



Long Term System 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

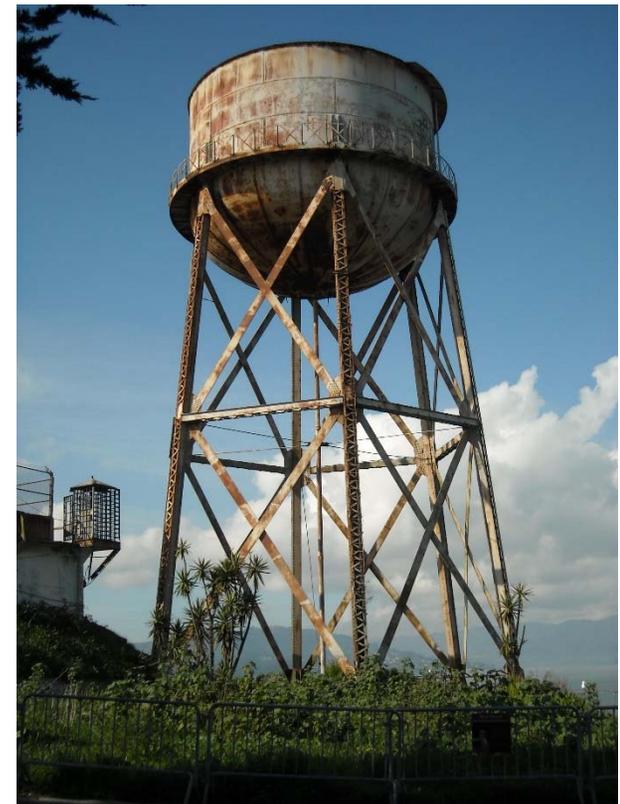
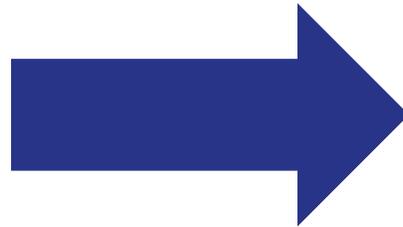


