Smart Management for Small Water Systems

Introduction to Asset Management

June 25 - 26| Cambridge, Ohio

www.southwestefc.unm.edu
www.efcnetwork.org

EFCN environmental finance center network

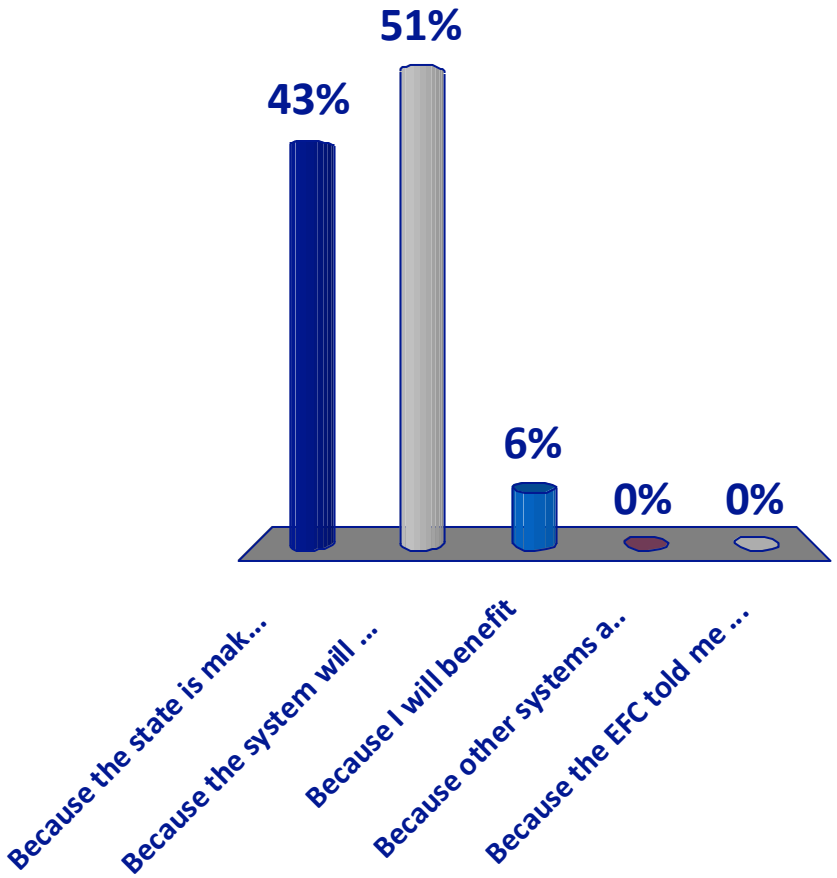
NADO National Association of Development Organizations

GFOA Government Finance Officers Association

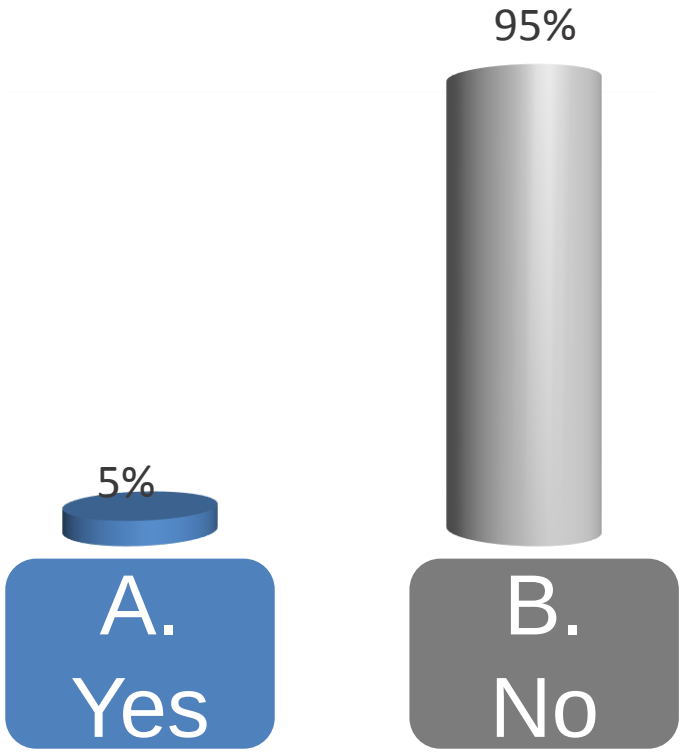
This program is made possible under a cooperative agreement with the U.S. EPA.

Why Should I Do Asset Management?

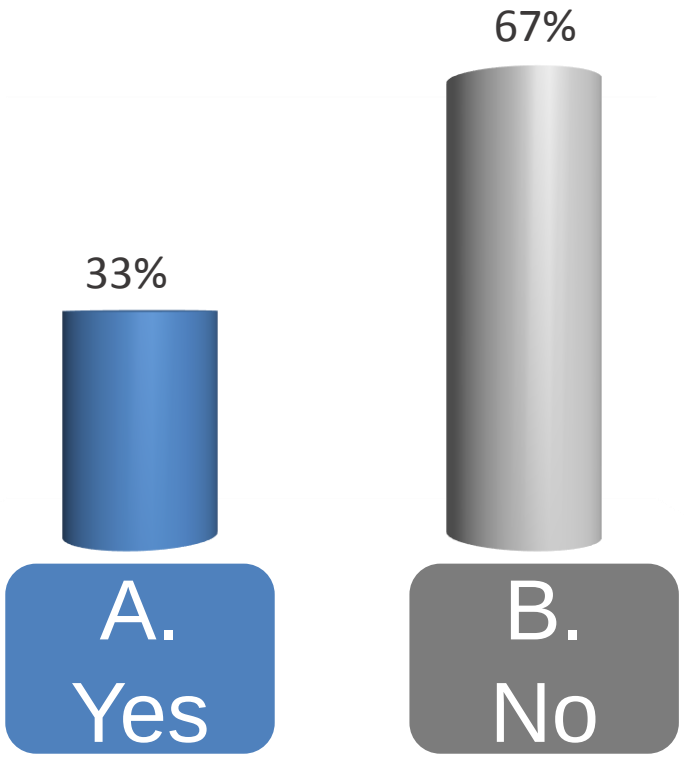
A. Because the state is making me
B. Because the system will benefit
C. Because I will benefit
D. Because other systems are doing it and I want to be like everyone else
E. Because the EFC told me I should



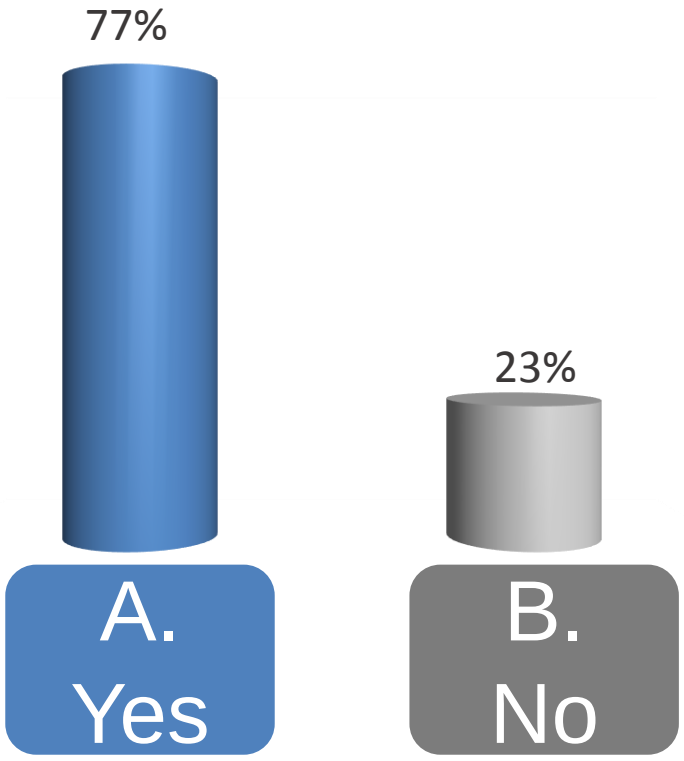
Do you have all of the money you need to pay for all the staff you need, all the O&M you want to do, replace all the assets you would like, provide all the service you want to your customers?



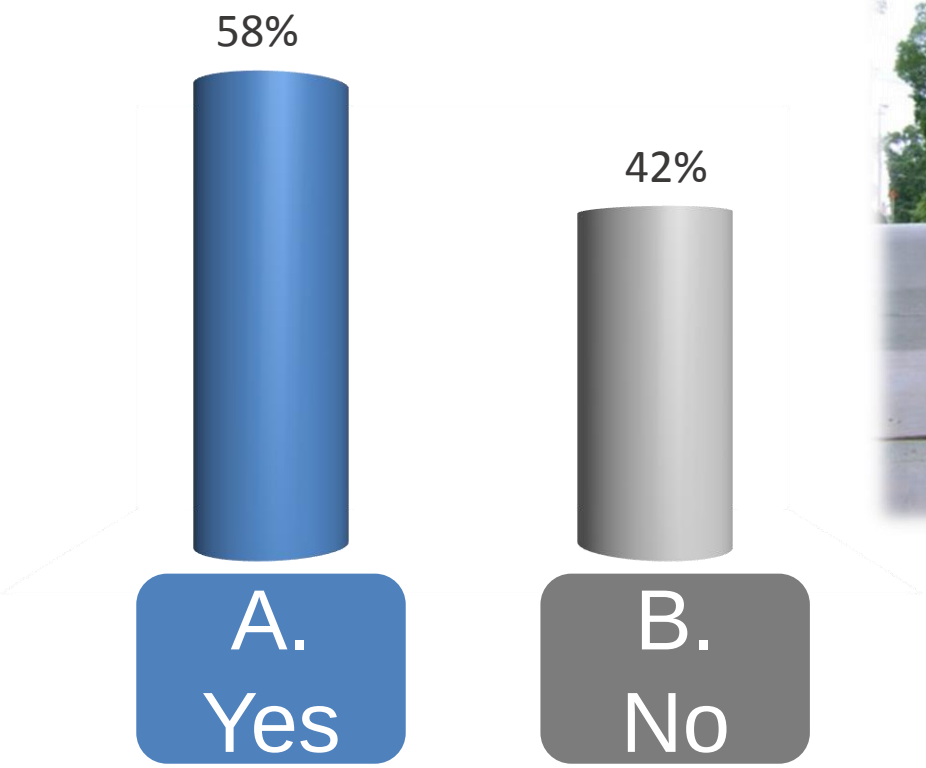
Do you know where all your assets are? Do you know what condition they're in? Do you know how much longer they will last?



Do you know what your customers want your assets to do? Do you manage your assets to meet this level of service?



If you have a set budget for asset replacement, do you know which assets are the most critical to replace? Do you have a data driven process to decide? Do you use asset criticality in making this decision?



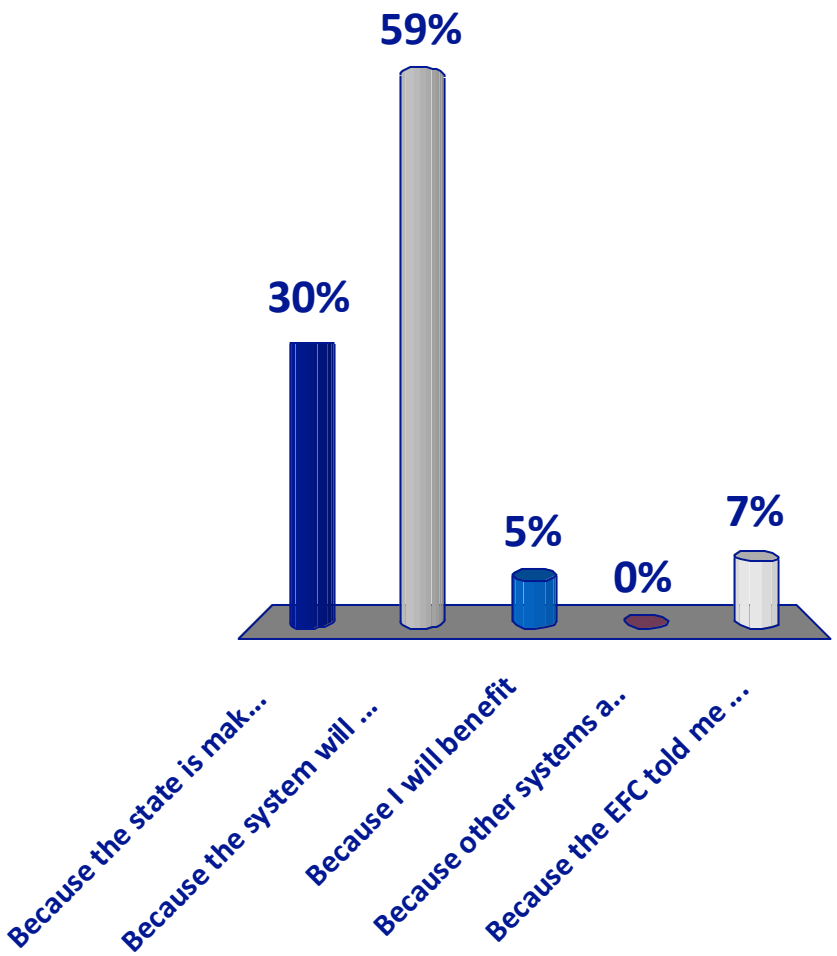
If the answer to these questions is any of the following:

No, I don’t have all the money I need
No, I don’t know where all my assets are
No, I’m not really sure what my customers want
No, I’m not sure which assets are the most important to replace

Asset Management is designed for you

Why Should I Do Asset Management?

A. Because the state is making me
B. Because the system will benefit
C. Because I will benefit
D. Because other systems are doing it and I want to be like everyone else
E. Because the EFC told me I should



Did your answer change from the first time I asked? If not, we'll be asking again at the end!

My goal is to win you over!!!!

ASSETS

What assets do you manage, where are they, what condition are they in, what is their useful life, how much are they worth, and what is their energy use?

CRITICALITY

What is the overall business risk based on probability and consequence of asset failure? Is there redundancy to reduce risk?

FUNDING

Do you have funding sources to provide the capital you need for O&M, capital replacement and energy efficiency improvement?

SERVICE LEVEL

What level of service do you want to provide for your customers? How will you measure performance?

LIFE CYCLE

Is there a strategic plan for operating and maintaining system assets? Is a process, based on risk, in place to determine when to repair, rehabilitate or replace assets? Are you considering energy efficiency?

One View of Asset Management

Asset Management – The Way it Fits Together

ASSETS

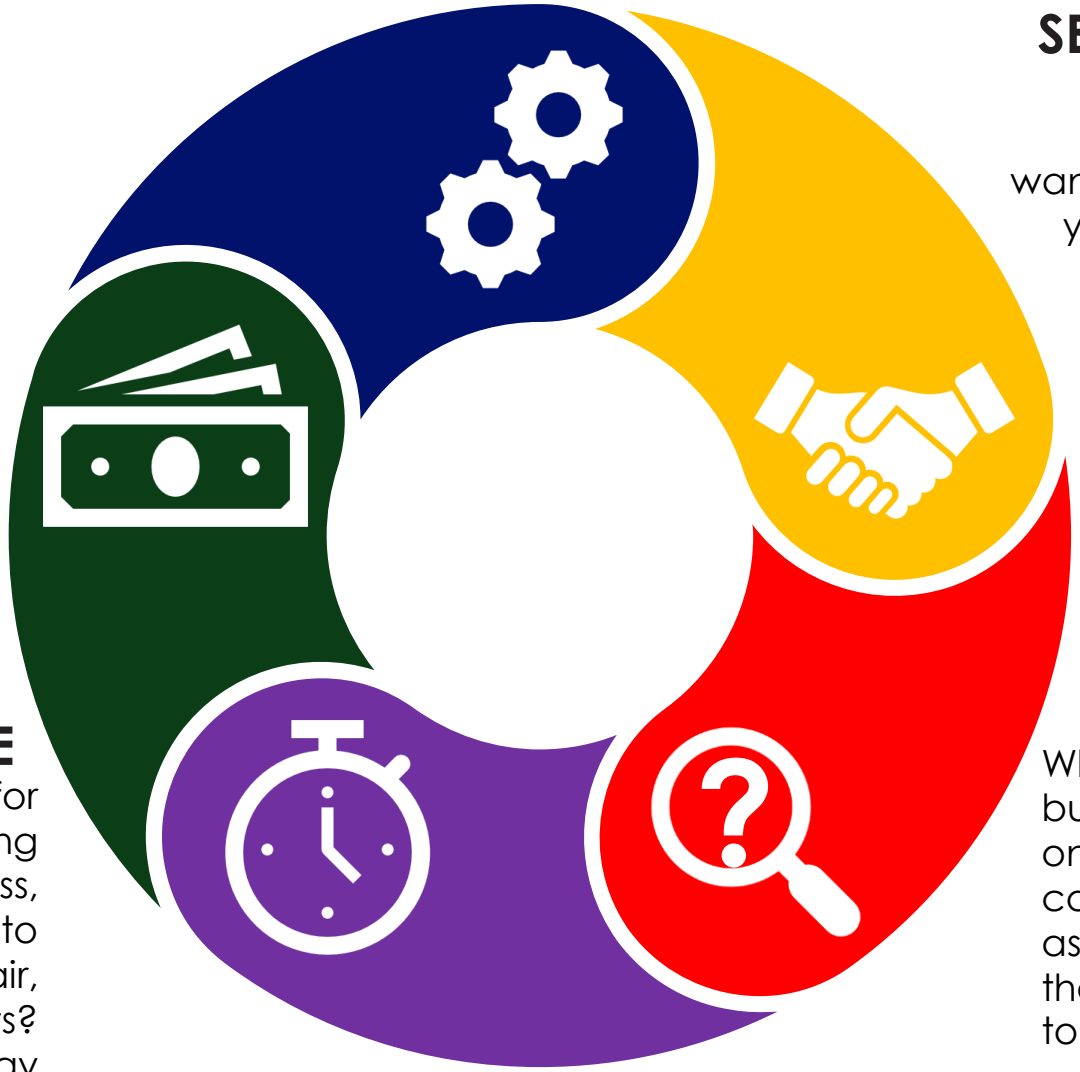
What assets do you manage, where are they, what condition are they in, what is their useful life, how much are they worth, and what is their energy use?

FUNDING

o you have funding sources to provide the capital you need for O&M, capital replacement and energy efficiency improvement?

LIFE CYCLE

Is there a strategic plan for operating and maintaining system assets? Is a process, based on risk, in place to determine when to repair, rehabilitate or replace assets? Are you considering energy



SERVICE LEVEL

What level of service do you want to provide for your customers? How will you measure performance?

CRITICALITY

What is the overall business risk based on probability and consequence of asset failure? Is there redundancy to reduce risk?

How do you define Asset Management?

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)

Basically, it's just helping you spend your limited dollars in the best way possible to keep your customers happy and to be a good steward of the system itself


BENEFITS

Work Efficiency

Reduce field time: Don’t have to look for assets

Know where spare parts are and have the right parts

Know which O&M tasks to do and when (and which ones not to do)

Improved Emergency Response

Knowing where assets are located allows for a quicker response and quicker resolution of the problem

Dealing with Natural Disasters

Enhanced Communications

Customer communications improved

Greater Acceptance of Rates

Improved CIP Process

Financial Benefits: Accessing Funding

Financial Benefits
Phasing Projects

Financial Benefits: Investing Incrementally

Transferring Knowledge – Big

Who Can Asset Management Benefit?

Governing Body

Operations and Management Staff

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

Asset Management is a **Thought Process** not a Computer Program

Asset Management is not the same as **Managing Assets**

Assess Your Baseline or Starting Point

AM IQ

https://southwestefc.unm.edu/AssetManagementIQ

http://southwestefc.unm.edu/

UNM | Center for Water and the Environment

HOME | SERVICES | EVENTS | BLOG | CONTACT US

SOUTHWEST ENVIRONMENTAL FINANCE CENTER

- WHO WE ARE
- ☰ SERVICES
  - WHAT WE DO
  - ASSET MANAGEMENT
  - SMALL SYSTEMS PROJECTS
  - SOURCE WATER PROTECTION
  - TRIBAL DRINKING WATER
  - WATERCARE COMMUNITIES
  - WATER LOSS CONTROL
  - WATER SYSTEM FINANCE
- EVENTS
- BLOG

Home > Services > Asset Management

Overview | **AM IQ** | AM Manual | State Contacts | Resources

Asset Management IQ

The Asset Management IQ tool will help you establish a baseline for your current asset management practice and over time will help you measure progress. You can use the Interactive Asset Management IQ test online by clicking here.

Kansas Department of Health and Environment

Appendix F

ASSET MANAGEMENT IQ

An Asset Management IQ Test is presented here in order to help you review the concepts of the various core components of Asset Management. Both the test and a scoring table are also available as a printable pdf, which may be copied for use by multiple personnel within your utility.

In the web version of the 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 Asset Management 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.

If the user completes the entire Asset Management IQ tool (all 30 questions) before starting Asset Management, it will provide a baseline evaluation at the beginning of Asset Management. Comparing the scores of each of the six sections will show which areas have the biggest gaps in terms of Asset Management activities. These scores may provide information about where efforts should be focused. You may wish to start with areas that are the weakest, offering a large improvement with a little effort, or with areas that are strong, which would offer a chance to get started in a familiar area.

As the utility progresses, the Asset Management IQ can be repeated and the scores compared to previous scores. At a minimum, you may wish to repeat the Asset Management IQ every year.

It should be noted that a total score of 150 would represent best practice in all areas of Asset Management. Not all utilities will be interested in achieving this goal. The utility should set its own target levels. The tool is meant to help utilities gauge their progress over time.

PREV 1 2 3 4 5 6 7 8 NEXT

Asset Management IQ Section I

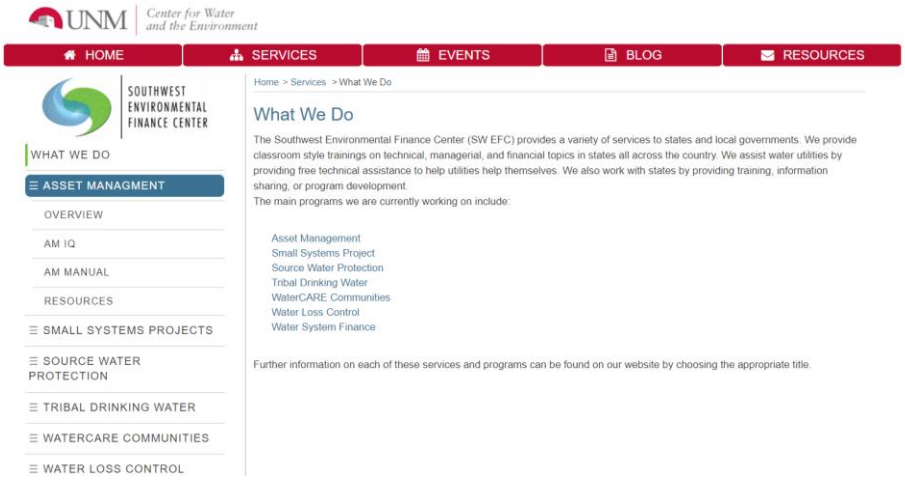
A. Is Asset Management terminology understood throughout the organization?
(Click on the answer that most accurately describes your situation.)

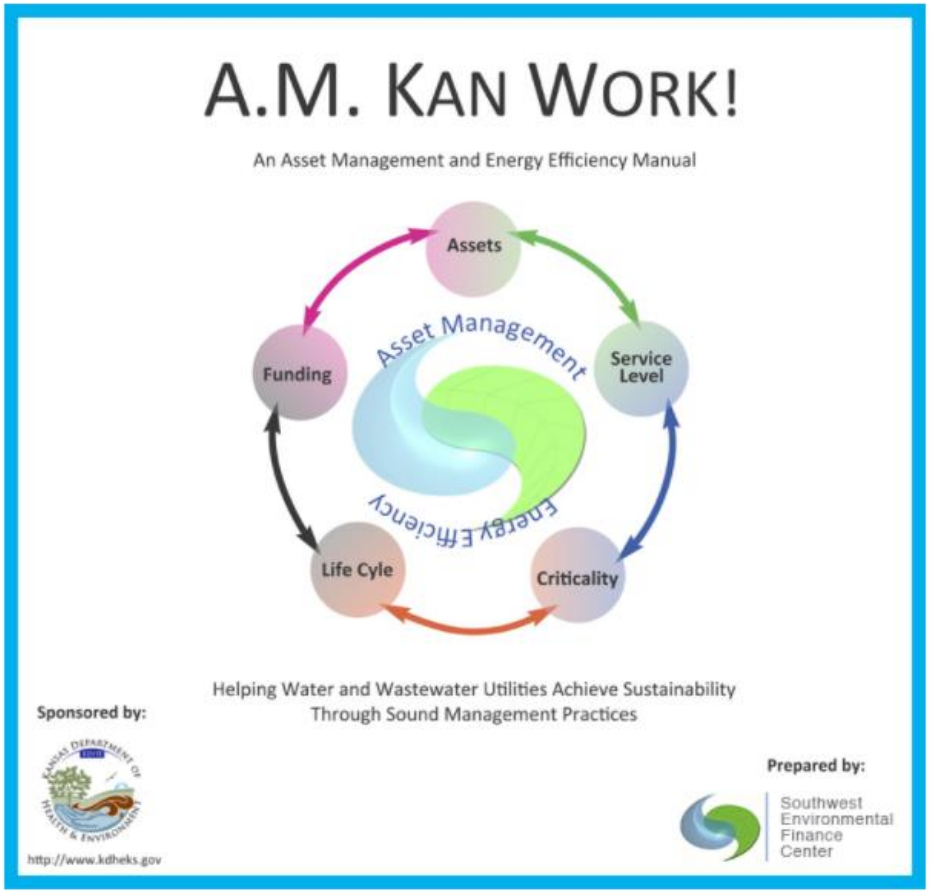
0	No one within the organization understands terminology nor has any knowledge of Asset Management concepts. (0 points)
	One person within organization understands Asset Management concepts and terminology. (1 point)
	Less than 50% of the organization's personnel (a few key people within the organization) understand Asset Management concepts and terminology. (2 points)
	More than 50% of the organization's personnel understand Asset Management concepts and terminology. (3 points)
	All[1] of the organization's personnel understand Asset Management concepts and terminology. (4 points)
	Throughout the entire organization personnel would be able to state what AssetManagement is and understand Asset Management concepts and terminology. (5 points)

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

http://southwestefc.unm.edu/asset-management-manual/

Resources to Help!!



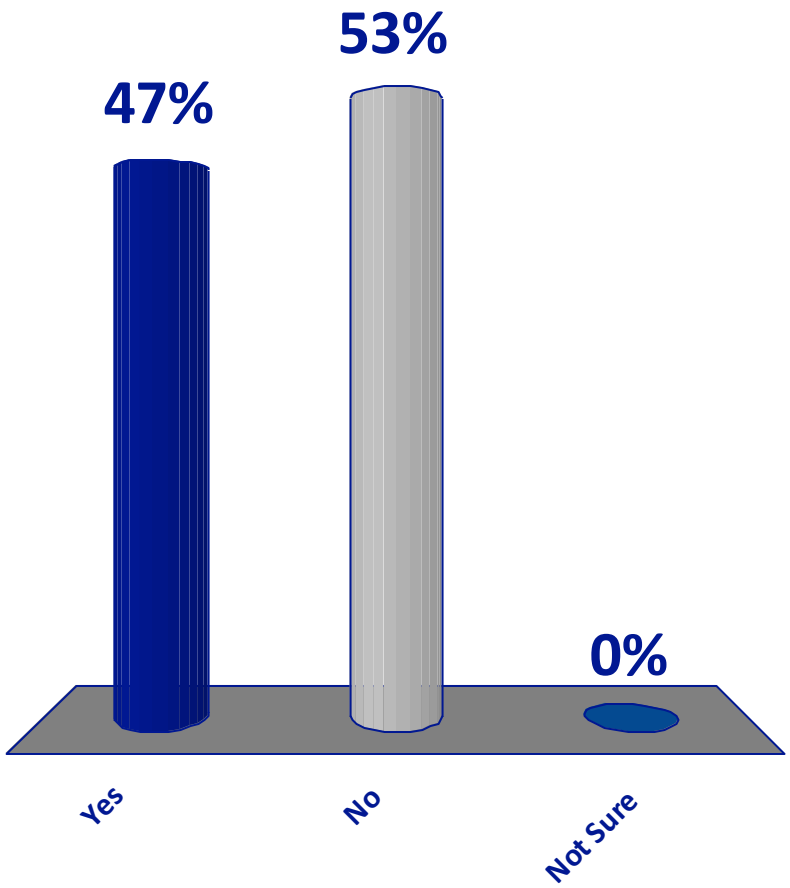


Have you ever been to asset management training before?

A. Yes

B. No

C. Not Sure

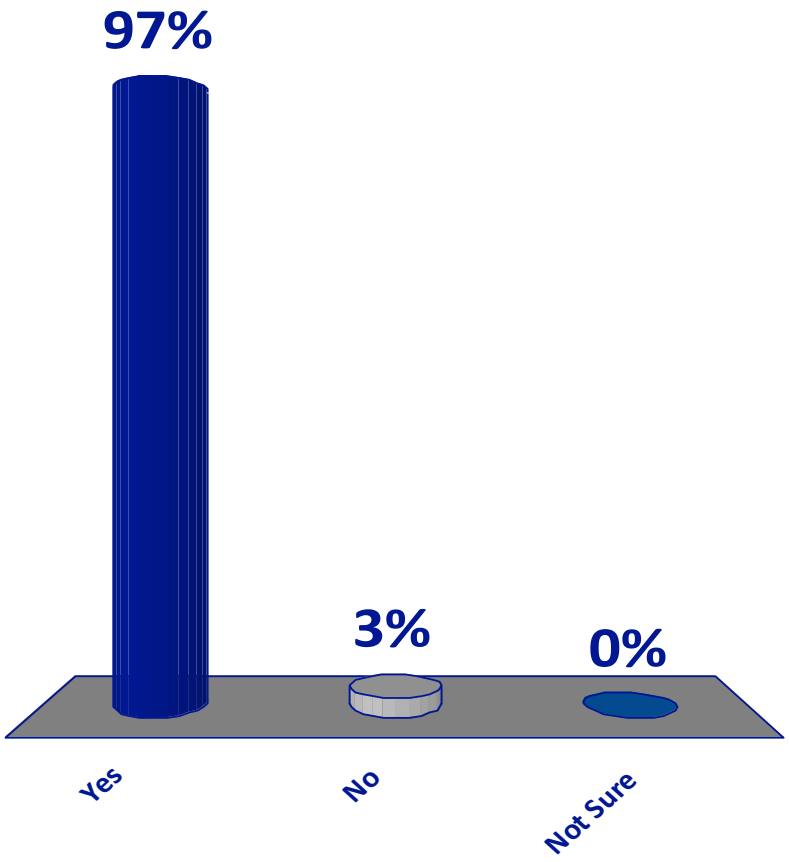


Have you begun any activities that you would deem asset management?

A. Yes

B. No

C. Not Sure

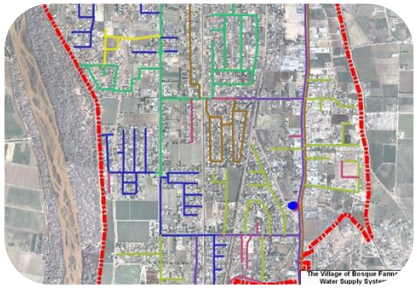


Asset Inventories and Maps

Techniques, Tools, and Examples

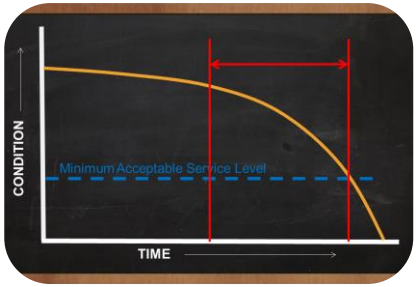
Current State of the Assets

What do you own?



Where is it located?

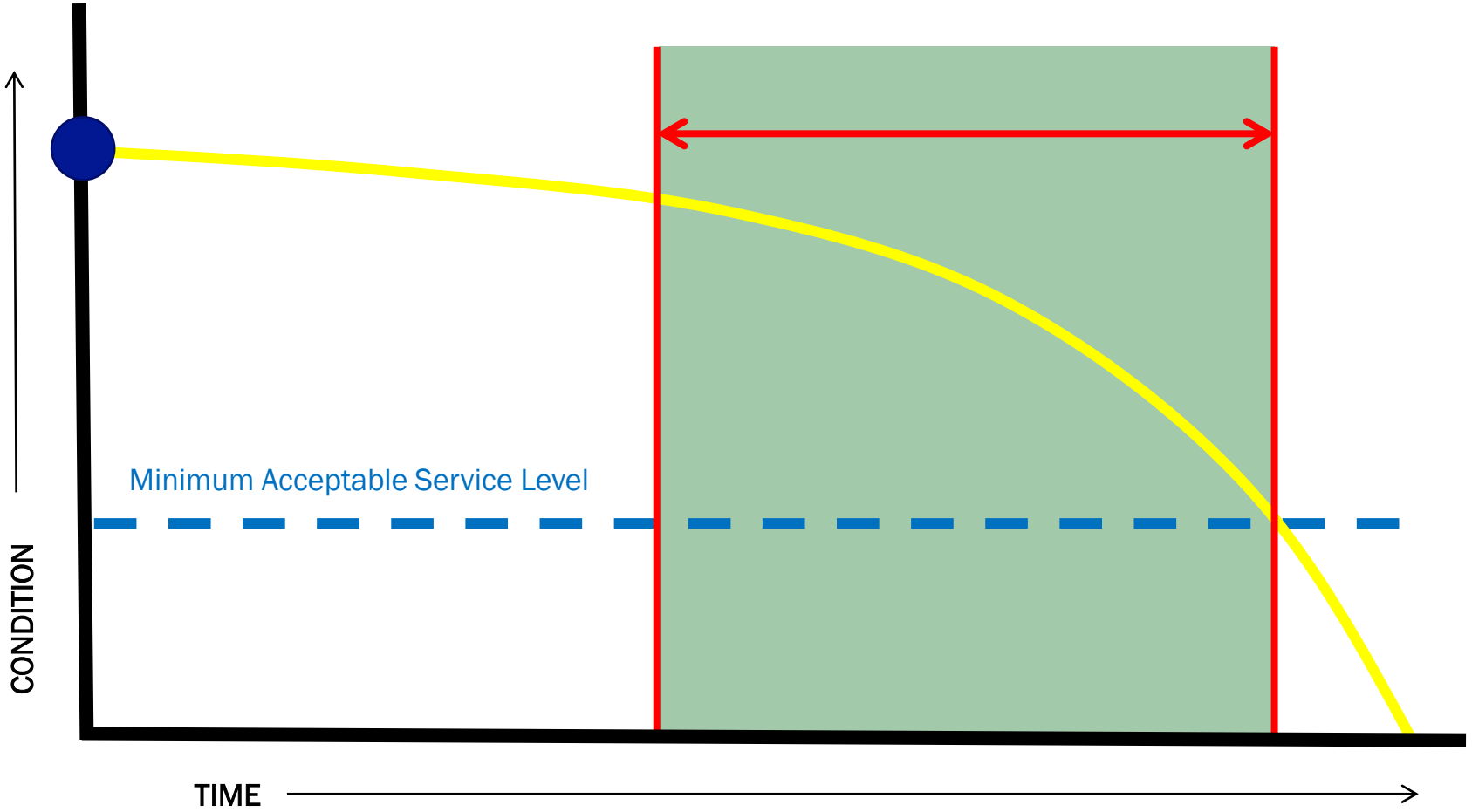
What condition are they in?



