



# Infrastructure Investment

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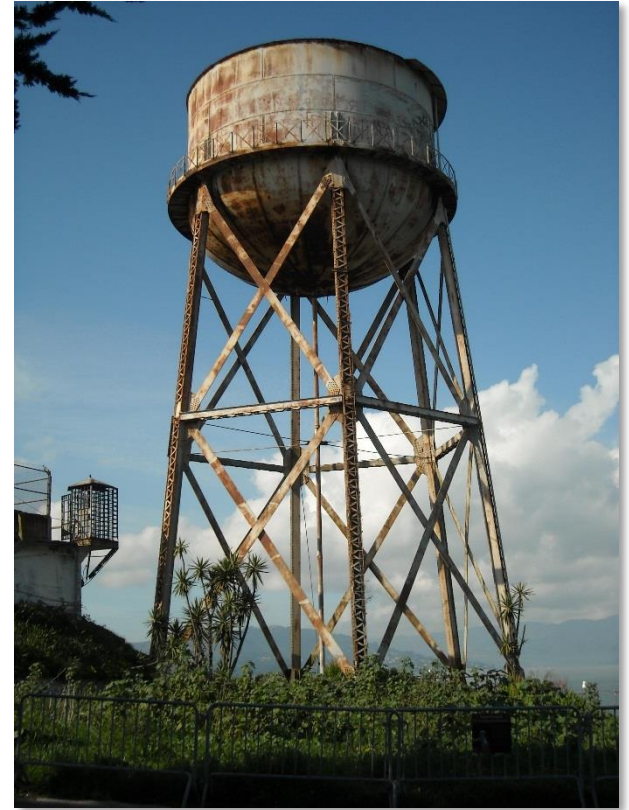
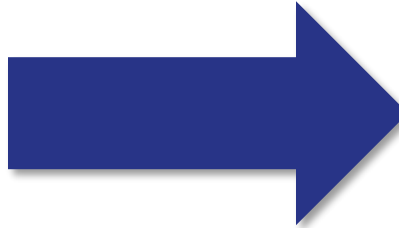
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# Infrastructure or Capital Assets



# Infrastructure Wears Out





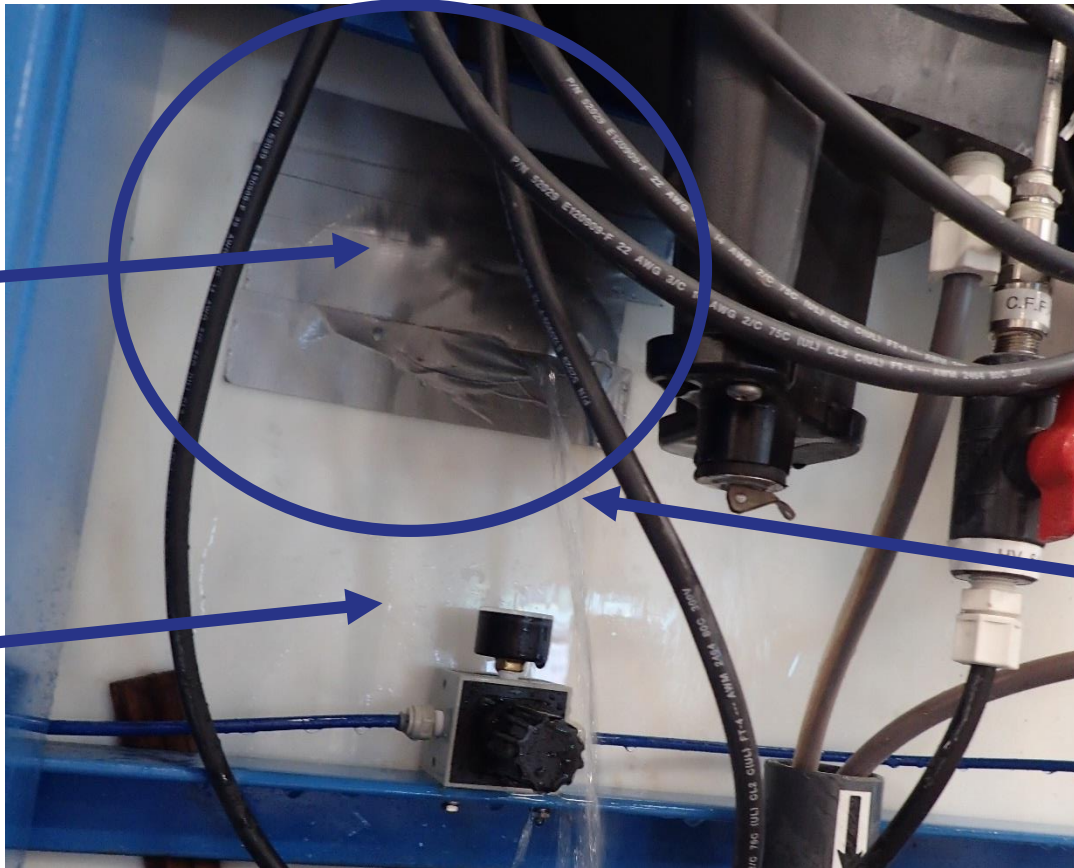
# Infrastructure Wears Out



# Infrastructure Wears Out



Water  
Tank



Leak





There are two ways to keep up  
your infrastructure...

# Ways to Keep Up Infrastructure



Mike Daly · White Cliffs MDWUA, NM

# Ways to Keep Up Infrastructure



Source: <https://www.youtube.com/watch?v=rH867Y-8-VM>



# Two Ways to Fix Things



**Proactively**  
Repair, rehabilitation  
and replacement on  
a set schedule



**Reactively**  
You wait for it to  
break



# Being Proactive

- Requires long term system planning—  
Asset Management and Capital  
Planning
- Has its advantages, according to people  
in the field...

