



Long Term System Planning

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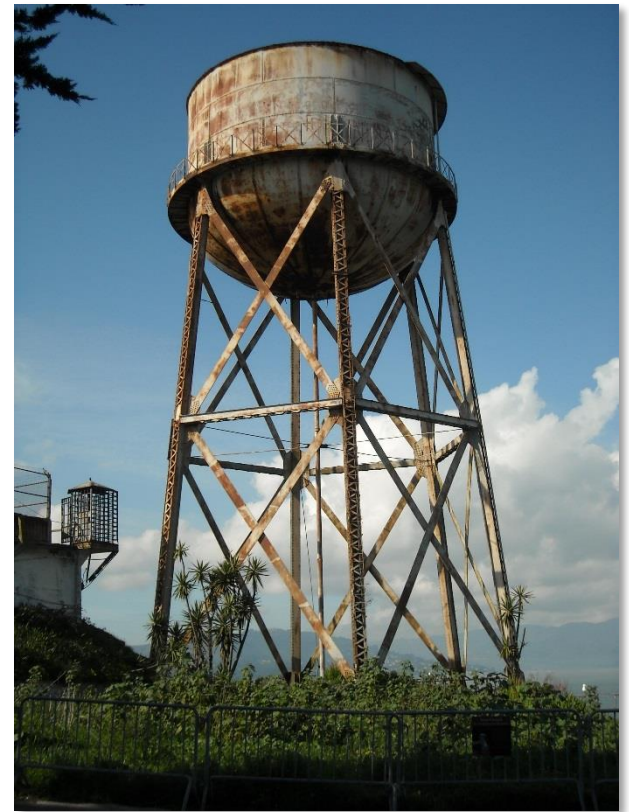
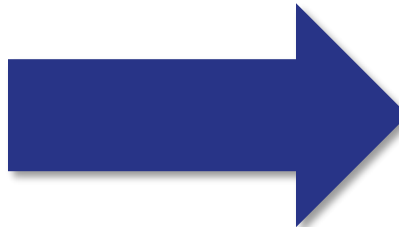
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Infrastructure or Capital Assets