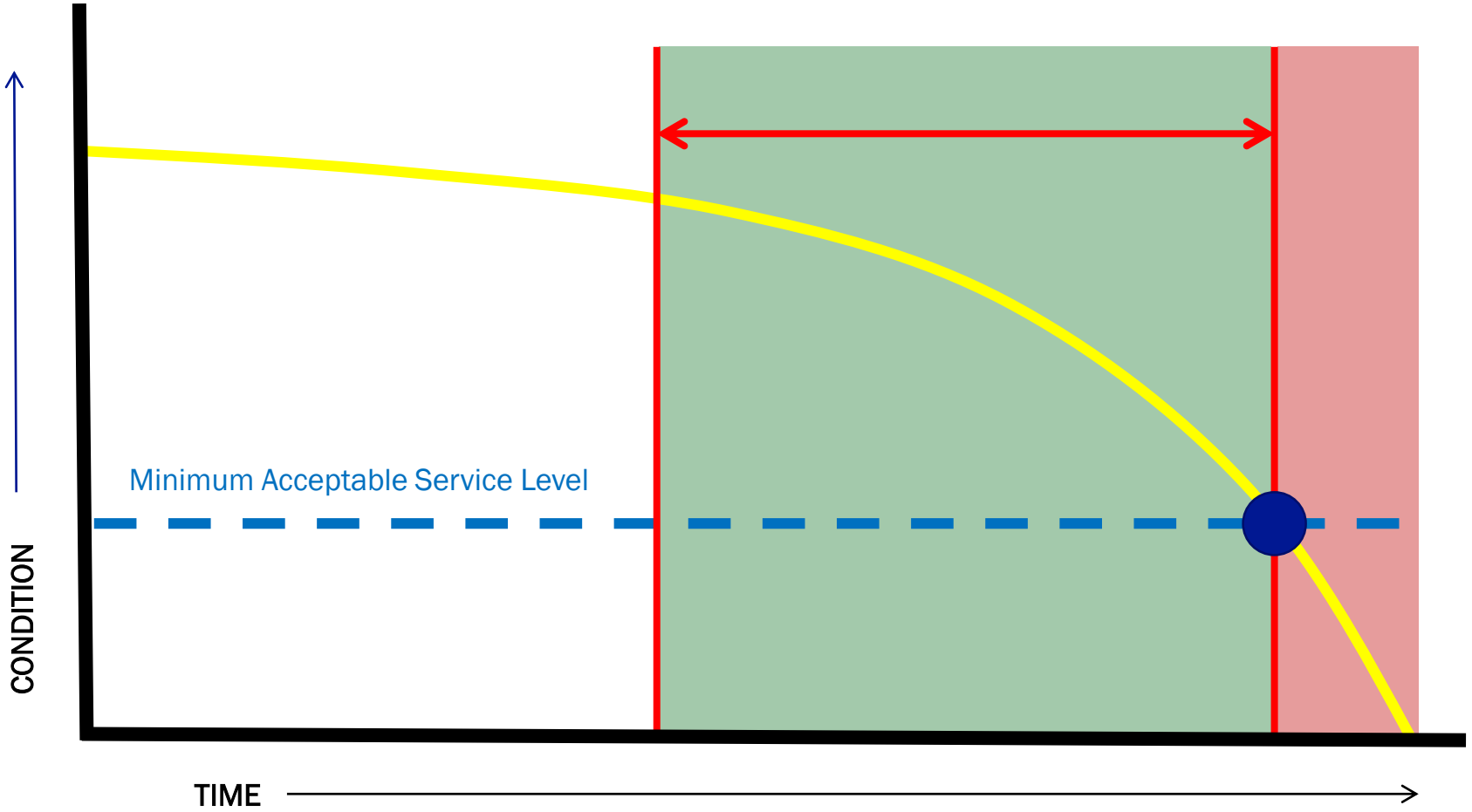
What is the remaining useful life?

What is the replacement value

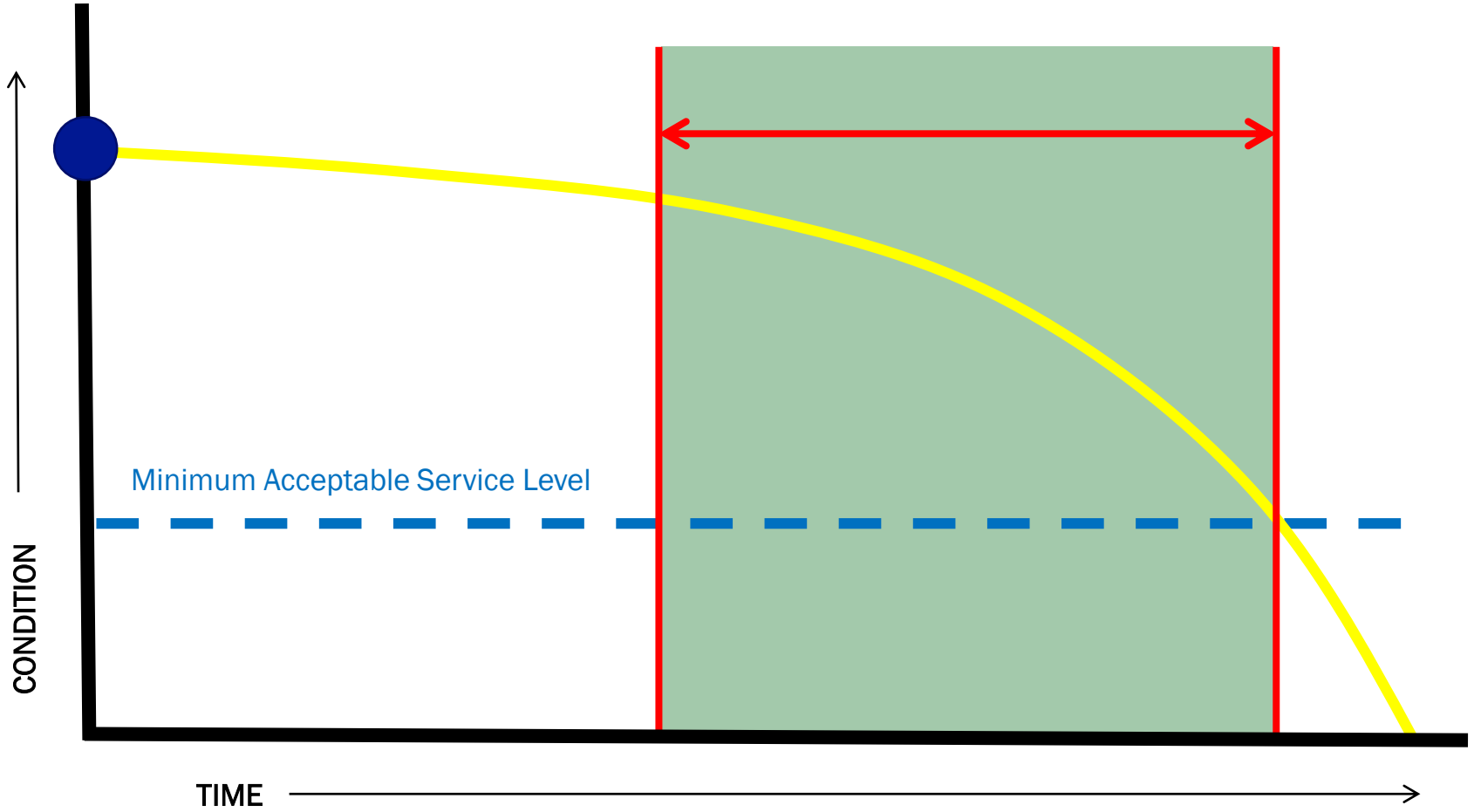
Condition Curve



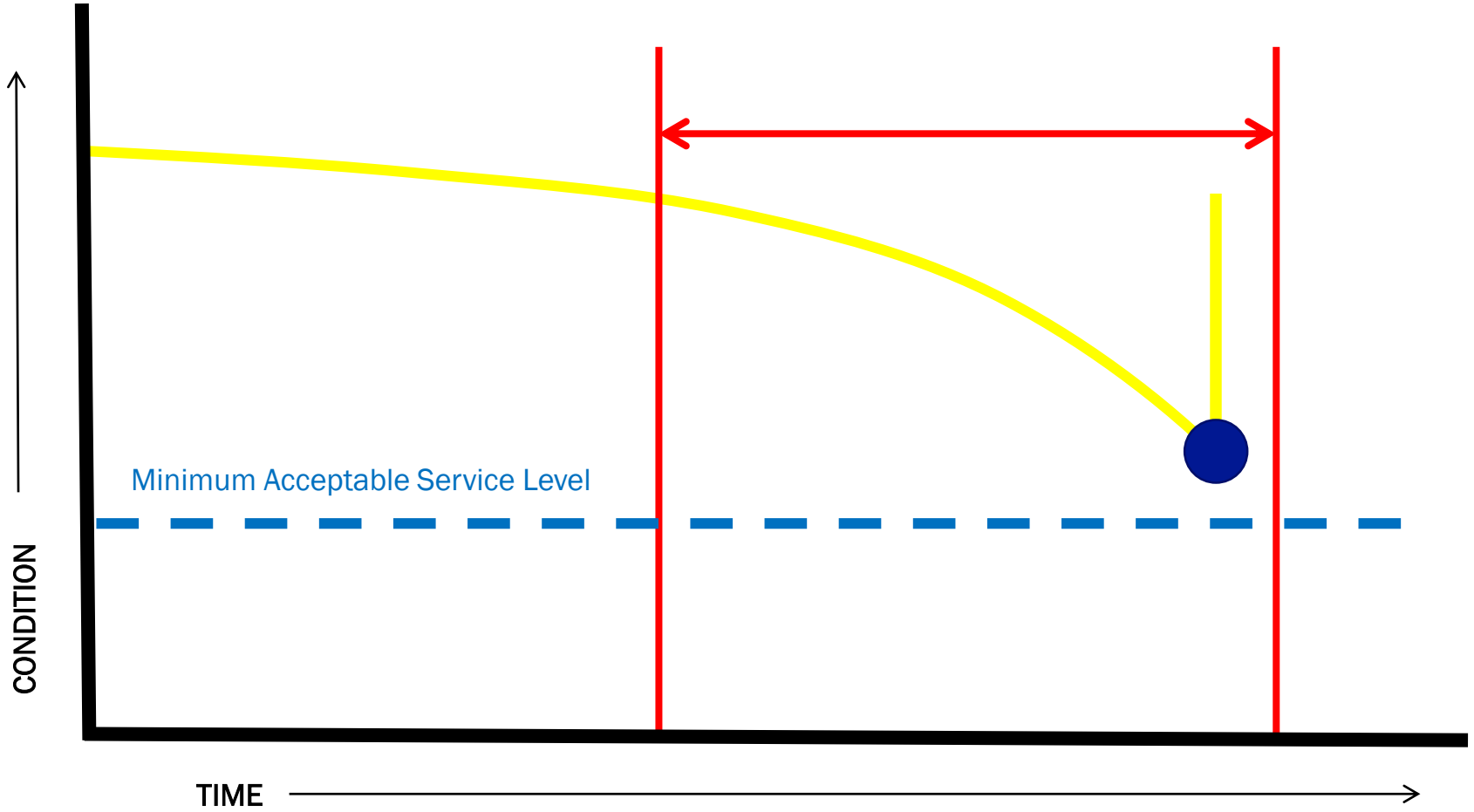
Condition Curve



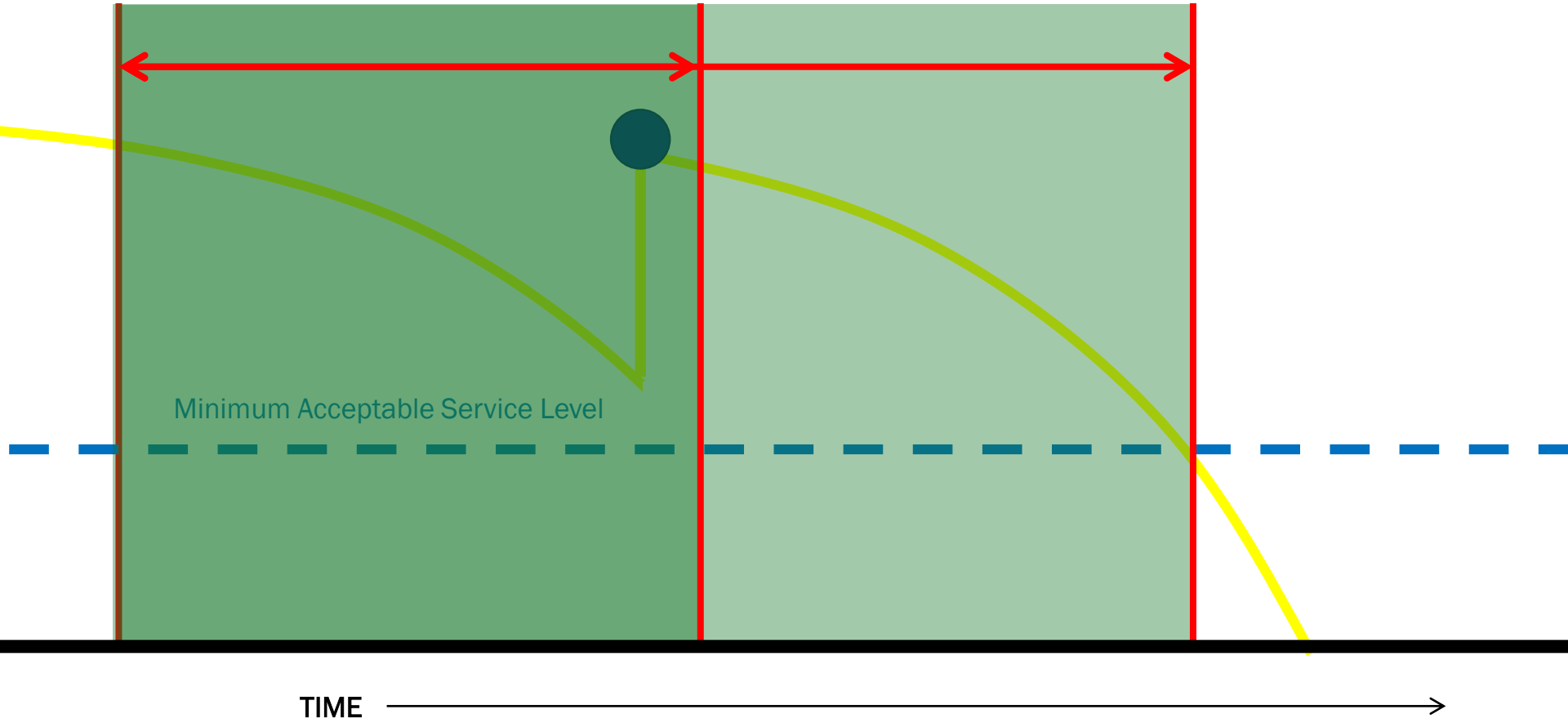
Condition Curve



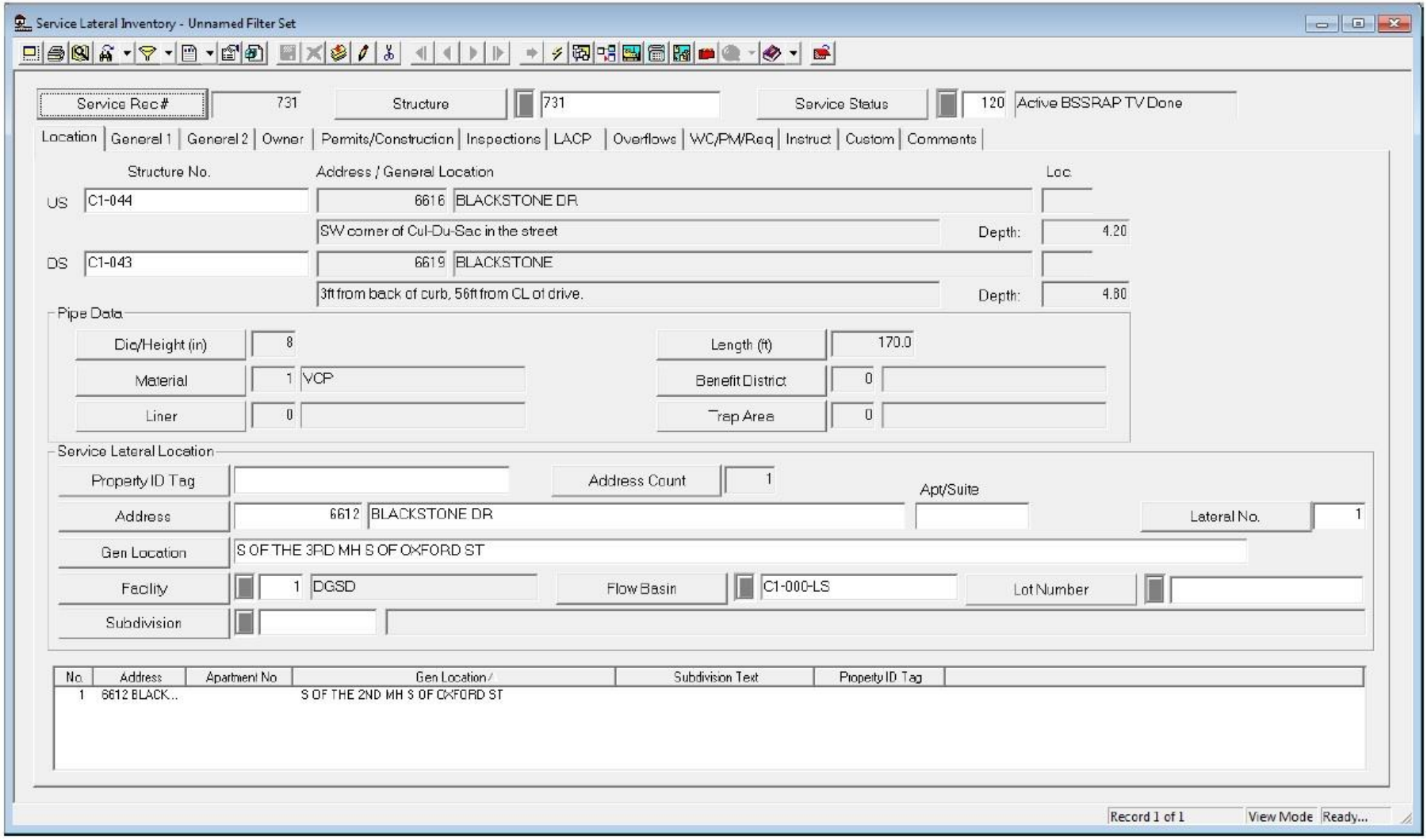
Condition Curve



Condition Curve



You need an Asset Inventory



Work Order Entry - Work Order Activity Rules

Row Tools

Order Type: WM — *Maintenance Work Order*

WO Type: 1 — *Maintenance Order*

Records 1 - 10

WO Status	WO Status Description	Next Status	Allowed Status 1	Allowed Status 2	Allowed Status 3	Allowed Status 4	Allowed Status 5
M	Maintenance Work Request	M*	MA	MR			
M*	MWO Waiting Manager Approval	MA	ME	MG	MI	MR	
MA	MWO Approved	MB	MD	ME	MI	MM	
MB	MWO Material Issued	MG	MH	MJ	MM		
MC	W/O In Planning	ME	MF	MG	MI	MJ	MM
MD	W/O Plant Shutdown	ME	MF	MG	MI	MJ	MM
ME	W/O Waiting for Parts	MF	MG	MH	MJ	MM	
MF	W/O Parts Staged and Ready	MG	MH	MJ			
MG	W/O Ready to Schedule	MH	MJ				
MH	W/O Issued & Released	MJ					

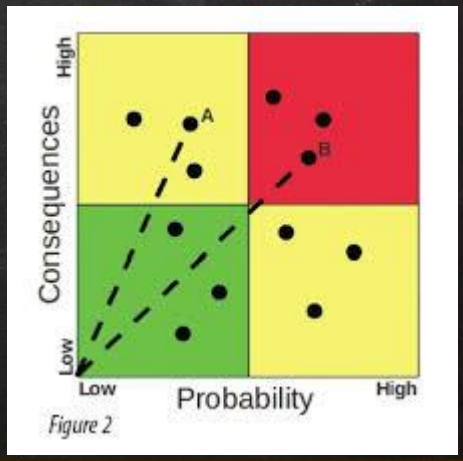


Figure 2

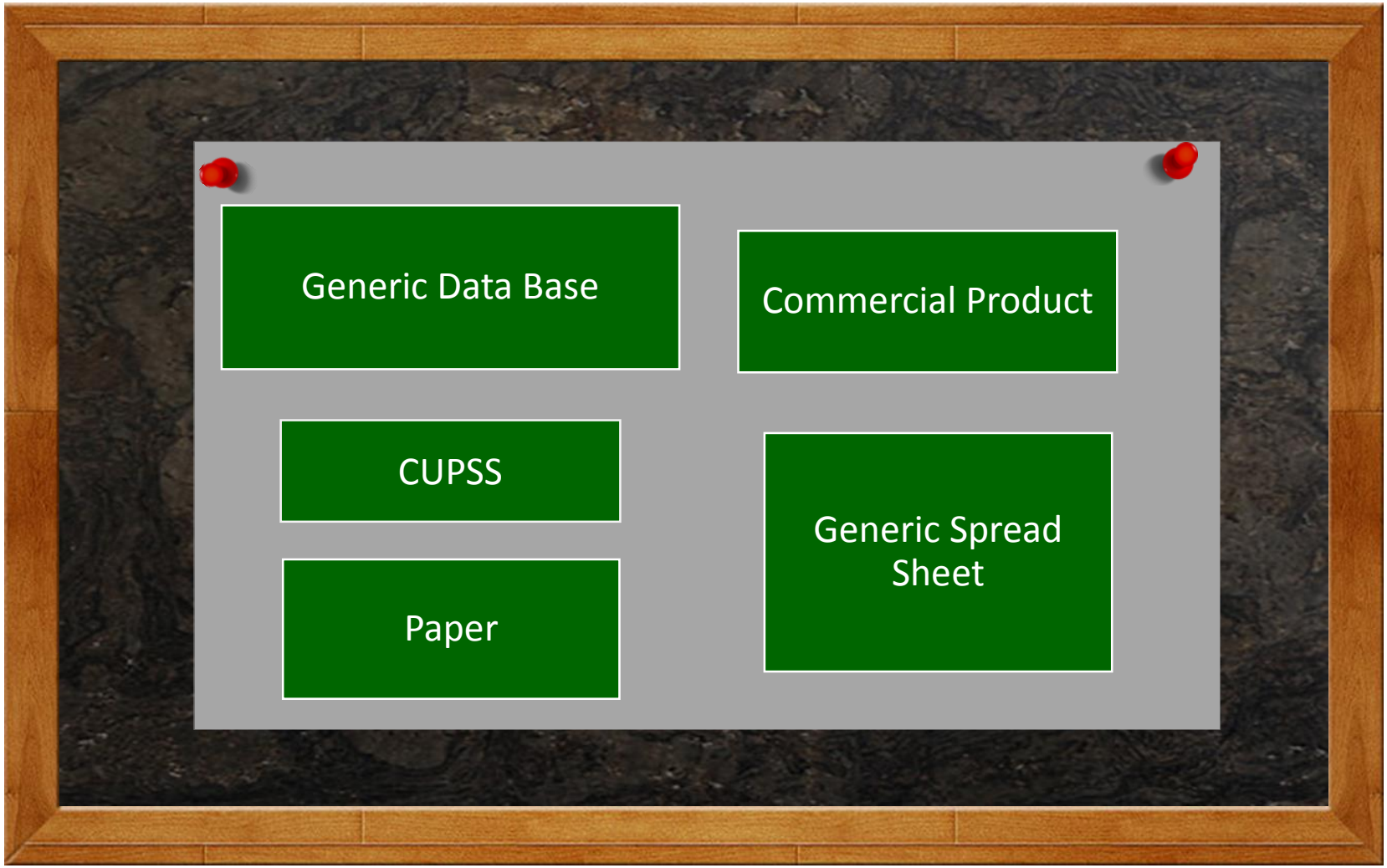
WHAT ASSETS DO YOU WANT TO TRACK?

GIVE ASSETS ID NUMBERS

- Systems Maps
- Interviews
- System Records
- Existing inventories
  Numbering Systems
- Photographs

START WITH THE DATA YOU HAVE

LOTS OF WAYS TO STORE DATA



Tools Available

Reference Guide for Asset Management Inventory and Risk Analysis

Inventory	
Necessary Data	Optional Data
• **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)**	• 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/

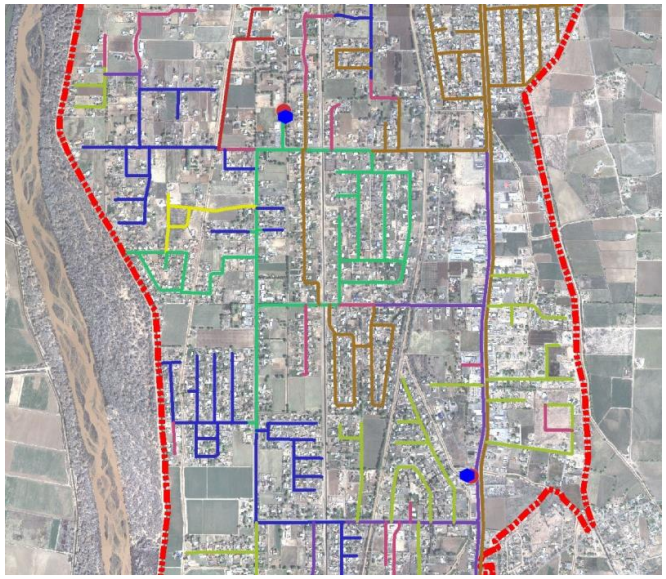
Tools Available

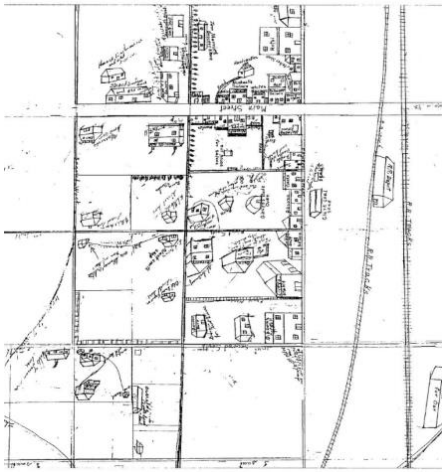
Inventory Spreadsheet

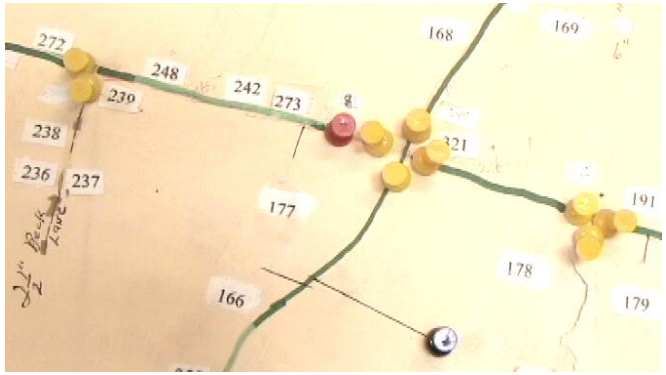
	A	B	C	D	E	F	G	H	I	J	K	L
1	System Name:											
2	Current Year	2018										
3												
4	ID Number	Asset Class or Category	Sub Asset Class or Sub Category	Asset Name	Type	Size	Length (if Pipe)	Operational Status (A = Active, I = Inactive, N = Non-Operational, S= standby/spare)	Manufacturer	Model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

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


Water Utility Mapping
When you know better,
you do better.
~ Maya Angelou
F7
G7
G8
6" CAST IRON
2" CAST IRON
4" PVC
6" PVC
12" PVC
2" PVC
The Rest of the Area is Cast Iron 70+yrs.
Cast Iron 40 yrs.
PVC 25yrs
12" PVC 20yrs.





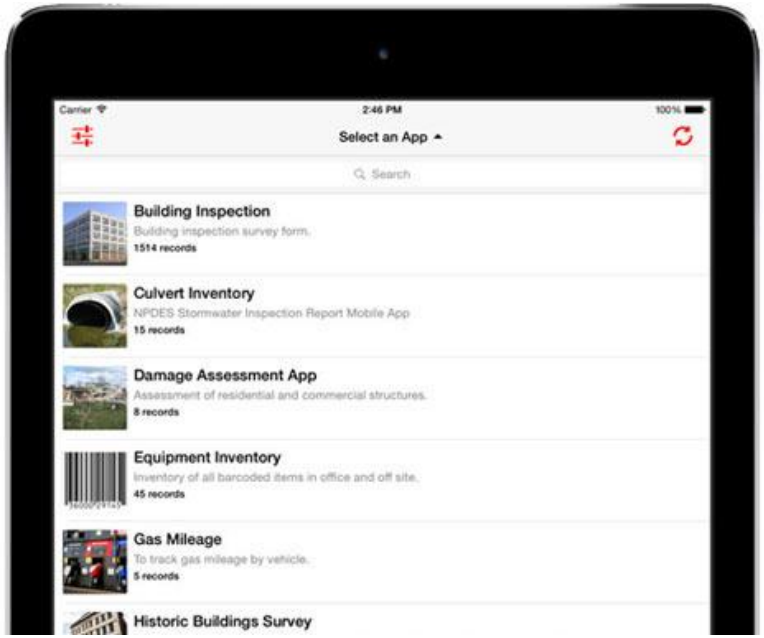


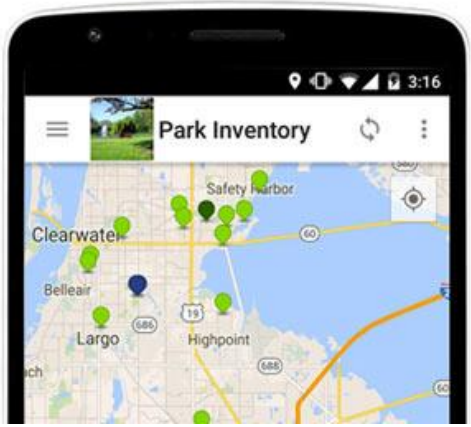
ALL TYPES OF MAPS CAN BE USEFUL.

Which assets would be helpful 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

Equipment & Software: How to choose





MAPPING IS ABOUT PROCESS

1

PLAN

Decide what you want to collect, what tools and software you need, and what time frame you're working in.

2

COLLECT

Go out and get your data: location info, office info, other info

3

COMBINE SOURCES

Pull together useful data from other available sources.

4

PROOF DATA

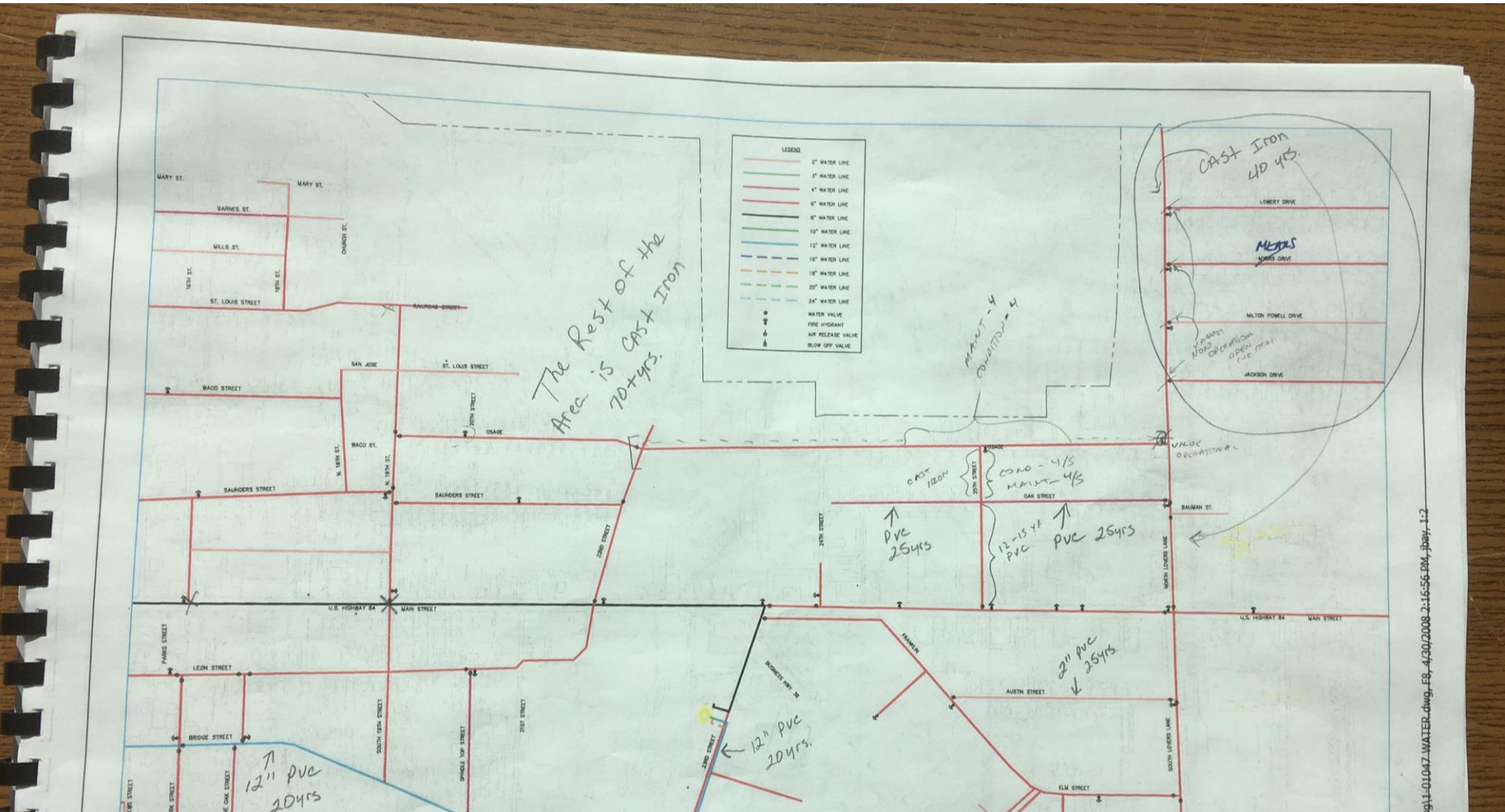
Review your data. Does it make sense? Are there conflicts?

