Long Term Capital Planning

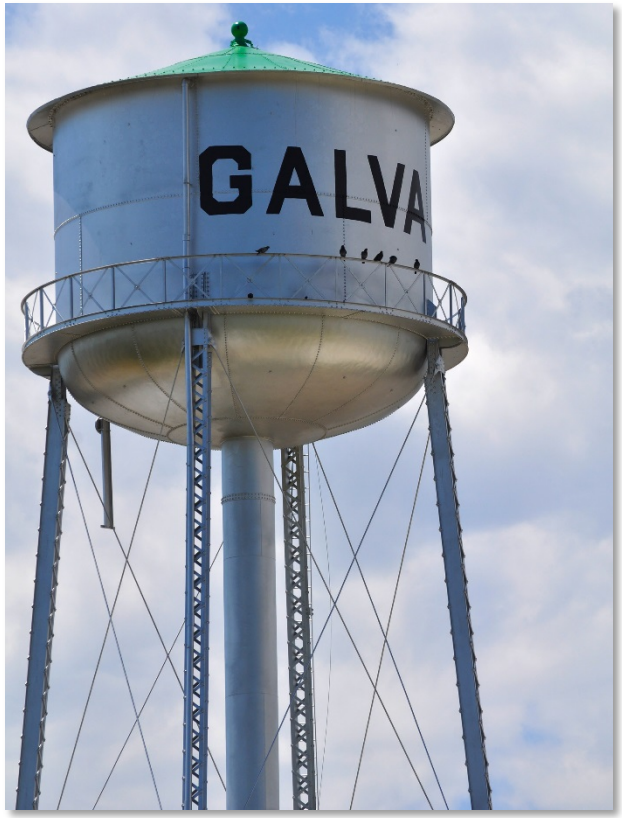
Session Objectives

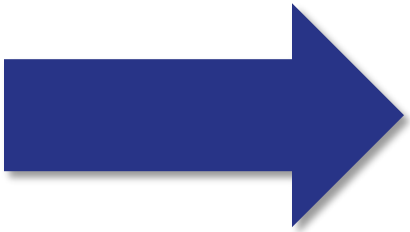
- Learn about two aspects of long-term system planning: asset management and capital planning

- Figure out how to pay for the future needs

Infrastructure or Capital Assets

Infrastructure Wears Out





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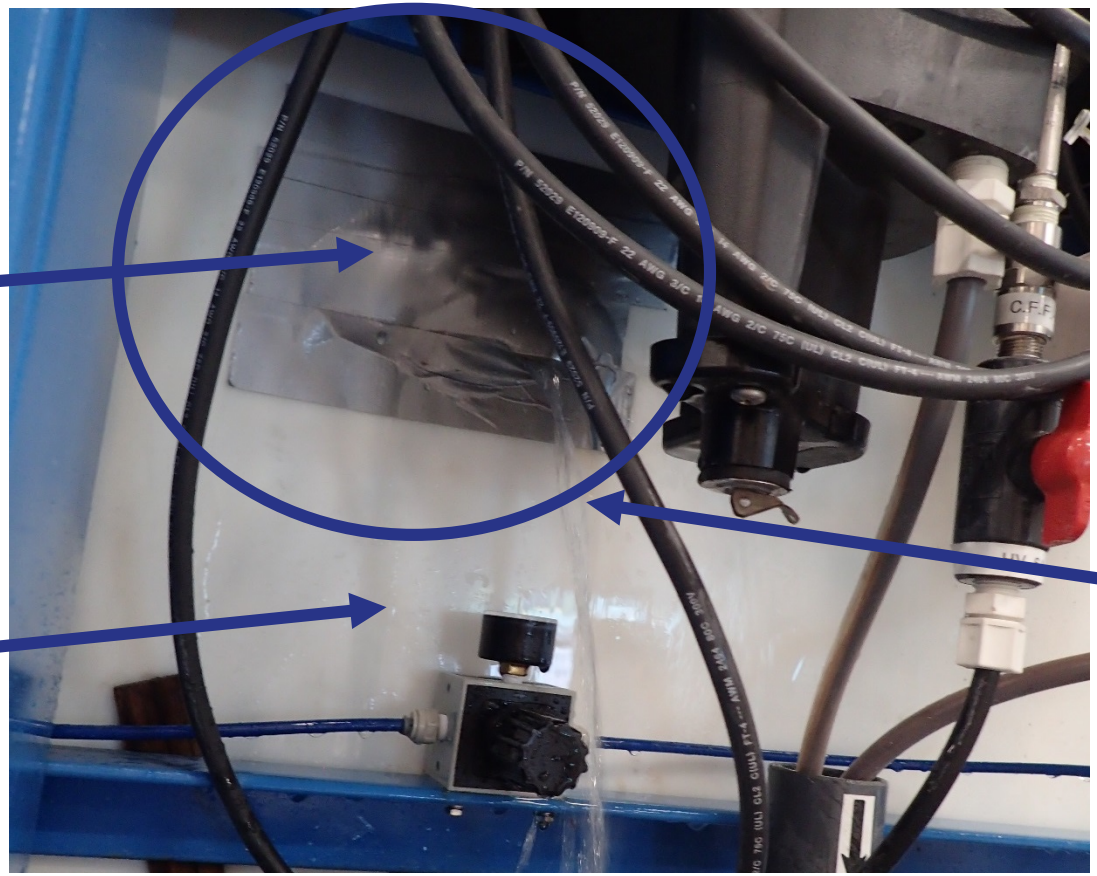
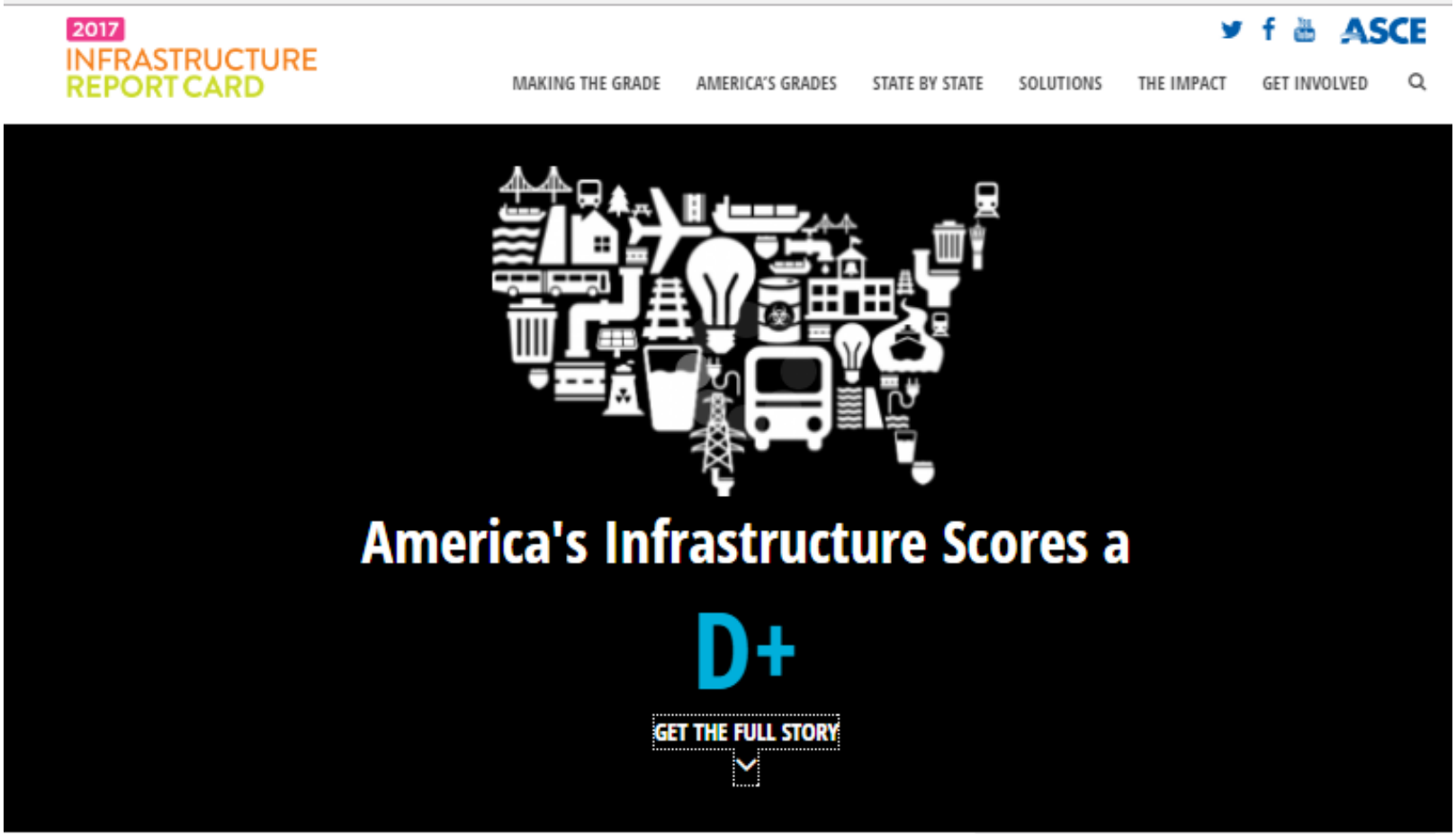