# Measuring Needs, Not Guessing



Ted Riehle · Old Forge, NY



# Better Board Communication



Chris Jacobs · Somersworth, NH

# Efficient System Management



Doug Powers · Tucumcari, NM

# Fewer Emergencies



Mike Daly · White Cliffs MDWUA, NM



# Justification for Rate Increases



Ted Riehle · Old Forge, NY

# 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



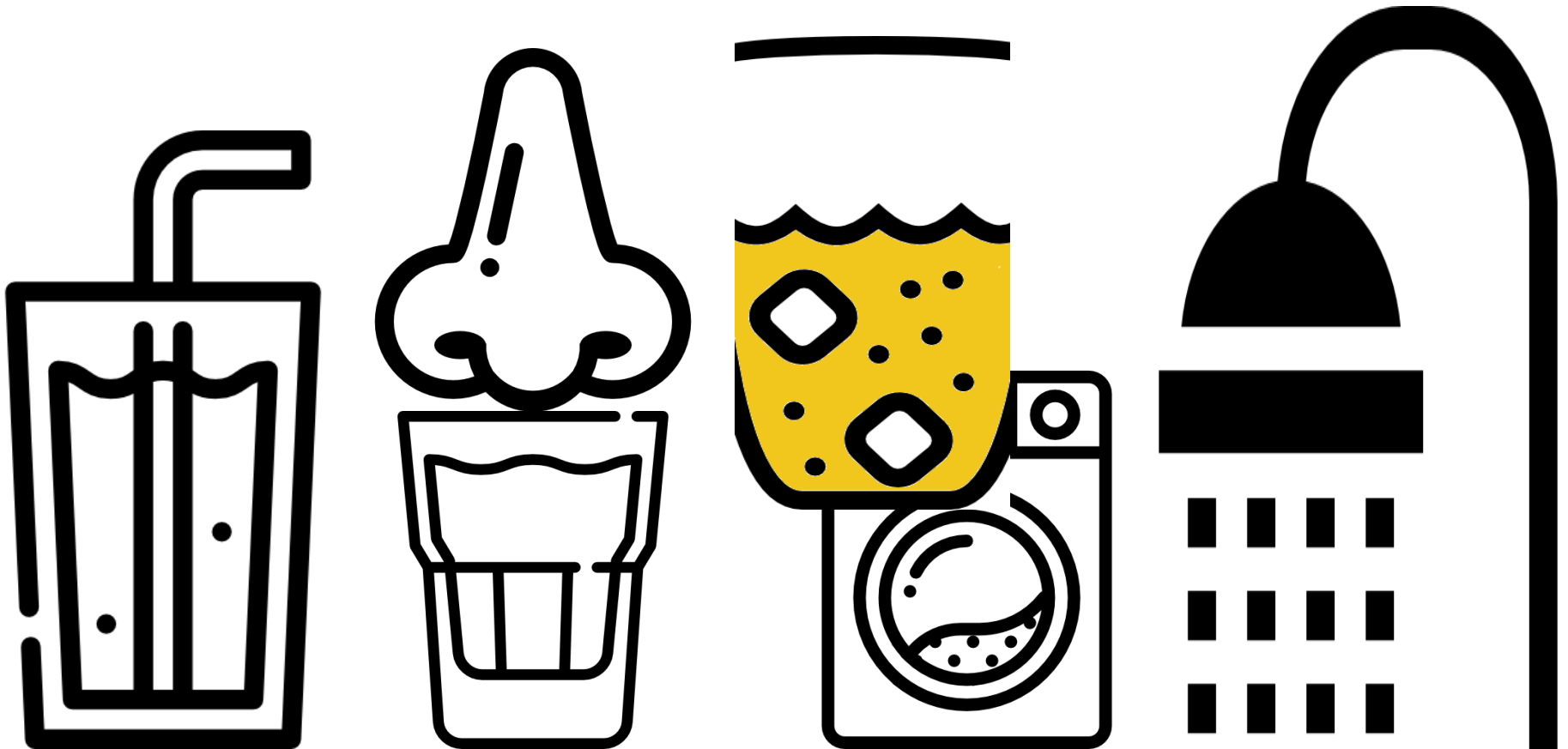
Track Progress  
Towards  
Meeting Goals

Involve  
Staff



What would my customers want?

What do customers care about?