5

MAKE MAPS, USE THEM & IMPROVE THEM

Use your maps, improve them and keep them current. A tool that isn't used is worthless.

An Example of Creating a Map format: A physical map book



Data in another format: Excel

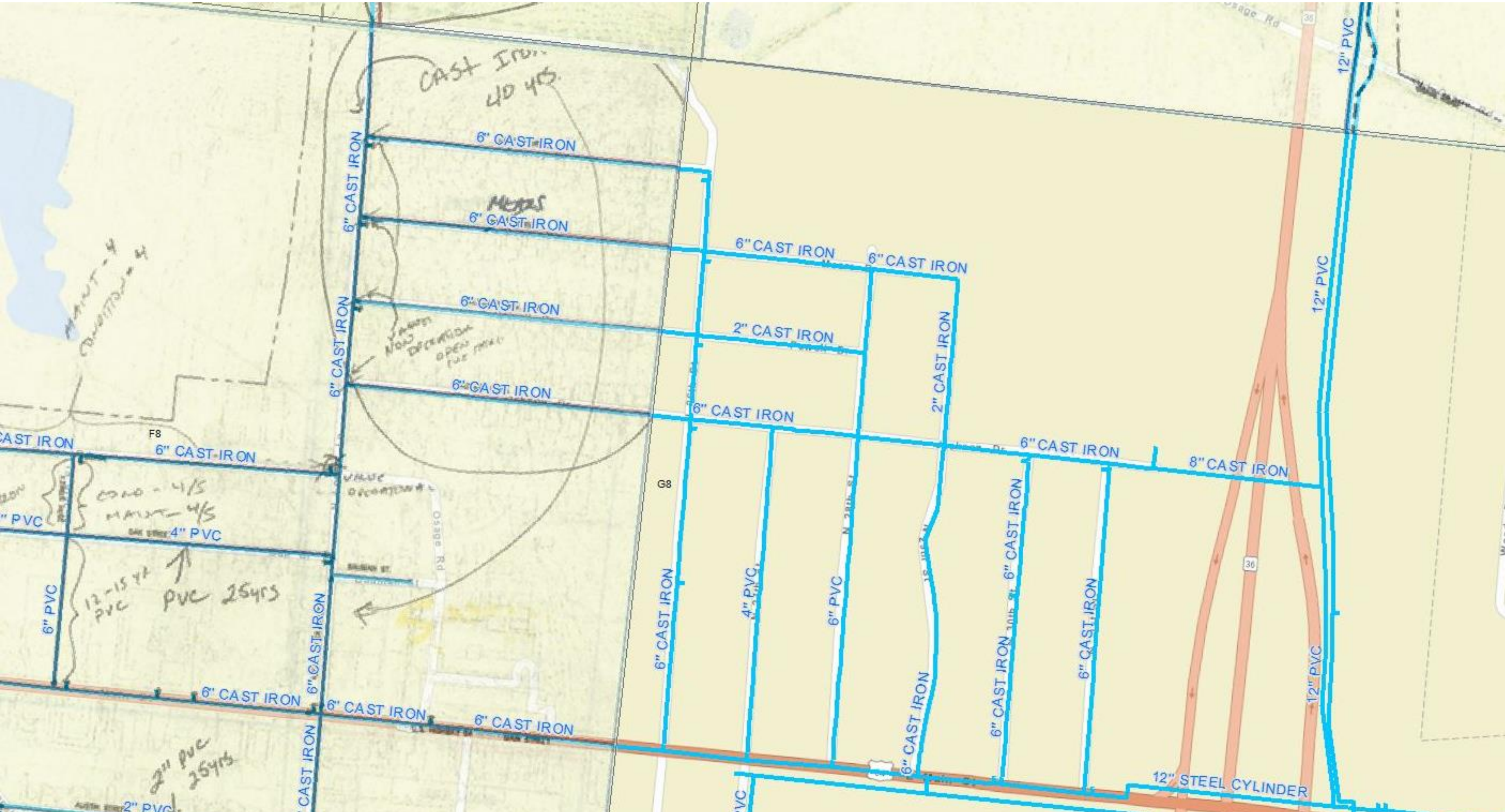
	A	B	C	D	E	F	G	H	I
1	WATER & SEWER LEAK CALL LOG								
2	WA/SE	DATE	TIME	ADDRESS	USER	CALLED	NOTES	UPDATES	WORK TICKET #
3	WA	2/9/2016	10:38AM	OLD HILLSIDE NURSING HOME	BH	RM	FIRE HYDRANT RUNNING	CREW WORKING ON LINE PER RM @ 10:50AM	48674
4	STREET	2/9/2016	11:24AM	1008 PLEASANT	DD	RM	LEAK IN THE STREET	FIXED	48642
5	SE	2/10/2016	10:00AM	400 FINNIMORE	BH	RM	SEWER BACKED UP AT STREET	UNCLOGGED	48683
6	WA	2/10/2016	10:00AM	3502 RIVER ROAD	BH	RM	A CAR HIT THE FIRE HYDRANT	FIXED DA/CN 2-22-16	48644
7	WA	2/10/2016	10:00AM	CORNER OR 22ND AND WACO	BH	RM	LEAK FILLING UP CULVERT		
8	SE	2/10/2016	10:36AM	2015 WACO STREET	DD	RM	RAW SEWER SHOOTING UP IN AIR FROM CLEAN OUT	UNCLOGGED	48684
9	WA	2/10/2016	3:15PM	1105 S LOVERS LANE	BH	RM	METER LEAK	FIXED	48647
10	WA	2/10/2016	3:30PM	206 FIELDSTONE	DD	RM	LEAK-METER WAS RUN OVER BROKE CUTOFF	FIXED	48648
11	WA	2/10/2016	3:32PM	119 N 28 ST	BH	RM	LEAK @ METER	FIXD	48649
12	WA	2/10/2016	3:57PM	119 N 28 ST	BH	RM	CUSTOMER CALLED AGAIN AND SAID METER LEAK WAS VERY LARGE. CALLED RODNEY TO LET HIM KNOW	FIXED	48649
13	WA	2/11/2016	9:00AM	28TH AND MEARS	BH	RM	WATER SHOOTING OUT OF MANHOLE	FIXED	48687
14	WA	2/11/2016	9:00AM	BLESSINGS BUILDING	BH	RM	WATER LEAK BEHIND BUILDING	FIXED	48671
							CALLED LAST NIGHT AT 8 AND THEY		

Used primarily in printed form…

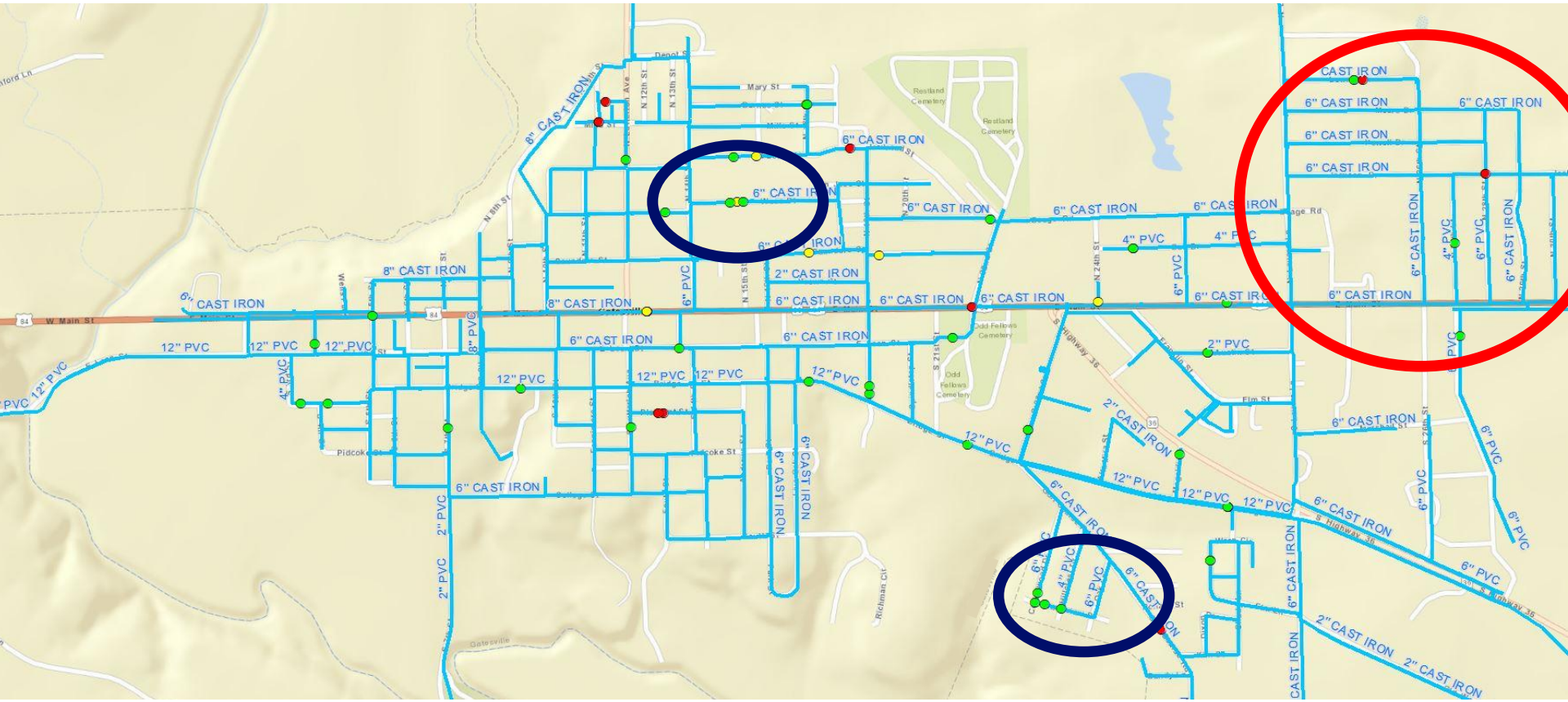
WATER & SEWER LEAK CALL LOG

WA/SE	DATE	TIME	ADDRESS	USER	CALLED	NOTES	UPDATES	WORK TICKET #
WA	02/09/2016	10:38AM	OLD HILLSIDE NURSING HOME	BH	RM	FIRE HYDRANT RUNNING	CREW WORKING ON LINE PER RM @ 10:50AM	48674
STREET	02/09/2016	11:24AM	1008 PLEASANT	DD	RM	LEAK IN THE STREET	FIXED	48642
SE	02/10/2016	10:00AM	400 FINNIMORE	BH	RM	SEWER BACKED UP AT STREET	UNCLOGGED	48683
WA	02/10/2016	10:00AM	3502 RIVER ROAD	BH	RM	A CAR HIT THE FIRE HYDRANT	FIXED DA/CN 2-22-16	48644
WA	02/10/2016	10:00AM	CORNER OR 22ND AND WACO	BH	RM	LEAK FILLING UP CULVERT		
SE	02/10/2016	10:36AM	2015 WACO STREET	DD	RM	RAW SEWER SHOOTING UP IN AIR FROM CLEAN OUT	UNCLOGGED	48684
WA	02/10/2016	3:15PM	1105 S LOVERS LANE	BH	RM	METER LEAK	FIXED	48647
WA	02/10/2016	3:30PM	206 FIELDSTONE	DD	RM	LEAK-METER WAS RUN OVER BROKE CUTOFF	FIXED	48648
WA	02/10/2016	3:32PM	119 N 28 ST	BH	RM	LEAK @ METER	FIXD	48649
WA	02/10/2016	3:57PM	119 N 28 ST	BH	RM	CUSTOMER CALLED AGAIN AND SAID METER LEAK WAS VERY LARGE. CALLED RODNEY TO LET HIM KNOW	FIXED	48649
WA	02/11/2016	9:00AM	28TH AND MEARS	BH	RM	WATER SHOOTING OUT OF MANHOLE	FIXED	48687
WA	02/11/2016	9:00AM	BLESSINGS BUILDING	BH	RM	WATER LEAK BEHIND BUILDING	FIXED	48671
SE	02/11/2016	9:53A	102 1/2 SURRY 300A	DD	RM	CALLED LAST NIGHT AT 8 AND THEY TURNED OFF WATER BUT THEN REALIZED	SEWER STOP UP FIXED	48685
SE	02/11/2016	11:01AM	409 PARK	DD	RM	SEWER BACKING UP BUT SAID THEY NEED TO PUMP BOTH SIDES, WHEN THEY ONLY	FIXED	48686
				KS	RM	WANTS TO KNOW IF THERE IS A METER IN PLACE OR IF HE NEEDS TO GET ONE INSTALLED	01/16/2016 11:20:00 AM THERE IS AN EXISTING WATER LINE THERE, WILL INSTALL METER WHEN THEY ARE READY	48659/48676
						WATER LEAK	IT IS NOT A LEAK 02-17-16	48654

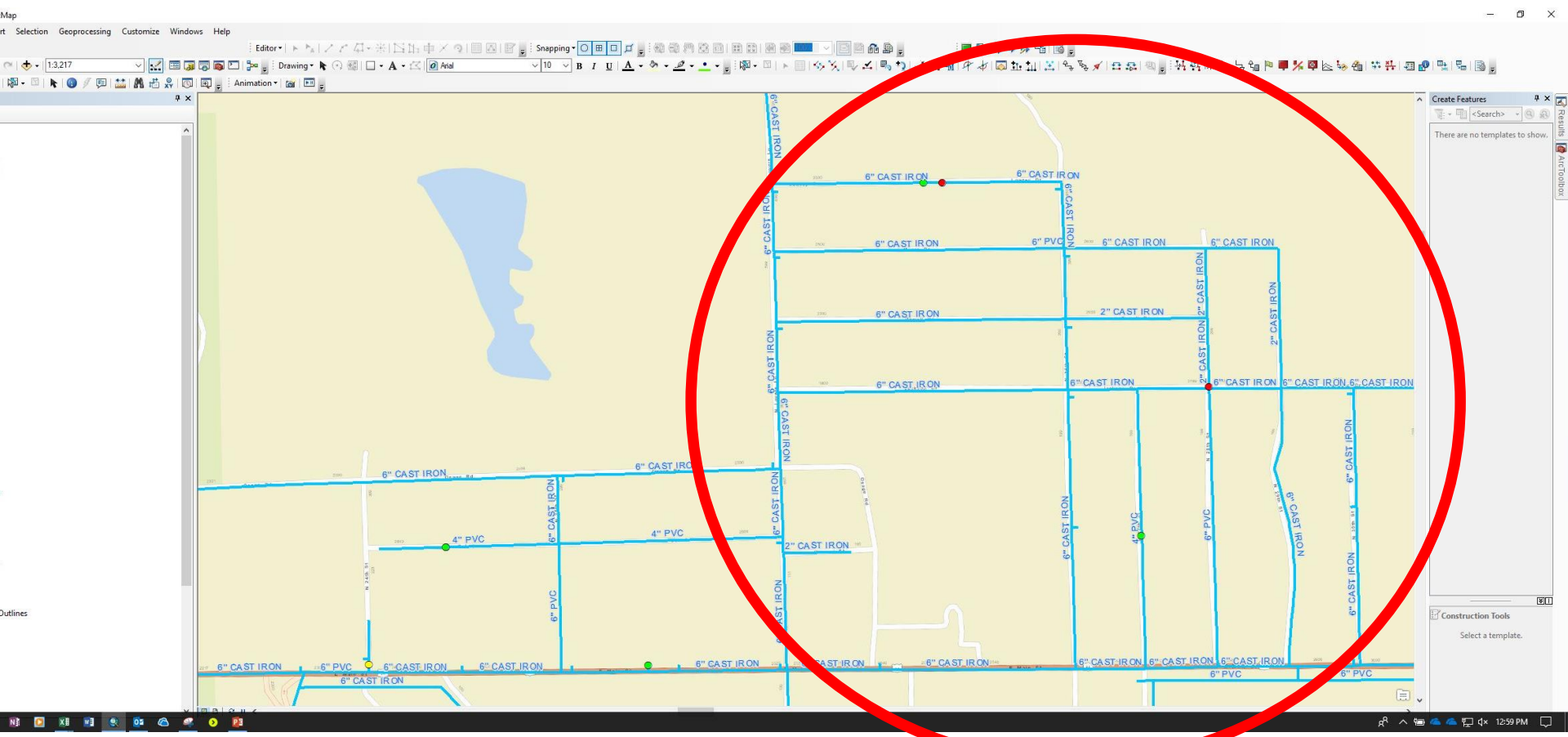
Same data combined in another format: GIS



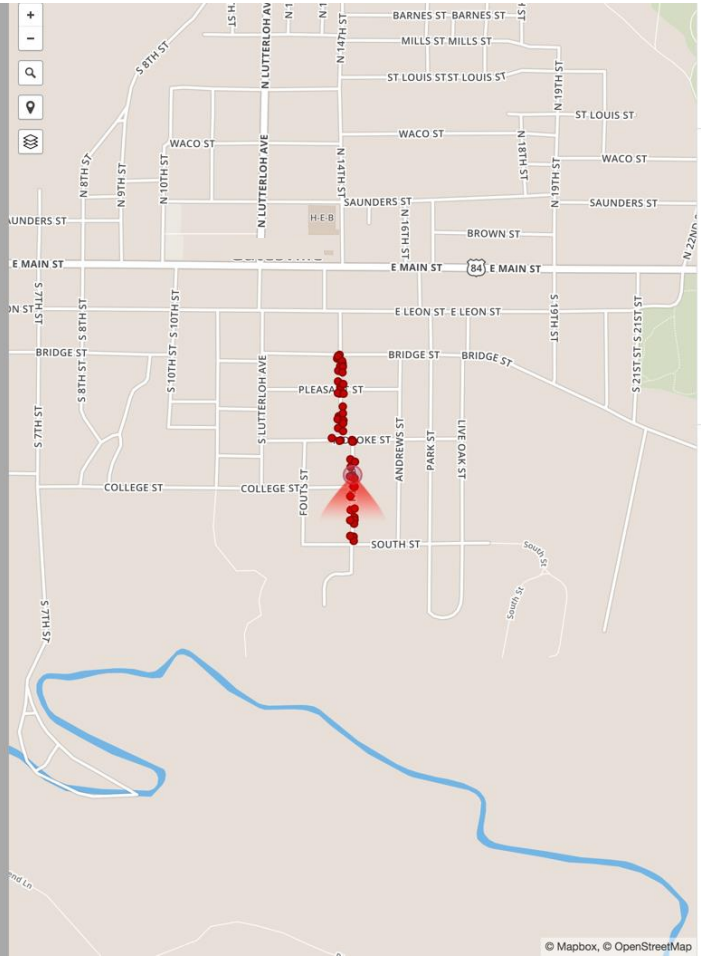
Same data combined in another format: GIS



Close up of same data



20 Years of pavement cuts…



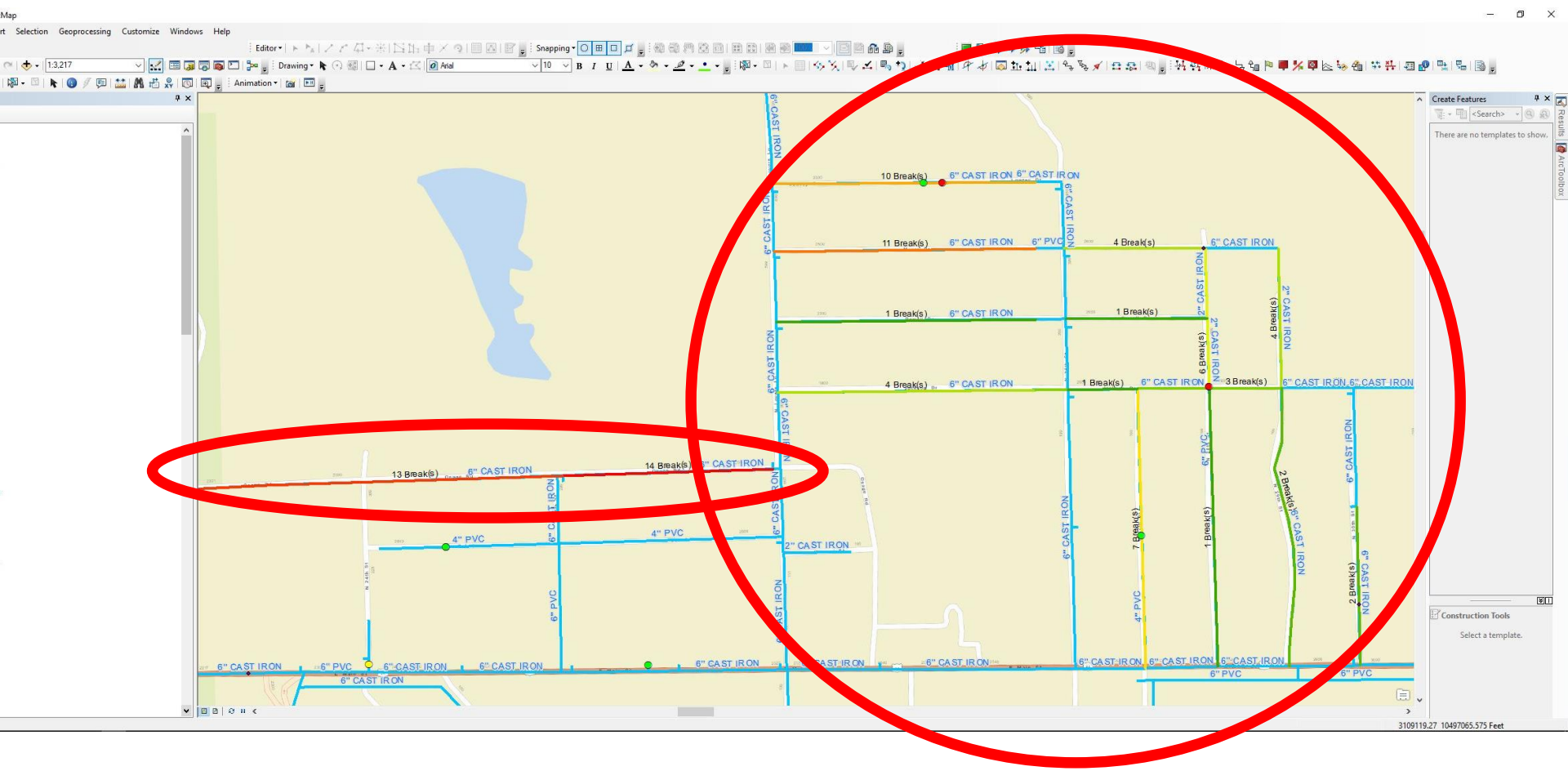
Download

Original
Large
Thumbnail

Metadata

Date:	2017-04-06 13:53:28
Make/Model:	Apple iPhone 6
Software:	Fulcrum iOS 2.14.0 (3057), iOS 10.2.1, Apple, iPhone 6
Dimensions:	810 x 1080 (0.9MP)
Size:	474 KB
Latitude:	
Longitude:	
Accuracy:	
Altitude:	
Direction:	
Distance:	

Combined data from all sources



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.

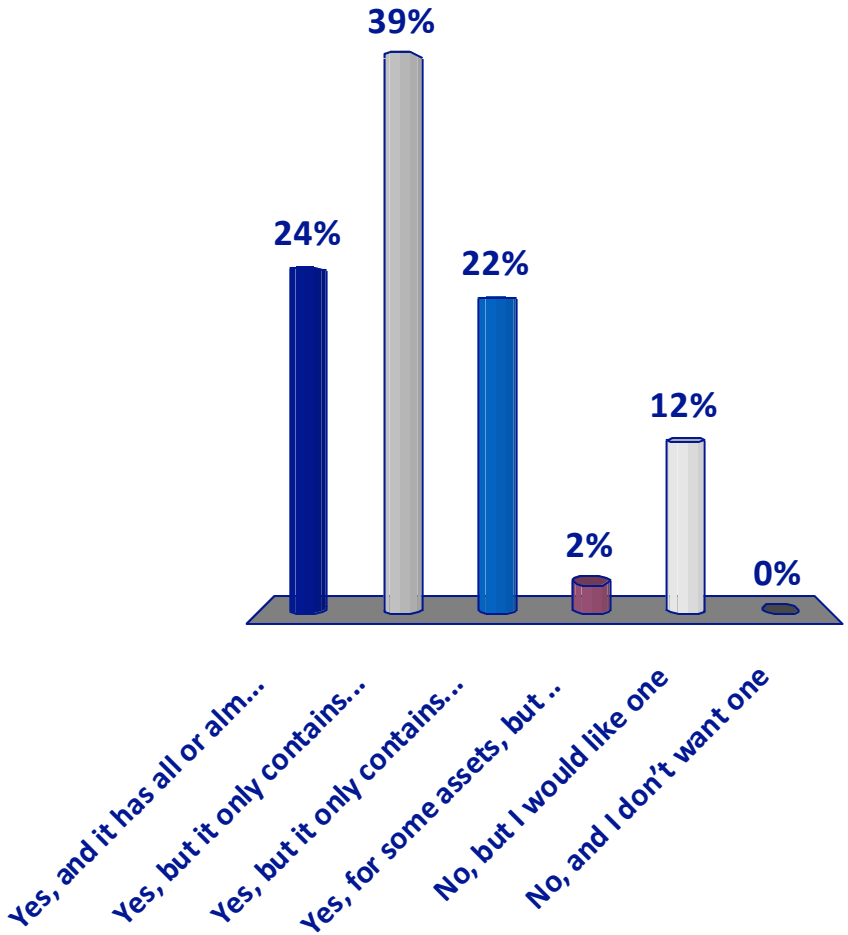
The whole is more valuable than the individual parts.

We've harnessed the collective knowledge…

… to make better, data-driven, decisions.

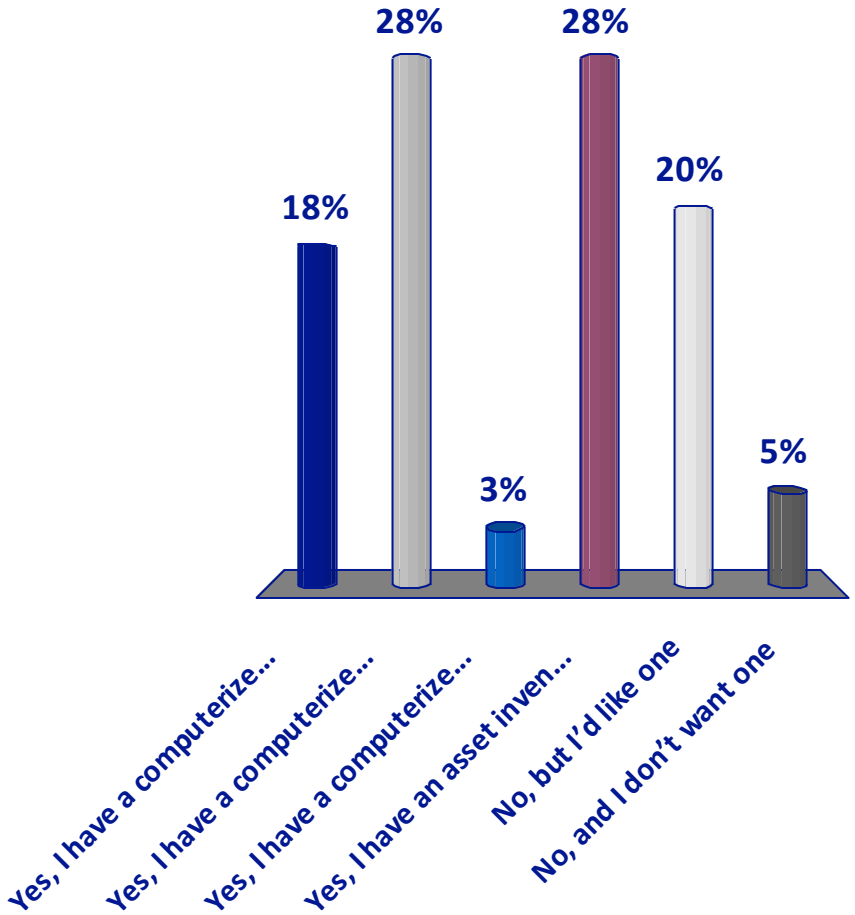
Do you have a map indicating where your assets are located?

A. Yes, and it has all or almost all of my assets
B. Yes, but it only contains some of my assets
C. Yes, but it only contains some of my assets and is not very accurate
D. Yes, for some assets, but we don't use
E. No, but I would like one
F. No, and I don't want one



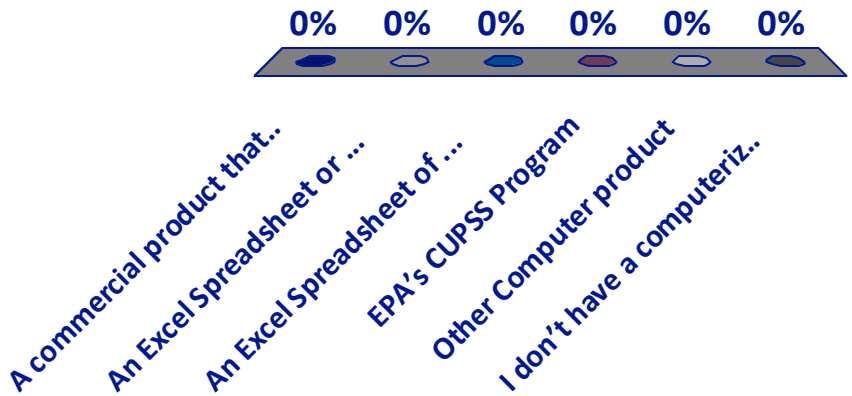
Do you have an inventory of your assets?

A. Yes, I have a computerized asset inventory that has all or almost all of my assets
B. Yes, I have a computerized asset inventory but it only has a portion of my assets
C. Yes, I have a computerized asset inventory but it is in a format that I find unhelpful or not very useful
D. Yes, I have an asset inventory on paper
E. No, but I'd like one
F. No, and I don't want one



What type of computerized inventory program do you use?

A. A commercial product that I pay for
B. An Excel Spreadsheet or Access Database that someone customized for us
C. An Excel Spreadsheet of Access Database that we developed
D. EPA's CUPSS Program
E. Other Computer product
F. I don't have a computerized inventory program



LET'S DO A SIMPLE ASSET MAPPING WORKSHOP …

Level of Service

Setting and measuring level of service goals

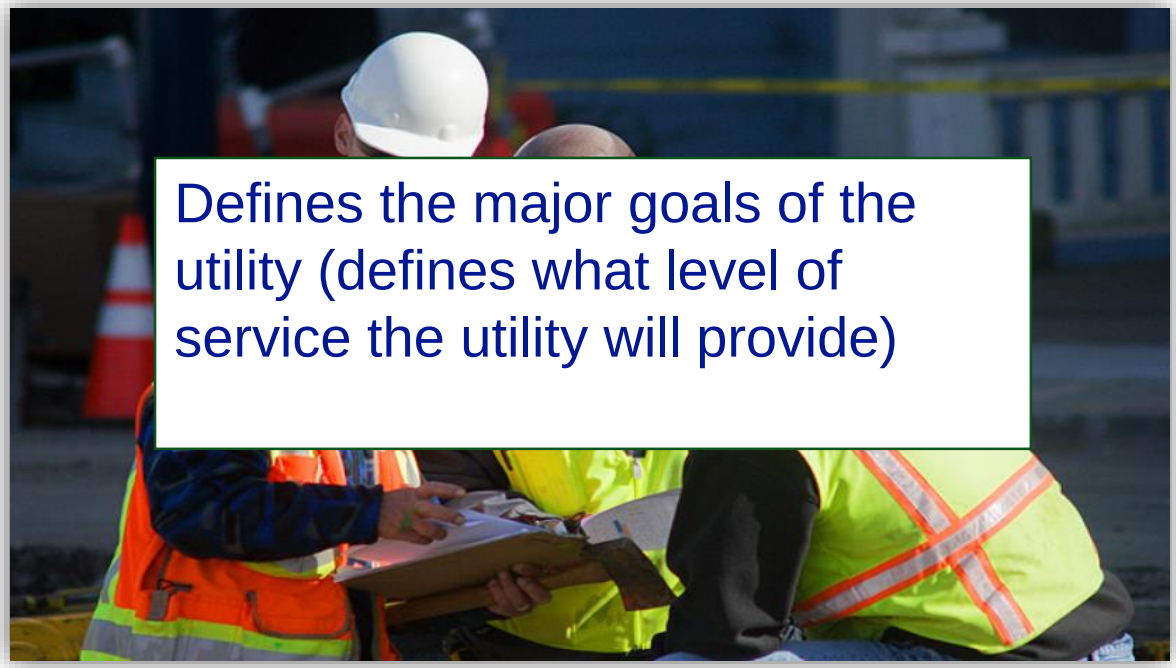
WATER UTILITIES ARE FIRST AND FOREMOST CUSTOMER SERVICE BUSINESSES

SO IT'S ALL ABOUT THE CUSTOMERS

CUSTOMER SERVICE IN ASSET MANAGEMENT TERMS

CALLED LEVEL OF SERVICE

CUSTOMER SERVICE IN ASSET MANAGEMENT TERMS



CALLED LEVEL OF SERVICE

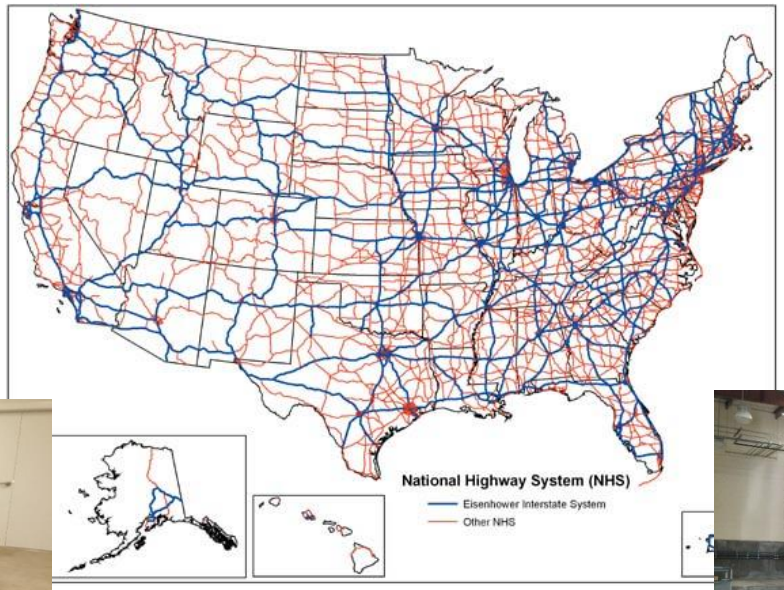
LEVEL OF SERVICE IS A CHANCE TO

What's really important

HAVE A CONVERSATION WITH CUSTOMERS

Why does it matter if you actually know what you provide your customers? Why should you care?

