



Smart Management for
Small Water Systems

Utility Asset Management 101

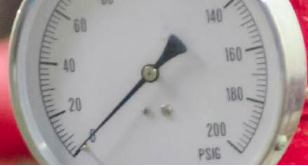
Brian Bohnsack PhD, Program Manager

Wichita State University Environmental Finance Center

October 2, 2019

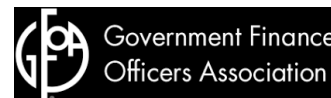


Government Finance Officers Association



The Small Systems Program Team

- Environmental Finance Center at The University of North Carolina at Chapel Hill
- Southwest Environmental Finance Center at the University of New Mexico
- Syracuse University Environmental Finance Center
- Environmental Finance Center at Wichita State University
- EFC West
- Environmental Finance Center at the University of Maryland
- New England Environmental Finance Center at the University of Southern Maine
- Great Lakes Environmental Infrastructure Center
- Government Finance Officers Association (GFOA)
- National Association of Development Organizations (NADO)





Areas of Expertise



Asset Management



Rate Setting and Fiscal Planning



Communication and Decision-Making Strategies



Water Loss Control



Controlling Energy Costs



Accessing Infrastructure Financing Programs



Workforce Development



Water Conservation Finance and Management



Collaborating with Other Water Systems



Resiliency Planning



Managing Drought



Today's Activities

- An Overview of Asset Management
- Core Components of Asset Management
- Questions/Comments



Asset Management- Growing National Recognition

- America's Water Infrastructure Act of 2018 added asset management outreach and promotion as a requirement for state capacity development programs.
- Summary of status of state efforts is available in State Asset Management Initiatives- February 26, 2019 report by EPA Office of Water.



Asset Management Is...

maintaining a **desired level of service**
(what you want your assets to provide)

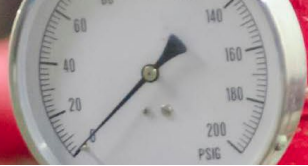
at the **lowest life cycle cost**
(best appropriate cost - not no cost)

Asset Management is designed to be a process to make management decisions easier and help people decide how and where to spend money to achieve the desired results.

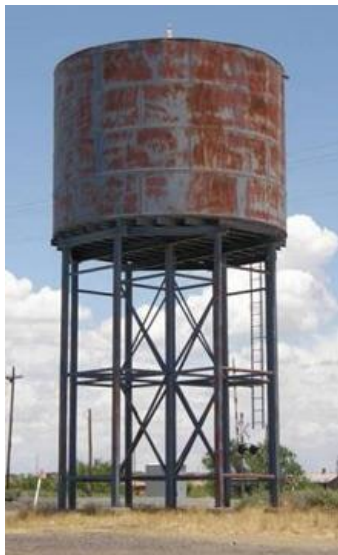


Decision Making Factors

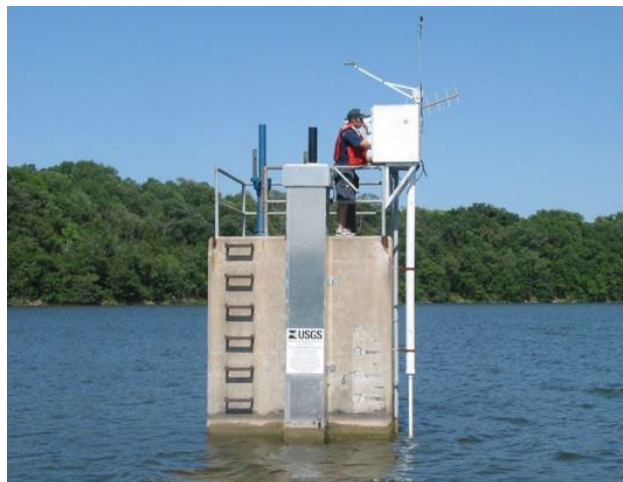
- What are the benefits of the project?
- What are the risks of not doing the project?
- What do customers really want?
- What financing is available for the project?
- Does the project meet a critical need?
- What is the best expenditure of funds?
- What are the alternatives?