Water Tank

Leak

Poor Investment → Poor Infrastructure



REPORT CARD

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

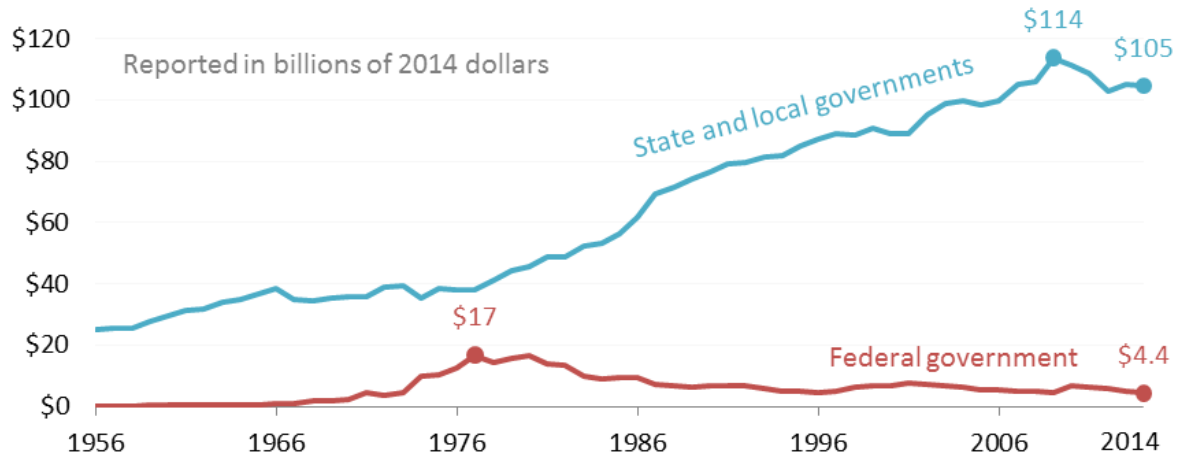
http://www.infrastructurereportcard.org/

A few hard truths

The onus will continue to be on local governments to pay for their own infrastructure

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.