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



Developing your own road map

Goals

1.

2.

3.


GOAL SETTING
S
SPECIFIC
M
MEASURABLE
A
ATTAINABLE
R
RELEVANT
T
TIME-BOUND

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 O 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?

“Every

“There is no
chlor
fluori
the

“T
d
white.”

e
water to
my kids.”

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

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?

What would we measure?

Call log of complaints
Nature of complaints
When the call came in
When someone responded

How could we collect or save the data?

Word table
Excel spreadsheet
Database
Computer program

How often would we check whether we met this goal?

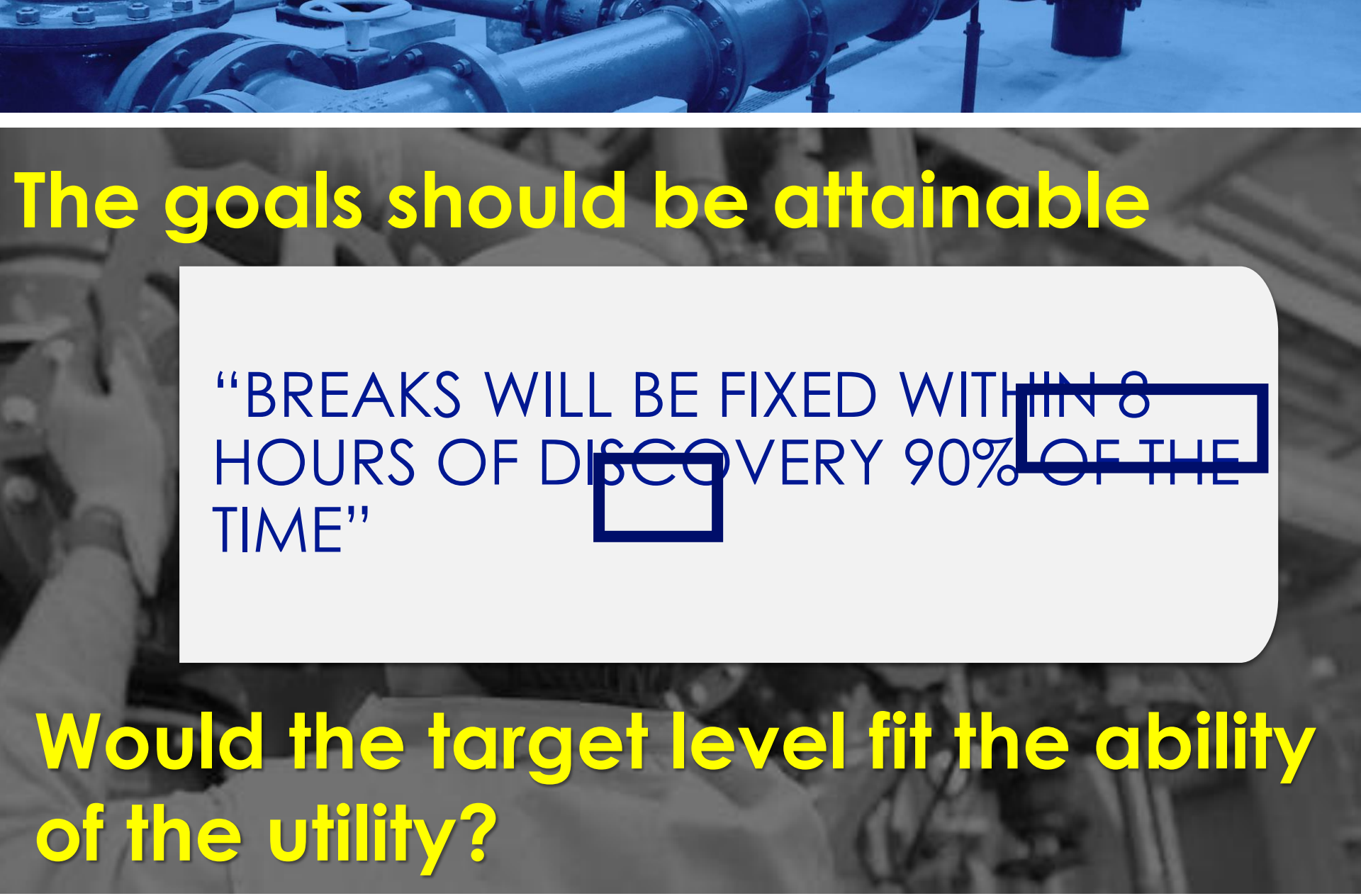
Weekly?
Monthly?
Quarterly?
Semi-Annually?
Annually?

What are the advantages and disadvantages of more often or longer time frames?

Who would want to know whether you met the goal?

Managers?
Elected Leaders
Customers?
Others?

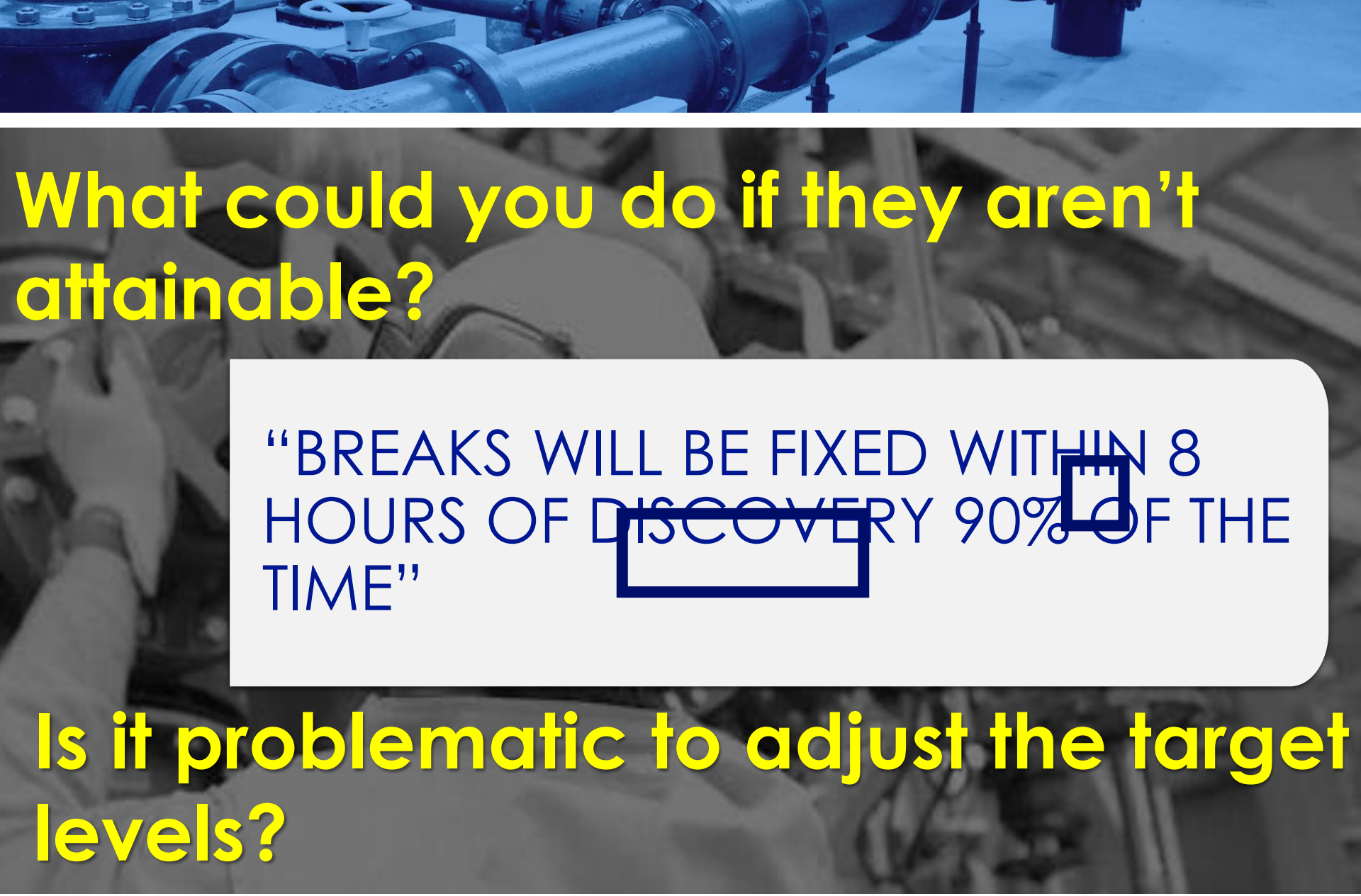
How would you tell each? How could you share the information?



The goals should be attainable

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

Would the target level fit the ability of the utility?



What could you do if they aren't attainable?

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

Is it problematic to adjust the target levels?

The goals should be relevant or realistic to the utility

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

Would the goal be relevant or realistic to the utility?

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

Don’t we already operate with goals?

UNDERSTANDING OF COSTS

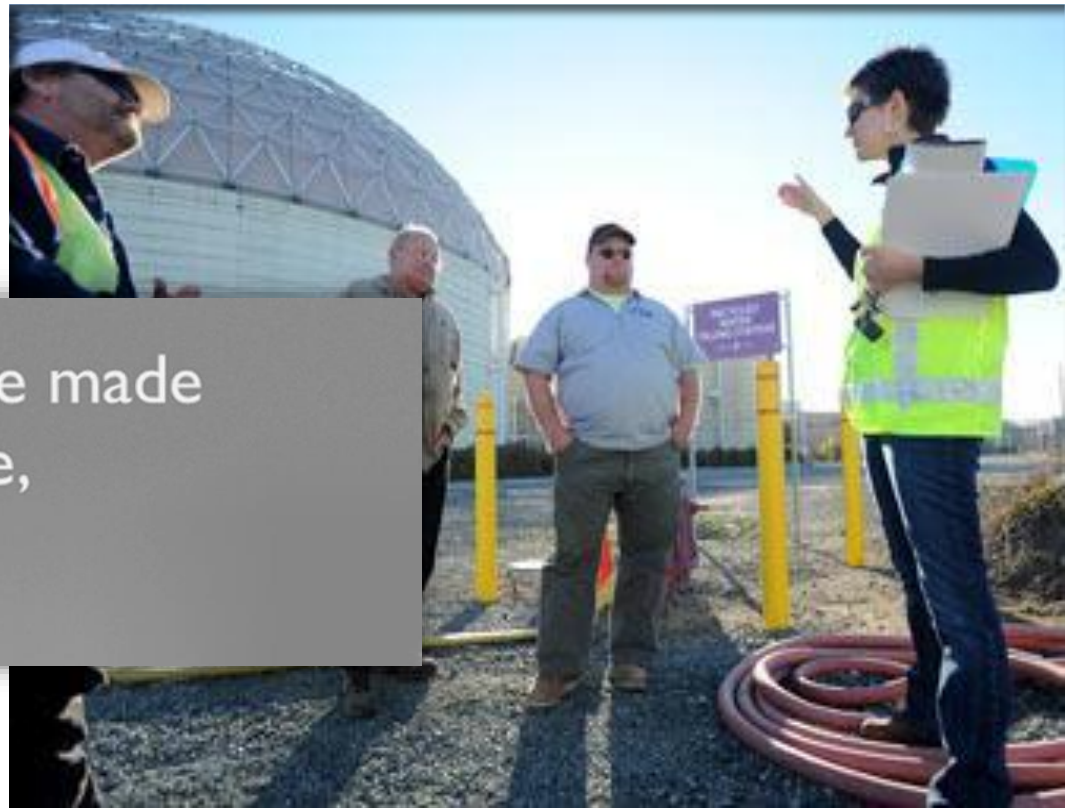
Service and cost are related

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

New Zealand

Ross Waugh, AM Practitioner, New Zealand Video LS-6

ONE MORE ACRONYM…..KISS



> "Everything should be made as simple as possible, but not simpler."
>
> Albert Einstein

Keep it Simple and Sustainable

Recall

We want written goals in order to understand what we are trying to do

If we have written goals, we need to measure them

AM IN ACTION: MEASURING LEVEL OF SERVICE GOALS

Stacy Gallick,
Formerly with Johnson County Wastewater, Kansas

O&M monthly report for-				Jan-11
Treatment				Levels of Service (LOS)
	Monthly	Year to date	% compliance	Goals
Flow treated, mg				
Average flow treated, mg				
Total Violations				
Monthly compliance				
Plant violations				
Plant 1				5 or fewer/year or
Plant 2				98% compliance
Plant 3				
Plant 4				
Plant 5				
Plant 2 wet wether				70% compliance
Plant 3 wet weather				70% compliance
Solids Disposal				
503 compliance				100% compliance
Bio solids land applied				40% or more land applied
Bio solids land filled				remainder to be land filled
Odor complaints				Less than 10 complaints/year
Preventive work orders				
Corrective work orders				10 to 15% of total work orders
Collections				
	Monthly	Year to date	% compliance	
Lines cleaned				Clean 52 miles/month or 624 miles/year
Line televised				Televise 2% annually or 3 miles/month
Number of back ups				
overflows				Backups/overflows- less than 4/year
dry weather				Dry- less than 2.4/100 miles/year or 53/year
wet weather				Wet- less than 2.4/100 miles/year at a 10 year rain event or 53/year
Manhole repairs				
Line repairs				
Odor complaints				
Preventive work orders				
Corrective work orders				
Safety				
Training scheduled				32 hours/employee/year
	Monthly	Year to date		
Training completed, hours				

PREV 1 2 3 4 5


GOAL:
GOAL:
GOAL:
GOAL:


GOAL

GOAL ARE NOT SET IN STONE

GOALS CAN BE CHANGED

GOALS CAN BE ADDED OR REMOVED

OR ADJUSTED OVER TIME

Level of Service Goals
Example from a Utility:

- Increasing Hydrant Inspection to 100% in a 5 year period
- Lowering non-functioning hydrants to <= 1% per fiscal year
- Reducing 3 month consecutive estimated billings to < 5% of customers
- Reducing Non-Revenue water to 10% per fiscal year
- Tracking tools to ensure that goals are being met

Tools Available

Southwest Environmental Finance Center

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.

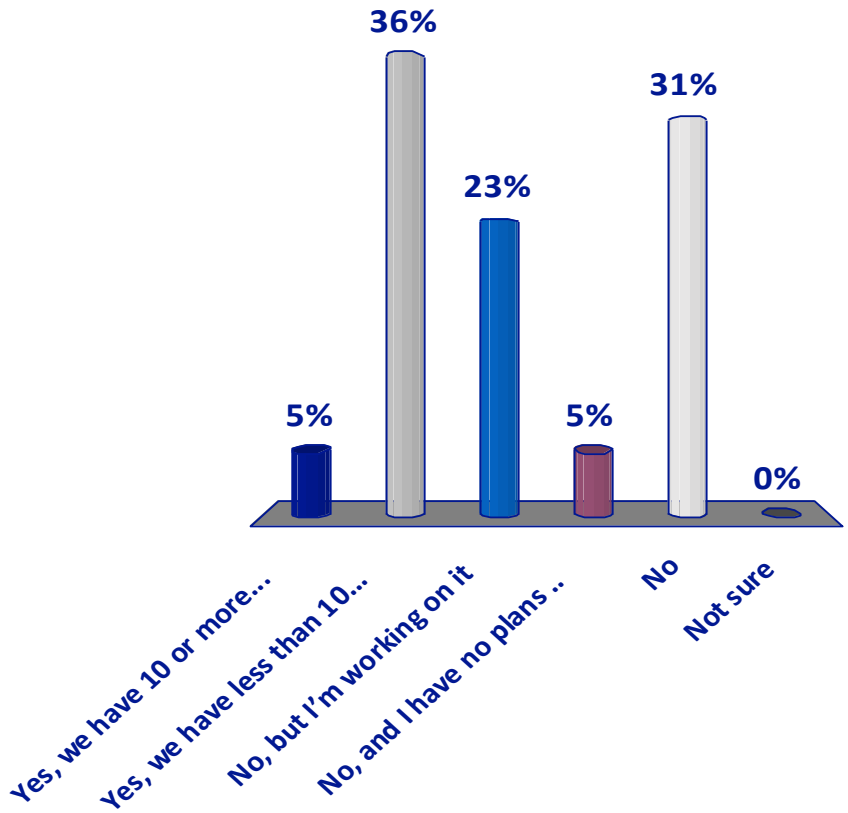
Determining your Level of Service goals should not be overwhelming. Keep it simple; develop 10 – 12 goals around the most important aspects for your utility. The information below can be used as a resource in setting your utility's goals.

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

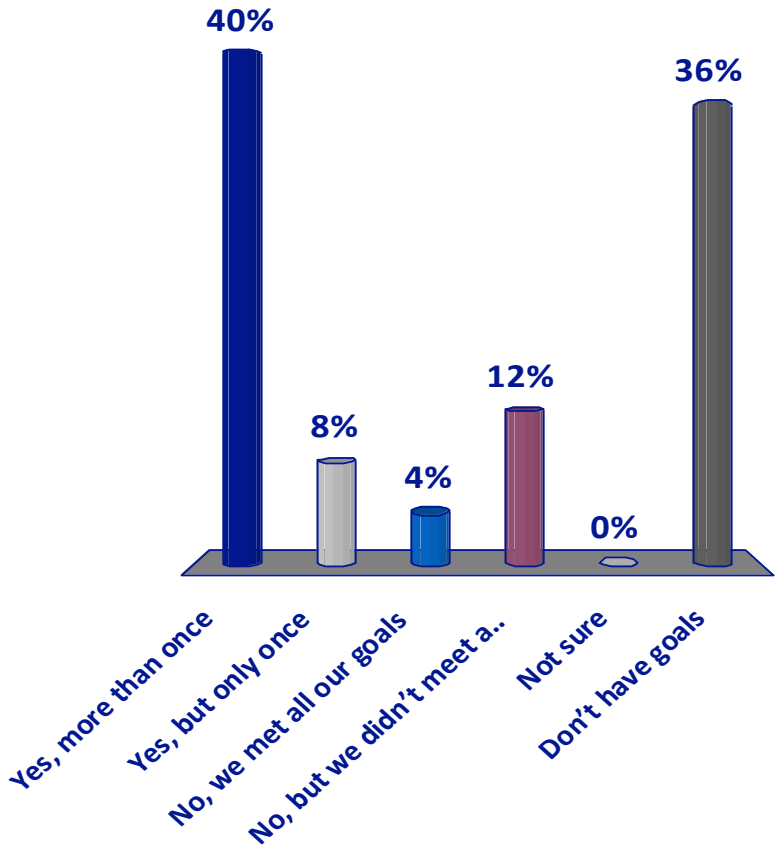
Have you set any level of service goals?

A. Yes, we have 10 or more goals that we track
B. Yes, we have less than 10 goals that we track
C. No, but I'm working on it
D. No, and I have no plans to do so
E. No
F. Not sure



If you have goals, have you made any changes (personnel, operational, funding, or any other) based on not meeting a goal?

A. Yes, more than once
B. Yes, but only once
C. No, we met all our goals
D. No, but we didn't meet all our goals
E. Not sure
F. Don't have goals




WORKSHOP

CRITICALITY

How important is it that specific assets keep functioning?

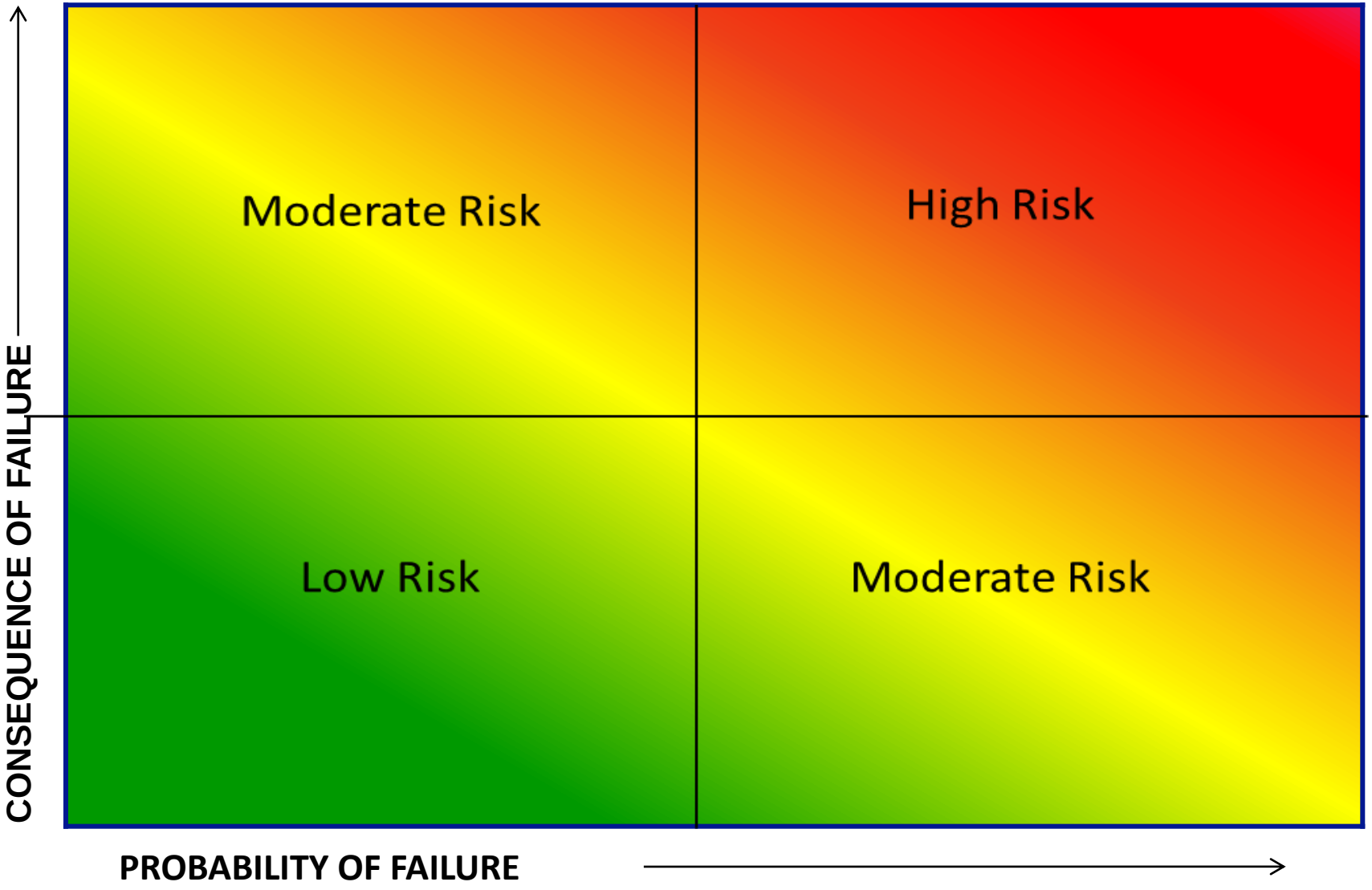
Critical Assets

Using data to generate probability of failure–such as pipe break data–which is the first part of criticality, and how to add consequences to the analysis

What is the likelihood that an asset will fail?

What is the consequence if the asset does fail?

ASSET RISK


Moderate Risk
High Risk
Low Risk
Moderate Risk
CONSEQUENCE OF FAILURE
PROBABILITY OF FAILURE

Failure Modes

MORTALITY

LEVEL OF SERVICE

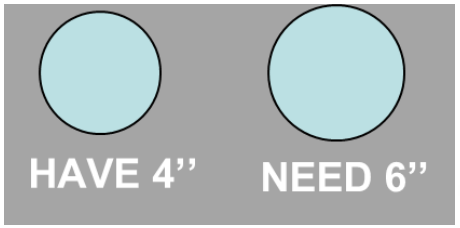
CAPACITY

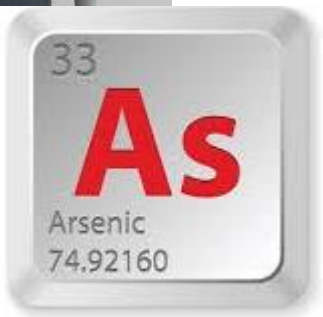
FINANCIAL INEFFICIENY

MORTALITY

FAILURE MODES

LEVEL OF SERVICE





FAILURE MODES

CAPACITY

FAILURE MODES

FINANCIAL INEFFICIENCY

More to fix than to replace

ASESSING CONSEQUENCES?

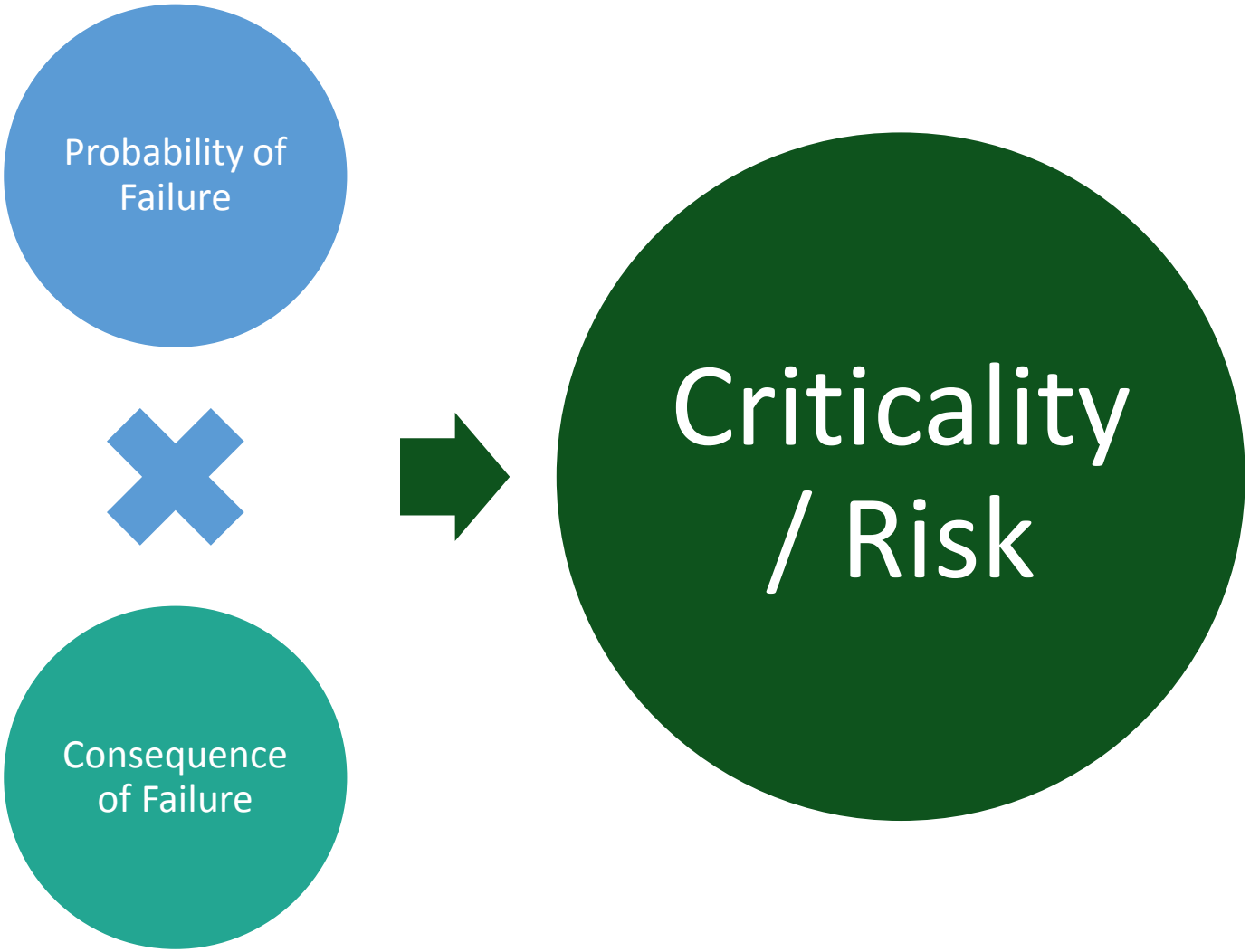
FINANCIAL

ENVIRONMENTAL

SOCIAL

CONSIDER THE TRIPLE BOTTOM LINE

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 Very Low	**2** Low	**3** Moderate	**4** High	**5** 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

- 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

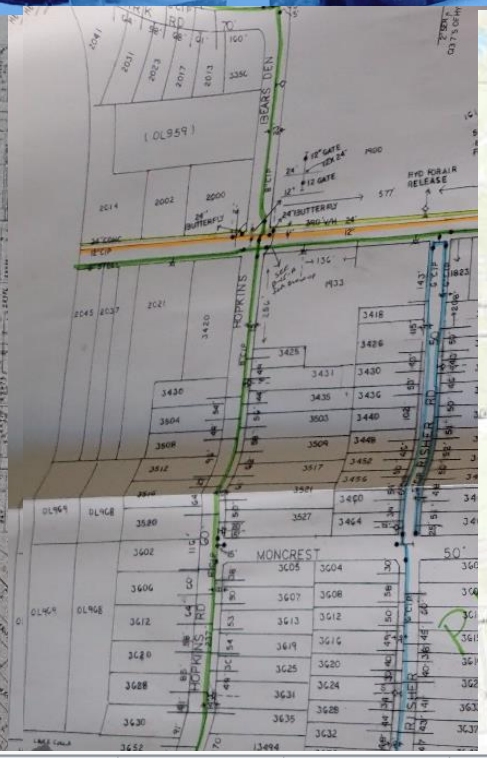
- Inability to fight a fire - loss of property, loss of life
- Inability to properly flush system - health concerns
- Water damage to nearby structures
- Level of Service Failures

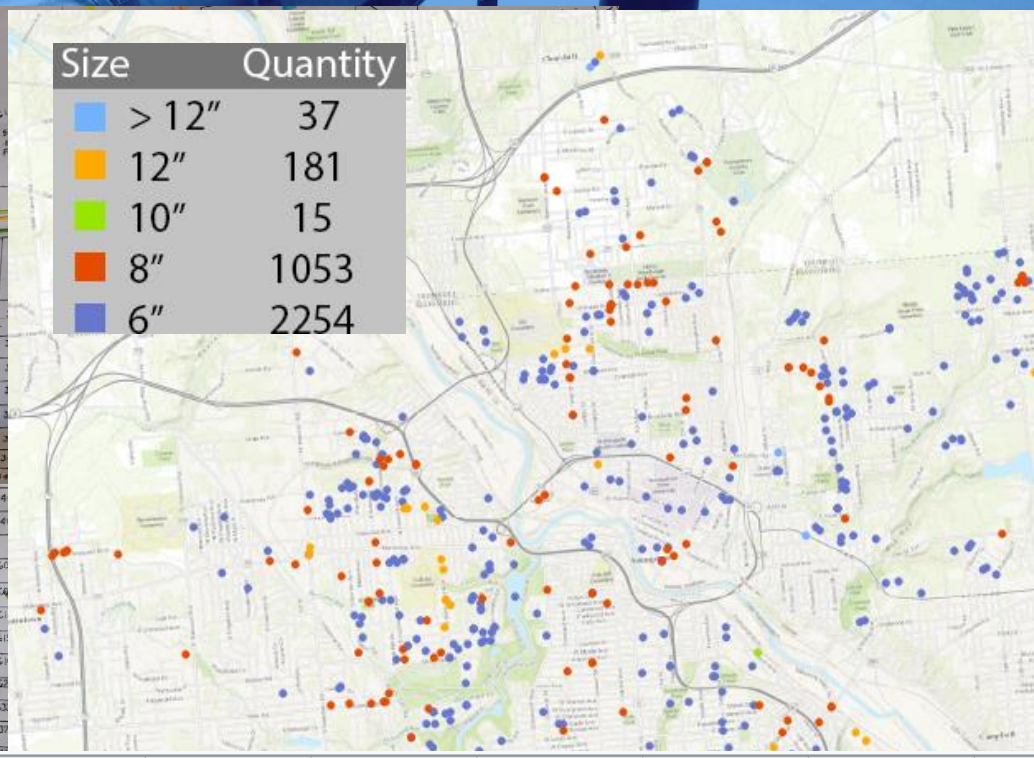
Provides you with lists of characteristics to take into consideration when determining Probability and Consequence of Failure

