

Long-Term Investment for Financial Resiliency

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Objectives:

- Understand Some Financial Metrics for Long-Term Planning
- Understand Concepts of Asset Criticality
- Understand the Relationship Between Life Cycle Costing, Asset Management, and Capital Planning



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Poll Question: What is Your Background?

- Science
- Engineering
- Law
- Finance
- Management
- Other



Poll Question: How Many Clients Does Your System Serve?

- Up to 500
- 501 – 2,500
- 2,500 – 10,000
- 10,000+
- Not a system

Where do we get started?

Local governments:

annual audited financial statements

Non-governments:

balance sheets, shareholder reports, annual reports, etc.

BAVARIA	
STATEMENT OF NET ASSETS	
PROPRIETARY FUND	
JUNE 30, 2011	
	Water and Sewer Enterprise Fund
Assets	
Current Assets:	
Cash - operating	\$ 368,061
Accounts Receivable (Net)	66,246
Prepaid Insurance	5,856
Total Current Assets	640,263
Noncurrent Assets:	
Restricted cash	177,208
Capital assets	
Land	209,556
Buildings	22,082
Improvements other than buildings	5,871,709
Machinery and equipment	896,073
Construction in progress	1,454,079
Less: Accumulated depreciation	(2,883,225)
Deferred Charge	38,833
Total noncurrent assets	5,781,214
Total Assets	6,421,678
Liabilities	
Current Liabilities:	
Accounts Payable	21,090
Accrued Expenses	2,767
Due to Other Funds	8,176
Customer Deposits	62,625
Deferred Subsidy Revenue	460,005
Current Portion of Long Term Debt	343,811
Total Current Liabilities	898,474
Noncurrent Liabilities:	
Compensated Absences	15,605
Revenue Bonds (Net of current portion)	233,357
Notes Payable (Net of current portion)	646,873
Total Noncurrent Liabilities	895,835
Total Liabilities	1,794,309
Fund Net assets	
Invested in capital assets, net of related debt	6,355,133
Restricted for debt service	114,583
Unrestricted	162,362
Total fund net assets	\$ 6,632,078



Operating Ratio

$$= \frac{\textit{Total Operating Revenues}}{\textit{Total Operating Expenses (including or excluding depreciation)}}$$

Operating Ratio: A measure of efficiency that compares operating revenues to operating expenses. Offers a broader perspective on self-sufficiency. The operating ratio shows how efficient a company's management is at keeping costs low while generating revenue or sales. The higher the ratio, the more efficient the company is at generating revenue vs. total expenses.

Operating Ratio: Not Including Depreciation

Did you generate the revenues needed to pay for O&M by itself?

Operating Ratio (not including depreciation)

This version of operating ratio measures whether the utility's revenues from sales are sufficient to cover just the cost of operations and maintenance (without any consideration for capital expenses).

[Read more about Operating Ratios in this blog post](#)

Formula	Set Your Target:
$\frac{\text{Total Operating Revenues [1]}}{\text{Total Operating Expenses [2] - Depreciation [3]}}$	greater than or equal to 1.0 Minimum Benchmark: >1.0 <i>(you may wish it to be > 1.5)</i>
Value for [REDACTED] in Fiscal Year 2019:	0.95
Did you meet your target in Fiscal Year 2019?	
Did you improve since the previous year?	
What's the trend over the last 5 years?	

[See Full Size Graph](#)

[Go to top](#)

Operating Ratio: Including Depreciation

Did you generate the revenues needed to pay for O&M and a little for capital?

Operating Ratio (including depreciation)

Measures the profitability of the water and/or wastewater system. It shows whether the utility's revenues from sales are sufficient to cover the cost of operations (O&M) and depreciation, which is used here as a surrogate for capital needs.

[Read more about Operating Ratios in this blog post](#)

Formula

Total Operating Revenues [1]

Total Operating Expenses [2]

Set Your Target:

greater than or equal to

1.0

Minimum Benchmark: >1.0
(you may wish it to be > 1.2)

Value for Village of [redacted] in Fiscal Year 2019:

0.57

Did you meet your target?



Did you improve since the previous year?



