



Rural
Community
Assistance
Partnership



Asset Management for Small Water and Wastewater Systems

RCAC, the western RCAP, is an equal opportunity provider and employer.

This publication was developed under Assistance Agreement No. 84025001 awarded by the U.S. Environmental Protection Agency. It has not been formally reviewed by EPA. The views expressed in this document are solely those of the RCAP, Inc. and EPA does not endorse any products or commercial services mentioned in this publication.



Your Presenter Today

Sabrina Straus

RCAC Environmental
Small Utility Consultant I
Washington and Oregon
(971) 978-9257

www.rcac.org



Rural Community Assistance Partnership

RCAP National Office
1701 K St. NW, Suite 700
Washington, D.C. 20006
www.rcap.org

Western RCAP
Rural Community Assistance
Corporation
www.rcac.org

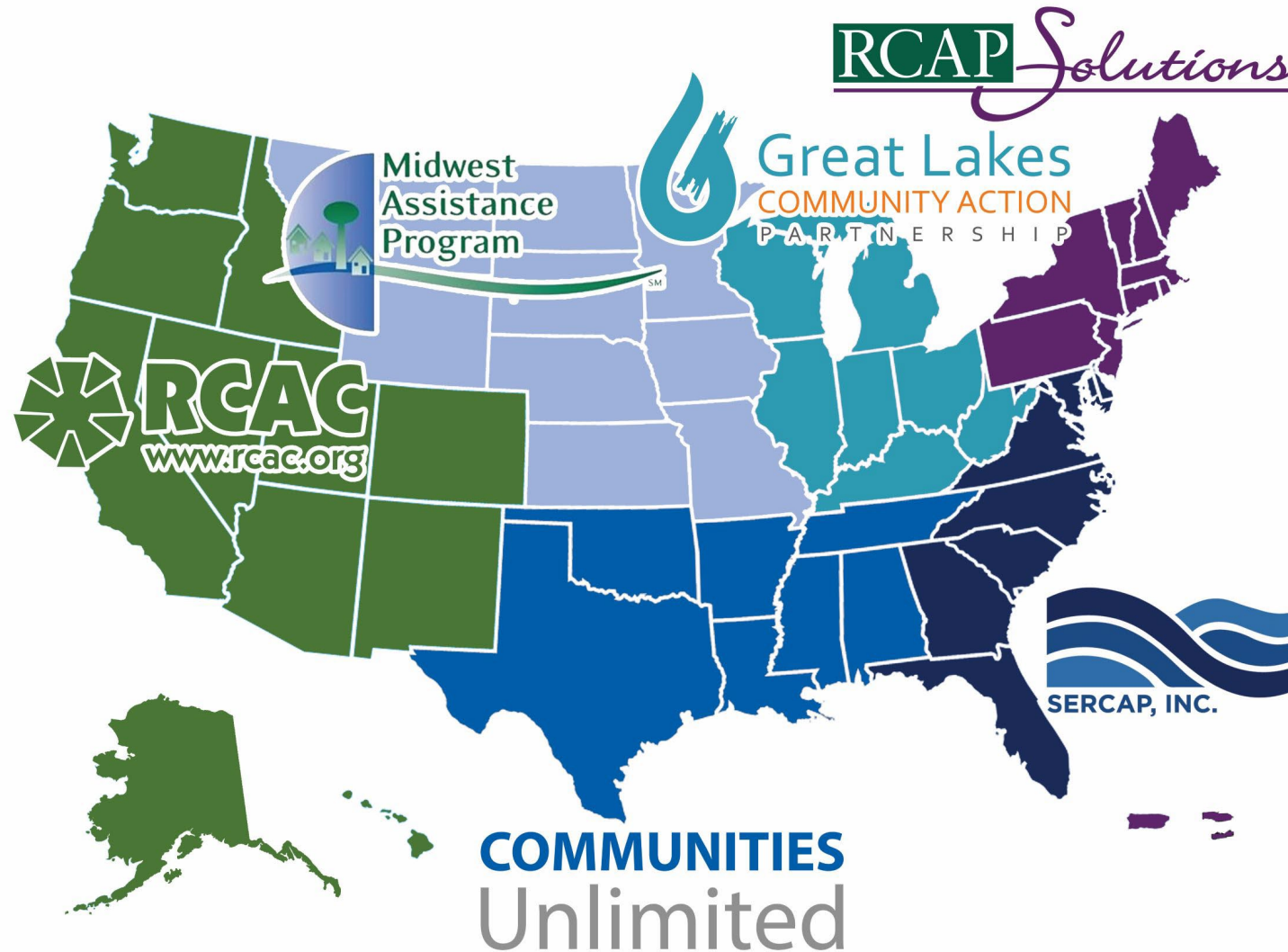
Midwestern RCAP
Midwest Assistance Program
www.map-inc.org

Southern RCAP
Communities Unlimited
www.communitiesu.org

Great Lakes RCAP
Great Lakes Community
Action Partnership
www.glcap.org

Southeastern RCAP
Southeast Rural Community
Assistance Project
www.sercap.org

Northeastern RCAP
RCAP Solutions
www.rcapsolutions.org



RCAC Programs

- Affordable housing
- Loan Fund - water and wastewater infrastructure financing
- Classroom and online training
- On-site and remote technical assistance
- Income surveys and rate analysis
- Rural Economic Development

Asset Management

Asset Management Definitions:

- A **long-term** program to attain and sustain the **chosen** level of service for the life of the asset in the **most cost-effective** manner.
- A method to incorporate **system renewal** into the Capital Improvement Plan (CIP) and **include risk management** in system budgeting.

