



the
intro

ASSET MANAGEMENT: BLENDING SOURCE WATER PROTECTION

PRESENTED BY HEATHER HIMMELBERGER, P.E.



WHO
AM
I?



Heather

Engineer by training
Operations,
Management, and
Finance by choice

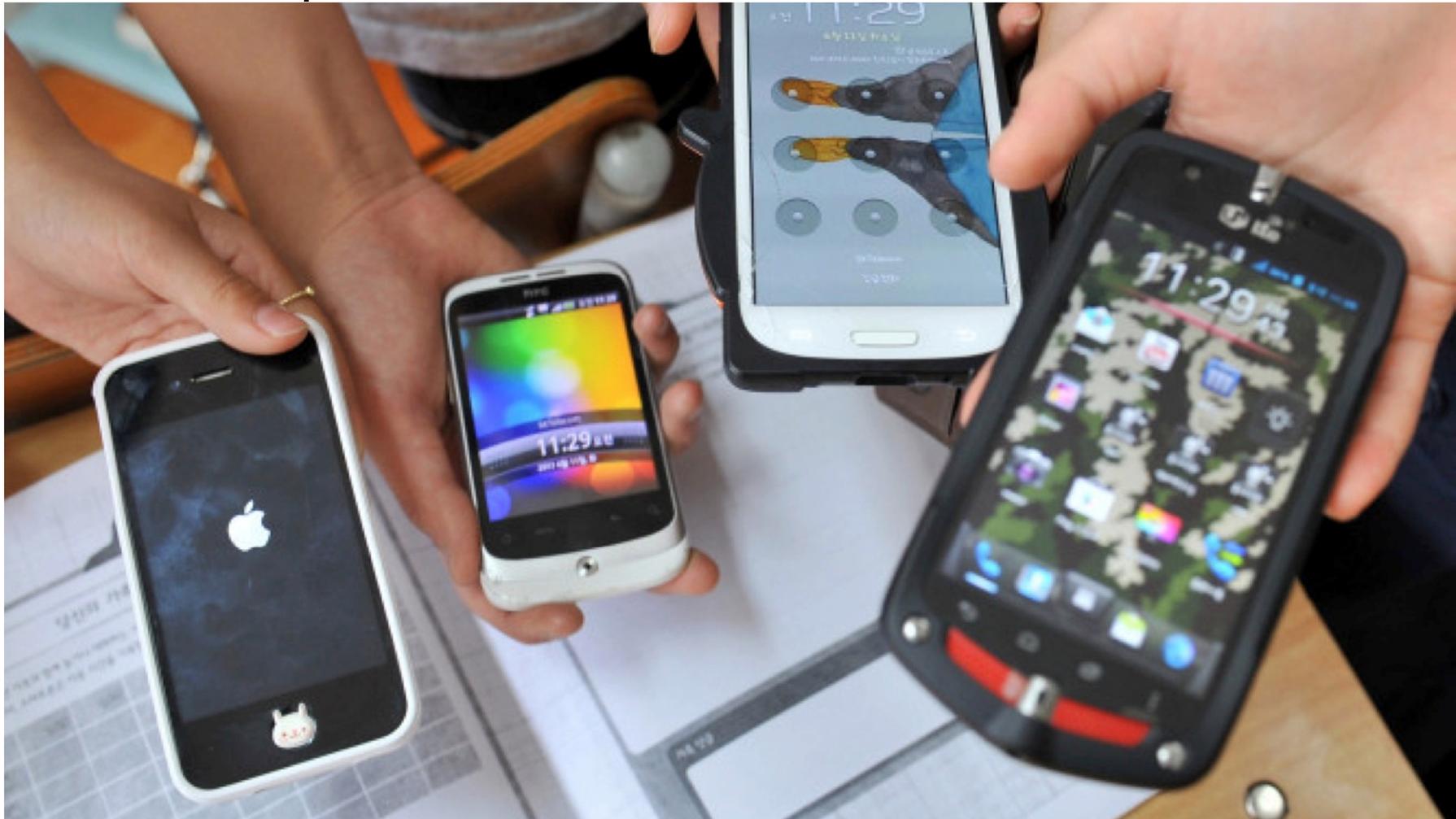


SOUTHWEST
ENVIRONMENTAL
FINANCE CENTER

Housekeeping ...



Please set cell phones to vibrate ...



When ya gotta go ...



Lunch provided....



Organization of the day...



Informal ...



Agenda





ASSET MANAGEMENT: BLENDING SOURCE WATER PROTECTION

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Water utilities exist for one reason:



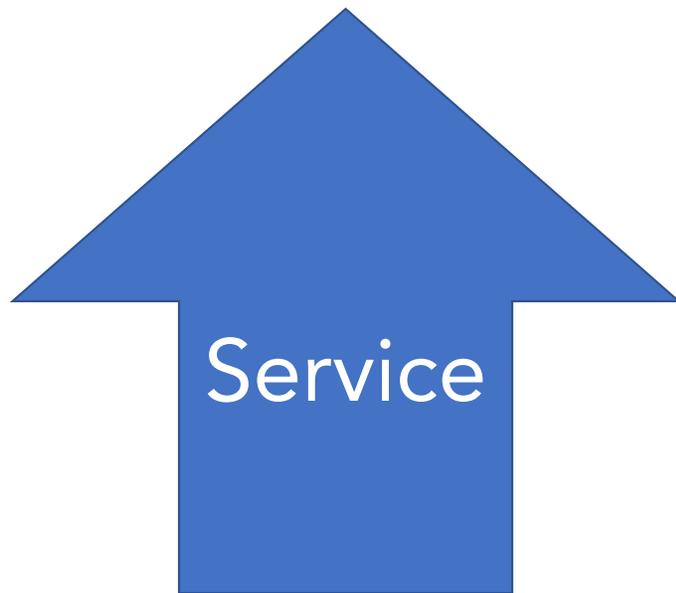
To Serve Customers

Customers expect:

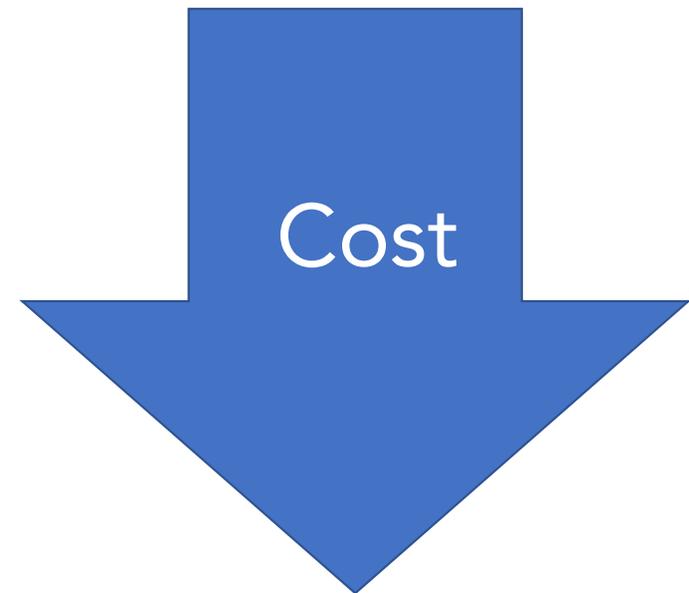


Reliability
Quality
Safety
Customer Service
Affordability
Others??

So, Utilities End Up With Competing Priorities



Deliver
Exceptional
Service



At a Really Low
Cost



We need a strategic way to focus our efforts, resources, activities, time, etc. to best address the competing priorities.

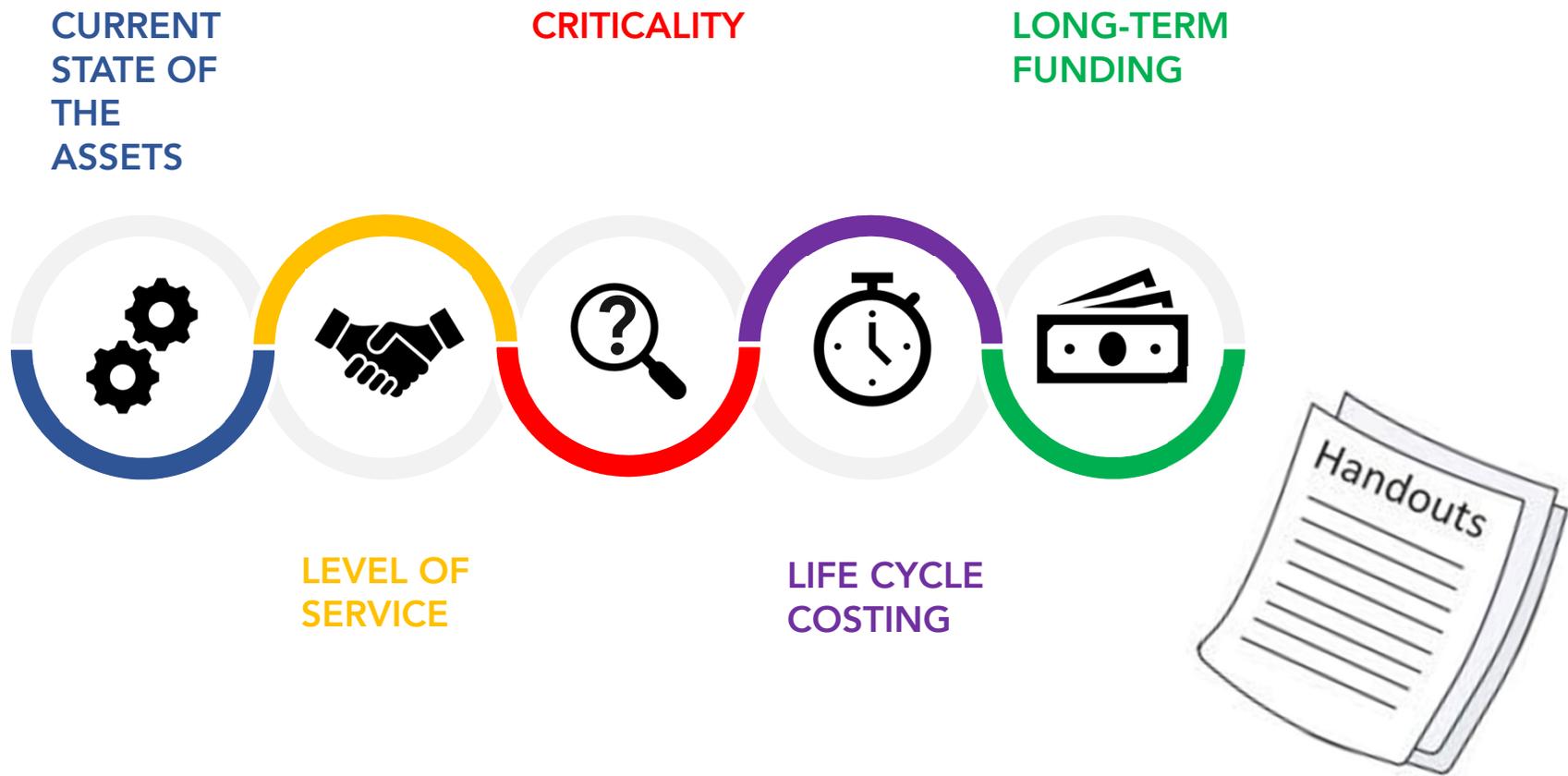


Asset Management provides the **framework** to help utilities (and any other organization) provide the **desired level of service** at the **lowest life cycle cost**.

“Desired level of service”: what you want your assets to provide

“The lowest life cycle cost”: best appropriate cost.

Asset Management: 5 Core Components



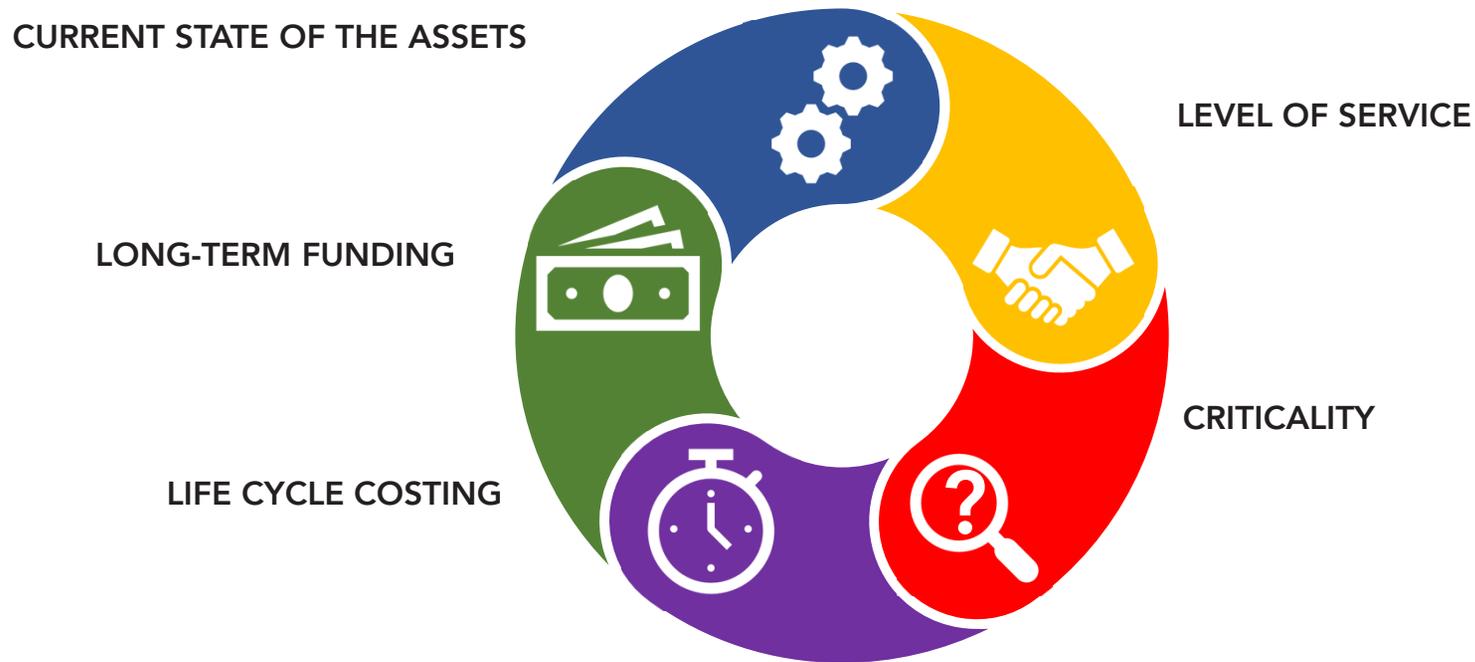
Asset Management Is Not Actually Linear



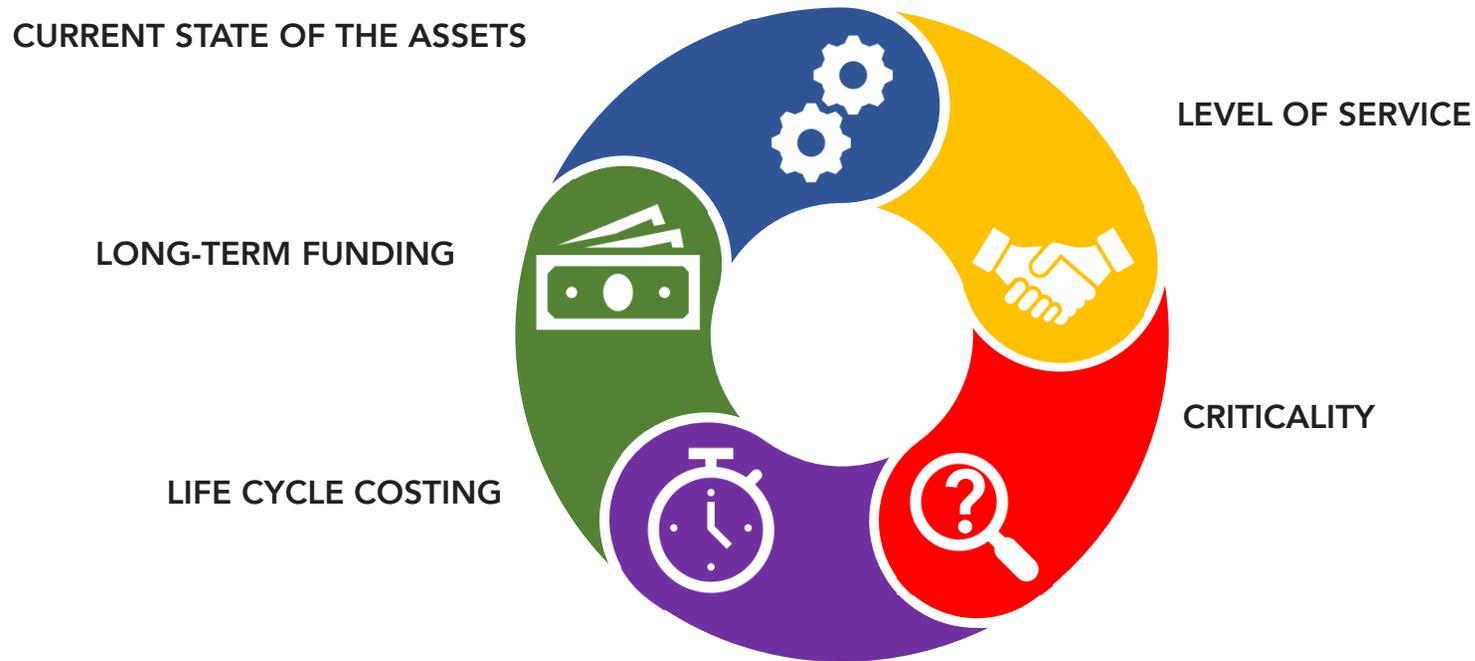
Asset Management Is A Thought Process, NOT a Computer Program



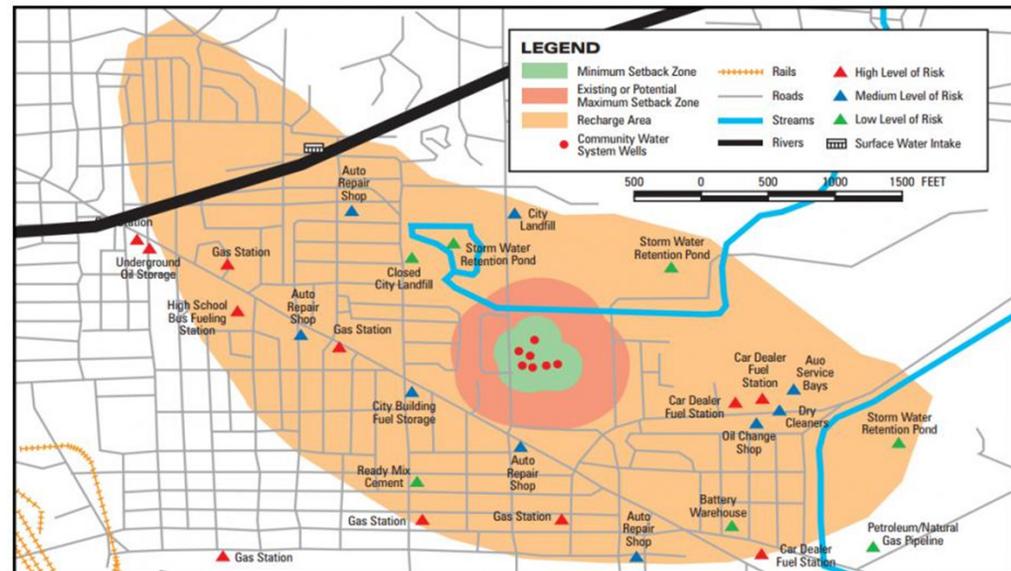
Asset Management Is Journey Not a Destination



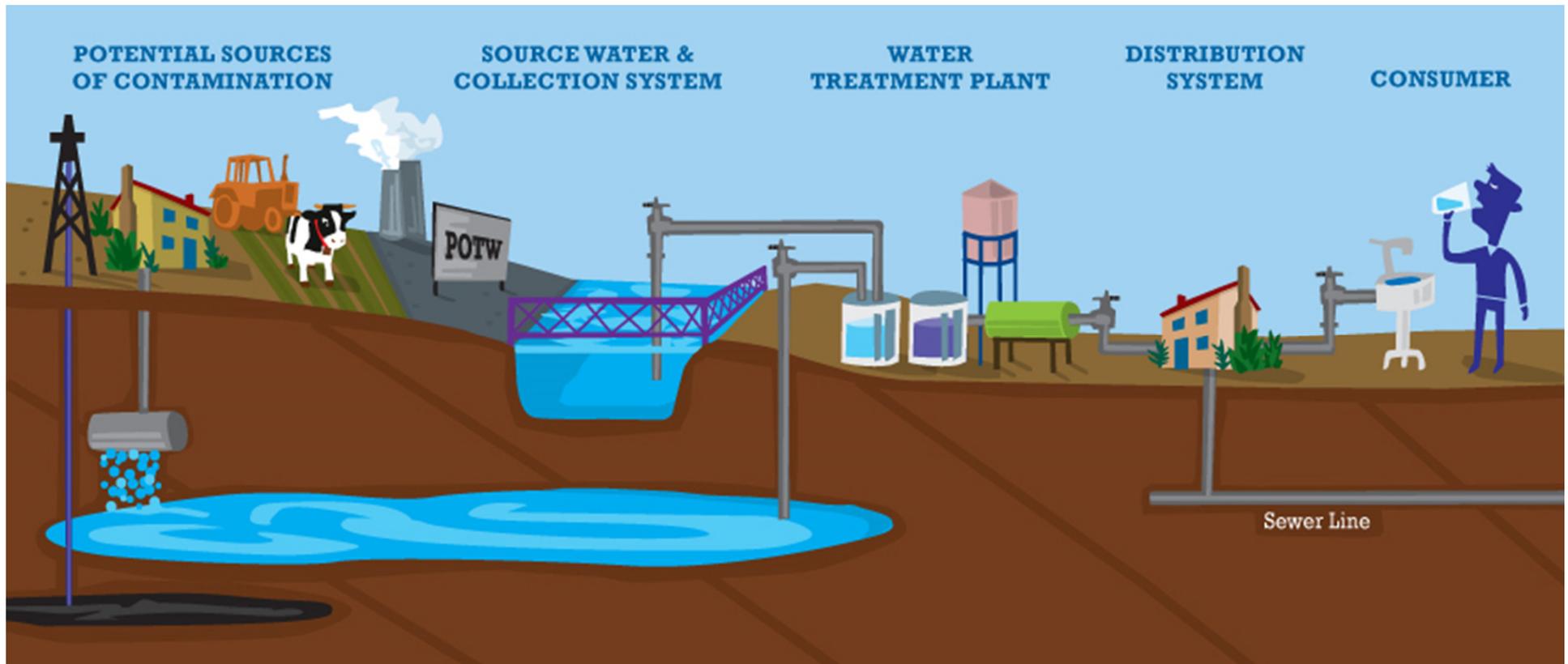
So, Why Are We Talking About AM in a Source Water Protection Training?



Source Water Protection is (Or Should Be) and Integral Part of the Overall Planning, Management, Operations, Maintenance, Repair, Replacement, and Funding Program of a Utility



If Asset Management Provides the Framework for the Rest of the System, Source Water Protection Should be Included



Why Care About Source Water Protection?



Triple Bottom Line

Financial Reasons



Cheaper to prevent than to remove contamination

Installation of treatment to remove contamination can be extremely expensive

On going operation and maintenance costs can be high, as well as the cost of higher level operators

If a source needs to be abandoned in favor of developing a new source, costs can be very high

If a massive event happens there may be legal costs

Environmental Reasons

Protecting source water has the side benefit of protecting the environment around the source water



Educating the public about the source water, including what to do and not do will help protect the overall environment

Keeping contaminants from entering or spreading within water sources

Social Reasons

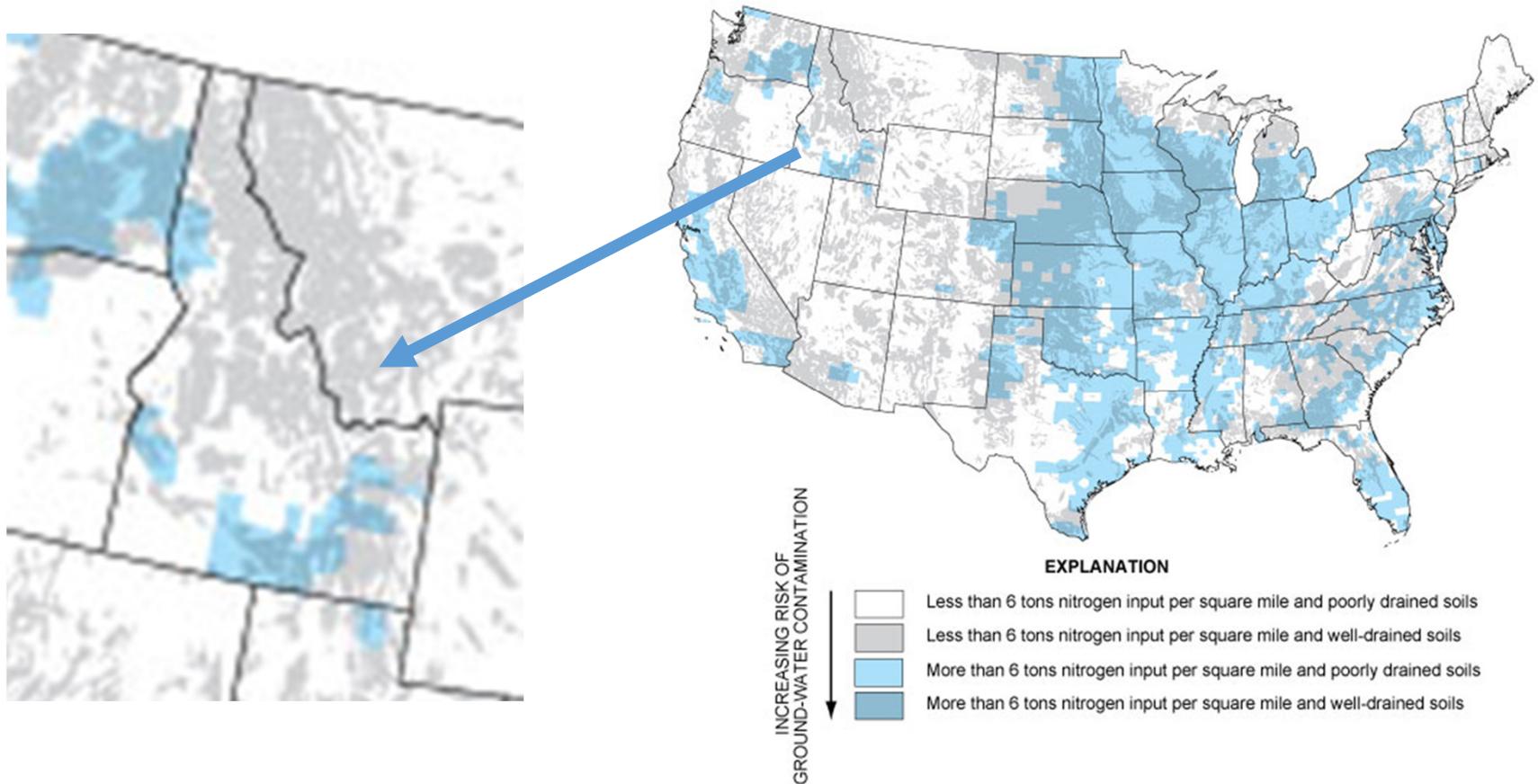
Protecting the public health

Being good stewards of the financial, environmental, and utility resources

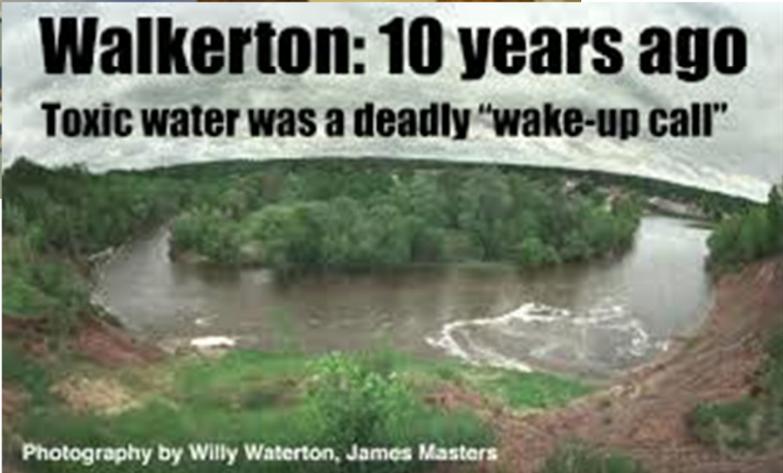
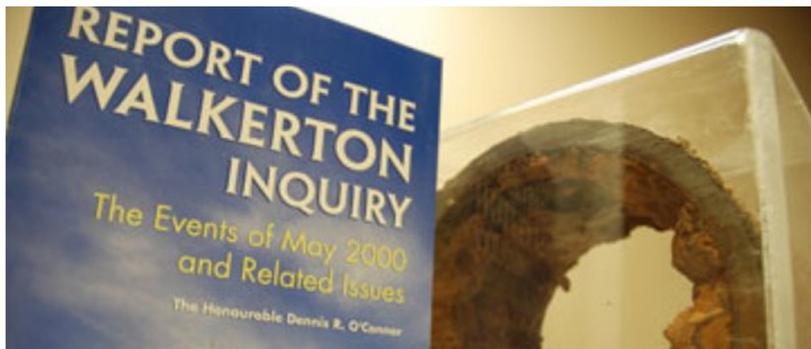
Ensuring ease of treatment and operations for employees



Concerns: Potential for Contamination



Potential for Harmful Incident



Climate Change Impacts

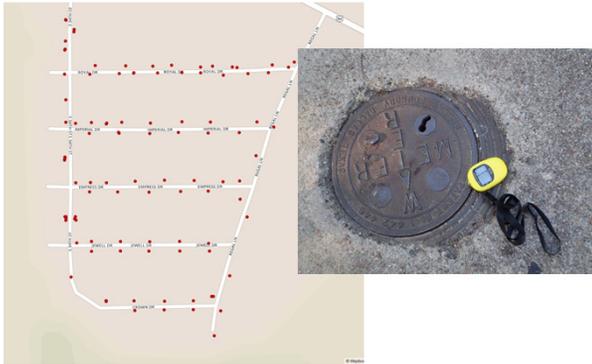


What is the number #1 reason most systems say is the reason they don't do Source Water Protection?