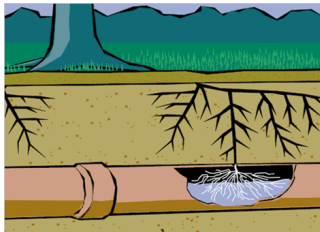


# Asset Criticality

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



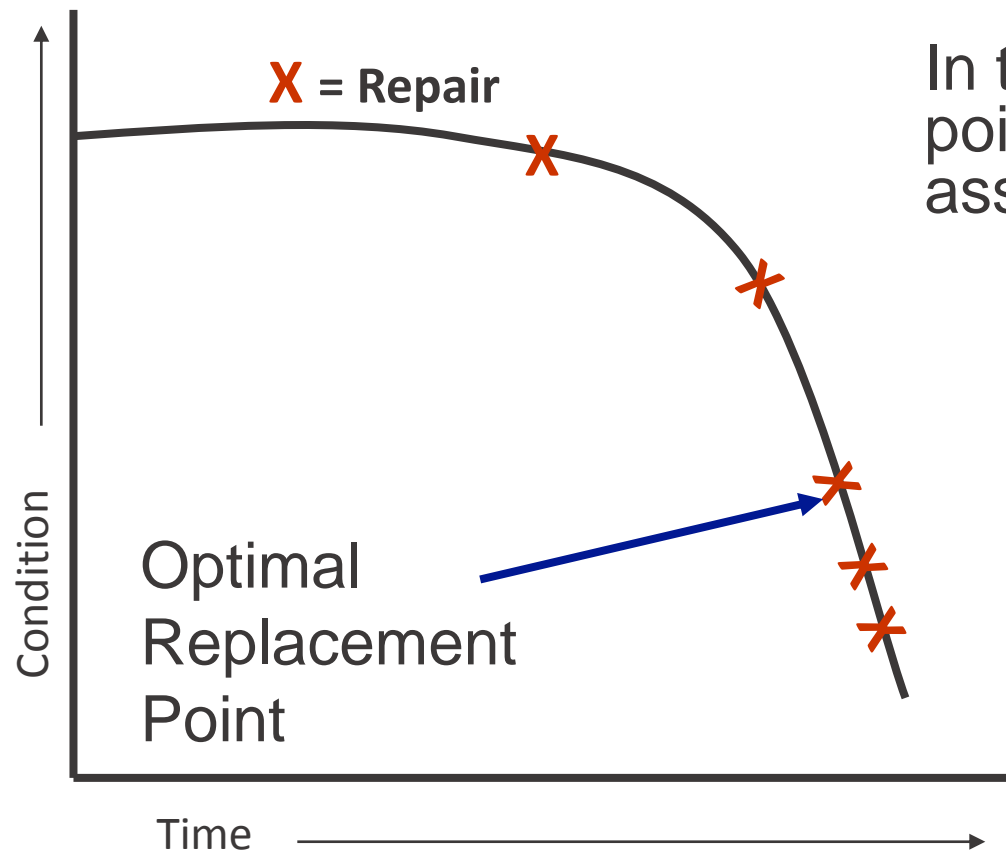


# Quick Exercise—4 Assets

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



# Life Cycle Costing: Replacement of Assets



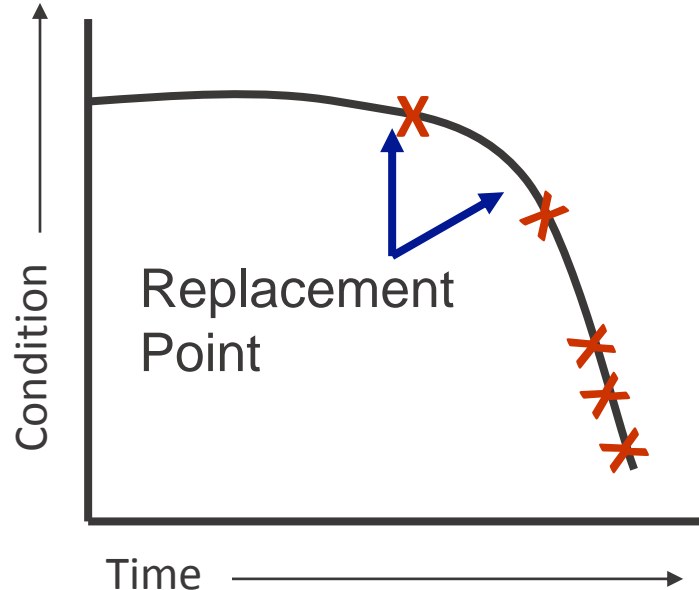
In theory, there is an exact right point at which to replace an asset

Not possible to know the optimal time to replace every asset

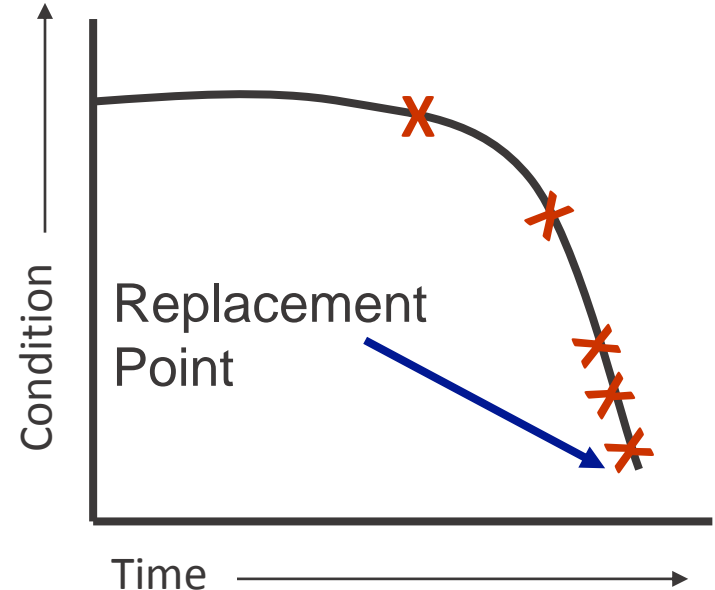
So... need to use the concept of risk

# 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



# Long Term Capital Planning

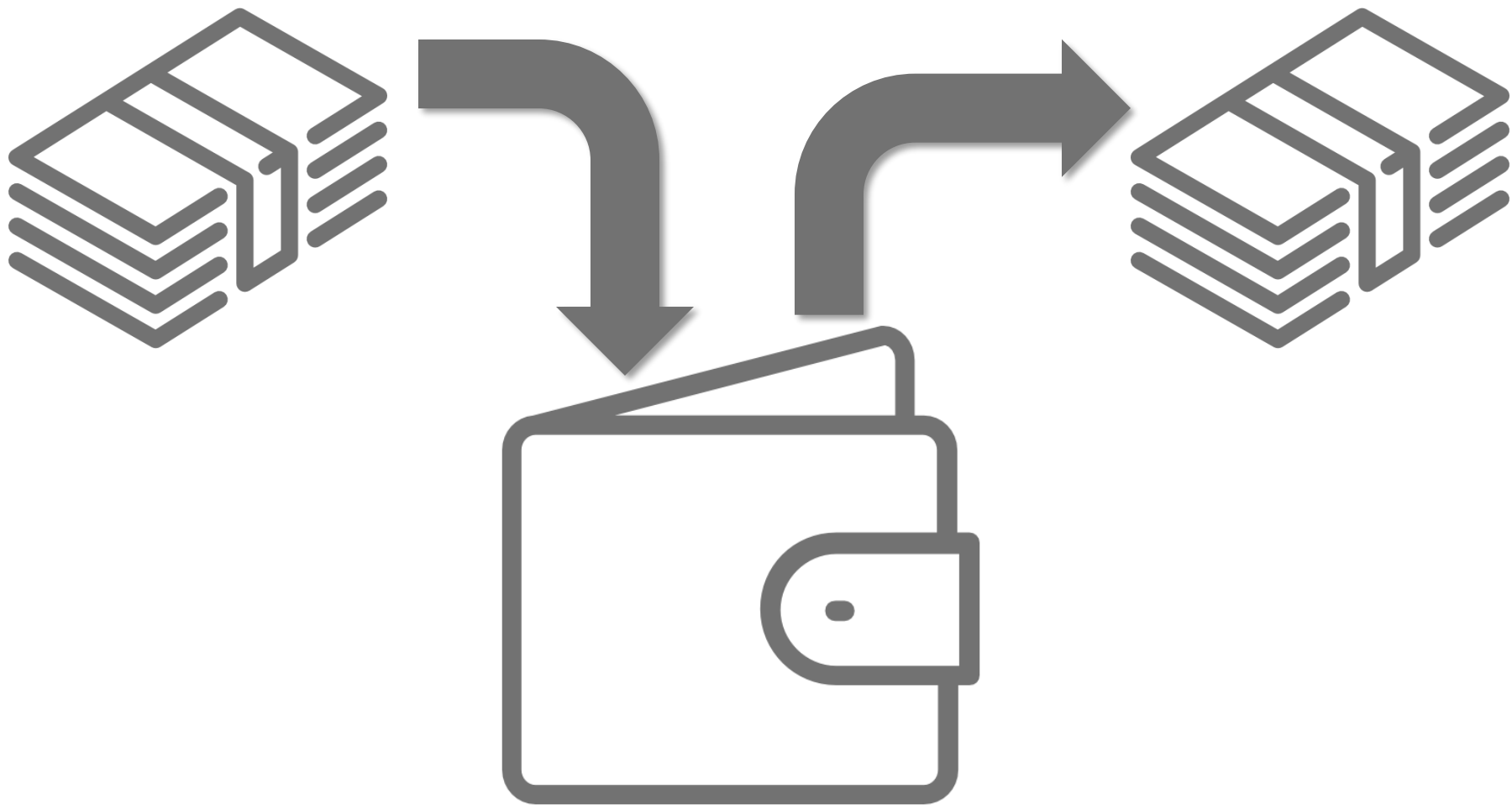
- This is strongly related to asset management
- An official multi-year document that identifies and prioritizes capital projects, identifies funding sources, and sets timelines