Before You Begin to Plan

**Get Key
People
Together
- Build
Your
Team**

Decision makers

Community members

Utility staff

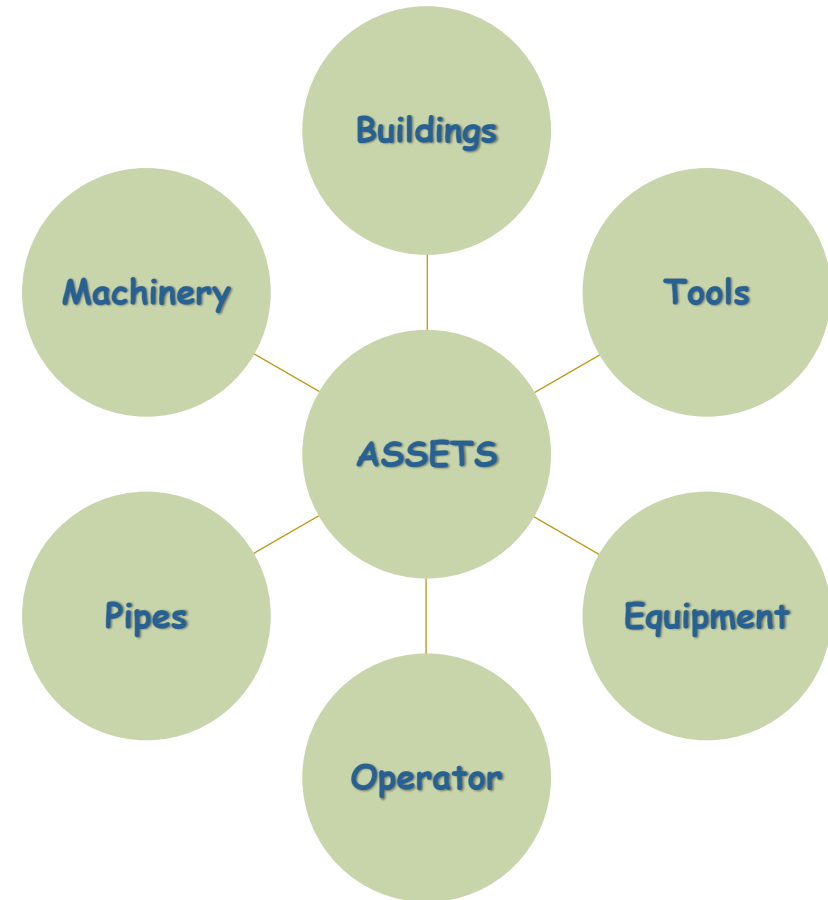
Business owners

Financial staff

Who else?

What is an Asset?

All your “stuff”; pipes, pumps, computer programs, furniture, rolling stock, valves, motors, buildings...



Asset Truths

- All assets are **not** created equal
- All assets eventually **fail**
- Failures **directly** affect system performance

AM = Risk Based Planning Process

$\text{Risk} = f(\text{Criticality} \times \text{Condition})$

$\text{Risk} = f(\text{Consequence of Failure} \times \text{Likelihood of Failure})$

AM = Risk Based Planning Process

		Condition					
	<i>Priority</i>						
Criticality		Very Good	Good	Fair	Poor	Very Poor	
		1	2	3	4	5	
Very Low Impact	1						
Low Impact	2	2					
Medium Impact	3						
High Impact	4						
Very High Impact	5					25	

Why Is AM a Good Idea?

- Because assets are **large**, expensive, long-lived, and often **buried**
- Well maintained assets are essential to protect public health
- Economic development depends on reliable and safe water delivery

Good Management Comes With a Price...

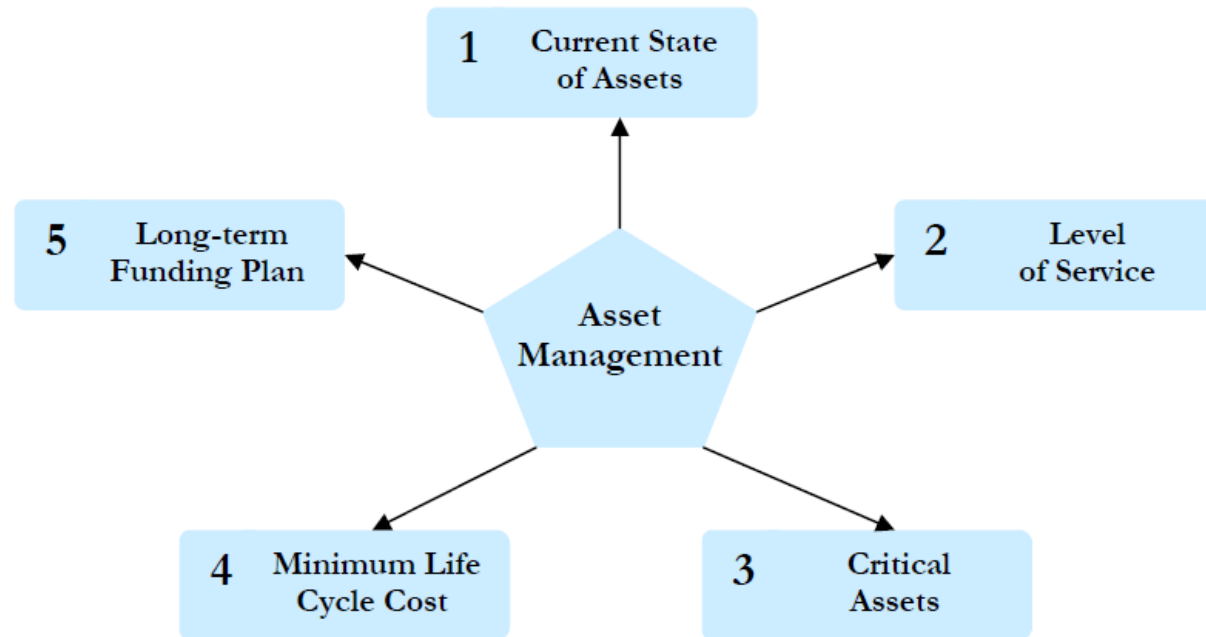
What are the two questions you must always be able to answer?

- **Why are we doing this?**
- **What is it going to cost?**

Customers don't need to "like" the answers.