Because it is a voluntary program

Consider, is everything the utility does mandatory?



Lot's of activities a utility does are “voluntary”



While Source Water Protection Measures May Be More Important for Some Utilities than Others, Everyone Should Consider Source Water Protection



It should be at least an integral part of the planning and Asset Management process

So, How Do Asset Management and Source Water Protection Tie Together?



Source Water Protection:

Vision
Source Water Characterization
Program Goals
Action Plan
Implementation
Evaluation and Revision

Ties Between AM & Source Water

Source Water Protection:

Vision

Source Water Characterization

Program Goals

Action Plan

Implementation

Evaluation and Revision

CURRENT STATE OF THE ASSETS



Ties Between AM & Source Water



LEVEL OF SERVICE

Source Water Protection:

Vision

Source Water Characterization

Program Goals

Action Plan

Implementation

Evaluation and Revision

Ties Between AM & Source Water



CRITICALITY

Source Water Protection:

Vision

Source Water Characterization

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Ties Between AM & Source Water

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LIFE CYCLE COSTING



Ties Between AM & Source Water

Source Water Protection:

LONG-TERM FUNDING



Vision

Source Water Characterization

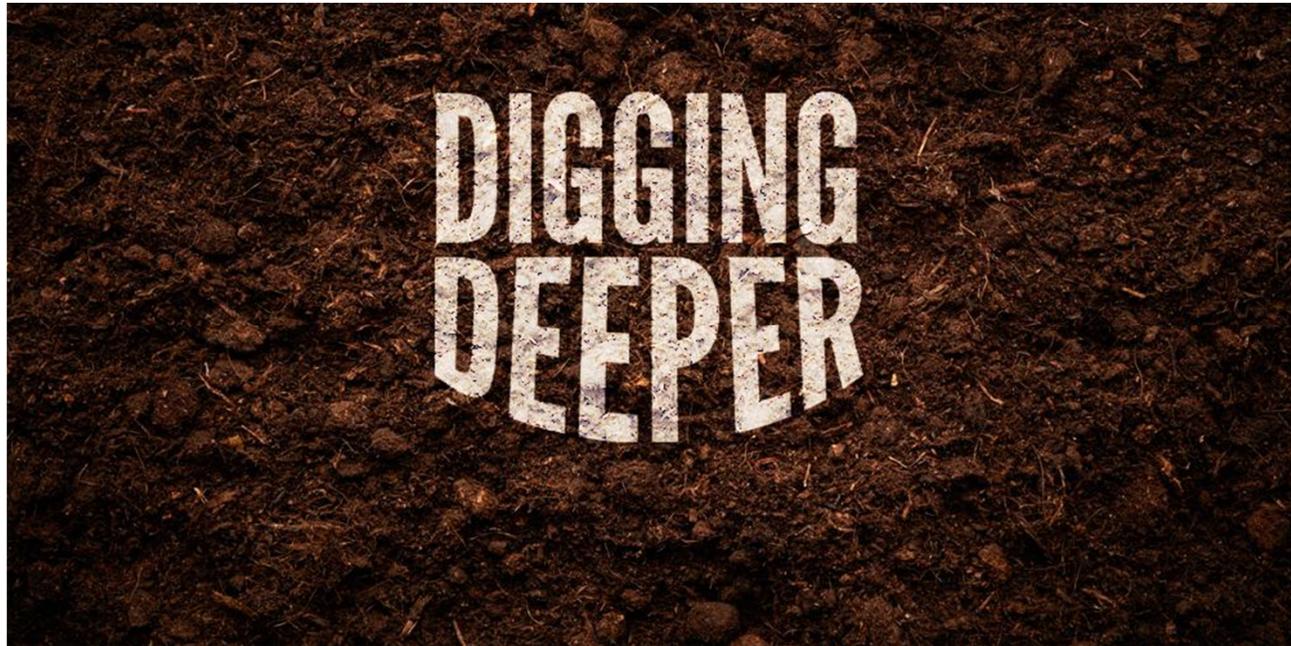
Program Goals

Action Plan

Implementation

Evaluation and Revision

We'll Go Through Each Component in
More Detail For the Rest of the Training



A Few Questions Before We Start

How many of you
have been to AM
Training before?

How many of you
have implemented
Asset Management
in whole or in part?

How many of you
have been to
Source Water
Protection
Training?

How many of you
have implemented
some portions of a
Source Water
Protection
Program?

How many of you
have implemented
a robust Source
Water Protection
Program?



A Few Questions Before We Start

How many of you
have groundwater
sources only?

How many of you
have surface water
sources?

How many of you
have a combination
of groundwater
and surface water
sources?



What questions do you have before we dig in deeper?



What are you hoping to learn from this training?



ASSET MANAGEMENT: LEVEL OF SERVICE

PRESENTED BY HEATHER HIMMELBERGER, P.E.

Ties Between AM & Source Water



LEVEL OF SERVICE

Source Water Protection:

Vision

Source Water Characterization

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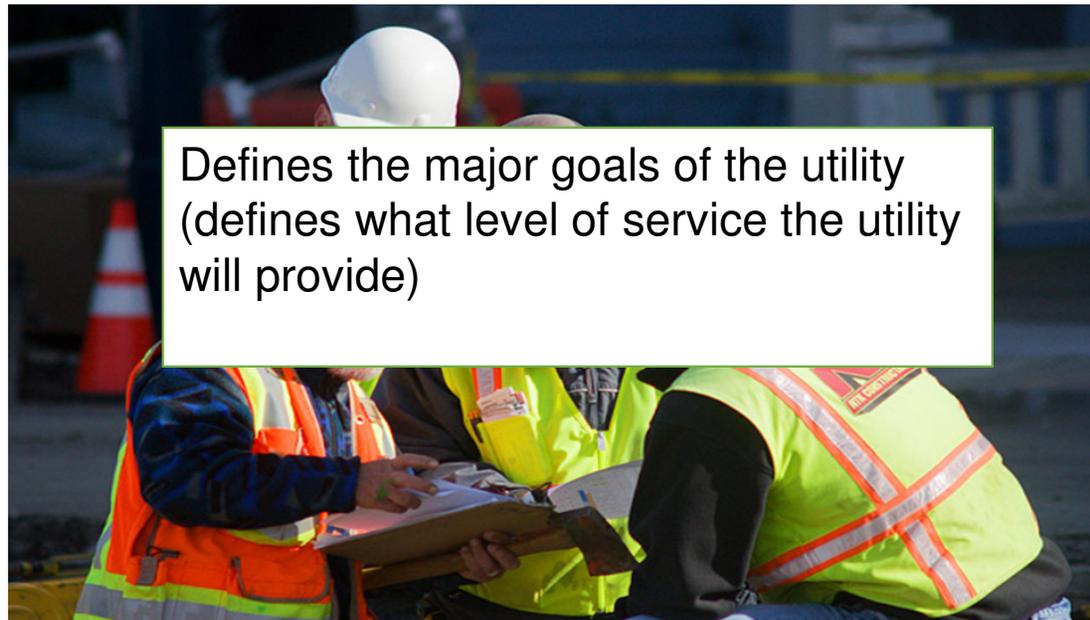
Evaluation and Revision

WATER UTILITIES ARE FIRST AND FOREMOST CUSTOMER SERVICE BUSINESSES



SO IT'S ALL ABOUT THE CUSTOMERS

CUSTOMER SERVICE IN ASSET MANAGEMENT TERMS



CALLED LEVEL OF SERVICE

First Part: Establish Overall Mission





Do you have
a mission
statement?
Do you
know what
it is?

What makes a
good mission
statement?



Mission Statement

A Good Statement...

A Bad Statement...

Uses language your constituents use.	↔	Uses jargon, doesn't understand your audience.
Is emotionally stirring.	↔	Is logical and cold.
Communicates the "why."	↔	Communicates only the "what" or "how."
Is concise.	↔	Is really long.
Is a single, powerful sentence.	↔	Is a rambling paragraph.
Sounds good spoken out loud.	↔	Is full of clauses and hard to say.
Is memorable.	↔	Is forgettable.
Surprises.	↔	Is dull.
Is actionable.	↔	Can't be quantified.
Is specific.	↔	Is vague.

The Good and the Bad

Who's mission statements?

NASA

- To improve life **here**,
- to extend life to **there**,
- to find life **beyond**.



- To refresh the world
- To inspire moments of optimism and happiness
- To create value and make a difference

TED

Ideas worth spreading

“ — mission is to organize the world's information and make it universally accessible and useful”

– Google

Ex. Water Mission Statements: What's good and not so good about each



We provide a safe, reliable, high-quality water supply with superior service and value.



To assure responsive customers service; provide reliable, high quality, affordable and sustainable water supply, wastewater collection and treatment and reuse systems; and support a healthy, environmentally sustainable and economically-viable community.



The Water Utilities Department will develop and maintain a competent team of professionals who strive continuously to improve the level of service to our customers through accurate utility billing, increased technological enhancements, and a greater emphasis on customer solutions, while planning for future needs of a growing and diverse community.

But do I really need a mission statement? Does it actually matter?



Similarly, What is the Overall Mission & Vision for the Source Water Protection Plan?



A General Vision for Source Water

“Source Water Protection is essential for providing a reliable supply of high-quality drinking water. By 2025, every public community water supply will be protected by an active source water protection program.”



Has anyone developed a vision for their Source Water Protection Program?



If yes, can you share it?

Out of the overall mission statement comes Level of Service Goals

Examples

Presented below are some examples of the types of goals a utility may set in each of these categories. The target levels included in the goals below (highlighted in the gray boxes) are examples and can be changed to meet the needs of the customers and to match the resources available to the water utility.

Public Health and Safety

- Meet Federal Safe Drinking Water Act Primary Drinking Water Standards 100% of the time.
- Meet state and local health based drinking water regulations 100% of the time.
- Maintain high level of confidence in water quality by completing all monitoring and reporting requirements of federal and state regulatory programs and reporting results to customers annually in the consumer confidence report.
- Maintain consistent chlorine residual (minimum of 0.2 mg/L, average of 0.8 mg/L) throughout the distribution system via water line flushing program, as necessary, and proper maintenance of the chlorination system.

LOS

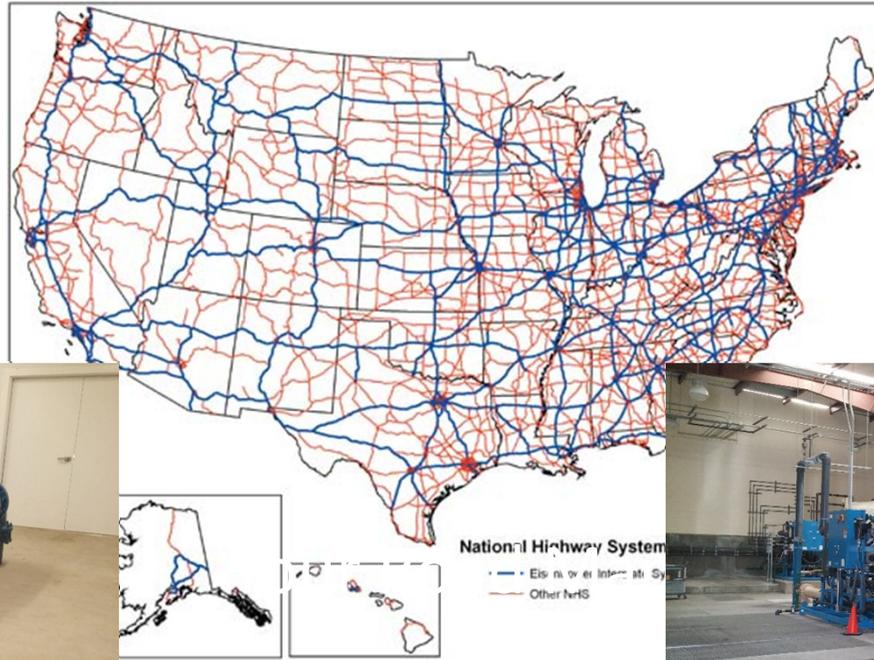
Level of Service

WHAT ARE YOU TRYING TO
PROVIDE YOUR CUSTOMERS
NOW?

HOW WELL ARE YOU
CURRENTLY DOING THAT?

HOW DO YOU KNOW?

Level of Service: You're Roadmap to Where You're Going





Developing your own road map

Goals

1. _____
2. _____
3. _____



What if you say “I’d like to

...PROVIDE GOOD WATER”

What would your customers expect?

What do our customers think “Good Water” is?

“There is no chlorine or fluoride in the water”

“Every contaminant is at 0 mg/L.”

“The water tastes good.”

“The water doesn’t look white.”



“I can give the water to my kids.”

What do our customers think “Good Water” is?

“There is no chlorine, fluoride, water”

“Every”

“I”

...If we aren't *specific* about what we mean, our customers won't believe we are providing “good water.”

“T
do
white.”

ve
er to
my kids.”



If we make the goal specific everyone knows exactly what we mean by “good water”

**“WE WILL MEET THE SDWA
PRIMARY DRINKING WATER
STANDARDS 100 % OF THE TIME”**

A goal won't really help us if we can't measure it....

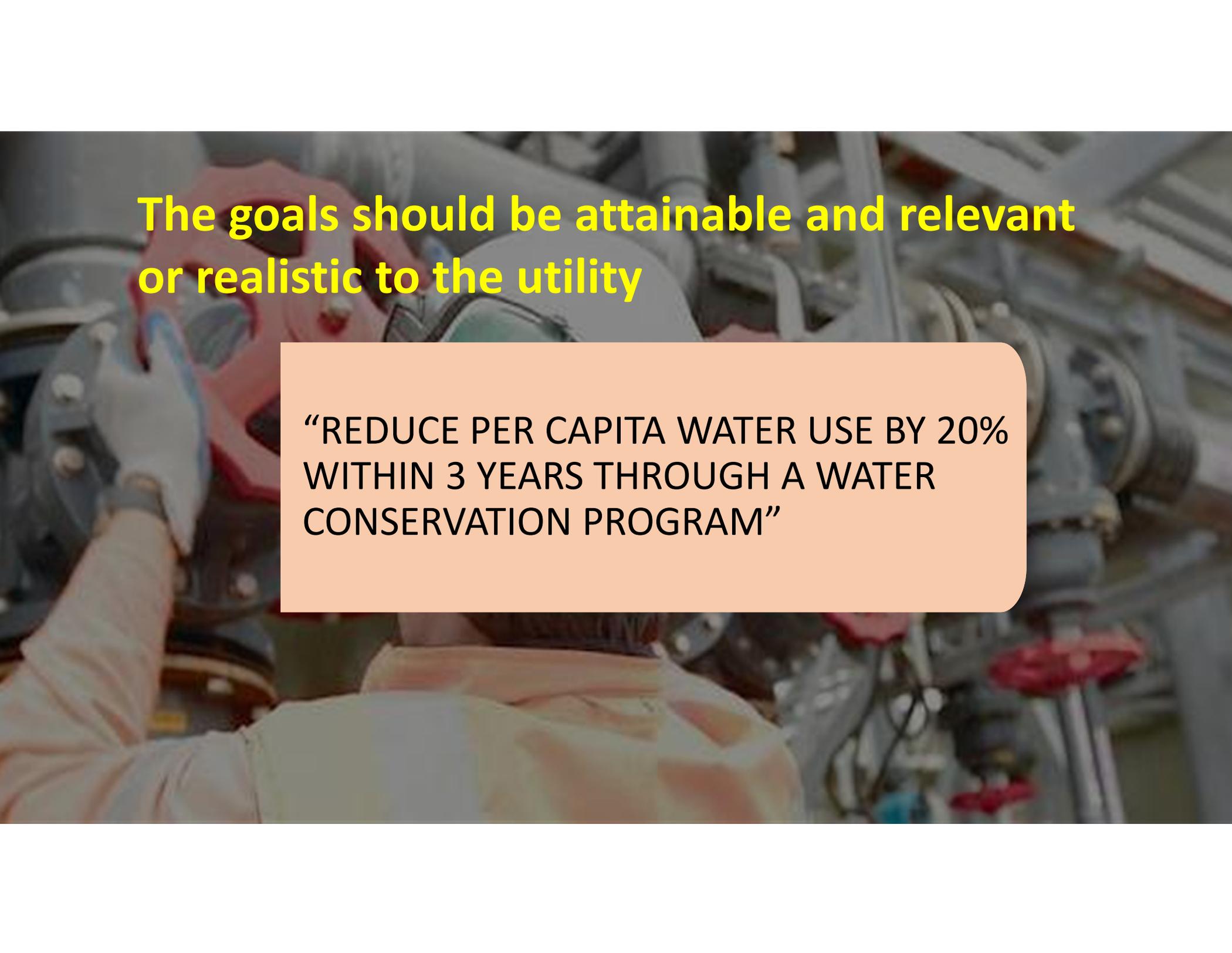
What if our goal was: “We want to have exceptional customer service.”

Could we measure this goal?

Could we measure this one?

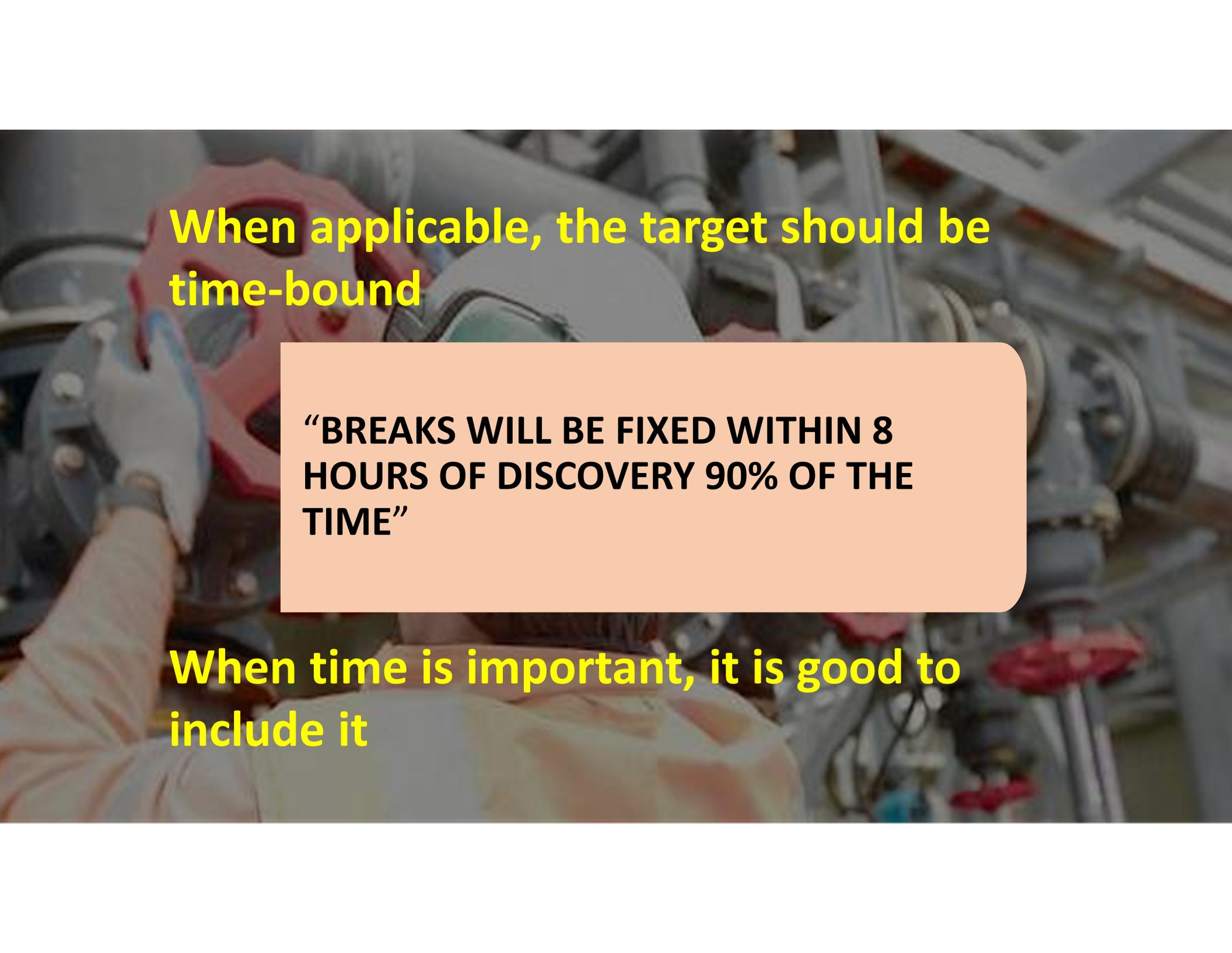
“Respond to water quality complaints by next business day 95% of the time”

What would we need to track to measure it?



**The goals should be attainable and relevant
or realistic to the utility**

“REDUCE PER CAPITA WATER USE BY 20%
WITHIN 3 YEARS THROUGH A WATER
CONSERVATION PROGRAM”



When applicable, the target should be time-bound

“BREAKS WILL BE FIXED WITHIN 8 HOURS OF DISCOVERY 90% OF THE TIME”

When time is important, it is good to include it

Choose some goals to relate specifically to Source Water Protection

Think about goals that are important for the program and for the public



Ex: Provide high quality drinking water long-term in all types of weather conditions

Ex: Protect Lake ?? equitably between drinking water and other users

Adding goals for Source Water.....

Allows for visibility, accountability, importance, and equitability with other goals of the water utility

Allows for measurement of the source water goals

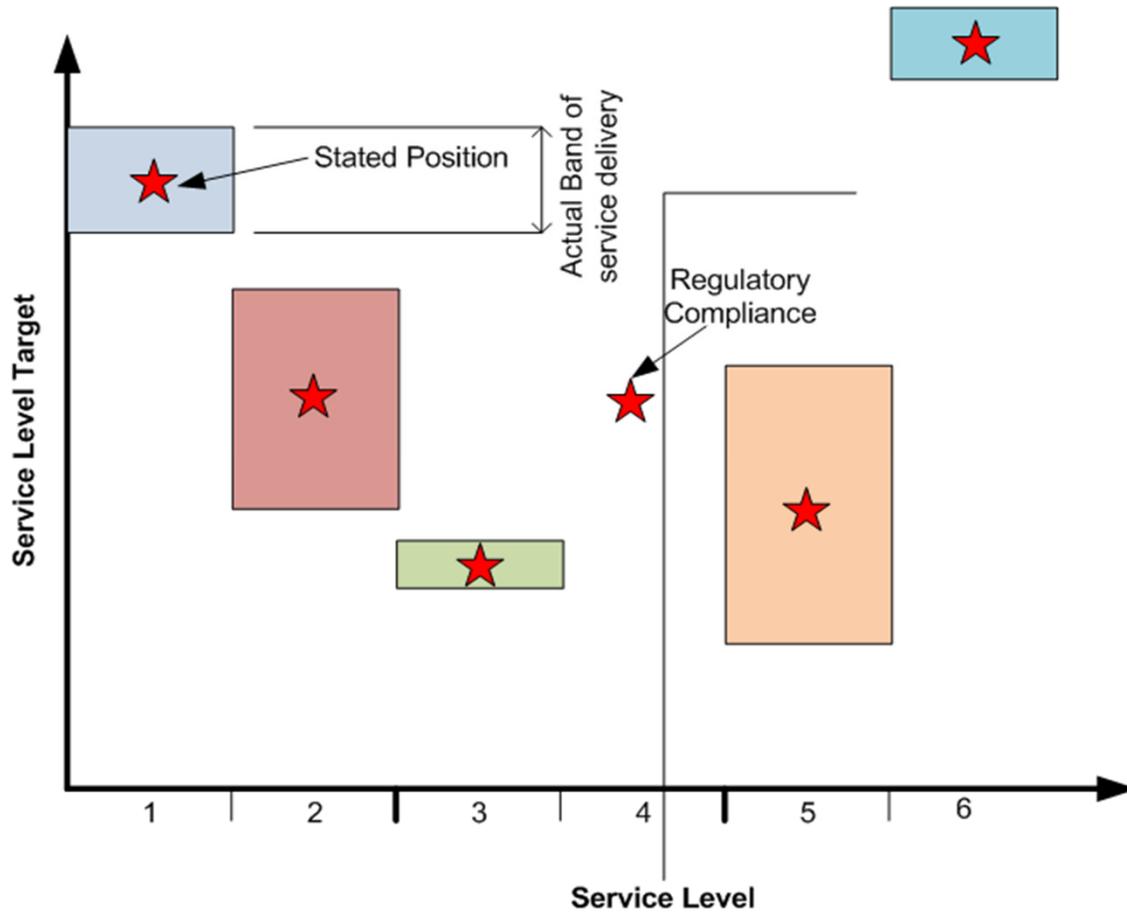
Allows for a discussion of what is needed to meet goals. Sets up Discussion regarding what to do if goals aren't met



Has anyone developed goals for their Source Water Protection Program?



If yes, can you share some?



