

PEERING DOWN THE PIPE

The cost of managing dirty water in sanitary sewers and runoff from storms has increased faster than overall local service costs over the last 20 years, boosted by aging infrastructure, more stringent federal regulations on cities, and increased rainfall due to climate change. Going forward, more flexible state and federal policies may reduce dependence on expensive facility upgrades and help manage capital costs.

In 2021, Wisconsin municipalities spent \$1 billion, or nearly 14.9% of their total outlays, on handling dirty water through sanitary and stormwater sewers.

These are two of the most basic and important services provided by local governments such as cities and villages and, to a lesser extent, towns. Sewers safeguard public health, limit flooding, and protect natural resources, yet their sizable cost is often overlooked when discussing local finance. However, as new challenges emerge, such as increased flooding from climate change, these underappreciated public services and their cost are receiving more attention.

[State Department of Revenue \(DOR\) data](#) on local spending show the costs of managing dirty water grew steadily over the past two decades. Spending on sanitary sewers grew at a 3.3% annual rate over that period, from \$451.8 million in 2003 to \$816.7 million in 2021. Most sewer systems are paid for through special proprietary funds financed with user fees (see box on page 2). Over the same period, overall local

government spending on operations and capital projects grew at a lower rate of 2.2% a year.

Total capital and operating spending on stormwater management shows an increase of 2.6% annually, slower than sanitary sewers. However, two somewhat different components of stormwater management showed diverging trends. Outlays for stormwater drainage that are mostly funded from fees increased at a rate of 6.5% annually, rising from \$51.2 million in 2003 to \$158.0 million by 2021, while spending on storm sewers financed by core government revenues such as the property tax declined by 2.1% per year, from \$86.3 million to \$58.5 million in 2021.

In this brief, we generally combine spending on ongoing local operations and capital projects because the available state data do not allow us to distinguish between these two types of spending in some cases, including for separate local sewer utilities.

The available data on expenditures outside of these separate utilities show a decrease in average annual capital spending on both sanitary and storm sewers in the period between 2012 and 2021 when compared to 2003 and 2011. This shift reflects a reduced need to extend sewer and stormwater services to new neighborhoods given the decline in [housing construction following the Great Recession](#). More recently, however, annual capital spending has increased. The uptick may correspond with a rebound in housing starts, which have grown in recent years even if they have not returned to mid-2000s levels, as shown in our November 2021 [brief on housing permits](#).

In addition, the [deep tunnel project](#), a massive metro Milwaukee infrastructure investment intended to reduce

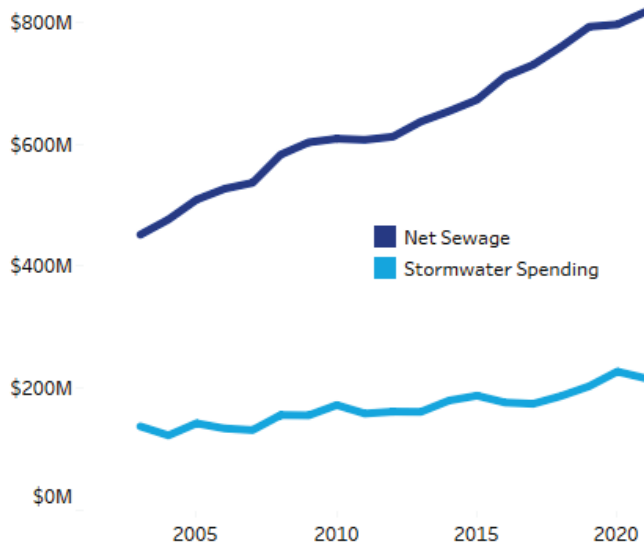
Two Types of Dirty Water

Wastewater from homes, businesses, and factories flows directly into a municipality's sanitary sewer system. Once in that system, wastewater flows to treatment plants that clean it and then release it into streams and lakes.