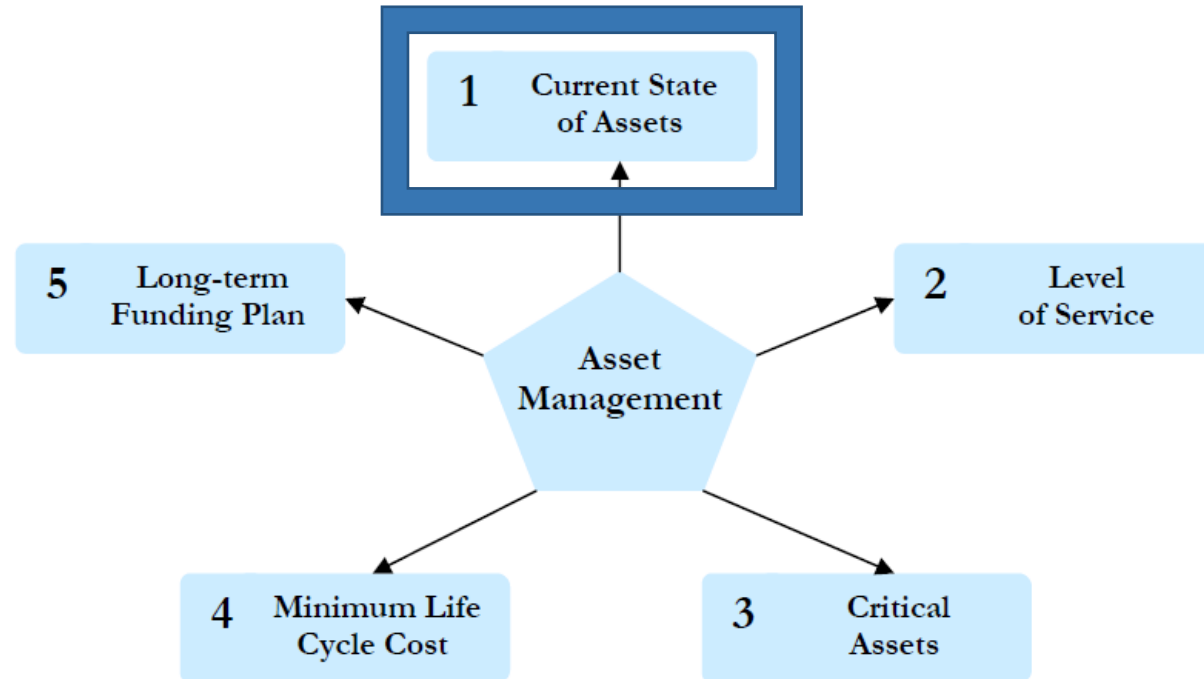
What is Asset Management

Flow Chart: The Five Core Questions of Asset Management Framework

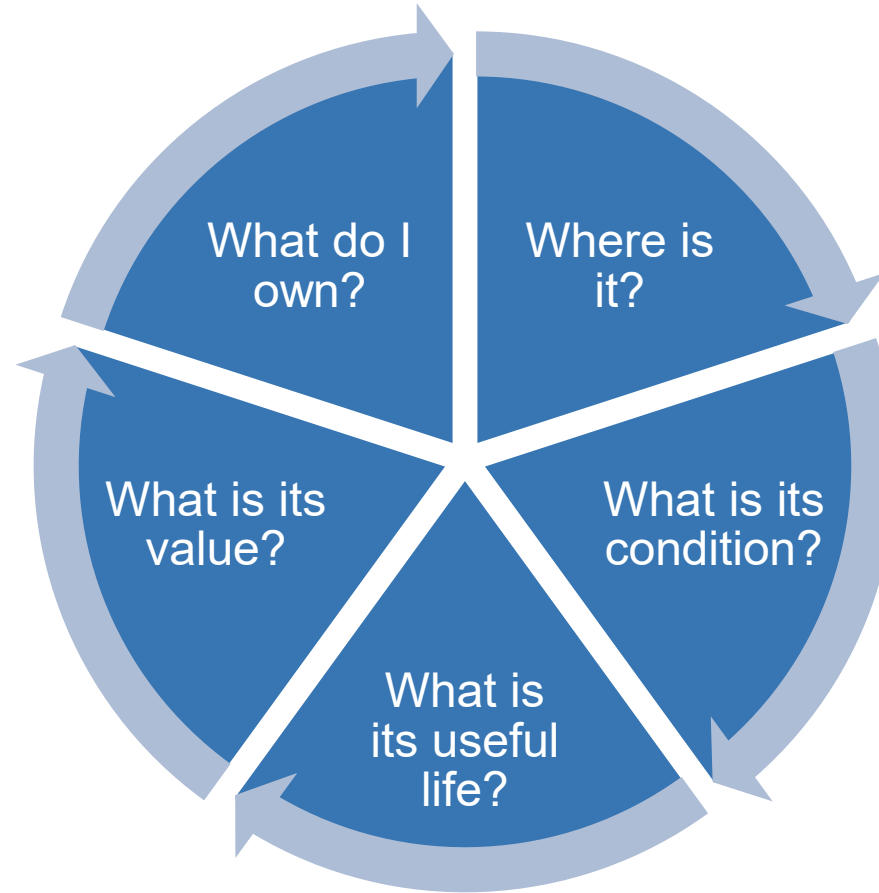


Step 1 Current State of Assets

Flow Chart: The Five Core Questions of Asset Management Framework



Step 1 Current State of Assets



Step 1 Current State of Assets

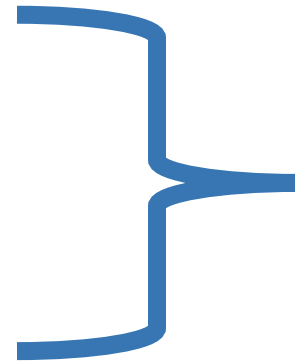
What do we own?

- Prepare an asset inventory
- What type of asset is it?
 - Short lived – generally replaced by cash
 - Long lived (Capital Asset) generally financed but can be cash replaced

Step 1 Current State of Assets

Identify number/feet/type of all important components in your utilities

- ☐ *Year Installed
- ☐ Useful Life
- ☐ **Condition**
- ☐ Replacement Cost



**No
Fibbing**

Step 1 Current State of Assets

Where is the asset located?

- Prepare a system facility map and show where assets are located
- Are they located in the “best” place?
 - ☐ Computer back ups
 - ☐ Extra vehicle keys

Step 1 Current State of Assets

Collecting the data.... the biggest challenge!

- Facility Maps and Plans
- Bid/Construction documents
- “As-builts”/Record Drawings
- Walk the line
 - Wheel or pace yardage
 - Count valves, hydrants etc.
- Your experience and observation

Step 1 Current State of Assets

Identify condition of assets

- Use a value system, 1 – 10, 1 - 5
- Determine which number means immediate replacement

Step 1 Current State of Assets

Assess useful life

- What is the total useful life of the asset
- Calculate the remaining useful life

Step 1 Current State of Assets



Asset Management: A Handbook for Small Water Systems

One of the Simple Tools for Effective
Performance (STEP) Guide Series



Step 1 Current State of Assets

Introduction to the System Inventory Worksheet

The following System Inventory Worksheet will help you:

- Identify all of your system's assets;
- Record the condition of your assets;
- Record the service history of your assets;
- Determine your assets' adjusted useful lives;
- Record your assets' ages; and,
- Estimate the remaining useful life of each of your assets. Usually, there are two steps to estimating useful life:
 1. Determine the expected useful life by using the manufacturer's recommendations or the estimates provided in the box to the right. Adjust these numbers based on the specific conditions and experiences of your system.
 2. Calculate an adjusted useful life by taking into account the service history and current condition of your asset.