http://efc.web.unc.edu/2015/09/09/four-trends-government-spending-water/

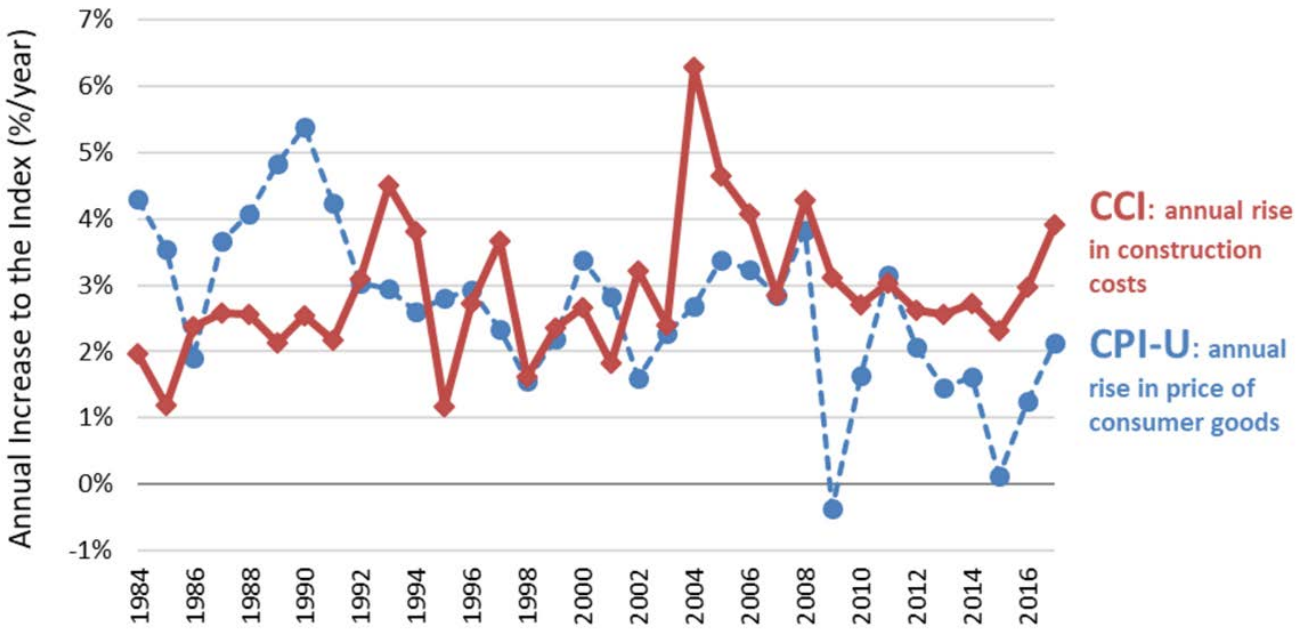
Construction costs will keep going up

Nationally, construction costs are growing at about 3%/year (CCI).

Faster than the "rate of inflation" (CPI-U).

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

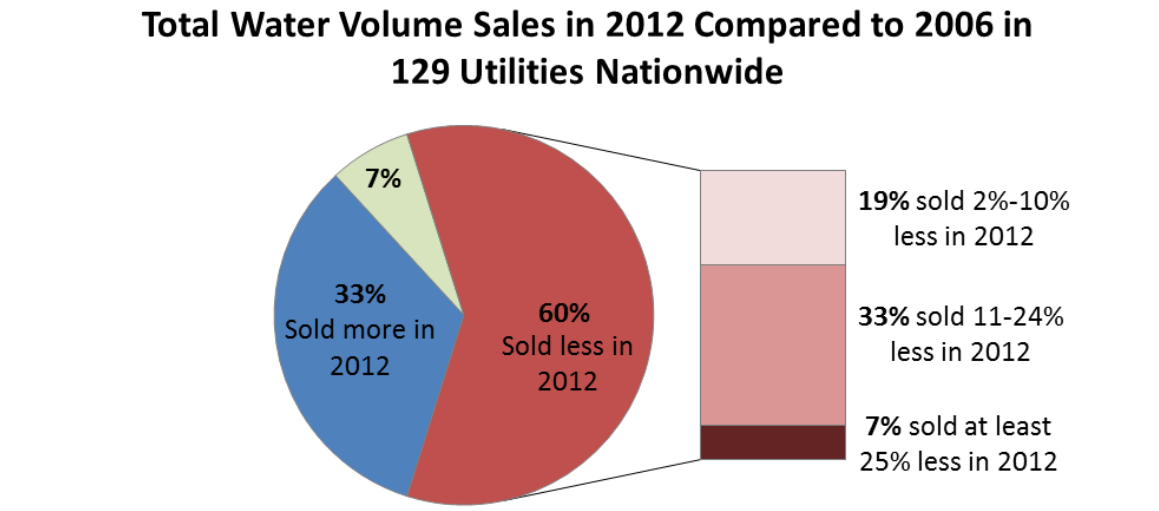
Construction costs (CCI) rose on average of 2.9%/year in the last five years, while consumer goods (CPI-U) only rose an average of 1.3%/year in the same period



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).

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

Water use is declining for many systems. Could mean lower revenues.



Data analyzed by the Environmental Finance Center at the University of North Carolina, Chapel Hill and Raftelis Financial Consultants, Inc. Data Source: Biennial, national AWWA-RFC Water and Wastewater Rate Surveys in 2006 and 2012. Water utilities that reported their total daily gallons sold (MGD) in 2006 and 2012 are included in this analysis. 81% of the sampled utilities increased total number of accounts from 2006 to 2012.

Source: EFC *Environmental Finance* blog post "Even Total Water Demand is on the Decline at Many Utilities"
http://efc.web.unc.edu/2014/04/15/total-water-demand-on-the-decline/

A few hard truths

- Local governments need to incorporate capital costs in their budgets – do not rely (solely) on grants.
- Operations and capital costs are going up.
- Water demand (driver of main source of revenue) may be going down for many municipalities.
  - Assess your water billing data and run different (conservative) scenarios when budgeting.

Capital planning efforts

Asset Management Plan: a long-term plan (20+ years) identifying when each existing asset may need to be replaced or rehabilitated.

Capital Improvement Plan: a multi-year plan identifying capital projects in the next few years, their costs, and how they will be funded.