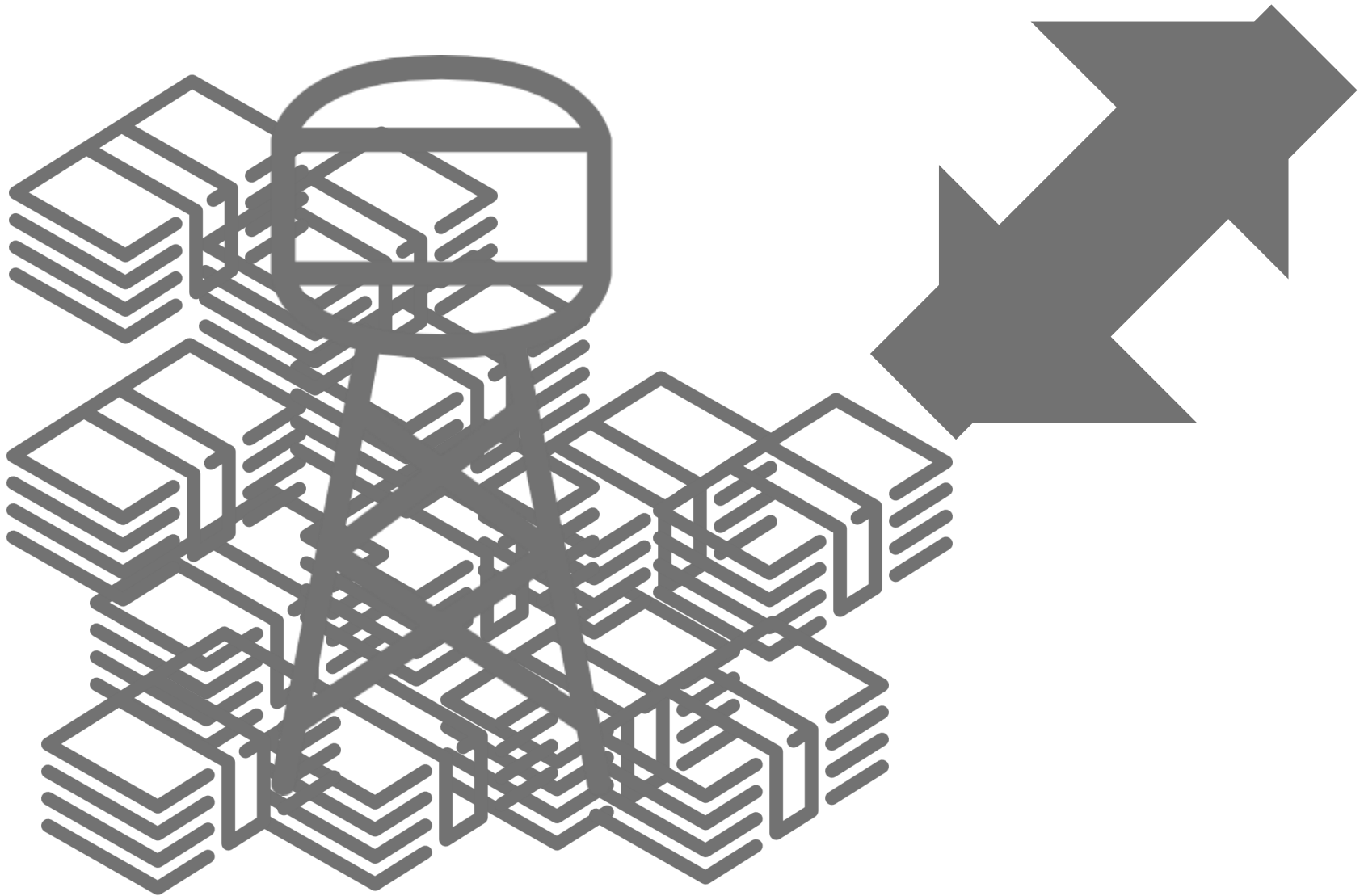


# Four approaches to paying for capital improvements

# Pay As You Go

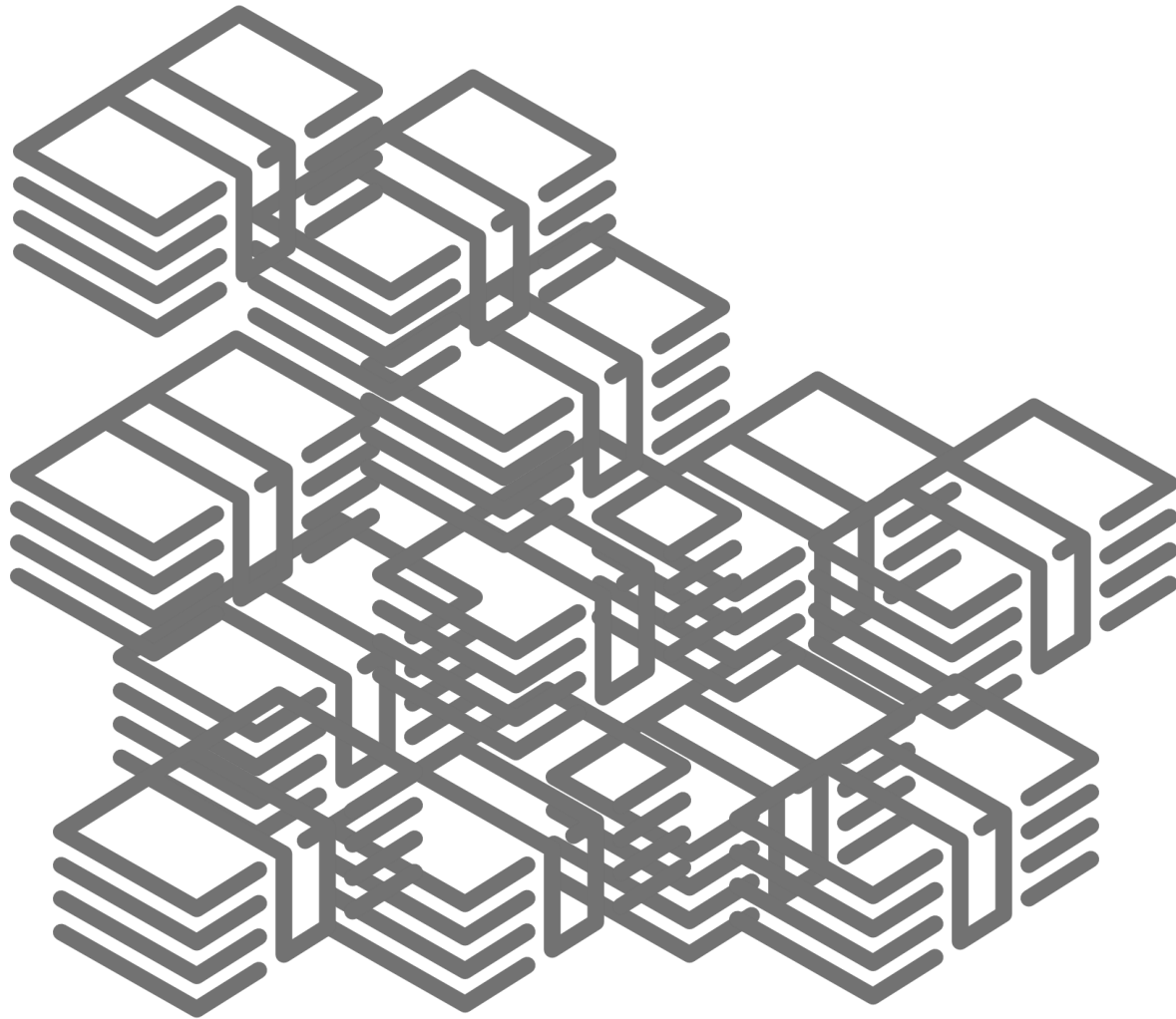


# Save In Advance and Pay





# Borrow and Pay Later

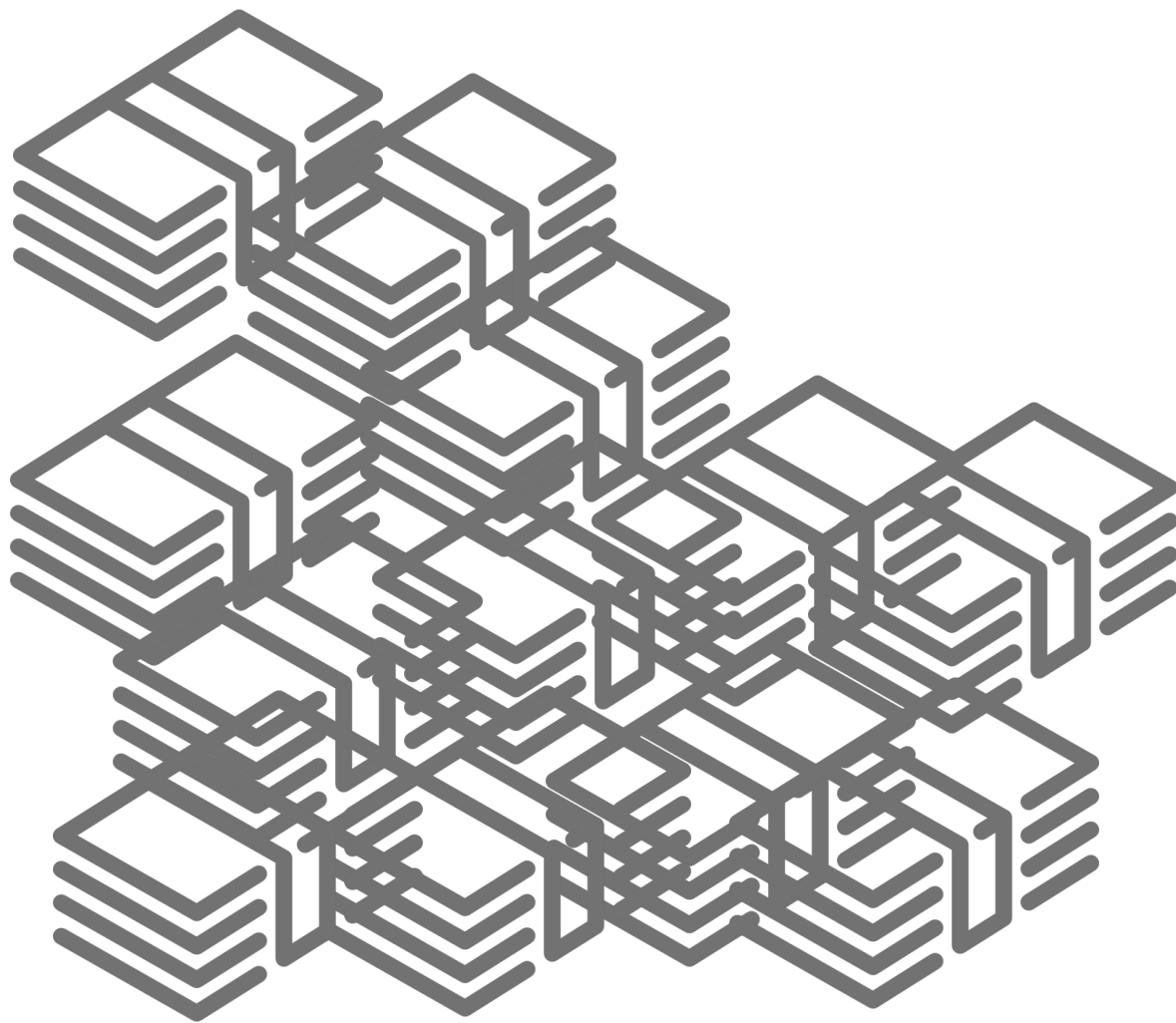


**BANK**





# Get a Grant



**GRANT**



# Ways To Pay

- Pay as you go
- Save in advance and pay
- Borrow and pay later

Money  
from your  
customers

- Grants (let someone else pay)