LOS Goals have service level bands around the goal, some big some small

LEVEL OF SERVICE IS A CHANCE TO



What's really important

HAVE A CONVERSATION WITH CUSTOMERS

UNDERSTANDING OF COSTS

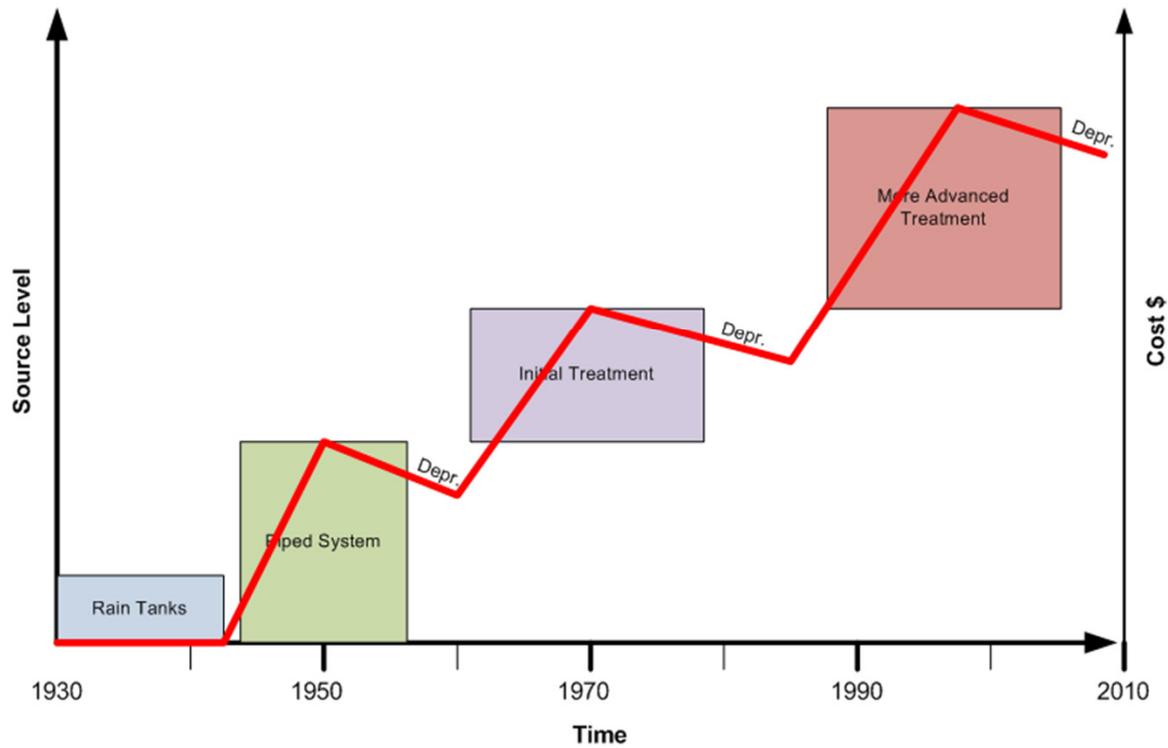


Service and cost
are related

higher levels of service = higher costs
lower levels of service = lower costs

Service Level Cost Change

Service Level – Cost Model



GOAL: [✓]
GOAL: [✓]
GOAL: [✓]
GOAL: [✓]



GOALS ARE NOT SET IN STONE



**GOALS CAN
BE CHANGED**

**GOALS CAN BE
ADDED OR
REMOVED**

**OR
ADJUSTED
OVER TIME**

Tools Available



LEVEL OF SERVICE

Guidelines, Categories and Example Goals

Guidelines

The Level of Service Goals should define what your customers and employees can expect from the water utility. When customers understand what the utility is providing for them in terms of service and they are given a say in what the utility may provide in the future, they are more willing to pay. Customers need to understand that service is related to cost and typically the higher the level of service desired, the higher the costs associated with producing that level of service. Determining what the customer wants and is willing to pay for drives the decision making for the utility.

When defining your level of service goals, remember to write SMART goals – Specific, Measurable, Attainable, Realistic and Time Bound (when appropriate). This will allow the utility to track its performance, show successes and failures and revise for improvement each year. Goals can be changed or adjusted over time. Goals can also be added or removed from the list.

It's important to involve customers and staff in the process of establishing the goals or service levels. The goals can be either internal or external. External goals are those that directly impact the customers. Internal goals are those that are related to operations and that would not be easily understood by customers. Progress towards meeting the goals should be tracked and reported to upper management and the public.

Determining your Level of Service goals should not be overwhelming. Keep it simple; develop 10 – 12 goals around the most important aspects for your utility. The information below can be used as a resource in setting your utility's goals.

Categories

No matter where the water utility is located, customers desire roughly the same types of things from their utility – water that is safe and reliable, delivered at an adequate pressure, and that their concerns are addressed. Thankfully, this list is relatively small, allowing the utility to develop a targeted list of goals that address the major customer requirements. Level of Service Goals will typically fall into one of the following categories: Public Health and Safety, Customer Service, System Maintenance, Response Time, Water Loss

WORKSHOP

Current State of the Assets

CURRENT STATE OF THE ASSETS



Source Water Protection:

Vision

Source Water Characterization

Program Goals

Action Plan

Implementation

Evaluation and Revision

Current State of the Assets



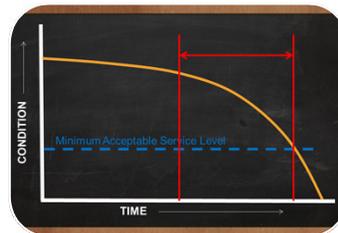
What do you own?



Where is it located?



What condition are they in?



What is the remaining useful life?



What is the replacement value?

Start with an Asset Inventory

Service Lateral Inventory - Unnamed Filter Set

Service Rec.# 731 Structure 731 Service Status 120 Active BSSRAP TV Done

Location | General 1 | General 2 | Owner | Permits/Construction | Inspections | LACP | Overflows | WC/PM/Req | Instruct | Custom | Comments

Structure No.	Address / General Location	Loc.
US C1-044	6616 BLACKSTONE DR SW corner of Cul-Du-Sac in the street	Depth: 4.20
DS C1-043	6619 BLACKSTONE 3ft from back of curb, 56ft from CL of drive.	Depth: 4.80

Pipe Data

Diag/Height (in)	8	Length (ft)	170.0
Material	1 VCP	Benefit District	0
Liner	0	Trap Area	0

Service Lateral Location

Property ID Tag	Address Count	1	Apt/Suite	
Address	6612 BLACKSTONE DR	Lateral No.	1	
Gen Location	S OF THE 3RD MH S OF OXFORD ST			
Facility	1 DGSD	Flow Basin	C1-00C-LS	Lot Number
Subdivision				

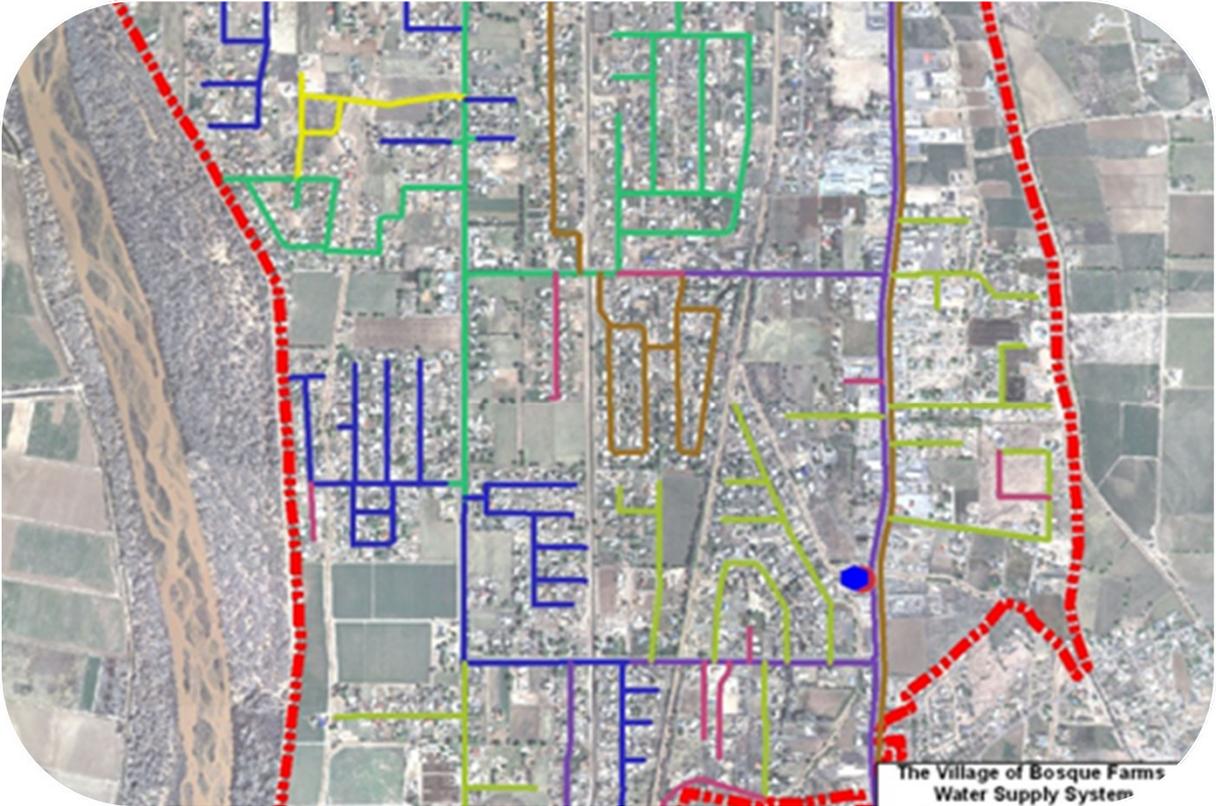
No.	Address	Apartment No	Gen Location /	Subdivision Text	Property ID Tag
1	6612 BLACK...		S OF THE 2ND MH S OF OXFORD ST		

Record 1 of 1 View Mode Ready...

What assets do you own?



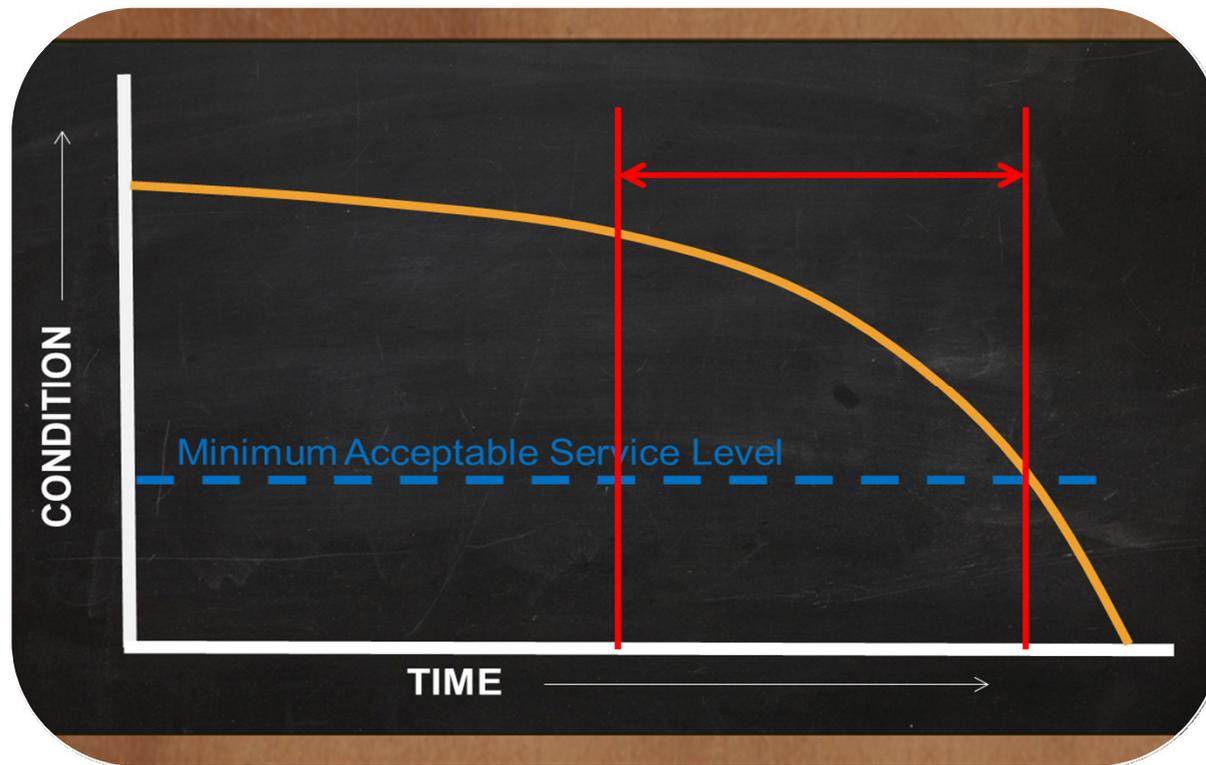
Where are the assets?



What is the condition of each asset?



What is the useful life remaining? (i.e., how much longer will each asset last?)



What is the replacement cost?

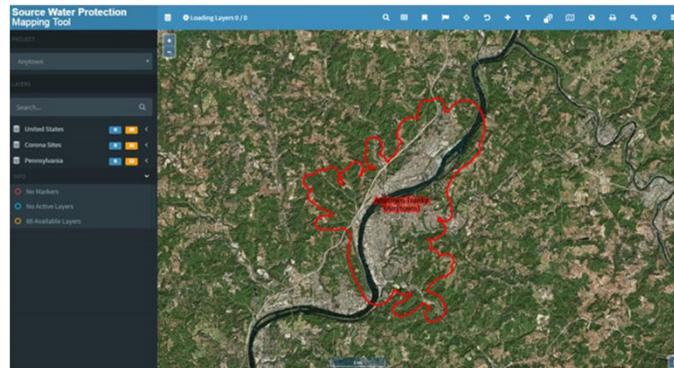


Source Water Protection Assets: Man-Made (Gray Assets)

What assets
could these be?



Inventory the Natural Resources that are important for source water protection



Inventory the Green Assets that are important for source water protection



Inventory Assets That are Part of Contamination Control

What assets could these be?



Considerations

How to define the green and natural assets as assets

Combining the green and natural assets with the gray assets

Understanding which green and natural assets are important for source water protection

Culture change: Assets don't have to be man-made or gray (concrete and steel)

Tools Available

Reference Guide for Asset Management Inventory and Risk Analysis

Inventory	
Necessary Data	Optional Data
<ul style="list-style-type: none">• Asset size - diameter and/or flow rate• Asset location• Installation date• Condition - Visible inspection, then update as needed with Maintenance history, age• Useful life (varies with type, if unknown an estimate is 50 years)	<ul style="list-style-type: none">• Model number• Supplier name & phone• Under warranty• Warranty expiration date• Manufacturer• Manufacturer's recommended O&M• Maintenance records: last date hydrant was flushed or exercised• Operational• Color (if useful)• Were design specifications followed?• Asset use

Provides you with information on what you may want to include in your inventory and where you can look for such data

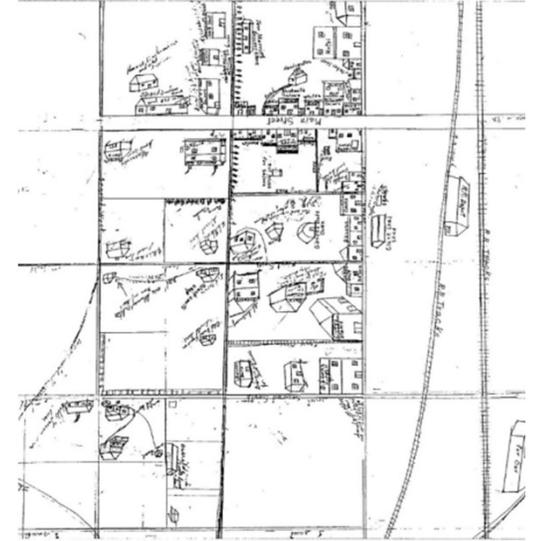
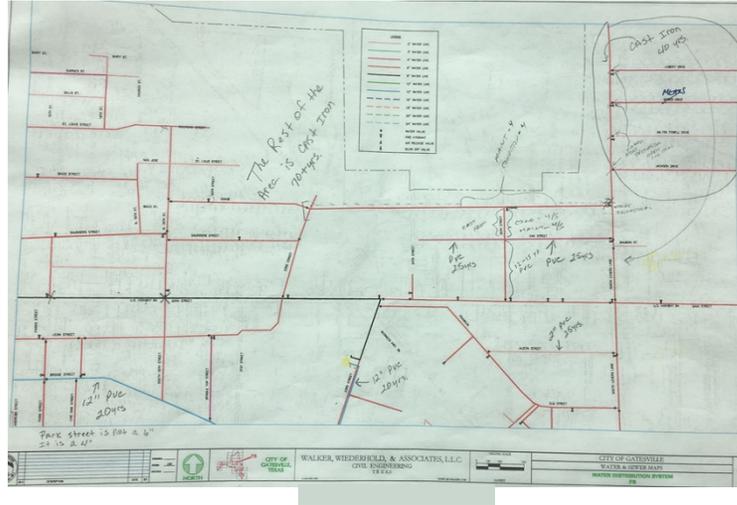
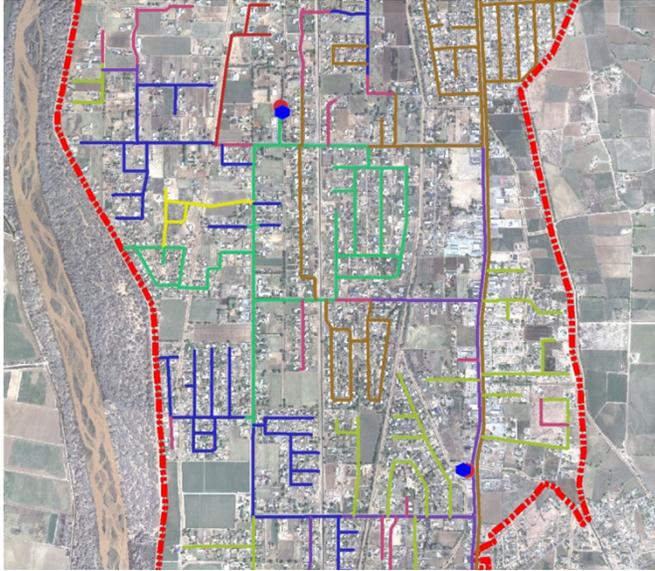
<http://southwestefc.unm.edu/asset-management/>

Tools Available

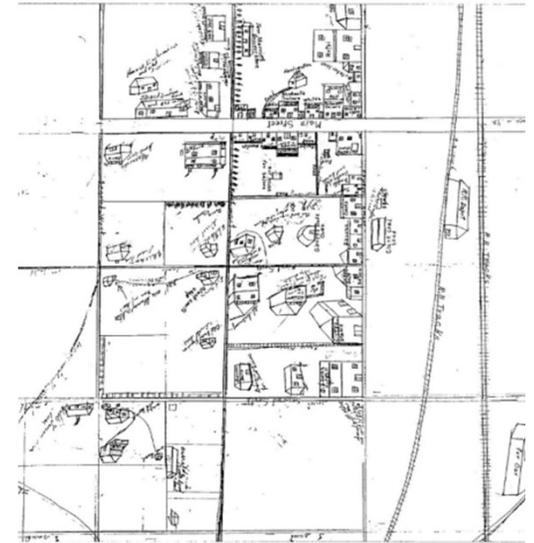
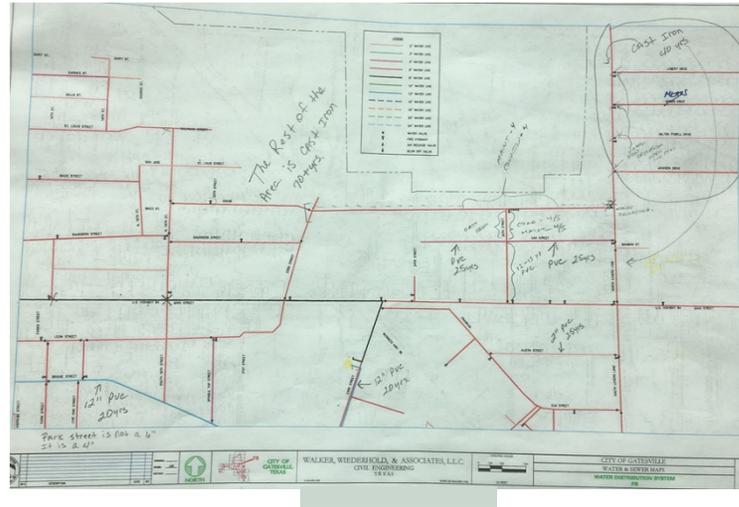
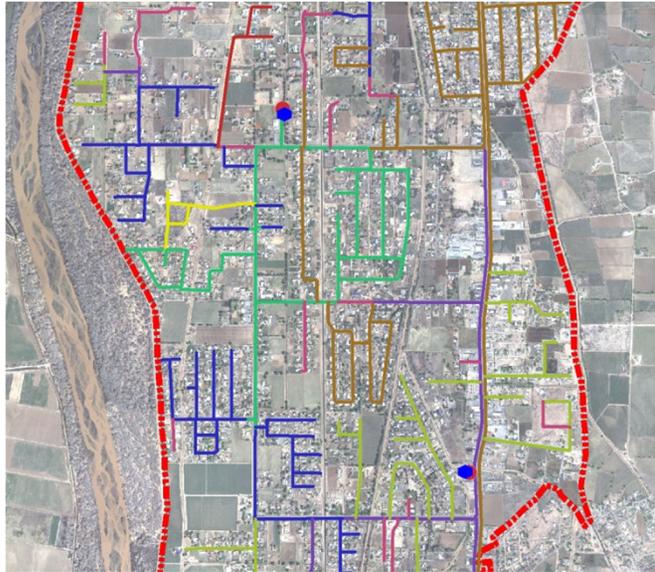
Inventory Spreadsheet

	A	B	C	D	E	F	G	H	I	J	K	L
1	System Name:											
2	Current Year	2018										
3												
4	ID Number	Asset Class or Category	Sub Asset Class or Sub Category	Asset Name	Type	Size	Length (if Pipe)	Operational Status (A = Active, I = Inactive, N = Non-Operational, S= standby/spare)	Manufacturer	Model Number	Serial Number	Supplier Name
5												
6												
7												
8												
9												
10												
11												
12												
13												

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



ALL TYPES OF MAPS CAN BE USEFUL.



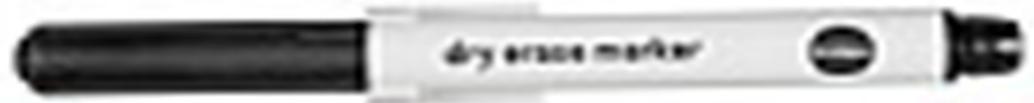
MAPS CAN ALSO BE VERY USEFUL IN SOURCE WATER PROTECTION TO IDENTIFY AREAS NEEDING PROTECTION, ASSETS INCLUDED IN PROTECTION, LAND THAT IS OWNED AND COULD BE OWNED.

If You Don't Have a Map, Which Assets Would be Most Helpful to Put on a Map?

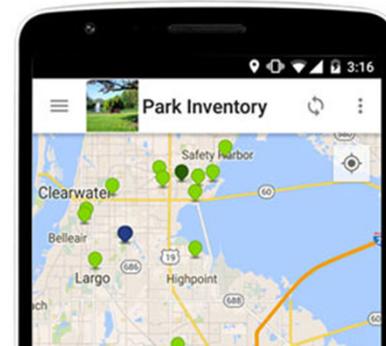
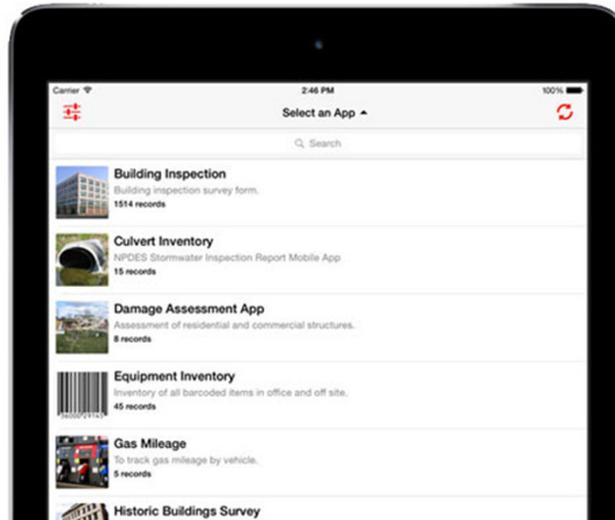


Start with things that will help you the most.

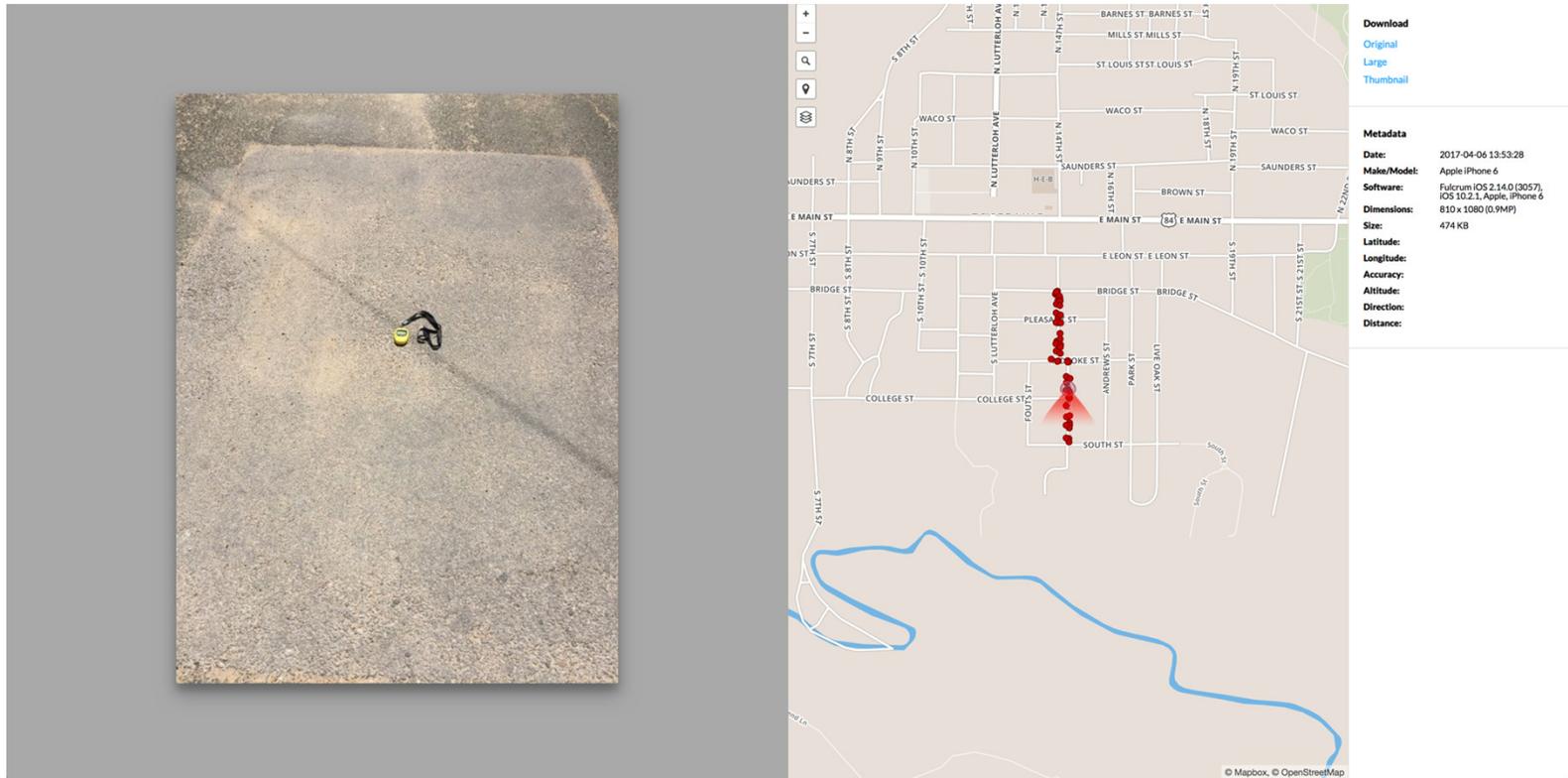
You most likely have
a lot more data to
start with than you
think you do to create
a map



Equipment & Software: Lots of Choices to Help



Collecting Field Data: In This Case 20 Years of pavement cuts...



