Overview

Asset management at water utilities has received much attention lately, as part of the broader U.S. focus on the deterioration of our public assets and their need for renewal. In fact, as a result of highly publicized water main breaks leading to significant flooding, the public has become more attuned to deteriorating water system assets. Consequently, people now have a better understanding of the reasons for an increase in related projects and the increased rates that frequently accompany that work.

According to a U.S. Government Accountability Office (GAO) report on the water infrastructure in the United States, there is mounting evidence that the integrity of the U.S. drinking and wastewater infrastructure is at risk and needs a concerted effort to improve the management of key assets—pipelines, treatment plants, and other facilities—and a significant effort to maintain, rehabilitate, and replace these assets (GAO 2002).

The U.S. Environmental Protection Agency (EPA) estimates that drinking water utilities will have to invest $384.2 billion over the next 20 years to address their deteriorating infrastructure needs. However, it is becoming more difficult for water utilities to finance these investments (EPA 2013). For instance, according to the GAO, one-third of water utilities have deferred maintenance because of insufficient funding, report that 20% or more of their pipelines are nearing the end of their life, and lack plans for managing their capital assets (GAO 2002).

Quick Facts

• The GAO reports mounting evidence that the integrity of the U.S. drinking and wastewater infrastructure is at risk
• The EPA estimates utilities will need to spend $334.8 billion over the next 20 years on infrastructure needs
• Several public and proprietary asset management programs and approaches are available to help utilities
Estimates of Renewal Needs
There are a number of U.S. estimates of infrastructure replacement at water utilities, in particular those based on demographics and those that are conducted by the EPA every five years. These assessments are useful in helping water utilities develop asset management programs.

Demographic assessments have resulted in what has been termed the Nessie Curve—as the population grows, so does the length of installed water system piping. Also, as the pipe ages, it will reach its maximum lifespan along with other pipes installed at the same time. Therefore, pipe replacement needs reflect the population growth of many years earlier (Cromwell et al. 2003, Cromwell and Speranza 2006).

Asset Management Programs
To address these issues, water utilities need to develop a systematic, structured approach that allows for maintenance and renewal of assets at a manageable pace, while maintaining an adequate level of performance from those assets. Many asset management programs and approaches are available to water utilities as they develop their own programs. Some are public while others are proprietary to consulting firms, software providers, or consortia. These programs include:

- **International Infrastructure Management Manual** (IPWEA 2011)
- **Implementing Asset Management: A Practical Guide** (AMWA et al. 2007)
- “Sustainable Infrastructure Management Program Learning Environment” (WRF and WERF 2008)

When designing and implementing an asset management program, water utilities should ensure that there is high level management support, development of a multi-department asset management team with decision-making authority, open sharing of data and information across departments, and clear objectives for the program.

Water utilities should engage in dialogue with their customers about the costs and risks associated with deteriorating assets. This will help utilities develop a more comprehensive needs assessment and enable analysis of different approaches to extend the life of their infrastructure (Damodaran et al. 2005). These conversations with customers will also help water utilities explain the value and benefits of infrastructure repairs, because customers will ultimately be paying for this work through higher rates.

Steps To Address Asset Management
Water utilities should consider the following steps when developing or implementing an asset management program:

- Commence asset management activities by developing a plan (Cromwell and Speranza 2006, AMWA et al. 2007)
- Establish an interdepartmental asset management team, including senior management
- Establish levels of service and key performance indicators for the water utility (Cromwell and Speranza 2006, AMWA et al. 2007, Damodaran et al. 2005, Thacher et al. 2011)
- Create an inventory of assets throughout the utility (AMWA et al. 2007, Matichich et al. 2005)
- Design a business risk assessment program, considering assets to be managed and how they might fail (Barnes et al. 2008, Gaewski and Blaha 2007)
- Begin using data to establish the remaining life of water utility assets (Deb et al. 2002, Rajani et al. 2011, Thomson and Wang 2009)
- Record all breaks and failures, including leaks (Friedman et al. 2010, Deb et al. 2002)
- Consider condition assessment activities to gauge current condition of assets (Marlow et al. 2007, Thomson and Wang 2009)
- Plan renewal activities based on the best possible evaluation of the water utility (Cromwell et al. 2003, Grigg 2004, Deb et al. 2002)
- Continuously improve asset management activities
References


Gaewski, P.E., and F. J. Blaha. 2007. Analysis of Total Cost of Large Diameter Pipe Failures. Denver, Colo.: AwwaRF.


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