



# Successfully Protecting Your Investment in Drinking Water Infrastructure: Best Practices from Communities & Local Experts

## *A GUIDE FOR LOCAL DECISION-MAKERS*

### 1. RELIABILITY

PROPER  
MANAGEMENT

RESILIENCY

### 2. COST EFFICIENCY

REDUCED COSTS

WATER SYSTEM  
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### 3. COMMUNICATIONS

CUSTOMER  
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GETTING STARTED

Local decision-makers are key players in determining the long-term success of the water systems they oversee. A critical part of that success is deciding how to invest, protect and operate infrastructure, a process commonly referred to as *asset management*. With a proper plan for asset management, a system can improve service and reliability, reduce risk and unexpected costs, and enhance communication with customers and stakeholders while realizing many additional benefits. The purpose of this document is to highlight some of the benefits of sound planning and maintenance of infrastructure through asset management.

#### WHAT IS AN ASSET?

An asset is an infrastructure element that contributes capital value to a water system. Typical assets in a water system include pumps, motors, pipes, meters, and any building, vehicle, tool, piece of equipment, furniture, or machinery used in the operation of the system. Asset management is the practice of getting the most you can out of your resources by cataloging your infrastructure capital assets and managing them to minimize your operations and maintenance costs and lower the total cost of ownership for your system. A high-performing asset management program includes detailed asset inventories, operation and maintenance tasks, and long-range financial planning that will increase the value of each of your assets.

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**“Our goal was to get away from ‘run until failure’ mode, and get to the point where we’re working on the system in a proactive way instead of reactive.”**

*– Larry Paine, City of Hillsboro, KS*

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# BACKGROUND

## HOW CAN ASSET MANAGEMENT HELP YOUR SYSTEM SUCCEED?

When your system actively understands and manages assets, you can help your community better prioritize and fund necessary investments to reduce long-term costs and risk. Other sectors, such as departments of transportation, use asset management for their long-term infrastructure management. Some communities are adopting cross-sector asset management programs where investments are coordinated across infrastructure areas. You can increase cost efficiency, improve system reliability, and fortify communications by implementing an asset management program. The following factsheets describe specific examples of these benefits.

### PURPOSE OF THIS DOCUMENT

This document provides examples of common challenges, asset management solutions, and benefits associated with the topics to the right. You can use this document to gain an asset management perspective of your own water system and its assets. Doing so may help you identify small or large ways that your system can benefit from asset management. Select a topic from the right that you are interested in to learn more about the benefits of asset management.

**RELIABILITY:** System reliability is achieved when water systems can anticipate, prepare for, and make contingency plans for critical asset failures. Asset management is an important tool to ensure that a water system is properly managed and has the resiliency to adapt to changing needs.

**COST EFFICIENCY:** Cost savings are achieved when assets are identified, tracked, and proactively managed to reduce costs and increase water and energy efficiency. Many water systems partner with nearby water systems to share assets as a way to reduce costs.

**COMMUNICATIONS:** Proactive asset management helps systems effectively communicate challenges and solutions to customers, which helps maintain customer satisfaction and protect human health in the event that assets fail or maintenance activities impact users.

The **GETTING STARTED** guide at the end of the document contains resources and tips for designing and implementing your own asset management program. The steps for getting started include:

- ◆ Build a team and gather information.
- ◆ Take inventory and prioritize assets.
- ◆ Plan for the future and determine costs.
- ◆ Create your asset management plan.

#### ASSET MANAGEMENT HELPS LOCAL DECISION-MAKERS ACCOMPLISH THEIR GOALS TO:

- ◆ Protect public health
- ◆ Improve financial sustainability
- ◆ Set policies so the system can operate effectively
- ◆ Set and meet customer service goals
- ◆ Act transparently
- ◆ Communicate effectively with customers

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GETTING STARTED

# PROPER MANAGEMENT

Systems must routinely make wise operation and management decisions to provide reliable services to their community. Having an asset management plan in place decreases time for existing and new system stakeholders/operators to understand the water system status and path going forward. It also allows for better system management and knowledge retention during staff turnover at a system. The following examples show how water systems integrated comprehensive planning into their process to resolve debt, improve community and customer relations, and maintain safe systems.

