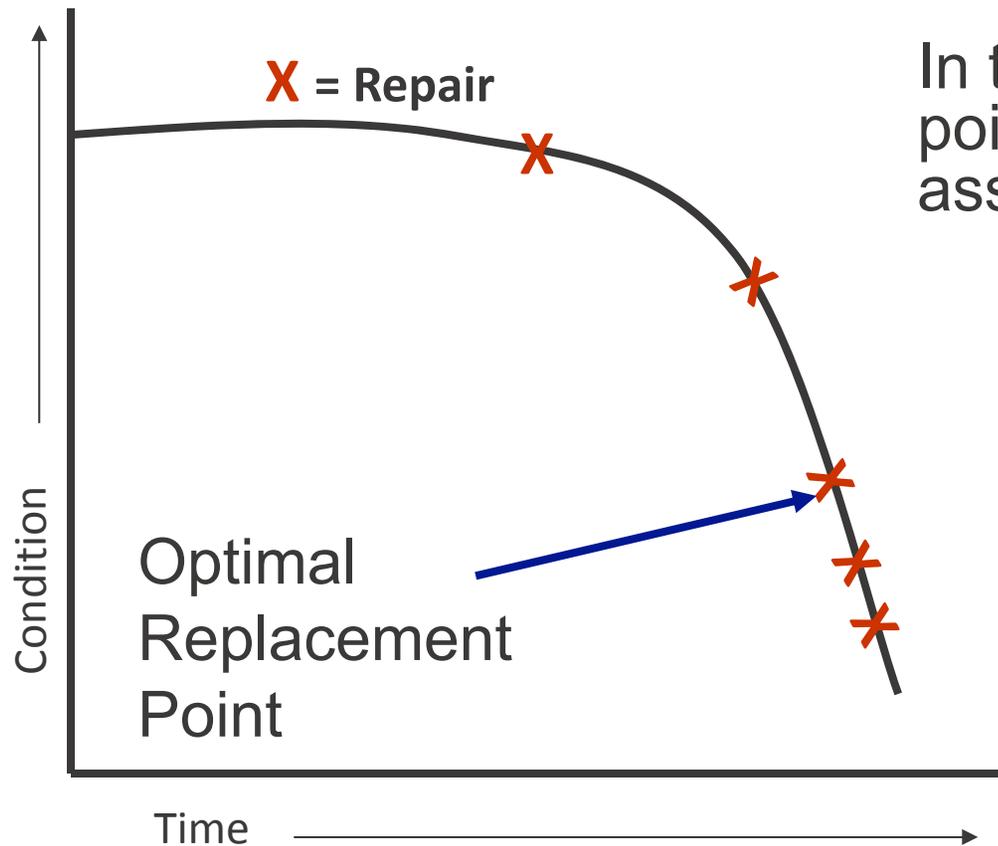


# Asset Criticality





# 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

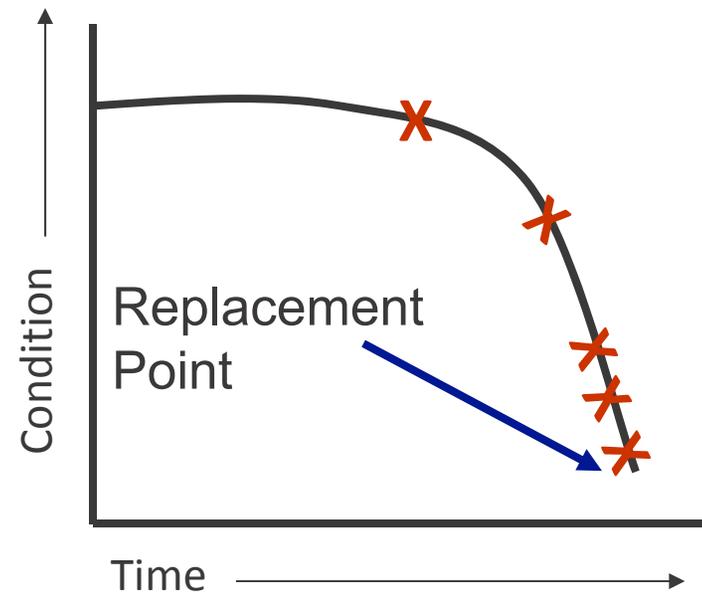
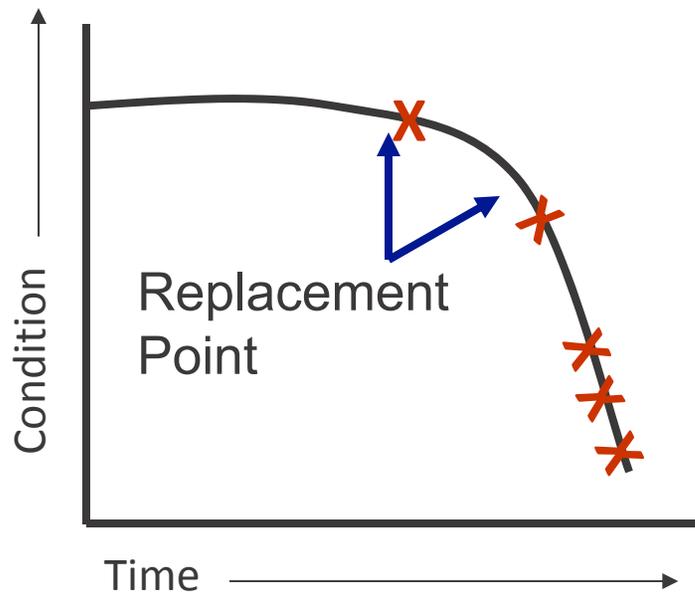
So... need to use the concept of risk