Utility Decision Making



Storage
Tank
Rehabilitation
\$650,000



Intake
Structure
Repairs
\$820,000



Pipe
Replacement
\$950,000



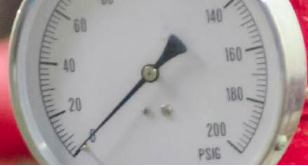
Filter
Rehab
\$300,000



Asset Management Relies On:

- What you already know
- Resources you have available to you
- Knowledge of the **ENTIRE** workforce

Think of Asset Management as
“Applied Common Sense”



Five Core Components of AM



Current State of the Assets



Level of Service



Criticality



Life Cycle Costing



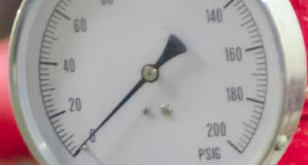
Long-Term Funding



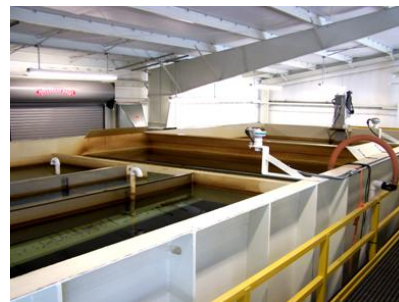
Core Component 1

Current State of the Assets





What Do I Own?





THE UTILITIES
DEPARTMENT
HAS 20,407
MANHOLE LIDS
IN TOPEKA

True
OR
False

-0:00 HD

True or False?

Like Comment Share



City of Topeka Utilities Department

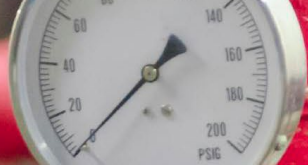
1

43 Views · about 2 months ago

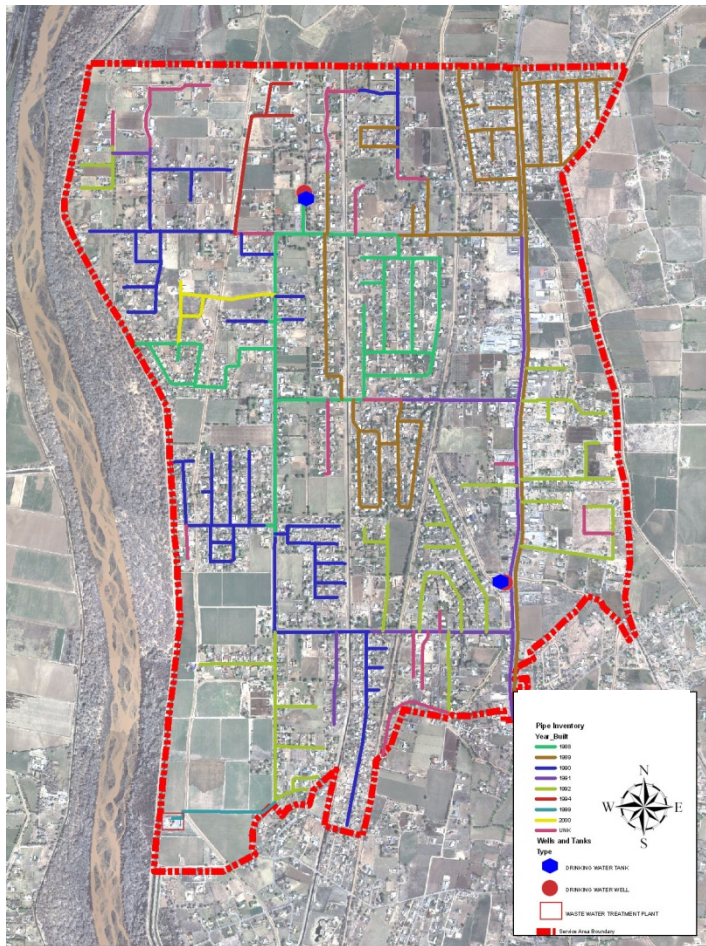
True or False Answered: FALSE! The Utilities Department only has 20,407 manhole lids within Topkea. Thanks for playing

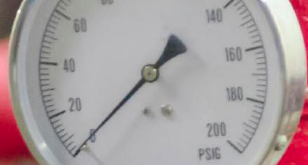
Chat (31)