Asset Management...are you doing it?

Heck yeah!

Heard of it, but not doing it yet!

Yeah...I don't know what you're talking about

Mike Daly, White Cliffs, NM Video Profile

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 Asset Management

1) Current State of the Assets
2) Level of Service
3) Criticality
4) Life Cycle Costing
5) Long-Term Funding

Current state of the assets

List all of your 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?

Example of an Asset Inventory

Asset Inventory

ID Number	Category	Type	Size	Manufacturer	Serial Number	Location	Installation Date	Condition	Energy user Y/N (if Yes, see Energy Inventory)	Comments

Source: A.M. KAN Work!

Level of Service

Involve Customers

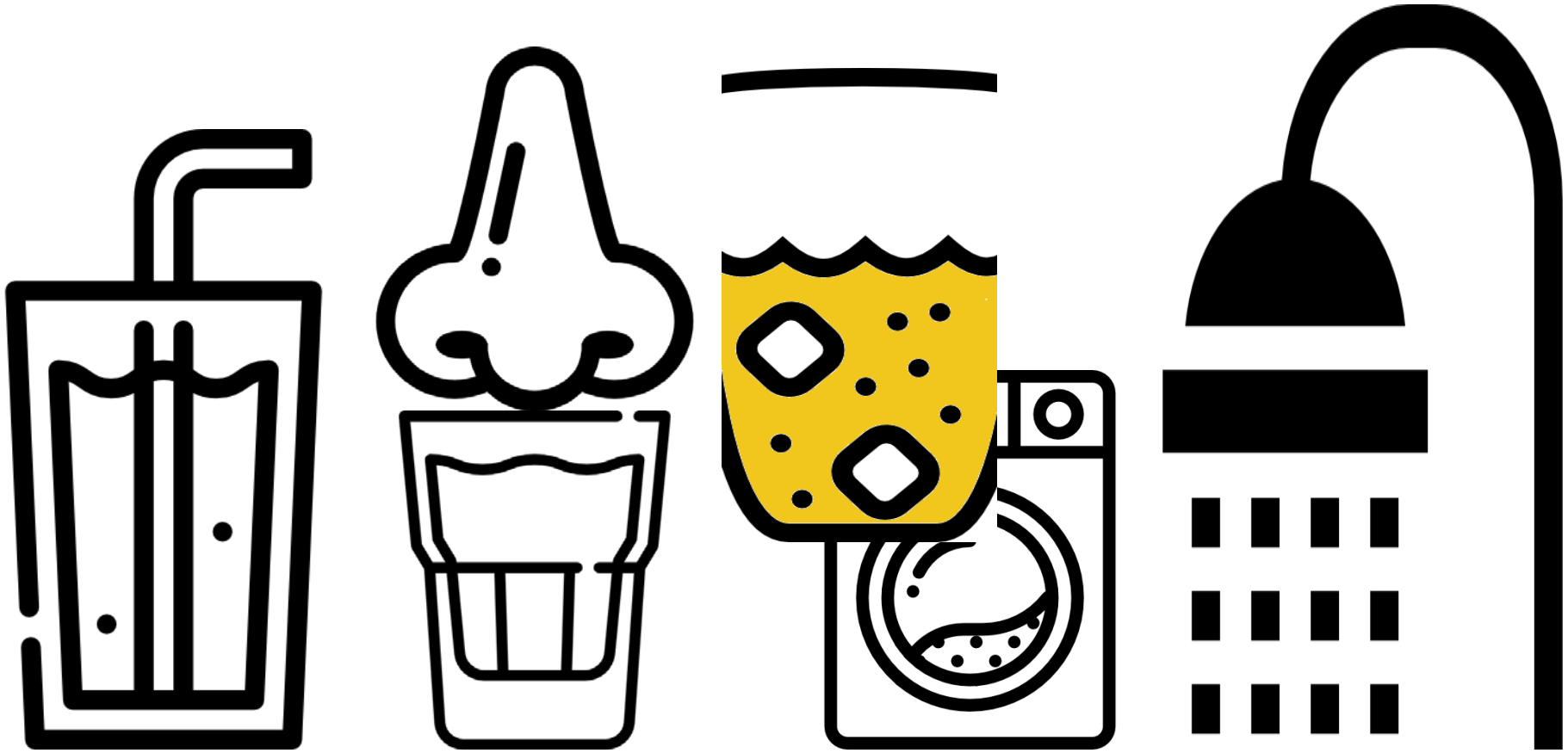
Measurable Goals: Internal and External

Track Progress Towards Meeting Goals

Involve Staff

What would my customers want?

What do customers care about?



Criticality – 2 parts

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

What is the **consequence** if the asset does fail?