Not easy to come by

# Infrastructure Funding Programs



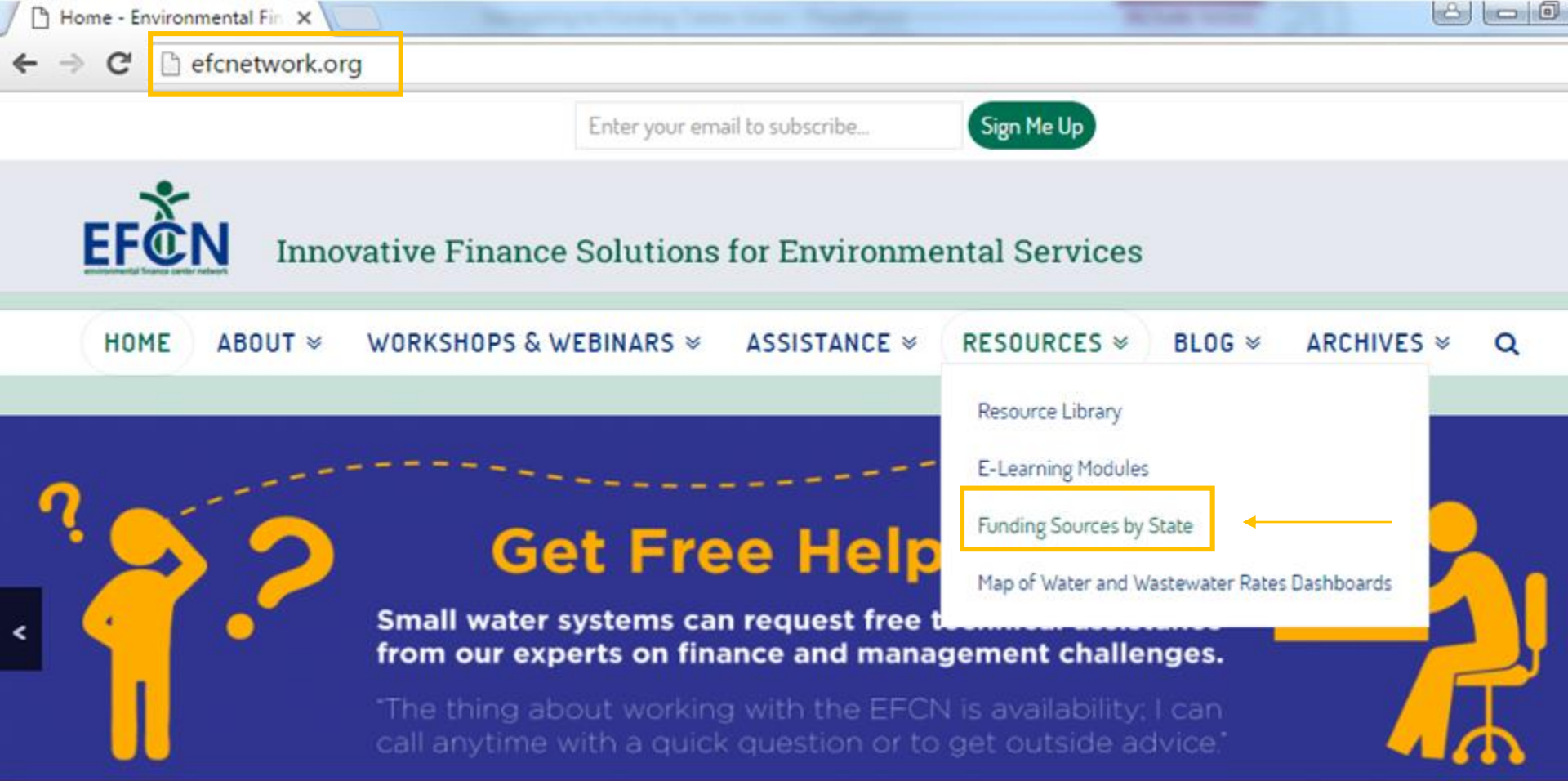
40 Years



COBANK™

Building Better Neighborhood





## Navigating to Funding Tables

Step 1: efcnetwork.org

Step 2: Select "Funding Sources by State or Territory" under the Resources Tab



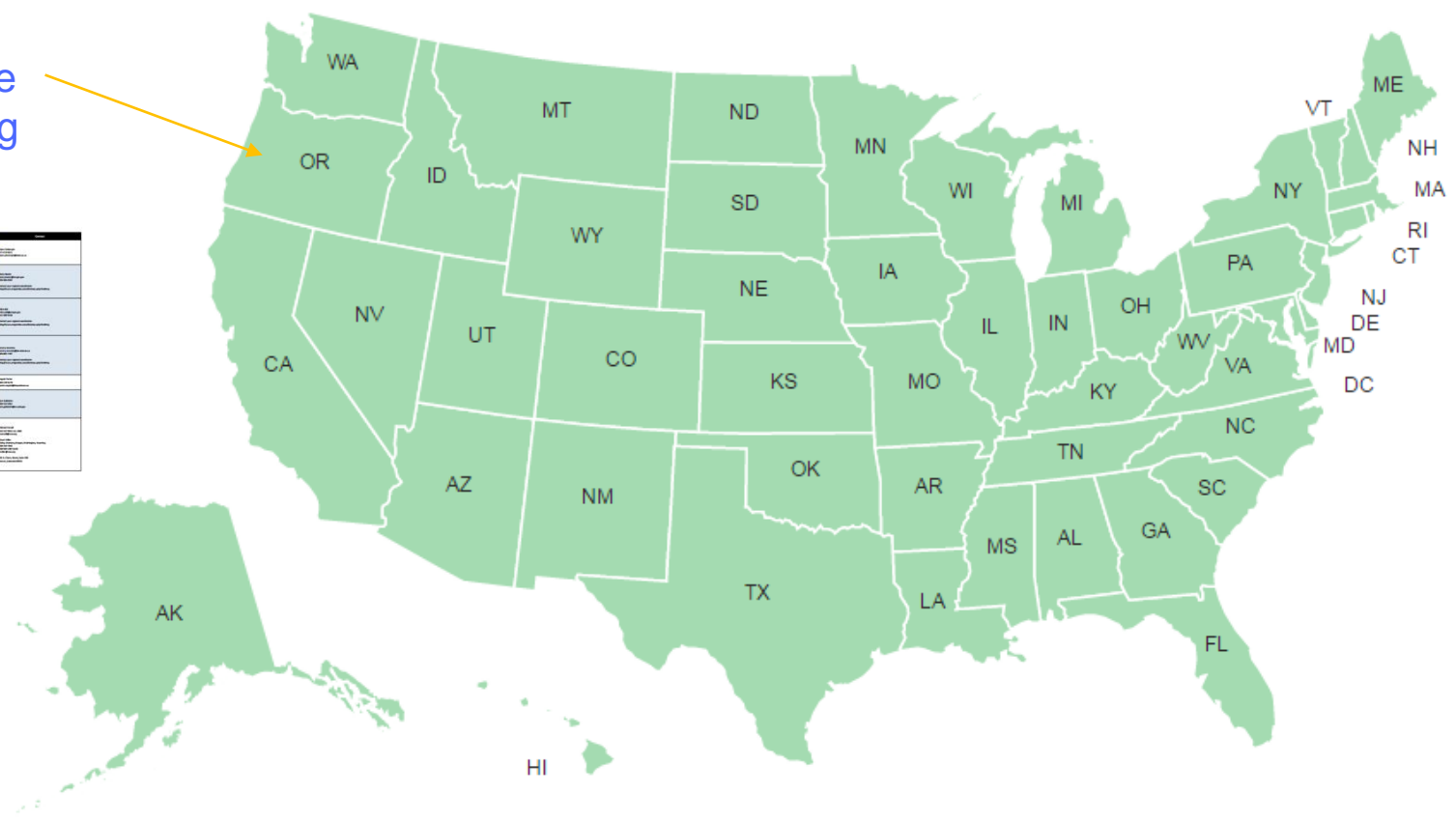
# Funding Sources by State

*Note: Some states may have additional resources listed below the map.*

Click on the map below to view funding sources for each state:

Click on an individual state to view funding table.

State	Funding Source	Link
AK	Alaska Department of Education	<a href="#">Link</a>
AK	Alaska Department of Health	<a href="#">Link</a>
AK	Alaska Department of Social Services	<a href="#">Link</a>
AK	Alaska Department of Transportation	<a href="#">Link</a>
AK	Alaska Department of Wildlife	<a href="#">Link</a>
AK	Alaska Department of Labor	<a href="#">Link</a>
AK	Alaska Department of Corrections	<a href="#">Link</a>
AK	Alaska Department of Community Development	<a href="#">Link</a>
AK	Alaska Department of Natural Resources	<a href="#">Link</a>
AK	Alaska Department of Public Safety	<a href="#">Link</a>
AK	Alaska Department of Veterans Affairs	<a href="#">Link</a>
AK	Alaska Department of Education and Early Childhood Development	<a href="#">Link</a>
AK	Alaska Department of Health and Social Services	<a href="#">Link</a>
AK	Alaska Department of Transportation and Public Facilities	<a href="#">Link</a>
AK	Alaska Department of Wildlife Conservation	<a href="#">Link</a>
AK	Alaska Department of Labor and Workforce Development	<a href="#">Link</a>
AK	Alaska Department of Corrections and Probation	<a href="#">Link</a>
AK	Alaska Department of Community Development and Planning	<a href="#">Link</a>
AK	Alaska Department of Natural Resources and Conservation	<a href="#">Link</a>
AK	Alaska Department of Public Safety and Security	<a href="#">Link</a>
AK	Alaska Department of Veterans Affairs and Military Affairs	<a href="#">Link</a>