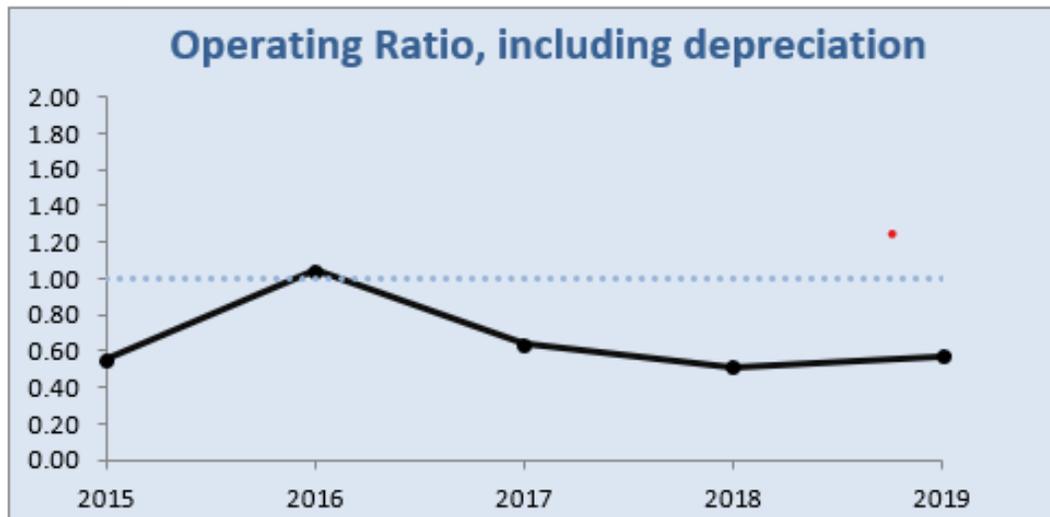
What's the trend over the last 5 years?



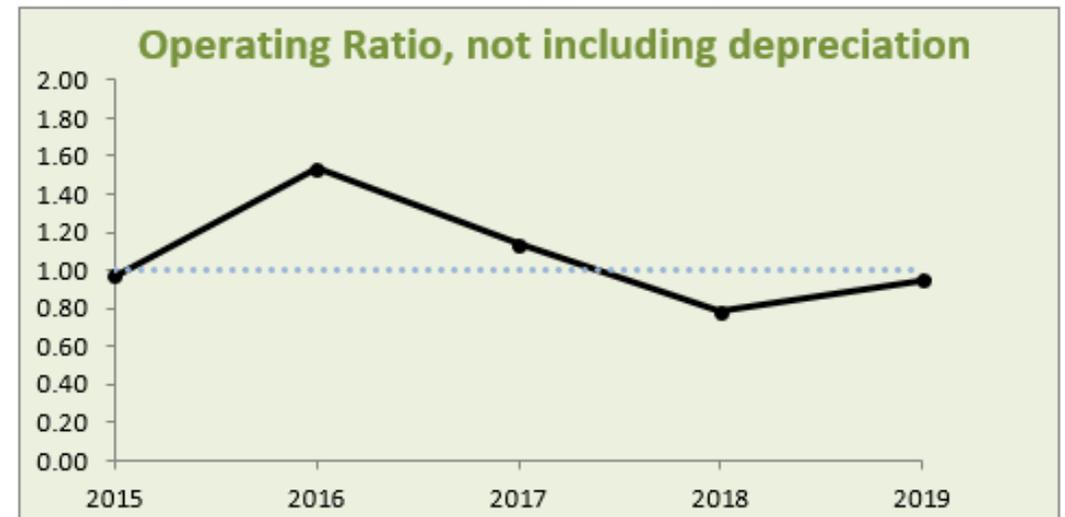
[See Full Size Graph](#)

Operating Ratio

Did you generate the revenues needed to pay for O&M and a little for capital?



Did you generate the revenues needed to pay for O&M by itself?