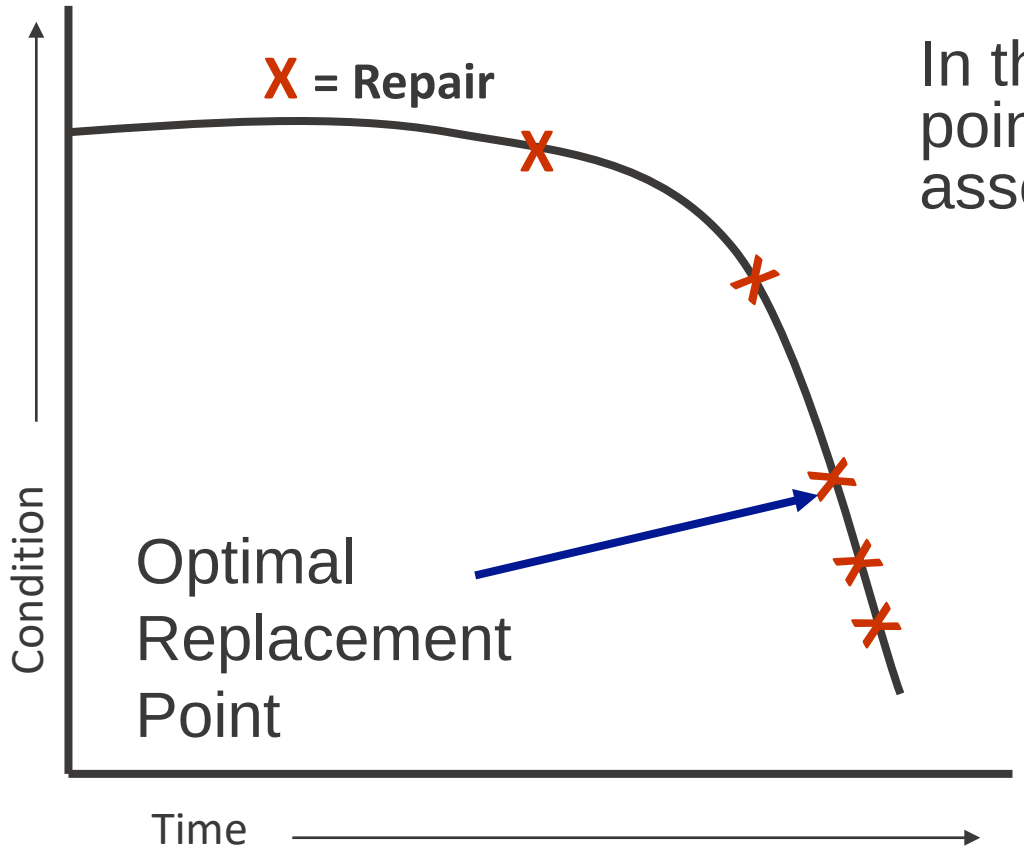
Asset Criticality

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



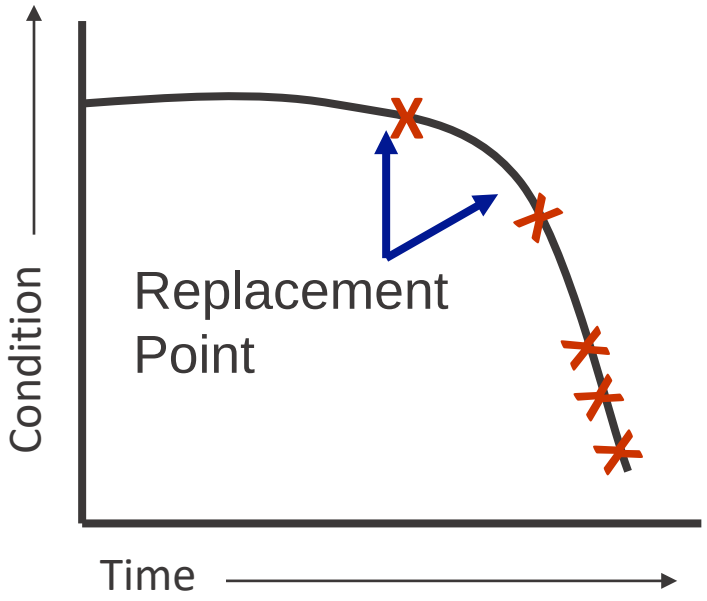
In theory, there is an exact right point at which to replace an asset

Not possible to know the optimal time to replace every asset

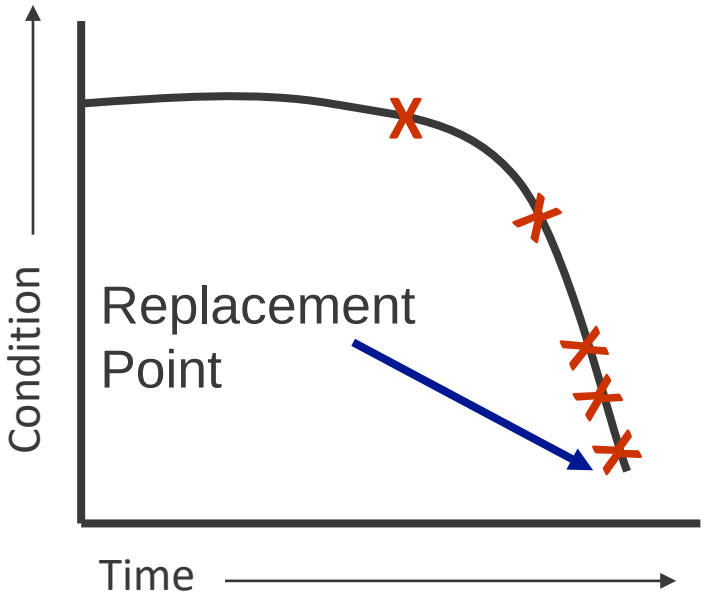
So… need to use the concept of risk

Life Cycle Costing & Risk

High risk assets:
replace assets early,
before failure



Low risk assets:
run to failure and
replace afterwards



Prioritize asset rehabilitation / replacement

Example System Inventory Worksheet						
Date Worksheet Completed/Updated: 8/14/02						
Asset	Expected Useful Life	Condition	Service History	Adjusted Useful Life	Age	Remaining Useful Life
Well 1 (1993)	30	Good		30	9	21
Well 1 pump	10	Good	Rehab (1996)	10	9	1
Well 2 (1993)	30	Good		30	9	21
Well 2 pump	10	Good	Rehab (1998)	10	9	1
Pumphouse (1993)	30	Good		30	9	21
Electrical components	10	Some corrosion	Rehab (1994)	10	9	1
Chlorinator (1993)	10	Good	Rehab (1998)	5	3	2
Storage tank 1 (1993)	40	Good	Rehab (2000) - $17,000	40	9	31
Storage tank 2 (1993)	40	Good	Rehab (2000) - $17,000	40	9	31
Storage tank 3 (2000)	40	Almost new		40	2	38
Distribution System:						
Hydrants (15)	40	Unknown		40	9	11
Valves (45)	40	Unknown	6 valves don't work	40	9	11
6-inch (PVC)	60	Unknown		60	9	51
4-inch (PVC)	60	Unknown		60	9	51
2-inch (PVC)	60	Unknown	Repair breaks (2/year)	60	9	51