MAPPING IS ABOUT PROCESS



I HAVE INFORMATION

I know something, I have information in my possession (in my head, my notebook, my truck, etc.)



DATA IS DIGITIZED & SHARED

My data and data from other sources is digitized and combined.



WE KNOW MORE

The collective data and knowledge is now available to all.



I DOCUMENT IT

My information gets written down, or otherwise formally documented for use by others

DATA IS COMBINED, ANALYZED & VISUALIZED

Use appropriate tools (pushpins, GIS, etc.) to analyze and visualize the combined data.

The whole is more valuable than the individual parts.

We've harnessed the collective knowledge...

... to make better, data-driven, decisions.



Ties Between AM & Source Water



CRITICALITY

Source Water Protection:

Vision

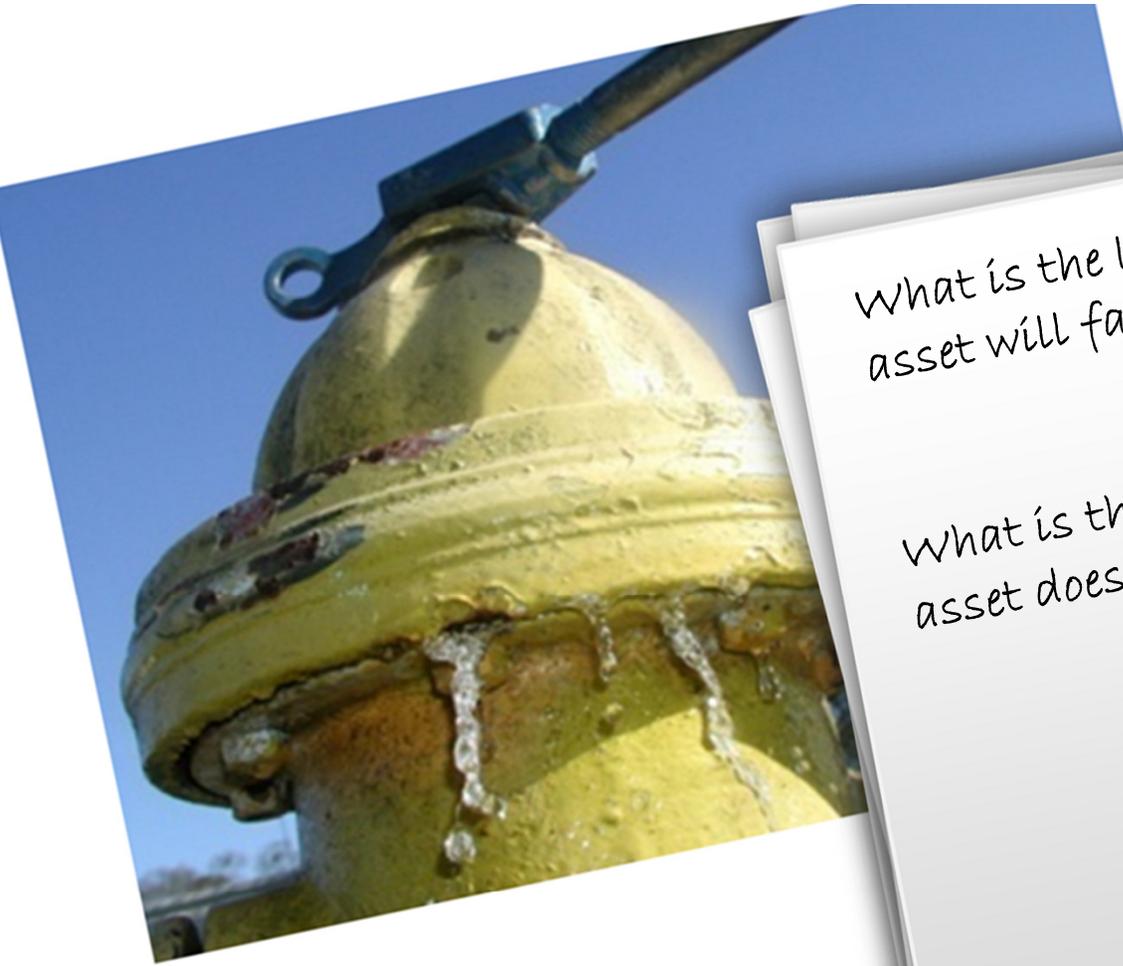
Source Water Characterization

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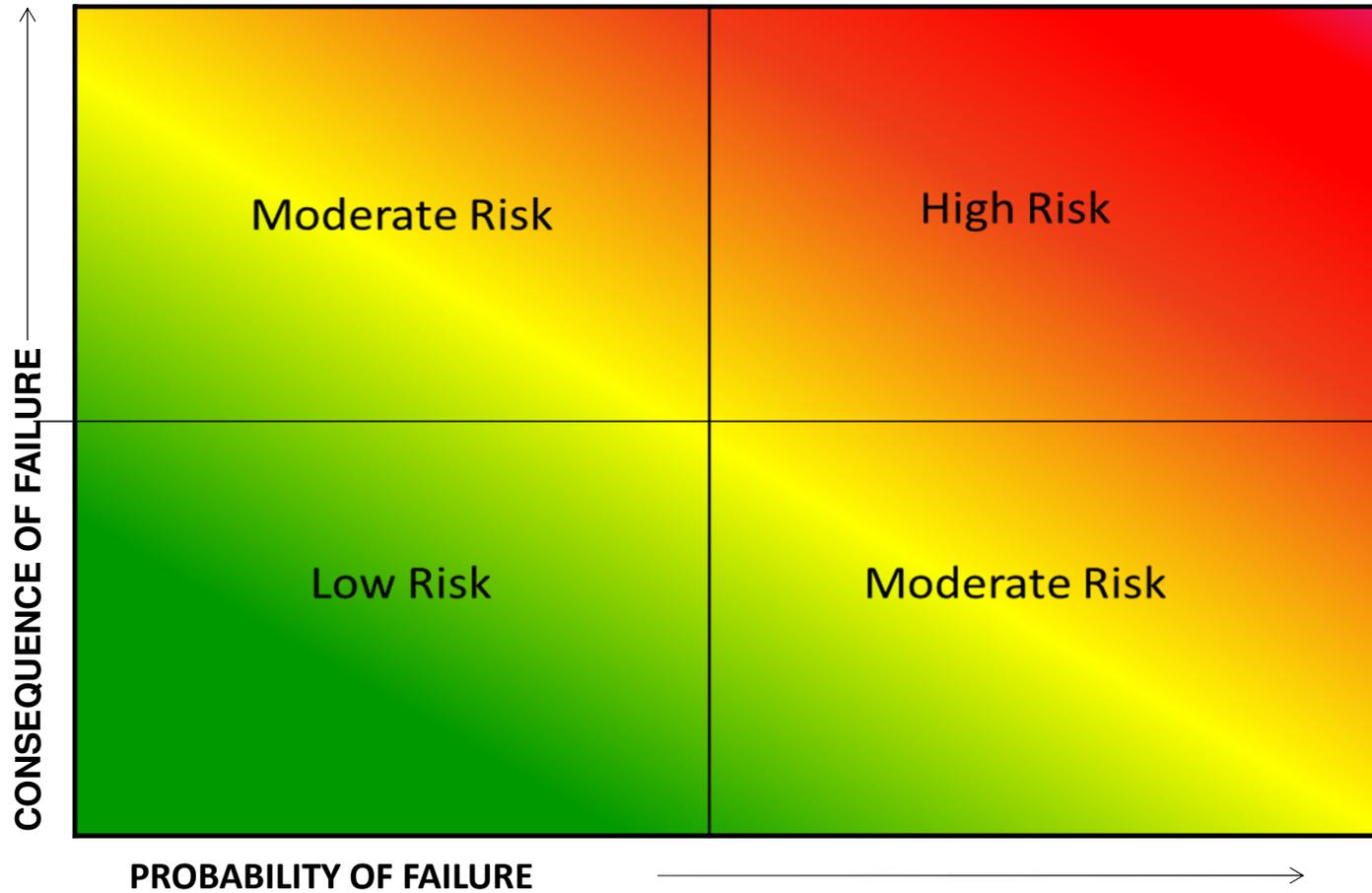


What is the likelihood that an asset will fail?

What is the consequence if the asset does fail?



ASSET RISK



Failure Modes



ASSESSING CONSEQUENCES?



CONSIDER THE TRIPLE BOTTOM LINE

Rank POF from 1 to 5

- | | |
|---|--|
| 1 | • EXTREMELY LOW PROBABILITY OF FAILURE |
| 2 | • REASONABLY LOW PROBABILITY OF FAILURE |
| 3 | • AVERAGE PROBABILITY THAT ASSET WILL FAIL |
| 4 | • HIGH LIKELIHOOD THAT THE ASSET WILL FAIL |
| 5 | • EXTREMELY HIGH LIKELIHOOD THAT THE ASSET WILL FAIL |

Rank COF from 1 to 5

1

- EXTREMELY LOW CONSEQUENCES IF ASSET FAILS

2

- REASONABLY LOW CONSEQUENCES IF ASSET FAILS

3

- AVERAGE CONSEQUENCES IF ASSET FAILS

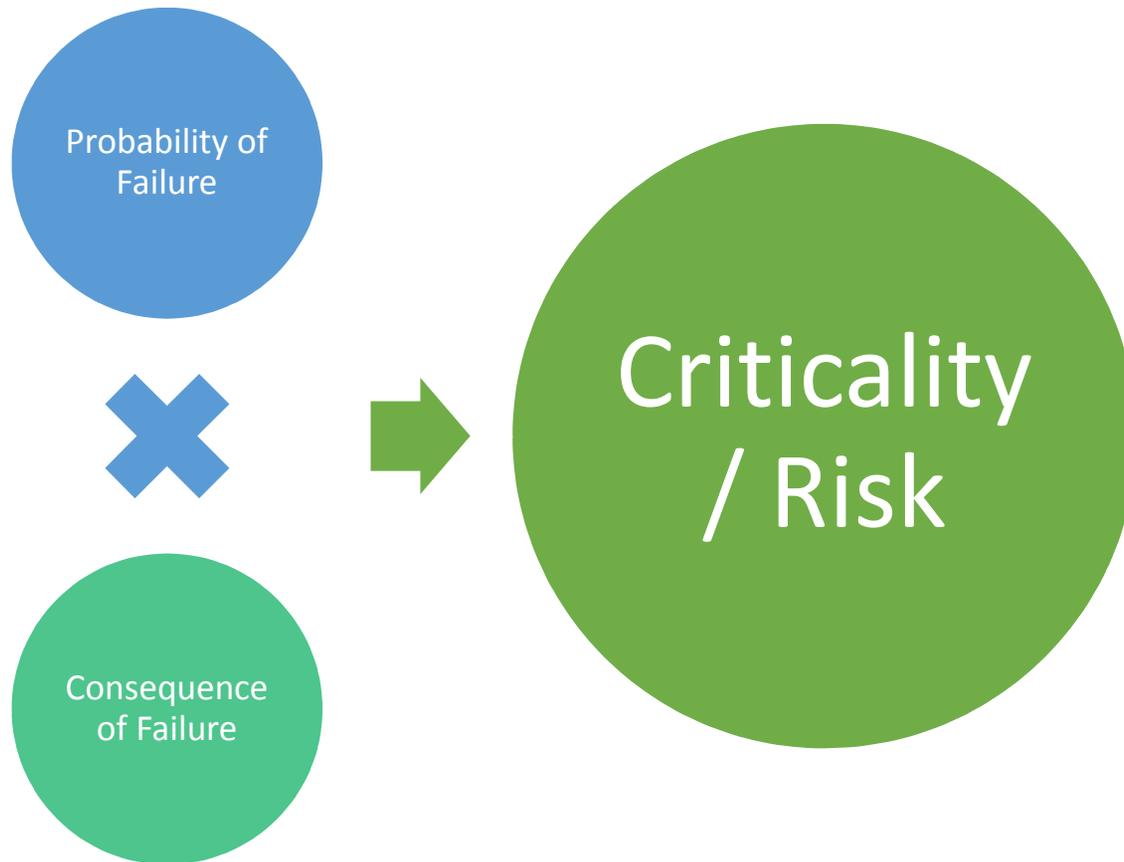
4

- HIGH CONSEQUENCES IF THE ASSET FAILS

5

- EXTREMELY HIGH CONSEQUENCES IF ASSET FAILS

Calculating Criticality



CRITICALITY CHANGES

- ✓ **CRITICALITY IS NOT STATIC**
- ✓ **EACH DAY CRITICALITY CHANGES SLIGHTLY**
- ✓ **NEED TO REASSESS CRITICALITY AT LEAST EVERY YEAR IF NOT SOONER**
- ✓ **REASSESS WHEN MAJOR CHANGES ARE MADE (UPGRADES, REPLACEMENTS, MAJOR CONSTRUCTION, REHABILITATION, REDUNDANCY ADDED)**

Tools Available

Criticality of Assets

Allows you to calculate risk for assets

Asset: _____

Date: _____

Consequence (Cost) of Failure	5	5	10	15	20	25
	4	4	8	12	16	20
	3	3	6	9	12	15
	2	2	4	6	8	10
	1	1	2	3	4	5
Multiplied		1	2	3	4	5
	Probability of Failure					
1	2	3	4	5		
Very Low	Low	Moderate	High	Very High		

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

Tools Available

Reference Guide for Asset Management Inventory and Risk Analysis

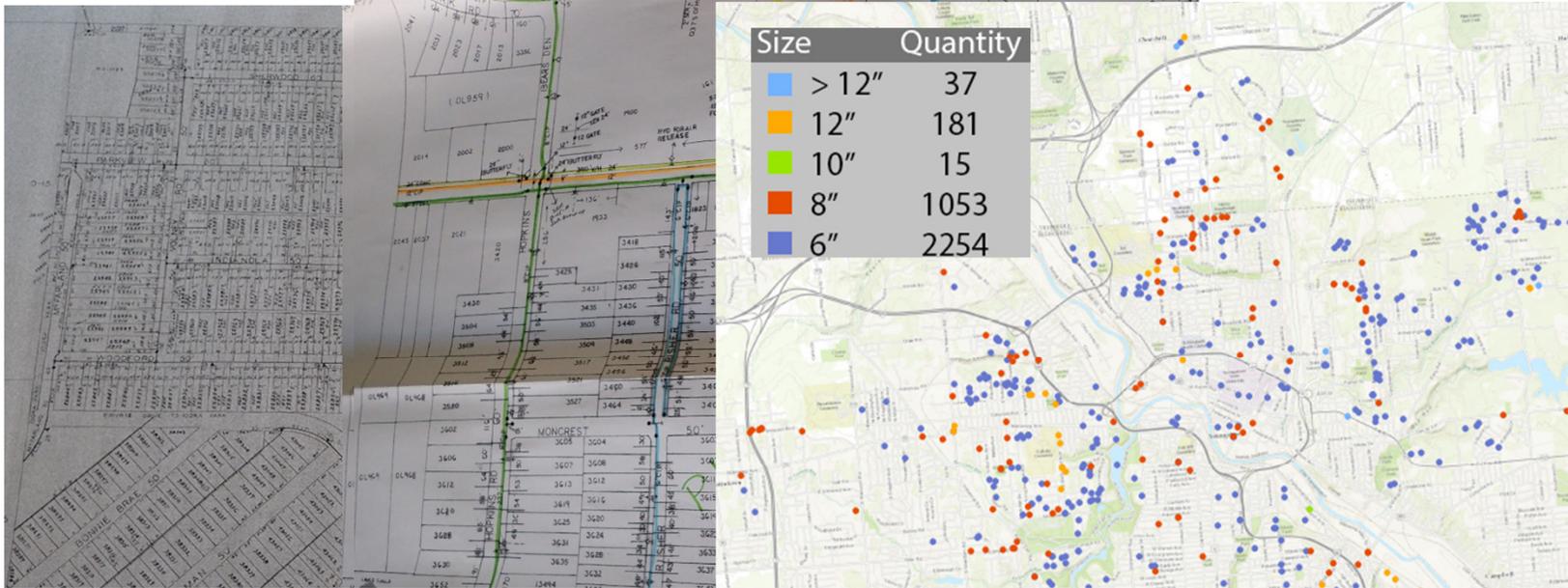
Risk - Hydrants (Fire, Flush, Flow Test)	
Probability of Failure <ul style="list-style-type: none">• Age• Condition - rusting, corrosion, leaking seal?• Frequency of Use - is it opened at least annually as part of a flushing or testing program?• Routine maintenance completed?• Pipe size connected to - less than 6 inch may cavitate• Tools needed to open readily available to fire department and water department?	Consequence of Failure <ul style="list-style-type: none">• Inability to fight a fire - loss of property, loss of life• Inability to properly flush system - health concerns• Water damage to nearby structures• Level of Service Failures

Provides you with lists of characteristics to take into consideration when determining Probability and Consequence of Failure

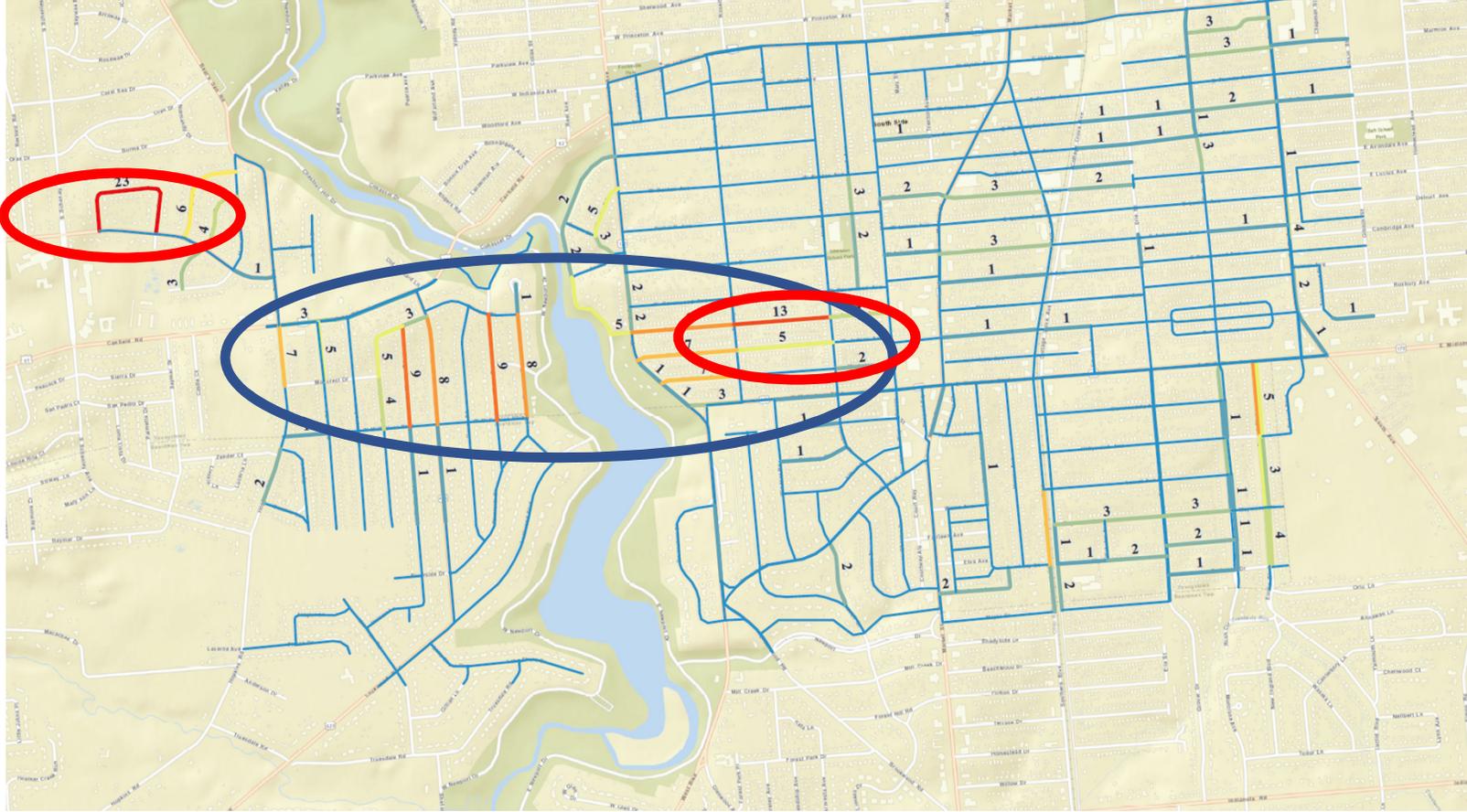
<http://southwestefc.unm.edu/asset-management/>

Using data to generate
probability of failure

An Example



ID	LOCATION	W_O_DATE	WORK_ORDI	ADDRESS	DIRECTION	TYPE_WORK	DATE_REP	COMMENTS	COUNT	ACCOUNT	W A
1	BENITA	20030204		250		30	2030318	JM Rayen Schor		1000000	CTY
2	Victoria Rd	20030905		500		30	20031016	JM		100275	AUS
3	Boardman	20030730		25 E		30	20030926	JM		100813	CTY
4	Hendricks Rd	20030502		3805		30	20030709	JM		127391	AUS
5	HALLS HEIGHTS	20030122	L-1243	39		30	20030220	RC		1000000	CTY
6	HALL HEIGHTS	20030127	L-1244	3641		30	20030127	RC Water off		1000000	CTY
7	PARKHILL	20030203	L-1245	1135		30	20030315	RC		124602	CTY
8	INDIANOLA	20030203	L-1247	862		30	20030315	RC		137470	CTY
9	CLARENCE DALE	20030203	L-1248	125		30	20030315	RC		155953	CTY
10	Bessemer	20030324	L-1250	355		30	20030324	RC Water off		118022	CTY
11	Bessemer	20030324	L-1251	353		30	20030324	Water Off		118021	CTY
12	Indianola Rd	20030728	L-1257	737		30	20030818	RC		162538	BDM
13	Hunter	20030823	L-1258	2645		30	20030823	RC Water off		149232	CTY
14	Philadelphia	20030910	L-1260	343 E		30	20031013	RC		152607	CTY
15	Vestal Rd	20030912	L-1261	3137		30	20031013	RC		118221	CTY
16	Oxford	20030916	L-1263	716		30	20031013	RC		116552	CTY
17	Garland	20030916	L-1264	115 N		30	20031013	RC		175413	CTY



Adding consequences to the
analysis

An Example





What is the likelihood that your source water assets will fail?

What is the consequence if the asset does fail?

POISONED WATER

- 7 DEAD
- HALF THE TOWN SICK

Walkerton
WE'D LOVE THE PLEASURE OF YOUR COMPANY

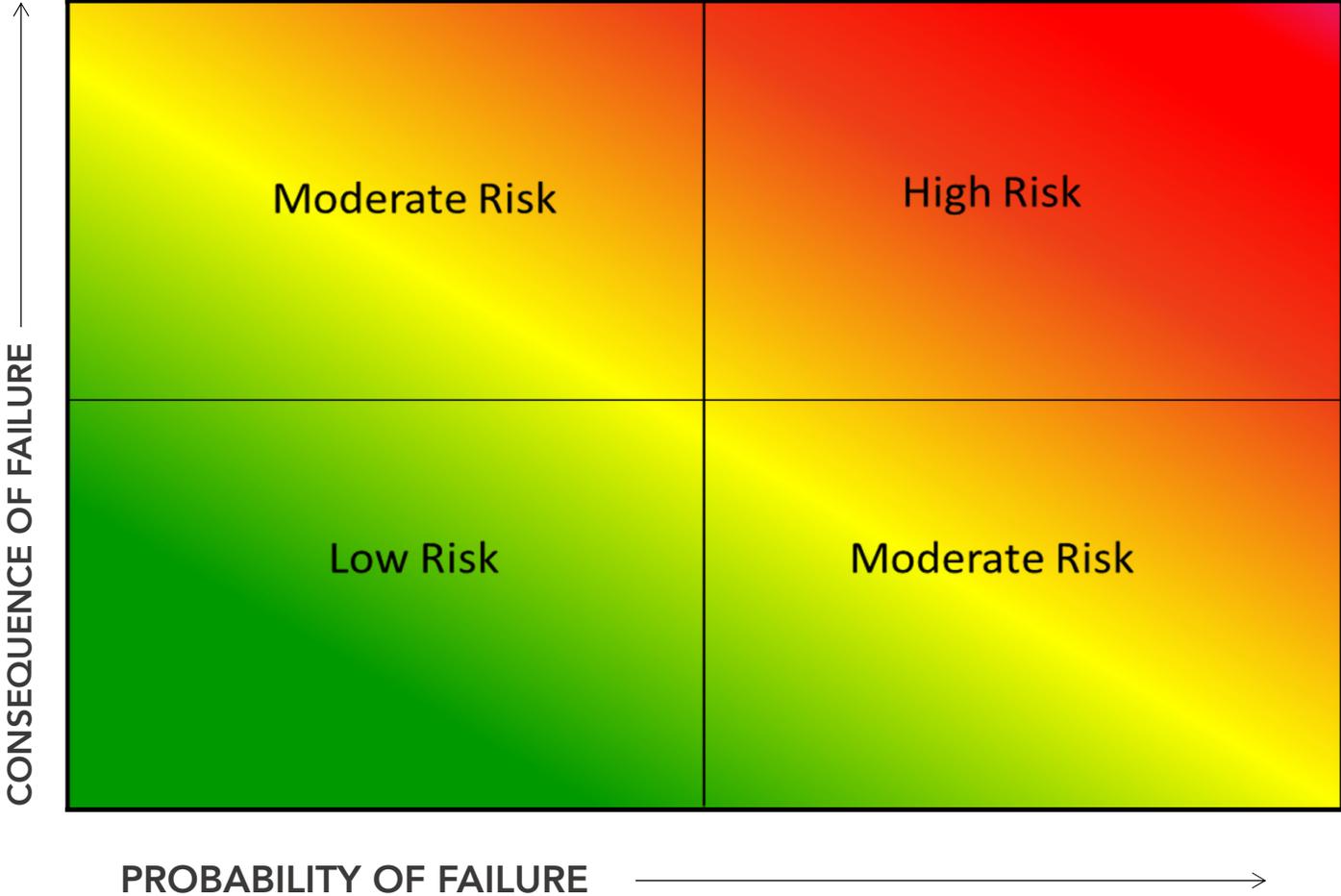
Consider the probability that the natural infrastructure will fail to deliver protection of the source water

Consider the consequences of the natural infrastructure failing

Include the criticality of the natural infrastructure within the context of the criticality of the man-made infrastructure

Can also consider source water protection as part of the consequences of man-made infrastructure failures

ASSET RISK



WORKSHOP

Ties Between AM & Source Water

Source Water Protection:

Vision

Source Water Characterization

Program Goals

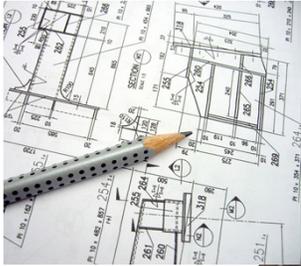
Action Plan

Implementation

Evaluation and Revision

LIFE CYCLE COSTING





DESIGN



CONSTRUCTION



OPERATION



MAINTENANCE



Repairs

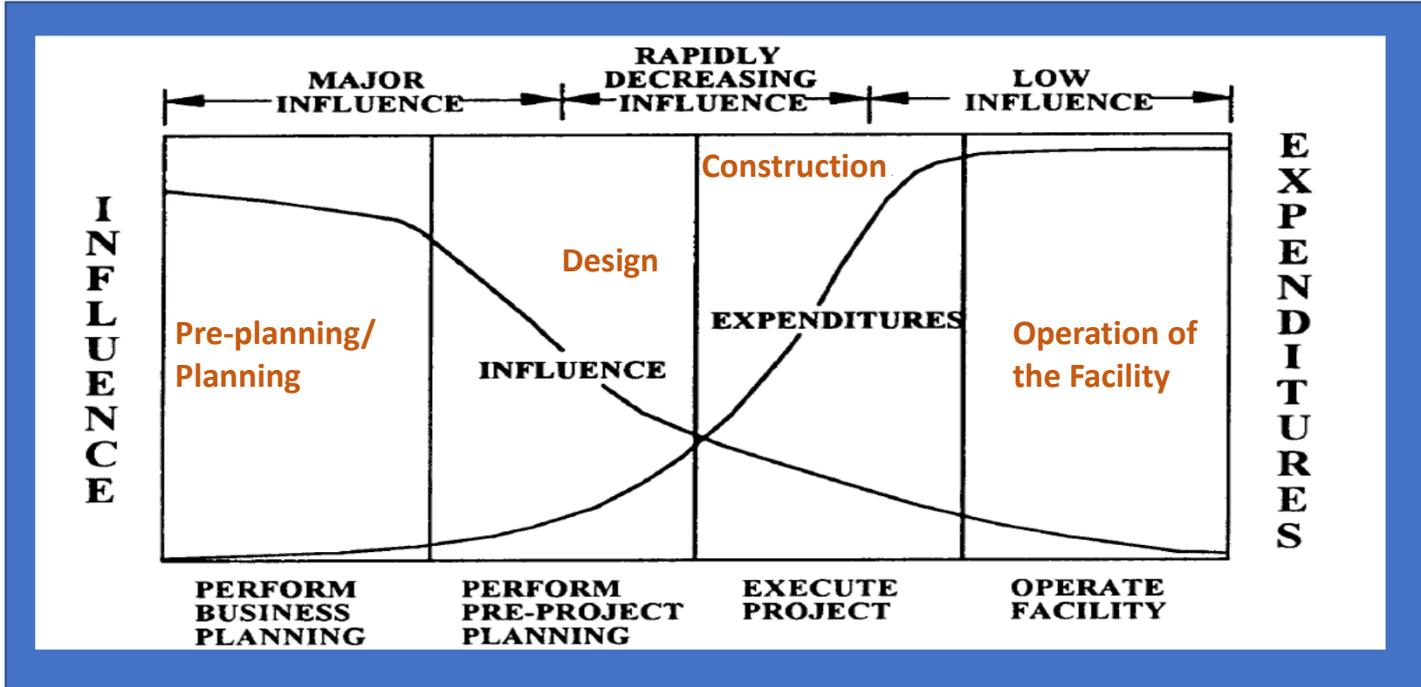


Rehab



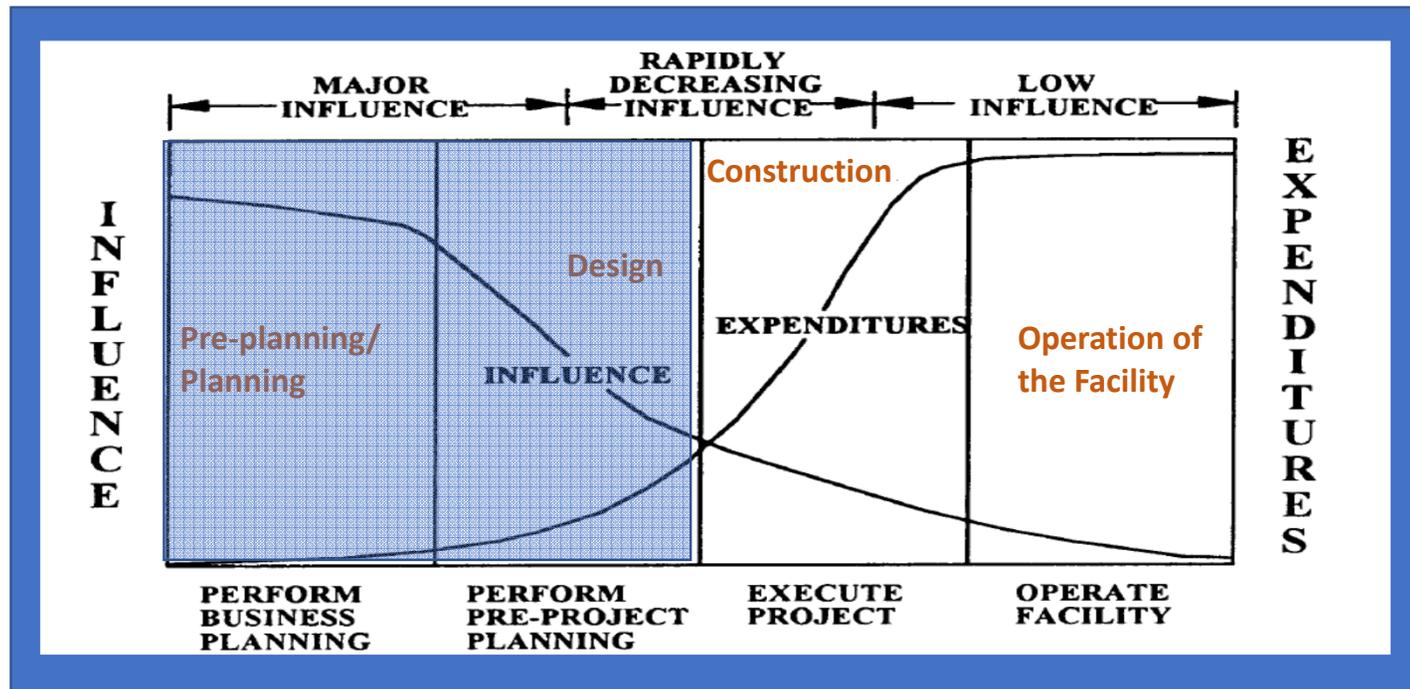
Replace

LIFE CYCLE COSTING:
NEED TO CONSIDER THE
ENTIRE LIFE



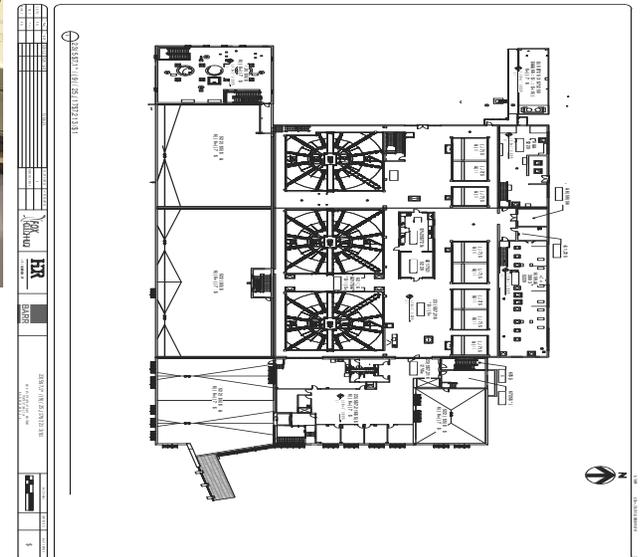
Source: Gibson and Hamilton (1994) Analysis of pre-project planning effort and success variables for capital facility projects. Construction Industry Institute Source Document 105.

Best chance for cost savings is in design phase

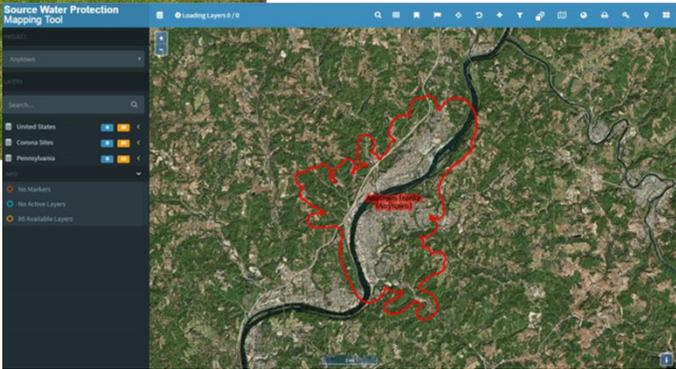
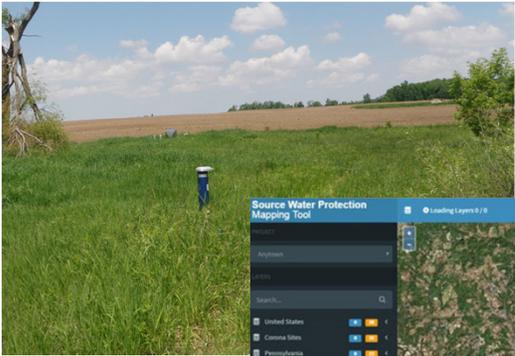


Source: Gibson and Hamilton (1994) Analysis of pre-project planning effort and success variables for capital facility projects. Construction Industry Institute Source Document 105.

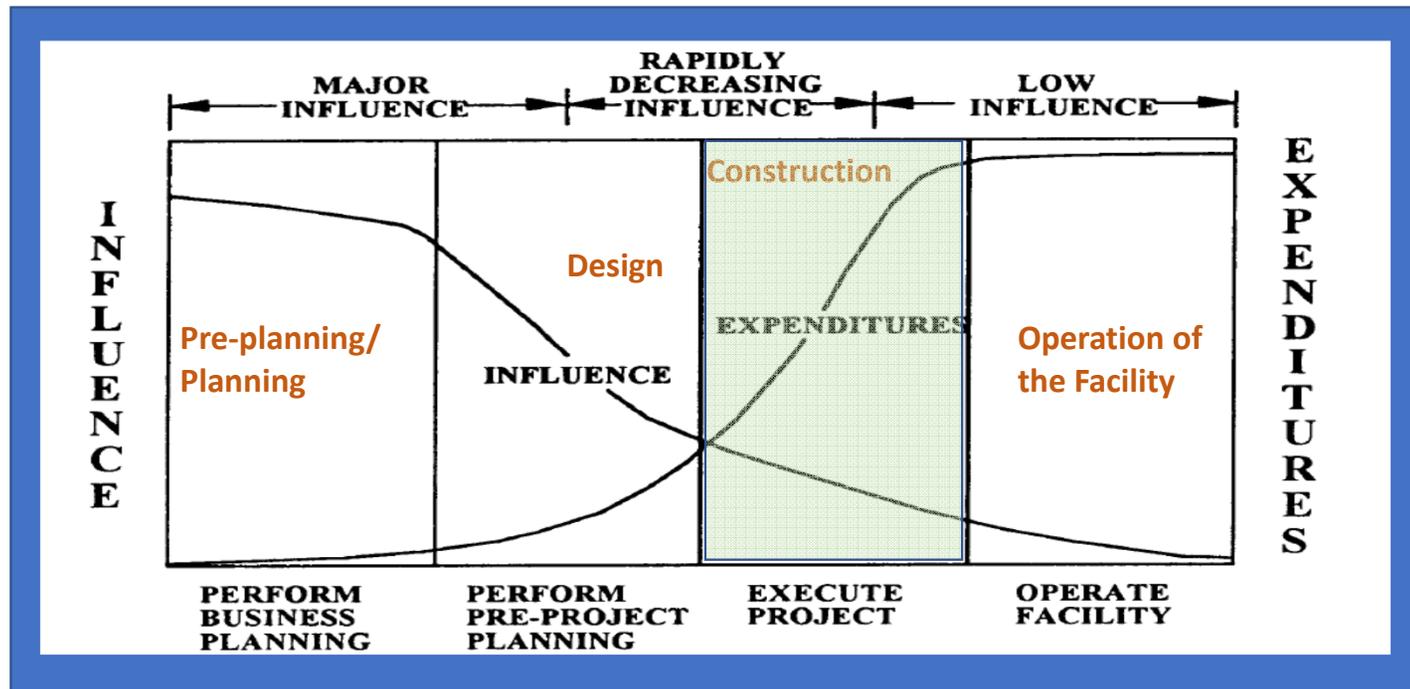
Involving Operations Personnel & Management Personnel in Pre-Design and Design



Don't forget to include source water protection in initial design



Consider construction as another opportunity to improve the situation



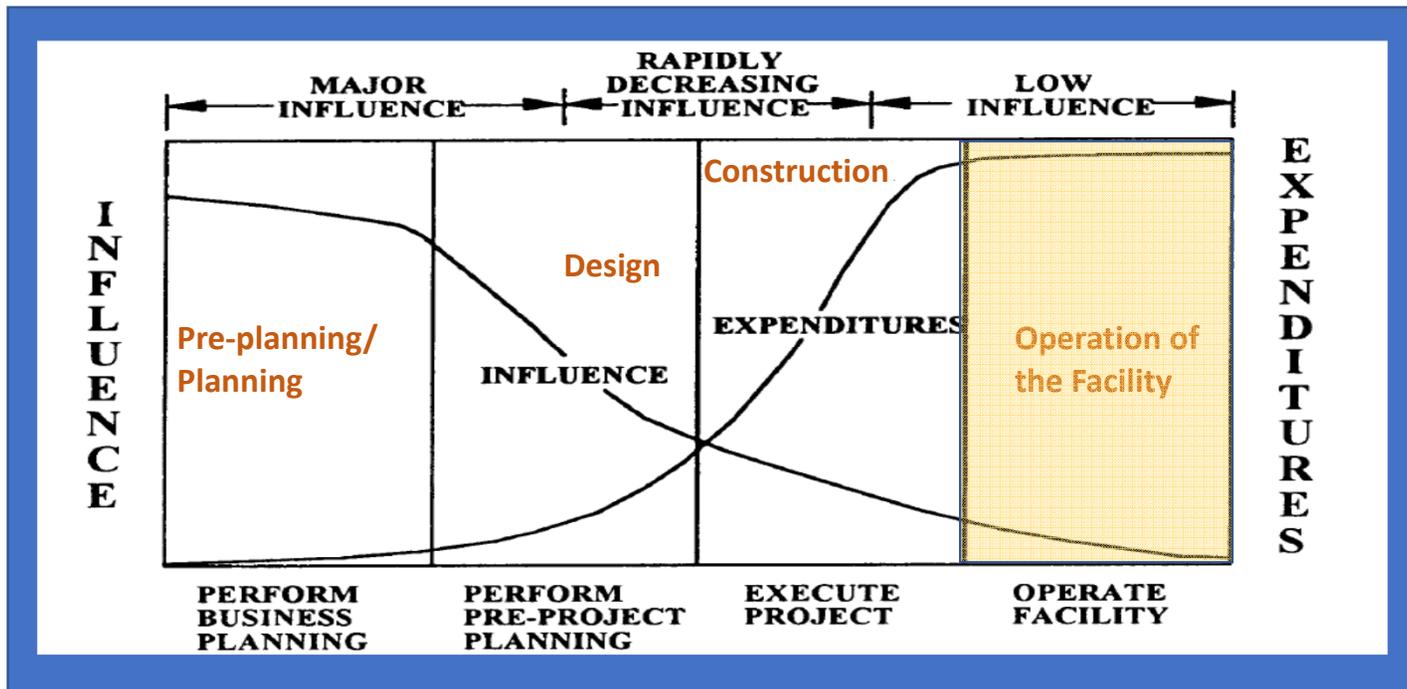
Source: Gibson and Hamilton (1994) Analysis of pre-project planning effort and success variables for capital facility projects. Construction Industry Institute Source Document 105.

Construction Phase



Does construction make a difference in how long an asset last or in how well they operate?

By the Time You Are “Given” the Assets, Most of the Costs Are Locked In



Source: Gibson and Hamilton (1994) Analysis of pre-project planning effort and success variables for capital facility projects. Construction Industry Institute Source Document 105.

Work Efficiency



Locations of Assets



Spare Parts



Proactive Operation

Energy Efficiency



Off-peak pumping, when possible

Pumps designed properly for operational situation

VFDs when appropriate

Lights, HVAC efficiency

Alternative energy



Water Efficiency

Reducing non-revenue water

Fixing leaks

Encouraging water conservation



Financial Efficiency



Manual vs. automated operation

Operation matches the needs of the customers

Running equipment in optimal operational range

Regulatory Efficiency



Operate the system to consistently meet regulatory requirements

Doing the right maintenance at the right time, the right way extends the life of the assets and reduces the risk of the facility

What maintenance
Activities Do You
Do?

When Do You Do
Them?

How Do You Do
Them?

What Do They
Cost?

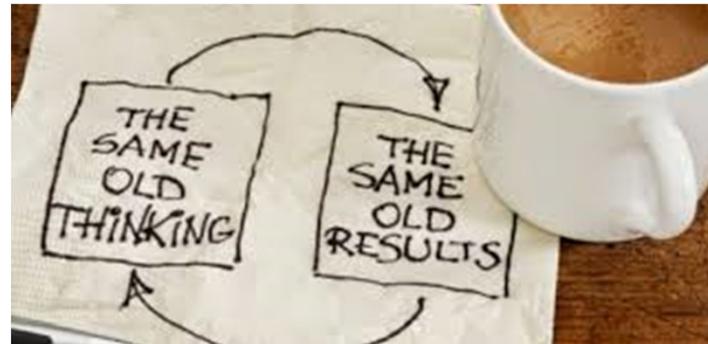
What Impact Do
They Have?

Why did you pick
this approach?

Another Concept: Don't Just Fix It, Improve It!



Use the knowledge you have to make things better next time.



O&M Examples: Large Utility in Kansas

Expensive and Too Large for the Need



½ HP Pump

\$1,500 Purchase

\$700 ~ \$900 to rebuild

Retrofit: Same Performance, Cost Savings

**1/16 HP Pump \$250 new
No rebuild**

**Each Pump Minimum of
\$2,000 savings every 2
years**



Consider how to maintain the natural assets that are part of the source water protection program; include the cost of the O&M in the budget as well as the time to complete the activities



Include “replacement” or rehabilitation of natural infrastructure in the overall CIP

Considerations

Green can be harder to maintain than gray

Green/natural infrastructure may require different skill sets than traditional operators may possess

O&M may be a great opportunity to look for ways to integrate different departments/skill sets

Data Driven Decisions



Use data to help you make better decisions and to optimize your operations and maintenance

Making Decisions About Where to Spend Your Money

What do we want to know?

Available Budget



Costs



Benefits



Outside Funding



Costs



What are the short term and long term costs of doing a particular project

Initial Capital Cost (CapEx)

Ongoing O&M Costs (O&M)