Debt Service Coverage Ratio

$$\frac{\text{Total Operating Revenues} - \text{Operating Expenses (excluding depreciation)}}{\text{Principal} + \text{Interest Payments on Long Term Debt (annual)}}$$

Debt Service Coverage Ratio: How well you can cover your debt after you pay your day-to-day expenses.

$$\text{Debt Service Coverage Ratio} = \frac{\text{Operating Revenues} - \text{Operating Expense (excluding depreciation)}}{\text{Principal and interest payments on long term debt (annual)}}$$

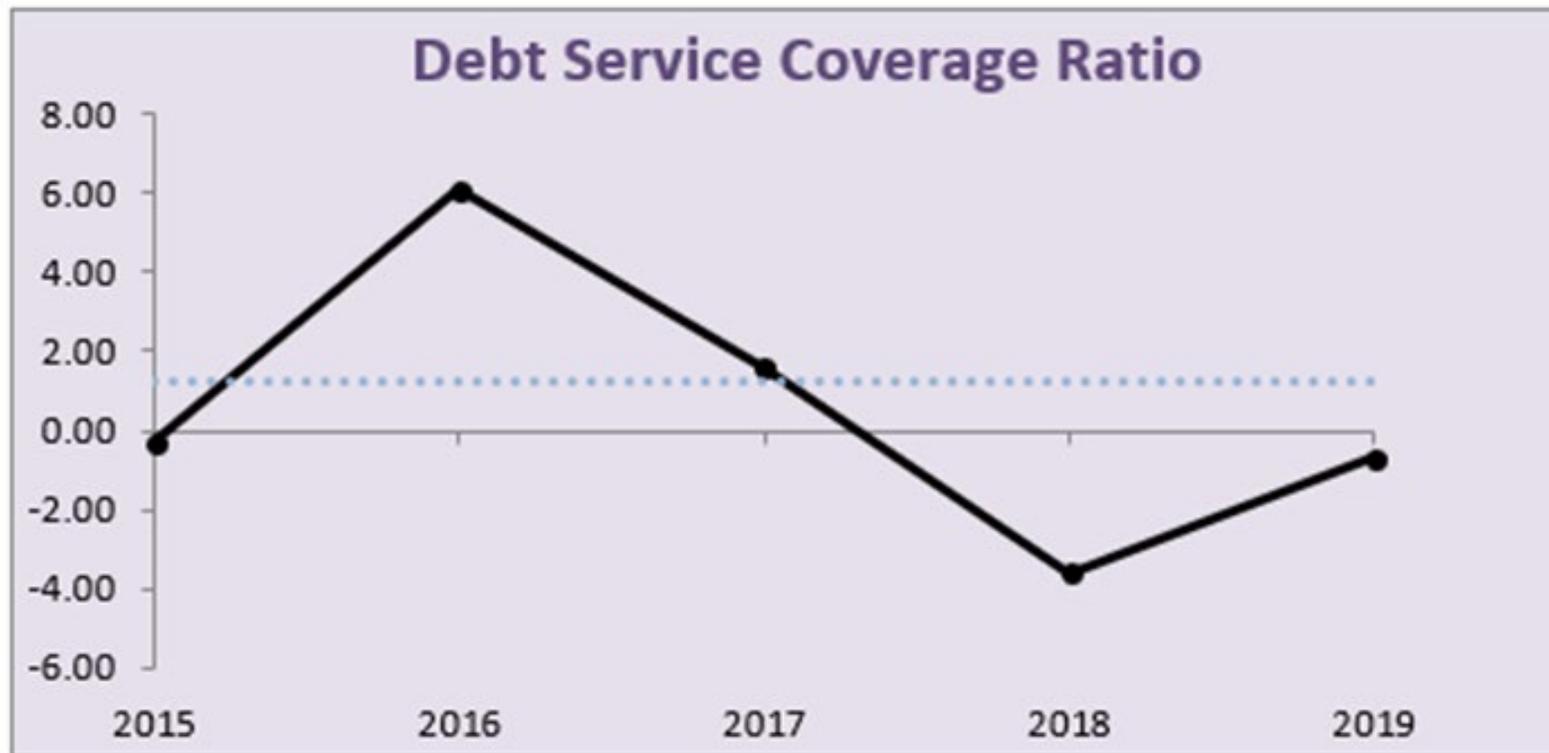
Debt service coverage ratio of 1 is minimum needed to cover annual debt.

Lenders often require Debt service ratio of 1.2 (extra 20% buffer for security and downturns)

2013: Median debt service coverage ratio of AAA utilities was 2.7. AA utilities-median of 1.9.

