



Drinking Water





EXECUTIVE SUMMARY

Our nation's drinking water infrastructure system is made up of 2.2 million miles of underground pipes that deliver safe, reliable water to millions of people. Unfortunately, the system is aging and underfunded. There is a water main break every two minutes and an estimated 6 billion gallons of treated water lost each day in the U.S., enough to fill over 9,000 swimming pools. However, there are signs of progress as federal financing programs expand and water utilities raise rates to reinvest in their networks. It is estimated that more than 12,000 miles of water pipes were planned to be replaced by drinking water utilities across the country in the year 2020 alone. In 2019, about a third of all utilities had a robust asset management program in place to help prioritize their capital and operations/maintenance investments with limited dollars, which is an increase from 20% in 2016. Finally, water utilities are improving their resilience by developing and updating risk assessments and emergency response plans, as well as deploying innovative smart water technologies like sensors and smart water quality monitoring.

CAPACITY & CONDITION

Access to clean and safe drinking water is critical to public health and economic prosperity and, on average, people use around 82 gallons of water per person, per day in the United States. Nearly half of water utilities report declining or flat total water sales in the past 10 years, largely due to efficiency improvements. Water usage dropped 3% from 2010 to 2015, despite a 4% increase in the nation's total population. Due to declining water usage, there is currently adequate drinking water capacity in the U.S. About 39 billion gallons of water a day are withdrawn from surface water or groundwater sources for public supply. Public supply use represents about 12% of total freshwater withdrawals.

There are more than 148,000 active drinking water systems in the nation. Just 9% of all community water systems serve over 257 million people, while the bulk of community water systems — 91%, or nearly 46,000 in total — serve communities with populations under

10,000 people. About 13 million households in the nation rely on water from private wells.

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 thus 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.

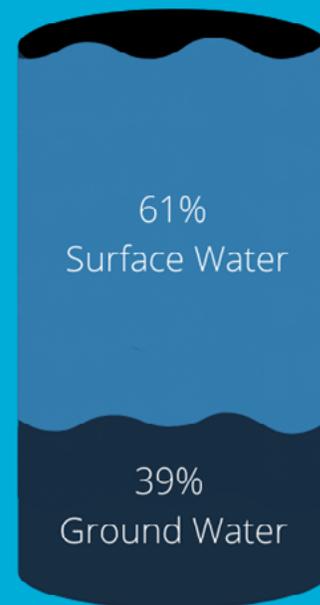
Between 2004 and 2017, various sources estimate there were between 10 to 37 leaks and breaks per 100 miles of pipe. One report found a 27% increase in water main break rates between 2012 and 2018, reaching an estimated 250,000 to 300,000 breaks per year; this is equivalent to a water main break every two minutes. Smaller utilities can have up to twice as many pipe breaks

U.S. PUBLIC WATER SUPPLY CONSUMPTION

Public supply water is used for domestic, commercial and industrial purposes

39 billion Gallons of Water Used for Public Supply Each Day

- Public supply water is gathered from surface water or groundwater.
- Surface Water is defined by river, lakes or reservoirs



**Source: U.S. Geological Survey*

than larger utilities, in part because smaller utilities often have more miles of pipe per customer and have a smaller customer base from which to collect revenue, resulting in less funds for repair and asset management.

Water utilities are increasing the rate of pipe replacement and repair. In 2015, utilities were replacing, on average, 0.5% of their pipes per year, meaning it would take an estimated 200 years to replace the entire system. By 2019, utilities were replacing between 1% and 4.8% of their pipelines per year on average, a replace-

ment rate that matches the lifecycle of the pipes. It is estimated that more than 12,000 miles of water pipes were planned to be replaced by drinking water utilities across the country in 2020.

Drinking water systems currently lose at least 6 billion gallons of water, or 9,091 Olympic-size swimming pools, every day. This equates to 2.1 trillion gallons of non-revenue water loss per year. The U.S. lost an estimated \$7.6 billion of treated water in 2019 due to leaks.