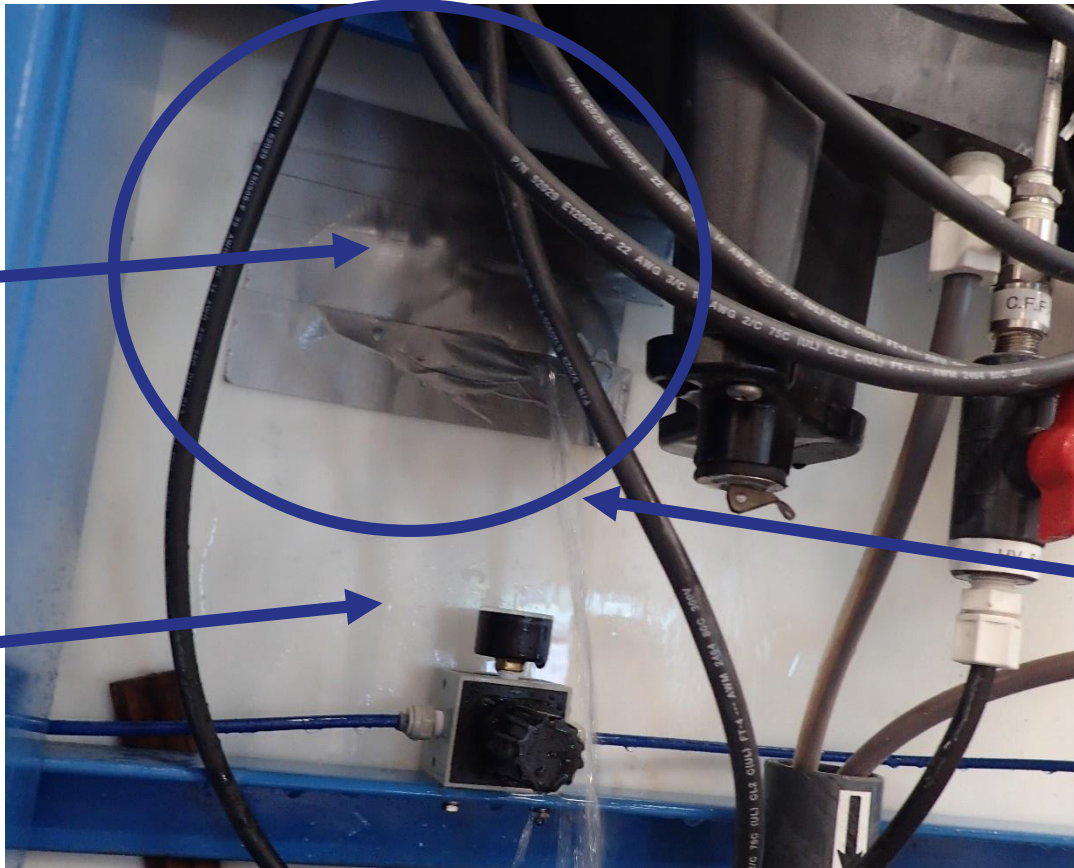
Infrastructure Wears Out



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



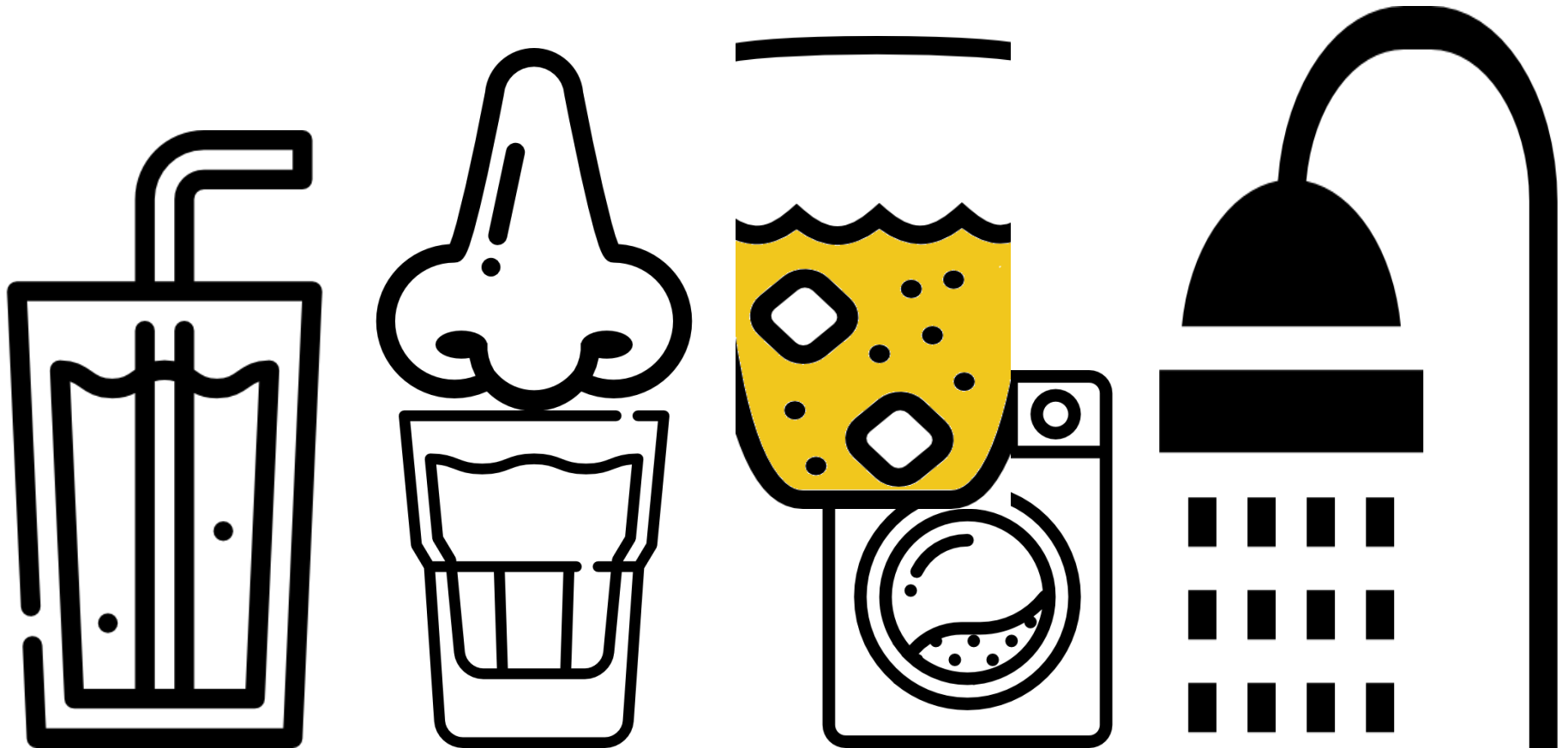
Track Progress
Towards
Meeting Goals

Involve
Staff



What would my customers want?

What do customers care about?