Two copies of the worksheet are provided. The first copy is followed by instructions that will help you understand how to complete it. The second worksheet is an example. Appendix A has blank worksheets that you can photocopy and use.

Estimated Useful Lives

Asset	Expected Useful Life (in years)
Intake Structures	35-45
Wells and Springs	25-35
Galleries and Tunnels	30-40
Chlorination Equipment	10-15
Other Treatment Equipment	10-15
Storage Tanks	30-60
Pumps	10-15
Buildings	30-60
Electrical Systems	7-10
Transmission Mains	35-40
Distribution Pipes	35-40
Valves	35-40
Blow-off Valves	35-40
Backflow Prevention	35-40
Meters	10-15
Service Lines	30-50
Hydrants	40-60
Lab/Monitoring Equipment	5-7
Tools and Shop Equipment	10-15
Landscaping/Grading	40-60
Office Furniture/Supplies	10
Computers	5
Transportation Equipment	10

Note: These numbers are ranges of expected useful lives drawn from a variety of sources. The ranges assume that assets have been properly maintained.

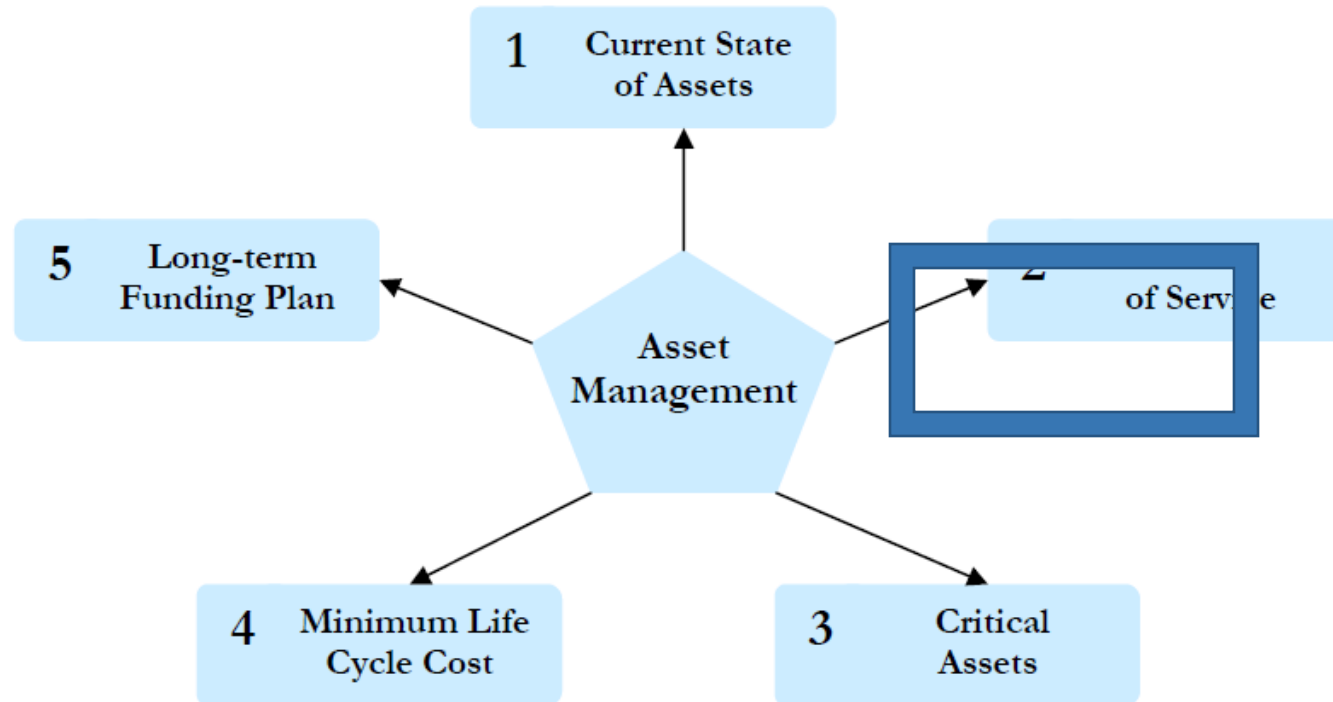
Step 1 Current State of Assets

Determine asset values and replacement costs

- Capital Facility Plan
- Parts suppliers
- Well drillers
- Engineering estimates

Step 2 Level of Service (LOS)

Flow Chart: The Five Core Questions of Asset Management Framework



This flow chart shows the relationships and dependencies between each core framework question.

Step 2 Level of Service

A policy decision to provide an “amount” of service to meet (local standards)

Step 2 Level of Service

Financial Viability

“Sufficient funds to operate, maintain and manage a public water system, on a continuing basis, in full compliance of federal and state laws”

Step 2 Level of Service

- No violations
- Planning requirement
- Backup generator
- Emergency plans
- Well trained personnel
- Nice truck w/emblem
- Clean facilities
- Phone answered in 3 rings
- Good water pressure
- System optimization
- Repair parts on-hand
- Proactive maintenance
- Public relations
- Adequate Rates