Repair and Rehab Costs Over Time

What is the overall life expectancy of the project

Benefits

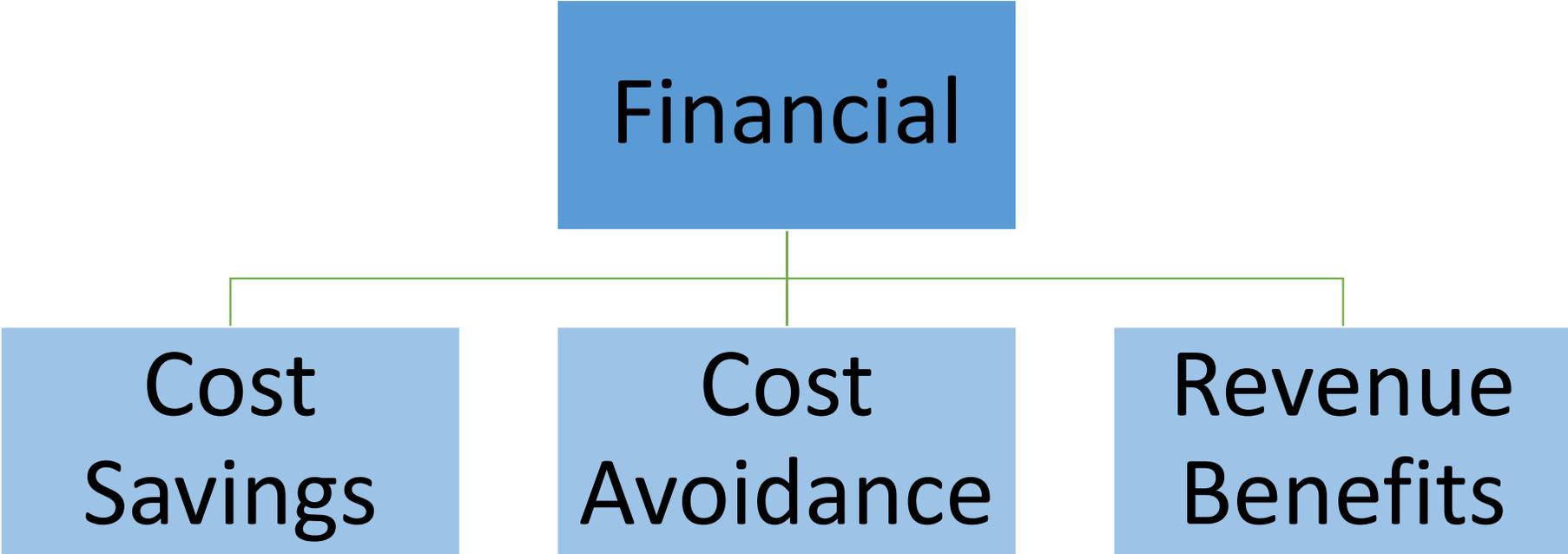


SOCIAL

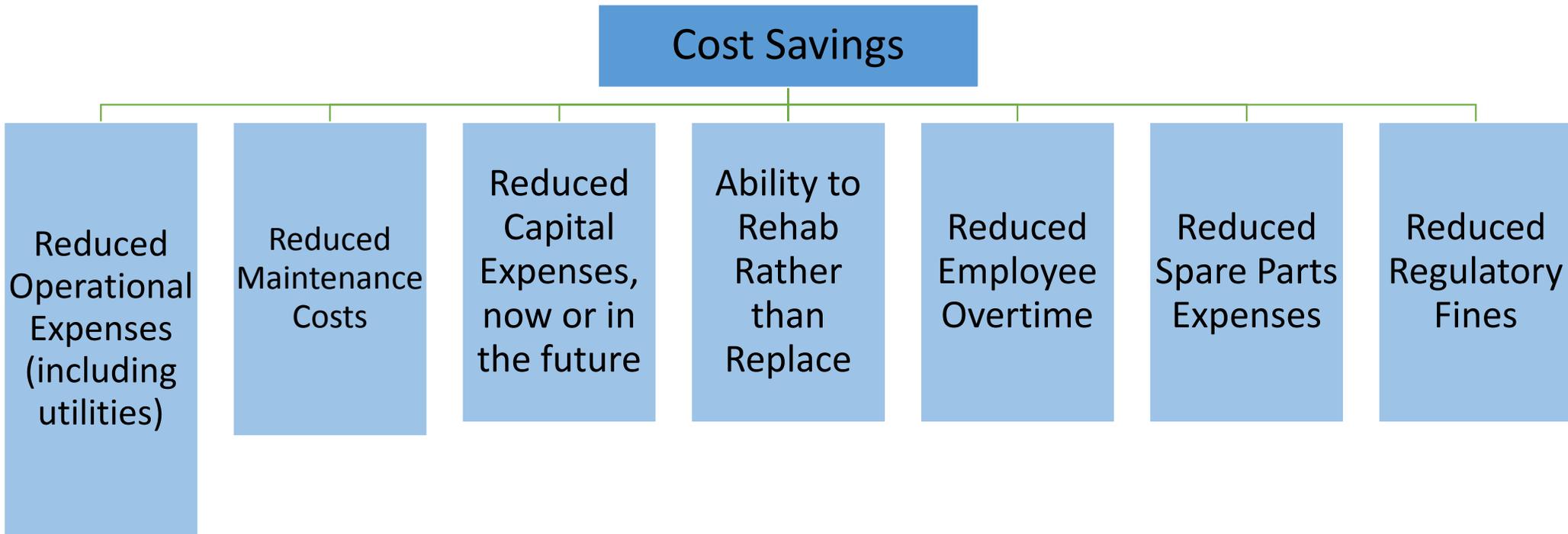


Triple Bottom Line

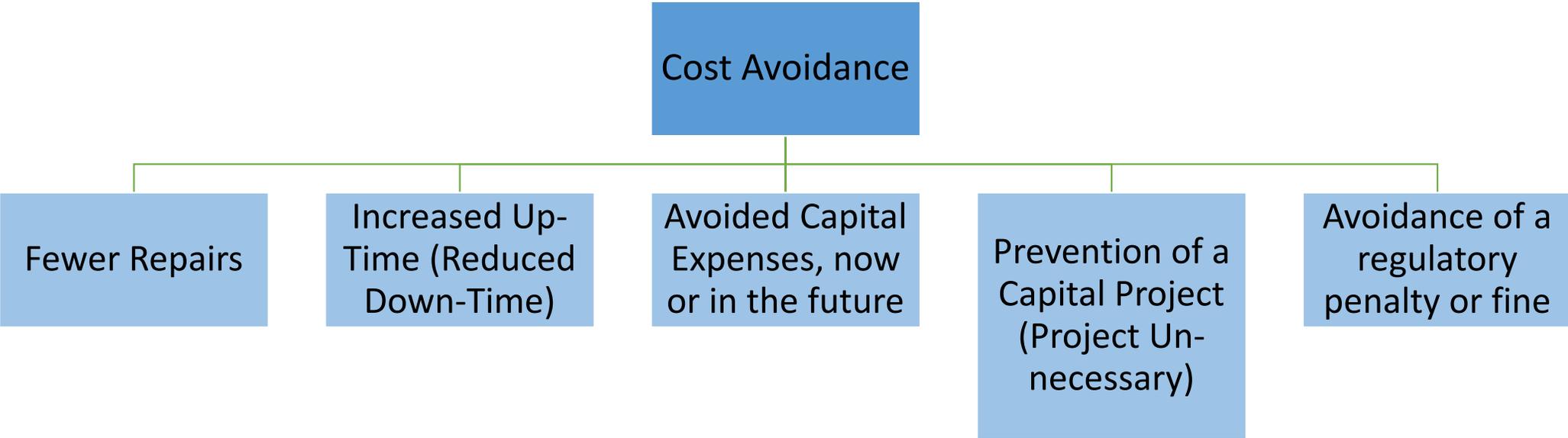
Thinking Through Potential Benefits



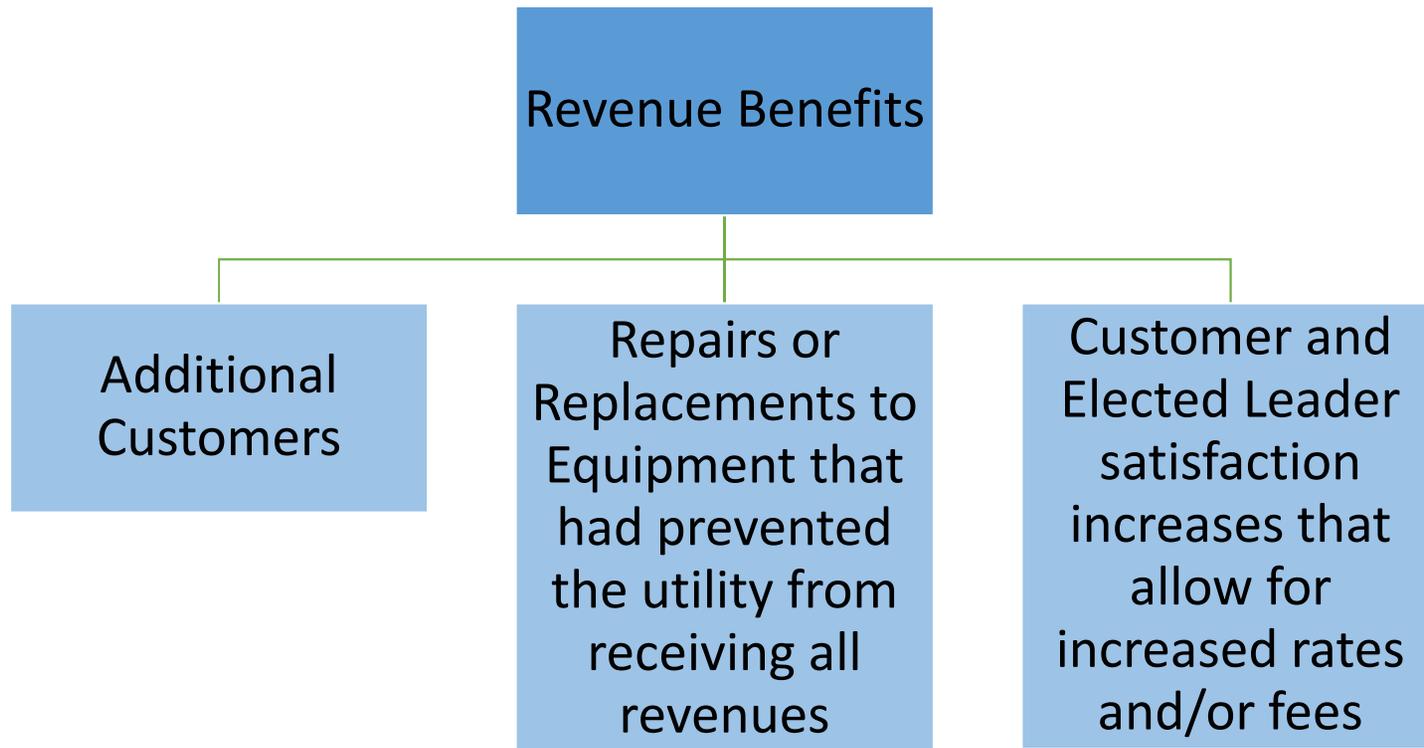
Thinking Through Potential Benefits



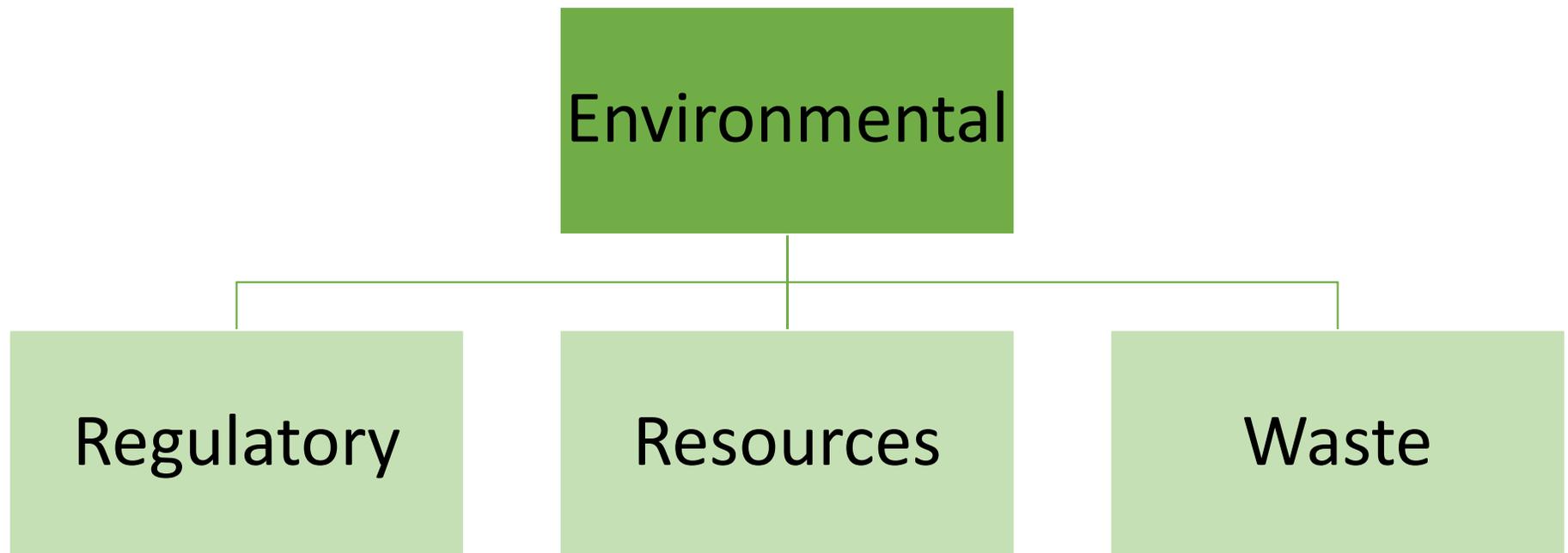
Thinking Through Potential Benefits



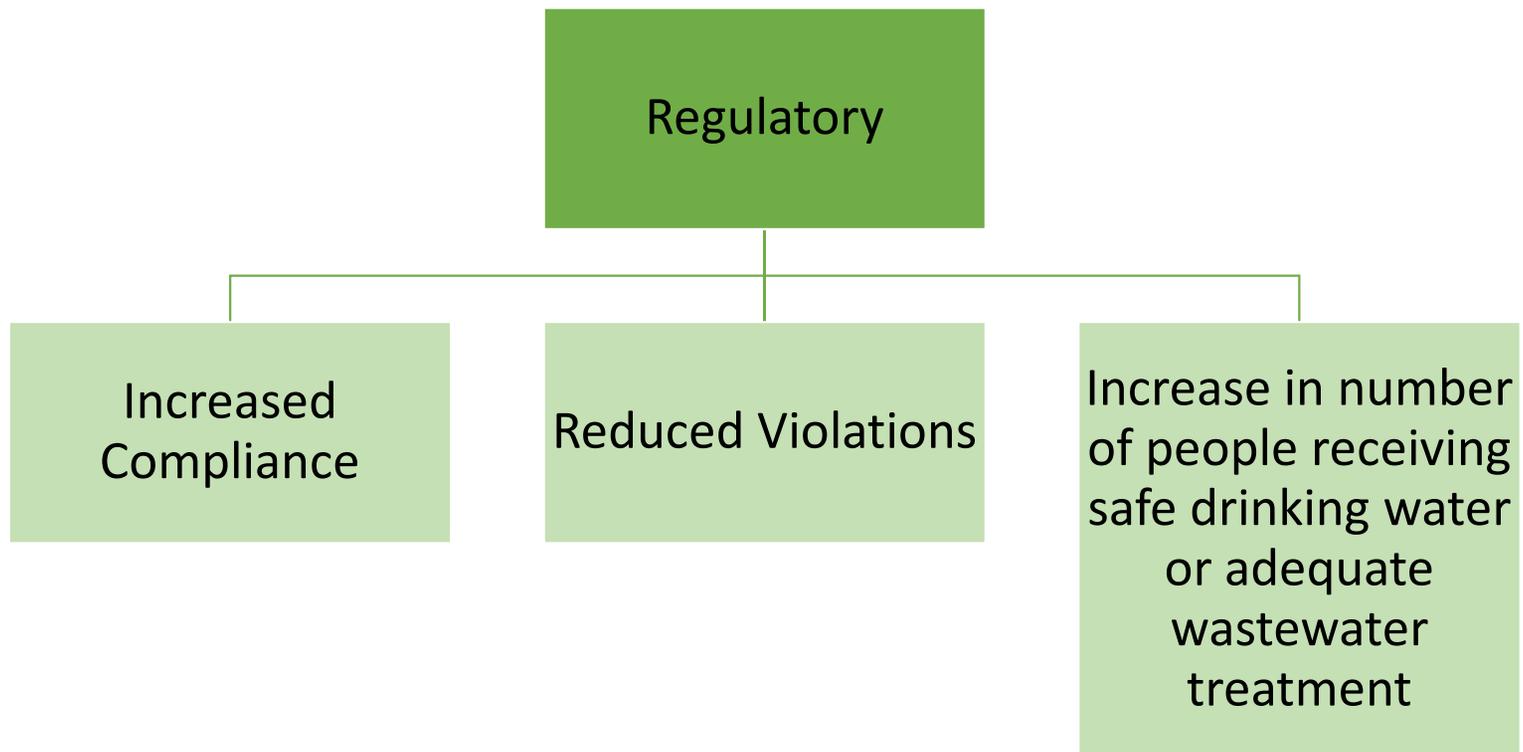
Thinking Through Potential Benefits



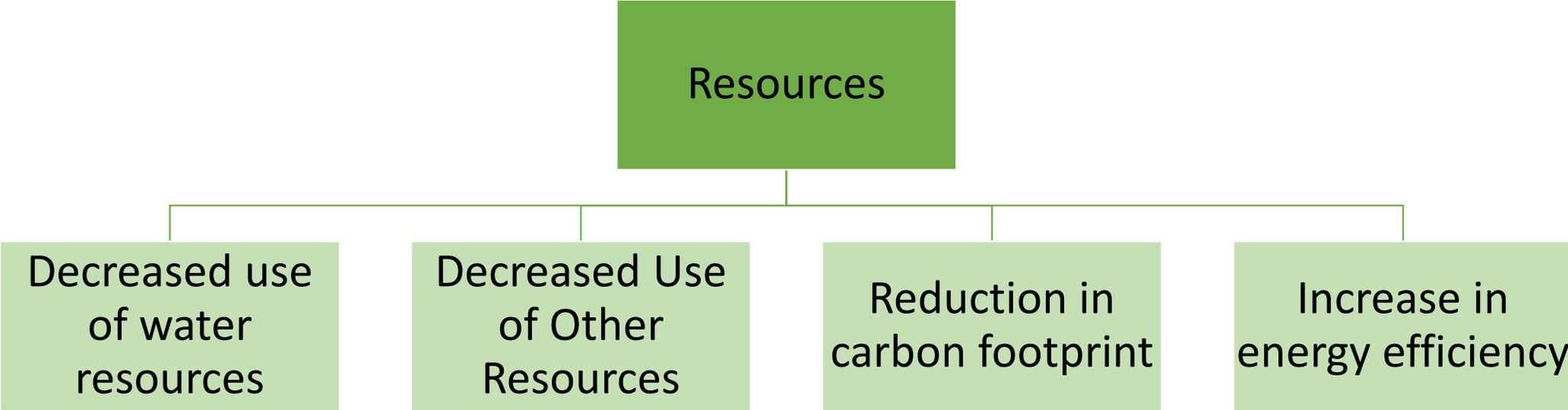
Thinking Through Potential Benefits



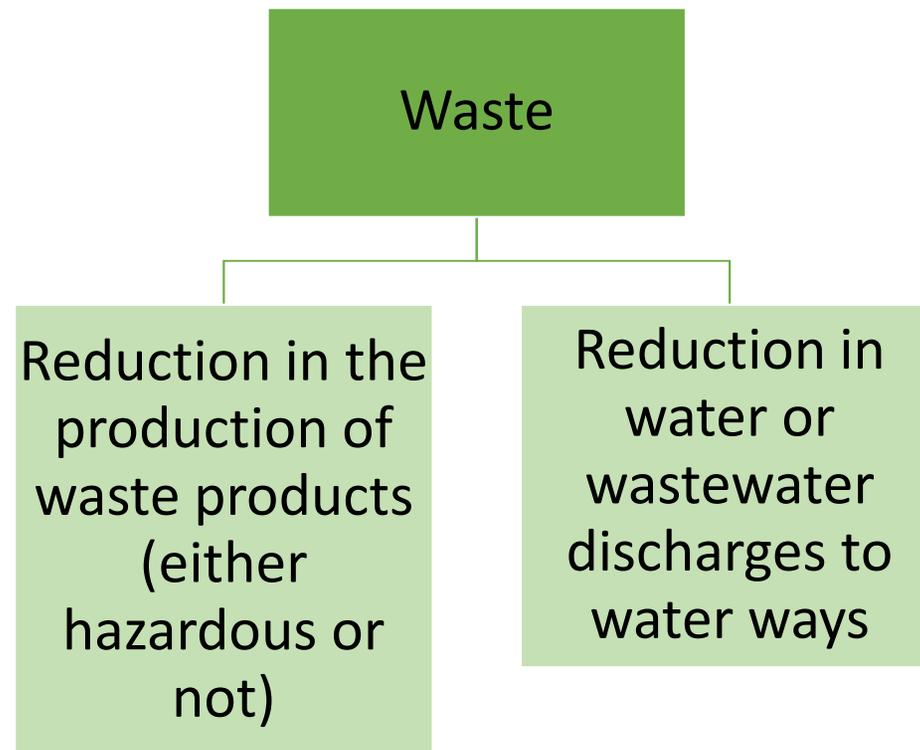
Thinking Through Potential Benefits



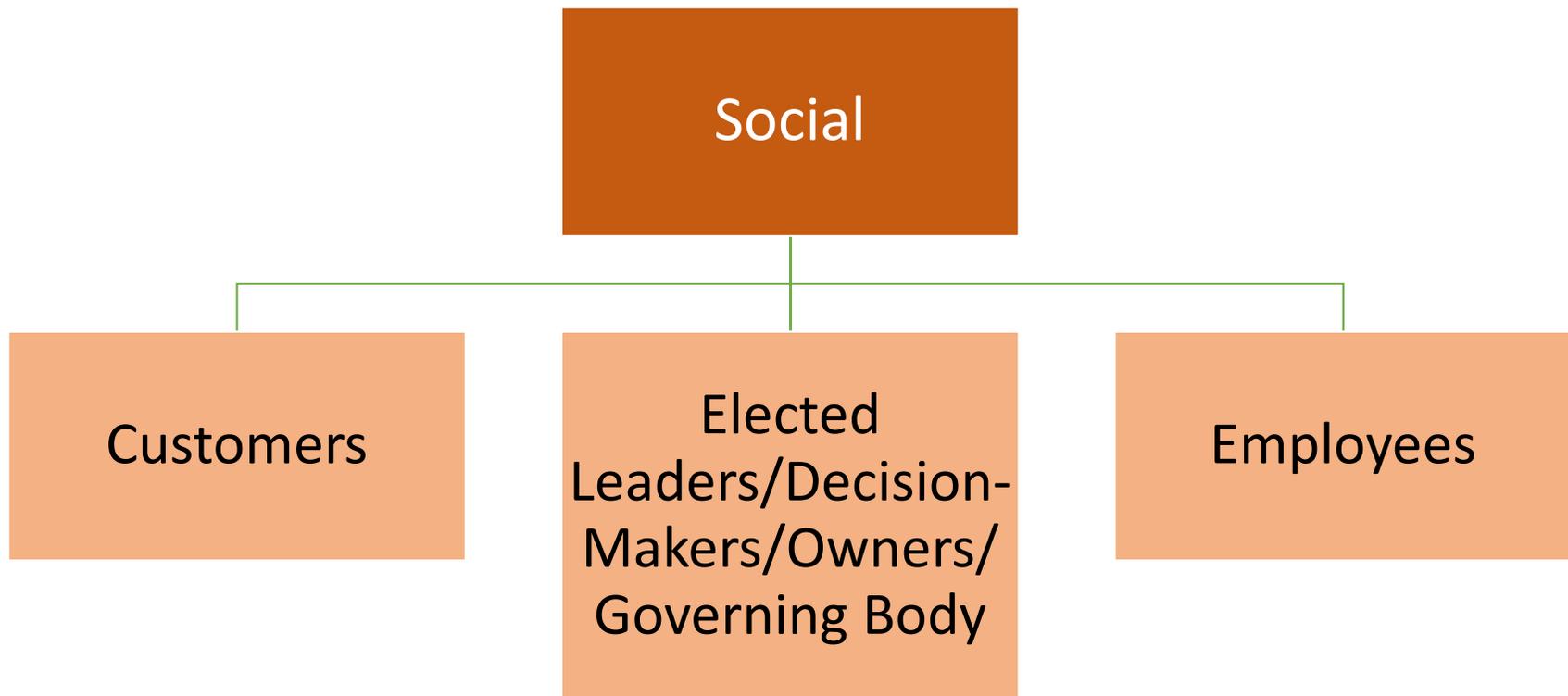
Thinking Through Potential Benefits



Thinking Through Potential Benefits



Thinking Through Potential Benefits



Thinking Through Potential Benefits

Customers

Increased customer satisfaction

Fewer service disruptions

Fewer blocked roads or fewer road cuts

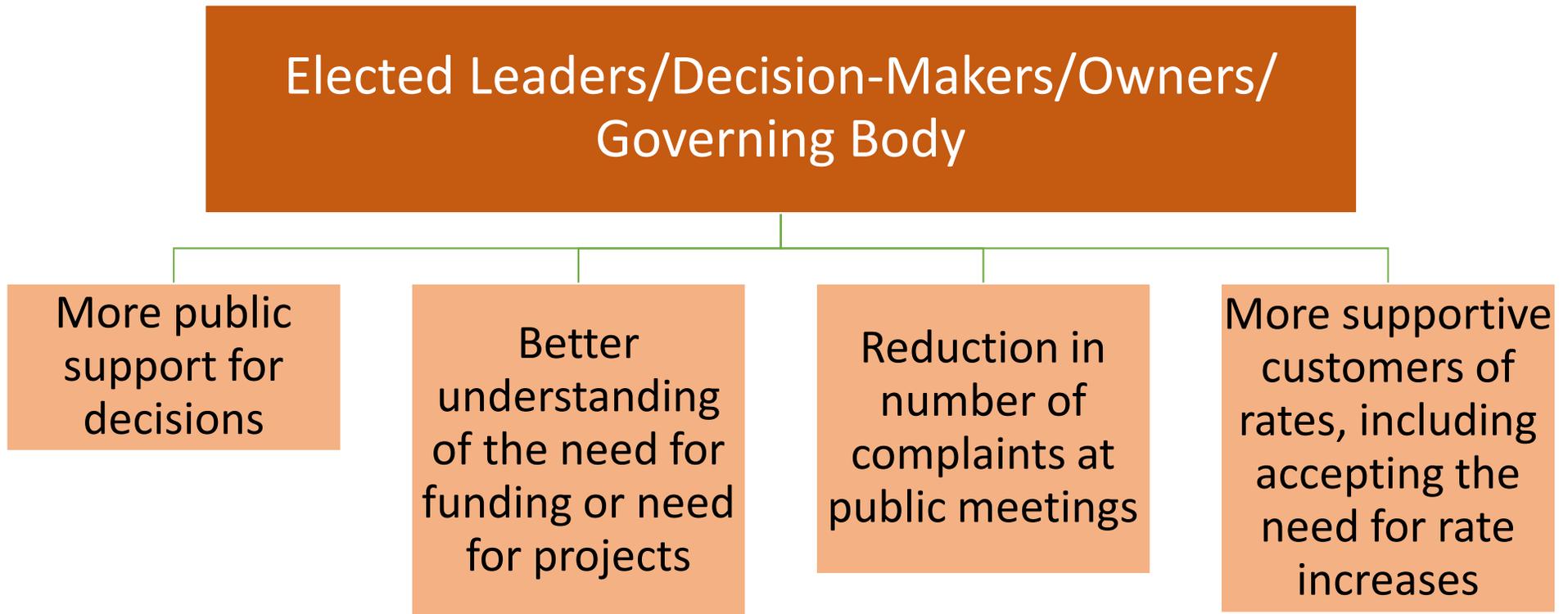
Fewer disruptions to businesses

Reductions in number of customer complaints or in complaints of a particular type

More willingness to support rate increases

Customers receive water or wastewater treatment who did not have such services before (or adequate services)

Thinking Through Potential Benefits



Thinking Through Potential Benefits

Employees

Increased job satisfaction

More planned, less reactive work

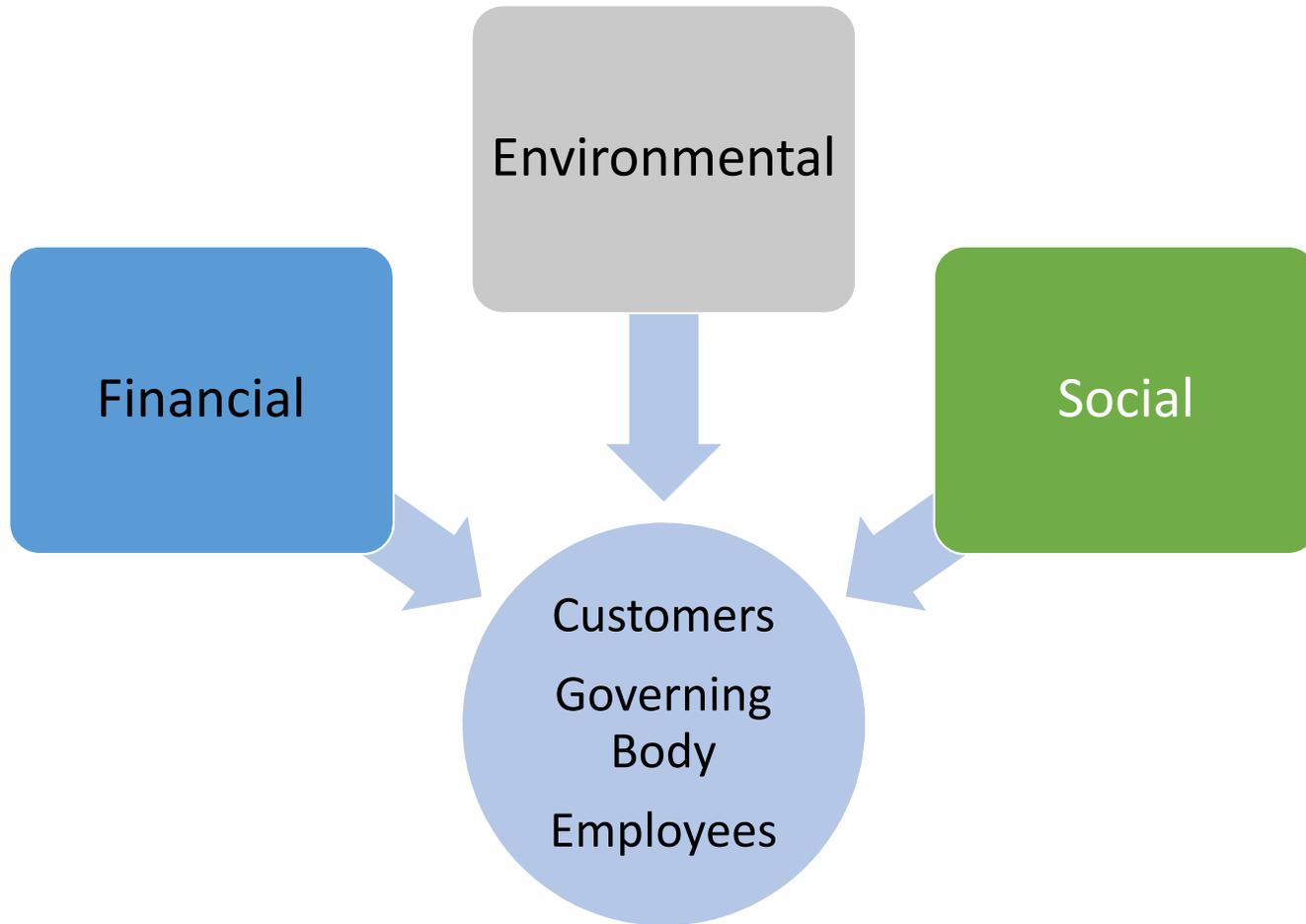
Fewer safety incidents or injuries

More ability to effect work and projects

Potential for employee benefits such as pay increases or other monetary or non-monetary benefits

Opportunities for Career Advancement

Total Benefits



Not all projects will achieve all (or even most) of these benefits....