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“Small towns may not have the capability to run a utility. You’re helping to build capabilities when you put together an Asset Management Plan. When the utility starts running more efficiently, you’re building social capital.”

- Larry Paine, City of Hillsboro, KS

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## CHALLENGE: KEEPING RECORDS OF OPERATIONS AND NEEDS

Clewiston Utilities, a system in Florida serving 10,000 people, had limited staff and money. There was only so much they could accomplish each year, and it was easy to get overwhelmed. Without an asset management plan, they found themselves reacting to emergency or unanticipated situations instead of being proactive.

## SOLUTION

Clewiston Utilities developed an asset management plan and underwent a comprehensive planning process. The asset management plan allowed Clewiston Utilities to begin to transition from reactive to proactive operation and maintenance of their system’s assets. Additionally, it was useful to have a document as a reference for the city’s Board of Commissioners to see the day-to-day operations and understand what the operator needed. The system also found that the asset management plan could be used to set the scope for their annual budget.

Subsequently, the system was contacted by the Florida Department of Environmental Protection (FLDEP) with suggestions for ways in which the system could improve operations. Having the plan helped the system respond to the FLDEP’s suggestions because they already understood the baseline of their system and could create a plan of action utilizing their upcoming maintenance schedules and other planned tasks. Additionally, the system received principal loan forgiveness for their State Revolving Fund loan because they met Florida’s requirement of having and implementing an asset management plan. Without the plan already in place, it likely would have been more difficult to show the need to reinvest in an old system.




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The (asset management) project enables us to better finance capital improvement projects by acquiring loans and grants to maintain the water department assets.

- Town of Southwest Harbor, Population 2,375

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# PROPER MANAGEMENT (CONT'D)

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## CHALLENGE: SCHEDULING MAINTENANCE OF ASSETS

Pennichuck Corporation is a holding company with five wholly owned operating subsidiaries in New Hampshire. At Pennichuck Water Works, Inc., in Merrimack, NH, the operator would manage and schedule tasks based on activities versus assets. Under this management approach, the water system had performed maintenance on the same fire hydrant more than five times, and it was unclear whether the maintenance was necessary each time. Each maintenance occurrence cost approximately \$6,600 per incident, totaling \$33,000.

## SOLUTION

The system determined that if they had an asset management plan to track the assets in the system, they would have been able to create a better plan and cut down costs on unnecessary repairs and replacement to focus on the critical assets and needs. Pennichuck now tracks costs down to specific assets in their asset management plan. The use of the plan allows Pennichuck to know when activities related to a particular asset take place and what those activities are. Inspections on the fire hydrant now occur twice per year, and maintenance is performed as needed. Considering the large number of retirements anticipated in the water sector in the near term, Pennichuck also found their easy-to-use asset management plan an important piece to capture knowledge and prioritize recordkeeping by managing operations.



## LONG-TERM BENEFITS

Proper management of a water system's assets decreases long-term costs and disruptions to the system. When system operations and capital improvements are planned, they can be managed when determining annual budgets and which expenditures can be undertaken in a given year without adversely impacting rates, reliability of the system, or customer satisfaction. The process of setting up and maintaining an effective asset management plan can support and improve the management of your water system.



# RESILIENCY

Events outside your control, such as storms, are unavoidable and can impact your ability to deliver water to customers. Through asset management, systems identify critical assets and plan for potential disruptions. Having plans in place decreases response time, making it possible to restore service quickly when services are unexpectedly interrupted.

## CASE STUDY: PENNICHUCK EAST UTILITY, NH

Pennichuck East Utility, part of the Pennichuck Corporation, serves roughly 8,000 people in communities largely located in southern and central New Hampshire.

### CHALLENGE

New Hampshire experienced an ice storm December 2008 that left 30 small drinking water utilities, including Pennichuck East Utility, and their customers without power and water for 5 days.

### SOLUTION

The ice storm pushed the water system to think about risks and plan for them in order to reduce impacts to the system and its customers. They asked questions to identify the various risks the system would face due to weather events, such as how long residents would be without water if the utility lost power. Their top priorities were the ability to respond to weather events by minimizing damage and rapidly recovering from disruptions to service. The water system found that when they inventoried and tracked assets, they were able to assess risk and consequences of failure, allowing them to plan redundancy, contingency, and operations accordingly. Creating risk event scenarios has also helped them plan to protect their most vulnerable and critical customers, such as schools and hospitals.