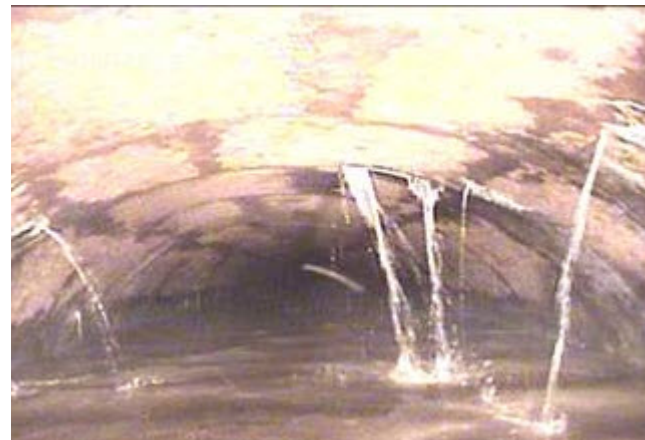


Where are my assets?





What is the condition of my assets?



Photos from City of Topeka Utilities Department's post

in Timeline Photos



True
OR
False

Large brick storm sewer installed
in Topeka in the 1880's



City of Topeka Utilities Department

July 31

In regards to yesterday's True or False question, the answer is TRUE! The City of Topeka Utilities Department has approximately 29,730 linear feet of BRICK sanitary sewer still in use today. There are segments of this brick sewer that have installation dates that range from 1892-1924. Pictured is a brick storm sewer that was constructed in 1880. The largest of these brick sewers were 5-7 feet in height.

We hope you enjoyed playing along and gained some fun Topeka history. Make sure to like our page so that you can get notified when we post more True or False questions!

You and 29 others 1 Comment 4 Shares

Like Comment Share

Most Relevant



Karl Fundenberger I'm pretty sure this old line is the reason my toilet is haunted

Like · Reply · 8w



Write a comment...



Like Comment Share

Options Send in Messenger

*Image Source: Impact of Water on the Development of Topeka



What is the remaining life of my assets?

1 Year

100 Years

10 Years

15 Years

20 Years



What is the value of my assets?

Replacement

Current Value



Historical Value



The Asset Inventory

- Data is compiled into an Asset Inventory
 - Can be:
 - Generic Database
 - Generic Spreadsheet
 - Commercial Product
 - EPA Product (Such as Check Up Program for Small Systems “CUPSS”)
 - Paper
 - Balance collection of asset data with costs and benefits
 - Update and maintain the inventory continuously



Core Component 2

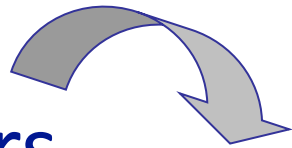
Required Level of Service





Level of Service Process

Involve
Customers



Measurable
Goals: Internal
and External



Track Progress
Towards
Meeting Goals

Involve
Staff

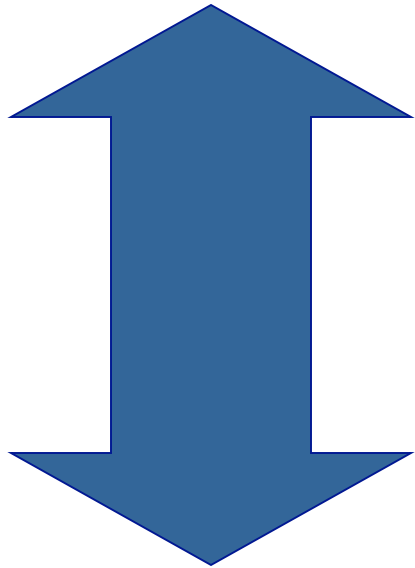


“What would my customers want?”



Selecting the Goals

Maximum Level = Physical capabilities of the assets



Your Choice

Minimum Level = Must meet all regulatory requirements



Examples

Examples of External Goals:

Fewer than 5 odor complaints per quarter related to WWTP

Minimum water pressure of 50 psi throughout system, 95% of the time

Customer service line available from 8 am – 5 pm, 5 days per week

Customer complaints addressed within 1 business day, 95% of the time

Fewer than 2 sewer backups per month

Examples of Internal Goals:

75% planned maintenance, 25% reactive maintenance

Reduce energy consumption by 10% at the wastewater treatment plant



Core Component 3

Which Assets are Critical to Sustained Performance?





Components of Criticality

What is the probability or likelihood that an asset will fail?



How do my assets fail?

What's the condition of my assets?



Components of Criticality



What is the consequence if the asset does fail?

What is the cost of the repair?