Prioritization Worksheet		
Importance	Redundancy	Priority (1 is high)
Needed for service	Other well, but need backup	6
Needed for service	Other well, but need backup	3
Needed for service	Other well, but need backup	6
Needed for service	Other well, but need backup	3
Needed for service	Other well, but need backup	6
Needed for control	No redundancy - corrosion	2
Mandatory	No redundancy - need backup	1
eed for fire flow and demand	Other tanks	6
eed for fire flow and demand	Other tanks	6
eed for fire flow and demand	Other tanks	6
Needed for public safety	Other hydrants	5
Needed for isolation	Other valves, but some are out of service	4
Needed for delivery	No redundancy	6
Needed for delivery	No redundancy	6
Needed for delivery	No redundancy	6

Source: EPA's "Asset Management: A Handbook for Small Systems"

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

Asset Management Plan – the summary

1. Inventory all of your assets
2. Assess their age, condition, and when do you expect the asset will need to be rehabilitated or replaced
3. Assess the criticality of each asset: likelihood of failure, and consequence of failure
4. Prioritize the assets into a timeline of when the system should aim to rehab/replace them
5. Focus on next few years and create a C.I.P.
6. Keep updating! Repeat steps 2-5.

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 Planning...are you doing it?

Heck yeah!

Heard of it but not doing it yet!

yeah...I don't know what you're talking about

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 Plan (CIP)

An official multi-year document that identifies and prioritizes capital projects in the near future, identifies funding sources, and sets timelines for projects.

May include projects not listed in the Asset Management Plan.

Example of a simple Capital Improvement Plan

	Planning Years (Values in 000s)						
Project Name	**FY 02**	**FY 03**	**FY 04**	**FY 05**	**FY 06**	**Future**	**Total**
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
Repalcement 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

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.