...but important to consider all categories when assessing activities

Budget Should be Reconsidered Every Year

We don't want to assume we have it right or that conditions can't change

Within Overall Budget
Want to Be Sure we Are
Spending the Money in
the Right Place

Available Budget



Sometimes if outside funding is available, that can impact our ability to do source water protection

Outside
Funding

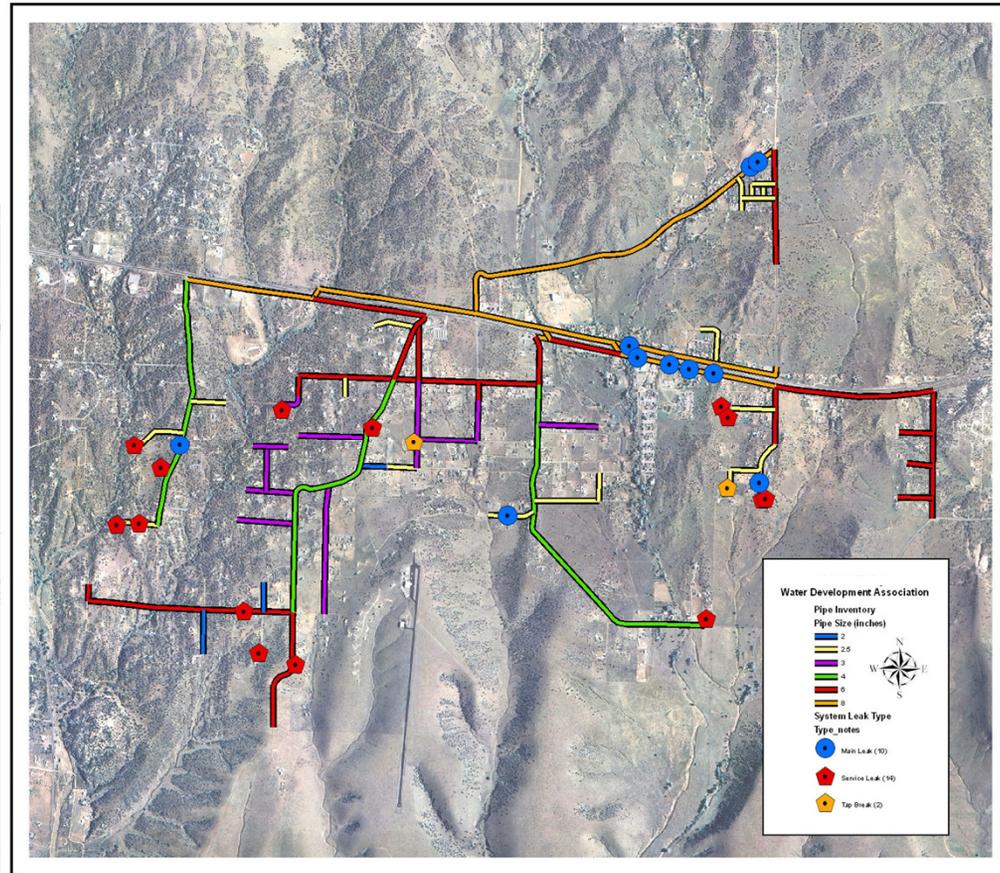




The
Bottom
Line: Make
Data
Driven
Decisions



One Example



WORKSHOP

Ties Between AM & Source Water

Source Water Protection:

LONG-TERM FUNDING



Vision

Source Water Characterization

Program Goals

Action Plan

Implementation

Evaluation and Revision

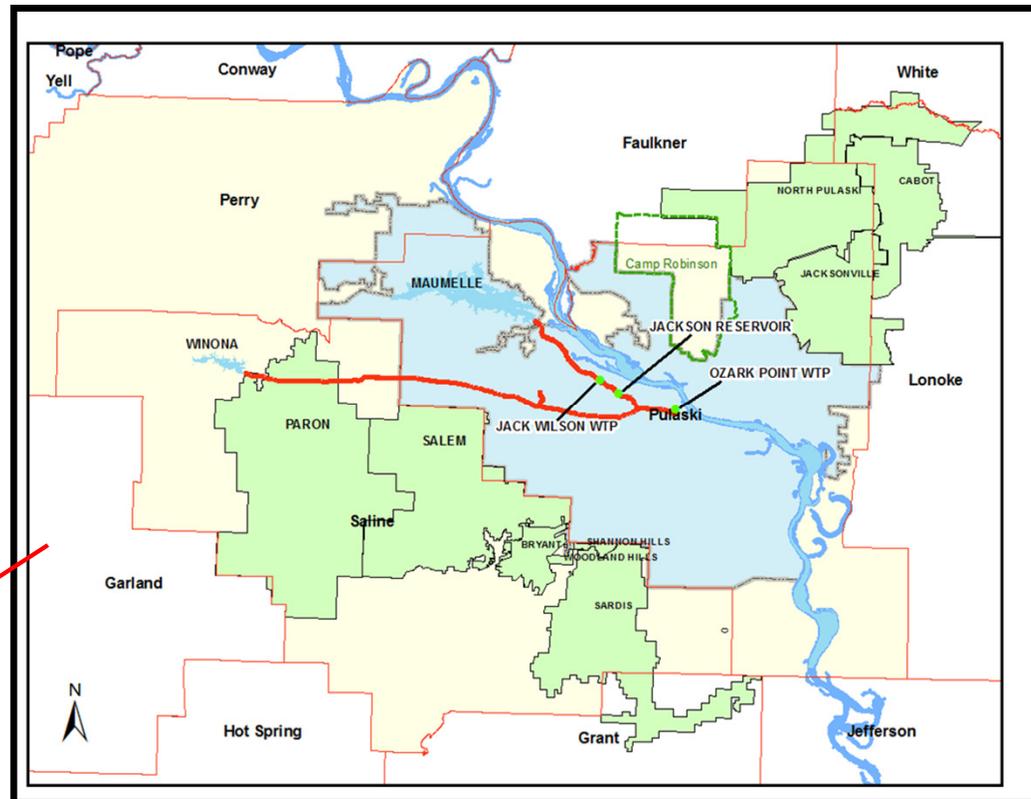
Day to Day Funding

Does the utility collect enough money to address day to day expenses (operation and maintenance of the facility)
Generally this is the revenue from rates

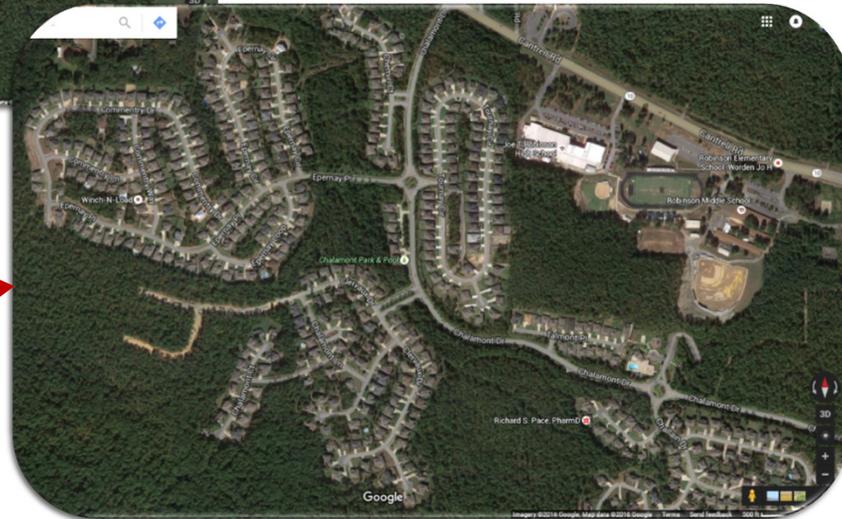
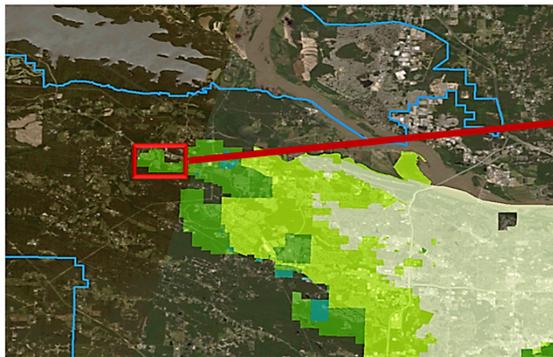


Using Rates to Support Source Water Protection: Central Arkansas Water

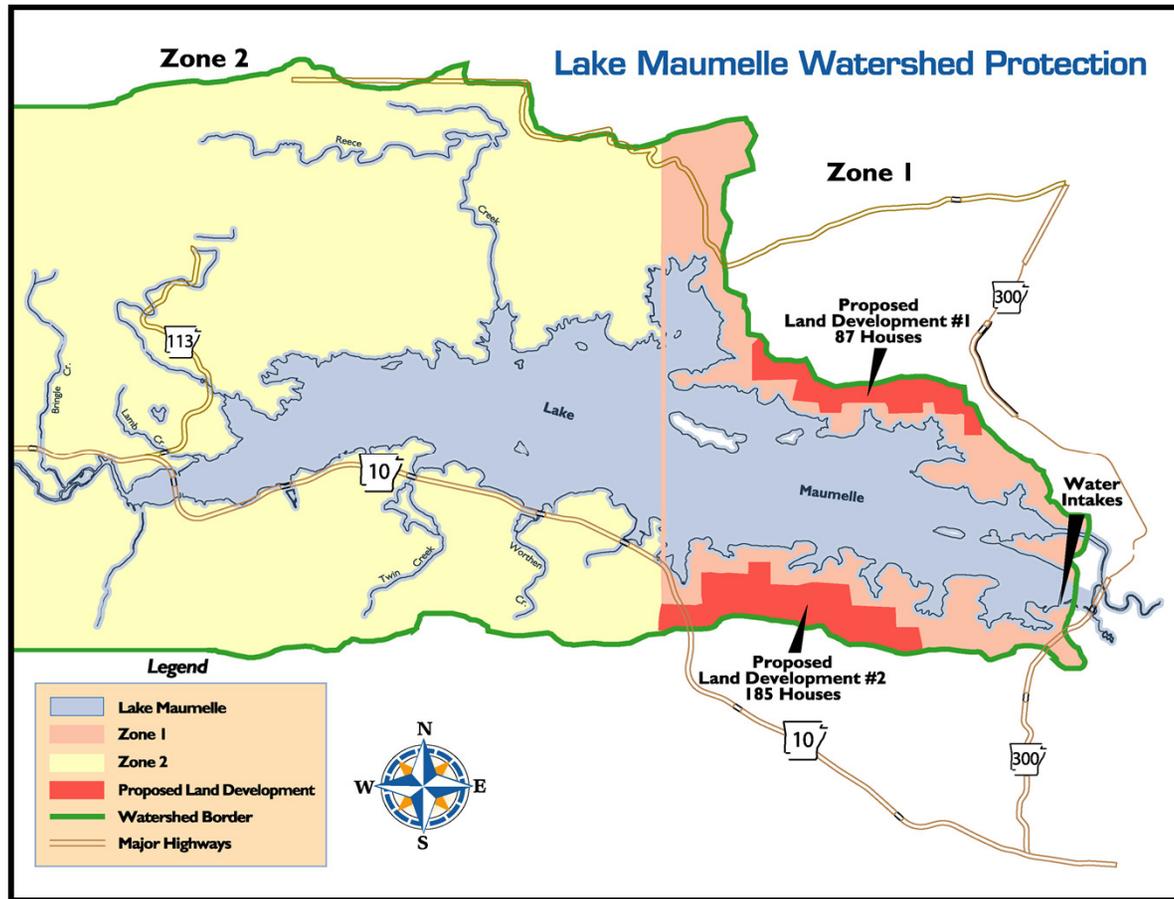
- Serves over 450,000 Arkansans with safe, high quality water
- One in every 7 Arkansans benefit from CAW's service
- Supply from 2 reservoirs: Lake Maumelle & Lake Winona



Development Pressures



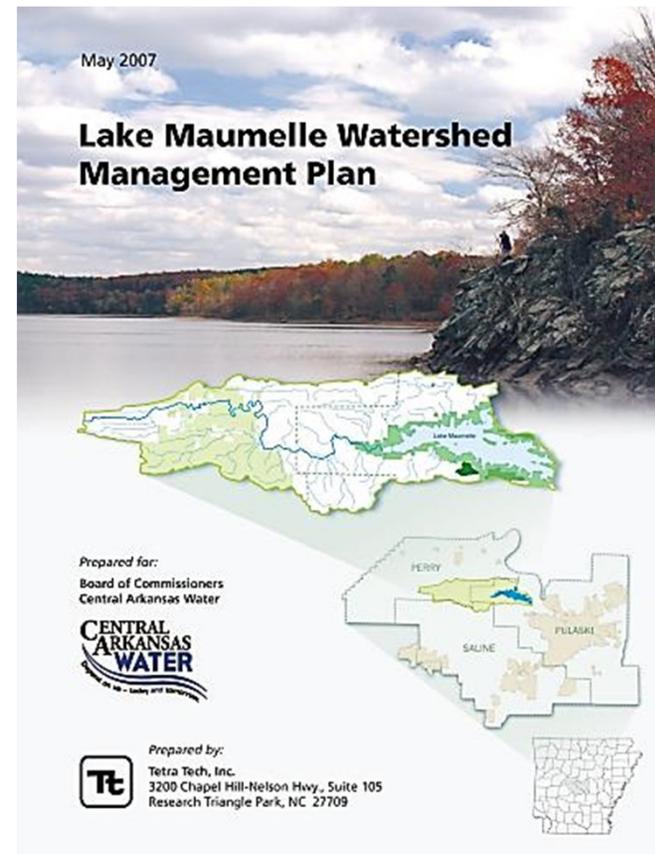
Proposed Developments Pre-2004



2007 Management Plan

Findings:

- Existing water quality is very good
- Future water quality will not meet goals under build-out scenarios



2007 Management Plan

Findings:

- Existing water quality

is

- Fu

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SCENARIOS

“No single management option can meet all of the objectives [of this plan]; therefore a combination of methods and actions are needed.”

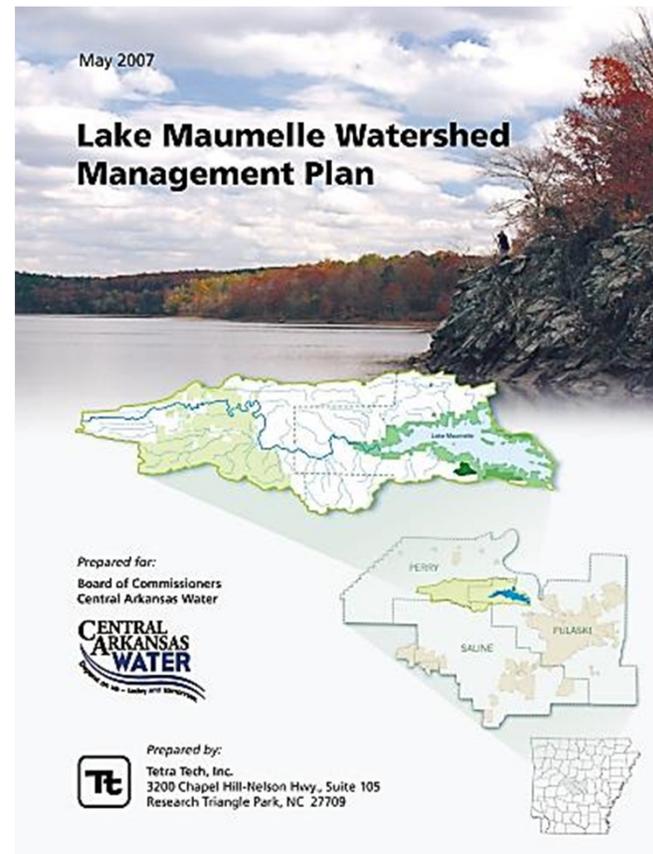


2007 Management Plan

Set targets for Total Organic Carbon (TOC), Turbidity, and Phosphorous

- Recommended Management Strategies
- Recommended New Regulations
- Recommended Actions

Acquire 1,500 acres of Conservation Land (by 2017)



Economic Value

2015 report by Earth Economics

Value of Primary Benefits

- Lake Maumelle: \$19.7M to \$91.7M per year

Value of Co-Benefits

- Lake Maumelle: \$44.7M to \$380.6M per year

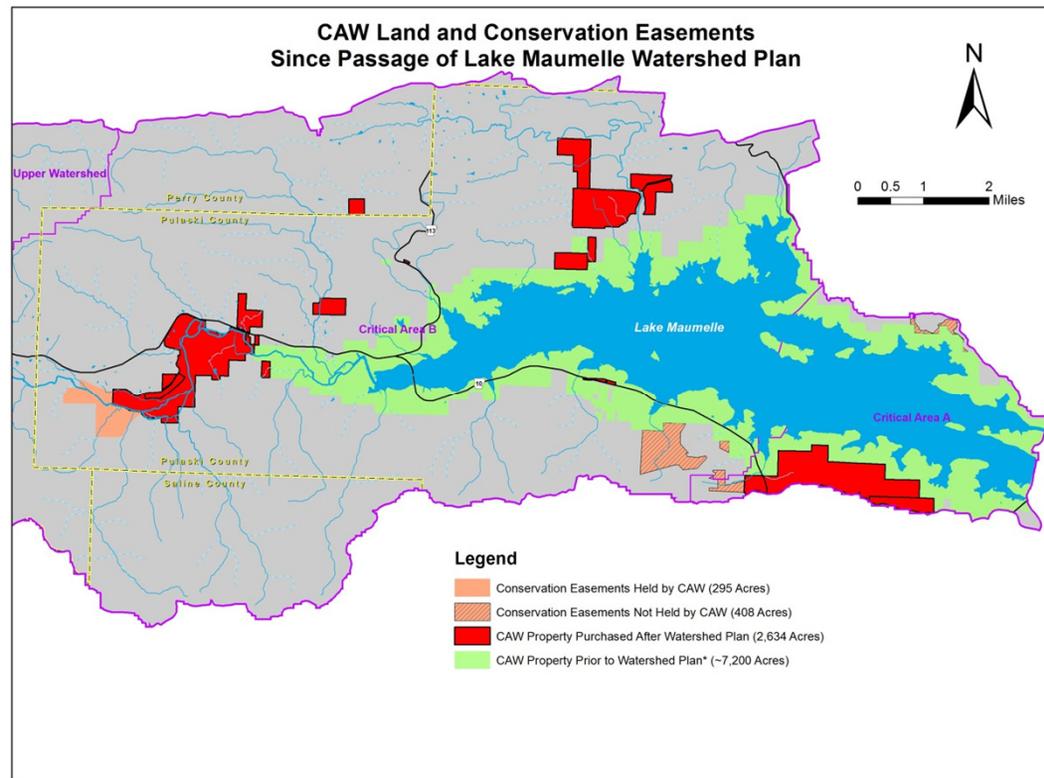
100 year Asset Value

- Lake Maumelle: \$1.5B to \$11B



Acquisitions

- Purchased 2,654 acres of property since plan adoption
- Placed 295 acres under a Conservation Easement



Plan Implementation - WPF

- Implemented a \$0.45 watershed protection fee per meter.
- Displayed on bills to increase consumer knowledge of watershed protection.
- Wholesale fee calculated based on their number of accounts.
- Generates approximately \$1 million per year.

METER NUMBER(S)		BILLING PERIOD			METER READINGS			CONSUMPTION	DESCRIPTION
FROM	TO	DAYS	PREVIOUS	READ CODE	PRESENT	READ CODE	100 CUBIC FEET		
274095	12/19/14	1/23/15	35	1052		1056	4	WATER	
YOUR AVERAGE WINTER CONSUMPTION FOR SEWER IS:							4		
CURRENT ACTIVITY									
Monthly Charges 9.07 24.57 22.02 55.66									
Watershed Protection .45 .45									
Franchise Fee .95 2.46 3.41									
Sales Tax .94 1.98 2.92									
Fed. Safe Drinking Water Act .30 .30									
Service Line Replacement Fee 1.00 1.00									
TOTAL CURRENT CHARGES \$11.71 \$28.03 \$24.00 \$63.74									
TOTAL AMOUNT NOW DUE \$32.63CR \$28.03 \$24.00 \$19.40									

Watershed Protection Fee

- Rate study was conducted in 2008, and a resolution for the WPF was adopted.
- WPF was first added to bills in May 2009.

Section 4. A Watershed Protection Fee of \$0.45 per month per 5/8" or 3/4" equivalent meter will be added to the monthly bill for all customers effective with water billed on or after May 1, 2009. The fee will accumulate to establish a fund that may be used for small land purchases, to service the debt on larger land purchases, and/or fund the administration of the Watershed Protection Program. If debt is incurred the fee will continue as necessary throughout the life of the loan to service debt repayment. Once the fund balance has exceeded \$3,000,000, the fee will stop billing until the fund has fallen below \$2,000,000. The fee may also be suspended should CAW deem it no longer necessary for the Watershed Protection Program.

METER	WATERSHED PROTECTION FEE
SIZE (diameter)	EFFECTIVE May 1, 2009
5/8"	\$.45

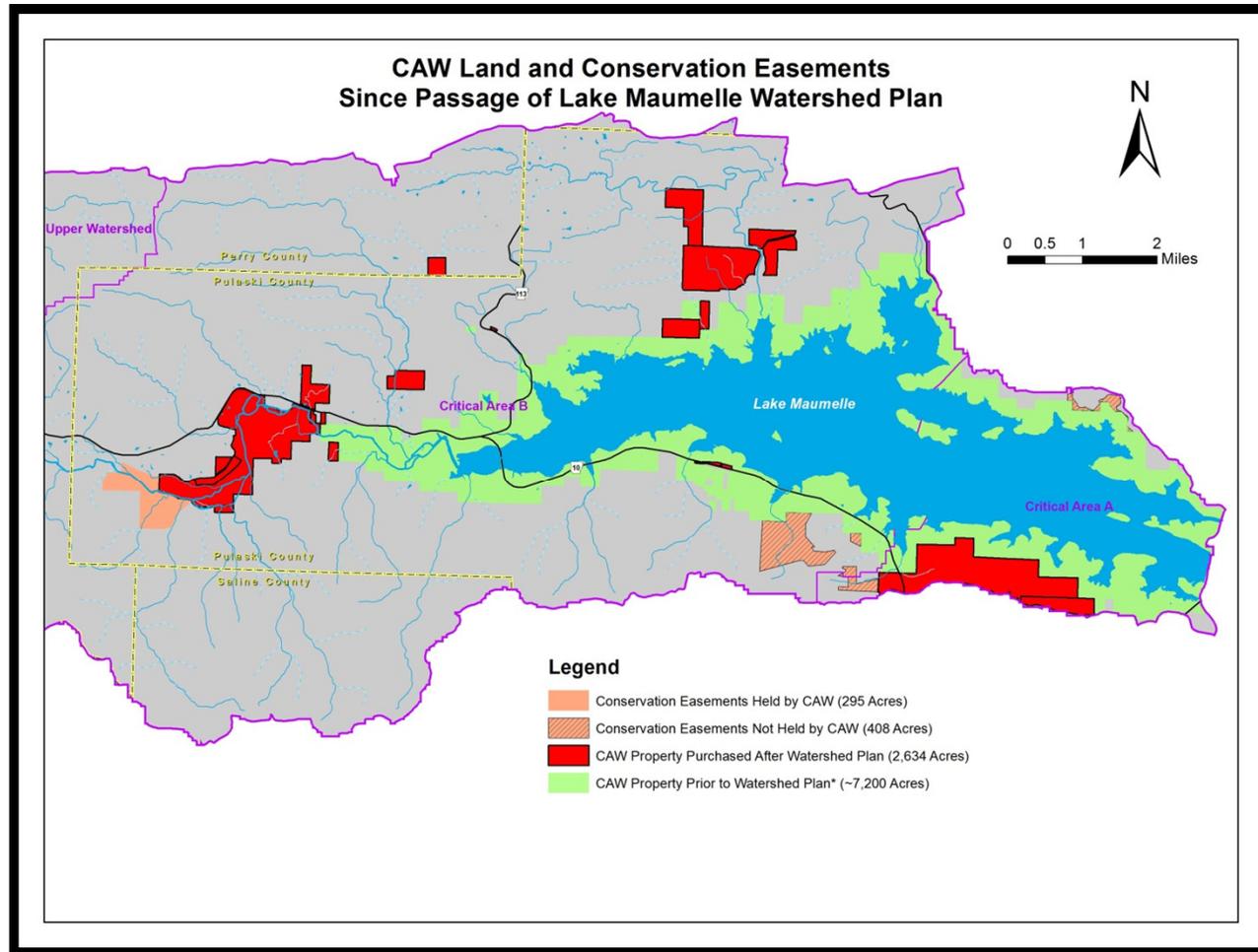
Watershed Protection Fee

- Rate study was conducted in 2012, and a resolution amend the WPF was adopted.
- Dropped the cap on WPF fund.
- Added fee levels based on meter size.
- Request for this change was citizen driven.

Section 3. The **Watershed Protection Fee** of \$0.45 per month per 5/8" or 3/4" equivalent meter will continue as implemented in 2009, and be added to the monthly bill for all customers. The fee will accumulate to establish a fund that may be used for small land purchases, to service the debt on larger land purchases, and/or fund the administration of the Watershed Protection Program.

METER SIZE (diameter)	WATERSHED PROTECTION FEE
5/8"	\$.45
3/4"	\$.45
1"	\$.68
1 1/2"	\$ 1.13
2"	\$ 2.25
3"	\$ 3.60
4"	\$ 6.75
6"	\$ 11.25
8"	\$ 22.50
10"	\$ 36.00

Acquisitions & Conservation



Managing the Land

- 1) Land Acquisitions and Conservation
- 2) Forest Management: Fire, Thinning, Roads
- 3) Restoration & Reforestation
- 4) Monitoring
- 5) Wildlife and Recreation
- 6) Education and Outreach
- 7) Risk Mitigation and Emergency Response

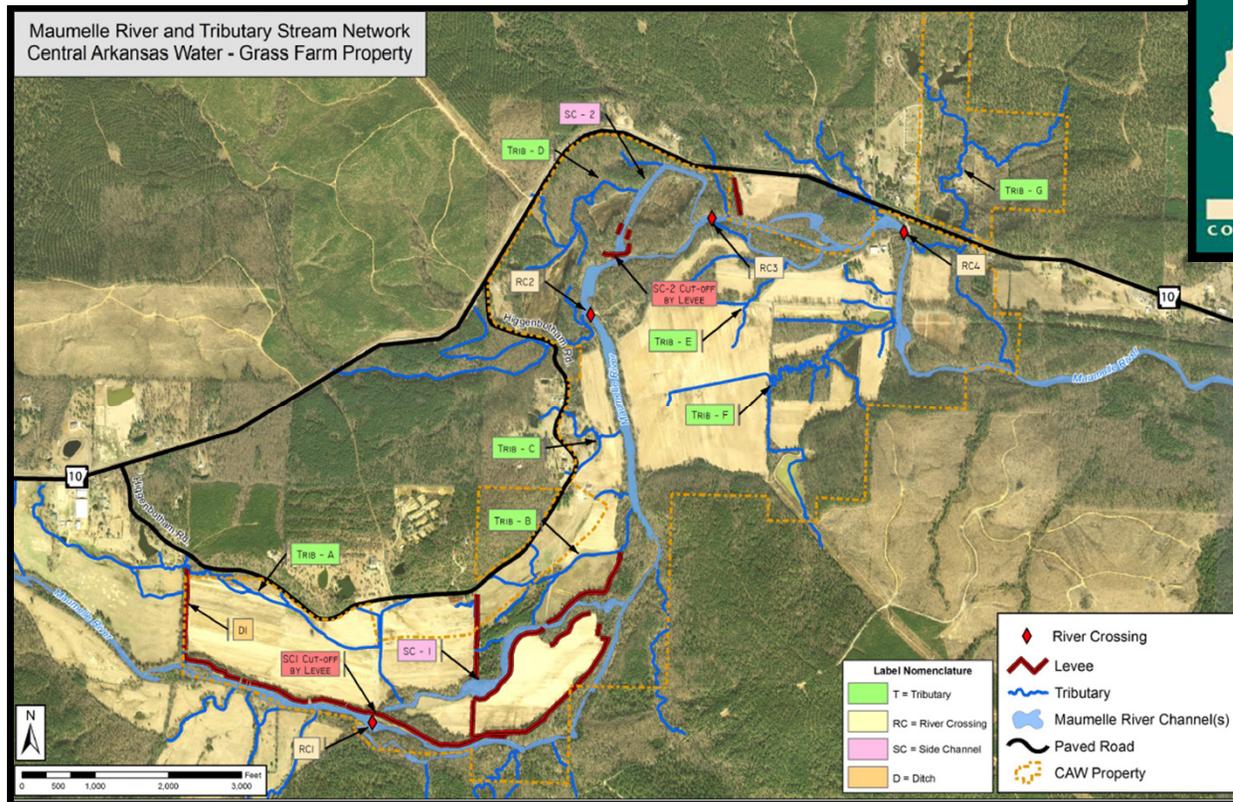
Most funding is through rate-based operation revenue, capital funds, grants, and government cost-share.



Acquisitions & Conservation

Highlight: Purchase of the WGF

- 2010 CAW purchased the 915ac Winrock Grass Farm (WGF)





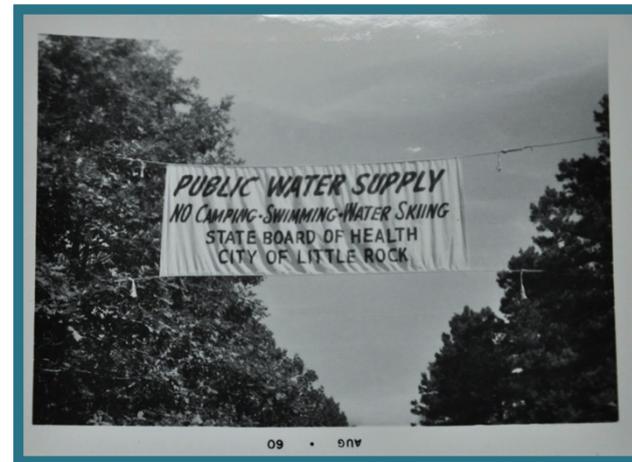
*“That’s great and all, but how do
“WE” do it?”...*



Lessons Learned

...from CAW on Watershed Management:

- Requires significant resources
- Commit for the long term
- Have a technically sound plan developed with **stakeholder input**, but be flexible in implementation
- Use adaptive management approach
- Keep landowners informed
- Monitor!



Involves stakeholders at all levels

Policy Advisory Council

- Arkansas Realtors Association
- Audubon Arkansas
- CAW Board
- Citizens Protecting Maumelle Watershed
- City of Little Rock
- City of North Little Rock
- Deltic Timber
- Grande Maumelle Sailing Club
- League of Women Voters
- Little Rock Regional Chamber of Commerce
- Maumelle Water Corporation
- Maumelle Bass Club.
- North Little Rock Chamber of Commerce
- Perry County Quorum Court
- Pulaski County Quorum Court
- Ratepayers (Little Rock)
- Ratepayers (Wholesale)
- Ratepayers (North Little Rock)
- Sierra Club
- Small Property Owners (Western)
- Small Property Owners (Northern)
- US Forest Service

Guided the overall development of the plan and established the overarching goals and principles of the plan itself. Decisions required consensus.