Debt Service Coverage Ratio

Did you generate the revenues needed to pay for U&M and existing debt service?



Percent of Capital Assets Depreciated

How much have your utility's assets depreciated (nearing the end of their lives)?

[Go to](#)

Percent of Capital Assets Depreciated

An indicator that measures how much of the assessed value of all of your depreciable assets has already been depreciated. Keep in mind that depreciation is measured by accountants and not by your system engineers. The number may or may not be a good measure of the actual wear and tear on your system.

Formula

Total Accumulated Depreciation [8]

Total Depreciable Capital Assets [9]

Set Your Target:

Less than or equal to: Don't get close to 100%

35%

Value for **Willapa Valley Electric Springs (NM)** in Fiscal Year 2019:

39%

Did you meet your target in Fiscal Year 2019?

Did you improve since the previous year?

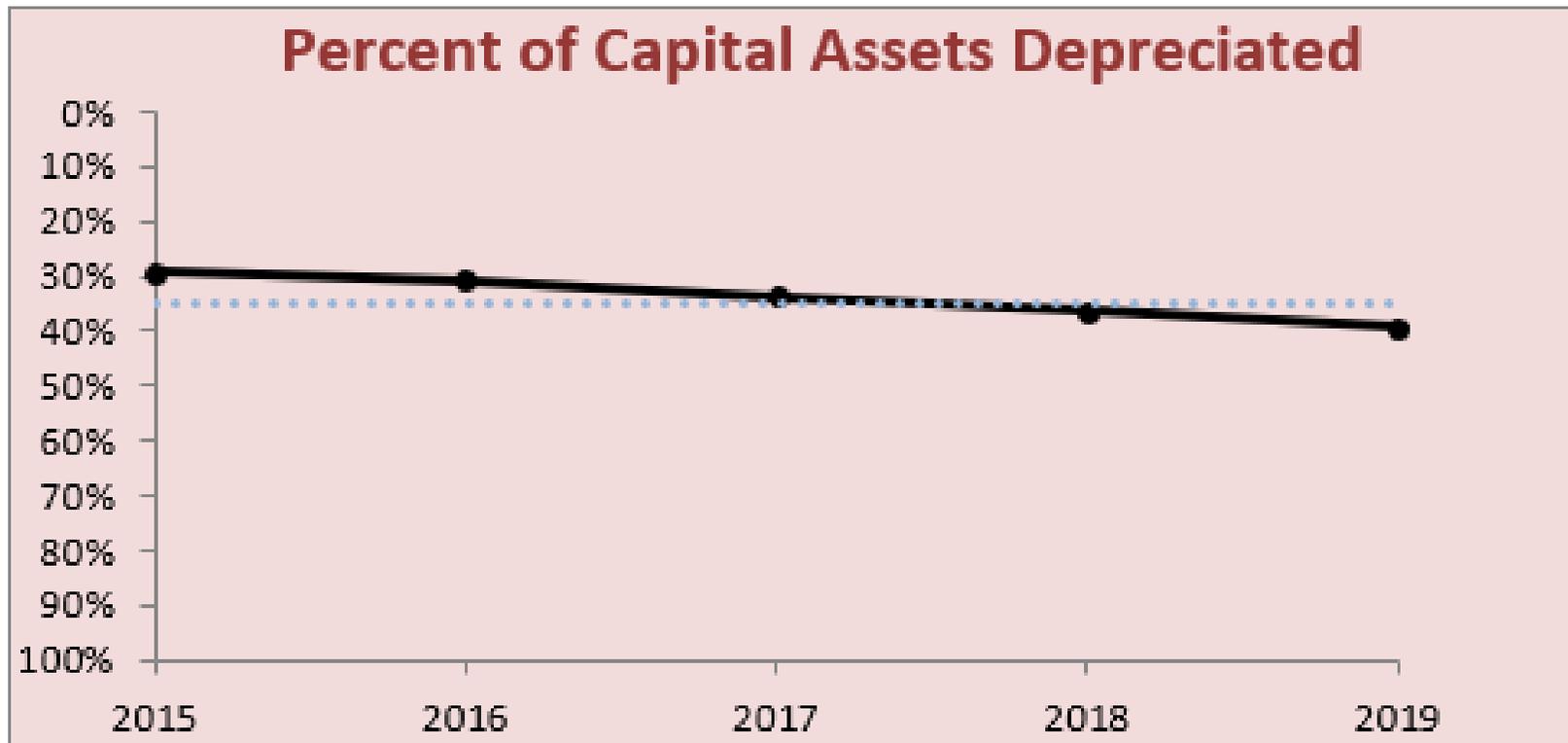
What's the trend over the last 5 years (reversed)?