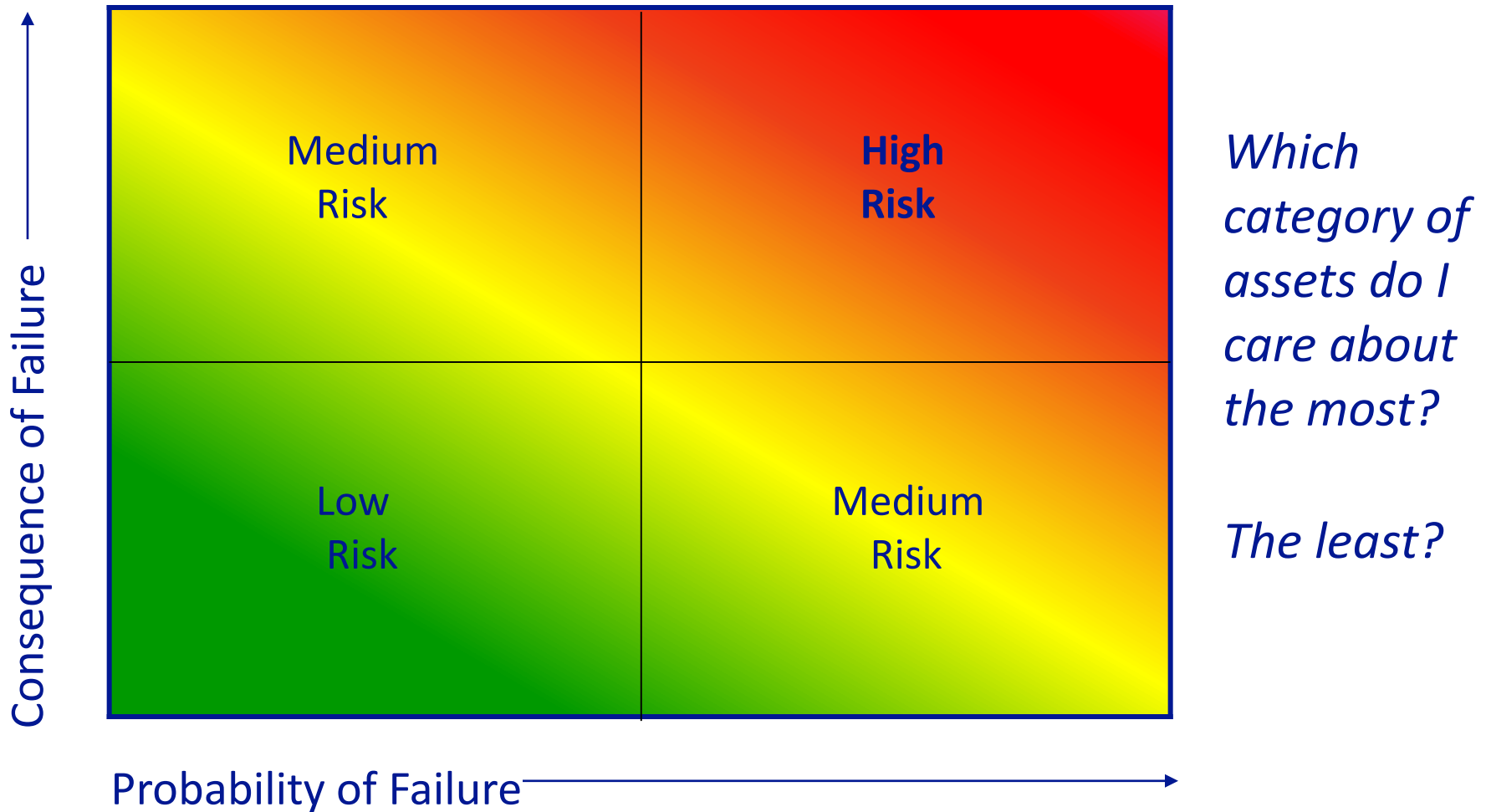
Are there legal, environmental, and/or social consequences?

Are there redundant assets?





Critical Assets – Risk Analysis





Core Component 4

What is the best life cycle cost of O&M and Capital?





Concept of Life Cycle Costing

Consider all costs of operating and maintaining the assets over the entire life cycle.



