



actual disinvestment, that led to the disaster that occurred,” according to Ted Henifin, Jackson’s third-party water administrator.

The complete loss of potable water in Jackson is a rare case, but pipes that leak but do not burst are ubiquitous. Many pipes are owned and managed by their communities, but few are paying enough attention to leakage. “In my assessment, it’s a massive issue, but most of it is hidden, so it’s an insidious issue,” said George Kunkel, principal of Kunkel Water Efficiency Consulting, a Hershey, Pennsylvania-based firm that helps water utilities improve their efficiency.

Water can be lost in a variety of ways, including through leaky pipes in people’s homes and on its way from its original source to the utility, but the issue the nation’s municipalities are largely able to control is the losses that occur when water moves through pipes from the utilities to users.

According to a March 2024 Associated Press article, Sunil Sinha, a water researcher at Virginia Tech, was quoted as estimating that some areas of Detroit lose an estimated 70 percent of the water from pipes that are up to 120 years old. Several Chicago suburbs likely are losing more than 40 percent of water, and some Georgia systems are losing more than 80 percent of their treated drinking water.

The cost of the lost water doesn’t come directly out of a municipality’s funds; instead, it is passed along to its users. As a result, there hasn’t been a potent incentive in utilities and the municipalities that own them to address the issue, unless there is a water shortage as in areas suffering from droughts. Still, there is a moral obligation to protect residents’ money, notwithstanding whether it is spent on taxes or on water bills.

Sometimes, the problem comes to the attention of state legislators—and then action may follow. That was the case in the State of Tennessee, according to Steve Cavanaugh, president and chief executive officer of Cavanaugh & Associates and chair of the outreach subcommittee for the Water Loss Control Committee at the American Water Works Association (AWWA).

## PERSPECTIVE

## Leaky Pipes: “An Insidious Issue”

BY KATHERINE BARRETT AND RICHARD GREENE

**A**ccording to the American Society of Civil Engineer’s 2021 Infrastructure Report Card, “Our nation’s drinking water infrastructure is composed of 2.2 million miles of pipe, most of which is underground and unseen by the millions of consumers who rely on it every day; unfortunately, this often means that water infrastructure is out of sight and therefore out of mind. Some of the nation’s oldest pipes were laid in the 19th century, and pipes that were laid post-World War II have an average life span of 75 to 100 years, meaning that many of them are reaching the end of their design life.”

Taken to its extreme, the problems of aging pipes can prove to be disastrous. The best-known example of this occurred on August 30, 2022, when the water system in the City of Jackson, Mississippi, failed, causing many residents to lose their tap water entirely for days. The president declared it a federal disaster and the governor declared it a state disaster. Ultimately, the Environmental Protection Agency (EPA) named a third-party manager—essentially a receiver—to take over control of the water system there.

Unlike natural disasters like hurricanes and tornadoes, this could have been foreseen. “It was due to a long-term lack of investment, or

"One legislator made a racket after hearing from a furious ratepayer who was upset at his rates going up and who had the right connections," he recalled. Other states that are "moving forward" with regulatory pressure on their municipal water utilities are California, Georgia, Hawaii, Indiana, and Texas, he said.

One of the major challenges to cutting back on the water lost through pipes is that there's a disheartening lack of data available about the actual amount of water lost between utility and user.

One solution here is an AWWA water audit, which the EPA defines as "an accounting of all of the water in a water system resulting in a quantified understanding of the integrity of the water system and its operation. It is the first step in formulating an economically sound plan to address water losses."

It would likely be prohibitively expensive for many individual communities to develop the software necessary for this approach. Fortunately, AWWA and the International Water Association (IWA) provide this software for free. According to the AWWA's website, "This software is the industry standard tool for conducting the annual water audit and using the results to guide a program for cost-effective water loss control and revenue recovery. It first came out more than 15 years ago and is now used throughout North America and in other countries around the world."

Of course, even with the data in hand, the decision of what to do about water loss comes down to a cost benefit analysis. "On an annual basis, it wouldn't make sense to spend \$500,000 in leakage reduction if the value of the leakage was \$50,000, because then you're costing customers more for the repair than they're paying for the water," Cavanagh explained.

Even when the cost benefit analyses are persuasive, "Not even the largest utilities have the funding to replace all their leaky pipes," says Sinha, a tenured professor of Civil and Environmental Engineering at Virginia Tech and director of the Sustainable Water Infrastructure Management Center. "And right now the smaller utilities don't even have the capacity to fill out the forms for a grant."



## Taken to its extreme, the problems of aging pipes can prove to be disastrous.

One utility which has made impressive progress in dealing with its leaky pipes over the last couple of decades is Halifax Water, which is fully owned by the City of Halifax, Nova Scotia. As John Eisnor, director of operations there, explained, his utility has been able to determine where its problems are by dividing up the utility water system into smaller sectors. "Each district metered area (DMA) has a fixed number of metered entry and exit points for water," he said, "so you know how much water goes into and out of each of those. Through the night when few people are using water, the flow should be similar from night to night, but if you see an increase in the amount of water being measured during those times, you know there could be a new leak."

When that happens, the city can send out a crew with specialized acoustic gear that enables them to hear the noise made by the leaks in the metallic water pipes. "When a leak is found, the crew puts a mark on the asphalt, and then we put out

crews to make the repair," he said. In the 24 years since this process began, the utility's water leakage has been reduced by half.

Though the DMA approach may not be applicable for all utilities, "If you have a proactive leakage program, you should theoretically be able to find your leaks before they find you," Eisnor said. "Otherwise you could get to a point where the leak could become catastrophic." ■



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