[See Full Size Graph](#)

Percent of Capital Assets Depreciated

How much have your utility's assets depreciated (reaching the end of their lives)?



A blue-tinted photograph of industrial machinery, likely a water treatment plant, featuring large pipes and tanks.

What is Depreciation?

- Loss of value of an asset not restored by current maintenance
- An economic fact for any water system
- From both physical factors and functional or non-physical factors



Causes of Depreciation

Functional or Non-Physical Factors

- Obsolescence due to new designs, innovations, and other improvements
- Inadequacy to meet current demand
- Changes in regulations



“Fully Funding” Depreciation

- By the time the asset is scheduled to wear out, you will have saved the purchase price of the asset
- This isn't as good as doing asset management and capital planning, but it is better than nothing

Straight Line Depreciation Example



Large Hydro-pneumatic Tank

Purchase Price:
\$10,000

Useful Life:
10 years

Annual Depreciation:
(\$1,000)

Annual Depreciation

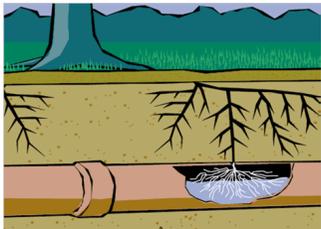
	Major Enterprise Fund
	Water and Sewer Fund
<i>OPERATING REVENUES:</i>	
Charges for Services	\$324,180
Water and Sewer Taps	1,500
Other Operating Revenues	13,706
Total Operating Revenues	\$339,386
<i>OPERATING EXPENSES:</i>	
Personnel	\$176,759
Water and Sewer Operations	148,499
Depreciation	140,087
Total Operating Expenses	\$465,345
Operating Income (Loss)	(\$125,959)

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?

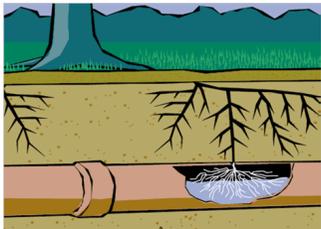


Asset Criticality

What is the 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?