# Life Cycle Costing & Risk

High risk assets:  
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



# Capital Planning?

- A. We're doing it!
- B. Heard of it but not doing it
- C. What now?



# 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

- Identify regulatory deficiencies (discuss with regulatory agencies, look at proposed regulations, talk to consultants) in a 10-20 year window
- Identify population changes (growth, stagnation, decline)
- Identify deferred maintenance problems or where current service is inadequate



# 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



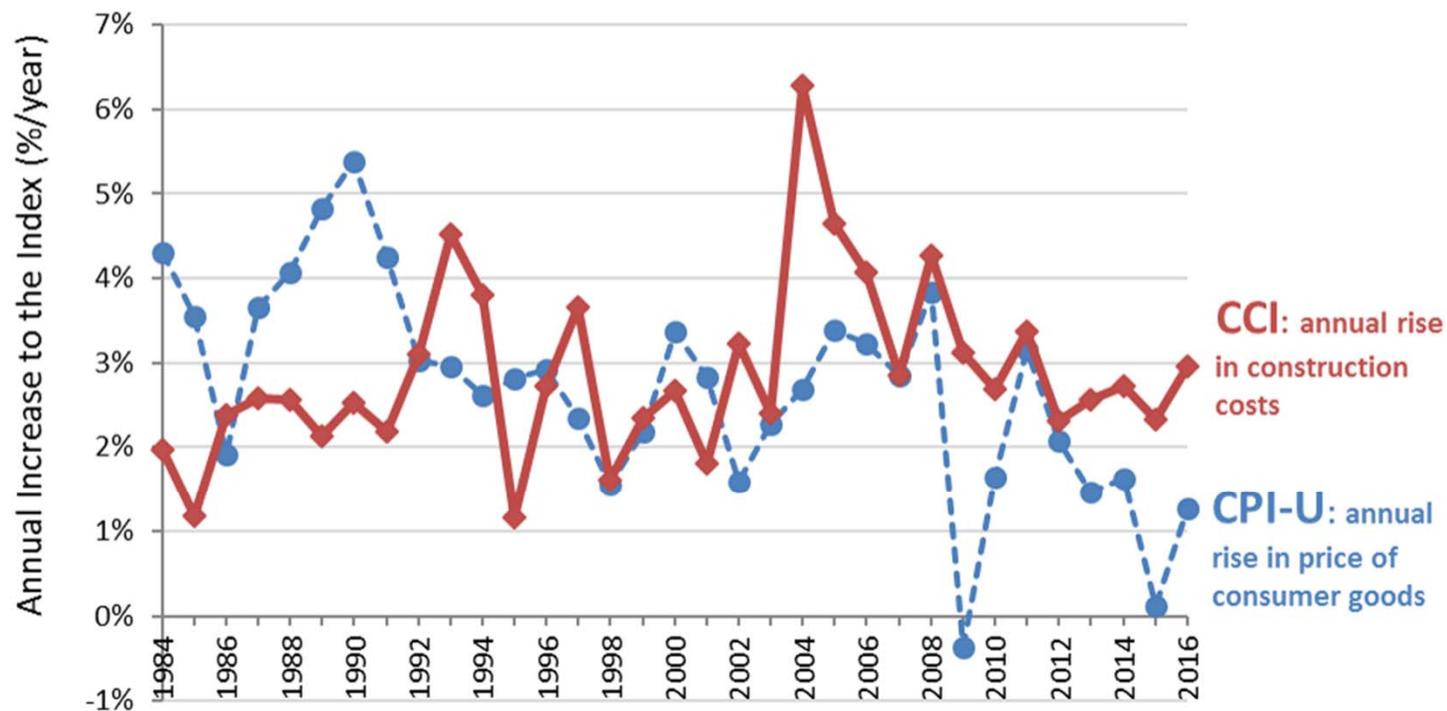