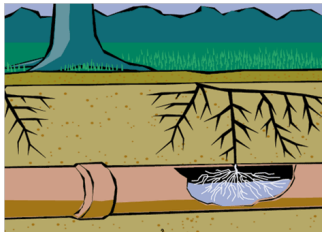


Asset Criticality

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





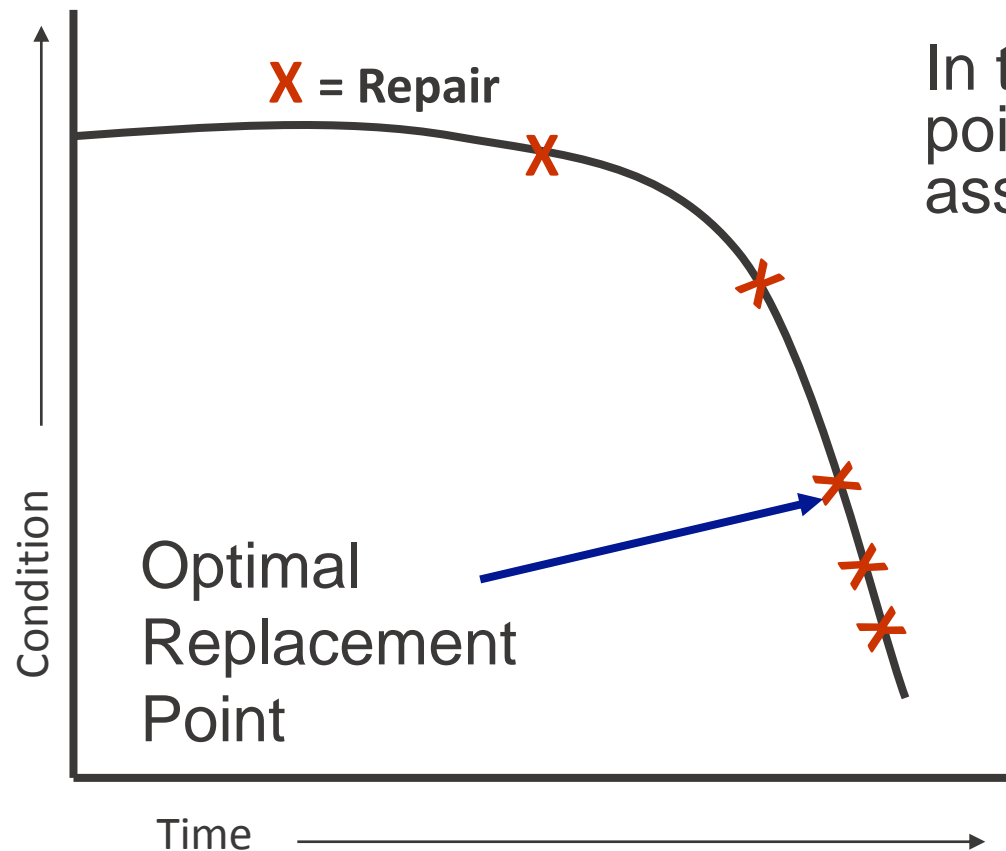
Quick Exercise—4 Assets

1. Brand new well
2. Aging portable generator used in emergencies in an area with a hospital and a 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



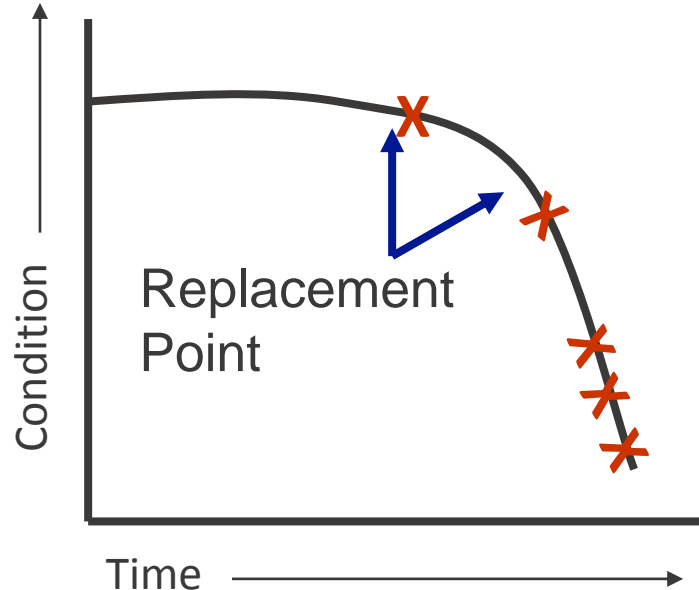
In theory, there is an exact right point at which to replace an asset

