

Getting Optimized

PARTNERSHIP FOR SAFE WATER GUIDELINES

Asset Management Contributes to Optimizing a Distribution System BY BARB MARTIN

The asset management planning process lets a water utility derive maximum value from its physical assets. Regardless of its size, a utility can reap huge benefits from a comprehensive asset management program.

Although inventorying a utility's physical assets is an important step in any asset management program, optimal programs provide utilities with the tools and information needed for making data-driven decisions to better prioritize maintenance actions, minimize system downtime, and complete capital and strategic planning for replacing and rehabilitating distribution system components.

Asset management is a component of the Partnership for Safe Water's distribution system self-assessment process. Although this column examines the major components of an asset management program from the perspective of component effects on distribution systems, sound asset management principles may be applied to many other types of water, wastewater, and stormwater infrastructure.

An asset management plan provides a structured framework for improving distribution system performance and justifying future planning and expenditures—particularly important given today's limited budgets and aging infrastructure. A comprehensive asset management program includes a

- distribution system inventory
- condition assessment
- maintenance program
- system planning and needs assessment
- system financial analysis
- capital improvement plan and program
- capital management system

FIRST STEPS

As detailed in AWWA's *Operational Guide to AWWA Standard G200: Distribution Systems Operation and Management*, a

comprehensive, accurate asset inventory is the first piece of data required to make informed decisions regarding pipeline rehabilitation and replacement. Assets include any physical distribution system component: pipes, valves, hydrants, pumps, storage tanks, etc.

Utilities just beginning to develop an asset management plan may need to invest time and resources to accurately locate and verify system assets and link the information with locational and other types of resources and tools, such as a geographic information system or computerized maintenance management system. The information gained as a result of the asset inventory may be used to produce or update a distribution system schematic map that can be used to support a variety of activities, including the Partnership for Safe Water distribution system self-assessment process.

The asset inventory should include such information as

- asset condition (condition assessment)
- age
- capacity
- size, length, diameter, or other physical attributes
- normal valve positions (open or closed)
- construction materials
- installation date and service history
- anticipated service life

However, asset information isn't limited to these details and can include any additional data the utility may find beneficial to record and track. Resources are available to help utilities obtain this information, including tools for estimating an asset's service life. A plan should

be made to address any data gaps identified during the asset inventory.

COMPLETING THE PLAN

Once a utility's assets are identified and recorded, their repair and maintenance should be prioritized to help with planning and financial decision making. Assets are typically prioritized by age, consequences of failure, likelihood of failure, and equipment redundancy, such as the presence of backup equipment, replacement parts, or critical spares.

It's also helpful to establish specific performance criteria for the prioritization process. For example, criteria associated with prioritizing pipelines for main replacement or rehabilitation may include an asset's age, break density, and other factors.

Based on the prioritized asset information, an asset management plan will help a utility estimate anticipated rehabilitation or replacement costs for assets so a framework for future funding and resource allocation may be developed. A variety of resources are available to help utilities estimate costs, including information on the remaining useful lives of distribution system assets and asset values.

Small systems may wish to reference the US Environmental Protection Agency's Check-Up Program for Small Systems, which can be accessed online at <http://water.epa.gov/infrastructure/drinkingwater/pws/cupss>. The program provides resources and tools for utilities beginning the asset management process.

By following an asset management plan, utilities take steps to secure necessary funding to support planned infrastructure repair and rehabilitation (see [Municipal Projects Leverage Funding Mechanisms for Future Needs](#), page 18).

This may include increasing rates, securing outside financial assistance, or managing investments.

Because water distribution systems continually change, asset management is an ongoing process. The asset inventory and associated information should be regularly updated to ensure future planning decisions are based on the most accurate information available. In turn, a utility's asset management plan should be frequently evaluated and adjusted as necessary.

To update asset information, utilities may wish to establish a formalized plan and standard procedures that entail update frequency, processes used, and responsible parties. Staff who are involved with related activities, such as maintenance, may be trained to ensure information is accurately recorded according to established procedures.

DISTRIBUTION SYSTEM OPTIMIZATION

A comprehensive asset management plan can be invaluable when performing a distribution system self-assessment, planning for flushing operations or other system maintenance, troubleshooting distribution system issues, or responding to customer complaints. For example, an accurate distribution system schematic map, developed as a product of the asset inventory and used in conjunction with a current hydraulic model, can be valuable in developing procedures for unidirectional flushing activities or establishing water quality sampling site locations.

Using asset management principles to accomplish a utility's infrastructure replacement or rehabilitation goals, as well as proactively maintaining distribution system components, can help a utility preserve the physical and hydraulic integrity of its distribution system. Such an approach can have a positive effect on water quality and performance.

Communicating timely information to those who require it is another attribute

of optimized distribution systems. Asset management can provide a foundation for linking related distribution system information. For example, utilities may link asset management information with maintenance details, water quality information, or customer complaints to provide a single source of comprehensive information to utility staff, thereby increasing the speed with which customer complaints or other issues can be addressed. Information technology staff may provide valuable assistance by developing ways to integrate distribution system data into a central and accessible location.

As with any program, the value of an asset management program depends on the quality of the information collected and how the information is used. Although asset management can be a complex process, many resources are available to provide assistance. For example, the AWWA Asset Management Resource Community's Web page at www.awwa.org/assetmanagement provides a wealth of information on asset management topics, including best practices, asset management plans, planning and funding for replacement and rehabilitation, and more. Additional information about the Partnership for Safe Water may be accessed at www.awwa.org/partnership. 

Editor's Note: *To discover how the Portland Water Bureau implemented a comprehensive asset management plan, see [Investigating Strategies for Maintaining, Repairing, or Replacing Utility Assets](#), page 14.*

RESOURCES

- Grigg, N.S., 2012. *Water, Wastewater, and Stormwater Infrastructure Management*. IWA Publishing (catalog No. 20785).
- Jordan, J.K., 2010. *Maintenance Management for Water Utilities*. AWWA (catalog No. 20446).