Step 2 Level of Service

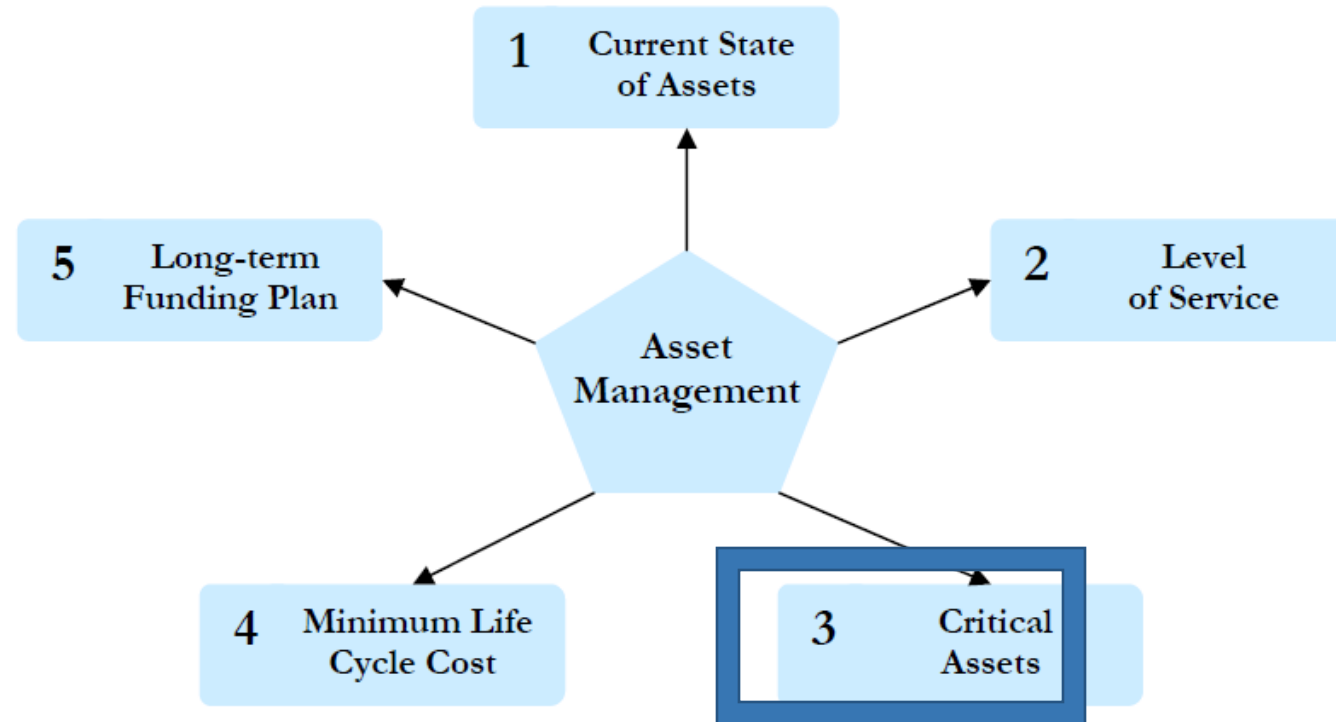
Tracking achievement

- Set criteria
- Based on adopted standards
- Meeting set standards shows customers you take this responsibility seriously

 **Public Relations** 

Step 3 Critical Assets

Flow Chart: The Five Core Questions of Asset Management Framework



This flow chart shows the relationships and dependencies between each core framework question.

Step 3 Critical Assets

Identify importance of assets

- How important is this asset? Is it critical or is it for redundancy?

Step 3 Critical Assets

Which assets are critical to sustained performance?

Conduct a **Risk & Resiliency Assessment** to identify vulnerability from intrusion, terrorism, storms, flooding, earthquakes...



Guidance for Small Community Water Systems on Risk and Resilience Assessments under America's Water Infrastructure Act

Who Should Use this Guidance?

- This guidance is intended for small community water systems (CWSs) serving greater than 3,300 but less than 50,000 people to comply with the requirements for **risk and resilience assessments** under America's Water Infrastructure Act of 2018 (AWIA).
- For larger CWSs, EPA recommends the [Vulnerability Self-Assessment Tool](#) (VSAT) Web 2.0 or an alternate risk assessment method.
- CWSs serving 3,300 or fewer people are not required to conduct risk and resilience assessments under AWIA. EPA recommends, however, that very small CWSs use this or other guidance to learn how to conduct risk and resilience assessments and address threats from malevolent acts and natural hazards that threaten safe drinking water.

What is the Purpose of this Guidance?

- This guidance will help small CWSs meet the requirements for risk and resilience assessments in AWIA.
- This guidance does not address emergency response plans (ERPs), which are also required under AWIA for CWSs serving more than 3,300 people.
 - EPA has developed an [Emergency Response Plan Template and Instructions](#) for CWSs to comply with AWIA.
- Further, this guidance does not cover all aspects of water system security and resilience, such as asset management, climate change, and emergency preparedness and response. Visit EPA's [Drinking Water and Wastewater Resilience](#) page to find more information.

What are the Risk and Resilience Assessments Requirements in AWIA?

AWIA requires CWSs serving more than 3,300 people to assess the risks to and resilience of the system to malevolent acts and natural hazards. The law specifies water system assets (e.g., infrastructure) that the assessment must address. These assets are listed in Tables 1a – 10b in the *Risk and Resilience Assessment Checklist* (see fillable checklist below on page 4).

Water systems **must certify to EPA** that the system conducted the assessment not later than the following dates:

- March 31, 2020 for systems serving 100,000 or more
- December 31, 2020 for systems serving 50,000 or more but less than 100,000

Step 3 Critical Assets

Analyze failure consequences

Develop an **Emergency Response Plan (ERP)** to show what you are going to do about failure, who does what, phone numbers...

Step 3 Critical Assets

What's the probability of failure?

- Past history
- Age and condition
- Trends

List assets by failure type

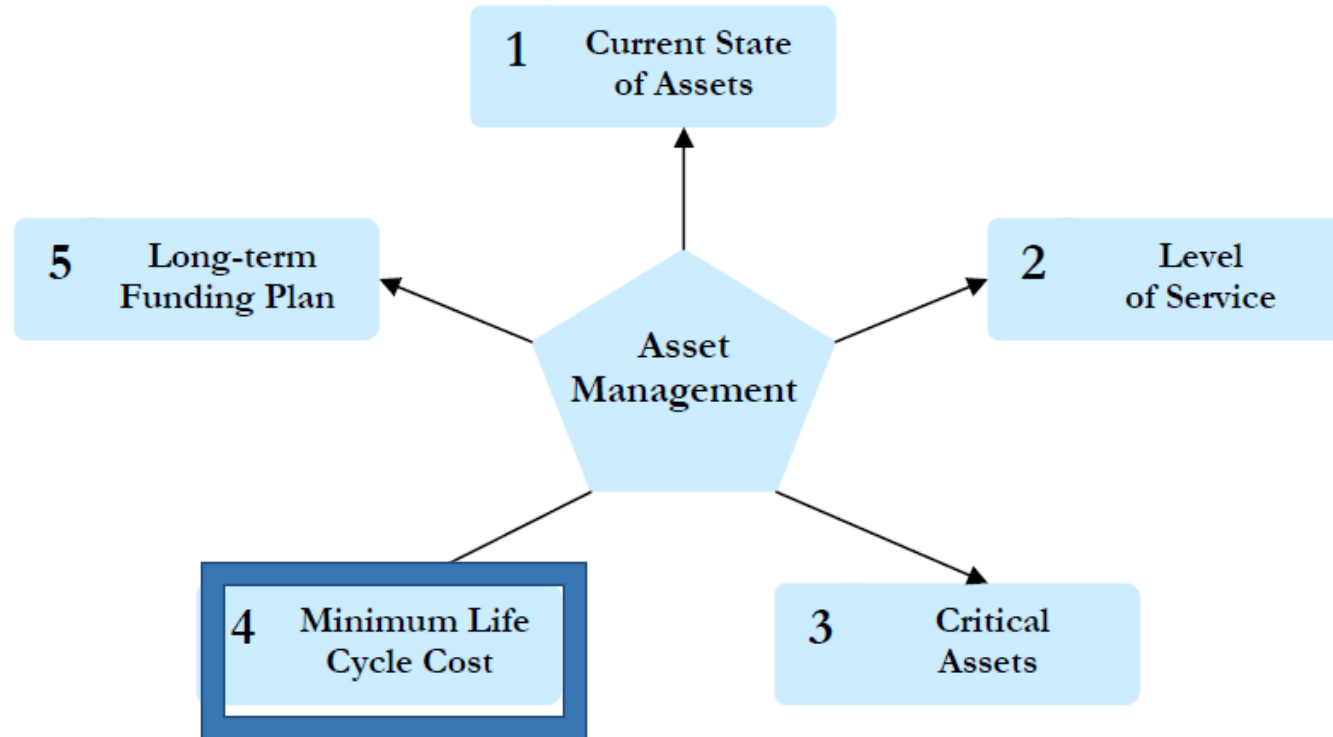
Step 3 Critical Assets: Prioritize Projects