Not possible to know the optimal time to replace every asset

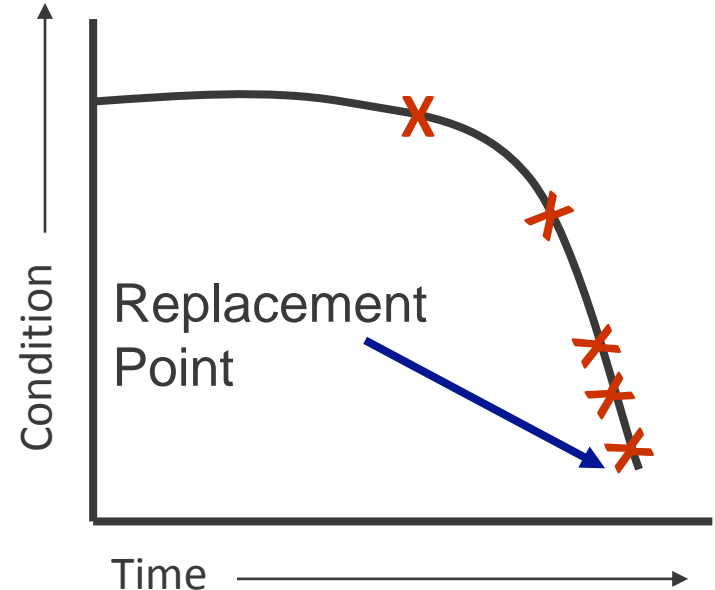
So... need to use the concept of risk

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



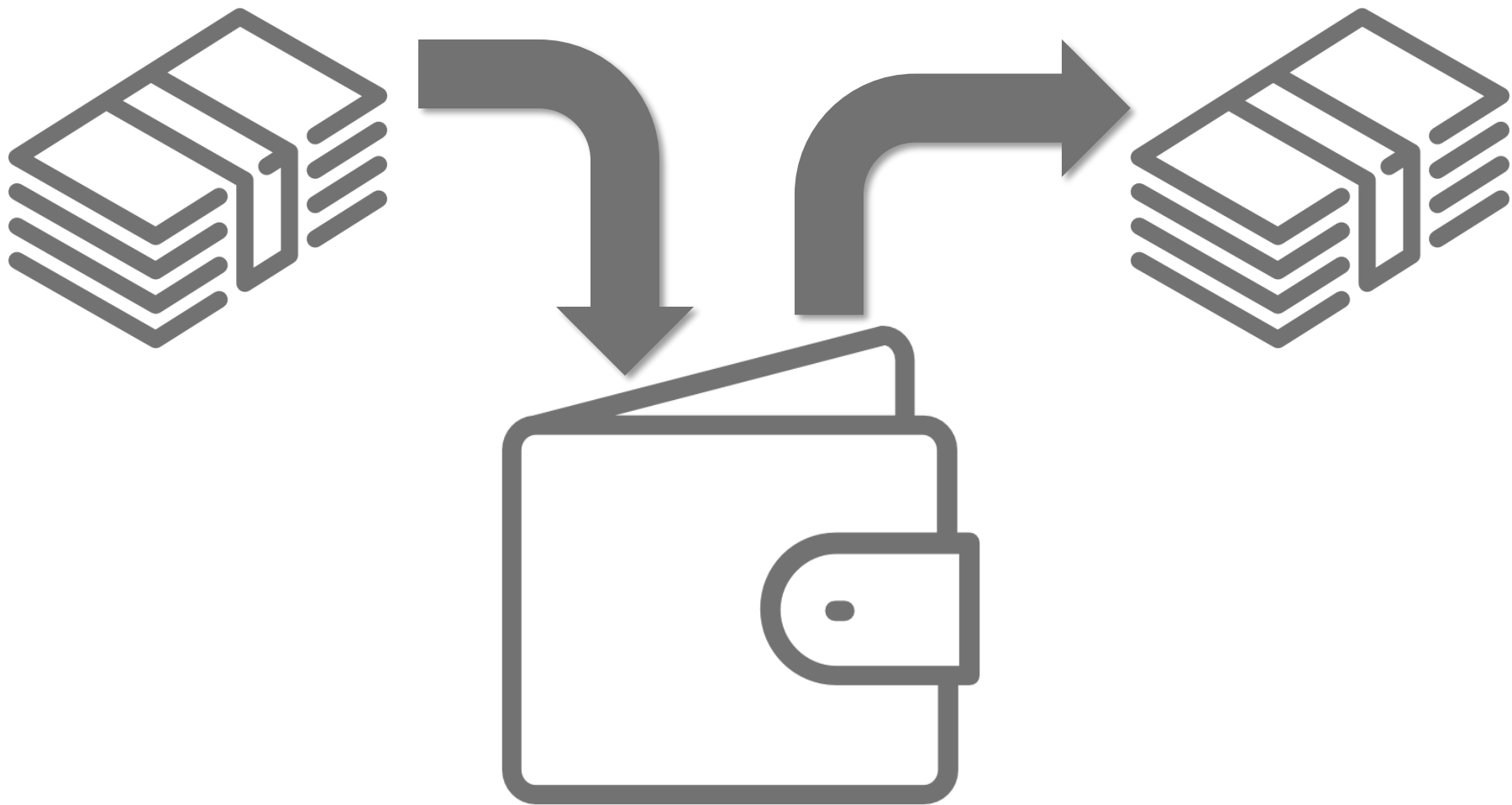
Long Term Capital Planning

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

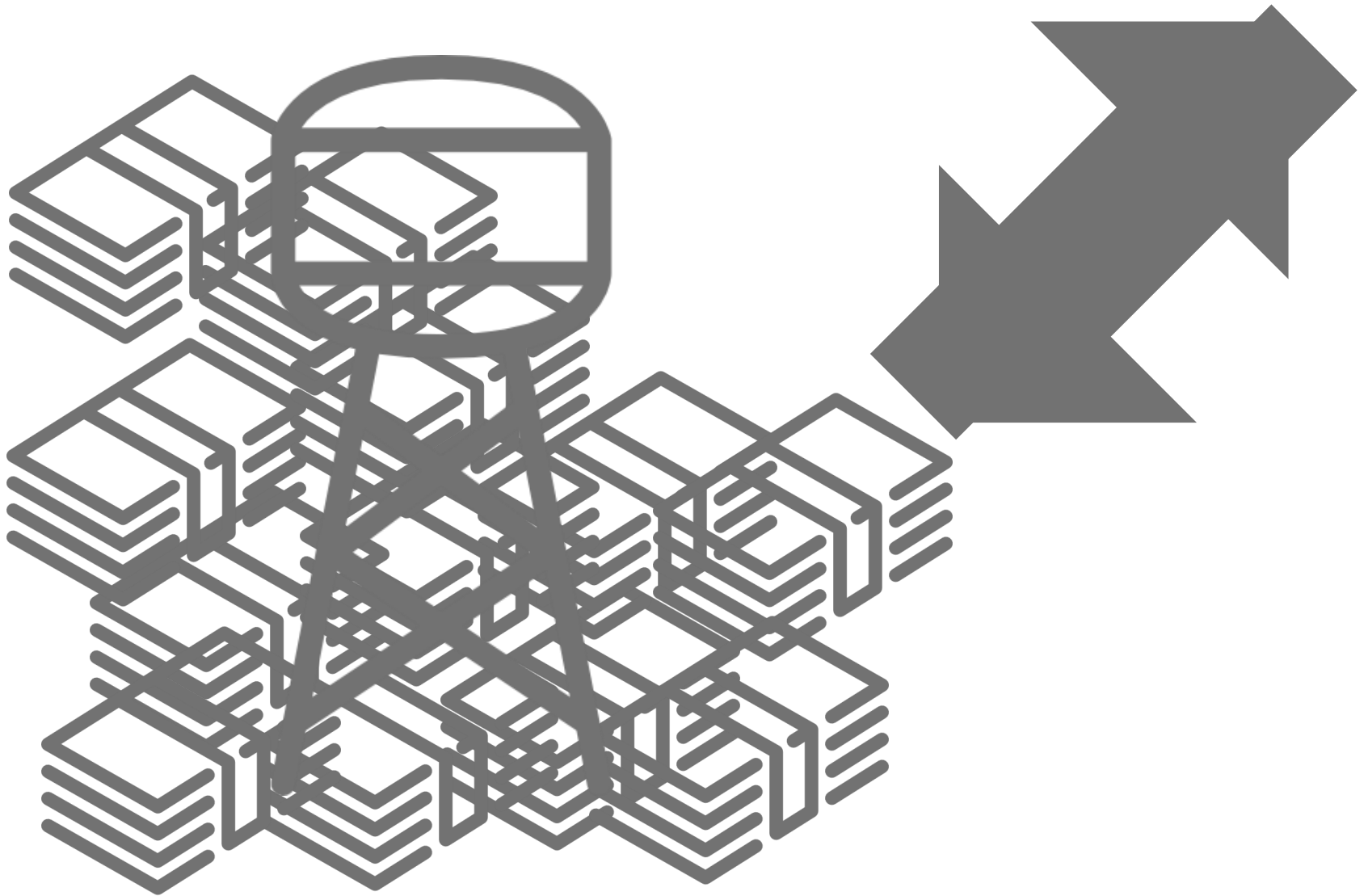


Four approaches to paying for capital improvements

Pay As You Go

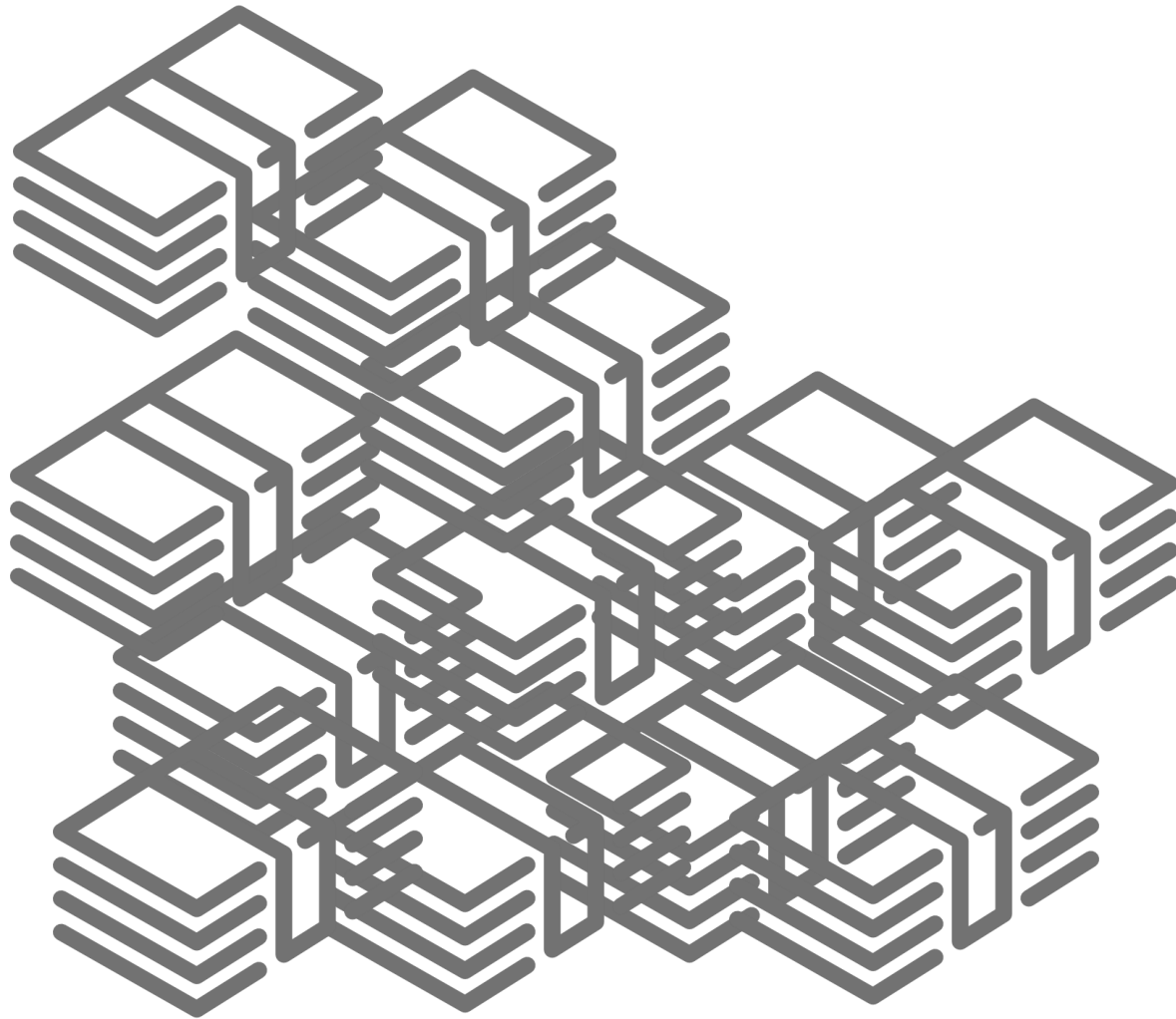