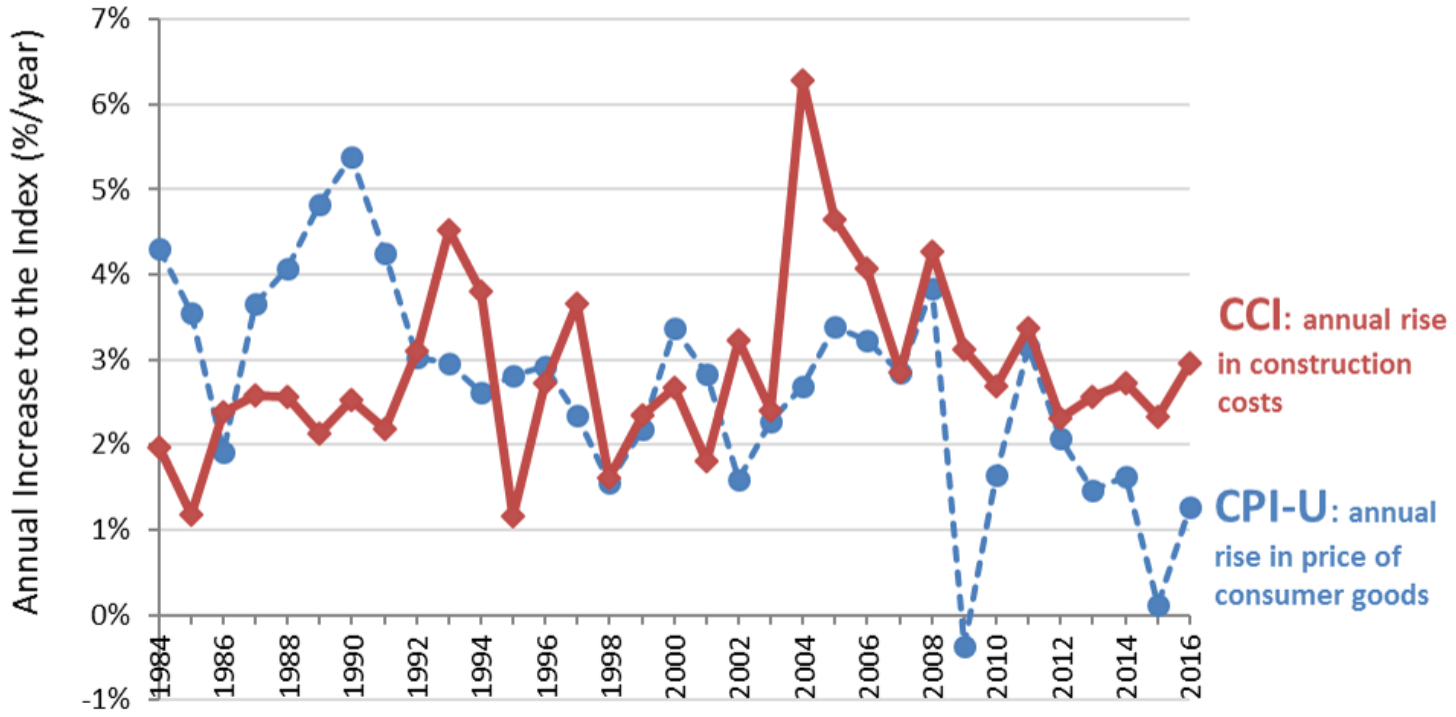
Measures of Inflation

- **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



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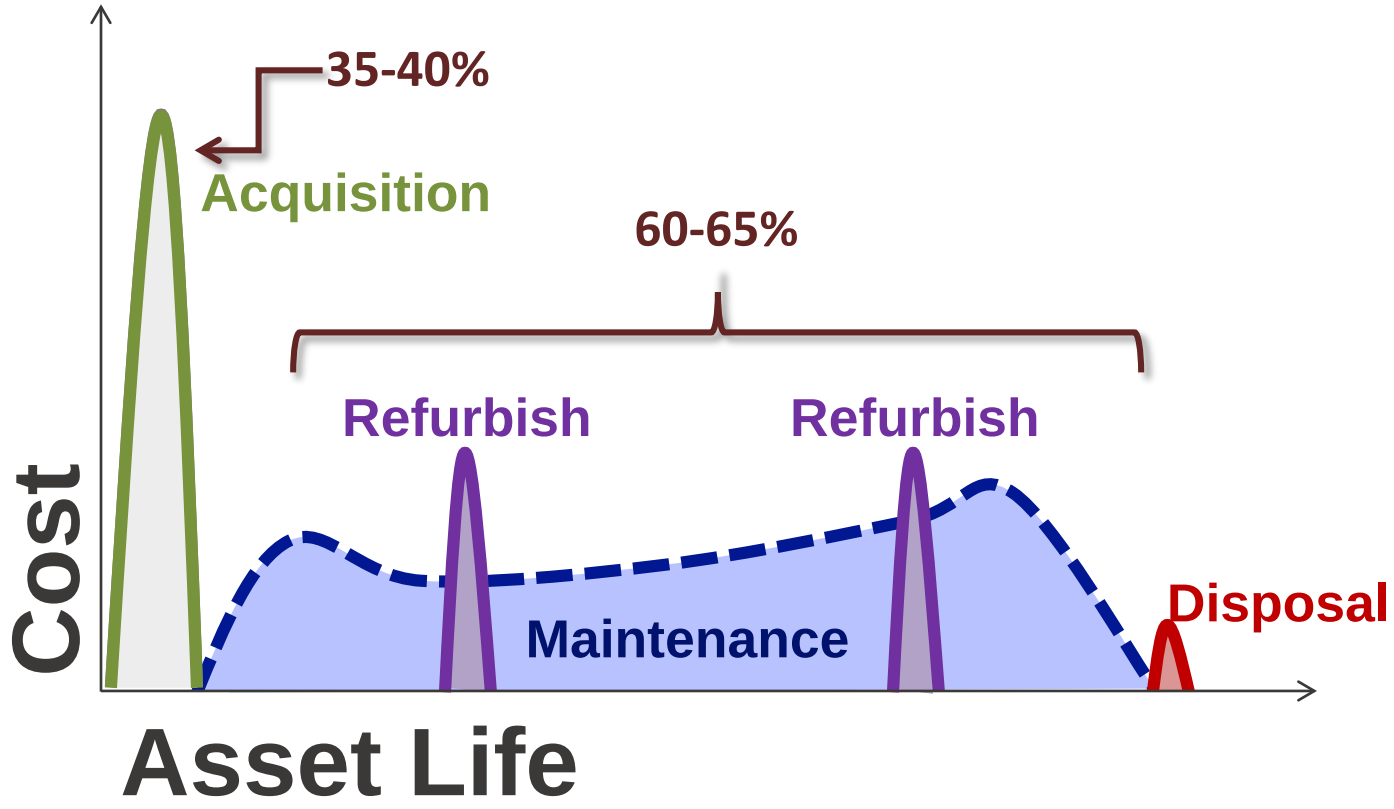
Source: *Environmental Finance* blog post available at http://efc.web.unc.edu/2012/09/26/using-an-index-to-help-project-capital-costs-into-the-future/

Reminder: Life Cycle Costing

- Purchase Price ≠ Total Price

Capital Investments are Just the Tip of the Iceberg…



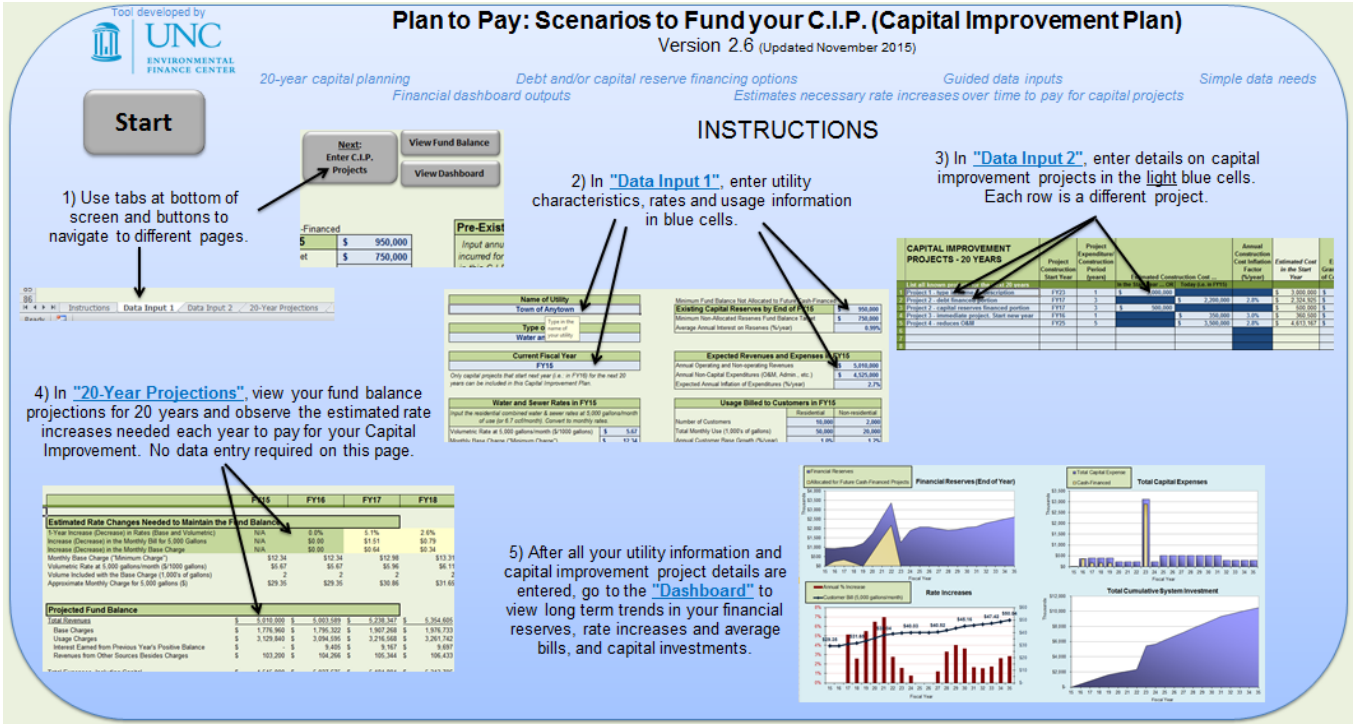
Source: Adapted from Steve Allbee, USEPA