Stormwater management systems collect rainwater that falls on urban areas and help it flow more quickly downstream or store it temporarily in retention ponds and other structures to prevent flooding and clean the water. Storm sewers consist of drains and pipes along city streets, while stormwater drainage systems include, ponds, rain gardens, and grassed ditches where excess water flows.

Fig 1: Sewer and Stormwater Spending has Grown Steadily

Net sewer and stormwater operating and capital spending, 2003-2021



Source: Wisconsin Department of Revenue Municipal Financial Reports

combined stormwater and sewer overflows into Lake Michigan, was completed in 2010, corresponding with a decline in storm sewer capital spending in Milwaukee County.

One emerging pollution challenge facing sewers and stormwater systems comes from PFAS, a set of chemicals used in flame retardants and other products, that break down very slowly over time and pose health risks. The EPA has proposed a new rule limiting PFAS in drinking water. Wisconsin created a surface water standard for PFAS in 2022, with an implementation process designed to limit dramatic cost increases. Such rules may lead to significant changes for both sewer and stormwater management systems, and over time may add substantial costs.

STORMWATER MANAGEMENT

Some of the rapid growth in stormwater spending over the past two decades is linked to additional municipalities creating dedicated utilities with their own fees. In 1999, [federal regulators strengthened](#) rules to control urban pollution coming from stormwater and other “non-point” sources (i.e. those that are less easily identifiable than point sources such as a factory). The federal rules expanded the number of local governments required to obtain permits for polluted stormwater runoff. The Legislature responded that same year by authorizing the creation of [utilities to manage stormwater](#) through measures such as

What’s a Proprietary Fund?

Proprietary funds help finance specific local services, often through user fees. In 2021, Wisconsin’s municipal governments spent more than \$3 billion, or about one-third of their total spending, through proprietary funds. Users typically directly pay for the costs associated with providing the service, which means these funds function more like a private business. Proprietary funds are used to pay for sewer systems, parking facilities, recycling operations, and attractions such as zoos, swimming pools, and golf courses.

seepage systems, detention ponds, wetlands, and other storage structures that treat water from urban areas and slow and reduce its flow into streams, rivers, and lakes.

To fund these measures, stormwater utilities can levy a dedicated fee, separate from sewage fees and property taxes. There are currently [123 stormwater districts in Wisconsin](#). Most were created between 2004 and 2010, including the districts in Milwaukee (2004), Green Bay (2004), and Kenosha (2006). Appleton (1995) and Glendale (1996) have stormwater impact fees that pre-date the state legislation, while Madison was among the first to create a dedicated utility in 2001.

Fees are based on the portion of a parcel of land covered by impervious surfaces such as a roof, parking lot, or concrete patio. These surfaces prevent water from seeping into the ground, adding to the volume of runoff that can carry pollution into lakes and rivers and increase flood risks.

Annual residential stormwater fees in [2022](#) ranged between \$10.30 in Mukwonago and \$244 in Bayside, with a statewide average of \$69.11 per residential property, according to data collected by the [Wisconsin Chapter](#) of the American Public Works Association. Charges for larger buildings, parking lots, and other surfaces that prevent water from seeping into the earth are scaled based on the residential per-unit rate, with larger structures paying more. Unlike fees for electricity, water, and heating services, stormwater utility fees are not subject to regulation by the state [Public Service Commission](#), which means they can be raised at the discretion of local elected officials. Under state law, however, local governments have to reduce property taxes if they use stormwater fees to pay for costs that were funded through property taxes prior to 2013,