Save In Advance and Pay





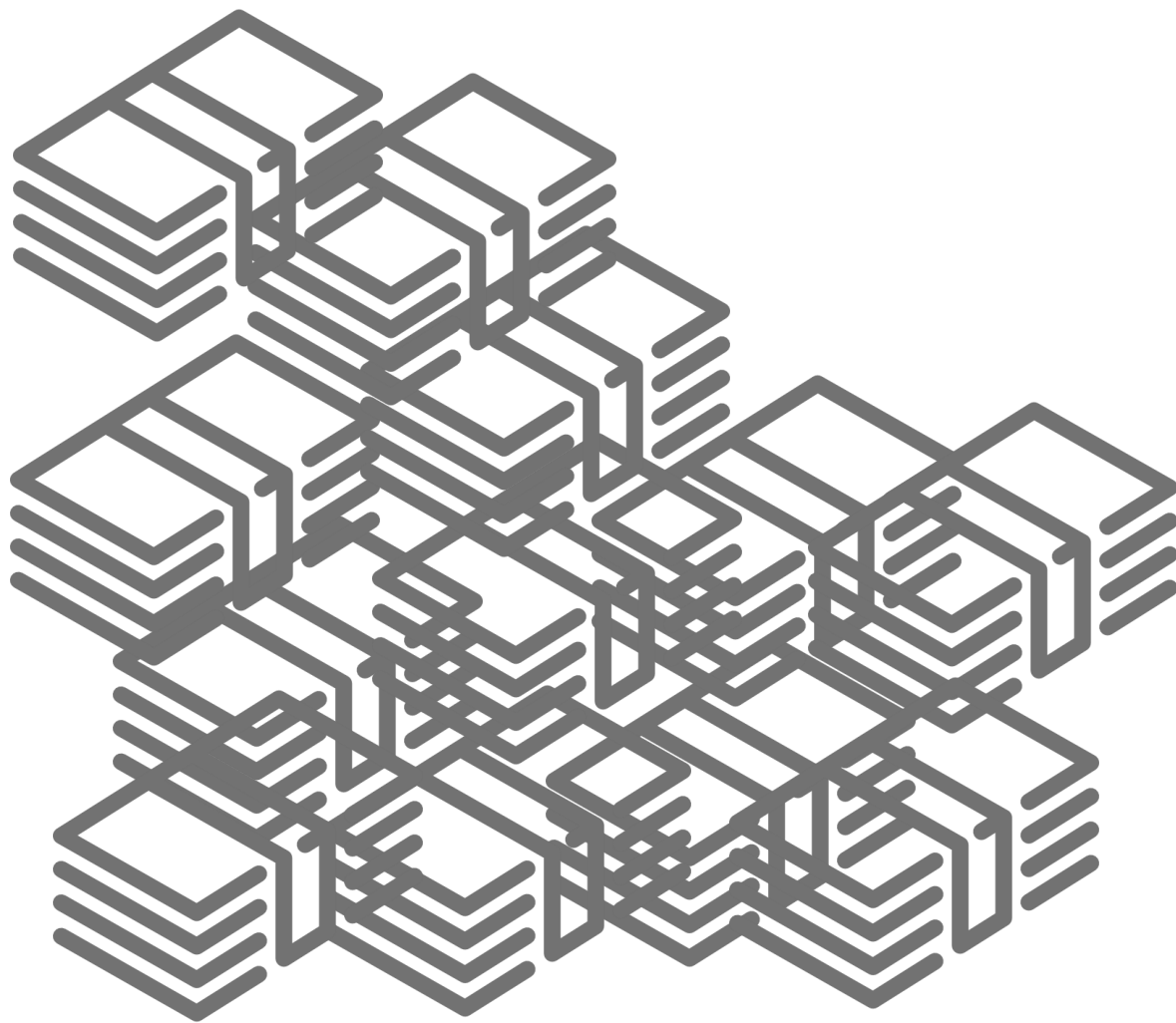
Borrow and Pay Later



BANK



Get a Grant



GRANT



Grants Aren't Completely Free Money

- Application for the grant can be expensive – staff time and money
- Applications can take months to process
- Often lots of strings attached
- Often require a percentage match
- Lots of competition
- Difficult to sustain

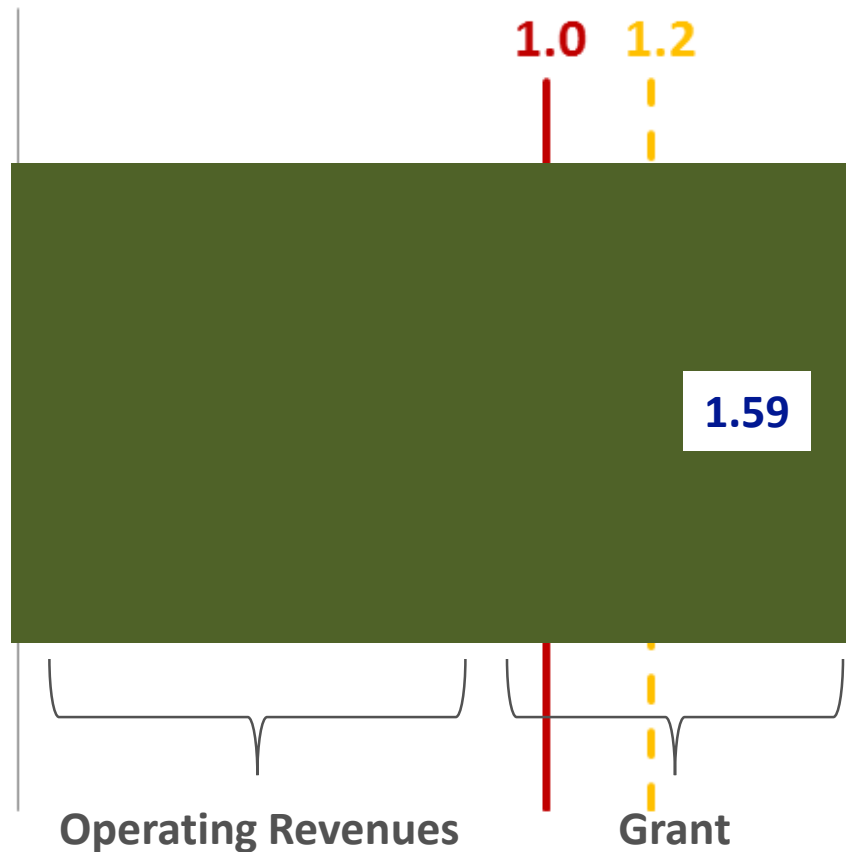


Quick Thought on Grants