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

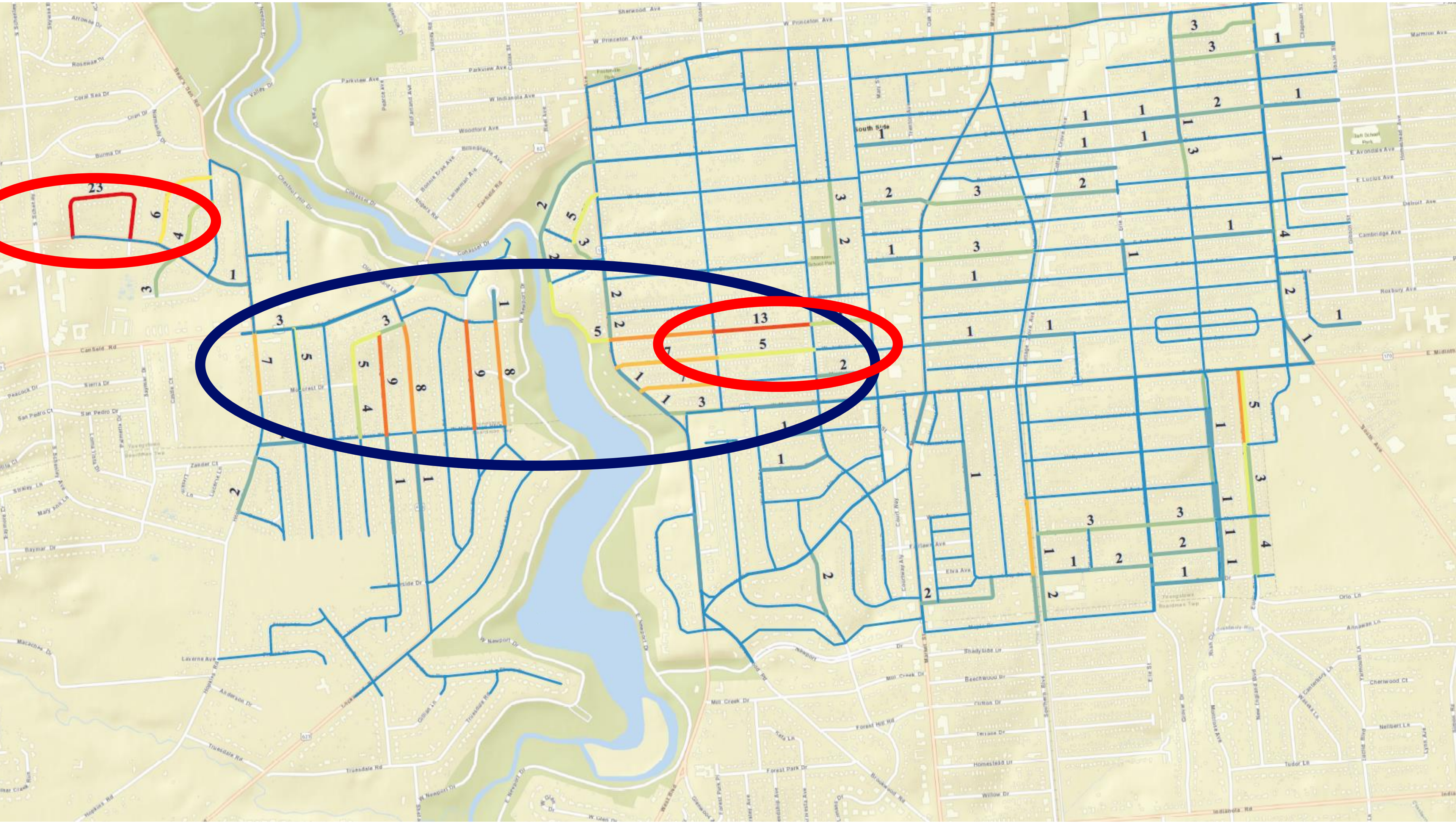
Using data to generate probability of failure

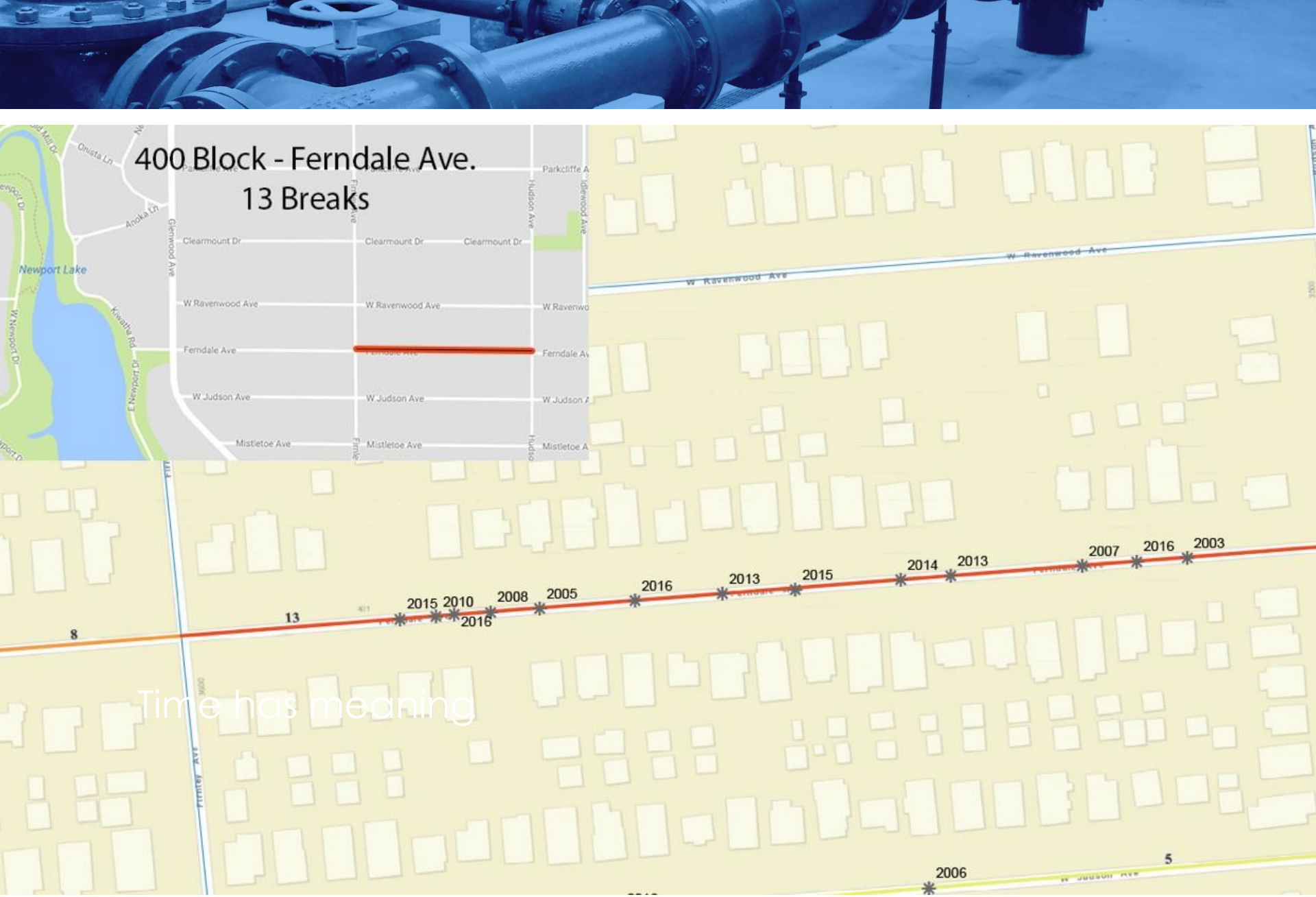
An Example





ID	LOCATION	W_O_DATE	WORK_ORDI	ADDRESS	DIRECTION	TYPE_WORK	DATE_REP	COMMENTS	COUNT	ACCOUNT	W_
1	BENITA	20030204		250		30	2030318	JM Rayen Schoc		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	CLARENCEDALE	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




400 Block - Ferndale Ave.
13 Breaks
Clearmount Dr
W Ravenwood Ave
Ferndale Ave
W Judson Ave
Mistletoe Ave
Newport Lake
13
8
2015
2010
2016
2008
2005
2016
2013
2015
2014
2013
2007
2016
2003
2006
5
Time has meaning

400 Block - Ferndale Ave.
13 Breaks
Parkcliffe Ave
Clearmount Dr
Newport Lake
W Ravenwood Ave
Ferndale Ave
W Judson Ave
Mistletoe Ave
Glenwood Ave
Hudson Ave
Kiwatha Rd
Anoka Ln
Onista Ln
W Newport Dr
E Newport Dr
W Ravenwood Ave
8
13
2015
2010
2016
2008
2005
2016
2013
2015
2014
2013
2007
2016
2003
2006
5

Nadyne Dr. and Meredith Dr.
23 Breaks
2003
2015
2013
2012
2012
2003
2012
2008
2015
2015
2012
2015
2010
2007
2003
2011
2012
2005
2006
2007
2011
2012
2014
2005
2007
Kirk Rd

Adding consequences to the analysis

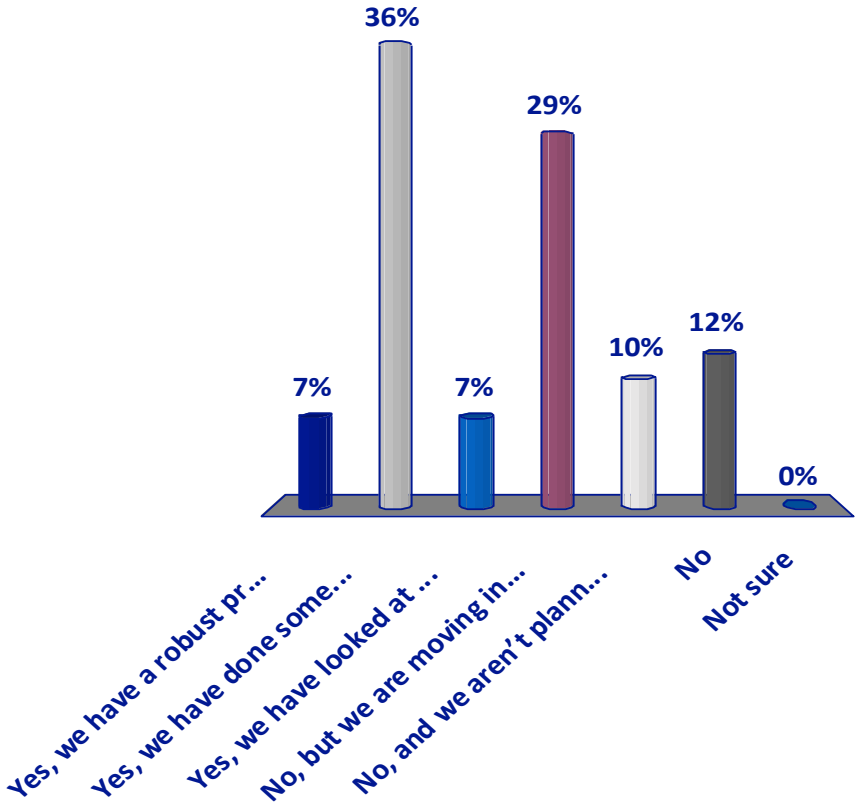
An Example

Frank Roth –Albuquerque Water Utility


3
3
1
7
5
5
6
8
6
8
4
1

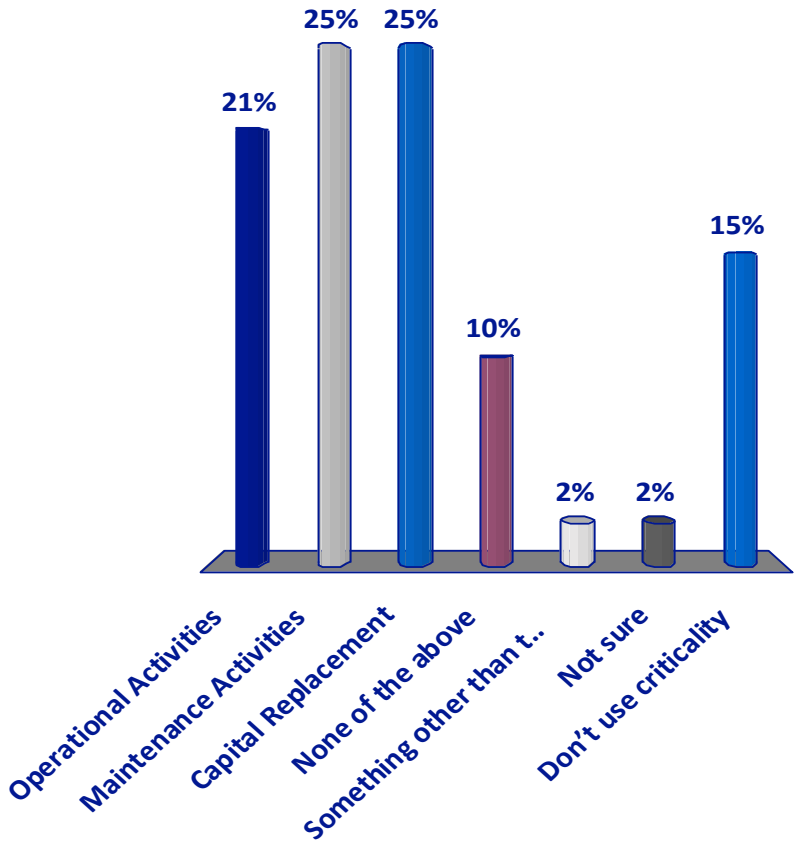
Have you considered asset criticality in your operations?

A. Yes, we have a robust process to assess which assets are highest criticality
B. Yes, we have done some work in this area
C. Yes, we have looked at probability of failure but not consequence of failure
D. No, but we are moving in that direction
E. No, and we aren't planning on it
F. No
G. Not sure



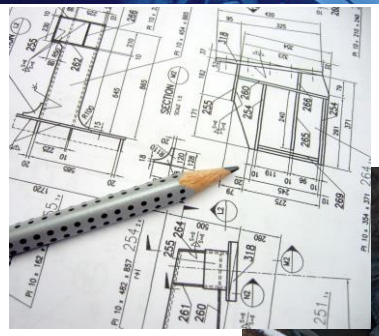
If you have done some work in criticality, have you used criticality to make decisions regarding O&M activities or capital replacement? (Check all that apply)

A. Operational Activities
B. Maintenance Activities
C. Capital Replacement
D. None of the above
E. Something other than the above activities
F. Not sure
G. Don’t use criticality



Life Cycle Costing

Developing a simple Capital Improvement Plan from existing data



DESIGN

CONSTRUCTION

OPERATION

MAINTENANCE

Repairs

Rehab

Replace

LIFE CYCLE COSTING: NEED TO CONSIDER THE ENTIRE LIFE

THE EARLIER WE INTERVENE THE BETTER

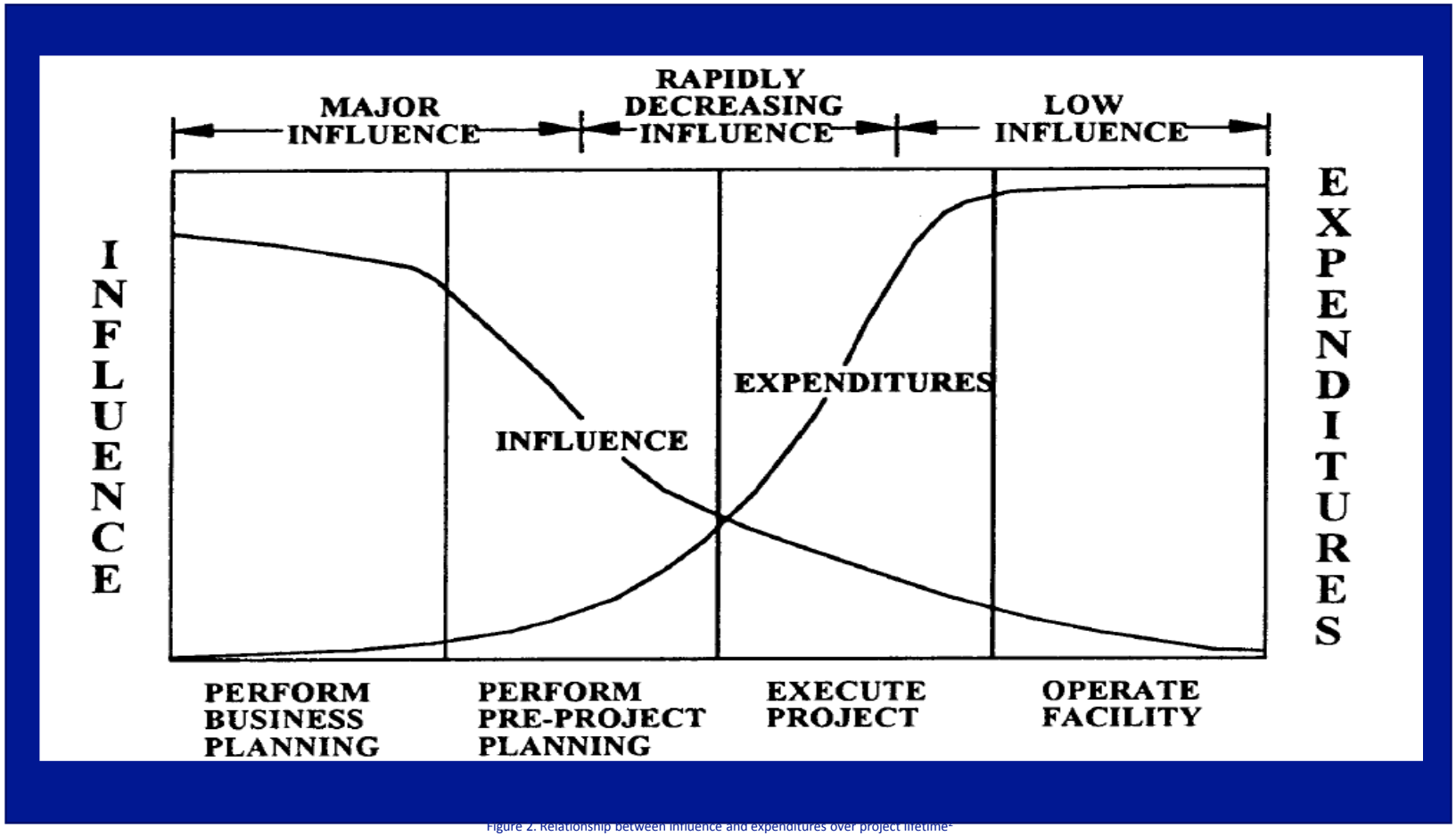


Figure 2. Relationship between influence and expenditures over project lifetime[2]

WHY DOES INTERVENING AT DESIGN (OR EVEN BEFORE) MATTER SO MUCH?

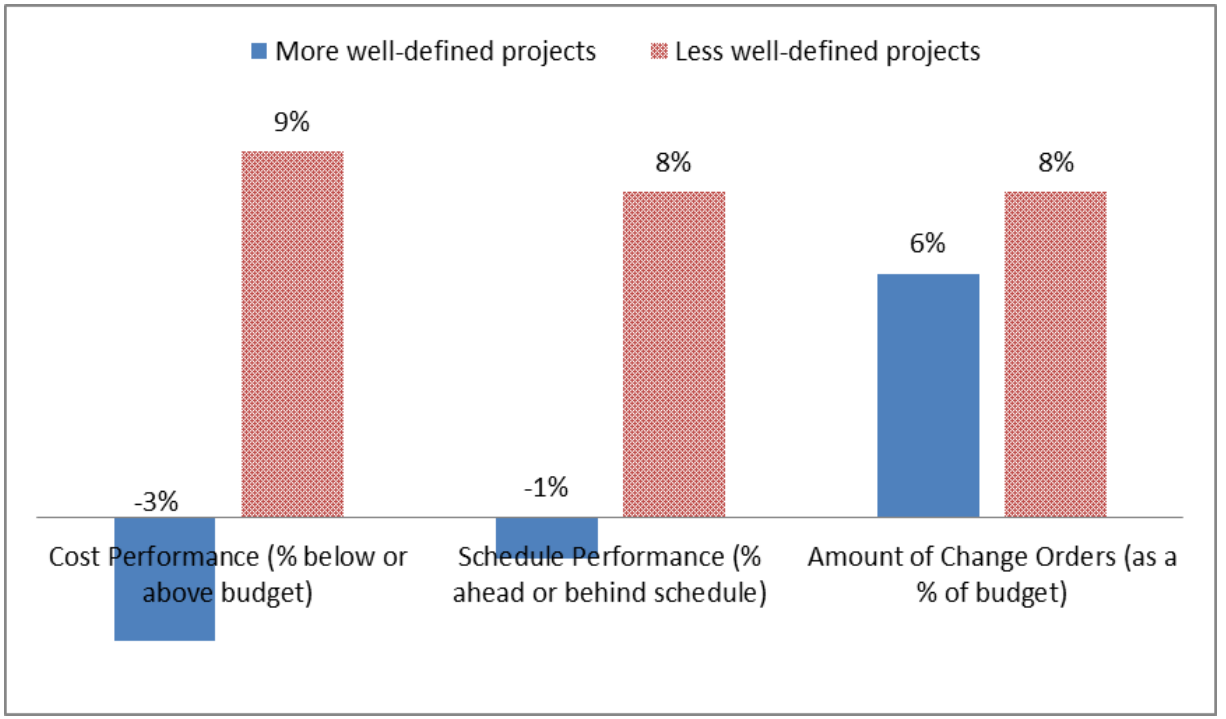


Figure 3. Comparison of project performance based on project definition[3]

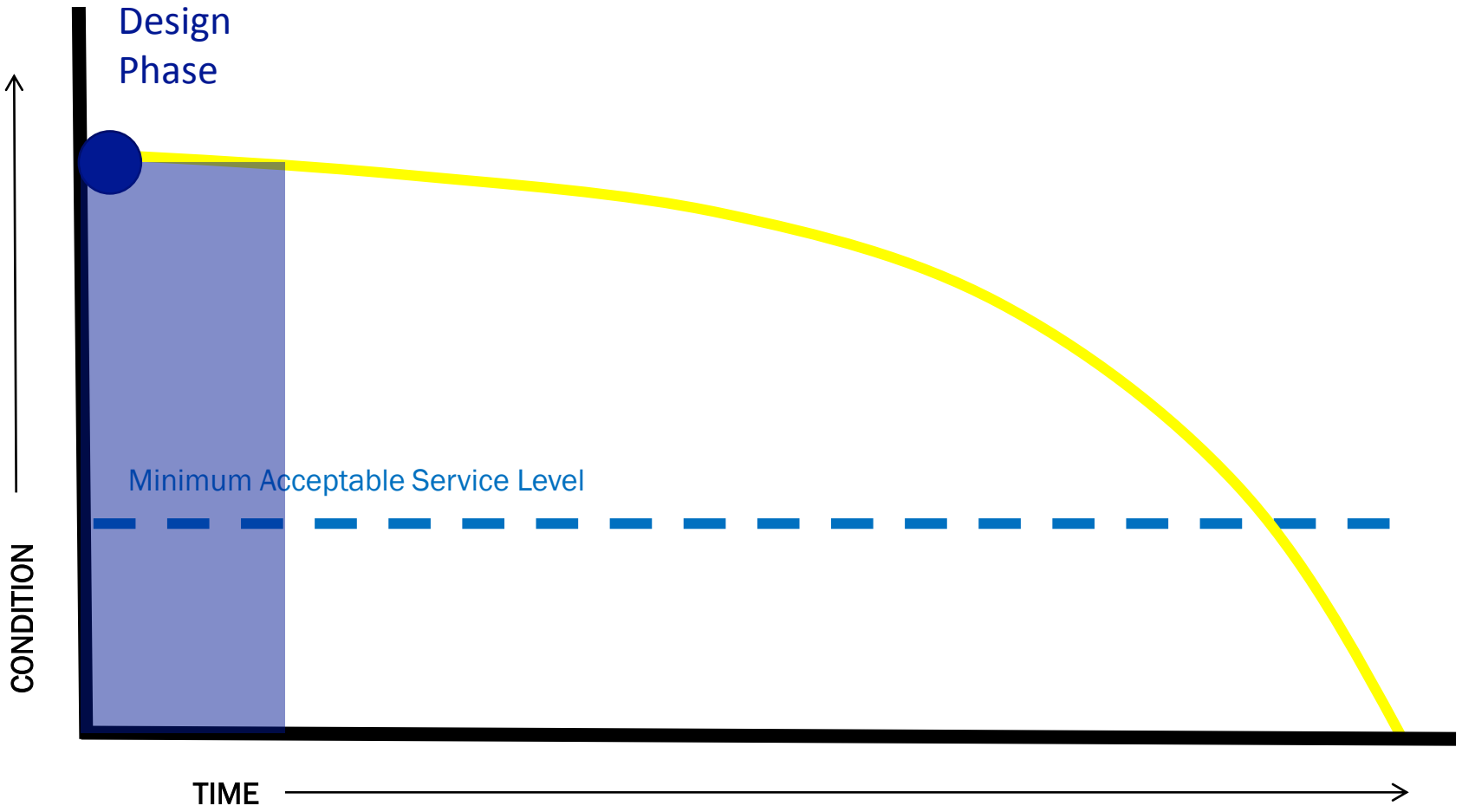
The O&M Side of Life Cycle Costing

Why is O&M Valuable?

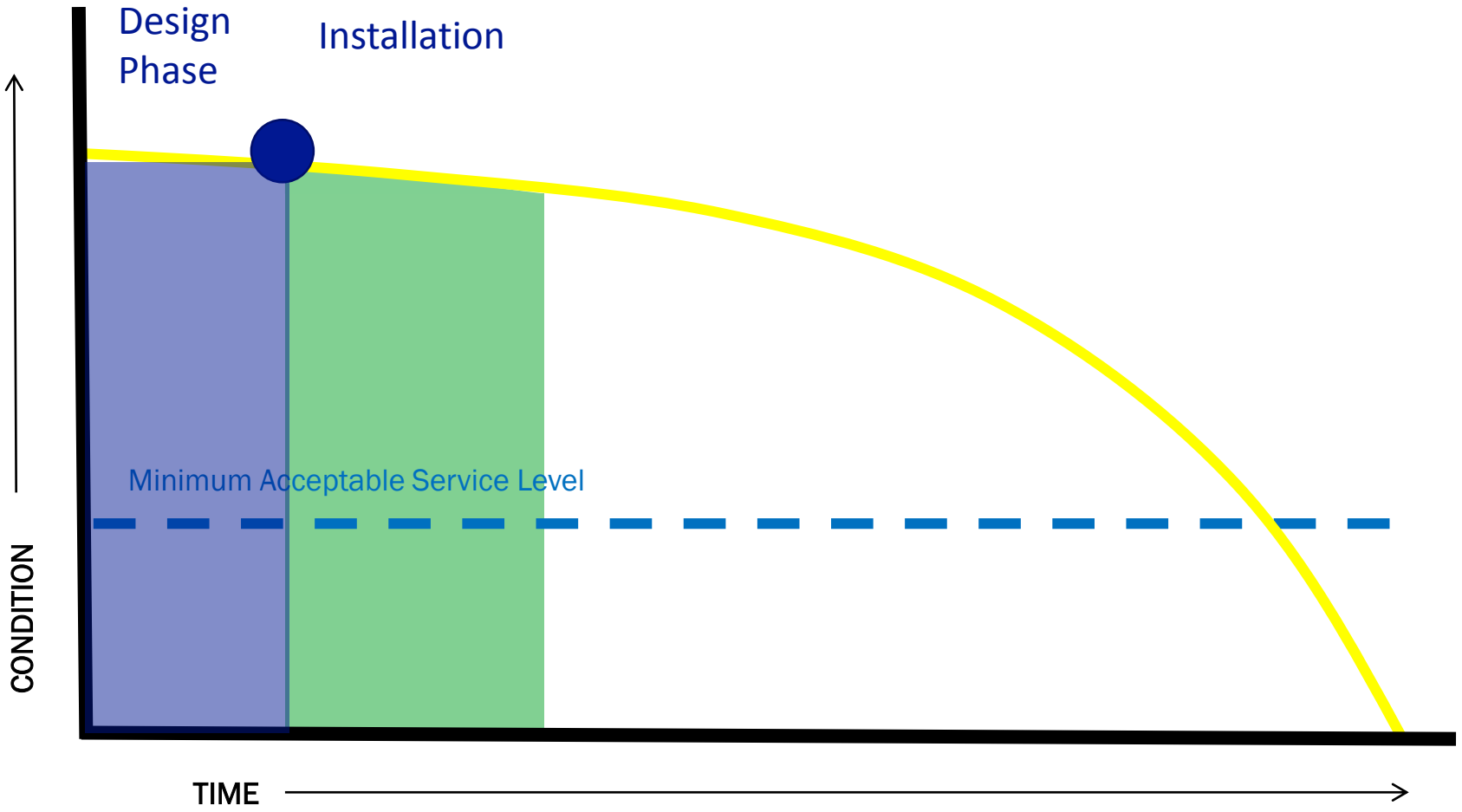
Or, to put it another way …


If someone maintained an airplane the way you maintain your facility would you fly in it?