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



EFC SW Resources

SOUTHWEST ENVIRONMENTAL FINANCE CENTER

- Link to switchboard: https://swefcamswitchboard.unm.edu/am/
- Link to AM resources: http://southwestefc.unm.edu/asset-management-resources/

How does your system fund capital projects? (select all that apply)

Whatever unexpected excess revenue is generated

Debt service

Funding depreciation

CIP and established funding sources

Grants

None of the Above/We don't have capital projects

How to pay for capital improvements

- Pay as you go (current receipts)
- Save in advance and pay (reserve funds)
- Pay later (someone loans you money)
- Grants (let someone else pay)

		Account	Budget
19		30-810-01 W/S PROF. SERVICES	$500.00
20		30-810-02 TOWN MANAGER SALARY	$28,499.99
21		30-810-03 W/S EMPLOYEE SALARY	$57,200.00
22		30-810-04 CLERK SALARY	$37,251.88
23		30-810-05 FICA EXPENSE	$8,703.00
24		30-810-06 W/S EMPLOYMENT TAX	$975.00
25		30-810-07 W/S OVERTIME	$4,500.00
26		30-810-08 MERIT BONUS	$3,000.00
27		30-810-09 HOLIDAY/EMPLOYEE APREC	$1,200.00
28		30-810-10 POSTAGE	$2,700.00
29		30-810-11 Office Supplies/Repairs	$4,700.00
30		30-810-12 PHONE	$3,400.00
31		30-810-13 W/S UTILITES	$30,000.00
32		30-810-14 TRAINING	$2,400.00
33		30-810-15 Employee Screening	$105.00
34		30-810-16 MAINT/REPAIR:SYST-EQUIP	$30,000.00
35		30-810-17 Mayor Salary	$1,800.00
36		30-810-18 Board Salary	$10,500.00
37		30-810-20 W/S UNIFORMS	$2,000.00
38		30-810-30 GAS AND OIL FOR VEHICLES	$4,500.00
39		30-810-31 TIRES FOR VEHICLES	$600.00
40		30-810-32 REPAIRS TO VEHICLES	$1,000.00
41		30-810-33 SUPPLIES & MATERIALS	$3,000.00
42		30-810-34 CHEMICALS AND SALT	$20,000.00
43		30-810-45 CONTRACTED SERVICES	$36,500.00
44		30-810-46 STATE PERMITS	$1,700.00
45		30-810-48 DUES/SUBSCRIPTIONS	$1,500.00
46		30-810-50 DEPRECIATION	$0.00
47		30-810-54 INSURANCE	$13,608.00
48		30-810-55 HOSPITAL INSURANCE	$22,443.00
49		30-810-57 MISC EXPENSE	$500.00
50		30-810-60 W/S - LGERS	$9,272.00
51		30-810-70 WATER STUDY EXPENSES	$24,000.00
52		30-810-74 Online Payments SVC	$1,600.00
53		30-810-75 ARRA LOAN PRINCIPAL	$8,875.00
54		30-810-76 PURCHASE WATER BILL	$2,400.00
55		30-810-79 Banking Fees	$500.00
56		30-810-89 CAPITAL OUTLAY NEW EQUIP	$0.00
57		30-810-90 TRANSFER TO OTHER FUND	$0.00
58		30-810-95 FINES AND PENALTIES	$1,500.00
			$382,932.87

Example from an actual budget of expenses

Note: the budgeted revenues were also $382,932.87

What not including money for capital looks like

How to budget for cash capital expenses

- ~~Don't budget for it~~ … NO!
- Have a CIP, know how much cash you will need and when for capital projects in the next few years, break it up into each year's budget, then budget for those amounts to build up (and spend down) your reserves for capital projects
- Know how much you expect to spend – on average – every year for capital projects and budget that annually
- Budget for depreciation

Depreciation

- A “cost” every year of your infrastructure wearing out; a percentage of its value.
- Accounting tool. May not be reflective of actual conditions.
- Depreciation underestimates replacement costs.
- Depreciation can and should be adjusted over time, but how often does that happen?
- At best, is an imperfect (likely low) method to budget for capital costs.
- Ignores possibility that you might use debt to pay for replacement.

Using depreciation as a mechanism to budget for cash capital expenses

- If you are not doing any capital improvements in the next year and don’t use another method to budget for future capital costs, you should at least include depreciation in your budget.

- If you are implementing a CIP and budgeting for it directly, you don’t necessarily need to include depreciation in your budget, except for assets that are not planned for in the AMP or CIP.

Using depreciation as a mechanism to budget for cash capital expenses

- By including depreciation into rates, you collect revenues for future cash capital improvements
  - Could put it all into fund balance and keep track of it with a spreadsheet
  - Better is to put it into a capital reserve fund that is separate and only for capital projects

- Capital costs higher than depreciation, so maybe budget for a little more than depreciation

Recorded webinar on depreciation for water systems

https://www.youtube.com/watch?v=d8A7MJXFV1U&t=1115s

Typical sources of external funding

Bonds	Revenue bonds, GO bonds
Loans	From banks, or can be subsidized: e.g. WIFIA, USDA, SRFs (EPA/State), State agencies
Grants	From agencies: e.g. CDBG (HUD), EDA, State agencies