Infrastructure or Capital Assets



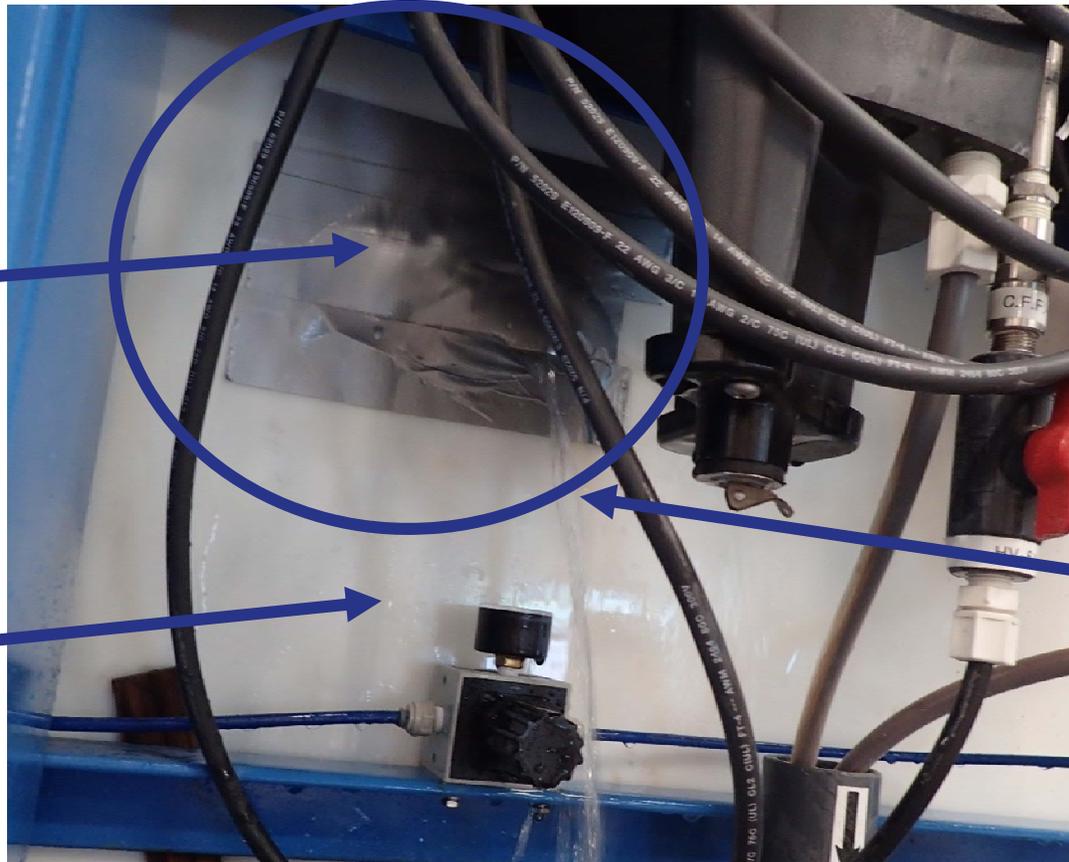


Infrastructure Wears Out





Infrastructure Wears Out



Water
Tank

Leak



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



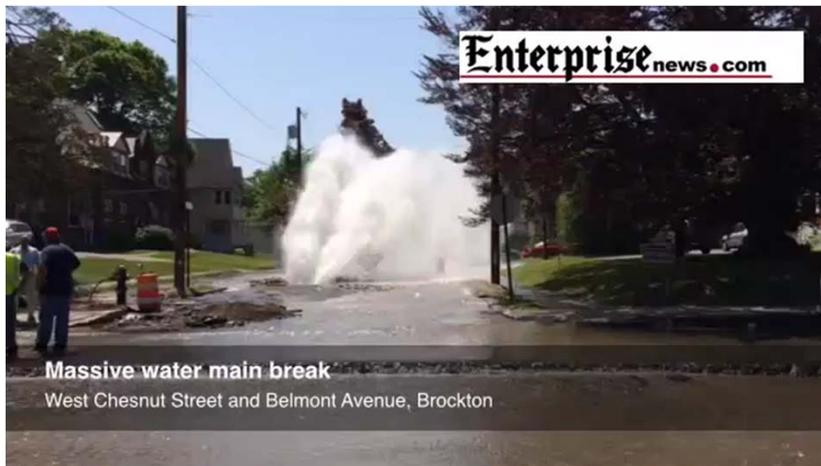
Source: <https://www.youtube.com/watch?v=rH867Y-8-VM>



Two Ways to Fix Things



Proactively
Repair, rehabilitation
and replacement on
a set schedule



Reactively
You wait for it to
break



Or, we can 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





Infrastructure at your system?

- A. All Proactive
- B. Mostly Proactive
- C. Equal mix of Proactive and Reactive
- D. Mostly Reactive
- E. All Reactive



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



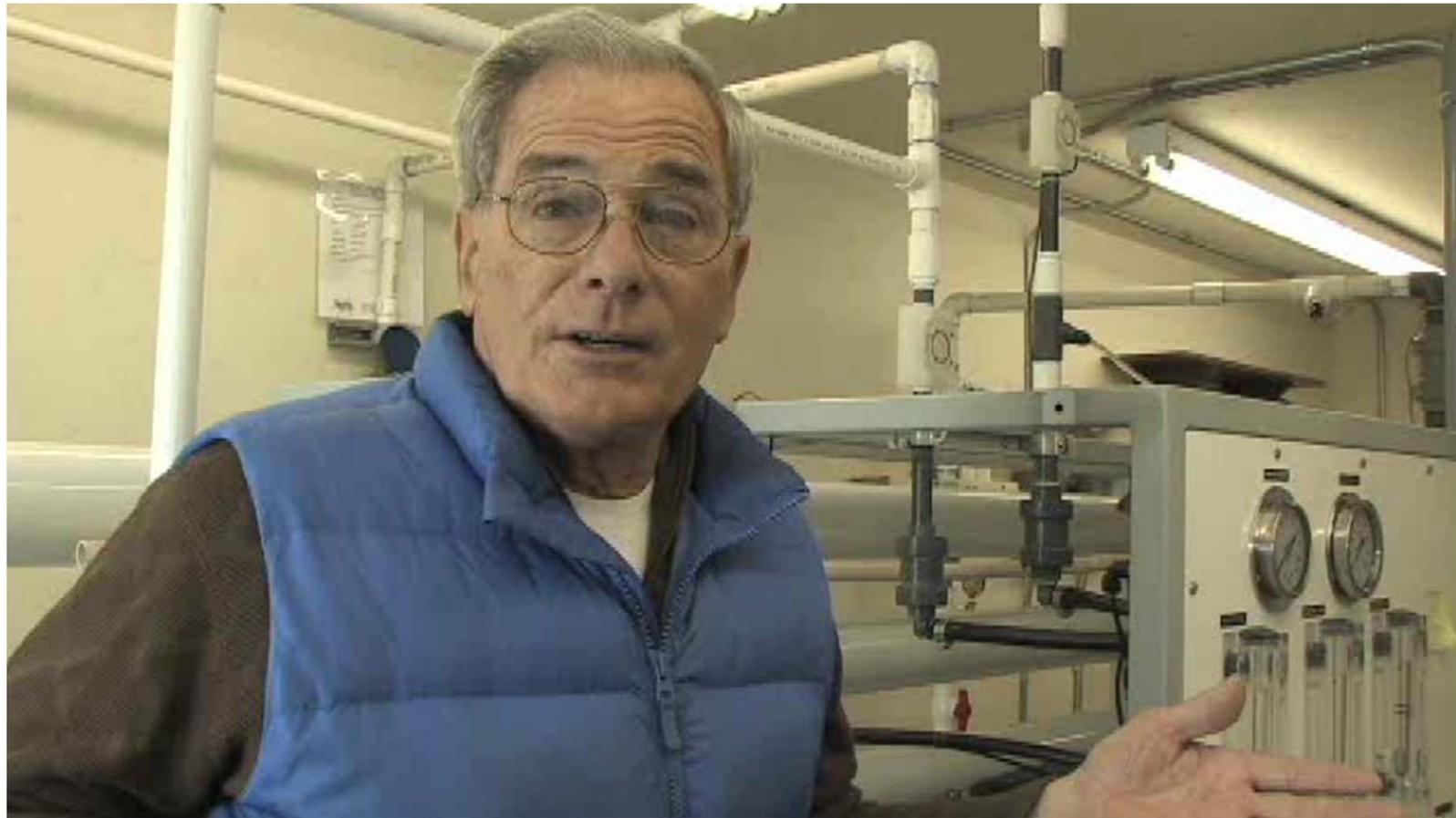
Efficient System Management



Doug Powers · Tucumcari, NM



Fewer Emergencies



Mike Daly · White Cliffs MDWUA, NM



Justification for Rate Increases



Ted Riehle · Old Forge, NY



Asset management helps you have the most impact in your system by spending your limited dollars in the best way possible