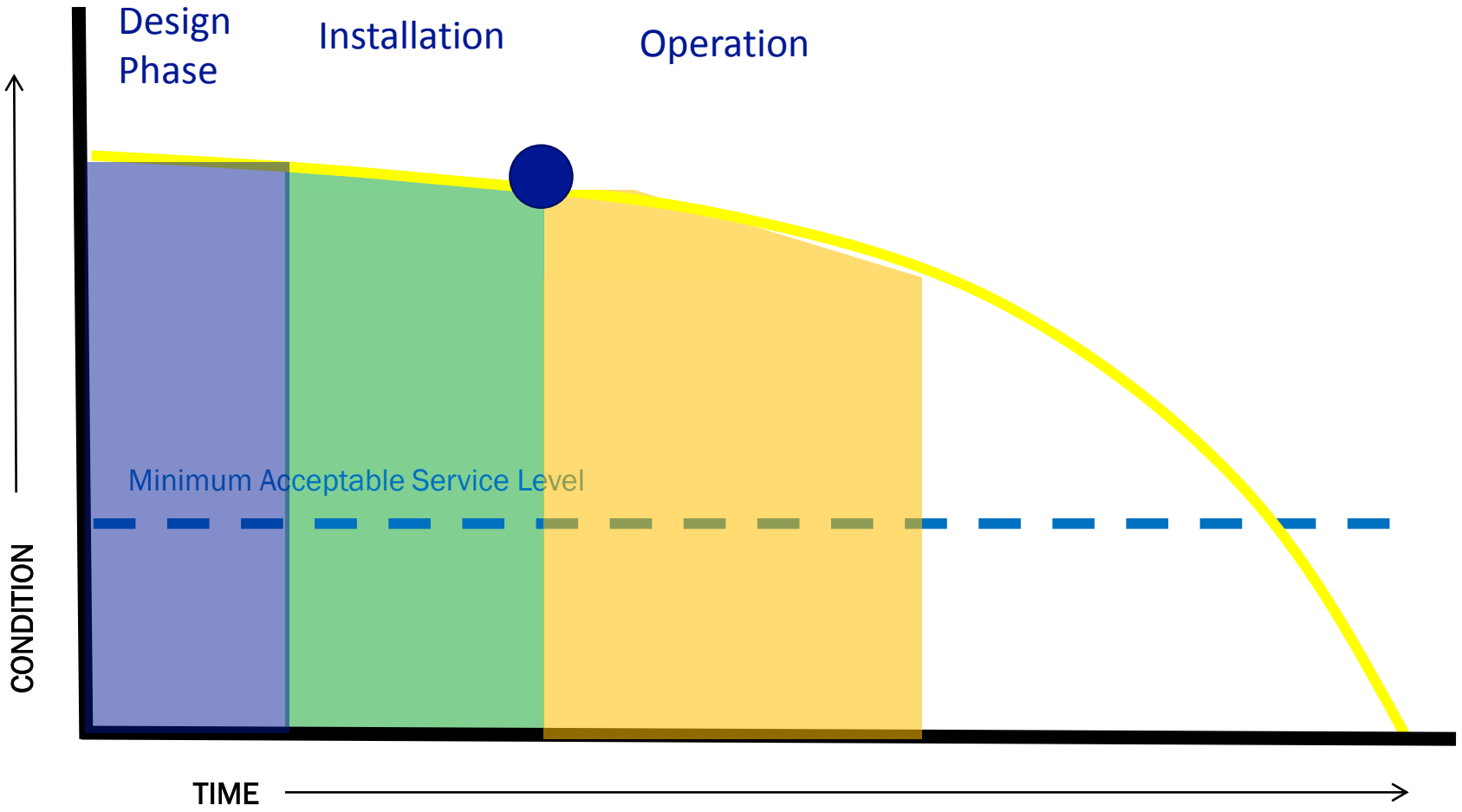
Asset Life


Design
Phase
Minimum Acceptable Service Level
CONDITION
TIME

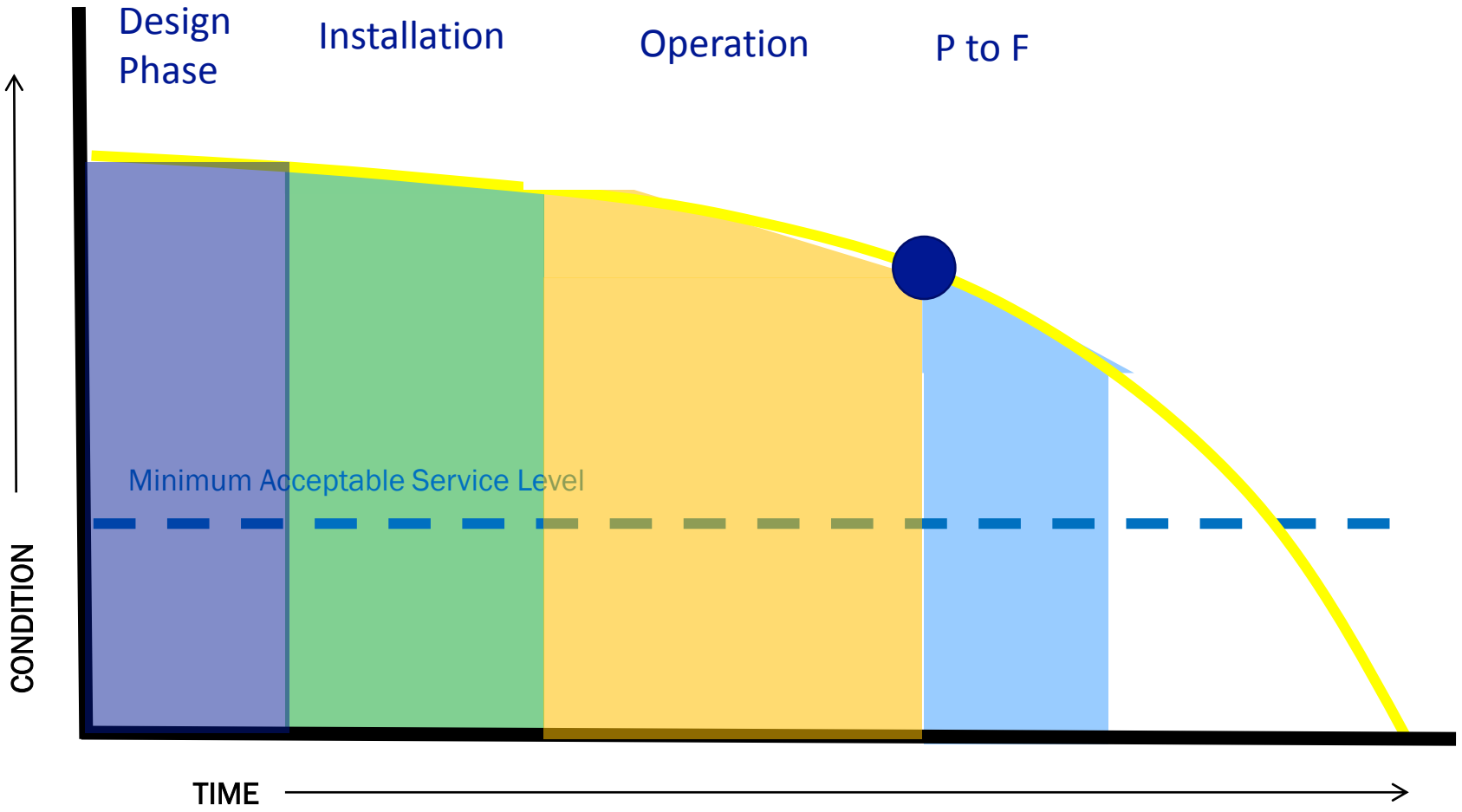
Asset Life


Design Phase
Installation
Minimum Acceptable Service Level
CONDITION
TIME

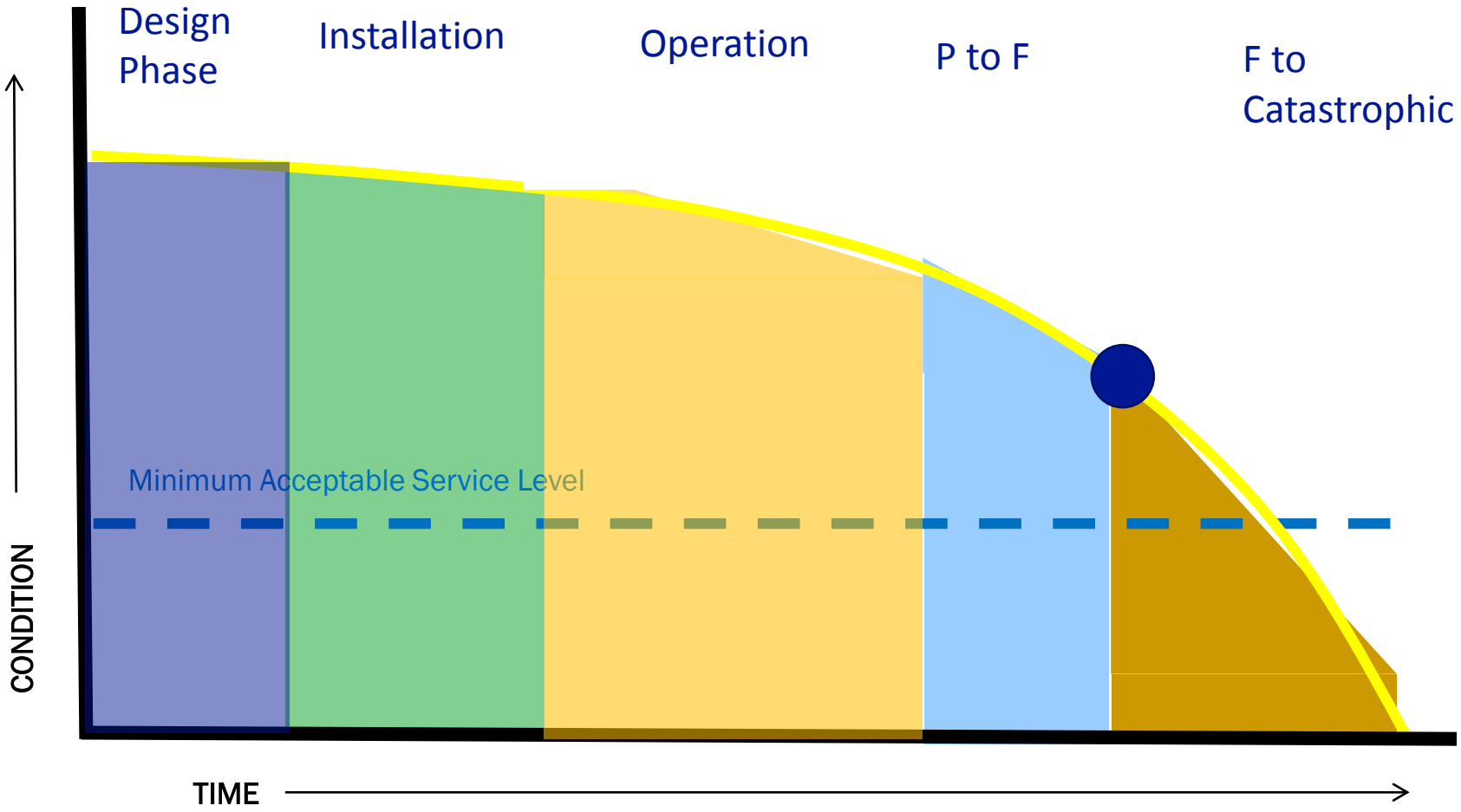
Asset Life


Design Phase
Installation
Operation
Minimum Acceptable Service Level
CONDITION
TIME

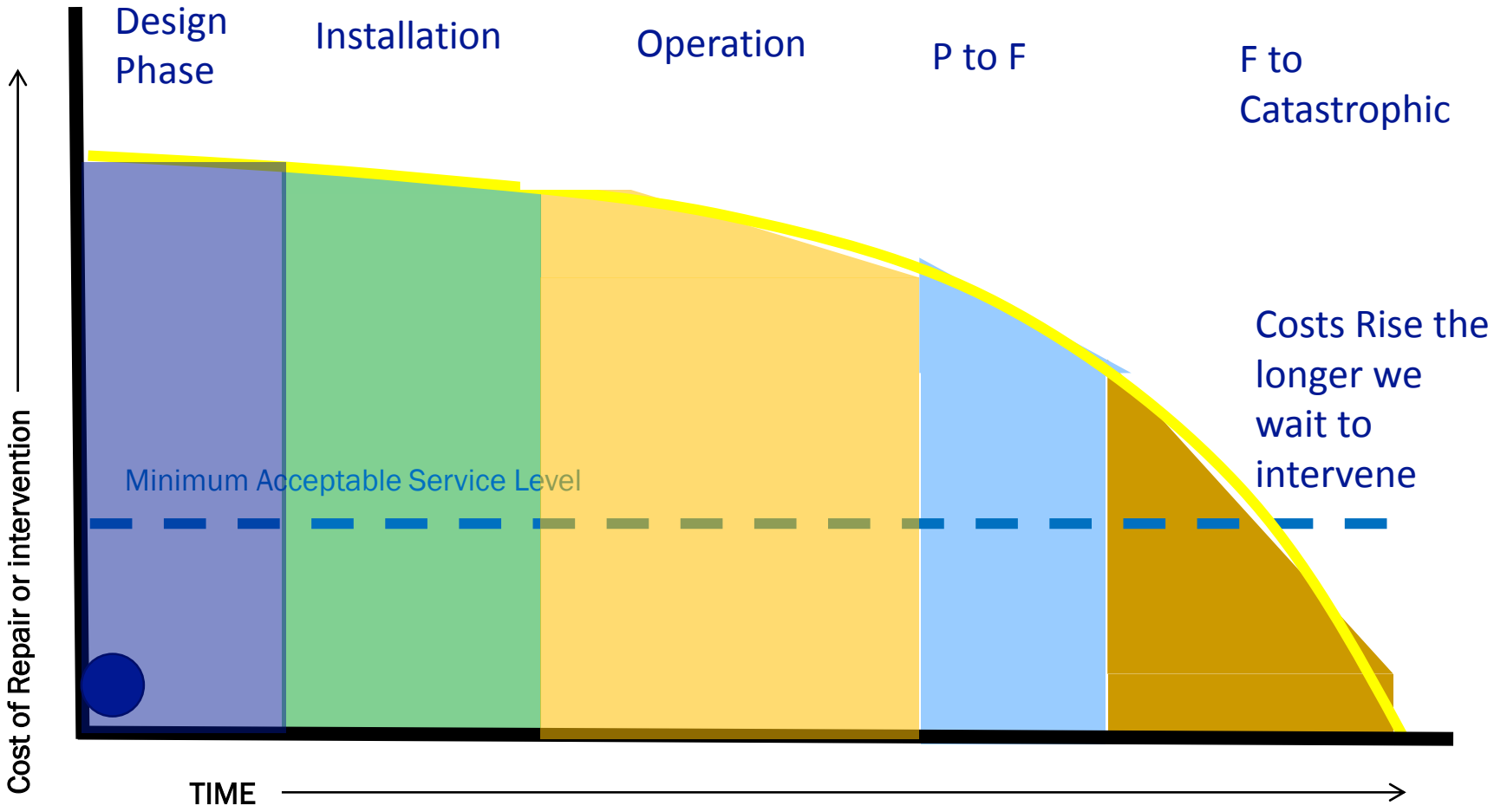
Asset Life


Design Phase
Installation
Operation
P to F
Minimum Acceptable Service Level
CONDITION
TIME

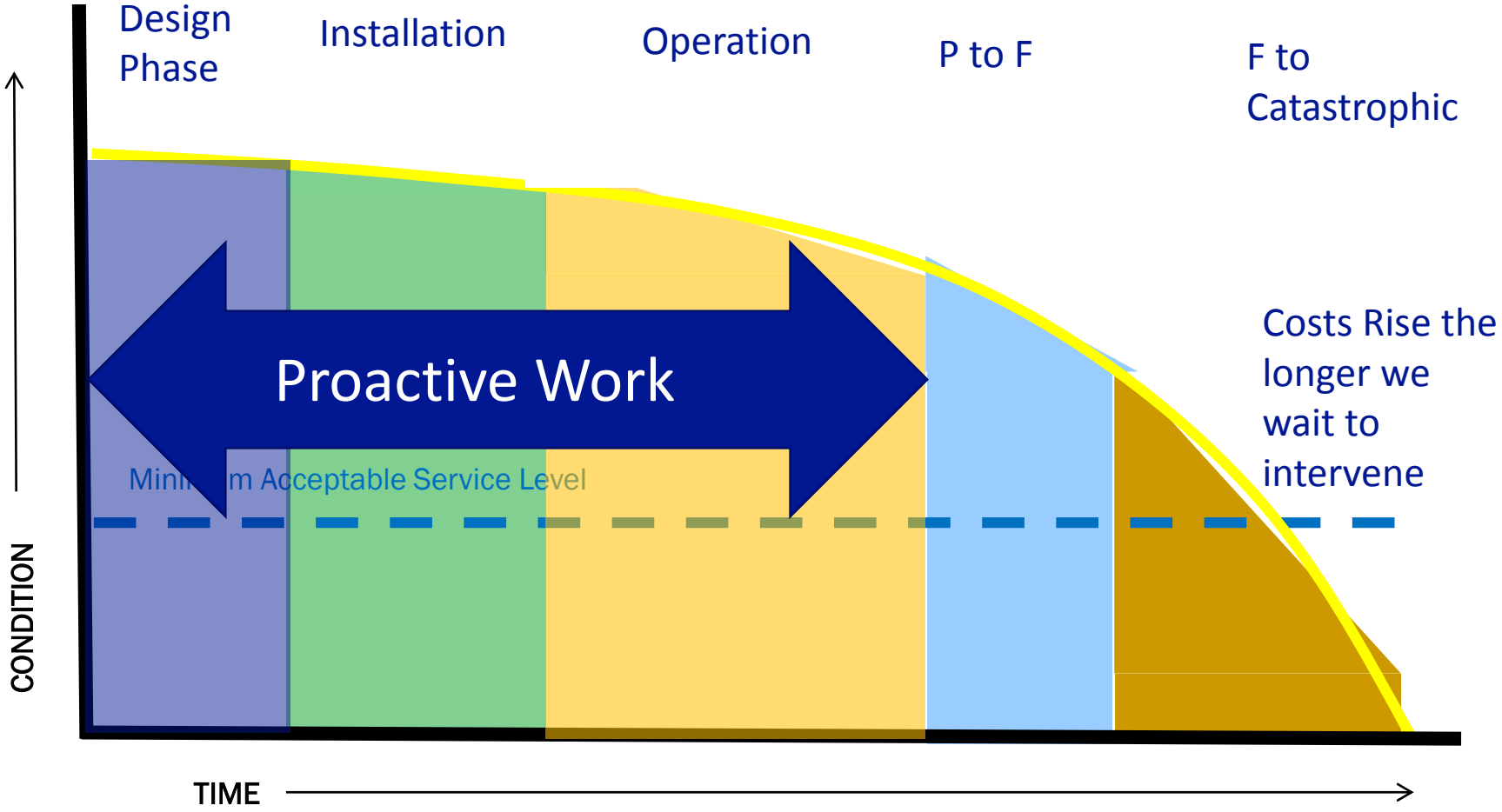
Asset Life


Design Phase
Installation
Operation
P to F
F to Catastrophic
Minimum Acceptable Service Level
CONDITION
TIME

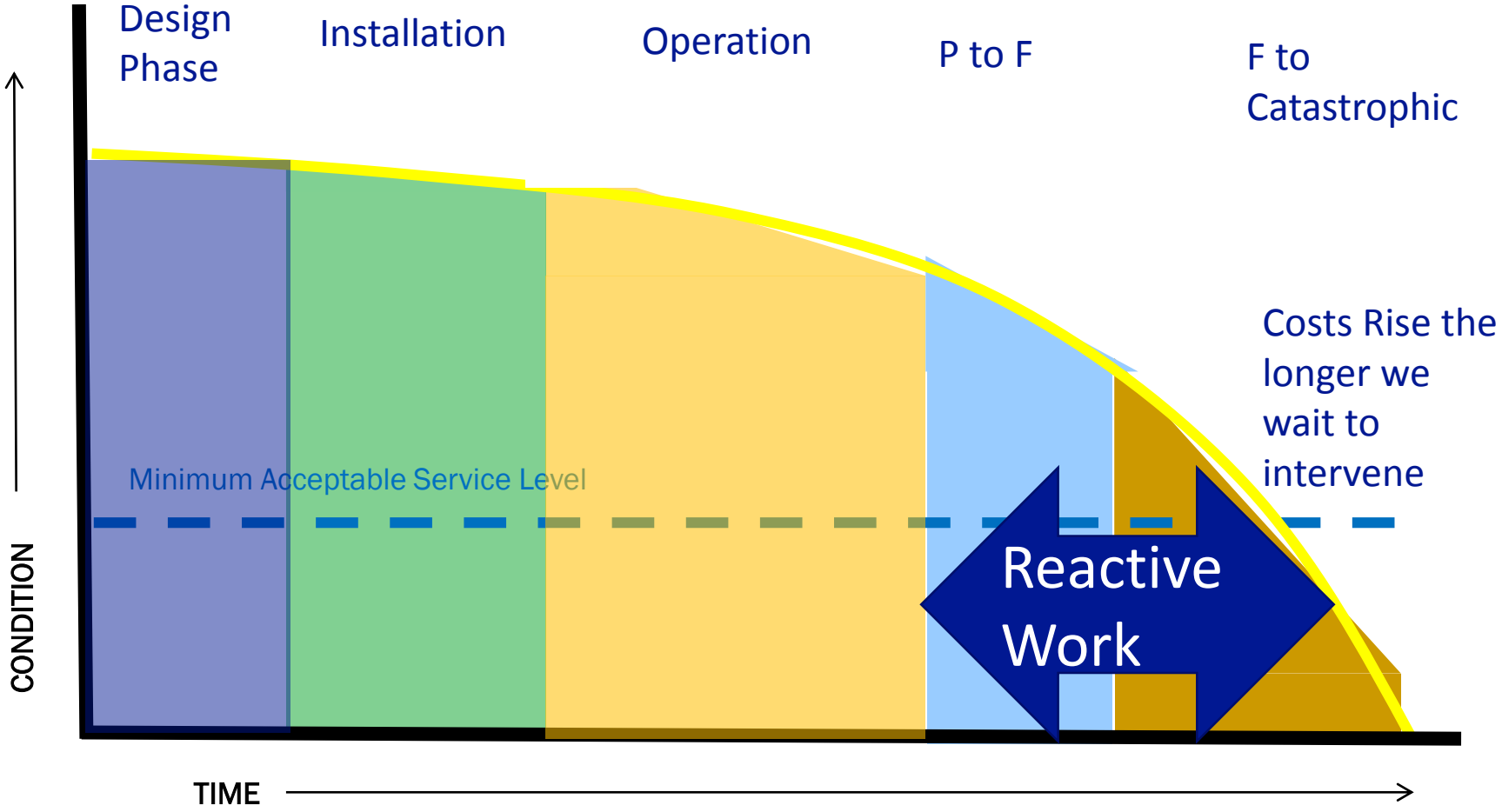
Asset Life


Design Phase
Installation
Operation
P to F
F to Catastrophic
Costs Rise the longer we wait to intervene
Minimum Acceptable Service Level
Cost of Repair or intervention
TIME

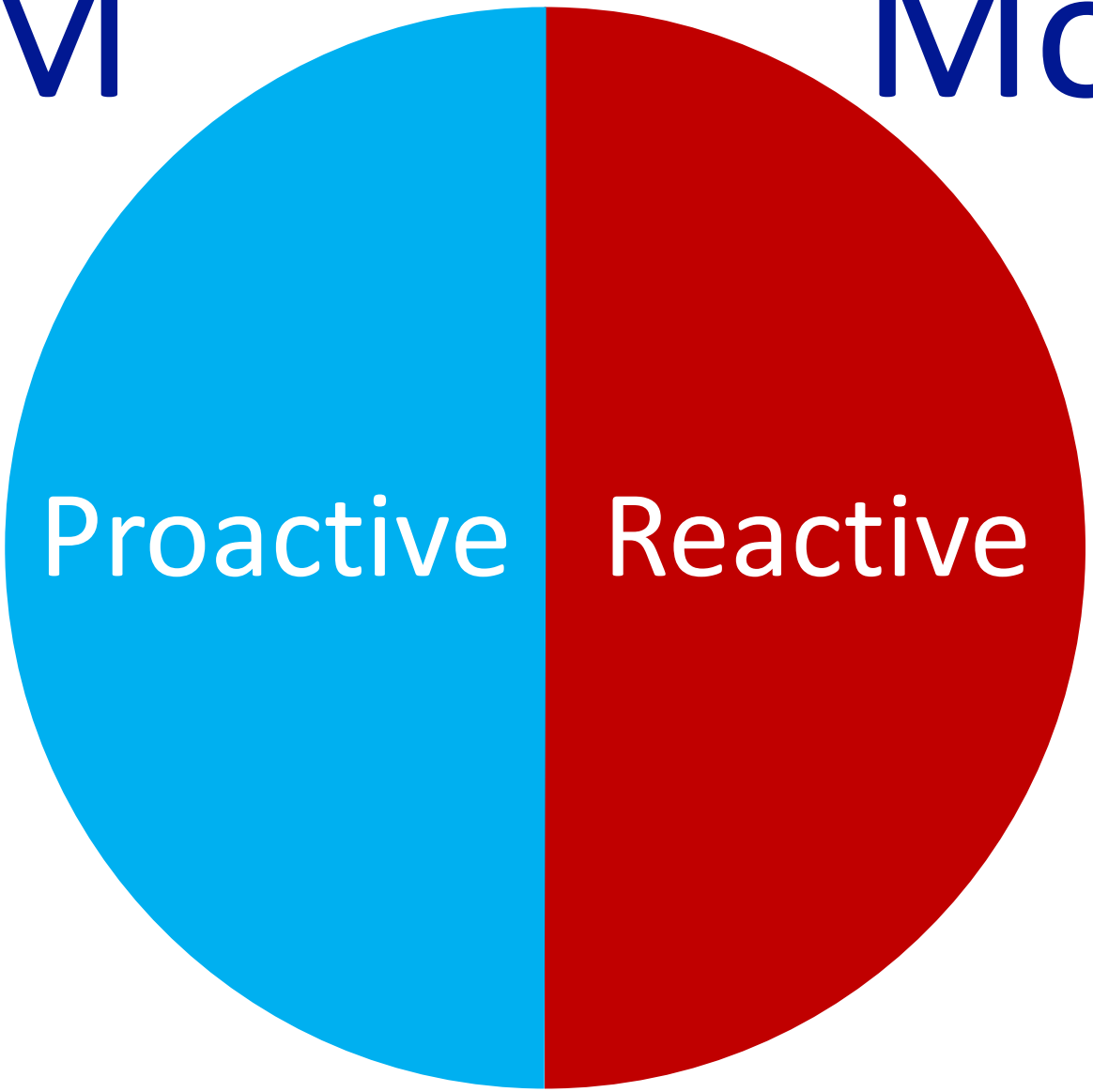
Asset Life


Design Phase
Installation
Operation
P to F
F to Catastrophic
Proactive Work
Costs Rise the longer we wait to intervene
Minimum Acceptable Service Level
CONDITION
TIME

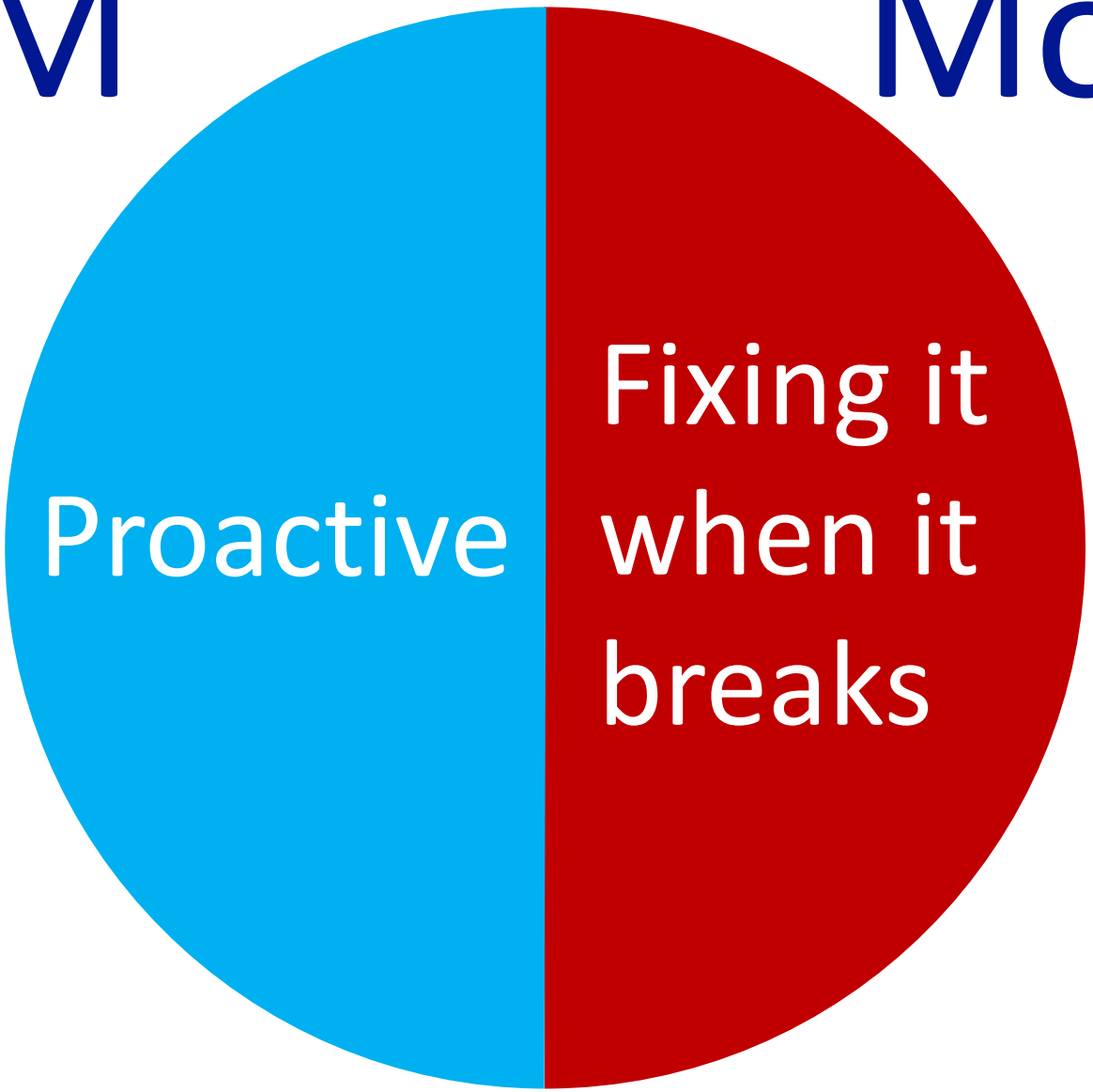
Asset Life


Design Phase
Installation
Operation
P to F
F to Catastrophic
Costs Rise the longer we wait to intervene
Minimum Acceptable Service Level
Reactive Work
CONDITION
TIME

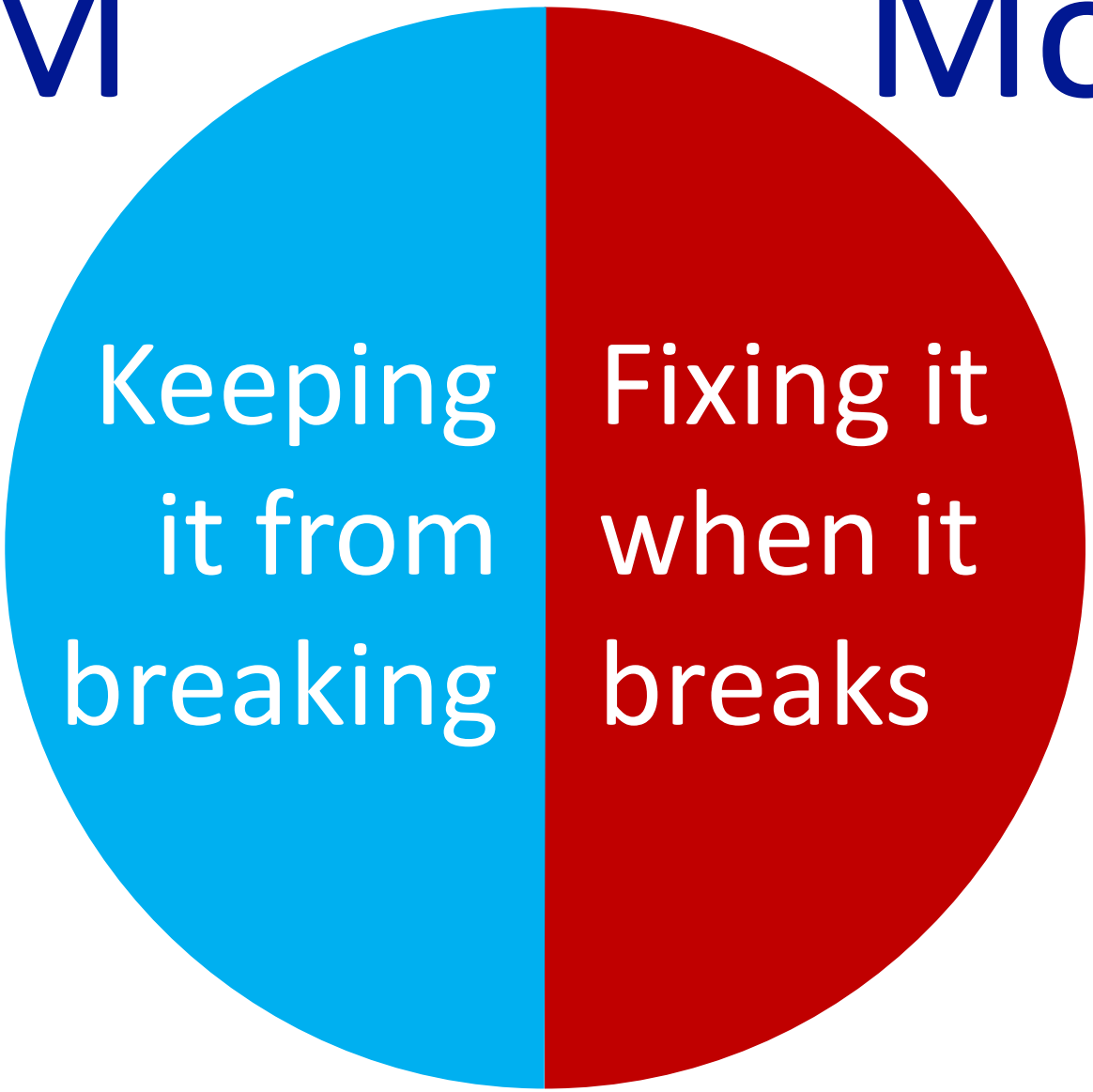
O&M Modes



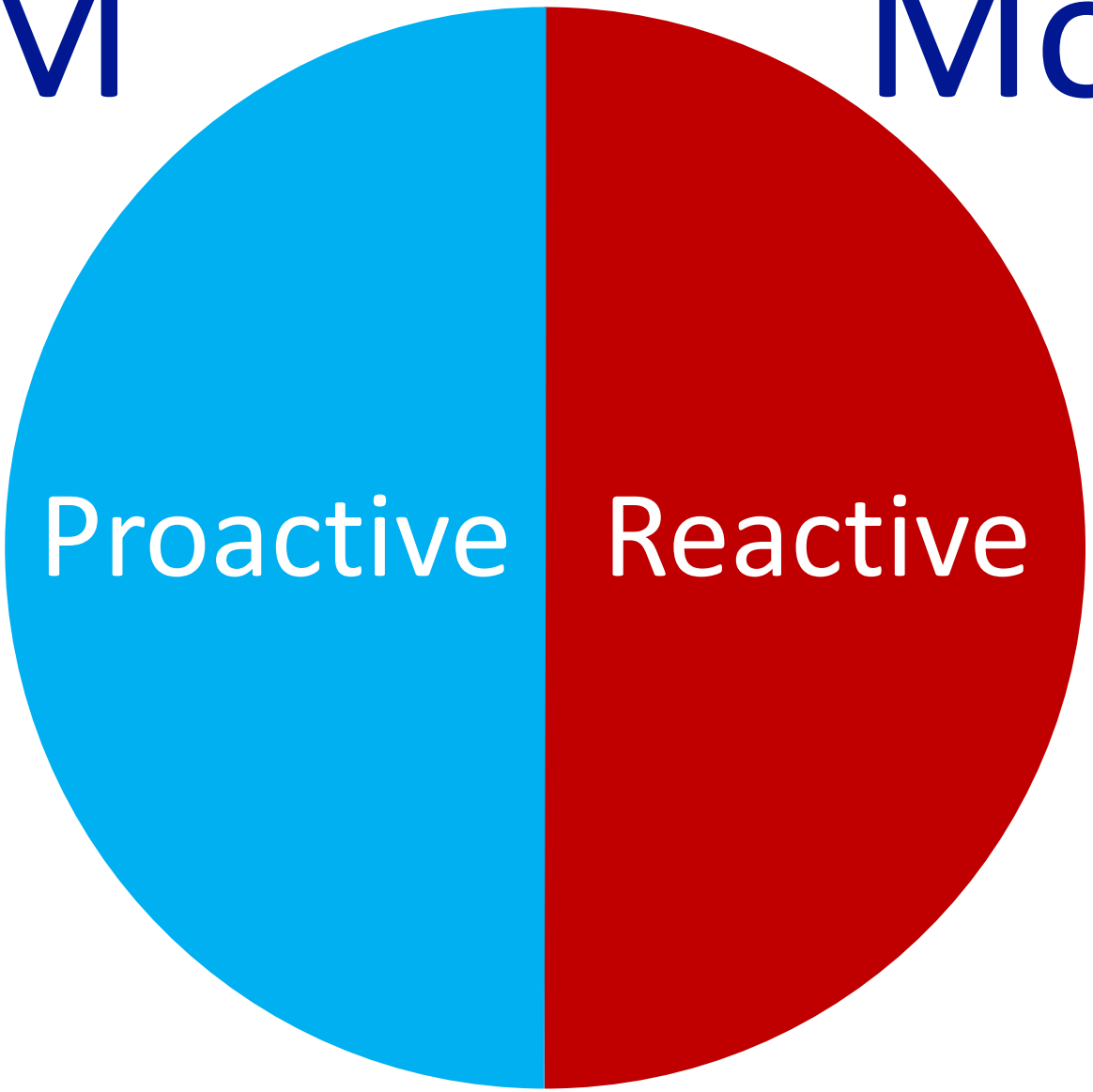
O&M Modes



O&M Modes



O&M Modes



O&M Modes

Proactive

Routine

\+ Preventive

\+ Predictive

= Savings

If you don't manage your assets, they will manage you.