### LONG-TERM BENEFITS

Taking an asset management approach also helped the system start utilizing information to design more effectively and efficiently and to make capital cost decisions. Asset management creates data which can be analyzed and managed using available technologies to improve efficiency and understanding so that systems can continuously improve. The water system was able to fully account for and integrate their electronic work order system, GIS, and real-time data monitoring by taking an asset management approach and prioritizing planning. Having the appropriate technology and access to data allowed them to own and operate additional assets without needing to also increase personnel. Gaining this understanding of their system's assets and operations clarified financing decisions for capital planning and helped the system manage peaks and valleys within current rate structures to minimize the impact to rate payers.

### CONTINGENCY PLANNING

Asset management helped a Florida system plan for and fund contingencies. Contingency planning encourages systems to:

- ◆ Anticipate change and weather events and emergencies,
- ◆ Determine probable outcomes, and
- ◆ Plan responses, including:
  - ◇ What equipment and manpower would be needed,
  - ◇ How the system can access that equipment, and
  - ◇ Who they can reach out to for help with responding to the situation.

Consider programs like Water and Wastewater Agency Response Networks (WARNs) which allows systems to loan equipment to each other when there is an emergency. As part of contingency planning, systems should be able to find and utilize their necessary equipment immediately in the event of a disaster.

Example: In the event that a Master Lift Station fails and overflows, the system would need to plan for temporary pumping, electrical assistance, availability of replacement pumps, cleanup, and generators. Unanticipated costs arise when an emergency occurs, so it is recommended that municipalities develop and maintain a contingency fund to offset these emergency costs.



# REDUCED COSTS

While some are unavoidable, many unexpected costs experienced by water systems can be prevented through proper maintenance or by long-term planning for necessary repair and/or replacement of assets. Asset management is also a powerful decision-making tool to identify the most cost-effective approach for managing and investing in infrastructure. In addition to helping manage the need for and cost of replacement, asset management can reduce planned and unexpected operation and maintenance costs by minimizing the potential for over- or under- maintenance of assets.

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## CASE STUDY: PORTLAND WATER BUREAU, OR

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The Portland water system's service area covers parts of Multnomah, Washington, and Clackamas counties in Oregon. In the 2015-2016 fiscal year, the Water Bureau directly served a population of more than 597,000 people in approximately 164,000 residential households and 20,000 commercial and industrial customers.

### CHALLENGE

The Portland Water Bureau faced a challenge when the electrical system and instrumentation controls at a pump station began to fail. To address this critical asset, they needed a solution that was financially responsible and improved the sustainability of the system. In addition to disrupting system operations, failure of the pump station would lead to basement flooding in homes and other buildings served by the pump station, significantly impacting customer satisfaction and potentially causing customers to lose trust in the system.

### SOLUTION

The water system considered three options: replacing only the parts of the pump station that were failing, also replacing the pumps with more energy-efficient pumps, or upgrading the entire pump station. They knew that the electrical and instrumentation controls were going to fail in the near term, at a replacement cost of \$1 million. By performing an analysis using an asset management approach, they determined that the benefits of having more efficient pumps did not outweigh the higher costs of putting in new pumps when considering the pump use expected over the next 30 years. Additionally, the pipes and the building were in good shape – they were expected to last for many years, which would not justify a whole building upgrade. Instead of spending \$6 million to replace everything at the pump station, the system analyzed their needs and risks and decided to spend \$1 million to replace only those assets that were failing.

### LONG-TERM BENEFITS

Utilizing asset management to identify and prioritize the short- and long-term system needs and risks allowed Portland Water Bureau to realize cost-savings in the short term and make informed decisions about long-term risk. With effective asset management, water systems can determine which assets have a high consequence and probability of failure. Determining the financial impact of an equipment failure can help your system define its best asset management practices, which may include increased level of routine maintenance, redundant equipment installation for critical assets, or planning for the repair/replacement cost of critical assets over time.

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“Asset management is like changing the oil in your car. It's preventative maintenance. Eventually your engine goes out if you don't change the oil regularly. Instead of spending a large amount of money unexpectedly at a later date, you spend a small amount of money on a regular basis. Higher costs are associated with deferred maintenance.”