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

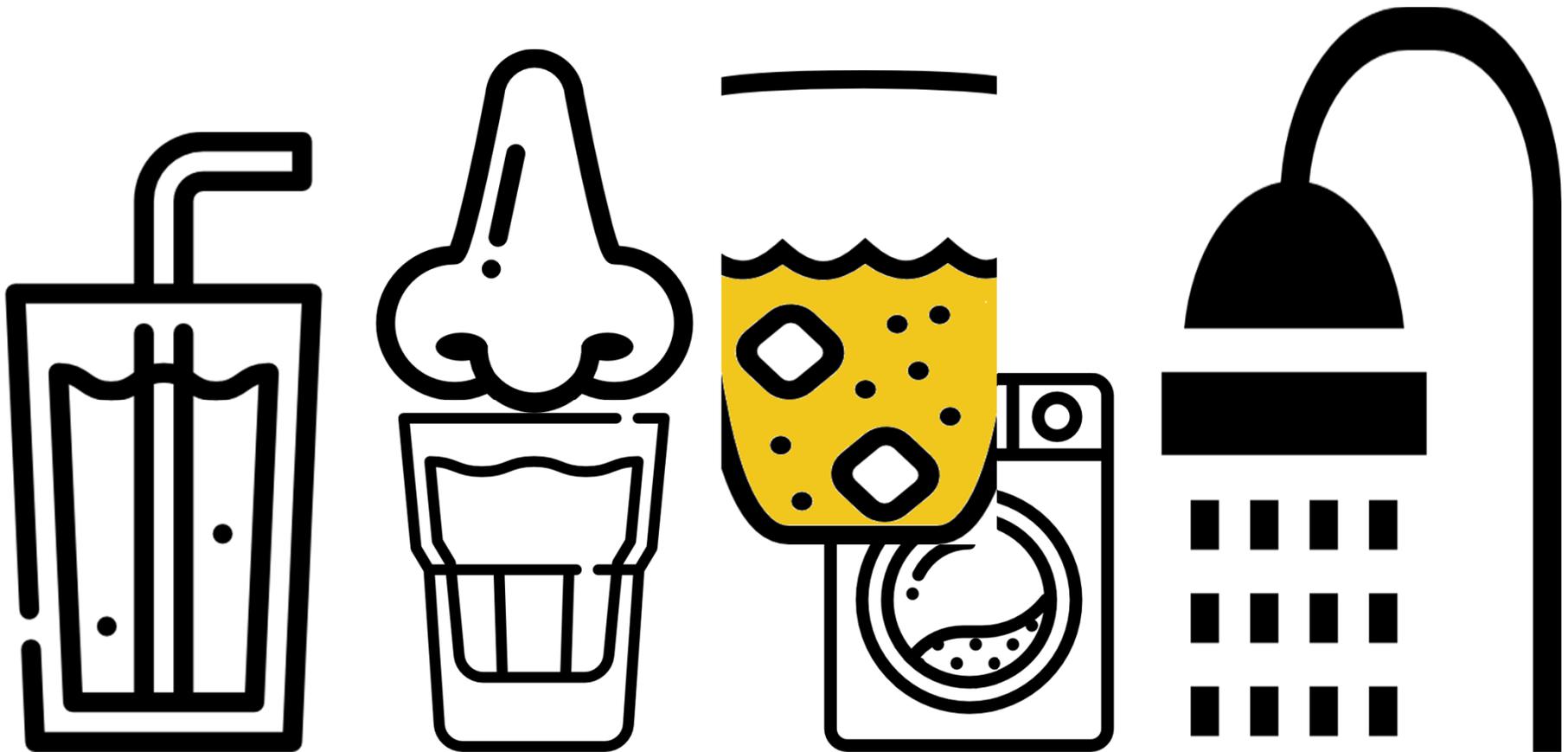
Involve
Staff



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

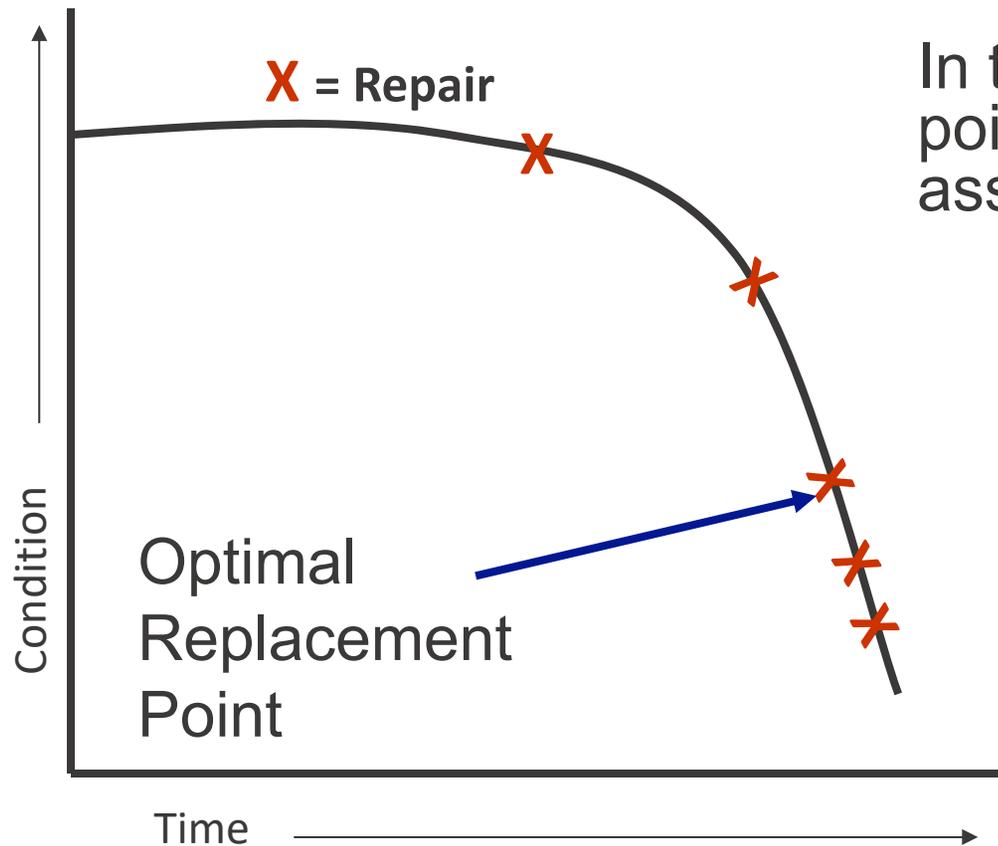