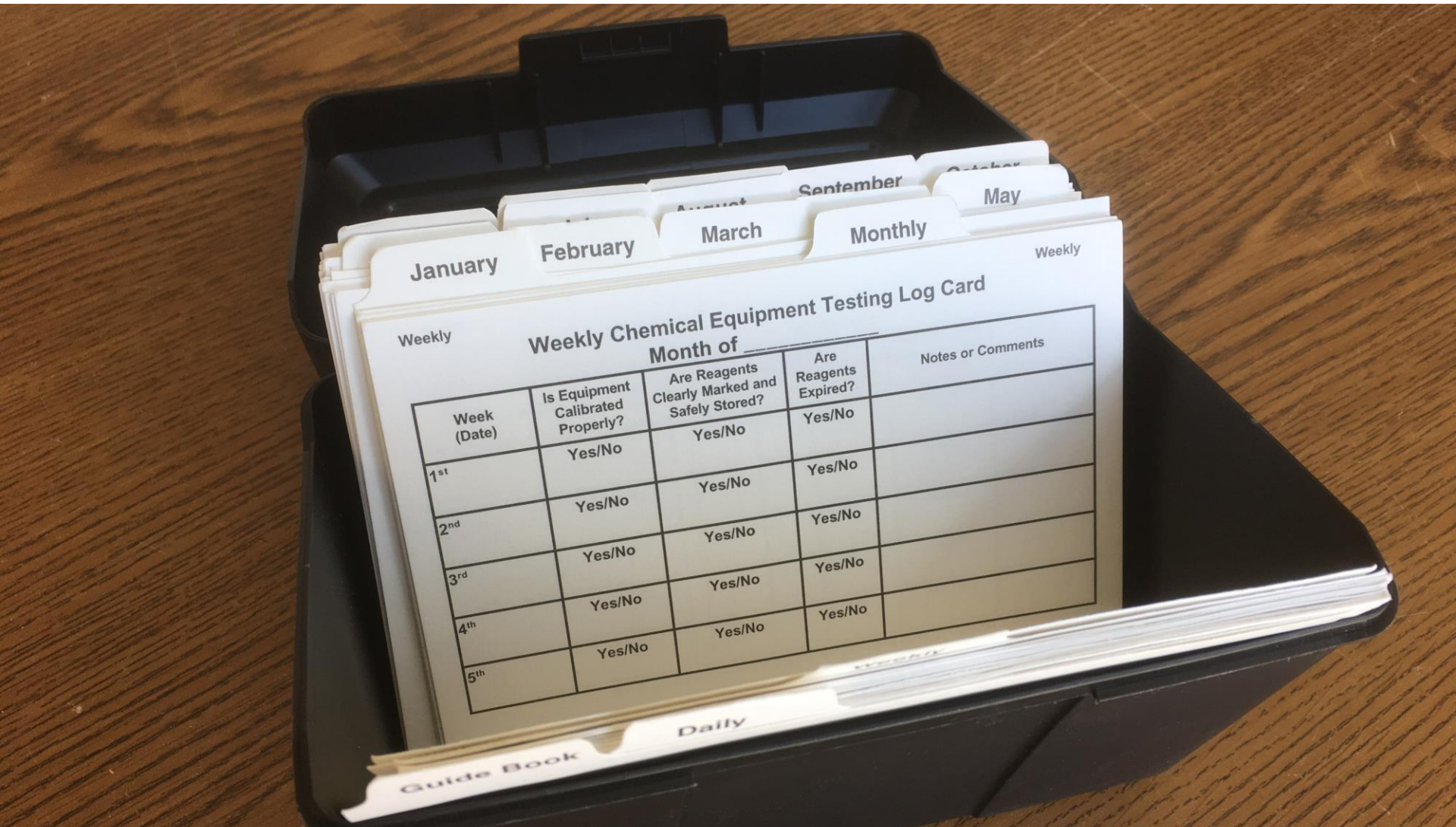
But you need…

This begs the questions…

What should I do?

When should I do it?

“Black Box Card File”



New EPA Electronic PM tool:

United States
Environmental Protection Agency

Preventive Maintenance for Small Public Water Systems Using Ground Water

An Interactive PDF with Suggested Preventive Maintenance Tasks and Logs

Introduction, System Information, Reference, and Contacts

1

https://www.epa.gov/dwcapacity/resources-small-public-water-system-operators

United States
Environmental Protection Agency

Preventive Maintenance for Small Public Water Systems Using Ground Water

An Interactive PDF with Suggested Preventive Maintenance Tasks and Logs

January O&M Task Lists & Logs

System characteristics

- Designed to help small systems
  - Plan and record O&M activities
  - Create a permanent print or digital record of those activities
- Intended for ground water systems with up to:
  - 6 wells & well pumps
  - 4 storage tanks and/or pressure tanks
  - 4 chemical feed pumps
  - 4 booster pumps
- Could be used by surface water systems as part of O&M program.

Document characteristics

- A set of interactive PDFs:
  - Lists typical recommended daily, weekly, monthly, quarterly, biannual and annual preventive O&M tasks
  - Permits ongoing data entry to create a complete O&M record
    - check boxes,
    - value boxes,
    - room for notes and additions
  - Includes a conversion calculator and does many calculations
  - Has hyperlinked table of contents and makes use of the Adobe Acrobat Bookmark tool for easy navigation (demo to follow)

Document characteristics

Data pages were capped at specific numbers of sources & equipment to limit file size, BUT …

- If you have more sources or equipment pieces than this format is designed for we can help.
- Contact us and we can walk you through some options, or
- Potentially assist with a customized solution

Software requirements:

ADOBE® READER®

Do not use Apple Preview

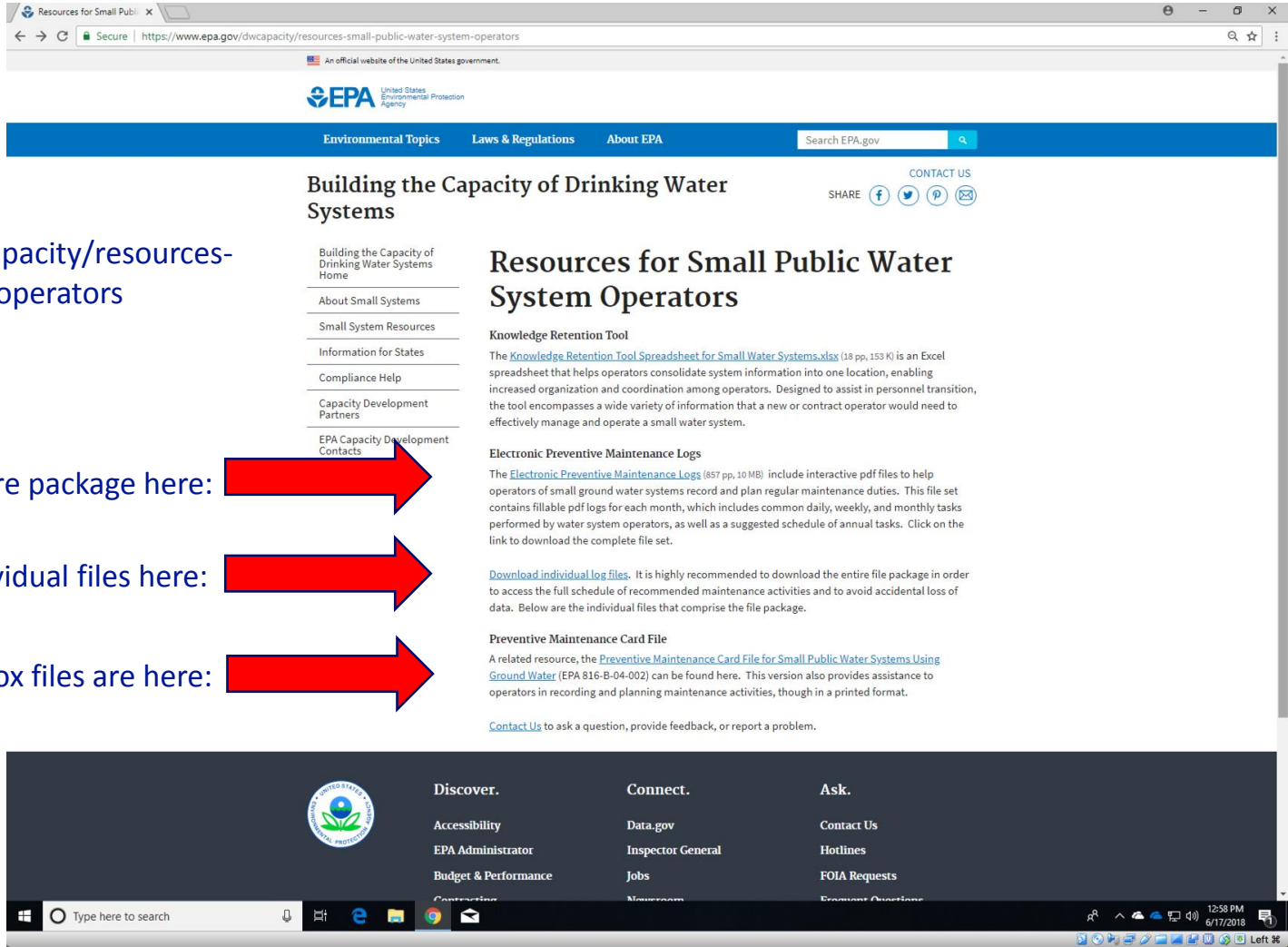
Where to get it:

https://www.epa.gov/dwcapacity/resources-small-public-water-system-operators

Download entire package here:

Download individual files here:

The older Black Box files are here:



DAILY DAILY DAILY

WELL WATER PRODUCTION

Daily Water Production Log Well 2

Prior Month End Master Meter Reading:		Amount of Water Used	Notes or Comments
Date	Meter Reading		
1st			
2nd			
3rd			
4th			
5th			
6th			
7th			
8th			
9th			
10th			
11th			
12th			
13th			
14th			
15th			
16th			
17th			
18th			
19th			
20th			
21st			
22nd			
23rd			
24th			
25th			
26th			
27th			
28th			
29th			
30th		Total:	0
31st			

CIP From Complete Inventory

With Inventory

1. Asset Replacement Date is Estimated and Included in Inventory
2. Asset Replacement Cost is Estimated and Included in Inventory
3. Look at all assets needing replacement in a given year
4. Add up Costs
5. List Assets included in each year
6. Look at short and long term asset replacement

From Inventory

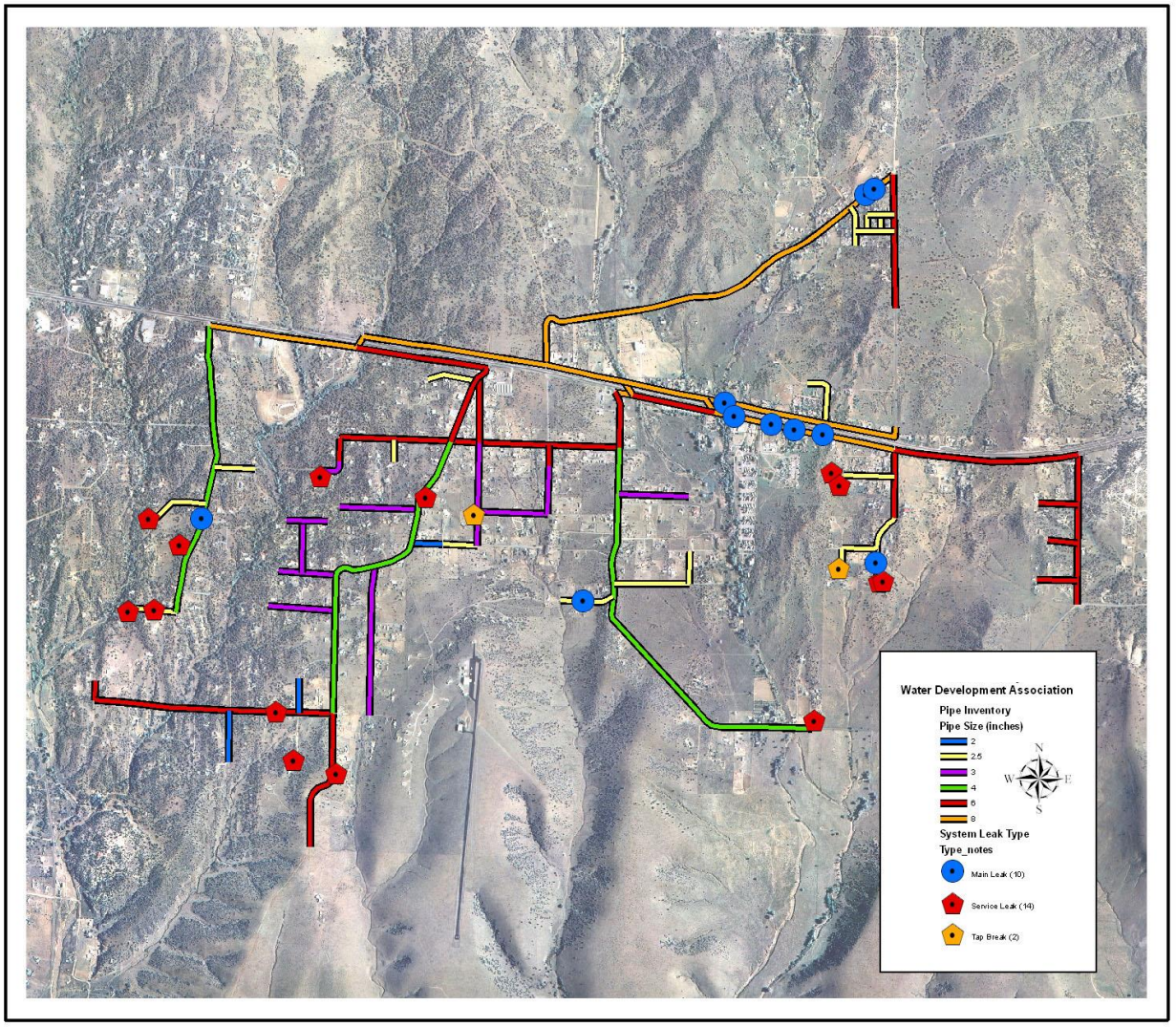
Asset	Year Needed	Number of Assets Needed in Year	Replacement Cost/asset	Total Replacement Cost
Borehole/Well casing/well screen	2017	2	$800,000	$1.6 million
Borehole/Well casing/well screen	2025	1	$800,000	$800,000
Well House Piping	2017	250 ft	$80/LF	$20,000

For simplicity: For long term CIP, can combine into 5 year periods

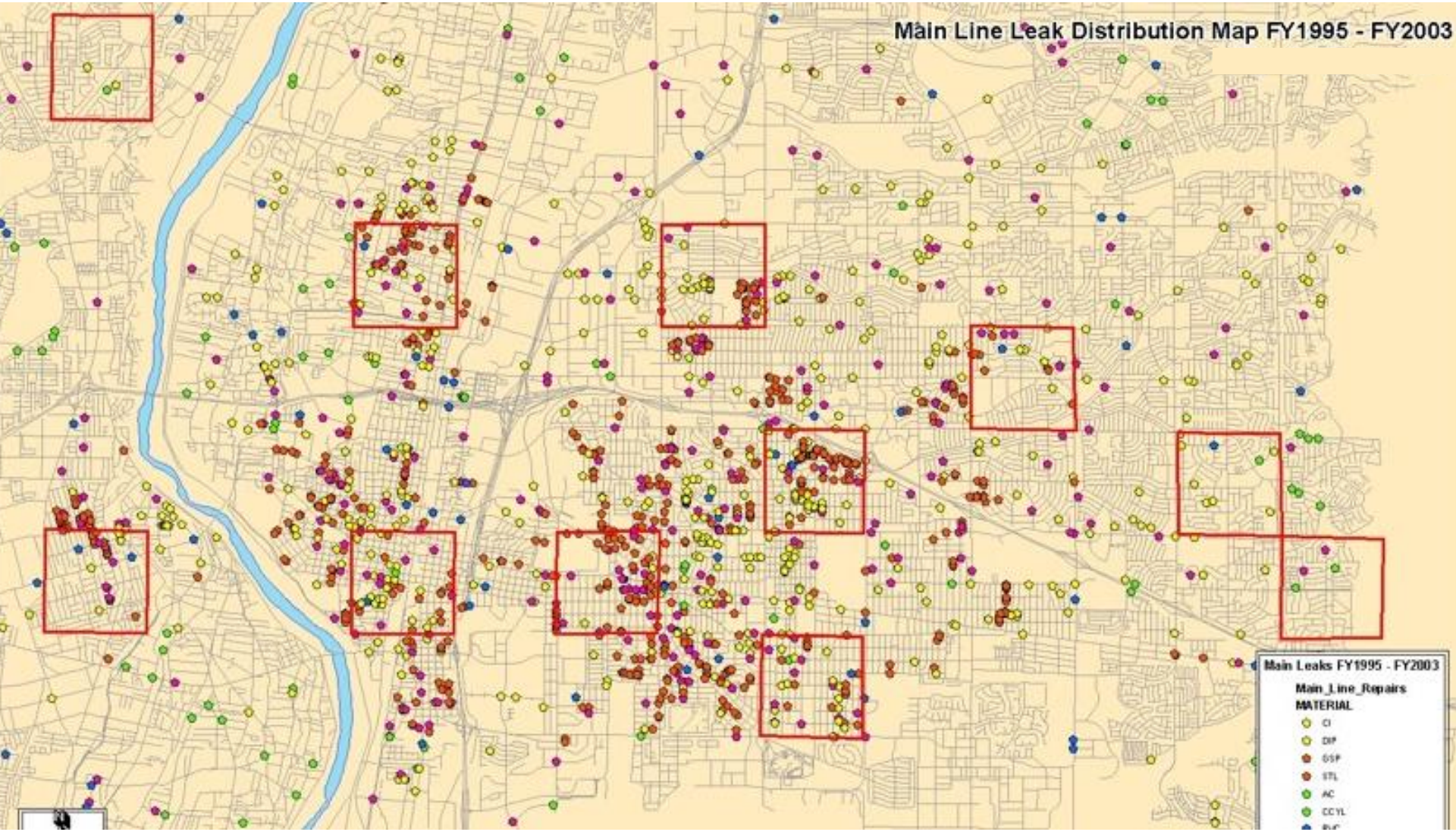
Assets Included	Years Needed	Number of Assets Needed in 5 Years	Total Replacement Cost
Borehole/Well casing/well screen, 2 miles of pipe, 10 hydrants, 3 master meters,….	2030 - 2035	20	$1.6 million
5 miles of pipe, 20 hydrants, 2 ARVs, …	2035 - 2040	200	$800,000
Well House Piping, Storage tank,….	2040 - 2045	50	$20,000

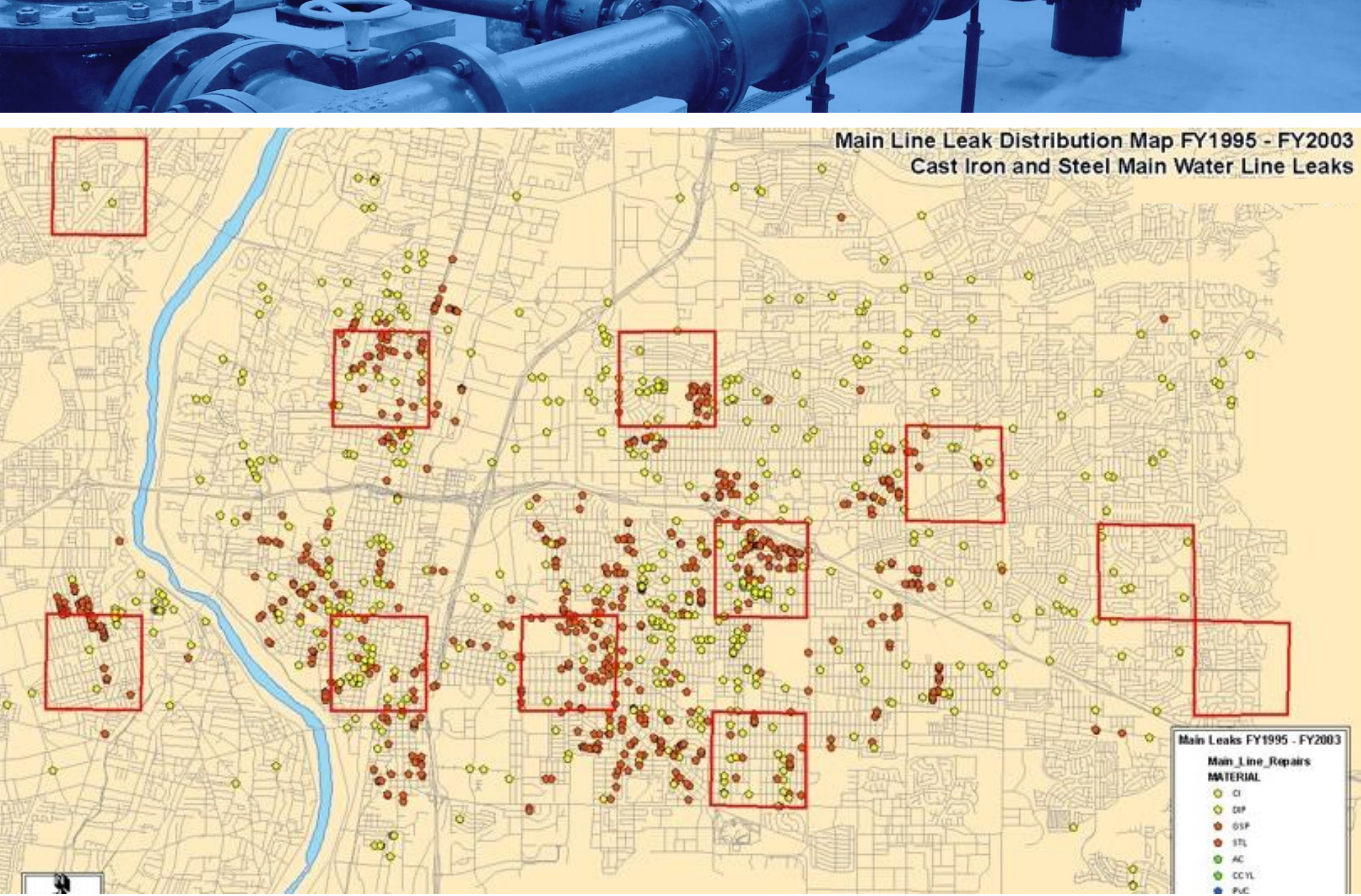
Some Examples: Data Driven Decisions

Question your assumptions

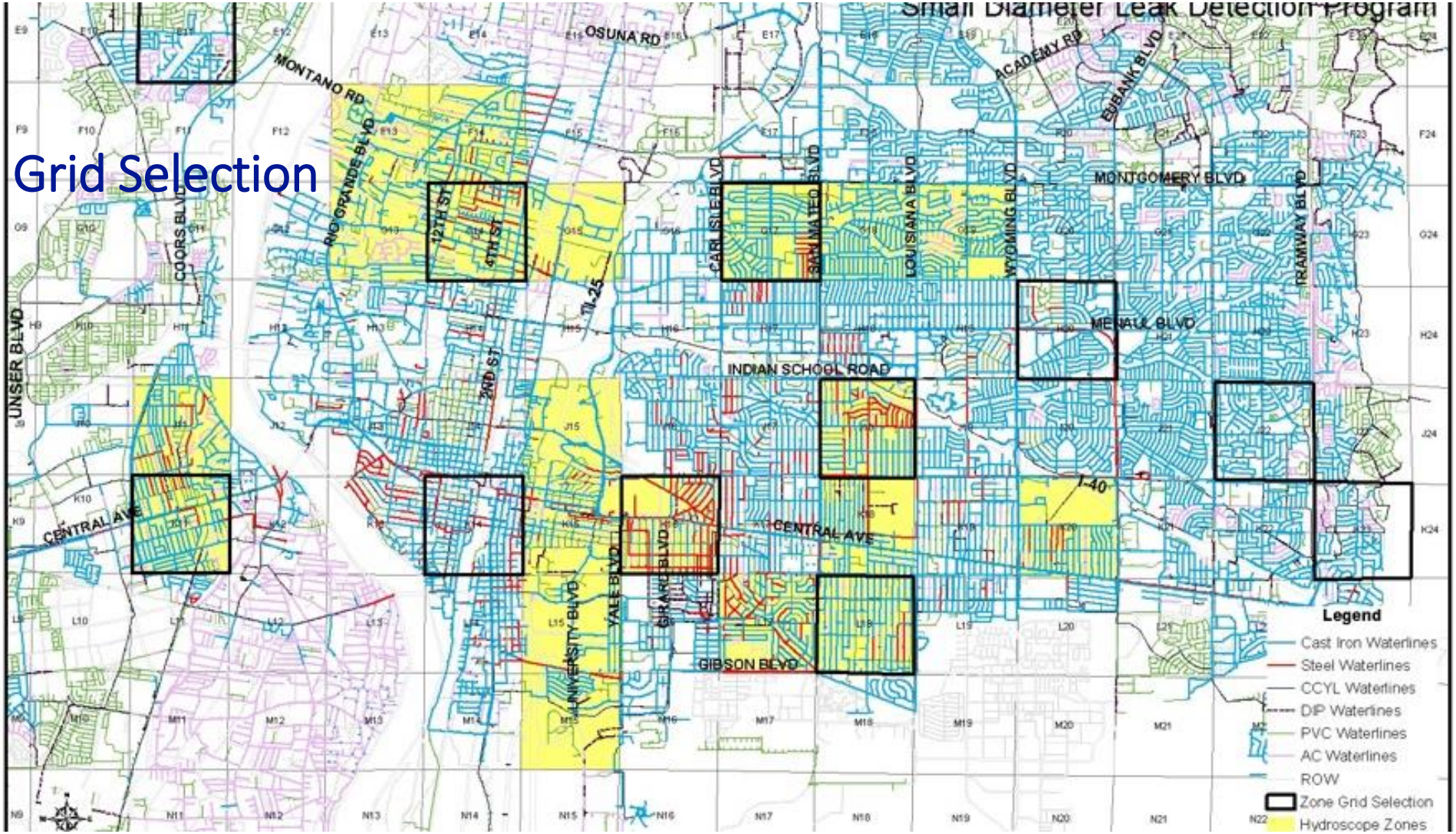


Some Examples of Uses of Break Data: ABCWUA Steel Water Lines


Main Line Leak Distribution Map FY1995 - FY2003
Main Leaks FY1995 - FY2003
Main_Line_Repairs
MATERIAL
CI
DIP
GSP
STL
AC
CCYL

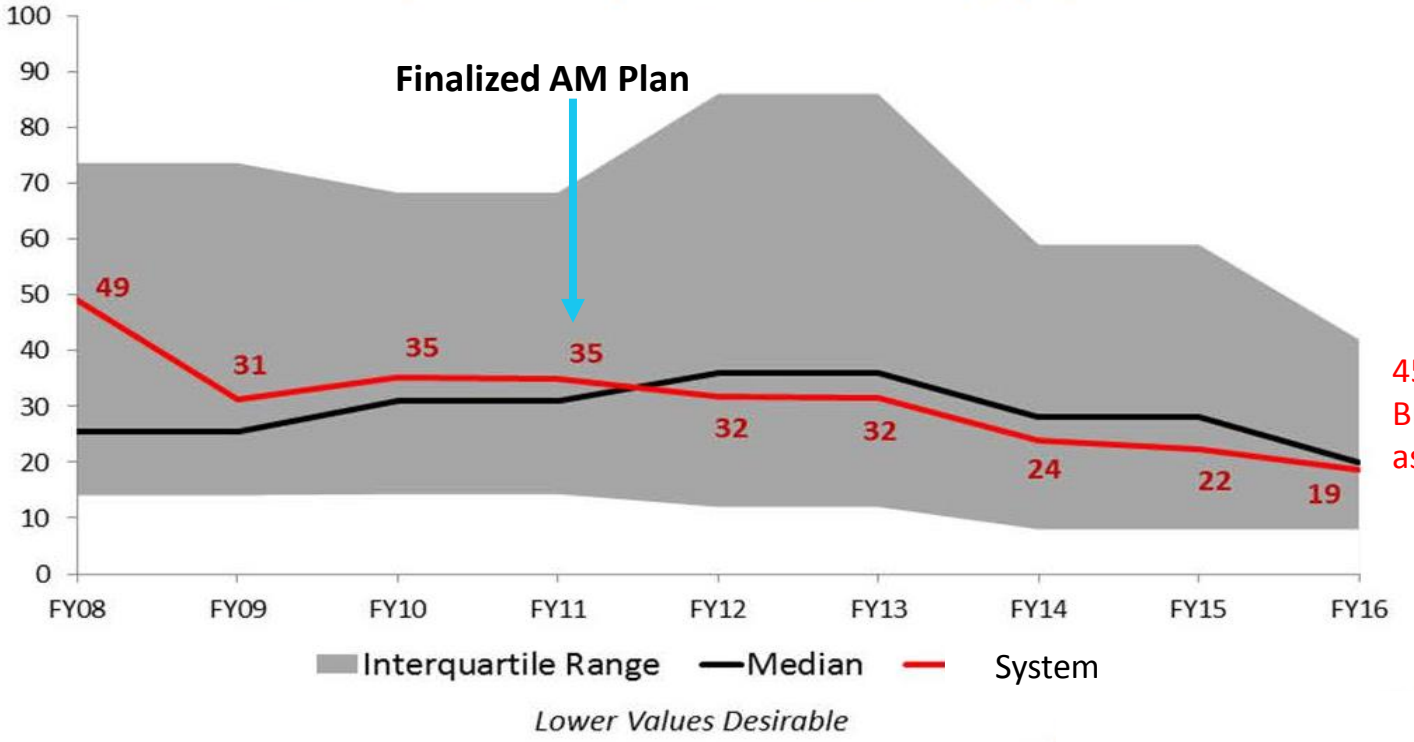

Main Line Leak Distribution Map FY1995 - FY2003
Cast Iron and Steel Main Water Line Leaks
Main Leaks FY1995 - FY2003
Main_Line_Repairs
MATERIAL
CI
DIP
GSP
STL
AC
CCYL
PVC

Grid Selection



Water Line Integrity

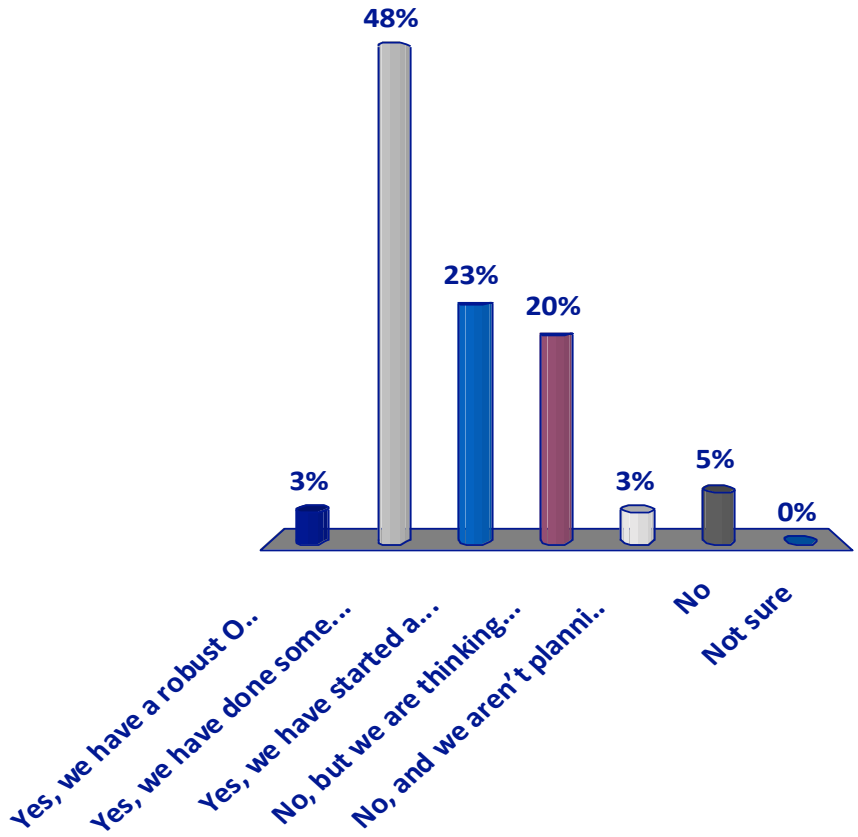
Leaks/breaks per 100 miles of pipe



45% Reduction in Break Rate (and associated costs)

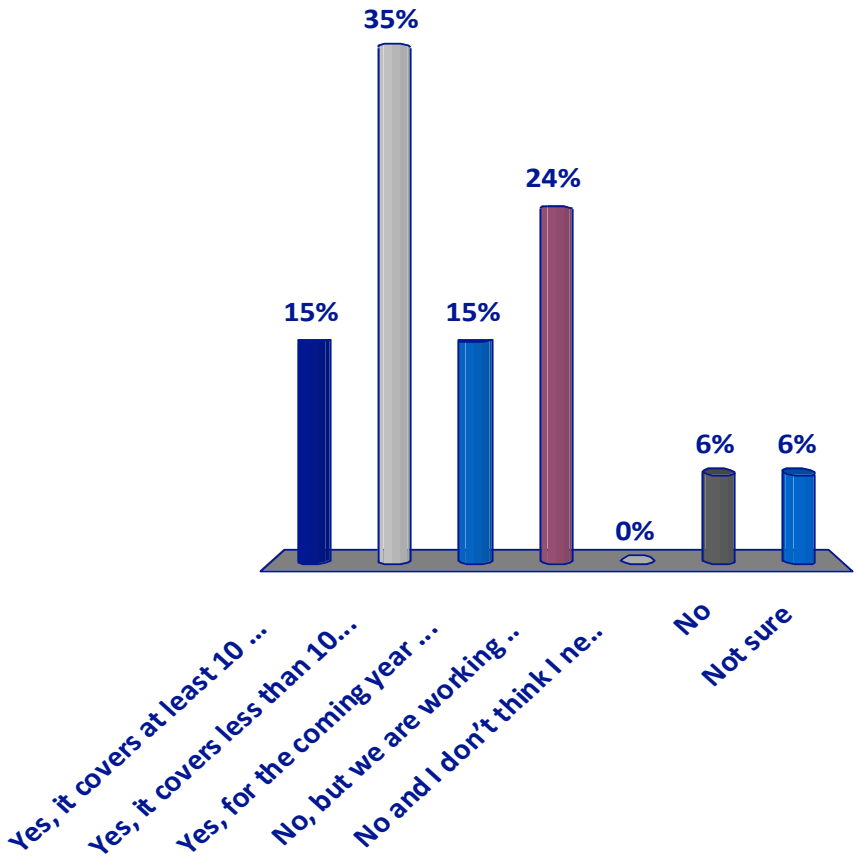
Do you have an operations and maintenance plan in place?

A. Yes, we have a robust O&M program to allow us to use data to make decisions about which activities to do
B. Yes, we have done some work in this area
C. Yes, we have started an O&M plan
D. No, but we are thinking about developing one
E. No, and we aren't planning on developing one
F. No
G. Not sure



Do you have a capital improvements plan in place?