# Measures of Inflation

- **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



## 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).

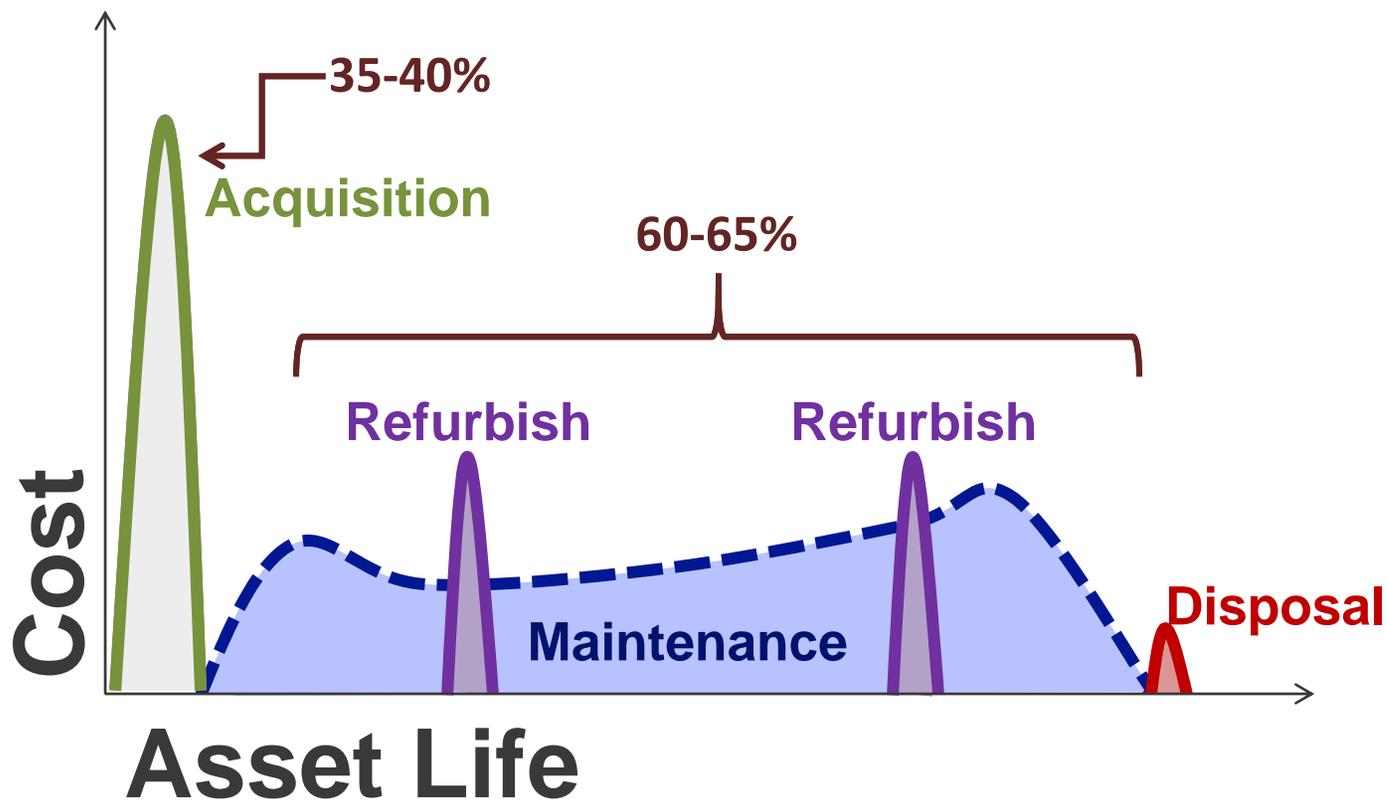


# Reminder: Life Cycle Costing

- Purchase Price  $\neq$  Total Price



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



Source: Adapted from Steve Allbee, USEPA



# Plan to Pay: Scenarios to Fund your C.I.P.

<http://efc.sog.unc.edu> or <http://efcnetwork.org>

Find the most up-to-date version in Resources / Tools

Free, simplified Excel tool allowing you to list your capital projects and plans for funding them, and automatically estimates rate increases

