

ALBEMARLE COUNTY SERVICE AUTHORITY

AGENDA ITEM EXECUTIVE SUMMARY

AGENDA TITLE: Water/Sewer Infrastructure	AGENDA DATE: January 19, 2012
STAFF CONTACT(S)/PREPARER: Gary O'Connell, Executive Director	INFORMATION: ■ ATTACHMENTS: (Yes)

BACKGROUND: See the attached news article on the need for water and sewer infrastructure “out of sight, out of mind.” In many ways, our region, and particularly the ACSA, is ahead of the curve and actively rehabilitating the water and sewer system infrastructure. The ACSA’s rehabilitation and maintenance programs allow us to meet customer needs, as the article states “people count on turning on the faucet and having clean water come out.”

BOARD ACTION REQUESTED: Informational; no action.

ATTACHMENTS:

Articles: “US Water and Sewer Systems Tapped Out.”

U.S. water and sewer systems tapped out

Aging underground infrastructure said to need billions for repairs

BY ASHLEY HALSEY III.

At first glance, the pizza-size hole that popped open when a heavy truck passed over a freshly paved District street seemed fairly minor.

Then city inspectors got on their bellies with a flashlight to peer into it. What they discovered has become far too common: A massive 19th-century brick sewer had silently eroded away, leaving a cavern beneath a street in Adams Morgan that could have swallowed most of a Metro bus.

It took three weeks and about a million dollars to repair the sewer, which was built in 1889. Time and wear had torn off all the bricks and sent them God knows where, said George S. Hawkins, general manager of the District of Columbia Water and Sewer Authority. "We have to find them and see if they're plugging up the system somewhere farther down the line."

If it were not buried underground, the water and sewer system that serves the nation's capital could be an advertisement for Band-Aids. And it is not much different from any other major system in the country, including those in many suburbs and in cities half as old as Washington — or younger.

Although they are out of sight and out of mind, except when they spring a leak, water and sewer systems are more vital to civilized society than any other aspect of infrastructure. Rapidly deteriorating roads and bridges could stifle America's economy and turn transportation headaches into nightmares; but if the nation's water and sewer systems began to fail, life as we know it will, too. Without an ample supply of water, people don't drink, toilets

Water, sewer systems, aging out of sight, need billions in repairs

WATER FROM AJ

don't flush, factories don't operate, offices shut down and fires go unchecked. When sewage systems fail, cities can't function, and epidemics break out.

"All the big cities have these problems and to me it's the unseemly catastrophe," Hawkins said. "My humble view is that the industry we're in is the bedrock of civilization because it's not just an infrastructure that is a convenience, that allows you to get to work faster or slower. At least with bridges or a road, people have some idea of what it is because they drive on them and see them."

And just like roads and bridges, the vast majority of the country's water systems are in urgent need of repair and replacement. At a Senate hearing last month, it was estimated that, on average, 25 percent of drinking water leaks from water system pipes before reaching the faucet. The same committee was told it will take \$335 billion to resurrect water systems and \$300 billion to fix sewer systems.

There is no better illustration of the looming national crisis than the District's system. The average D.C. water pipe is 77 years old, but a great many were laid in the 19th century. Sewers are even older. Most should have been replaced decades ago.

Emergency crews rush from site to site to tackle an average of

450 breaks a year. Raw sewage flows into the Potomac, the Anacostia and Rock Creek whenever it rains hard — hundreds of times a year — an annual flush of about 3 billion gallons, according to D.C. Water.

Firefighters are equipped with computerized cue sheets to tell them which of the 9,157 hydrants in the District have enough water pressure to put out a fire.

The average water and sewer bill has gone up about 50 percent in just four years, to \$65 a month for single-family homes. Unless there is federal regulatory relief, it could climb to \$100 a month by the end of the decade.

The decrepit system has 1,200 miles of water pipe and 1,800 miles of sewers. The water pipes are being replaced at an average of 11 miles a year. At that rate, replacing them all will take more than 100 years.

There's no money to do it any faster. And, Hawkins says, "if you did it much faster than that, you could paralyze the city in terms of traffic."

A snowstorm had turned the District into a ghost town a couple of years ago when Hawkins trudged through the snow to check a break in a water main at 21st Street and New Hampshire Avenue.

The intersection isn't far from several embassies, and a few foreign visitors came from a

hotel on the corner to watch as snowplows dug down to find the leak's source. Hawkins recalls telling the visitors that the old mains under New Hampshire Avenue burst fairly often. "They said: 'You have pipes that were put in in the 1860s? We thought we had it bad in Ghana!'"