Asset Criticality





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

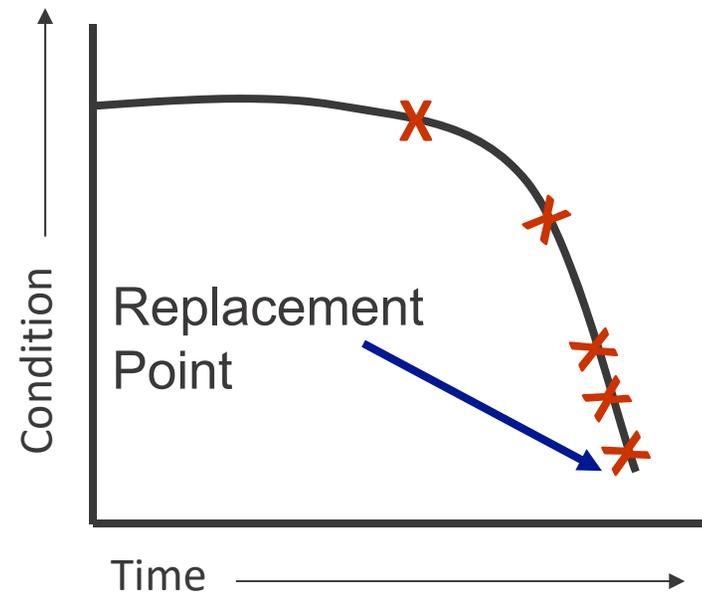
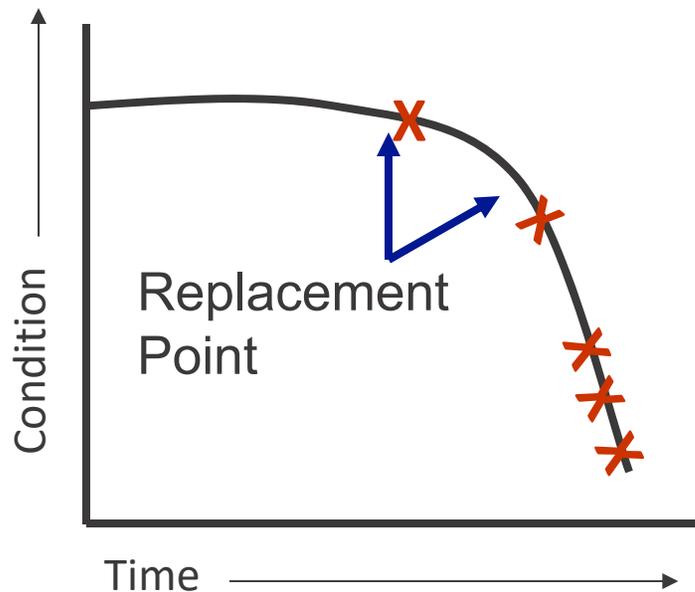
So... need to use the concept of risk