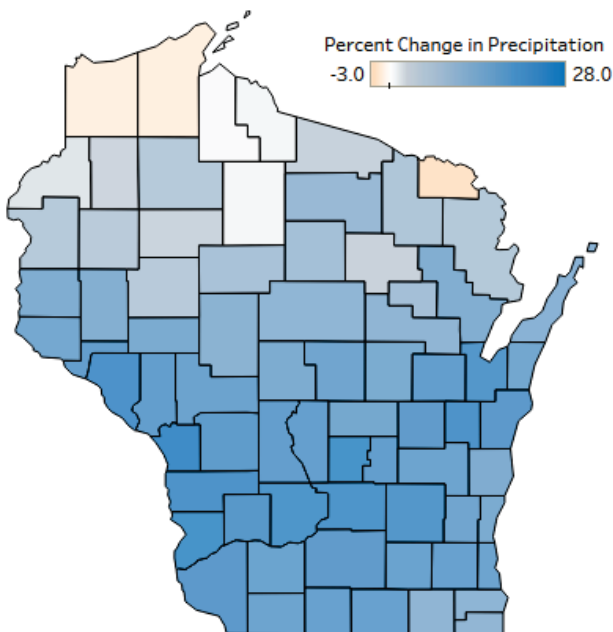


making creation of new stormwater utilities more difficult.

The greater propensity of large rainstorms, likely [driven by climate change](#), also has added to the cost of stormwater systems, which now must handle greater rainfalls to avoid flooding. Figure 2 shows how precipitation has increased across Wisconsin between 1950 and 2018. Statewide precipitation between 1940 and 1950 averaged 30.8 inches per year and increased to 35.2 inches between 2008 and 2018 [according to NOAA data](#). This trend is expected to continue, putting additional pressure on stormwater systems in the future.

Spending increases show that stormwater management is a priority for local governments, and stormwater utility fees have allowed them to fund those efforts. As part of a forthcoming update to the federally required [Clean Watersheds Needs Survey](#), the state Department of Natural Resources has documented over \$600 million in new stormwater capital investment needs among municipalities across the state. These figures do not include the capital investments needed to replace aging infrastructure and deal with increased flood risks. Data for the soon-to-be-released survey come from local stormwater plans and budget documents. While the amount is subject to revision by the federal Environmental Protection Agency (EPA), it indicates the magnitude of potential capital needs statewide.

Fig 2: Annual Precipitation has Increased Across the State
Percentage change in annual precipitation from 1950 to 2018



Source: UW-Madison Nelson Institute Center for Climatic Research

SANITARY SEWER SYSTEMS

Cities, villages, and towns provide sanitary sewer service to residents, either directly through the municipality, through sanitary sewer districts made up of multiple municipalities, or by contracting with neighboring communities.

According to [DOR data](#), there are 232 sewerage districts across the state with 302 member municipalities, funded with user fees collected by local governments and passed on to the sewerage districts. Some municipalities also retain a portion of these fees to pay for local sewer operations. Our data include both sewer spending directly by local governments and payments to sewerage districts.

Sewerage districts also can levy property taxes to generate additional revenues, but only 63 do so, with statewide collections of \$116.5 million in 2022. The Milwaukee Metropolitan Sewerage District's levy of \$109.1 million, which is [dedicated to funding capital projects](#), comprises 93% of the statewide total. The remaining districts all levy far smaller amounts, often less than \$100,000 annually. Like stormwater utilities, these districts are not regulated by the PSC and are not subject to the state's property tax limits.

For local governments that are not part of a sanitary sewer district, most pay for sewer systems through proprietary funds and user fees, with small contributions from property taxes in some cases. Only 57 of 1,850 cities, villages, and towns in Wisconsin pay for their sewer system costs solely with general revenues such as property taxes.

Our [January 2021 report](#) found that Wisconsin spends more on sewers than almost all other states. Local and state government here spent \$151 per capita on sewerage operations in 2017, which was fourth-highest in the country. A major factor appears to be the large number of local governments and special districts here that report sewerage spending. There is a strong relationship between statewide per capita sewerage spending and the share of local governments in a state involved in that function, suggesting economies of scale may play a role in holding down costs.

SAVING THROUGH FLEXIBLE REGULATION

While regulatory changes can drive increased sewer spending, flexible policies can help control costs. One



example is the implementation of the state’s 2010 limit on phosphorus in surface water, the first in the nation. The rule was intended to reduce phosphorus pollution, a persistent problem in surface waters that causes algae blooms that can disrupt recreation and affect the safety of drinking water. Initial projections made by a consulting firm hired by the Wisconsin DNR and Department of Administration suggested these regulations would result in an additional [\\$1.6 billion in capital costs, and \\$67 million annually in operating costs](#).