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

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

Step 4 Minimum Life Cycle Cost

Flow Chart: The Five Core Questions of Asset Management Framework



This flow chart shows the relationships and dependencies between each core framework question.

Step 4 Life Cycle Phase Asset Management

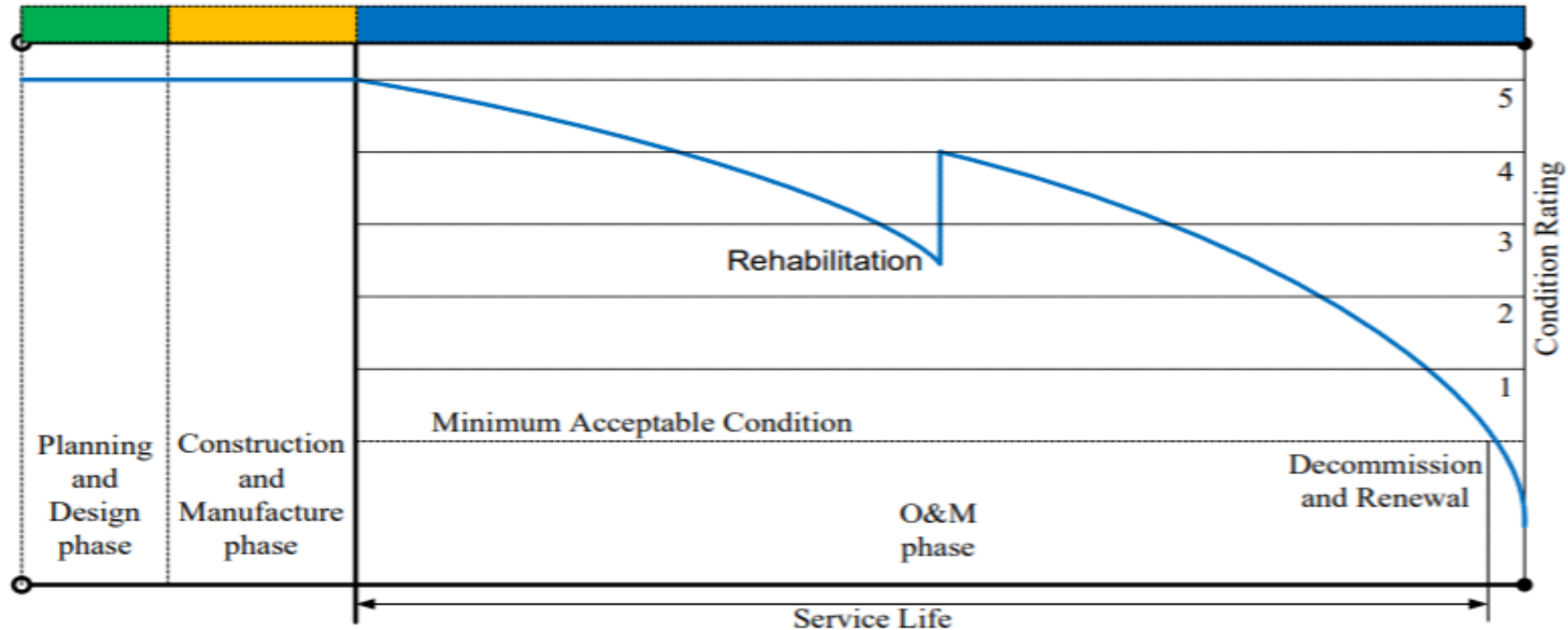
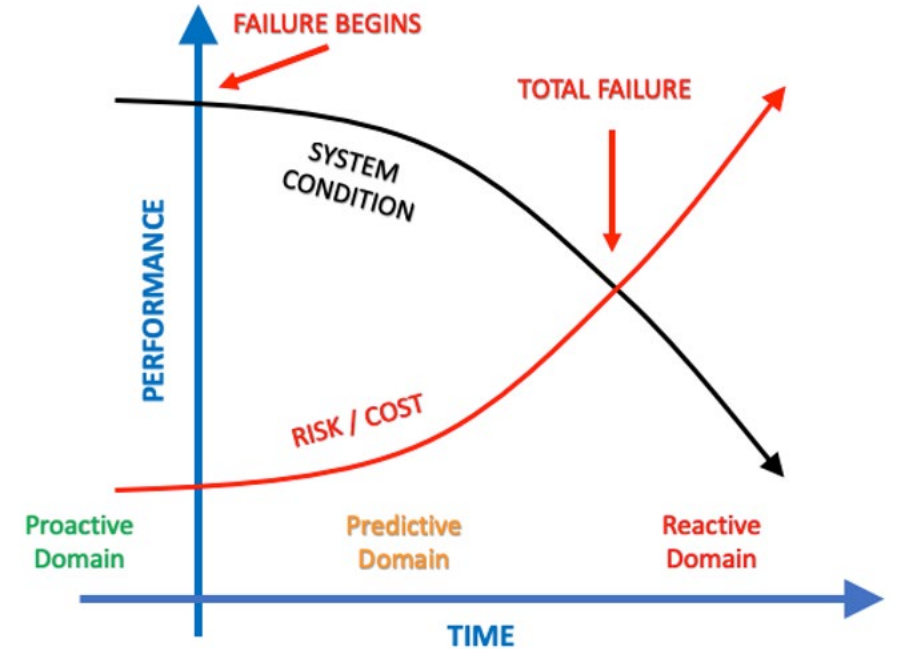


Figure 2-7. Life Cycle Phase Asset Management.