AK	Alaska Department of Education and Early Childhood Development	<a href="#">Link</a>
AK	Alaska Department of Health and Social Services	<a href="#">Link</a>
AK	Alaska Department of Transportation and Public Facilities	<a href="#">Link</a>
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AK	Alaska Department of Public Safety and Security	<a href="#">Link</a>
AK	Alaska Department of Veterans Affairs and Military Affairs	<a href="#">Link</a>



<https://ofmpub.epa.gov/apex/wfc/f?p=165:1:.....>



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Map Search



# Capital Planning and Asset Management Resources

# <https://efc.sog.unc.edu/project/capital-planning-resources-water-and-wastewater-utilities>

## Capital Planning Resources For Water And Wastewater Utilities

**Funded By:** North Carolina Department of Environmental Quality

**Program:** Drinking Water and Wastewater

[HOME](#) / [CAPITAL PLANNING RESOURCES FOR WATER AND WASTEWATER UTILITIES](#)

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Summary



Partners



Resources


Contact

This project, part of the NC Water System Capacity Development Support project funded by the Public Water Supply Section of NC Department of Environment and Natural Resources, brings together many resources focused on capital planning for drinking water and wastewater utilities. Capital planning often leads



# <https://efc.sog.unc.edu/resource/plan-pay-scenarios-fund-your-capital-improvement-plan>

Tool developed by



20-year capital planning  
Financial dashboard outputs

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

Version 2.6 (Updated November 2015)

Debt and/or capital reserve financing options  
Estimates necessary rate increases over time to pay for capital projects

Guided data inputs  
Simple data needs

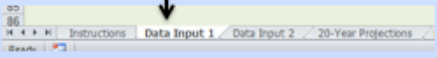
**Start**

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.