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

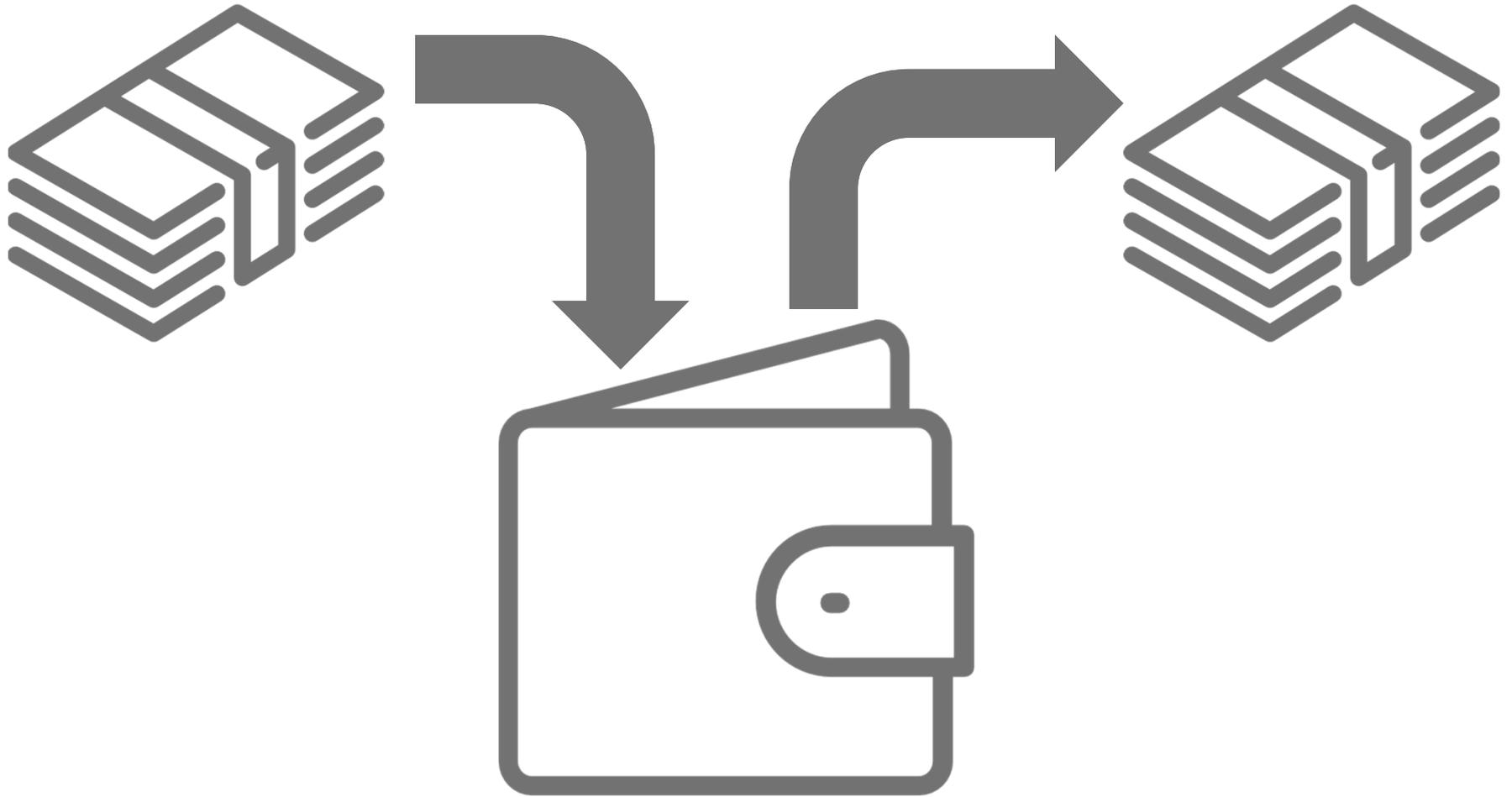
- This is strongly related to asset management
- An official multi-year document that identifies and prioritizes capital projects, identifies funding sources, and sets timelines