– Sterling Carroll, Florida Rural Water Association

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# WATER SYSTEM PARTNERSHIPS

Many water systems are able to achieve cost savings and increase reliability of services by developing partnerships with other water systems. Partnerships can range from informal arrangements, like sharing equipment, to more extensive partnerships, like sharing management or physical consolidation. Having an asset management program allows you to clearly identify areas where a partnership would benefit your system and can facilitate the process of developing a partnership by demonstrating sound water system management.

## CASE STUDY: HILLSBORO, KS

The water system in Hillsboro has approximately 1,100 connections serving a population of approximately 2,900 people.

### CHALLENGE

The water system in the City of Hillsboro, KS, was experiencing a low cash balance from year to year. Without rate adjustments or regular maintenance of equipment, the system fell into debt and needed significant repairs to fix rusted pipes and leaks throughout the system. The water system considered a partnership with the neighboring system of Marion, KS, where Hillsboro would become Marion's water supply provider. However, Hillsboro did not know what needed to be addressed to update and maintain their water system sustainably.

### RATE CONSIDERATIONS

Management of water systems is sustained by the revenues received from their customers. Developing a rate structure that best supports the system's priorities and objectives will help systems be sustainable. More information on pricing and affordability is available on EPA's website at <https://www.epa.gov/sustainable-water-infrastructure/pricing-and-affordability-water-services>.

### SOLUTION

To supply water to Hillsboro and Marion, Hillsboro began identifying critical tasks and making sure that they had redundancy and the ability to respond quickly to emergency events. As a result of this work, the water system now knows exactly what they own and has good estimates of replacement costs. They have the ability to share concrete information with the city council and provide an explanation about their needs and potential solutions. Previously, if something went wrong, there was little they could do to resolve the issue. Now, they know beforehand what will need to be replaced, so they can prevent critical failures and unexpected emergency bills.

### LONG-TERM BENEFITS

Both Hillsboro and Marion benefitted from the partnership and from Hillsboro's use of asset management. The two towns now use a joint program to do work orders and communicate about maintenance work orders between operators in the distribution system and at the treatment plant. This has led to higher customer satisfaction, because customers get faster responses. It has improved productivity of the operators. They can organize and prioritize work orders. Without a plan, operators were not able to prioritize tasks. In addition to identifying the critical maintenance and upgrades, the plan also creates routine maintenance schedules which improve the efficiency of operations and ensure that nothing slips through the cracks.

### COST SAVINGS THROUGH PARTNERSHIP

RCAP Solutions has worked with several small water systems in Maine to create their asset management plan using the [Check Up Program for Small Systems \(CUPSS\)](#), free asset management software developed by EPA. With this technical assistance, some of these water systems have used asset management planning to partner on bulk ordering of chemicals and sharing equipment, saving money and staff time.



# WATER AND ENERGY EFFICIENCY

Water loss and energy inefficiency can significantly contribute to systems’ operating costs. Asset management planning can be used to identify losses in the system and implement solutions to save money and time.

## CASE STUDY: MONACA BOROUGH, PA

Monaca Borough, a town just north of Pittsburgh, operates its own water and wastewater systems covering about 2,400 residential and commercial accounts and 30 additional industrial accounts.

### CHALLENGE

The Borough was experiencing over 50 percent water loss. Without asset management, the town did not know where the leak was occurring in order to identify and resolve the issue.

### SOLUTION

In 2010-2011, Monaca Borough installed an Advanced Metering Infrastructure (AMI) and Leak Detection System, funded by an energy performance contract. The installation was part of their efforts to better understand the status of their assets and detect leaks, limiting the water and energy lost by inefficient systems.

Utilizing the Leak Detection System, the town was able to detect a leak at 14th Street/Water Fall accounting for the loss of over 100,000 gallons per day, previously believed to be a naturally occurring waterfall. The 8” pipe contained a full circle split at the leak location that had existed within the system for over 20 years.

“Our leak detection was part of the planning process, and our asset management came about after the installation of the leak detection system. The installation of our AMI system with the leak detection started our overall assessment management system. We then GIS mapped all of our fire hydrants and valves throughout our system. The benefits of the new technology have sold us on the importance of asset management, and being able to do it in real time. Not monthly or quarterly!”