Clinton mayor arrested for 3rd time, now over town's water; her attorney denies any crime

BY GRACE TOOHEY and EMMA KENNEDY | gtoohey@theadvocate.com and ekennedy@theadvocate.com JAN 9, 2019 - 6:29 PM 4 min to read





Concept of Life Cycle Costing

Let's look at an example:

Option 1: Do more maintenance and rehab to forestall replacement

Initial Cost: \$90,000

O&M per year = \$2,000

Repair Costs = \$30,000

Rehabilitation = \$70,000

Life of Asset = 30 years

Option 2: Do less maintenance and replace more often

Initial Cost: \$90,000

O&M per year = \$500

Repair Costs = \$5,000

Rehabilitation = \$0

Life of Asset = 10 years

For 30 Year Time horizon:

Total Cost Option 1 = \$250,000

Total Cost Option 2 = \$300,000

When life cycle is considered, Option 1 is best



Life Cycle Costing Example

- Option 1 is the most economical for this set of circumstances.
- Other examples may have a different result.

The important thing is to do this type of analysis to justify the answer!!!



Life Cycle Costing and O&M

Routine and preventative maintenance can help extend the life of an asset.

Maintenance takes resources – time & supplies

What to do and when?

Concept of Risk

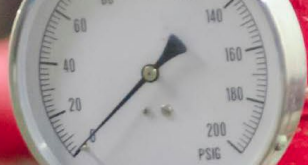


Life Cycle Costing and O&M

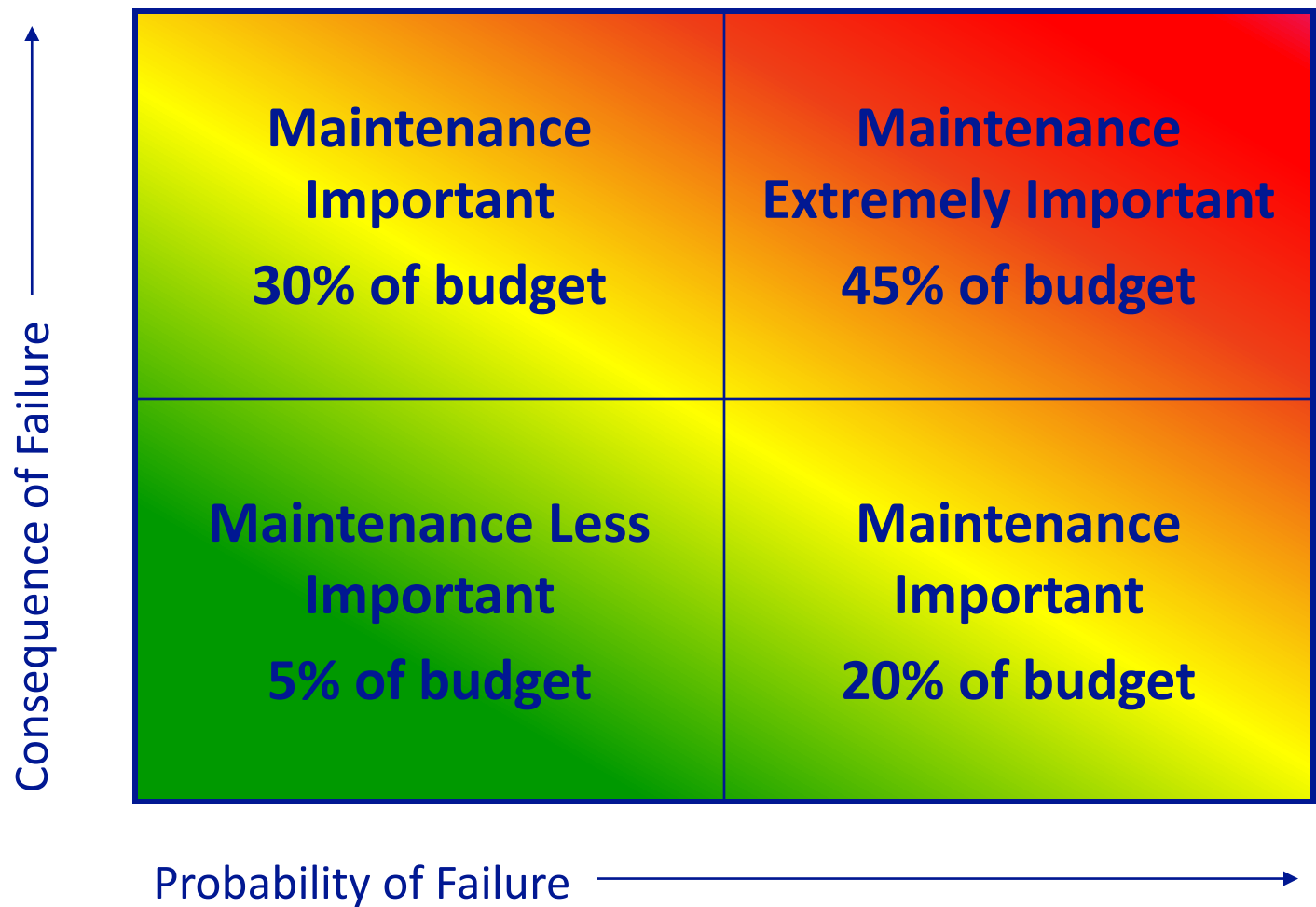
High Risk Assets: Preventative maintenance very important to try to prevent or forestall failures