The good news? The District's pipes are being replaced twice as fast as the average in other major water systems in America.

The gargantuan numbers tossed around during Decem-ber's Senate hearing as the cost of saving the country's water and sewage systems have no more promise of connecting with the public than has the \$7 trillion that transportation experts say should be spent to resurrect roads, bridges, aviation and transit in the next decade.

About \$9.4 billion more per year is needed for water and sewer work between now and 2020, according to a study released last month by the American Society of Civil Engineers. Without that, many Americans should prepare for regular disruption of water service and a jump in contamination caused by sewage bacteria, the study said.

The price of water, always below such commodities as electricity and gasoline, can be expected to rise dramatically as the demand taxes the systems that deliver it, analysts agree.

Nationwide, an estimated 1.7 trillion gallons of water leaks from pipes each year before it can be put to use. About 900 billion gallons of raw sewage flows into waterways.

Those leaks and untreated flushes aren't just a problem in creaking Eastern cities that date to Colonial times. Oklahoma, which didn't become a state until the 20th century, has estimated it needs to invest \$82 billion in water and sewer infrastructure during the next 50 years.

"I remember when they used to consider us out in the newer states like Oklahoma, as not having the infrastructure problems of older states," Sen. James M. Inhofe (R-Okla.) said, "but that's not true anymore."

Although suburbs that have appeared or expanded since World War II have newer systems, they're showing age. Even in this relatively mild year in which there have been fewer breaks — more mains break when there are severe temperature swings — the Washington suburbs have had problems. There have been more than 1,440 leaks or breaks in Montgomery and Prince George's counties this year. Fairfax County has had 300.

"People count on turning on the faucet and having clean water come out," said Sen. Benjamin L. Cardin (D-Md.), chairman of the subcommittee on water. "Our nation's water infrastructure is reaching a tipping point." But with the economy splutter-

ing and Congress eager to slash a burgeoning deficit, selling Americans on the need to pay billions more in water bills or taxes to salvage a system they didn't even know was breaking might be impossible.

"The customer base really doesn't know," Hawkins said. "Like when I turn on the faucet, what on Earth is needed to deliver that water? It's like magic. And then it goes down the drain. It's like magic again."

Hawkins was awakened on a Friday night in October 2010 to news that water was erupting all over the place at Constitution Avenue and Ninth Street.

"When a water main breaks, all hell breaks loose because it's under such high pressure," he said. "We dug an original hole because at first you can't really tell where the break is — the water can work its way to the surface through any fissure."

Pressure from the 24-inch main buckled the pavement a foot high. Water flooded the basement of the Department of Justice. The Smithsonian's National Museum of Natural History had to shut down the next day.

The torrent was unleashed by a water main that had been installed in the 1890s, when Grover Cleveland lived a few blocks away in the White House.

ALBEMARLE COUNTY SERVICE AUTHORITY

AGENDA ITEM EXECUTIVE SUMMARY

AGENDA TITLE: Water Demand Forecast	AGENDA DATE: January 19, 2012
STAFF CONTACT(S)/PREPARER: Gary O'Connell, Executive Director	INFORMATION: ■
	ATTACHMENTS: (Yes)

BACKGROUND: National American Water Works Association (AWWA) article on best practices for “sound water demand forecasts,” outlines, and reinforces the water resources planning we have been doing in our region. Also reinforces the need for a stronger RWSA water system metering project that will be studied and implemented as part of the water agreement.

BOARD ACTION REQUESTED: Informational; no action.

ATTACHMENTS:

Articles: AWWA article



Opflow's editorial purpose is to present new and established technologies and ideas that readers can apply to drinking water treatment and distribution, alert readers to possible related problems and solutions, interpret regulatory and technical information in a clear format, and foster and promote innovative ideas that help readers provide safe water to all.

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December

Sound water-demand forecasts are critical to water resources planning. As stressed in this month's cover article—How Can We Avoid the Coming Power Struggle for Water?—many basins are overtaxed, and demands continue to rise. Accurate forecasts are especially important when determining supply alternatives, modeling water use, and sizing facilities.