However, despite those projections, our data do not show a substantial change in the trend of sewerage spending over the past decade. This may be because implementation was phased in over time, and policy options were created to allow for permit compliance without major investments in treatment technology. Instead, treatment plants can make required pollution reductions by paying for farming practices that limit the amount of nutrients flowing from farm fields, and through watershed-based regional cooperation.

[Research](#) at UW-Stout and Marquette University suggests that when sewer systems meet permit requirements through actions to reduce polluted runoff, ratepayers can expect a 5% to 8% rate increase, while systems that pursue compliance via facility upgrades can expect a 22% rate increase. A [newly created clearinghouse](#) aims to make it easier for sewer systems to access this lower-cost option in the future. Changes to [federal law](#) also may make more funding available for these arrangements through the state’s clean water fund.

That local governments avoided a massive increase in spending in response to the new phosphorous rule shows the importance of providing flexibility when imposing new regulatory requirements.

MILWAUKEE METROPOLITAN SEWERAGE DISTRICT

One major entity that our data does not fully capture is the [Milwaukee Metropolitan Sewerage District](#) (MMSD), which conducts both sanitary and stormwater management and treatment services for most of the cities and villages in Milwaukee County (each of the county’s 19 municipalities is a member of MMSD except South Milwaukee), as well as portions of 10 municipalities in adjacent counties who are considered

non-members. MMSD operates one of two combined sewer systems in the state, which means that its two water reclamation facilities collect and treat flows from both storm and sanitary sewers across its service area.

As mentioned earlier, the district’s capital costs are largely covered through the property tax levy. Most of the district’s operating funds come from fees charged to residents by communities served by the district and passed along to MMSD. Remaining funds include sales of fertilizer produced by MMSD that support operations and payments by municipalities from adjacent counties that are based on equalized property values and support the capital budget.

According to the district’s comprehensive annual financial report, its total operating and capital spending grew by 2.5% between 2015 and 2021, from \$204.4 million to \$237.3 million. The district’s growth trailed the statewide rate of 3.2% combined sewer and stormwater spending.

One possible reason for this slower spending growth is the outsourcing of its wastewater treatment operations to a private company (Veolia Water Milwaukee). As we explained in a [September 2022 report](#), one benefit of MMSD’s 10-year contract with Veolia is its inclusion of controls on annual operating cost increases (there are also some potential downsides that we explain in the report). Further, the district is guided by a long-term capital management plan that seeks to “smooth” needed property tax levy allocations over multi-year periods, thus avoiding large year-to-year increases.

CONCLUSION

The growth in costs of clean water and flood protection in Wisconsin have slowed somewhat over the past decade but spending in this area remains among the highest in the nation on a per capita basis. In addition, these expenditures likely will continue to grow as the state addresses difficult pollution issues such as nutrients in surface waters and emerging threats such as PFAS. Changes to the climate will make the job even tougher by increasing large rainfalls and further stressing stormwater systems.

Because user fees are less likely to be affected by levy limits and other restrictions, sewer and stormwater utilities have been able to raise the revenue needed to adapt to changing regulatory and environmental conditions and to proactively invest in infrastructure



maintenance and improvements. To avoid placing an undue cost on users, however, additional federal funding and a growing focus on green infrastructure may be required to address stormwater management and sewage needs moving forward.

Changes at the federal level will likely make more funding available for green infrastructure projects to address both sanitary sewer and stormwater management issues. Further, the use of innovative models such as greater regional collaboration and economies of scale and private partnerships such as the MMSD contract may further limit expenditure growth. In another example, the state limited costly capital spending to lower phosphorous levels in water by adopting a flexible approach and pursuing solutions in the larger watershed. Given the potential challenges ahead, all of these tools and more may be needed to keep water clean and costs under control.