- Mario Leone, Manager, Monaca Borough

### LONG-TERM BENEFITS

The Borough has since reduced their water loss to under 20 percent. As shown in the table below, by developing an asset management plan and installing the system-wide AMI and Leak Detection System, Monaca Borough cut costs for utilities, chemicals, and overtime. These small changes in operational efficiency increased their system’s revenue, providing more available funding for capital improvement projects.

Revenues	2011	2012	2013	2014
	\$830,672	\$908,474	\$1,004,954	\$1,018,015
Utilities	\$ 104,000	\$ 67,112 (-35%)	\$ 63,223 (-39%)	\$ 64,125 (-38%)
Chemicals	\$ 3,500	\$ 2,073 (-40%)	\$ 1,909 (-45%)	\$ 1,730 (-50%)
Overtime	\$ 25,000	\$ 18,318 (-27%)	\$ 17,179 (-31%)	*\$ 10,173 (-40%)
Total Expenses	\$ 132,500	\$ 87,503 (-34%) (-\$44,997)	\$ 82,311 (-38%) (-\$50,189)	\$ 76,028 (-43%) (-\$56,472)

\*Regular wages were \$18,173 under budget in 2014 as the system had an employee on workers compensation.



# CUSTOMER SATISFACTION

Asset management is more than a system used to maintain and repair equipment; it proactively focuses on identifying cost savings, determining effective investment opportunities, and providing a higher level of service and customer satisfaction.

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“Asset management plans can and should positively impact the organization's culture. Assets are not limited to Pipe, Service Connections, Plant and Equipment, but should include Easements, Parcels, Customers, and all aspects of the utility operation.”

- Rich Pierson, Gull Lake Sewer and Water Authority

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## UTILIZING ASSET MANAGEMENT PLANS TO ENHANCE COMMUNICATIONS

An asset management plan can assist in determining the true cost of delivering drinking water to customers, including operations, maintenance, and infrastructure replacement, so that effective rate structures can be set and customer expectations can be met both in terms of reliability of safe and efficient services and consistency of financial load. Water quality and reliability of service are of utmost importance to customers. Communication is vital to garner support from customers for improvements to the water system. If stakeholders can see the benefits associated with infrastructure investment, they are more likely to support such improvements. Additionally, sound management practices, including creating and maintaining an asset management plan, instill confidence in customers. Key communications benefits derived from asset management planning include:

- ◆ Buy-in from stakeholders by clearly demonstrating the reasoning behind decisions and ensuring that information shared internally and externally is meaningful to your audience;
- ◆ Increased public trust and satisfaction through timely communication of accurate information;
- ◆ Improved community involvement due to your ability to communicate your asset management approach to customers so that they understand the system takes rate-setting seriously and has made informed decisions regarding which operational costs will be increasing or decreasing during the upcoming cycle; and
- ◆ Better continuity of operations and management and of community relations, which can be achieved by including a communication plan that addresses internal and external stakeholders as a part of your broader asset management plan.

### EFFECTIVE COMMUNICATION TIPS

1. In order to communicate externally, you have to communicate effectively internally.
2. Frame the necessary improvements in terms of public health or water quality when communicating with the public.
3. Have a reference guide with costs of repairs, examples of critical infrastructure, and maintenance dates to justify to stakeholders the need for financial investment.
4. Make sure to include customer satisfaction in your asset management plan. Be able to quickly respond to customer concerns.

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“Being able to document what a system has and what condition assets are in to ensure that information can be quickly relayed is an important step in creating and maintaining trust and satisfaction.”

- John Boisvert, Pennichuck Corporation

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# GETTING STARTED

Consider asset management as a strategic decision-making tool that can help your system address high-priority asset needs that are critical to a water system's performance, identify the costs of operating the system, and ultimately plan for future capital and operating expenditures. If you want to be more confident in decision-making and communicating with your community, or if you want to further improve cost effectiveness, asset management can get you where you want to go.

To get started, a water system should:

- ◆ Identify the team members who will support and implement the asset management program.
- ◆ Determine the asset inventory and prioritize assets.
- ◆ Create and implement an asset management plan.

## BUILD A TEAM

Community leaders may be asked to provide their perspective on the political landscape and community needs and concerns; however, these leaders do not need to be experts in all fields.

