

# Asset Management: A Best Practices Guide



## Introduction

<i>Purpose</i>	<p>This guide will help you understand:</p> <ul style="list-style-type: none"> <li>• What asset management means.</li> <li>• The benefits of asset management.</li> <li>• Best practices in asset management.</li> <li>• How to implement an asset management program.</li> </ul>
<i>Target Audience</i>	<p>This guide is intended for owners, managers, and operators of water systems, local officials, technical assistance providers, and state personnel.</p>

## Asset Management

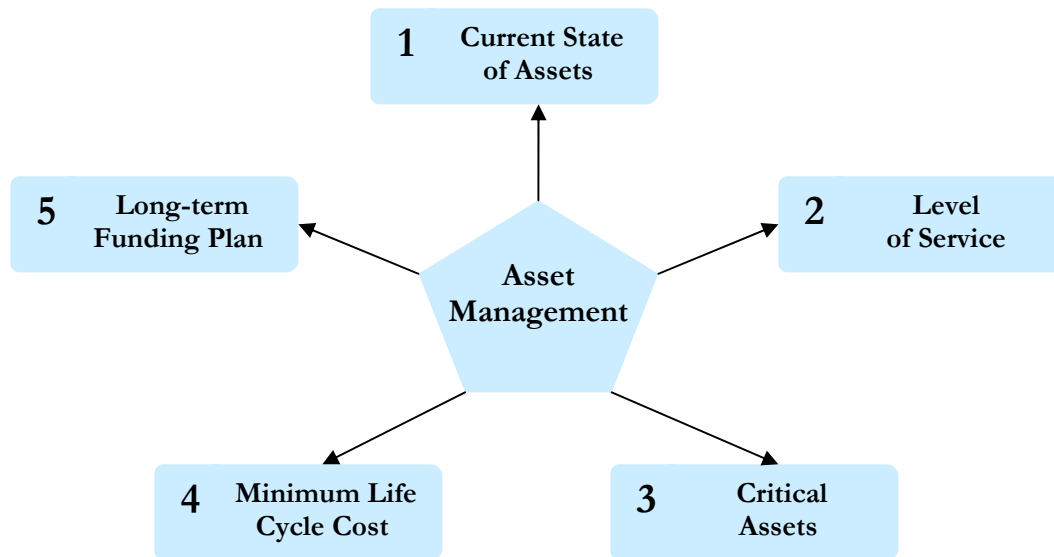
**Asset management** is maintaining a desired level of service for what you want your assets to provide at the lowest life cycle cost. Lowest life cycle cost refers to the best appropriate cost for rehabilitating, repairing or replacing an asset. Asset management is implemented through an **asset management program** and typically includes a written **asset management plan**.

Challenges faced by Water Systems	Benefits of Asset Management
<ul style="list-style-type: none"> <li>• Determining the best (or optimal) time to rehabilitate/repair/replace aging assets.</li> <li>• Increasing demand for services.</li> <li>• Overcoming resistance to rate increases.</li> <li>• Diminishing resources.</li> <li>• Rising service expectations of customers.</li> <li>• Increasingly stringent regulatory requirements.</li> <li>• Responding to emergencies as a result of asset failures.</li> <li>• Protecting assets.</li> </ul>	<ul style="list-style-type: none"> <li>• Prolonging asset life and aiding in rehabilitate/repair/replacement decisions through efficient and focused operations and maintenance.</li> <li>• Meeting consumer demands with a focus on system sustainability.</li> <li>• Setting rates based on sound operational and financial planning.</li> <li>• Budgeting focused on activities critical to sustained performance.</li> <li>• Meeting service expectations and regulatory requirements.</li> <li>• Improving response to emergencies.</li> <li>• Improving security and safety of assets.</li> </ul>

## Implementing Asset Management: Five Core Questions Framework

A good starting point for any size water system is the five core questions framework for asset management. This framework walks you through all of the major activities associated with asset management and can be implemented at the level of sophistication reasonable for a given system. These five core framework questions provide the foundation for many asset management best practices. Several asset management best practices are listed for each core question on the following pages. Keep in mind that these best practices are constantly being improved upon.

## Flow Chart: The Five Core Questions of Asset Management Framework



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

### 1. What is the current state of my system's assets?

The first step in managing your assets is knowing their current state. Because some of this information may be difficult to find, you should use estimates when necessary. Over time, as assets are rehabilitated, repaired or replaced, your inventory will become more accurate.