A. Yes, it covers at least 10 years of needs
B. Yes, it covers less than 10 years of needs
C. Yes, for the coming year only
D. No, but we are working on developing one
E. No and I don't think I need one
F. No
G. Not sure



Long Term Funding

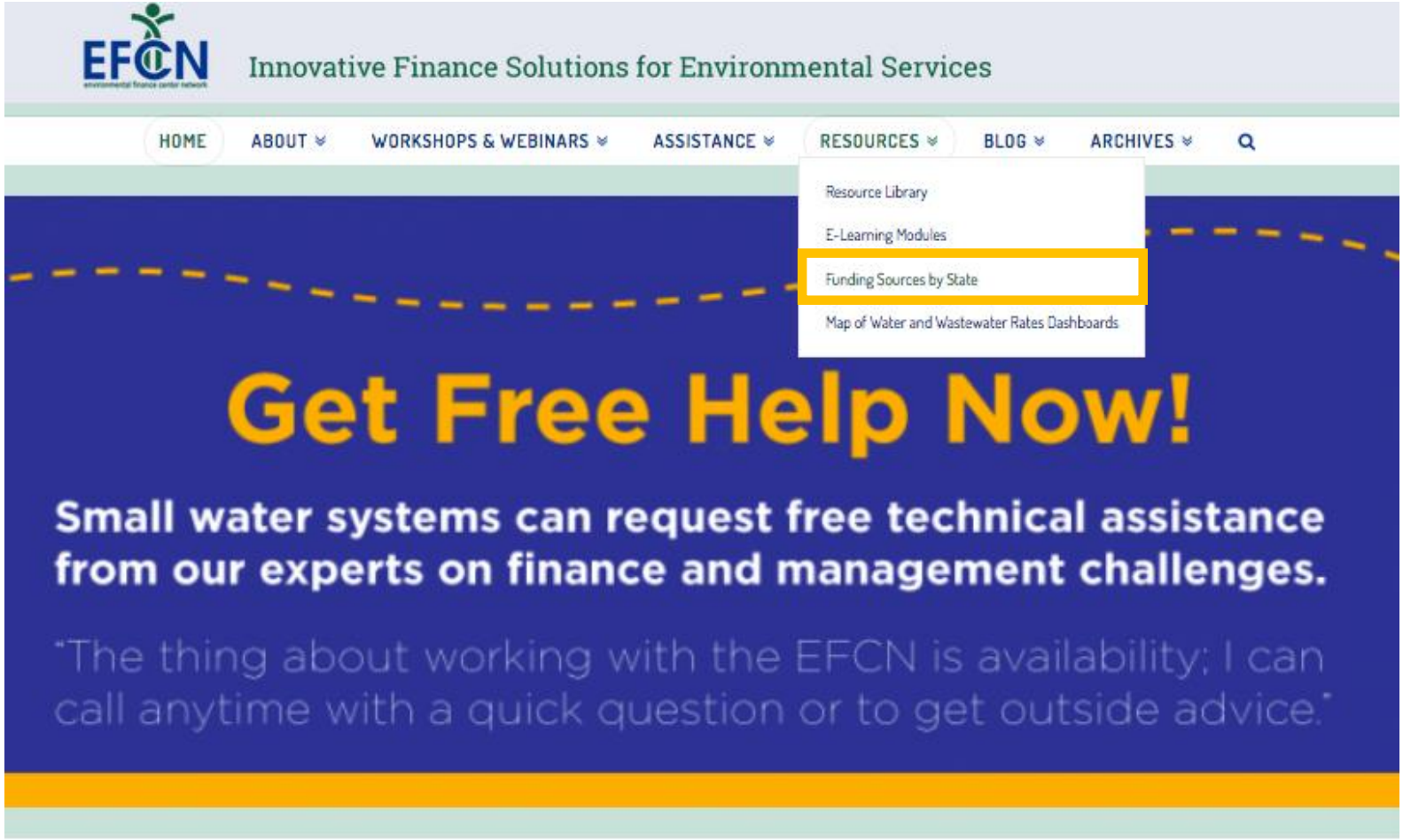
Developing an asset valuation for your system

Long Term Funding

- Do you know what types of funding are available to your utility?
- Is your system sustainable with current rates?
- Do you have the ability to invest in your utility?
- Are you investing enough?
- What would it cost to replace your system today?

Funding Tables By State

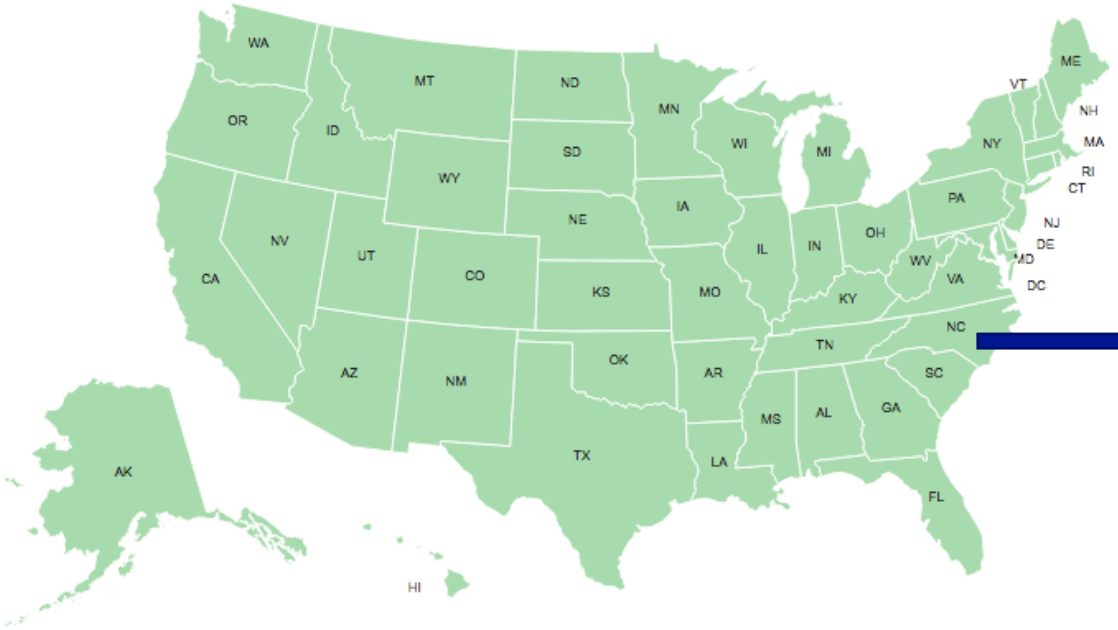
Select “Funding Sources by State” under the Resources Tab.



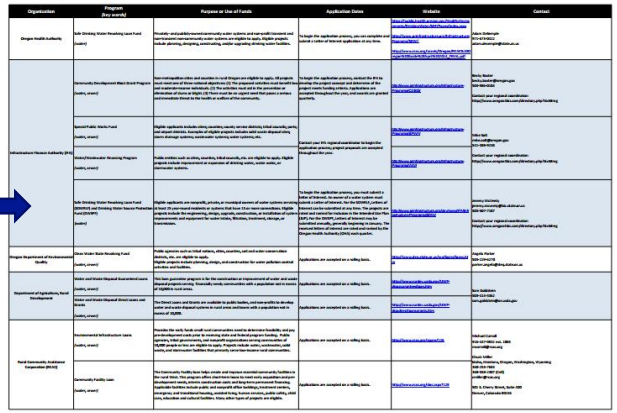
Funding Sources by State

Note: Some states may have additional resources listed below the map.

Click on the map below to view funding sources for each state:



Click on an individual state to view funding table.

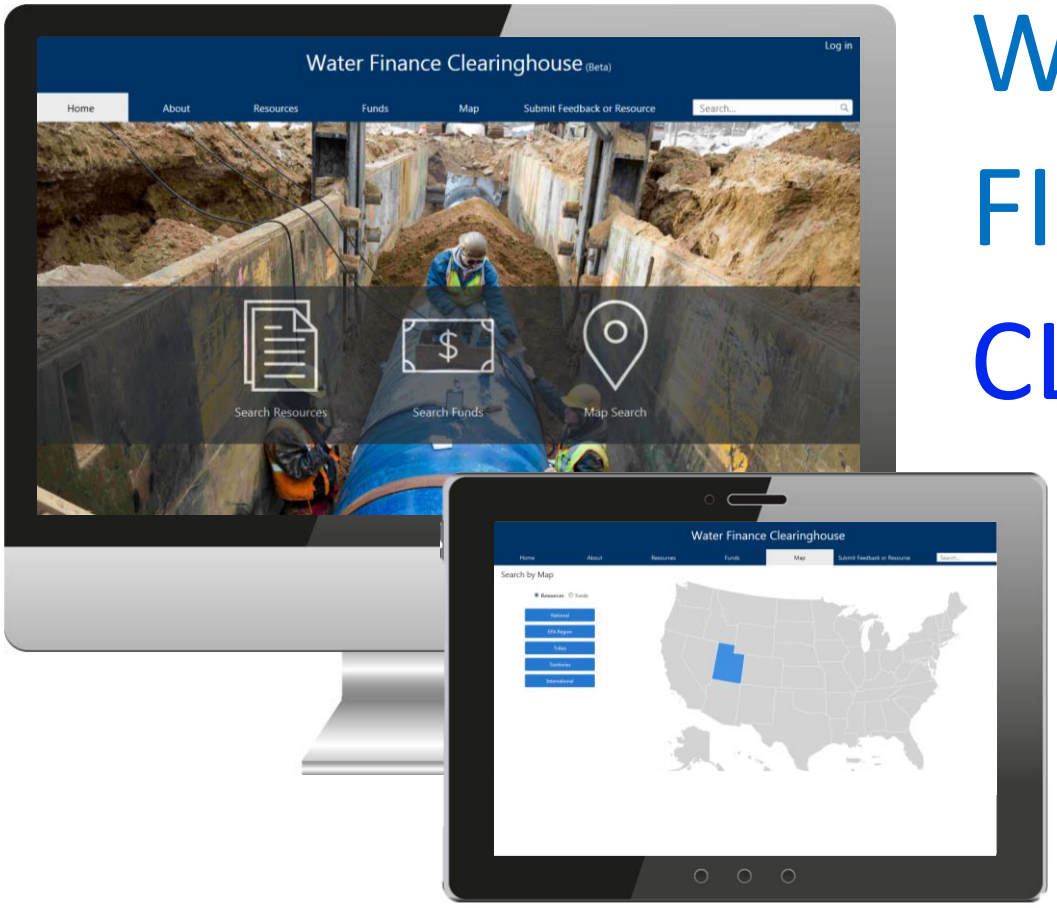


Oregon Water and Wastewater Funding Sources

Compiled by the OTCS, March 2021

Organization	Program (key words)	Purpose or Use of Funds	Application Dates	Website	Contact
Oregon Health Authority	Safe Drinking Water Revolving Loan Fund (SDWRLF)	Privately- and publicly-owned community water systems and non-profit (owned and operated) non-community water systems are eligible to apply. Eligible projects include planning, designing, constructing, and/or upgrading drinking water facilities.	To begin the application process, you can complete and submit a Letter of Intent application at any time.	https://healthyoregonwater.org/funding/drinking-water-revolving-loan-fund/ https://www.oregon.gov/oha/ph/healthywater/pages/dwsrf.aspx	Adam Grillenzoni 971-673-0412 adam.j.grillenzoni@dhsoha.state.or.us
Infrastructure Finance Authority (IFA)	Community Development Block Grant Program (CDBG, state)	Non-metropolitan cities and counties in rural Oregon are eligible to apply. All projects must meet one of three national objectives: (1) The proposed activities must benefit low/moderate income individuals. (2) The activities must aid in the prevention or elimination of slums or blight. (3) There must be an urgent need that poses a serious and immediate threat to the health or welfare of the community.	To begin the application process, contact the IFA to discuss/begin the project concept and determine if the project meets funding criteria. Applications are accepted throughout the year, and awards are granted quarterly.	http://www.oregon.gov/biz/Programs/CDBG/Pages/default.aspx https://www.oregon.gov/biz/Programs/CDBG/Pages/Publications.aspx	Becky Baxter becky.baxter@oregon.gov 503-986-0163 Contact your regional coordinator: https://www.oregon.gov/biz/Services_ptp/Pages/Reg
	Special Public Works Fund (SPWF, state)	Eligible applicants include cities, counties, county service districts, tribal councils, water districts, sanitary districts, and other municipal corporations with sewer or storm drainage systems, wastewater systems, water systems, etc.	Contact your IFA regional coordinator to begin the application process; project proposals are accepted throughout the year.	http://www.oregon.gov/biz/Programs/SPWF/Pages/default.aspx https://www.oregon.gov/biz/Publications/Publications/SPWFGuidelines.pdf	Mike Bell mike.bell@oregon.gov 503-986-0109 Contact your regional coordinator: https://www.oregon.gov/biz/Services_ptp/Pages/Reg
	Water/Wastewater Financing Program (Water/Wastewater Financing Program, state)	Public entities such as cities, counties, tribal councils, etc. are eligible to apply. Eligible projects include improvement or expansion of drinking water, water works, or wastewater systems.		http://www.oregon.gov/biz/Programs/WaterWastewaterFinancing/Pages/default.aspx http://www.oregon.gov/biz/Publications/Publications/WaterWastewaterFinancingGuidelines.pdf	
	Safe Drinking Water Revolving Loan Fund (SDWRLF) and Drinking Water Source Protection Fund (DWSPF) (water)	Eligible applicants are nonprofit, private, or municipal owners of water systems serving at most 25 year-round residents or systems that have 15 or more connections. Eligible projects include the engineering, design, upgrade, construction, or installation of system improvements and equipment for water intake, filtration, treatment, storage, or transmission.	To begin the application process, you must submit a Letter of Interest. An owner of a water system must submit a Letter of Interest to be considered for funding. Letters of Interest can be submitted at any time. The projects on the priority list cannot be inclusive in the Intended Use Plan (IUP) unless a Letter of Interest is on file. The IUP is updated annually, generally beginning in January. The received letters of interest are rated and ranked by the Oregon Health Authority (OHA) merit system.	http://www.oregon.gov/biz/Programs/WaterWastewaterFinancing/Pages/SRF.aspx http://www.oregon.gov/biz/Publications/Publications/SRFGuidelines.pdf	Jeremy Grimm jeremy.a.grimm@dhsoha.state.or.us 503-867-7307 Contact your regional coordinator: https://www.oregon.gov/biz/Services_ptp/Pages/Reg
Oregon Department of Environmental Quality	Clean Water State Revolving Fund (CWSRF, state)	Public agencies such as tribal nations, cities, counties, soil and water conservation districts, etc. are eligible to apply. Eligible projects include planning, design, and construction for water pollution control activities and facilities.	Applications are accepted on a rolling basis.	https://www.oregon.gov/deq/wq/Pages/cwsrf.aspx	Angela Parker 503-229-5758 parker.angela@deq.state.or.us
Department of Agriculture, Rural Development	Water and Waste Disposal Guaranteed Loans (Public, state)	The loan guarantee program is for the construction or improvement of water and waste disposal projects serving financially needy communities with a population not in excess of 10,000 in rural areas.	Applications are accepted on a rolling basis.	https://www.rd.usda.gov/programs-services/water-waste-disposal-loan-grants	
	Water and Waste Disposal Direct Loans and Grants (Public, state)	The Direct Loans and Grants are available to public bodies, and non-profits to develop water and waste disposal systems in rural areas and towns with a population not in excess of 10,000.	Applications are accepted on a rolling basis.	https://www.rd.usda.gov/programs-services/water-waste-disposal-loan-grants	Sara Goldstein 503-414-3362 sara.goldstein@wdc.usda.gov
Rural Community Assistance Corporation (RCAC)	Environmental Infrastructure Loans (Public, state)	Provides the early funds small rural communities need to determine feasibility and pay predevelopment costs prior to receiving state and federal program funding. Public agencies, tribal governments, and nonprofit organizations serving communities of 10,000 people or less are eligible to apply. Projects include water, wastewater, solid waste, and stormwater facilities that primarily serve low-income rural communities.	Applications are accepted on a rolling basis.	https://www.rcac.org/loans/226	Michael Carroll 916-447-9832 ext. 1001 mcarroll@rcac.org Rhett Miller Serving Alaska, Oregon, Washington, Wyoming 406-461-1983 406-581-8745 (cell) rmiller@rcac.org 501 S. Cherry Street, Suite 320 Denver, Colorado 80246
	Community Facility Loan (Public, state)	The Community Facility loan helps create and improve essential community facilities in the rural West. This program offers short-term loans to rural only acquisition and pre-development needs, interim construction costs and long-term permanent financing. Applicable facilities include public and nonprofit office buildings, treatment centers, emergency and transitional housing, assisted living, human services, public safety, child care, education and cultural facilities. Many other types of projects are eligible.	Applications are accepted on a rolling basis.	https://www.rcac.org/186-state/1126	

WATER INFRASTRUCTURE & RESILIENCY FINANCE CENTER AVAILABLE RESOURCES



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

Essential Resources and Information in the Clearinghouse

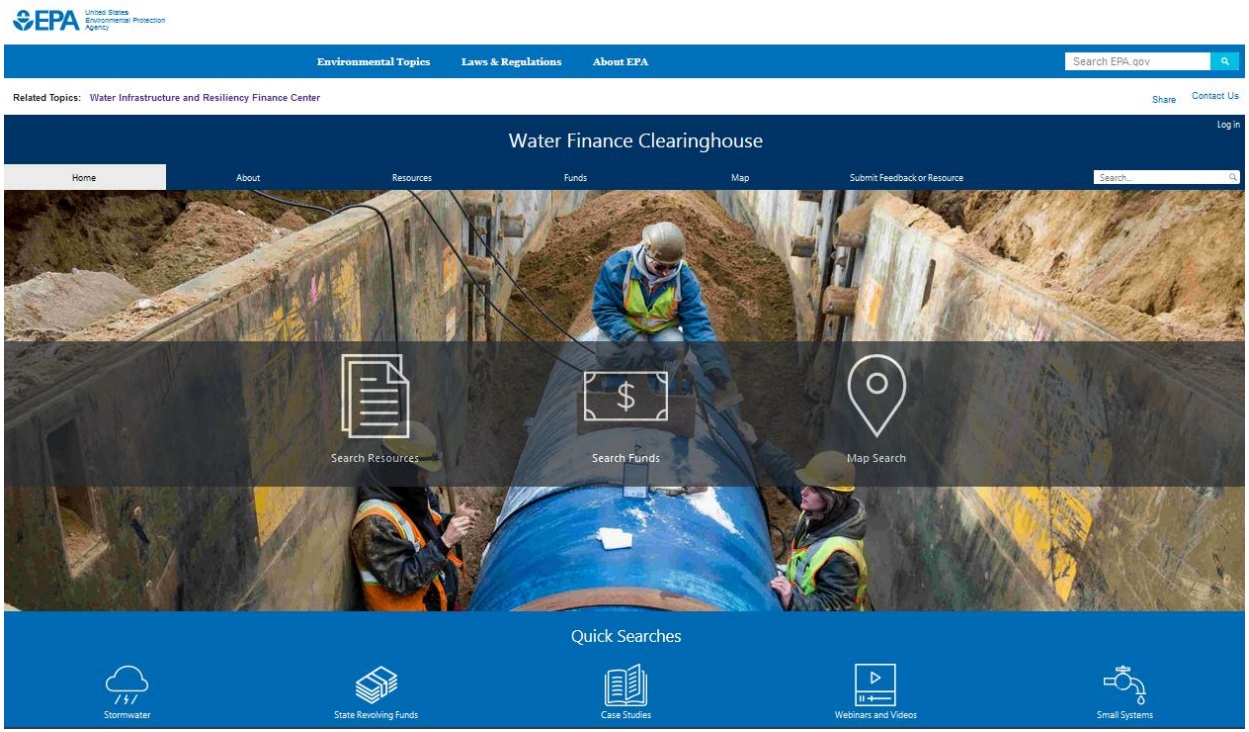
RESOURCES

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

FUNDING SOURCES

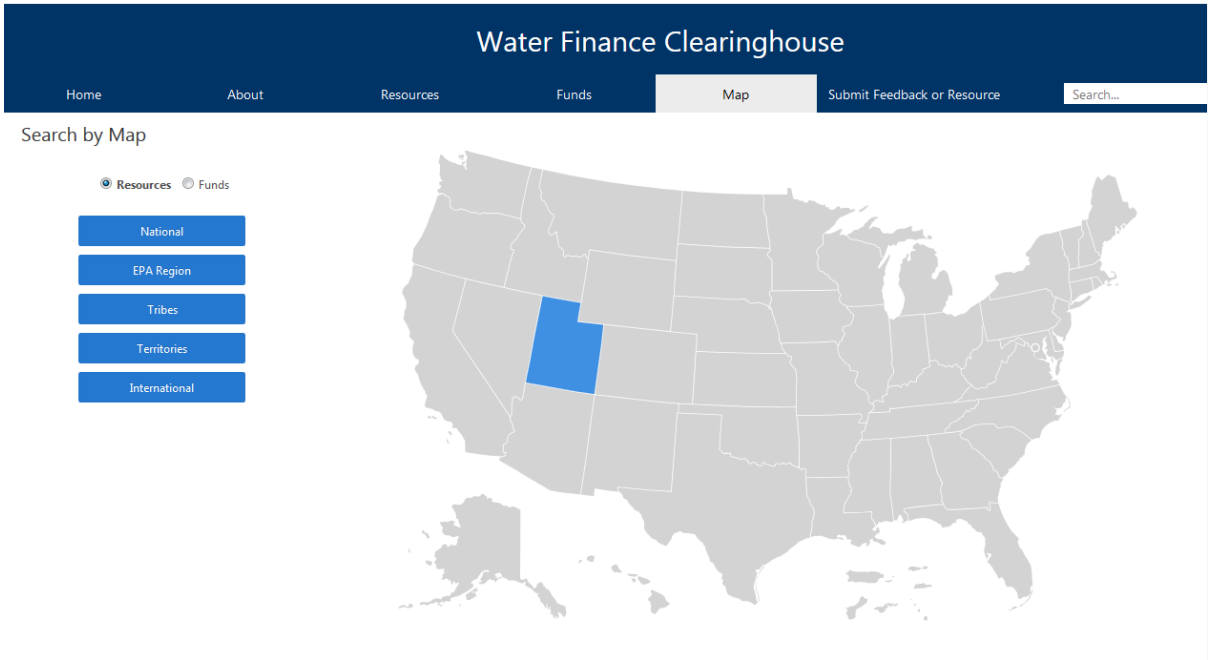
- **Federal funding** – grants and loan programs that support water infrastructure project development and construction
- **Regional funding** opportunities
- **State funding** – grant and loan programs
- **Foundation** opportunities
- **NGO**

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)

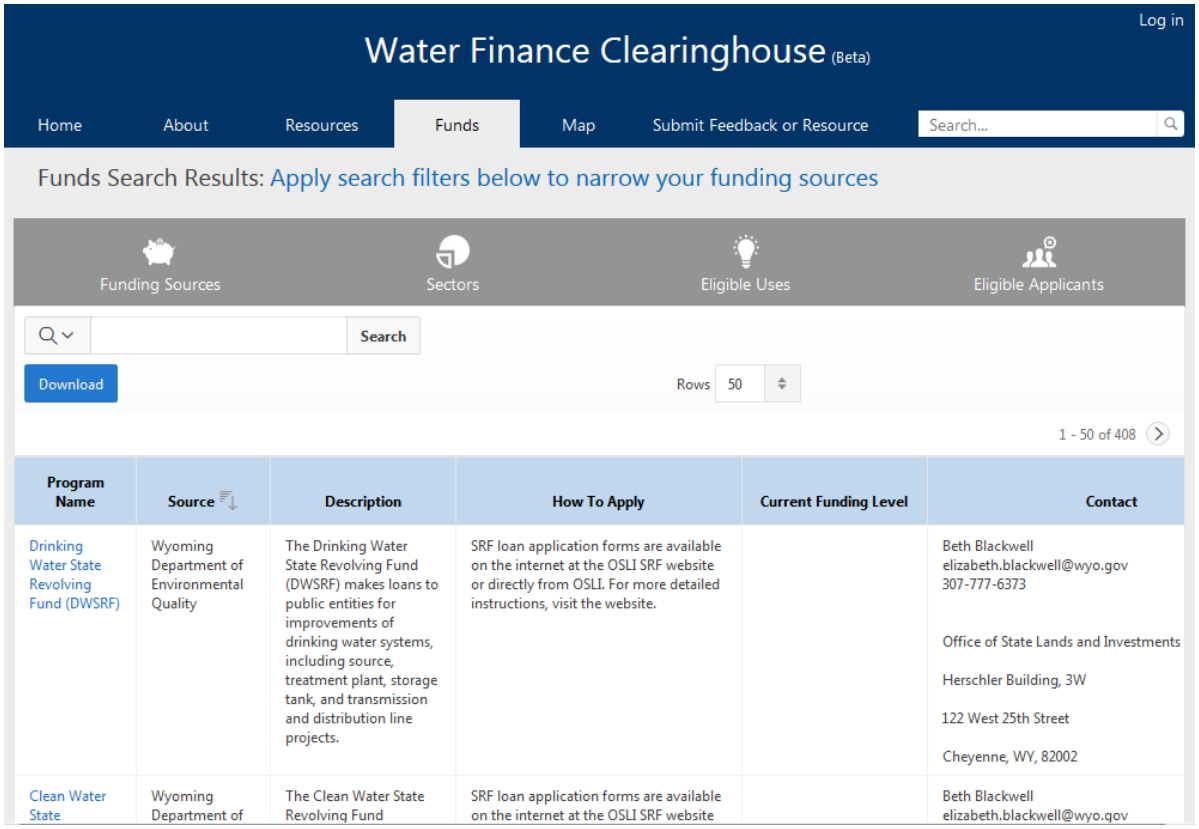
MAP SEARCH



Key Features:

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

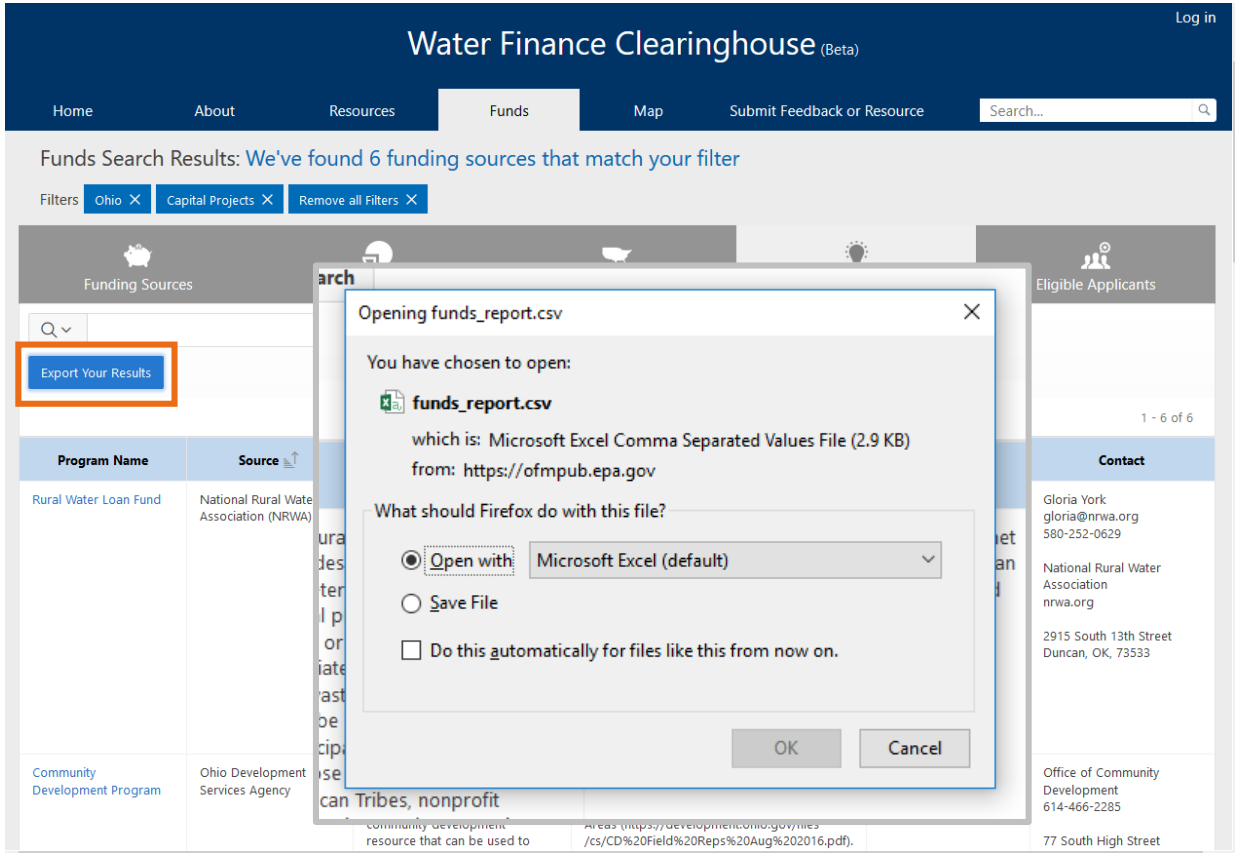
SEARCH FUNDS



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



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.

CONTACT

Visit the Site

www.epa.gov/wfc

EPA Clearinghouse Contact

Kristyn Abhold
Abhold.Kristyn@epa.gov

Sonia Brubaker
Brubaker.Sonia@epa.gov

EFCN Funding Tools and Resources

- Financial Health Checkup for Water Utilities - Tool
- Plan to Pay: Scenarios to Fund Your CIP - Tool
- Water and Wastewater Rates Analysis Model - Tool
- Designing Rate Structures that Support Your Objectives: Guidance Document

http://efcnetwork.org/resource-library/

Replacement Valuation Tool

Name:	
Date:	
Utility:	

Instructions:
Please input the water system's information in the green boxes. Please input the quantity and, where applicable, the size for each type of asset the utility owns. If the utility has recent unit price information for a specific type of asset listed below, that value can be input in the column labeled "Known Unit Price".

Orange Box: These are the calculated values

Gray Box: Unit Prices

SOUTHWEST ENVIRONMENTAL FINANCE CENTER

Asset Type	Asset	Size	Quantity	Unit	Low Range Unit Price:	High Range Unit Price:	Median Range Unit Price:	Known Unit Price:	Low Estimated Value	High Estimated Value	Median Value
Pipeline	Ductil Iron Pipe	4"-6"	199744	per Linear Foot	$ 24.26	$ 130.00	$ 42.50		$ 4,845,789	$ 25,966,720	$ 8,489,120
		8"-10"	87268		$ 33.11	$ 150.00	$ 100.50		$ 2,889,443	$ 13,090,200	$ 8,770,434
		12"-16"	64409		$ 49.64	$ 230.00	$ 90.00		$ 3,197,263	$ 14,814,070	$ 5,796,810
		18"-24"	155250		$ 97.59	$ 320.00	$ 265.00		$ 15,150,848	$ 49,680,000	$ 41,141,250
	Main PVC	4"-6"		per Linear Foot							
		8"-12"									
		14"-20"									
	HDPE			per Linear Foot							
	Service Line	.75"-2		Each							
Valves	Blow Off	2"		Each							
	Gate Valve			Each							
	Air Release Valve	1"-2"		Each							
	PRV	4"-8"		Each							
	Check Valve			Each							
Storage	Ground Storage			Gallons							
	Elevated Storage			Gallons							
	Steel Tank			Gallons							
	Concrete Tank			Gallons							
Hydrant	Fire Hydrant	4"-6"		Each							
Meters	Supply Meters	4"-6"		Each	$ 700.00	$ 8,000.00	$ 1,500.00		$ -	$ -	$ -
	Customer Meters	.75"-2"		Each							
Pumps	Sumbersible Pump	1/2 HP- 30 HP		Each							
	Booster Pump	500 GPM-2000 GPM		Each							
Treatment	Chemical Feed and Storage System			Each							
						Estimated Value Range:			$ 26,083,300	$ 103,551,000	$ 64,197,600

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

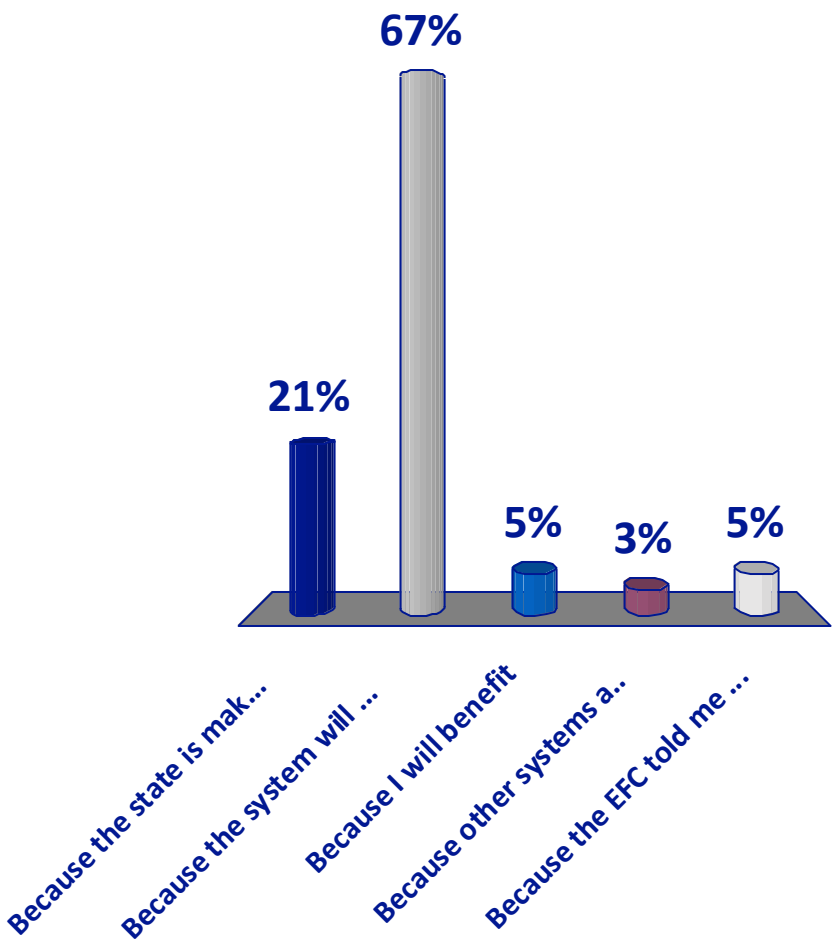
Valuable?

What can knowing the replacement value of your utility help you with? Is there value in knowing the replacement value?

Wrap Up

Why Should I Do Asset Management?

A. Because the state is making me
B. Because the system will benefit
C. Because I will benefit
D. Because other systems are doing it and I want to be like everyone else
E. Because the EFC told me I should



Some Closing Thoughts

It’s better to walk on the right road than run on the wrong one

Some Closing Thoughts

Asset Management is best done by the people who own, manage, and operate the assets

Some Closing Thoughts

Don’t let what you can’t do stop you from doing what you can do.

SOUTHWEST
ENVIRONMENTAL
FINANCE CENTER

Heather Himmelberger: heatherh@unm.edu

Dawn Nall: dnall@unm.edu

James Markham: jmarkham@unm.edu

Department of Civil Engineering MSC01 1070
1 University of New Mexico, Albuquerque, NM 87131
505-277-0644
swefc@unm.edu
http://southwestefc.unm.edu