Consider who you are adding to the internal and external stakeholder team. Ideally, the team will include individuals knowledgeable about infrastructure assets, political landscape, financial strategies, data sources and analysis, and community needs. However, do not let the size of the team prevent you from getting started. A team can start with a few people, and more team members can be added as needed.

Assemble a team, clarify roles and responsibilities, and determine how to gather asset information that is already available.

Check out the EPA document [Building an Asset Management Team](#) for more information.

## TAKE INVENTORY AND PRIORITIZE YOUR ASSETS

Before you can manage your assets, you need to know what you have, what condition it is in, and how much longer you expect it to last. To complete an inventory, list all your assets and collect the following information for each:

- ◆ Condition
- ◆ Age
- ◆ Service history
- ◆ Useful life

Once you have inventoried your assets, your next step will be to prioritize your assets based on their importance to your system by ranking your system's assets to help you decide how to allocate resources. Factors involved in prioritization include:

- ◆ How soon will you have to replace an asset (its remaining useful life)?
- ◆ How important is the asset to the provision of safe drinking water (its impact on public health)?
- ◆ How important is the asset to the operation of the system (can other assets do the same job)?

Ideally, an asset management plan will help you forecast your financial needs well into the future and develop a rehabilitation and replacement schedule appropriate for your system's priorities.

## PLAN FOR THE FUTURE

After prioritizing your assets, you will have to determine how much it will cost to rehabilitate and replace them as they deteriorate. To properly protect public health and deliver safe water, you need to rehabilitate and

### DATA SOURCES & TOOLS

Potential sources of data for getting started:

- ◆ As-built drawings
- ◆ Design drawings
- ◆ Manufacturers' manuals
- ◆ Bid documents
- ◆ Most recent sanitary survey
- ◆ Staff – current and previous
- ◆ Maps, including digital maps
- ◆ Photos and videos



# GETTING STARTED (CONT'D)

replace your assets in addition to operating your water system. Many systems will need considerable lead-time to budget and gather the necessary funds.

By developing an asset management plan, you will be able to allocate your resources in the most efficient way. This includes calculation of the amount of money that you will need to set aside every year (your annual reserve) to pay for the rehabilitation and replacement of your assets.

Preparing a financial forecast (by estimating how much revenue you expect for the next five years) will help you determine if you will need to supplement your revenues to carry out your asset management plan. To increase or more efficiently use your revenues to operate and maintain your system and carry out your asset management plan, you can:

- ◆ **Create additional reserve accounts.** Reserve all or some of the money you will need in a protected capital improvement reserve account and create an emergency account to fund unexpected repairs and replacements.
- ◆ **Form partnerships.** Working with other water systems may allow you to lower costs, simplify management, and continue to provide your customers with safe drinking water.
- ◆ **Consider increasing rates.** Alternatively, consider assessing a flat fee for infrastructure improvements or funding of a reserve account. Check with your state drinking water program for rate-setting information.
- ◆ **Apply for financial assistance.** Banks and government agencies can provide funds for infrastructure projects such as treatment facilities, distribution lines, and water source development. If you do not have enough funds to pay for needed capital improvements, you can apply for loans and grants.

Check out these EPA tools for asset management:

- ◆ [The Check Up Program for Small Systems \(CUPSS\)](#) — A free, easy-to-use, desktop software application that provides all of the necessary tools to implement an asset management program and develop effective asset management plans.
- ◆ [Asset Management: A Best Practices Guide](#) — Provides examples of questions to ask when determining an asset management approach.
- ◆ [Asset Management: A Handbook for Small Water Systems](#) — Provides examples of inventory, prioritization, reserves, and budgeting worksheets.
- ◆ [Asset Management for Local Officials](#) — This guide will help local officials make decisions regarding asset management at their systems.
- ◆ [Reference Guide for Asset Management Tools](#) — A framework to assist systems in developing and implementing an asset management plan.
- ◆ More resources for decision makers and operators can be found on the EPA [Asset Management Resources for Small Drinking Water Systems](#) Web page.