You should ask:

- What do I own?
- Where is it?
- What is its condition?
- What is its useful life?
- What is its value?

Best practices include:

- Preparing an asset inventory and system map.
- Developing a condition assessment and rating system.
- Assessing remaining useful life by consulting projected-useful-life tables or decay curves.
- Determining asset values and replacement costs.

## 2. What is my required “sustainable” level of service?

Knowing your required “sustainable” level of service will help you implement an asset management program and communicate to stakeholders what you are doing. Quality, quantity, reliability, and environmental standards are elements that can define level of service and associated system performance goals, both short- and long-term. You can use information about customer demand, data from utility commissions or boards, and information from other stakeholders to develop your level of service requirements. Your level of service requirements can be updated to account for changes due to growth, regulatory requirements, and technology improvements.

You should ask:

- What level of service do my stakeholders and customers demand?
- What do the regulators require?
- What is my actual performance?
- What are the physical capabilities of my assets?

Best practices include:

- Analyzing current and anticipated customer demand and satisfaction with the system.
- Understanding current and anticipated regulatory requirements.
- Writing and communicating to the public a level of service “agreement” that describes your system’s performance targets.
- Using level of service standards to track system performance over time.

## 3. Which assets are critical to sustained performance?

Because assets fail, how you manage the consequences of failure is vital. Not every asset presents the same failure risk, or is equally critical to your water system’s operations. Therefore, it is important to know which assets are required to sustain your water system’s performance. Critical assets are those you decide have a high risk of failing (old, poor condition, etc.) and major consequences if they do fail (major expense, system failure, safety concerns, etc.). You can decide how critical each asset is and rank them accordingly. Many water systems may have already accomplished this type of analysis in vulnerability assessments.

You should ask:

- How can assets fail?
- How do assets fail?
- What are the likelihoods (probabilities) and consequences of asset failure?
- What does it cost to repair the asset?
- What are the other costs (social, environmental, etc.) that are associated with asset failure?

Best practices include:

- Listing assets according to how critical they are to system operations.
- Conducting a failure analysis (root cause analysis, failure mode analysis).
- Determining the probability of failure and listing assets by failure type.
- Analyzing failure risk and consequences.
- Using asset decay curves.
- Reviewing and updating your system’s vulnerability assessment (if your system has one).

#### 4. What are my minimum life cycle costs?

Operations and maintenance (O&M), personnel, and the capital budget account for an estimated 85 percent of a typical water system's expenses. Asset management enables a system to determine the lowest cost options for providing the highest level of service over time. You want to optimize the work O&M crews are doing, where they are doing it, and why. An asset management program helps make risk-based decisions by choosing the right project, at the right time, for the right reason.

You should ask:

- What alternative strategies exist for managing O&M, personnel, and capital budget accounts?
- What strategies are the most feasible for my organization?
- What are the costs of rehabilitation, repair, and replacement for critical assets?

Best practices include:

- Moving from reactive maintenance to predictive maintenance.
- Knowing the costs and benefits of rehabilitation versus replacement.
- Looking at lifecycle costs, especially for critical assets.
- Deploying resources based on asset conditions.
- Analyzing the causes of asset failure to develop specific response plans.

#### 5. What is my best long-term funding strategy?

Sound financial decisions and developing an effective long-term funding strategy are critical to the implementation of an asset management program. Knowing the full economic costs and revenues generated by your water system will enable you to determine your system's financial forecast. Your system's financial forecast can then help you decide what changes need to be made to your system's long-term funding strategy.

You should ask:

- Do we have enough funding to maintain our assets for our required level of service?
- Is our rate structure sustainable for our system's long-term needs?

Some strategies to consider:

- Revising the rate structure.
- Funding a dedicated reserve from current revenues (i.e., creating an asset annuity).
- Financing asset rehabilitation, repair, and replacement through borrowing or other financial assistance.

#### Implementing Asset Management: Follow-up and Continuing Steps

The five core questions framework for asset management is the starting point for asset management. Beyond planning, asset management should be implemented to achieve continual improvements through a series of "plan, do, check, act" steps.

- Plan: Five core questions framework (short-term), revise asset management plan (long-term).
- Do: Implement asset management program.
- Check: Evaluate progress, changing factors and new best practices.
- Act: Take action based on review results.

**For additional information:** Call the Safe Drinking Water Hotline at 1-800-426-4791, visit the EPA Web site at <http://www.epa.gov/safewater/smallsystems> or contact your state drinking water representative.