**Name of Utility**  
Town of Anytown

**Type**  
Water

**Current Fiscal Year**  
FY15

**Water and Sewer Rates in FY15**

Input the residential combined water & sewer rates at 5,000 gallons/month of use (or 6.7 cubic feet). Convert to monthly rates.	
Volumetric Rate at 5,000 gallons/month (\$/1000 gallons)	\$ 5.67
Monthly Base Charge ("Minimum Charge")	\$ 12.34

**Existing Capital Reserves by End of FY15**

Minimum Fund Balance Not Allocated to Future Cash-Financed Projects	\$ 950,000
Existing Capital Reserves by End of FY15	\$ 250,000
Minimum Non-Allocated Reserves Fund Balance Target	\$ 700,000
Average Annual Interest on Reserves (%/year)	0.50%

**Expected Revenues and Expenses in FY15**

Annual Operating and Non-operating Revenues	\$ 5,910,000
Annual Non-Capital Expenditures (O&M, Admin., etc.)	\$ 4,525,000
Expected Annual Inflation of Expenditures (%/year)	2.7%

**Usage Billed to Customers in FY15**

	Residential	Non-residential
Number of Customers	10,000	2,000
Total Monthly Use (1,000's of gallons)	50,000	20,000
Annual Customer Rate Growth (%/year)	0.0%	0.7%

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


Project	Project Construction Start Year	Project Construction Period (years)	Estimated Construction Cost	Annual Construction Cost Inflation Factor (%/year)	Estimated Cost at the Start Year	End of Cycle
Project 1 - water main replacement	FY12	5	\$ 2,000,000	2.0%	\$ 2,000,000	\$ 2,000,000
Project 2 - sewer main replacement	FY17	3	\$ 1,500,000	3.0%	\$ 1,500,000	\$ 1,500,000
Project 3 - capital reserves financed portion	FY15	1	\$ 250,000	0.0%	\$ 250,000	\$ 250,000
Project 4 - immediate project, start new year	FY15	1	\$ 3,500,000	2.0%	\$ 3,500,000	\$ 3,500,000

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.


	FY15	FY16	FY17	FY18
<b>Estimated Rate Changes Needed to Maintain the Fund Balance</b>				
5-Year Increase (Decrease) in Rates (Base and Volumetric)	N/A	0.0%	5.1%	2.0%
Increase (Decrease) in the Monthly Bill for 5,000 Gallons	N/A	\$0.00	\$1.01	\$0.79
Increase (Decrease) in the Monthly Base Charge	N/A	\$0.00	\$0.04	\$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
<b>Projected Fund Balance</b>				
Total Revenues	\$ 5,910,000	\$ 5,991,589	\$ 6,228,347	\$ 6,364,695
Base Charges	\$ 1,776,960	\$ 1,795,322	\$ 1,907,268	\$ 1,936,733
Usage Charges	\$ 3,129,840	\$ 3,094,595	\$ 3,216,568	\$ 3,261,742
Interest Earned from Previous Year's Positive Balance	\$ -	\$ 9,495	\$ 9,167	\$ 9,697
Revenues from Other Sources Besides Charges	\$ 103,200	\$ 104,265	\$ 105,344	\$ 106,433

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.


**Financial Reserves (End of Year)**




**Rate Increases**



**Total Capital Expenses**



**Total Cumulative System Investment**



# <http://southwestefc.unm.edu/asset-management-overview/>

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ENVIRONMENTAL  
FINANCE CENTER

WHAT WE DO

ASSET MANAGEMENT

OVERVIEW

AM IQ

AM MANUAL

RESOURCES

ENERGY MANAGEMENT

SMALL SYSTEMS PROJECTS

SOURCE WATER  
PROTECTION

TRIBAL DRINKING WATER

WATERCARE COMMUNITIES

WATER LOSS CONTROL

Home > Services > Asset Management – Overview

## Asset Management – Overview



Assets are generally the most expensive components that a community can own, operate, maintain and replace. Making the right choice about how to manage a community's assets is key to being able to sustain the assets over time. One of the best tools to help a community manage its assets is called, Asset Management. It helps answer the questions of what should we do, how should we do it, when should we do it, and where is the best place to make an investment in our assets.

Asset Management is a proven method whose techniques have been refined by the international community, particularly in Australia and New Zealand. It has now been practiced overseas for well over 15 years and has been gaining popularity across the US for the

<http://southwestefc.unm.edu/amkan/main.php>

# A.M. KAN WORK!

An Asset Management and Energy Efficiency Manual



Helping Water and Wastewater Utilities Achieve Sustainability  
Through Sound Management Practices

Sponsored by:



<http://www.kdheks.gov>

Prepared by:







# <http://southwestefc.unm.edu/asset-management-iq/>

Appendix F

## ASSET MANAGEMENT IQ

An Asset Management IQ Test is presented here in order to help you review the concepts of the various core components of Asset Management. Both the test and a scoring table are also available as a [printable pdf](#), which may be copied for use by multiple personnel within your utility.

In the web version of the test, clicking on a choice will automatically enter the number of points for that option and keep track of the score for each section of the Asset Management IQ as well as the total cumulative score. If a new answer is selected, the new choice and the new points will appear and the old points will be removed.

If the user completes the entire Asset Management IQ tool (all 30 questions) before starting Asset Management, it will provide a baseline evaluation at the beginning of Asset Management. Comparing the scores of each of the six sections will show which areas have the biggest gaps in terms of Asset Management activities. These scores may provide information about where efforts should be focused. You may wish to start with areas that are the weakest, offering a large improvement with a little effort, or with areas that are strong, which would offer a chance to get started in a familiar area.

As the utility progresses, the Asset Management IQ can be repeated and the scores compared to previous scores. At a minimum, you may wish to repeat the Asset Management IQ every year.

It should be noted that a total score of 150 would represent best practice in all areas of Asset Management. Not all

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≡ SOURCE WATER  
PROTECTION

≡ TRIBAL DRINKING WATER

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## Asset Management – Resources

### General

- [Level of Service: Guidelines, Categories, and Example Goals](#) | [download](#)
- [Level of Service: Goal Measurement](#) | [download](#)
- [Criticality of Assets](#) | [download](#)
- [Reference Guide for Asset Management Inventory and Risk Analysis](#) | [download](#)
- [Introduction to Asset Management and Asset Management Resources](#) | [download](#)
- [Asset Management: The Five Core Components](#) | [download](#)
- [O&M Management Guide – DRAFT, Available for pilot](#)  
(Note: This is a zip file and must be extrated prior to opening) | [download](#)

### Asset Inventory

- [Inventory Database](#) (Note: This is a zip file and must be extrated prior to opening) | [download](#)
- [Instruction for using Asset Inventory Database](#) | [download](#)
- [Inventory Spreadsheet](#) | [download](#)





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