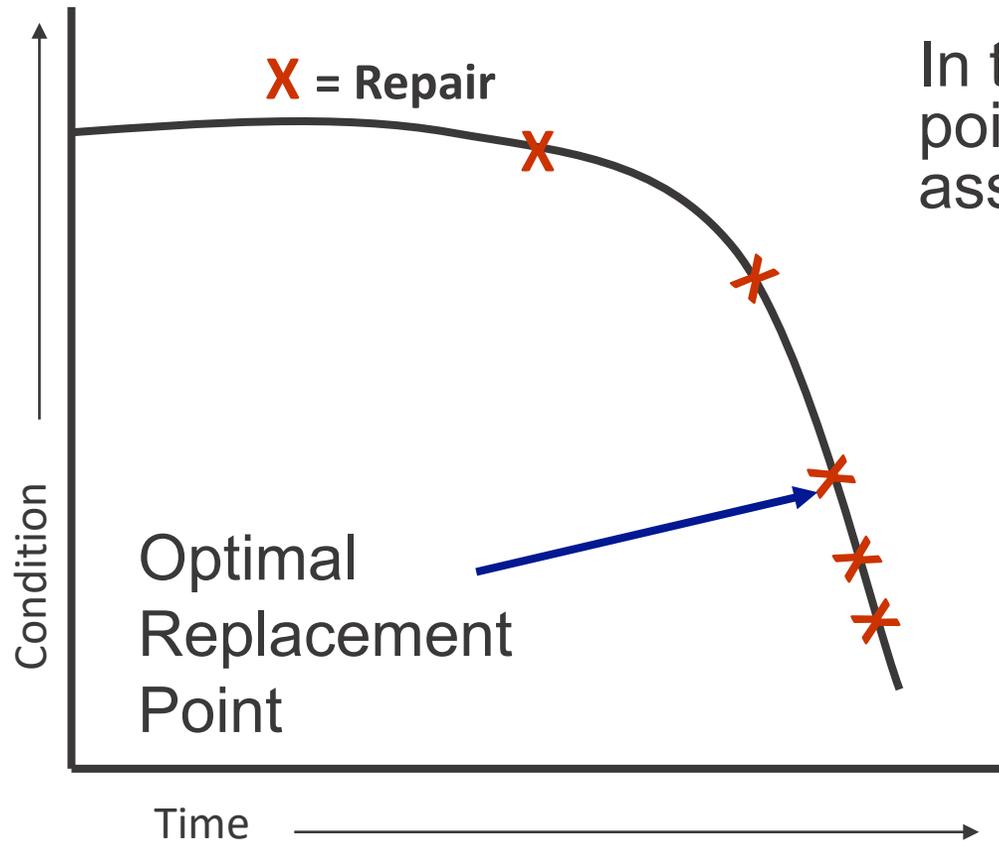




Asset Criticality



Life Cycle Costing: Replacement of Assets



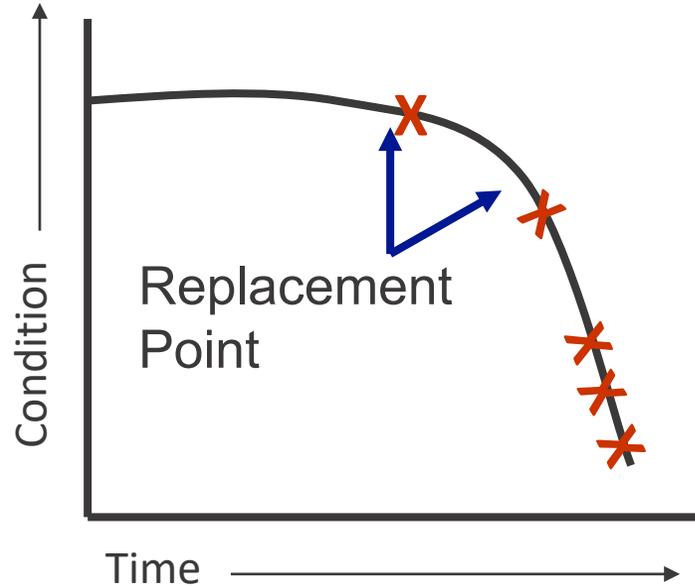
In theory, there is an exact right point at which to replace an asset

Not possible to know the optimal time to replace every asset

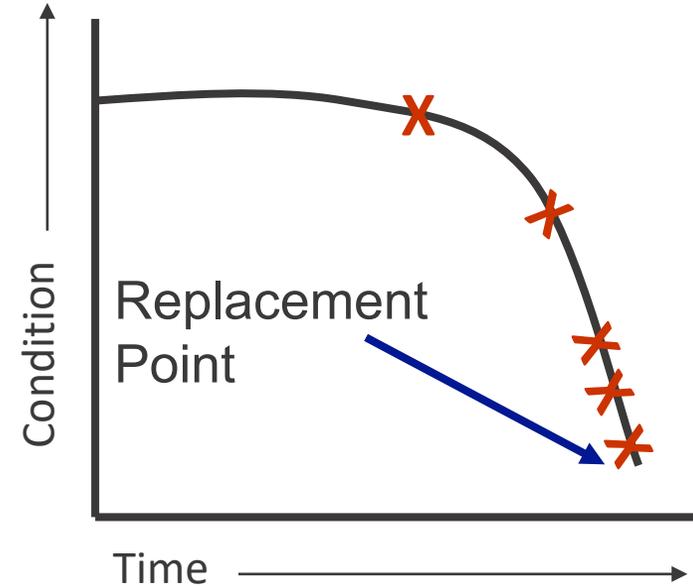
So... need to use the concept of risk

Life Cycle Costing & Risk

High risk assets:
replace assets early,
before failure



Low risk assets:
run to failure and
replace afterwards



Two Ways to Fix Things



Proactively
Repair, rehabilitation
and replacement on
a set schedule



Reactively
You wait for it to
break

When poll is active, respond at PollEv.com/hopethomson722

Text **HOPETHOMSON722** to **22333** once to join

How do you keep up infrastructure at your system?