Low Risk Assets: Only routine maintenance and minimal preventative maintenance, since assets can be allowed to fail

- Management Strategy: Run to Failure



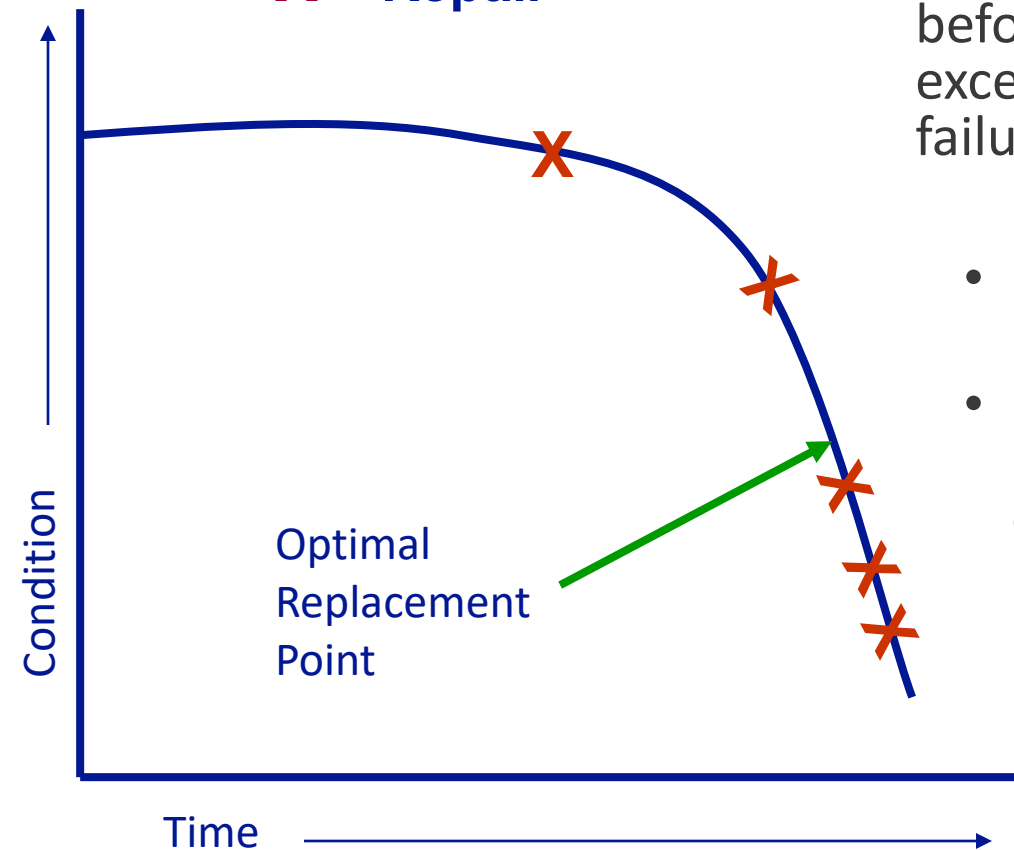
Maintenance Based on Criticality





Life Cycle Costing: Replacement of Assets

X = Repair



The optimal time to replace an asset is before repair or maintenance costs are excessive or just before a catastrophic failure.