- This presentation is about ***sustainable*** program finance
- Grants are not sustainable finance

Grants Can Distort Operating Ratio

Sewer Program from Michigan





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



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

Physical Factors

- Wear and tear resulting from use
- Decay, rot, rust, and corrosion from the passage of time and the elements
- Related to the extent that there is regular maintenance

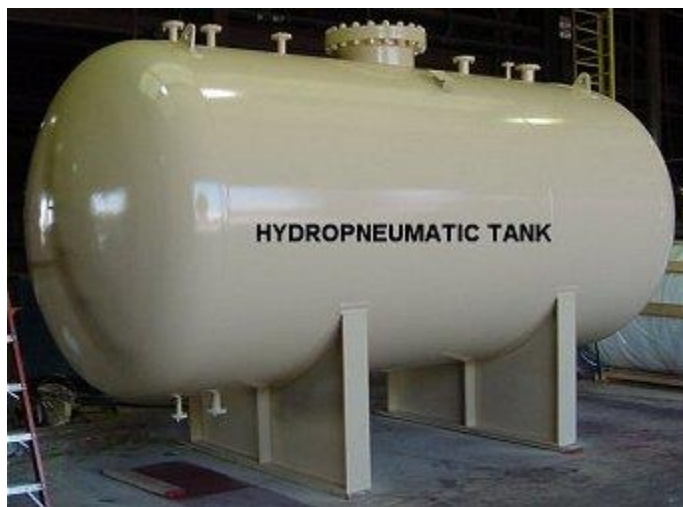


Causes of Depreciation

Functional or Non-Physical Factors

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

Straight Line Depreciation Example



Large Hydropneumatic Tank

Purchase Price:
\$10,000

Useful Life:
10 years

Annual Depreciation:
(\$1,000)



“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

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



Webinar: Demystifying Depreciation and How to Make Use of It



So What Can Systems Do?