FUNDING

Funding for drinking water infrastructure has not kept pace with the growing need to address aging infrastructure systems, and current funding sources do not meet the total needs. In general, however, state and local governments have invested more than their federal counterparts. Despite the growing need for drinking water

infrastructure, the federal government's share of capital spending in the water sector fell from 63% in 1977 to 9% of total capital spending in 2017. On average, about two-thirds of public spending for capital investment in water infrastructure since the 1980s has been made by state and local governments.

EPA Drinking Water State Revolving Fund Appropriations

The DWSRF provides low-interest loans to state and local drinking water infrastructure projects. It has continued to receive increased federal appropriations since Fiscal Year (FY) 2017.



However, there is some limited federal support. The U.S. Environmental Protection Agency’s (EPA) Drinking Water State Revolving Fund (DWSRF) provides low-interest loans to state and local drinking water infrastructure projects. The EPA provides an allotment for each state based on its Drinking Water Needs Survey that is conducted every four years, and states in turn provide a 20% funding match. From 2013 to 2018, the DWSRF program grew from just over \$2 billion in 2013 to nearly \$3 billion in 2018, providing loans of increasing sizes to states. Federal appropriations for the DWSRF helped boost the size of the program from FY17 to FY20. In 2018, the median size of a loan was about \$1 million, and one quarter of the projects were co-funded with another source, including funding from the U.S. Department of Agriculture’s (USDA) Rural Development program.

The EPA’s Water Infrastructure Finance & Innovation Act (WIFIA) program offers the sponsors of large projects (generally over \$20 million) a new financing tool to leverage limited federal resources, stimulate additional investment in our nation’s drinking water, wastewater, and stormwater infrastructure, and encourage greater private sector participation. As of 2019, prospective borrowers have submitted letters of interest for 156 projects, requesting over \$21 billion in WIFIA loans, including \$3.9 billion in requests for drinking water projects. Recognizing the program’s success, Congress doubled the program’s funding in FY20 compared to FY17. The additional support increased the program’s lending capacity from \$2.5 billion in 2017 to \$6 billion in 2019.

WIFIA Program Funding



The U.S. Department of Agriculture's (USDA) Rural Development has over 40 programs in place to support drinking water needs in rural communities across the nation. For example, its Water & Environmental Programs (WEP) provides direct and guaranteed loans, grants, technical assistance, and training to build critical infrastructure for populations of 10,000 or less. From 2015 to 2019, USDA provided over \$4.5 billion for 2,016 drinking water projects.

Federal funding and financing is critical, but the primary drinking water infrastructure funding mechanism is user fees. The average nationwide monthly drinking water rate increased 31% from 2012 to 2018. Although water rates have increased, utilities are still facing funding gaps; only 21% of all U.S. utilities report being able to

OPERATIONS & MAINTENANCE

Decades old drinking water infrastructure systems, declining water use, costs of regulatory compliance, and stagnant federal funding has resulted in many water utilities struggling to fund the cost of operations and maintenance of these systems.

Maintenance costs reached an all-time high of \$50.2 billion above capital in 2017, in part due to deferred capital projects. A recent survey found that 47% of the maintenance work undertaken by utilities is reactive and done as systems fail.

One of the measures that utilities are taking to improve operations and maintenance and shore up resilience and affordability is the development of asset management programs, which shifts decision-making from reactive to proactive. Some states have asset management requirements for drinking water systems, but there is no federal requirement. Other states give priority for DWSRF loans to water projects that have an asset management plan or provide funding for asset management plan development, training, and technical assistance. Overall, nearly a third of drinking water utilities have a robust asset management plan in place, which is an increase from 20% in 2016, while another 55% of utilities are in the process of implementation.

fully cover the cost of providing drinking water services, and only 20% of very large utilities and 10% of small utilities felt they will be able to provide full cost service in five years. Renewal and replacement of aging water and wastewater infrastructure, as well as the financing for capital improvements, are the top two issues facing the water industry.

Although 88% of Americans pay drinking water rates that are lower than the EPA's standard of affordability, it is estimated that up to 36% of households will not be able to afford the cost of drinking water by 2024. The EPA standard for affordability is that households spend no more than 2% on drinking water and 4.5% of median household income on both drinking water and wastewater services.