- Replace too early, money is wasted by not using all of an asset's life
- Replace too late, money is wasted because the repair will be more expensive

Not possible to know the optimal time to replace every asset

So... need to use the concept of risk



Capital Project Planning and Validation

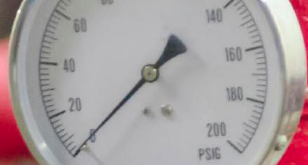
- Capital projects should be placed on Capital Improvement plan (CIP)
- Ideally, outlines 20 years of projects (or more). But commonly is 5 year timeframe.
- High dollar projects “validated”
 - Make sure project is needed
 - Make sure correct alternative is chosen
 - Make sure all information needed to make a good decision is provided
- Energy Efficiency should be considered in all future replacement projects



Core Component 5

**What is the best long term
funding strategy?**





Funding Sources

Internal/External Funding:
Capital Projects



- Loans
- Grants
- Special Funds
- Bonds

Internal Funding:
Operation & Maintenance



- Taxes
- Customer Fees
- Impact Fees
- Customer Rates

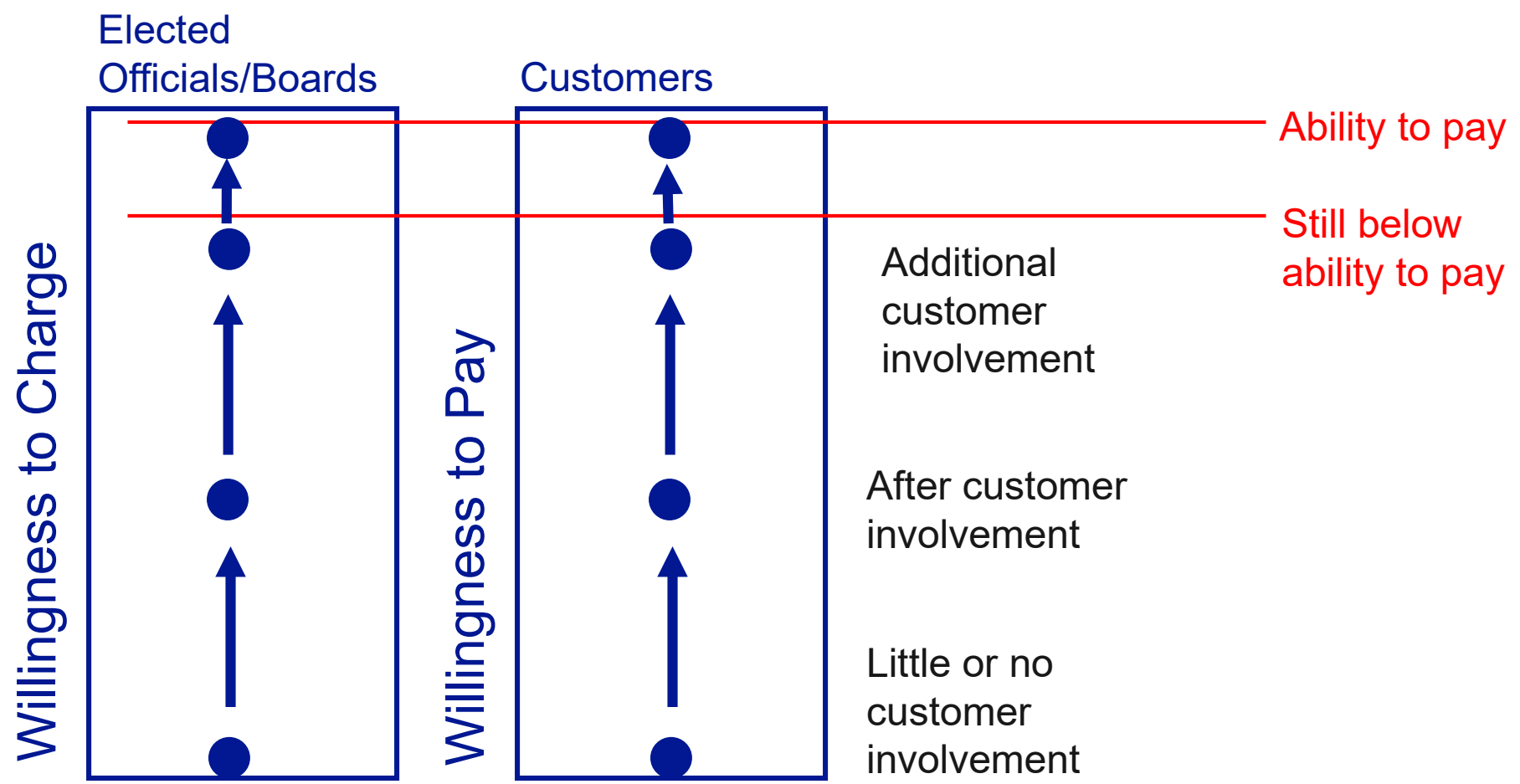


Rates

- Rates are an important part of funding for O&M and capital (rates include debt service for loans)
- Rates should be fair, equitable, and cover full costs, including reserve accounts
- AM can help build rate capacity



Building Rate Capacity





Asset Management Implementation



Where to Start?

- Anywhere
- Possible Starting Points
 - What makes sense to you
 - What's easiest
 - What you know the best
 - What you can see
 - What's the most important to staff, customers, or governing body
- Map may be good starting point

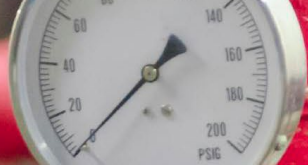


Acknowledgements

- Kansas Department of Health & Environment: Project sponsor/funder
- New Mexico Environmental Finance Center: Project completion
- EPA Office of Water and Australia/New Zealand International Infrastructure Management Manual: Basis for Asset Management Approach

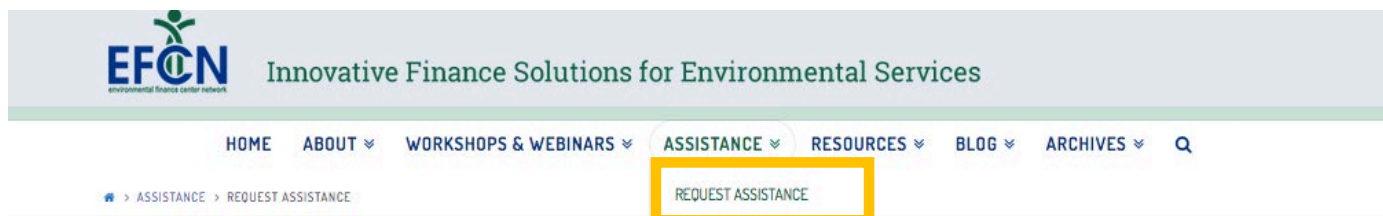