Tool developed by  
**UNC**  
 ENVIRONMENTAL  
 FINANCE CENTER

## Plan to Pay: Scenarios to Fund your C.I.P. (Capital Improvement Plan)

Version 2.6 (Updated November 2015)

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
Pre-Exist	\$ 750,000

**Pre-Exist**  
Input amount incurred for...

**Current Fiscal Year**  
FY15

**Water and Sewer Rates in FY15**

**Expected Revenues and Expenses in FY15**

**Usage Billed to Customers in FY15**

**CAPITAL IMPROVEMENT PROJECTS - 20 YEARS**

Project Name	Project Start Year	Project End Year	Project Cost (\$)	Annual Contribution Factor (in the Year)	Estimated Cost at the End of Year
Project 1	2015	2015	1,000,000	1.0000	1,000,000
Project 2	2016	2016	2,500,000	1.0000	2,500,000
Project 3	2017	2017	1,000,000	1.0000	1,000,000
Project 4	2018	2018	1,000,000	1.0000	1,000,000
Project 5	2019	2019	1,000,000	1.0000	1,000,000
Project 6	2020	2020	1,000,000	1.0000	1,000,000
Project 7	2021	2021	1,000,000	1.0000	1,000,000
Project 8	2022	2022	1,000,000	1.0000	1,000,000
Project 9	2023	2023	1,000,000	1.0000	1,000,000
Project 10	2024	2024	1,000,000	1.0000	1,000,000
Project 11	2025	2025	1,000,000	1.0000	1,000,000
Project 12	2026	2026	1,000,000	1.0000	1,000,000
Project 13	2027	2027	1,000,000	1.0000	1,000,000
Project 14	2028	2028	1,000,000	1.0000	1,000,000
Project 15	2029	2029	1,000,000	1.0000	1,000,000
Project 16	2030	2030	1,000,000	1.0000	1,000,000

**20-Year Projections**

	FY15	FY16	FY17	FY18
<b>Estimated Rate Changes Needed to Maintain the Fund Balance</b>				
3 Year Interest (Discounted to Base Rate and Volume)	n/a	0.0%	0.1%	0.0%
Increase (Decrease) in the Monthly Bill for 5,000 Gallons	n/a	\$0.00	\$1.11	\$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
Volume Rate at 5,000 gallons/month (5,000 gallons)	\$5.67	\$5.67	\$5.96	\$6.11
Volume Included with the Base Charge (1,000 of gallons)	2	2	2	2
Approximate Monthly Charge for 5,000 gallons (5)	\$29.35	\$29.35	\$30.96	\$31.65
<b>Projected Fund Balance</b>				
Total Assets	\$ 512,000	\$ 501,000	\$ 428,367	\$ 354,000
Base Charges	\$ 1,716,800	\$ 1,796,320	\$ 1,907,200	\$ 1,975,720
Usage Charges	\$ 3,329,600	\$ 3,094,080	\$ 2,716,080	\$ 2,293,760
Interest Earned from Previous Year's Positive Balance	\$ 0	\$ 9,400	\$ 9,167	\$ 8,607
Revenues from Other Sources (Reserve Charges)	\$ 103,200	\$ 104,200	\$ 105,344	\$ 106,433

**Financial Reserves (End of Year)**

**Rate Increases**

**Total Capital Expenses**

**Total Cumulative System Investment**



# Software: CUPSS (EPA)

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



**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](#)

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Welcome Back Helen, Beauty View Acres Subdivision - DW

What would you like to do today?

[Do Some Training](#)

[Create or Update My Schematic](#)

[Create or Update My Inventory](#)

[Print My Check Up Reports](#)

[Enter a New Task or Work Order](#)

[Search Asset and Maintenance](#)

[Enter My Finances](#)

[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