Long Term Funding

Do you know what types of funding are available to your utility?



For Gray Infrastructure, there are several funding sources but mostly SRF and RD



When Source Water is considered, there are many, many more partners and funders possible.

Some possibilities (not all inclusive)

National Fish and Wildlife Foundation

Healthy Watershed Consortium Grants

Foundations

NGOs

HUD

US DOI

National Park Service

Add some funding for source water protection in the overall budget

How much depends on the type and nature of the source water related infrastructure



**Resources Available From EPA
WATER INFRASTRUCTURE &
RESILIENCY FINANCE CENTER**



WATER INFRASTRUCTURE & RESILIENCY FINANCE CENTER

The Water Finance Center is an **information and assistance center**, helping communities make informed decisions for **drinking water, wastewater, and stormwater infrastructure** to protect human health and the environment.



Research

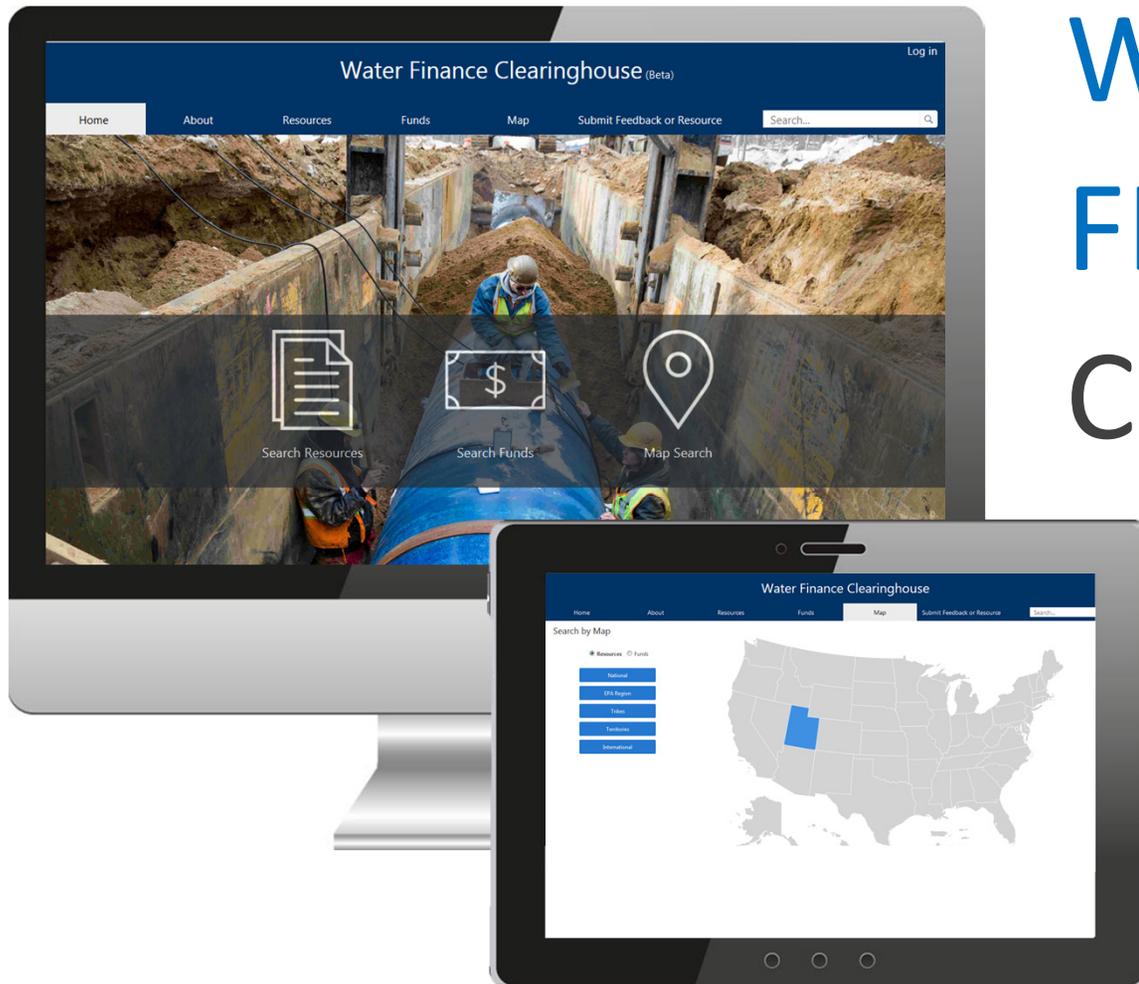
Advise

Innovate

Network

<https://www.epa.gov/waterfinancecenter>

WATER FINANCE CLEARINGHOUSE



Meeting the Needs of Key Stakeholders

The Water Finance Clearinghouse is an **easily navigable web-based portal** that helps communities locate **information** and **resources** that will assist them in making **informed decisions** for their drinking water, wastewater, and stormwater infrastructure needs.

www.epa.gov/wfc

CONTENT



WATER FINANCE RESOURCES

Reports, websites, trainings,
and other types of
information about water
infrastructure financing.



WATER FUNDING SOURCES

Current federal, state, local,
private, or other sources of
funding for water
infrastructure projects.

CONTENT

Essential Resources and Information in the Clearinghouse

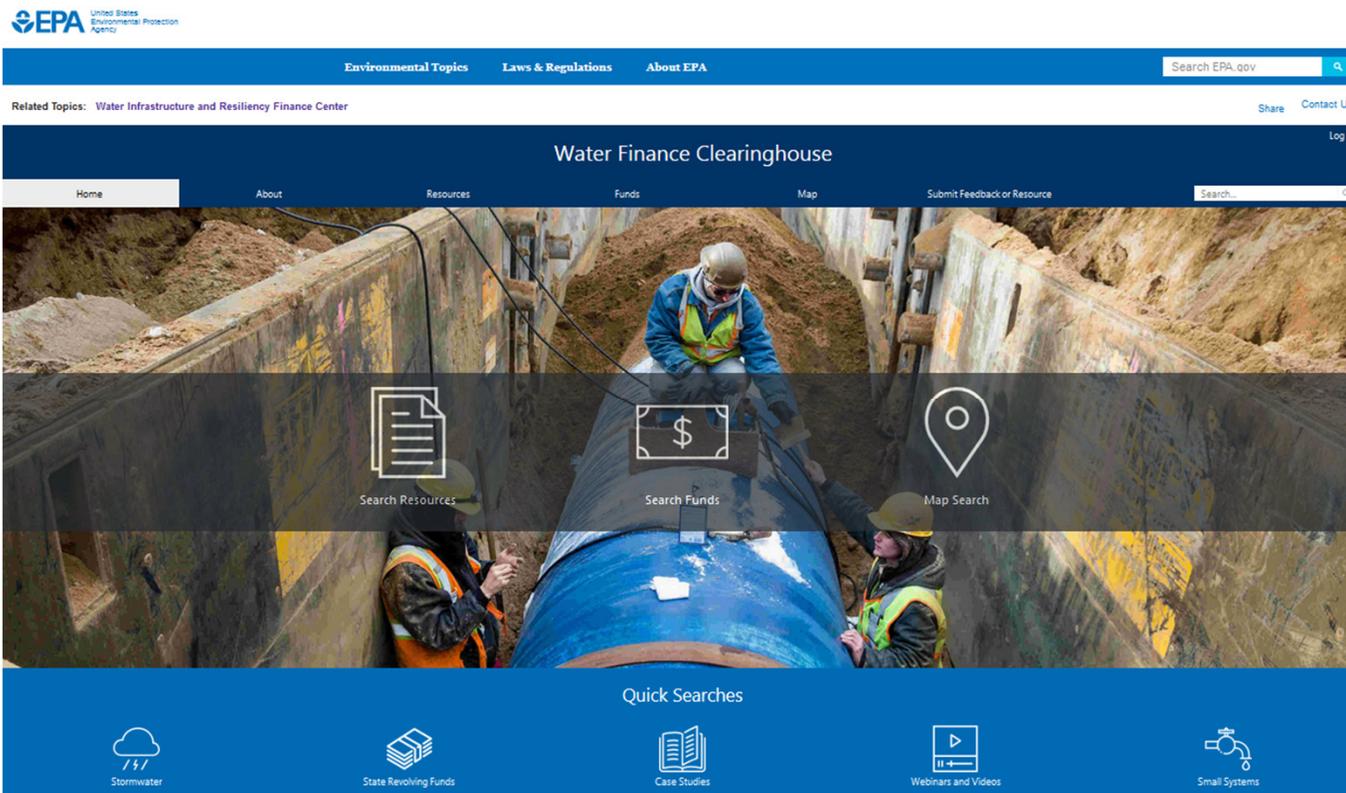
RESOURCES

- Reports
- Webinars
- Case Studies
- Videos
- Websites
- Trainings
- Guides
- Outreach
- Presentations
- Events
- Feasibility Studies
- Resource Lists
- Tools
- Other

FUNDING SOURCES

- **Federal funding** – grants and loan programs that support water infrastructure project development and construction
- **Regional funding** opportunities
- **State funding** – grant and loan programs
- **Foundation** opportunities
- **NGO**

WATER FINANCE CLEARINGHOUSE



- 2 Databases in 1
 - Funds
 - Resources
- Can search multiple ways:
 - Resources Icon/Tab
 - Funds Icon/Tab
 - Map Search
 - Global Search – searches both databases using key word/s
 - Quick Searches (applies filters for user)

MAP SEARCH

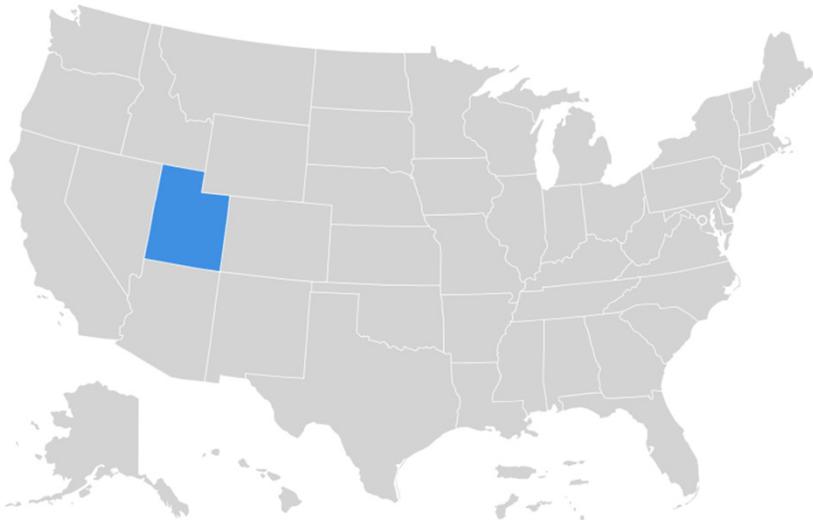
Water Finance Clearinghouse

Home About Resources Funds **Map** Submit Feedback or Resource Search...

Search by Map

Resources Funds

- National
- EPA Region
- Tribes
- Territories
- International



The image shows a screenshot of the Water Finance Clearinghouse website's 'Map Search' interface. At the top, there is a dark blue navigation bar with the title 'Water Finance Clearinghouse' and several menu items: 'Home', 'About', 'Resources', 'Funds', 'Map' (which is highlighted), and 'Submit Feedback or Resource'. To the right of the 'Map' menu item is a search input field labeled 'Search...'. Below the navigation bar, the page is titled 'Search by Map'. There are two radio buttons: 'Resources' (which is selected) and 'Funds'. Below these are five blue buttons with white text: 'National', 'EPA Region', 'Tribes', 'Territories', and 'International'. To the right of these buttons is a map of the United States. The state of Utah is highlighted in a solid blue color, while all other states are shown in a light gray color.

Key Features:

- Users can click on any state – will populate search results for resources tagged for that state.

SEARCH FUNDS

Water Finance Clearinghouse (Beta) Log in

Home About Resources **Funds** Map Submit Feedback or Resource

Funds Search Results: [Apply search filters below to narrow your funding sources](#)

Funding Sources
Sectors
Eligible Uses
Eligible Applicants

Rows 50
1 - 50 of 408

Program Name	Source	Description	How To Apply	Current Funding Level	Contact
Drinking Water State Revolving Fund (DWSRF)	Wyoming Department of Environmental Quality	The Drinking Water State Revolving Fund (DWSRF) makes loans to public entities for improvements of drinking water systems, including source, storage tank, and transmission and distribution line projects.	SRF loan application forms are available on the internet at the OSLI SRF website or directly from OSLI. For more detailed instructions, visit the website.		Beth Blackwell elizabeth.blackwell@wyo.gov 307-777-6373 Office of State Lands and Investments Herschler Building, 3W 122 West 25th Street Cheyenne, WY, 82002
Clean Water State	Wyoming Department of	The Clean Water State Revolving Fund	SRF loan application forms are available on the internet at the OSLI SRF website		Beth Blackwell elizabeth.blackwell@wyo.gov

Key Features:

- Drop-down filters at the top of the search results.
- Information Displayed:
 - Clickable Funding Option
 - Source
 - Description
 - How to Apply
 - Current Funding Level
 - Contact Information

KEY CLEARINGHOUSE FEATURES

The screenshot displays the 'Water Finance Clearinghouse (Beta)' website. The navigation bar includes 'Home', 'About', 'Resources', 'Funds', 'Map', and 'Submit Feedback or Resource'. A search bar is located on the right. Below the navigation, a message states 'Funds Search Results: We've found 6 funding sources that match your filter'. Filter buttons for 'Ohio', 'Capital Projects', and 'Remove all Filters' are visible. The main content area shows a table of funding sources with columns for 'Program Name' and 'Source'. An 'Export Your Results' button is highlighted with an orange box. A dialog box titled 'Opening funds_report.csv' is overlaid on the table, showing options to 'Open with Microsoft Excel (default)', 'Save File', or 'Do this automatically for files like this from now on.' The dialog also indicates the file is a 'Microsoft Excel Comma Separated Values File (2.9 KB)' from 'https://ofmpub.epa.gov'.

Program Name	Source
Rural Water Loan Fund	National Rural Water Association (NRWA)
Community Development Program	Ohio Development Services Agency

Key Features:

- Export search results at any time to an excel file – includes hyperlink.
- Search within search results.
- Reorganize search results by clicking on column header.
- Remove columns of information for customizable display.

A blue-tinted image of a water tower with a grid of books inside, set against a city skyline at dusk. The tower is supported by a metal lattice structure. The text 'LOOKING FORWARD' is overlaid in large white letters.

LOOKING FORWARD

The Water Finance Clearinghouse will be maintained and content expanded over time.

LEARNING MODULES

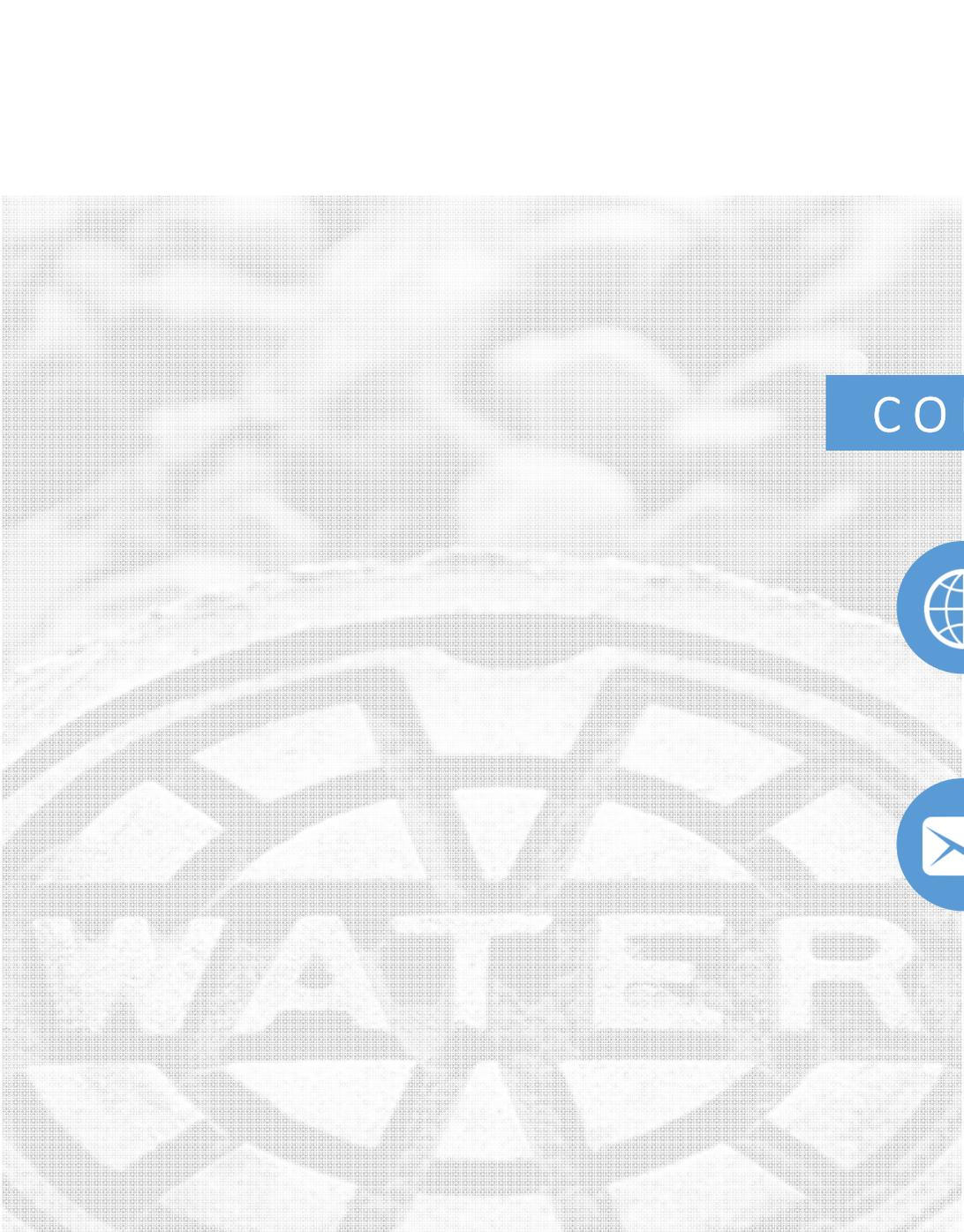
The Water Finance Center is developing step-by-step guides on specific water finance topics: Water loss financing, disaster recovery & resiliency financing, State Revolving Funds 101, financing decentralized systems, etc.

WATER FINANCE DATA

Incorporate data and analytics of water infrastructure investments made in the United States – through SRFs, other federal programs, and the market (muni bonds). May include water infrastructure needs data.

CLEARINGHOUSE 2.0

Soliciting recommendations and ideas for how to make the Clearinghouse even better for key stakeholders. What would you like to see?



CONTACT



Visit the Site

www.epa.gov/wfc



EPA Clearinghouse Contact

Sonia Brubaker
Brubaker.Sonia@epa.gov

Wrap Up





Resources
are
available
to help

<http://southwestefc.unm.edu> or Search for Southwest EFC



HOME

SERVICES

EVENTS

BLOG

RESOURCES



SOUTHWEST
ENVIRONMENTAL
FINANCE CENTER

WHO WE ARE

STAFF

FORMER STAFF

PARTNER ORGANIZATIONS

CONTACT US

FAQ

CAREERS

Twitter

Home

Southwest Environmental Finance Center



Select services



WHAT WE DO

≡ ASSET MANAGEMENT

≡ ENERGY MANAGEMENT

≡ SMALL SYSTEMS PROJECTS

≡ SOURCE WATER PROTECTION

≡ TRIBAL DRINKING WATER

≡ WATERCARE COMMUNITIES

≡ WATER LOSS CONTROL

Home > Services > What We Do

What We Do

The Southwest Environmental Finance Center (SW EFC) provides a variety of services to states and local governments. We provide classroom style trainings on technical, managerial, and financial topics in states all across the country. We assist water utilities by providing free technical assistance to help utilities help themselves. We also work with states by providing training, information sharing, or program development.

The main programs we are currently working on include:

- Asset Management
- Small Systems Project
- Source Water Protection
- Tribal Drinking Water
- WaterCARE Communities
- Water Loss Control
- Water System Finance

Further information on each of these services and programs can be found on our website by choosing the appropriate title.

Then, Source Water Protection

The screenshot shows a web browser window with the address bar displaying "southwestefc.unm.edu/what-we-do/". The left sidebar contains a navigation menu with the following items: ASSET MANAGMENT, ENERGY MANAGMENT, SMALL SYSTEMS PROJECTS, SOURCE WATER PROTECTION (highlighted with a blue circle), OVERVIEW, SOURCE WATER IQ, RESOURCES, TRIBAL DRINKING WATER, WATERCARE COMMUNITIES, WATER LOSS CONTROL, and WATER SYSTEM FINANCE. The main content area on the right includes the text "The main programs we are currently working on include:" followed by a list of services: Asset Management, Small Systems Project, Source Water Protection, Tribal Drinking Water, WaterCARE Communities, Water Loss Control, and Water System Finance. Below this list is a paragraph: "Further information on each of these services and programs can be found on our website by choosing the appropriate title." At the bottom left of the page is a "Twitter" link, and at the bottom right is a small upward-pointing arrow icon.

Select Source Water IQ



- HOME
- SERVICES
- EVENTS
- BLOG
- RESOURCES



SOUTHWEST ENVIRONMENTAL FINANCE CENTER

Source Water Protection – IQ

WHAT WE DO

- ASSET MANAGEMENT
- ENERGY MANAGEMENT
- SMALL SYSTEMS PROJECTS

SOURCE WATER PROTECTION

OVERVIEW

SOURCE WATER IQ

RESOURCES

- TRIBAL DRINKING WATER
- WATERCARE COMMUNITIES
- WATER LOSS CONTROL
- WATER SYSTEM FINANCE

A Source Water Protection IQ Test is presented here in order to help you review the concepts of the various core components of source water protection.

In this 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 Source Water Protection 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.

The Source Water Protection IQ Test will take you from considerations of your vision for source water protection to characterization of areas of concern and evaluation of the data available. It then guides you to consider your goals for source water protection and evaluates your action plan for implementing your goals. Finally, it asks you to consider stakeholder input and your process for continued evaluation and review of your plan. Taking the test in this order before starting a source water protection plan should help you in considering the steps needed to initiate and fully implement a plan.

As the utility progresses, the Source Water Protection IQ can be repeated and the scores compared to previous scores. Repeating it periodically can point out gaps in your information or weaknesses in your process and help you to focus your efforts efficiently. At a minimum, you may wish to repeat the test every year.

Start the Source Water IQ [HERE](#)

Click on "HERE" to Start the IQ

The Opening Page of the SW IQ

A decorative graphic consisting of a grid of colored squares. The top row has four squares: blue, purple, light green, and a slightly darker green. The bottom row has five squares: light green, light blue, medium blue, dark blue, and a very dark blue.

SOURCE WATER PROTECTION IQ

A Source Water Protection IQ Test is presented here in order to help you review the concepts of the various core components of source water protection.

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[Front](#)

[Section 1](#)

[Section 2](#)

[Section 3](#)

[Section 4](#)

[Section 5](#)

[Section 6](#)

[Section 7](#)

[Results](#)

Source Water Protection IQ Section I

VISION

A FORMALIZED VISION GUIDES THE DEVELOPMENT AND IMPLEMENTATION OF A SWP PROGRAM.

A. Does the organization have a written vision statement that formally expresses a commitment to Source Water Protection (SWP)?

0	The organization does not have a SWP vision of any kind. (0 Points)
	The organization has an idea of what the SWP vision statement is, but it is not written. (1 Point)
	The organization has a written SWP vision statement that recognizes that SWP is one of the multiple barriers for drinking water protection. (2 Points)
	The organization has a written SWP vision statement that recognizes that SWP is one of the multiples barriers for drinking water protection, and includes the commitment of, or intention to commit sufficient resources. (3 points)
	The organization has a written SWP vision statement that recognizes that SWP is one of the multiples barriers for drinking water protection, includes the commitment of, or intention to commit sufficient resources, and has been adopted by the governing board of the organization. (4 points)
	The organization has a written SWP vision statement that recognizes that SWP is one of the multiples barriers for drinking water protection, includes the commitment of, or intention to commit sufficient resources, has been adopted by the governing board of the organization, and has been distributed and is understood throughout the organization. (5 points)

¹All refers to greater than 90% of the organization's personnel.

0	Your Score For This Section
0	Your Cumulative Score

A series of 15
Questions
With Answers
Worth 0 to 5
points. Total
Score
Possible = 75

[Reset Scores](#)

Includes 7 Sections

Vision

Source Water
Characterization

Program Goals

Action Plan

Implementation

Stakeholder
Involvement

Evaluation and
Revision

*Based On AWWA, Source Water
Protection, Operational Guide to
AWWA Standard G300*

Can Print the Results as Well as Responses to Each Question



Source Water Protection IQ Scores

Name: City:

[Download Results As PDF](#)

2	Your score for section 1: Vision
11	Your score for section 2: Source Water Characterization
2	Your score for section 3: Program Goals
10	Your score for section 4: Action Plans
4	Your score for section 5: Implementation
2	Your score for section 6: Stakeholder Involvement
4	Your score for section 7: Evaluation and Revision
35	Your Cumulative Score

- [Front](#)
- [Section 1](#)
- [Section 2](#)
- [Section 3](#)
- [Section 4](#)
- [Section 5](#)
- [Section 6](#)
- [Section 7](#)
- [Results](#)

[Reset Scores](#)

Pages from the PDF: Can Print and/or Save PDF

NAME:

UTILITY:

2	Your score for section 1: Vision
11	Your score for section 2: Source Water Characterization
2	Your score for section 3: Program Goals
10	Your score for section 4: Action Plans
4	Your score for section 5: Implementation
2	Your score for section 6: Stakeholder Involvement
4	Your score for section 7: Evaluation and Revision
35	Your Cumulative Score

Your Source Water Protection IQ Question Breakdown

Section 1

A. Does the organization have a written vision statement that formally expresses a commitment to Source Water Protection (SWP)?

	The organization does not have a SWP vision of any kind. (0 Points)
	The organization has an idea of what the SWP vision statement is, but it is not written. (1 Point)
2	The organization has a written SWP vision statement that recognizes that SWP is one of the multiple barriers for drinking water protection. (2 Points)
	The organization has a written SWP vision statement that recognizes that SWP is one of the multiples barriers for drinking water protection, and includes the commitment of, or intention to commit sufficient resources. (3 points)
	The organization has a written SWP vision statement that recognizes that SWP is one of the multiples barriers for drinking water protection, includes the commitment of, or intention to commit sufficient resources, and has been adopted by the governing board of the organization. (4 points)
	The organization has a written SWP vision statement that recognizes that SWP is one of the multiples barriers for drinking water protection, includes the commitment of, or intention to commit sufficient resources, has been adopted by the governing board of the organization, and has been distributed and is understood throughout the organization. (5 points)

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Pages from the PDF: Can Print and/or Save PDF

NAME:

UTILITY:

2
11
2
10
4
2
4
35

Intended to provide a baseline when starting a program or wherever you are in the process

And measure progress over time

down

es a

it is not

that SWP is

that SWP is the

that SWP is commitment by the

that SWP is commitment e governing throughout

Asset Management
is a **Journey** not a
Destination



the
conclusion.

Asset Management
is a Thought
Process not a
Computer Program





DON'T LET WHAT YOU
CAN'T DO STOP YOU
FROM DOING WHAT
YOU CAN DO

CONTACT INFORMATION



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