DATA REQUIREMENTS

AECOM Water Demand Forecast

Thomas Dumm, chair, AWWA Water Resources Planning and Management Committee



The data required to develop an accurate demand forecast will come from a variety of information sources. Often more data are collected than are useful in the analyses, but it's difficult to determine what's useful until the process is under way. AWWA Manual of Water Supply Practices M50, *Water Resources Planning*, broadly categorizes the data needed for effective forecasting as follows:

- Consumption data encompass monthly consumption reports from a period of at least 10 years and the related number of accounts for every relevant customer group.
- Production data are needed to identify system losses and peaking characteristics within the system. *(New meters)*
- Monthly weather data by location for the same periods the consumption data cover are needed to identify seasonal patterns and the effect of weather on consumption.
- Demographic data are needed to provide variables such as population, households, household income, and number of occupants, and to derive the basis for projecting historical patterns for future periods.
- Established conservation measures by customer class and locality (if applicable) are important factors, as are any potential new conservation measures.
- Rate structure and price data may be used in the forecasting process. *(ACSA)*
- Economic factors, such as price indexes, housing starts, occupancy rates, employment rates, home values, lot size, and household income can be important pieces of information in certain circumstances.

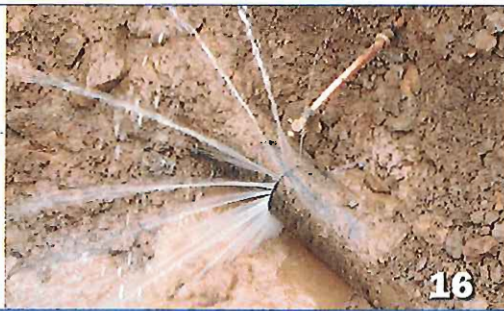
TIP OF THE MONTH—DROUGHT PREPAREDNESS *RWSA Drought Management Plan*

One of the most serious threats to the ability of a water utility to meet the demands of its customers is a drought. To respond to a drought emergency, the utility will have to tap into a supplemental supply, reduced demand, or both. Every water system should have an emergency response plan to address how water will be provided under conceivable emergencies. Although a drought can be serious, an immediate response isn't necessarily needed. It can take weeks or months for a drought to develop to the point at which water levels in streams and reservoirs fall too low to make them useful. That time can be used to organize resources to respond before the crisis becomes acute.

— AWWA, *Water Sources*

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AWWA is the authoritative resource for knowledge, information, and advocacy to improve the quality and supply of water in North America and beyond. AWWA is the largest organization of water professionals in the world. AWWA advances public health, safety, and welfare by uniting the efforts of the full spectrum of the entire water community. Through our collective strength we become better stewards of water for the greatest good of the people and the environment.

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Because of increasing leaks in a water main and costly repairs, a Virgin Islands utility turned to slipline technology to rehabilitate the main.

BY MUSTAFA ABUSAOUD AND RICHARD BOTTEICHER

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On the Cover: Lake Mead is one of the most important water resources in the West. However, changing rainfall patterns, climate variability, high levels of evaporation, reduced snowmelt runoff, and current water-use patterns are putting pressure on the lake's water management resources as the population depending on the lake for water and the Hoover Dam for electricity continues to grow.



copy to Board

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November 30, 2011

Mr. Gary O'Connell
Executive Director
Albemarle County Service Authority
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Dear Service Authority Members,

As President of the Virginia Chapter of the American Academy of Pediatrics (AAP), I am writing in support of community water fluoridation. Community water fluoridation is the most efficient way to prevent tooth decay, the most common chronic disease of childhood. Decay of primary (baby) teeth can affect growth, lead to malocclusion, cause significant pain and result in potentially life-threatening infections. In fact, an estimated 51 million school hours are lost per year in this country because of dental-related illness. Community water fluoridation reduces dental decay and therefore prevents the untoward disease sequella associated with dental infection. It improves the quality of life and saves money in dental treatment costs.

The AAP recommends that all persons drink water with an optimal fluoride concentration and brush their teeth twice daily with fluoride toothpaste. An AAP Policy Statement released in 2008 states that "Water fluoridation is a community-based intervention that optimizes the level of fluoride in drinking water, resulting in pre-eruptive and post-eruptive protection of the teeth. In short, fluoridated water is the cheapest and most effective way to deliver anticaries benefits to communities."

As a practicing pediatrician for 30 years, I know that dental caries continues to be a significant health concern for children. On behalf of AAP, I urge you to continue community water fluoridation in Charlottesville and Albemarle County.

Sincerely,

William B. Moskowitz, MD, FAAP
President, Virginia Chapter
American Academy of Pediatrics