- All proactive
- Mostly proactive
- Equal mix of proactive and reactive
- Mostly reactive
- Not a water system

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Being Proactive with Asset Management Planning

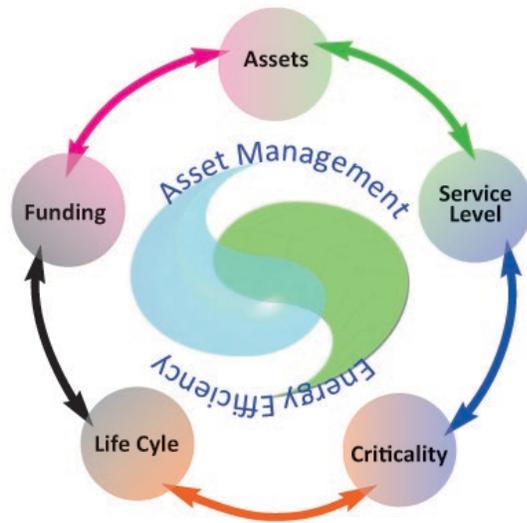
- Requires long term system planning—Asset Management and Capital Planning
- Has its advantages, according to people in the field...

Ways to Keep Up Infrastructure



Mike Daly · White Cliffs MDWUA, NM

Five Core Components of AM



Current State of the Assets

Level of Service

Criticality

Life Cycle Costing

Long-Term Funding



🌐 When poll is active, respond at PolleEv.com/hopethomson722 📄

📄 Text **HOPETHOMSON722** to **22333** once to join

Asset management?

We're doing it!

We are planning to, or have gotten started

What's that?

Not applicable

Powered by  **Poll Everywhere**



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?
- What is the asset criticality?