Photo courtesy of HRSD

SUSTAINABLE WATER INITIATIVE FOR TOMORROW (SWIFT)
IN EASTERN VIRGINIA

FUTURE NEED

Our nation’s drinking water systems face staggering public investment needs over the next several decades. ASCE’s 2020 economic study, *“The Economic Benefits of Investing in Water Infrastructure: How a Failure to Act Would Affect the U.S. Economic Recovery”* found that the annual drinking water and wastewater investment gap will grow to \$434 billion by 2029. Additionally, the cost to comply with the EPA’s 2019 Lead and Copper Rule is estimated at between \$130 million and \$286 million.

Drinking water utilities also face increasing workforce challenges. Much of the current drinking water workforce is expected to retire in the coming decade, taking their institutional knowledge along with them. Between 2016 and 2026, an estimated 10.6% of water sector workers will retire or transfer each year, with some utilities expecting as much as half of their staff to retire in the next five to 10 years.



PUBLIC SAFETY

Since 1974, the EPA has regulated the nation’s public drinking water supply through the Safe Drinking Water Act (SDWA). The EPA sets national health-based standards and determines the enforceable maximum levels for contaminants in drinking water. All water suppliers are required to notify consumers upon learning of a serious water quality problem, and states and the EPA are required to prepare annual summary reports of water system compliance that must be made available to the public. In 2019, the number of public water systems with health-based violations was 15% lower than in 2017, and public water systems that were returned to SDWA compliance increased nearly 7% compared to 2017.

Utilities face the increasing challenge of keeping pace with emerging contaminants such as per- and polyfluoroalkyl substances (PFAS), lead and copper in drinking water, and the regulatory requirements needed to remain in compliance with the SDWA. The EPA found that about 12% of water utilities’ needs are directly attributable to SDWA compliance. Utilities in more rural communities have a smaller rate-payer base, which results in less revenue and limited financial capacity to address aging infrastructure and compliance costs. Some struggling community water systems have found success in voluntarily partnering with a larger water utility to access the capital and expertise needed to meet SDWA compliance.

RESILIENCE & INNOVATION

As the nation faces more frequent extreme weather events, water utilities are taking action to increase the resilience of their systems to ensure safety and reliability. In fact, a 2019 survey found that emergency preparedness is one of the top 10 issues facing the water industry. The America’s Water Infrastructure Act of 2018 required community water systems serving more than 3,300 people to develop or update risk assessments and emergency response plans (ERPs). The law sets deadlines, all before December 2021, by which water systems must complete and submit the risk assessment and ERP to the

EPA. The law also specifies the components that the risk assessments and ERPs must address.

Utilities are also developing innovative smart water technologies such as leak detection, seismic resilient pipes, smart water quality monitoring, and real time data sensors, just to name a few. These technologies improve resilience by allowing utilities to respond to changing climate conditions, improve efficiency of operations by reducing water losses, and deliver real-time data that allows for interactive decision-making.



Photo courtesy of WSP

WATER TRAP ROCK WATER TREATMENT FACILITY IN LOUDOUN COUNTY, VIRGINIA



Drinking Water



RECOMMENDATIONS TO RAISE THE GRADE

- Triple the amount of annual appropriations to the Drinking Water State Revolving Fund program and fully fund the Water Infrastructure Finance and Innovation Act program and the U.S. Department of Agriculture Rural Development programs.
- Utilities should implement asset management programs, tools, and techniques to evaluate asset condition and risk, and to prioritize capital and O&M decisions; states should provide funding, training, and technical assistance for asset management programs.
- Increase utilities' resilience by integrating smart water technologies such as machine learning software and real time data sensors into drinking water infrastructure systems.
- Eliminate the state cap on private activity bonds for water infrastructure projects to bring an estimated \$6 billion to \$7 billion annually in new private financing.
- Increase federal and local support to find, train, and retain the next generation of the drinking water sector workforce to help offset the large number of expected retirements.
- Utilities need to conduct revenue forecasting models to determine the necessary rate revenues that reflect the true cost of water that is needed to provide safe, reliable drinking water and more resilient infrastructure.
- Develop and fund affordability programs to ensure that low-income and vulnerable communities do not bear a disproportionate burden of rate increases.
- Support voluntary partnerships for small community water systems in need.



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