- Pay as you go
- Save in advance and pay
- Borrow and pay later
- Grants (let someone else pay)
- Defer rehabilitation/replacement

Tip!
You can
mix and
match
approaches



Capital Planning Exercise

- For this example small town, let's look at their annual budget



Find Budget Expenses

What here is related to regular repair and maintenance, if anything?
(Operating cost)

What here is related to asset rehabilitation or replacement, if anything?
(Capital cost)

Note: Don't include salaries



Repairs and Maintenance

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



Rehabilitation and Replacement

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



Capital Planning Exercise

- Using the assets we discussed earlier, come up with a plan of how to pay for their replacement

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
FINANCIAL 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

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
\$ 950,000
et \$ 750,000

Pre-Exist
Input amount incurred for

NAME OF UTILITY
Town of Anytown

TYPE OF UTILITY
Water

CURRENT FISCAL YEAR
FY15

Water and Sewer Rates in FY15
Input the residential customer water and sewer rates at 5,000 gallons/month of use for FY15. Round to monthly rates.
Volume Rate at 5,000 gallons/month (5,000 gallons) \$ 5.42
Monthly Rate (Times 12) (Minimum Charge) \$ 65.04

Expected Revenues and Expenses in FY15
Annual Operating and Non-Operating Revenues \$ 5,416,000
Annual Non-Capital Expenses (DEBT, Admin., etc.) \$ 4,525,000
Expected Annual Deficit of Expenses (Percent) 3.2%

Usage Billed to Customers in FY15
Residential Non-Residential
Number of Customers 100,000 2,000
Total Monthly Use (1,000's of gallons) 50,000 20,000
Annual Customer Rate Growth (Percent) 1.5% 1.5%

CAPITAL IMPROVEMENT PROJECTS - 20 YEARS

Project Name	Project Construction Start Year	Project Construction End Year	Project Construction Period (Years)	Estimated Construction Cost (in \$)	Estimated Construction Cost Factor (Percent)	Estimated Cost in the Start Year	Estimated Cost in the End Year
Project 1: Water Main Replacement	2015	2017	3	\$ 1,000,000	2.0%	\$ 1,000,000	\$ 1,020,000
Project 2: Sewer Main Replacement	2016	2018	3	\$ 1,500,000	2.5%	\$ 1,500,000	\$ 1,575,000
Project 3: Water Treatment Plant Upgrade	2017	2020	4	\$ 2,000,000	3.0%	\$ 2,000,000	\$ 2,240,000
Project 4: Sewer Treatment Plant Upgrade	2018	2021	4	\$ 2,500,000	3.5%	\$ 2,500,000	\$ 2,812,500
Project 5: Water Main Replacement	2019	2022	4	\$ 1,000,000	2.0%	\$ 1,000,000	\$ 1,040,000
Project 6: Sewer Main Replacement	2020	2023	4	\$ 1,500,000	2.5%	\$ 1,500,000	\$ 1,575,000

Estimated Rate Changes Needed to Maintain the Fund Balance

	FY15	FY16	FY17	FY18
Estimated Rate Changes Needed to Maintain the Fund Balance	2.0%	2.1%	2.2%	2.3%
1 Year Increase (Decrease) in Rates (Based on Volume)	N/A	\$0.00	\$1.01	\$0.79
1 Year Increase (Decrease) in the Monthly Bill for 5,000 Gallons	N/A	\$0.00	\$0.64	\$0.34
Monthly Rate Change ("Minimum Charge")	\$12.34	\$12.34	\$12.98	\$13.31
Volume Rate at 5,000 gallons/month (5,000 gallons)	\$5.42	\$5.42	\$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 (5)	\$29.35	\$29.35	\$30.94	\$31.65

Projected Fund Balance

	FY15	FY16	FY17	FY18
Total Revenues	\$ 5,416,000	\$ 5,551,500	\$ 5,738,307	\$ 5,964,000
Base Charges	\$ 1,716,900	\$ 1,795,322	\$ 1,907,200	\$ 1,970,720
Usage Charges	\$ 3,170,800	\$ 3,264,000	\$ 3,376,100	\$ 3,507,280
Interest Earned from Previous Year's Positive Balance	\$ 0	\$ 9,400	\$ 9,107	\$ 9,007
Revenues from Other Sources (Reserve Charges)	\$ 101,200	\$ 100,200	\$ 100,300	\$ 100,400
Total Expenses	\$ 4,918,900	\$ 5,069,922	\$ 5,216,607	\$ 5,387,407

Financial Reserves (End of Year)

Total Capital Expenses

Rate Increases

Total Cumulative System Investment



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