Four approaches to paying for capital improvements

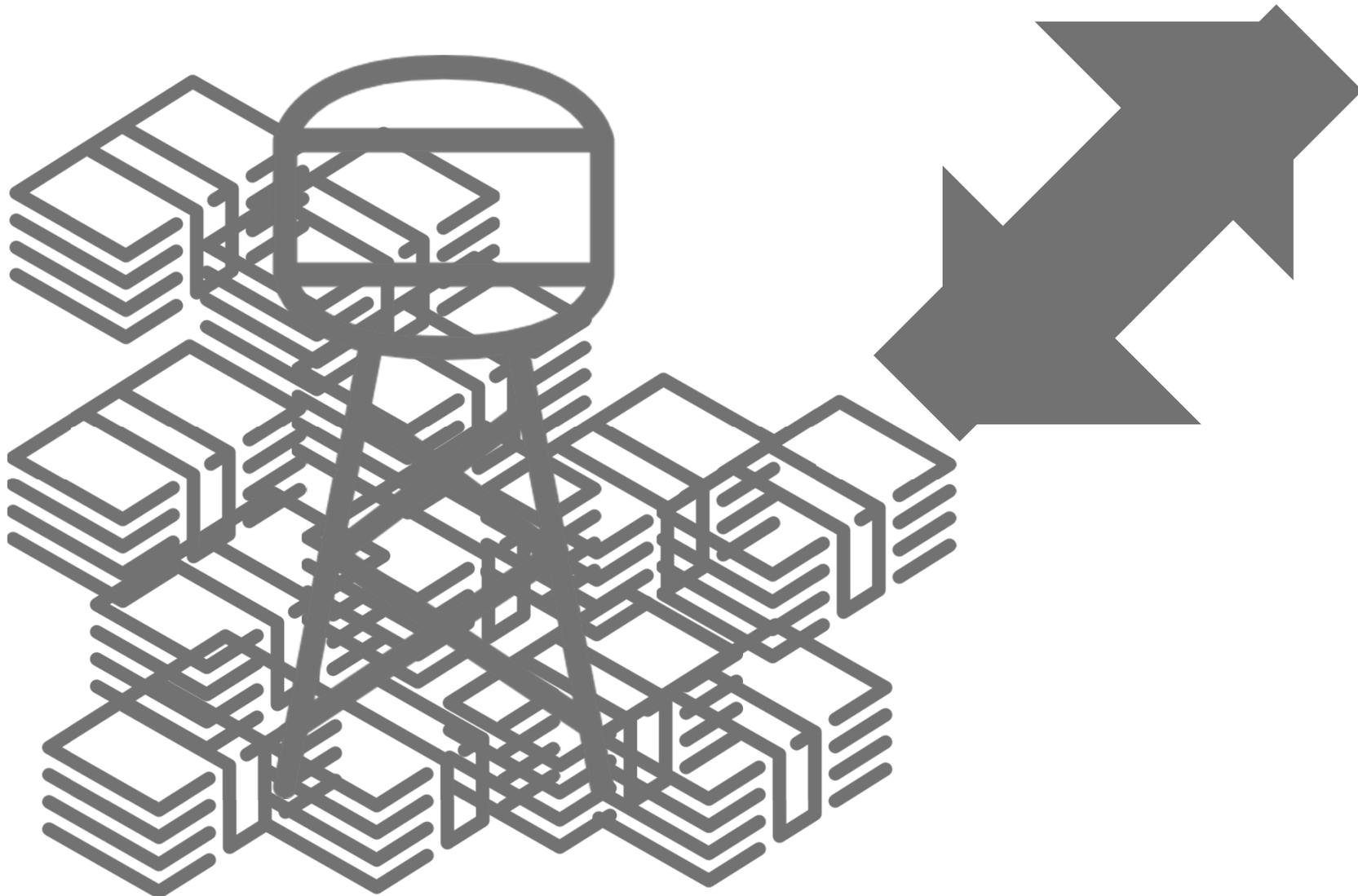


Pay As You Go





Save In Advance and Pay

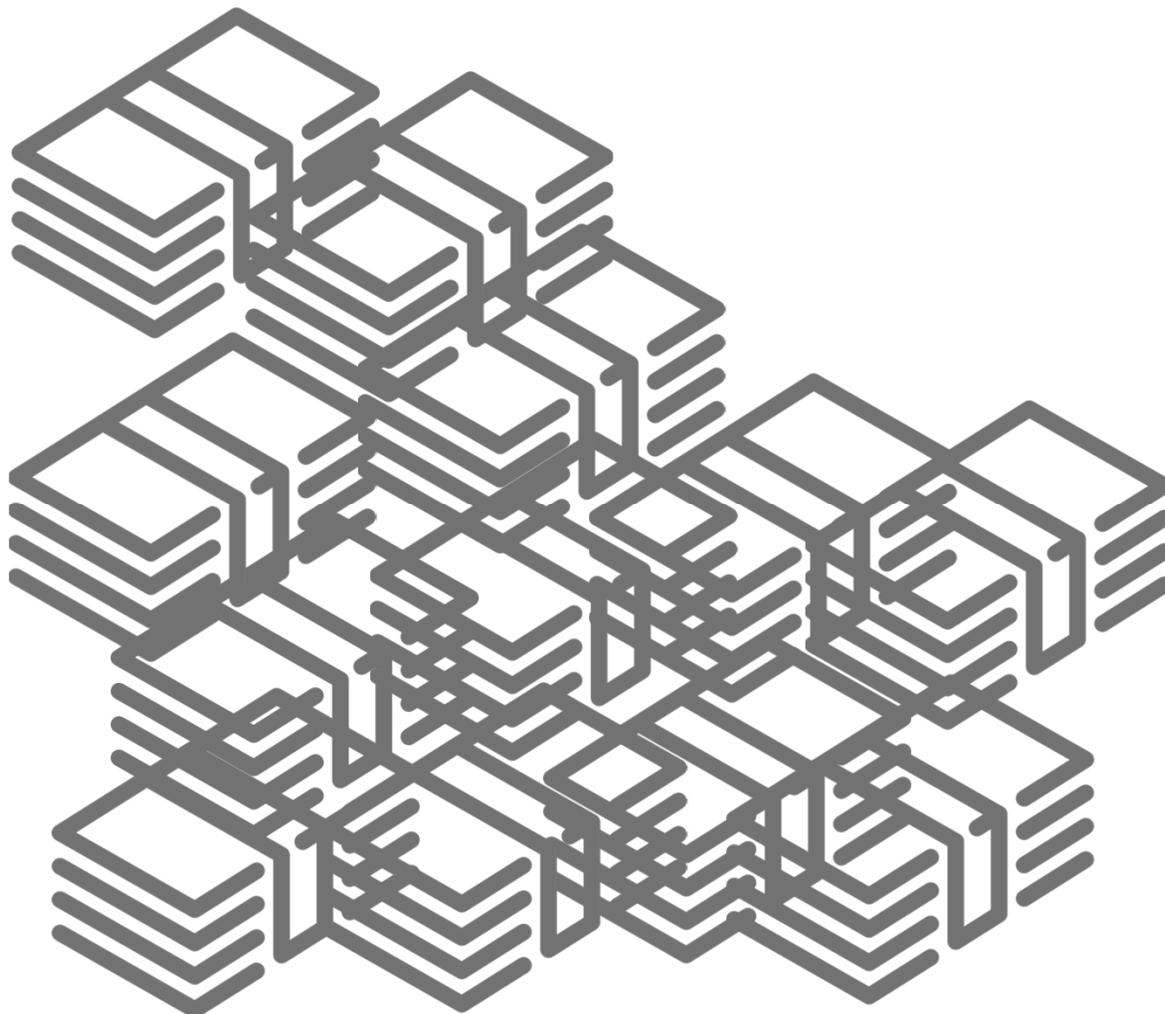




Borrow and Pay Later

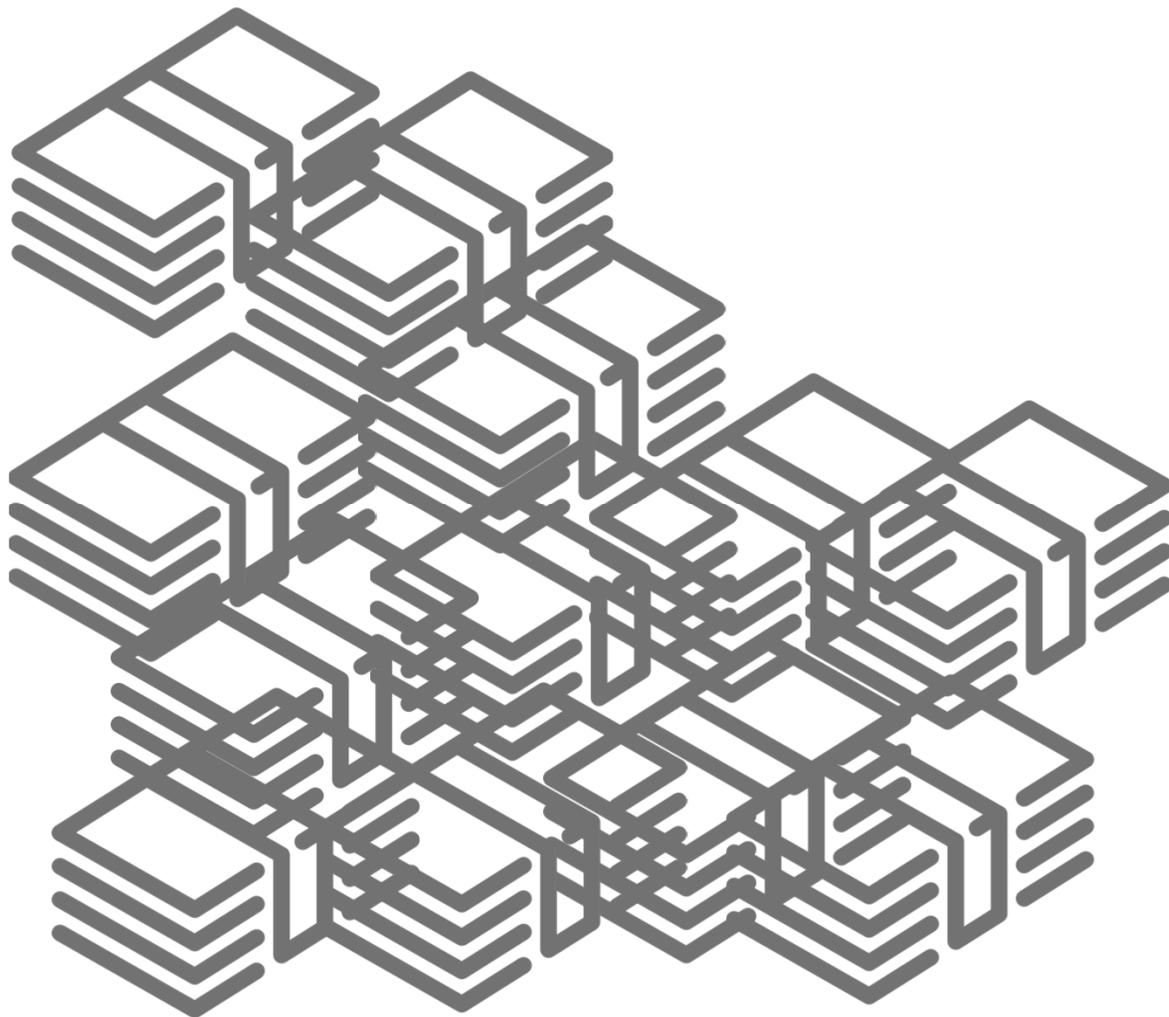


BANK





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





Find Irvindale's 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



Find Irvindale's Financial Statements

On the Statement of Cash Flows, can you see anything here related to capital expenditures?