Step 4 Minimum Life Cycle Cost

Key Concepts:

- Scheduled Maintenance
 - Reactive vs. Proactive vs. Pred
- Recordkeeping
 - Track trends
- Planning
 - Financial
 - Contingency



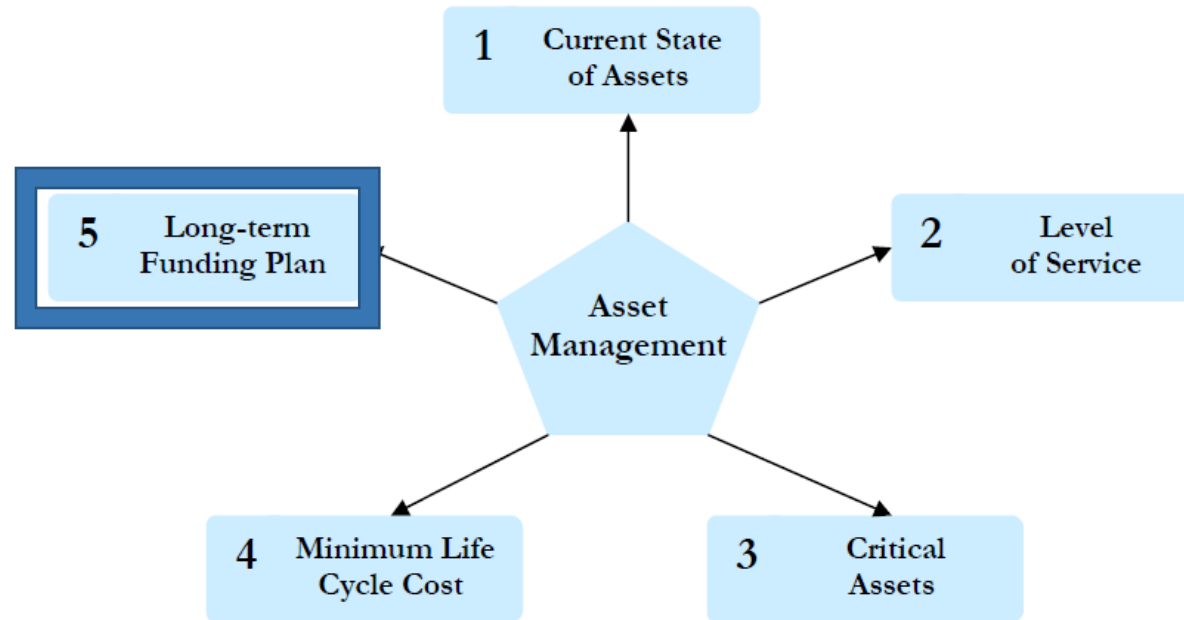
Source: <https://www.leancompliance.ca/post/proactive-v-s-predictive-v-s-reactive>

Step 4 Minimum Life Cycle Cost

1. Move from reactive maintenance to predictive
2. Know costs & benefits of rehabilitation vs. replacement
3. Deploy resources based on asset conditions
4. Analyze possible asset failures & develop specific response plans

Step 5 Long-term Funding Plan

Flow Chart: The Five Core Questions of Asset Management Framework



Step 5 Long-term Funding Plan

- ✓ Inventory your assets
- ✓ Service policies
- ✓ Replacement schedule
- ☐ Determine needed reserve accounts
- ☐ Determine funding sources
- ☐ Translate the above into rates!



Step 5 Long-term Funding Plan

Determine needed reserve accounts

- Short term asset replacement
- Cash components of capital projects such as preliminary engineering or matching funds



Step 5 Long-term Funding Plan

Determine funding sources:

- Cash reserves
- Loan sources
 - **Learn prioritization of funding**
- Likelihood of grants
 - USDA Rural Development
 - SRF “forgiveness”
 - CDBG

Step 5 Long-term Funding Plan

Keep in touch

Prioritization for loans and grants changes

- You will need to show financial planning and “sustainability” skills
- You will need to demonstrate “stewardship” of your utilities

Step 5 Long-term Funding Plan



CREATE AND
FOLLOW A
BUDGET



CREATE & FUND A
DEDICATED
ASSET RESERVE



REVISE YOUR
RATE STRUCTURE



ATTEND
EDUCATIONAL
WORKSHOPS!

6 Year Budget

Support the Asset Management Plan

- Begin with 4-year review of past actuals (min 3 yrs)
- Factual budget; 1 year (2024), 5-year projection (2025 – 2030)
- Budget projections include annual expenses, new loans & inflation
- Base budget on true expenses & reserve needs including asset management

