



# Pipe Corrosion an Avoidable Budget-Buster

“Because it satisfies the need for tough, durable, and corrosion-resistant pipe, [PVC pipe] has become vital to rural water and wastewater systems.”

By Bruce Hollands

The public rarely sees piping in government buildings or other infrastructure, but they do see its costs in the taxes they pay, because piping has a significant impact on government budgets.

Over the next 25 years, investment in electricity, water, sewer, and transportation infrastructure will require \$6.5 trillion, according to a report in the Spring 2007 issue of *strategy + business* magazine. Of that, water and sewer lines alone will cost between \$660 billion and \$1.1 trillion. Pipe represents the single largest component of a water utility's assets and significantly affects operations and maintenance costs.

Corrosion is the largest part of the problem, being the main cause of more than 700 water main breaks every day throughout North America (see [www.watermainbreakclock.com](http://www.watermainbreakclock.com)). Moreover, a 2002 congressional study found corrosion costs U.S. drinking water and sewer systems \$50.7 billion annually.

#### Old-Technology Pipe Materials

The reason for this systemic failure stems from the history of America's network over the past 100 years. First we used cast iron pipe, and then ductile iron. Both are now suffering the ravages of corrosion.

For instance, Denver workers repaired 97 breaks just between December 1, 2009 and January 19, 2010. And the problem appears to be worsening, according to the *Denver Post*, which noted, “328 water-main and service-line ruptures were recorded in 2008, up

from 306 in 2007 and 256 in 2006.”

In Detroit and nearby communities served by the city's aqueduct, officials have estimated 35 billion gallons leak from the system each year, leaving residents to pay more than \$25 million annually for water that never reaches their homes.

All told, leaking pipes lose an estimated 2.6 trillion gallons of drinking water every year, the equivalent of 17 percent of all water pumped in the United States.

As many as 1,000 water main breaks occur in many major cities each year.

#### Leaking Budgets

Water main breaks force local, state, and federal governments to take action more quickly than under normal budgetary scenarios, but the problems must be addressed one way or another.

In Cheyenne, the *Wyoming Tribune-Eagle* reports the water department “spends approximately \$1 million to rehabilitate and replace an average of 1.5 miles of water mains each year.”

Baltimore authorities estimate the cost of needed work tops \$2 billion, while the *Baltimore Sun* reported that two costly breaks in 2009 “washed away sizable chunks of the city's budget.”

#### Borrowing for Repairs

To solve the problem, local and state authorities often try some mix of borrowing, raising rates, or seeking federal assistance.

The Pittsburgh Water and Sewer Authority, for instance, has financed

its improvements by borrowing, which, according to the *Pittsburgh Post-Gazette*, “has boosted payments on the authority's \$779 million in debt toward \$44 million—25 percent higher than it paid five years ago.” The city's credit rating has suffered accordingly, with Moody's citing “pronounced risks” in its obligations.

Meanwhile, the cold snap in Jackson, Mississippi in January led to 154 water main breaks—the most in two decades. The breaks left much of the city without running water, forcing closure of most schools and businesses.

Jackson Mayor Harvey Johnson declared a state of emergency. He estimated the city would need \$76.2 million to replace 109 miles of water lines.

#### Budget-Friendly Solution

Yet in the neighboring town of Ridgeland, where PVC is widely used, there was no water main crisis.

“The type of pipes we have [plastic, or PVC] are less likely to have problems than iron pipes simply because they are more flexible and hold up better underground,” said Ridgeland Mayor Gene McGee.

PVC pipe has been used in the U.S. since the 1950s, and according to the Environmental Protection Agency, it has an unsurpassed resistance to corrosion. Because it satisfies the need for tough, durable, and corrosion-resistant pipe, it has become vital to rural water and wastewater systems.

In Great Falls, Montana, City Engineer Dave Dobbs said his city's water main failure rate of 122 in 1997 was

reduced to 35 in 2009 by “replacing old water lines with plastic PVC pipe.”

Another key consideration is the cost-effectiveness of PVC. Annual savings derived from PVC pipe now used in sanitary systems throughout the U.S. are estimated at \$270 million. Converting the entire sanitary sewer system to PVC could save upwards of \$800 million a year.

#### Installation Barriers

So why isn't PVC pipe more widely used?

Outdated and prohibitive local procurement rules often ignore relatively newer yet proven corrosion-proof technologies like PVC, hindering their broader application. The reasons most often cited for this range from a need to further “study” the material, to a reluctance to try something new, and even to a reliance on myths to reject its use.

Yet the technology has been recognized by all required state, national, and international agencies and standards organizations and is used by thousands of municipalities worldwide.

The federal government already has taken steps to fight corrosion. Regulation has tackled it in the energy sector, with the Office of Pipeline Safety mandating tough corrosion standards for energy pipelines.

Similar standards should apply for water and wastewater.

Bruce Hollands ([bhollands@uni-bell.org](mailto:bhollands@uni-bell.org)) is executive director of the Uni-Bell PVC Pipe Association, a not-for-profit organization based in Dallas, Texas.