This project has been funded wholly or in part by the United States Environmental Protection Agency under assistance agreement A18-0408-001 to the University of North Carolina at Chapel Hill. The contents of this document do not necessarily reflect the views and policies of the Environmental Protection Agency, nor does the EPA endorse trade names or recommend the use of commercial products mentioned in this document.



Request Technical Assistance

Select “Request Assistance” under the Assistance Tab off the EFCN homepage to access and submit the TA request form electronically.



REQUEST ASSISTANCE

The screenshot shows the "Technical Assistance Request Form" page. The page features a header with a collage of images including a person, a calculator, the EFCN logo, and a fire hydrant. The main content area has a title "Technical Assistance Request Form" in green. Below the title is a paragraph stating that the EFCN offers free help on financial and managerial topics to systems serving 10,000 or fewer people. A list of services is provided, including creating an asset management plan, financial planning, budgeting, capital planning, energy/water loss assessment, funding identification, collaboration, and resiliency planning. At the bottom, there is a call to action asking users to fill out the form to request assistance.

Technical Assistance Request Form

The EFCN offers free help on financial and managerial topics to systems serving 10,000 or fewer people. Examples of assistance we can provide include:

- Creating an Asset management plan
- Near-term financial planning and rate setting
- Analyzing your revenues and expenses
- Offering ideas on how to effectively budget
- Long-term capital planning
- Assessing options for lowering energy use and/or water loss
- Identifying sources of outside funding
- Collaborating with other water systems
- Resiliency Planning

If you are interested in requesting assistance from our experts, please fill out the form below. You will be asked a few questions to help us understand your water system and what kind of assistance you need.



Smart Management for
Small Water Systems

**Thank you for participating today.
We hope to see you at a future
workshop!**

brian.bohnsack@wichita.edu | 316-978-6421

www.efcnetwork.org



Government Finance Officers Association