Debt and Grants

Customer Deposits Received	12,513
Customer Deposits Returned	(16,239)
Net Cash Provided (Used) by Operating Activities	\$2,785
<i>CASH FLOWS FROM NONCAPITAL FINANCING ACTIVITIES:</i>	
Decrease in Due From Other Funds	\$2,417
Total Cash Flows from Noncapital Financing Activities	\$2,417
<i>CASH FLOWS FROM CAPITAL AND RELATED FINANCING ACTIVITIES:</i>	
Acquisition and Construction of Capital Assets	(\$83,115)
Principal Paid on Bond Maturities	(8,875)
Principal Paid to Jones County	(4,800)
Capital Contributions - Grants	82,222
Other Nonoperating Revenue	2,418
Net Cash Provided (Used) by Capital and Related Financing Activities	(\$12,150)
Net Increase (Decrease) in Cash and Cash Equivalents	(\$6,948)
Cash and Cash Equivalents, July 1	42,716
Cash and Cash Equivalents, June 30	\$35,768



Find Irvindale's Financial Statements

On the Statement of Revenues, Expenses and Changes in Net Position, what is the annual depreciation on the water system assets?



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)



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

Infrastructure Wears Out

GALVA

7:20 / 1:03:02
www.elcnetwork.org

UN

Webinar: Demystifying Depreciation and How to Make Use of It



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 Hydro-pneumatic 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



If Irvindale were to fully fund depreciation, what would it do to the rates?

What concerns might there be?



With Depreciation

Revenues Needed

from Rates:

~~\$344,500.00~~

\$484,532



The Rates with Depreciation

\$89.73 ~~\$63.79~~ base

\$14.74 ~~\$10.49~~ per 1,000 gallons

\$80.02 ~~\$54.08~~ base
\$1.59 per 1,000 gallons

\$25.00 base
\$10.63 ~~\$6.97~~ per 1,000 gallons



“Fully Funding” Depreciation

- At this point for Irvindale, fully funding depreciation is too little, too late since they have not been doing this
- They would not be able to save enough to pay for existing assets if they start funding depreciation now



So What Can Irwindale 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*



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...

Capital Improvement Projects - 20 Years

Project Name	Project Start Year	Project End Year	Project Construction Period (Years)	Annual Construction Cost (\$)	Annual Construction Factor (in the Year)	Estimated Cost at End of Year	Cost at End of Year
Project 1	2015	2015	1	1,000,000	1.0000	1,000,000	1,000,000
Project 2	2016	2016	1	2,500,000	1.0000	2,500,000	2,500,000
Project 3	2017	2017	1	1,000,000	1.0000	1,000,000	1,000,000
Project 4	2018	2018	1	1,000,000	1.0000	1,000,000	1,000,000
Project 5	2019	2019	1	1,000,000	1.0000	1,000,000	1,000,000
Project 6	2020	2020	1	1,000,000	1.0000	1,000,000	1,000,000
Project 7	2021	2021	1	1,000,000	1.0000	1,000,000	1,000,000
Project 8	2022	2022	1	1,000,000	1.0000	1,000,000	1,000,000
Project 9	2023	2023	1	1,000,000	1.0000	1,000,000	1,000,000
Project 10	2024	2024	1	1,000,000	1.0000	1,000,000	1,000,000

Expected Revenues and Expenses FY15

Annual Operating and Non-Operating Revenues: \$ 4,100,000
 Annual Non-Capital Expenditures (DEBT, Admin, etc.): \$ 4,520,000
 Expected Annual Deficit of Expenditures (FY15): \$ 420,000

Usage Billed to Customers in FY15

Residential: 100,000,000 gallons
 Commercial: 100,000,000 gallons
 Industrial: 100,000,000 gallons
 Total Monthly Use (1,000,000 of gallons): 300,000,000
 Annual Customer Rate (Monthly Payment): \$ 1.50

Estimated Rate Changes Needed to Maintain the Fund Balance

	FY15	FY16	FY17	FY18
3 Year Interest (Discounted to Sales Taxes and Subventions)	n/a	0.0%	0.1%	0.4%
Increase (Decrease) in the Monthly Bill for 1,000 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 1,000 gallons/month (1,000 gallons)	\$5.67	\$5.67	\$5.96	\$6.11
Volume Rate at 1,000 gallons/month (2,000 gallons)	2	2	2	2
Approximate Monthly Charge for 1,000 gallons (1)	\$29.35	\$29.35	\$30.94	\$31.65

Projected Fund Balance

	FY15	FY16	FY17	FY18
Total Assets	\$ 1,710,000	\$ 1,901,000	\$ 2,208,307	\$ 2,564,000
Base Charges	\$ 1,710,000	\$ 1,796,322	\$ 1,907,260	\$ 2,075,733
Usage Charges	\$ 3,379,640	\$ 3,904,095	\$ 4,276,088	\$ 4,793,782
Interest Earned from Previous Year's Positive Balance	\$ -	\$ 9,405	\$ 9,167	\$ 9,007
Revenues from Other Sources (Reserve Charges)	\$ 103,200	\$ 106,286	\$ 106,344	\$ 106,433

Financial Reserves (End of Year)

Total Capital Expenses

Rate Increases

Total Cumulative System Investment



Infrastructure Funding Programs



40 Years



Building Better Neighborhood