## PLAN, DO, CHECK, ACT

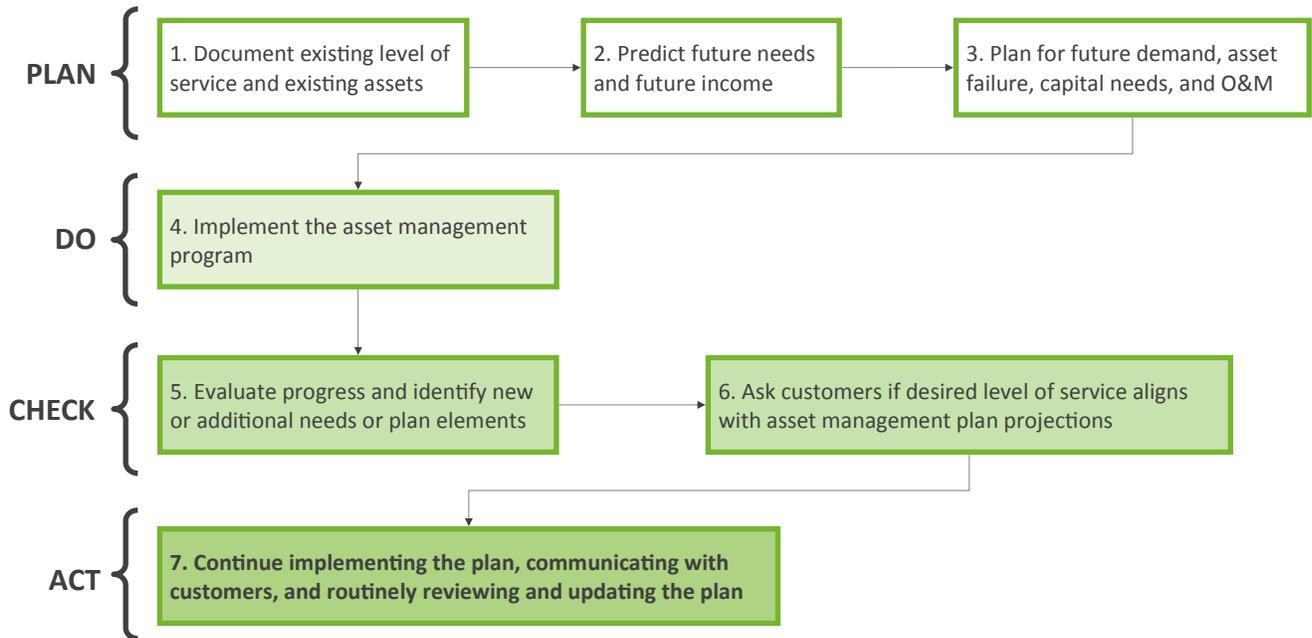
A basic asset management plan is based on the best available:

- ◆ Information about the current state of the water system. This includes the existing levels of service, management strategies, and financial and performance benchmarks.
- ◆ Predicted information about the water system. This includes projections about demand, cash flow, and potential asset failure.
- ◆ Opportunities for technical, managerial, and financial improvements at the water system.



# GETTING STARTED (CONT'D)

Develop a unique and tailored asset management plan following this workflow:



**Remember the importance of recordkeeping and knowledge retention.** An asset management plan should be a living document that is reviewed and updated as necessary and at least annually. Document and maintain records associated with the asset management program to strengthen knowledge retention efforts at your system.

## OTHER RESOURCES

In addition to the resources referenced in this document, many state drinking water programs also encourage asset management by providing training and guidance, assigning Drinking Water State Revolving Fund (DWSRF) priority points or other incentives to water systems engaged in asset management. Water systems may also receive asset management assistance from technical assistance providers.

- ◆ Drinking Water State Revolving Fund Program:  
<https://www.epa.gov/drinkingwatersrf>
- ◆ Technical Assistance Providers:  
<https://www.epa.gov/dwcapacity/capacity-development-resources-states-and-small-systems>  
<https://nrwa.org/initiatives/energy-efficiency/>
- ◆ USDA Water and Waste Disposal Loan and Grant Program:  
<https://www.rd.usda.gov/programs-services/water-waste-disposal-loan-grant-program>  
<https://www.rd.usda.gov/programs-services/water-waste-disposal-technical-assistance-training-grants>
- ◆ Water Infrastructure and Resiliency Finance Center:  
<https://www.epa.gov/waterfinancecenter>