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 Plan

Utilities Capital Improvement Plan FY 2023-28									
Program Area	Project Title	Prior Year(s)	Budget FY 2022-23	Planning FY 2023-24	Planning FY 2024-25	Planning FY 2025-26	Planning FY 2026-27	Planning FY 2027-28	Grand Total
Solid Waste	HMRLF- Gas Collection/Extraction System	\$0	\$0	\$540,000	\$0	\$590,000	\$0	\$615,000	\$1,745,000
	HMRLF- MSE Wall Development	\$449,000	\$15,290,000	\$0	\$0	\$0	\$0	\$5,730,000	\$21,469,000
	HMRLF- Phase III Cell 6 and 7	\$0	\$0	\$0	\$0	\$0	\$0	\$13,030,000	\$13,030,000
	HMRLF- Pavement Repair and Replacement	\$0	\$600,000	\$410,000	\$260,000	\$0	\$0	\$0	\$1,270,000
	HMRLF- Front Entrance Reconstruction	\$0	\$280,000	\$0	\$0	\$0	\$0	\$0	\$280,000
	HMRLF- Scale Replacement	\$0	\$600,000	\$0	\$0	\$0	\$0	\$0	\$600,000
	HMRLF- Leachate System Upgrades	\$0	\$580,000	\$0	\$0	\$0	\$0	\$0	\$580,000
Solid Waste Total Appropriations:		\$449,000	\$17,350,000	\$950,000	\$260,000	\$590,000	\$0	\$19,375,000	\$38,974,000
Water Distribution and Wastewater Collection	Asset Management	\$1,500,000	\$1,500,000	\$1,000,000	\$1,500,000	\$1,000,000	\$1,500,000	\$1,500,000	\$9,500,000
	Collection System Improvement Program	\$80,900,000	\$15,000,000	\$15,000,000	\$15,000,000	\$15,000,000	\$15,000,000	\$15,000,000	\$170,900,000
	Elledge Basin Capacity Improvements	\$0	\$0	\$0	\$250,000	\$0	\$250,000	\$0	\$500,000
	Facility Improvements	\$300,000	\$250,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$1,050,000
	Lift Station Improvements	\$750,000	\$4,500,000	\$750,000	\$750,000	\$750,000	\$750,000	\$750,000	\$9,000,000
	Muddy Creek Basin Improvements	\$0	\$0	\$0	\$250,000	\$0	\$250,000	\$0	\$500,000
	NCDOT Improvements	\$2,000,000	\$500,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$7,500,000
	South Fork Basin Improvements	\$0	\$0	\$0	\$250,000	\$0	\$250,000	\$0	\$500,000
	Tanglewood Force Main Condition Improvements	\$0	\$7,500,000	\$0	\$0	\$0	\$0	\$0	\$7,500,000
	Water Distribution Improvements	\$10,000,000	\$10,000,000	\$10,000,000	\$12,000,000	\$12,000,000	\$15,000,000	\$15,000,000	\$84,000,000
	Water Tank Rehabilitation	\$250,000	\$0	\$250,000	\$250,000	\$250,000	\$250,000	\$250,000	\$1,500,000
	Subtotal:	\$95,700,000	\$39,250,000	\$28,100,000	\$31,350,000	\$30,100,000	\$34,350,000	\$33,600,000	\$292,450,000
	Water Treatment	Water Treatment Plant Rehabilitation	\$3,000,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000
Subtotal:	\$3,000,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$6,000,000	
Wastewater Treatment	Biosolids Dryer Facility Upgrade	\$500,000	\$250,000	\$250,000	\$250,000	\$250,000	\$250,000	\$250,000	\$2,000,000
	Elledge WWTP Rehabilitation	\$250,000	\$1,500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$4,250,000
	Muddy Creek WWTP Rehabilitation	\$250,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$3,250,000
	WWTP Nutrient Removal	\$0	\$0	\$0	\$0	\$0	\$0	\$5,000,000	\$5,000,000
Subtotal:	\$1,000,000	\$2,250,000	\$1,250,000	\$1,250,000	\$1,250,000	\$1,250,000	\$6,250,000	\$14,500,000	
Wastewater/Water Total Appropriations:		\$99,700,000	\$42,000,000	\$29,850,000	\$33,100,000	\$31,850,000	\$36,100,000	\$40,350,000	\$312,950,000
Utilities Total Appropriations:		\$100,149,000	\$59,350,000	\$30,800,000	\$33,360,000	\$32,440,000	\$36,100,000	\$59,725,000	\$351,924,000

Plan to Pay: Scenarios to Fund your Long-Term Asset Planning

<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.

	FY15	FY16	FY17	FY18
3 Year Increase (Decrease) in Rate (Base and Volumetric)	N/A	0.1%	1.7%	2.6%
Increase (Decrease) in the Monthly Bill for 5,000 Gallons	N/A	\$0.09	\$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)	\$6.67	\$6.67	\$6.96	\$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	\$30.66	\$31.65

	FY15	FY16	FY17	FY18
Total Assets	\$ 5,112,000	\$ 5,003,589	\$ 5,228,367	\$ 5,354,005
Base Charges	\$ 1,776,860	\$ 1,796,322	\$ 1,907,260	\$ 1,976,720
Usage Charges	\$ 3,178,860	\$ 3,004,095	\$ 3,216,585	\$ 3,281,762
Interest Earned from Previous Year's Positive Balance	\$ 5	\$ 9,405	\$ 9,167	\$ 9,607
Revenues from Other Sources (Reserve Charges)	\$ 163,295	\$ 166,266	\$ 165,364	\$ 166,431

Use all known projects for 20 years	Project Completion Start Year	Project Expenditures Completion Period (Years)	Estimated Construction Cost (Million \$)	Annual Construction Cost (Million \$)	Estimated Cost in the Start Year	End Year
Project 1 - Water Treatment Plant	2015	5	1.0	0.2	1.0	2015
Project 2 - Water Distribution System	2017	3	2.0	0.67	2.0	2017
Project 3 - Sewer Collection System	2019	4	1.5	0.38	1.5	2019
Project 4 - Distribution System, Street-side	2021	2	0.5	0.25	0.5	2021
Project 5 - Sewer LID	2023	3	0.5	0.17	0.5	2023