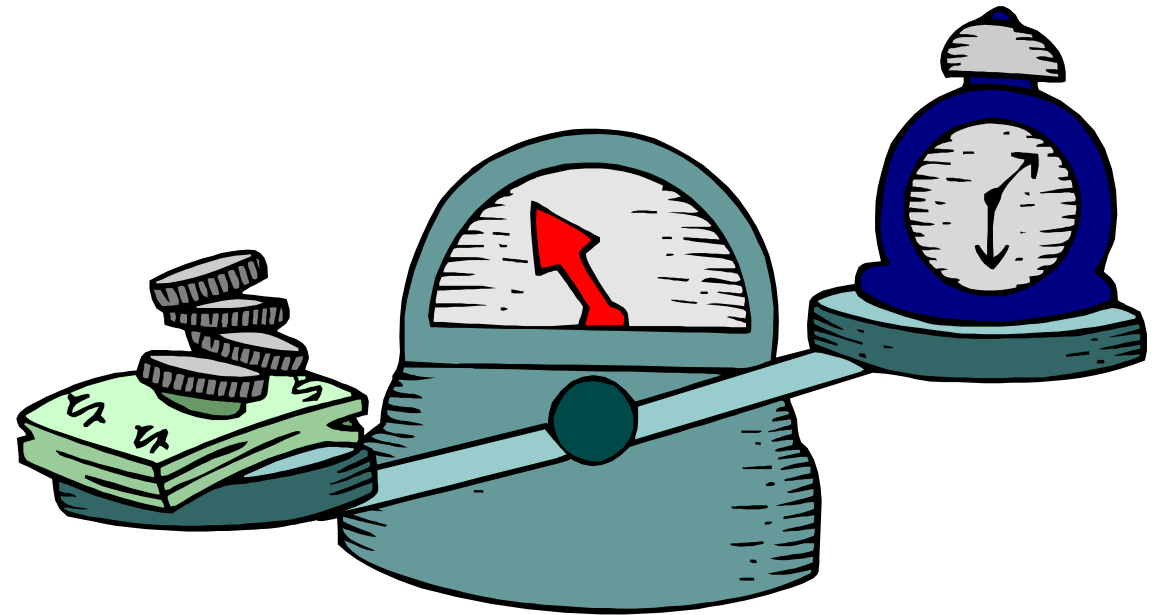
6 Year Budget - Reserves

	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6
Operating Reserve - Target Balance \$7,326 – Year 7						
Operating reserve beginning balance		\$0	\$0	\$1,221	\$2,442	\$3,663
Contribution to operating reserve			\$1,221	\$1,221	\$1,221	\$1,221
Operating reserve ending balance	\$0	\$0	\$1,221	\$2,442	\$3,663	\$4,884
Emergency Reserve - Target Balance \$50,000 – Year 13						
Emergency reserve beginning balance		\$0	\$0	\$0	\$5,000	\$10,000
Contribution to emergency reserve				\$5,000	\$5,000	\$5,000
Withdrawal from emergency reserve						
Emergency reserve ending balance	\$0	\$0	\$0	\$5,000	\$10,000	\$15,000
Short-lived Asset Reserve - Target Balance \$13,500 – Year 7						
Short-lived asset reserve beginning balance		\$0	\$0	\$2,700	\$5,400	\$8,100
Contribution to short-lived asset reserve			\$2,700	\$2,700	\$2,700	\$2,700
Withdrawal from short-lived asset reserve	\$0	\$0				
Short-lived asset reserve ending balance	\$0	\$0	\$2,700	\$5,400	\$8,100	\$10,800
Long-lived Asset Reserve – Target Balance \$90,000 – Year 13						
Long-lived asset reserve beginning balance		\$0	\$0	\$0	\$9,000	\$18,000
Contribution to long-lived asset reserve				\$9,000	\$9,000	\$9,000
Withdrawal from long-lived asset reserve	\$0	\$0	\$0	\$0	\$0	\$0
Long-lived asset reserve ending balance	\$0	\$0	\$0	\$9,000	\$18,000	\$27,000
Long-lived Asset Replacement Funding - Target Balance \$350,000 – Year 4						
Lost Creek Loan				\$175,000		
Lost Creek Grant				\$175,000		
Long-lived asset reserve						
Special capital improvement assessment						
Total funding for long-lived asset replacement	\$0	\$0	\$0	\$350,000	\$0	\$0
Ending Cash Balance for Current Year Does not include reserve account balances.						
	\$118,487	\$221,924	\$355,810	\$473,514	\$588,970	\$702,112

6 Year Budget - Inflation

Inflation is the erosion of spending power caused by an increase the price of commodities and consumer goods.

[CPI Inflation Calculator](https://bls.gov)
 [\(bls.gov\)](https://bls.gov)



6 Year Budget

- Written assumptions
- Data driven decisions
- Needed rate increases will be clearly shown
- Creates public information

Board Members & Water Rates

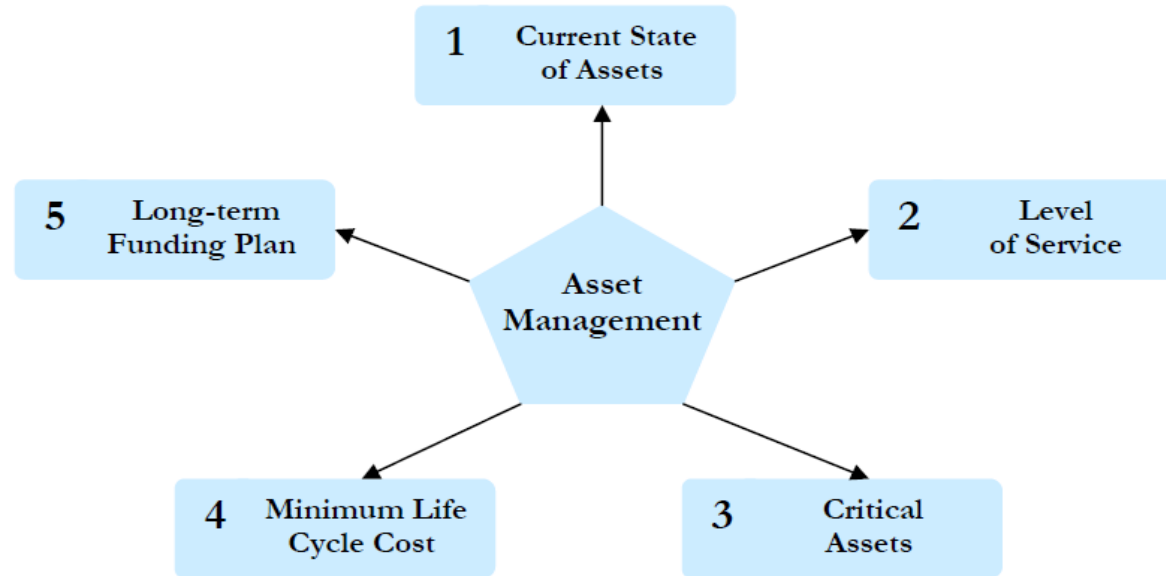
“Board Members have a **fiduciary duty** to assure that system revenues cover the **“true”** cost of water delivered.”

Ellen Miller

“The Water Board Bible”

What is Asset Management

Flow Chart: The Five Core Questions of Asset Management Framework



AM = Risk Based Planning Process

$\text{Risk} = f(\text{Criticality} \times \text{Condition})$

$\text{Risk} = f(\text{Consequence of Failure} \times \text{Likelihood of Failure})$

Take Away

- The AM Plan produces a “**visual picture**” of condition, location and replacement
- The AM Plan **supports** budget and rates
- There are tools and assistance to **help** you get started
- **First** step – get everyone on board

[illegible]

Questions & Final Remarks



Sabrina Straus

RCAC Environmental

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