Residents of Toledo, OH, have always seen water as a very important asset, says Patekka Bannister, commissioner of plant operations and chief of water resources for the Toledo Department of Public Utilities. There is water everywhere you look in Toledo, she says. "In terms of trade, a lot of the economy is based on water. When you go downtown you see the river running through, drive a little bit further you see Lake Erle. In your backyard there is some kind of a ditch or a creek, so we have that connection." As part a downstream community on the Maumee River in the Great Lakes Watershed, residents see the value of water.

An NPDES Phase I community, Toledo received its first MS4 permit in 1997 and almost immediately began work developing a funding mechanism to meet the mandate's requirements. By 1999, the city had completed the groundwork for implementing a stormwater utility.

The city uses the equivalent residential unit (ERU) for billing, representing the impervious surface areas of a typical residential property. In the city's stormwater utility system, an ERU is equal to 2,500 square feet of impervious surface area. Property owners are charged a fee for each ERU on their property. Single-family and duplex residential properties are charged one ERU regardless of the actual number of ERUs on the property; the fee for each of these residential properties is $3.80 per month. Non-residential property owners are charged for the measured number of ERUs on their property.

Credit When Due

"One thing I remember hearing was that a lot of the larger industrial users knew they had a lot of impervious surfaces, so getting that stormwater utility was going to cost them. Also, a lot of schools and churches had those same concerns," says Bannister.

The city formed a task force to put together a stormwater credit program that offers 10 different options for reducing a non-residential ratepayer's fee obligation, using a selection of stormwater management BMPs and policies.

The credits range from 10% reductions in fees for direct discharge as a flood prevention measure to 30% reductions for riparian setbacks and open-channel maintenance work. Credits for these and additional measures such as bioswales, retention/detention facilities, and other practices can be combined to increase the proportion of the fee that can be deducted. The full spectrum of credits is laid out in detail in the department's stormwater credit manual.

For instance, a swale, bioswale, or bioretention cell; a wetpond; or an extended detention facility—which also meets the design requirements for detention/retention—is eligible for a maximum credit of 60% (30% plus 30%) for the impervious area tributary to the practice. The maximum total credit available to any property or stormwater account is 50% of the stormwater service charge.

Consistent Funding Turns the Key

After the utility was set up and the fee passed, says Bannister, it was decided to not have a standalone department for stormwater. Revenue from the fee can be applied to fund stormwater projects regardless of which department houses them. "We have seven divisions, and we divide it out between those divisions and our streets department. The city council did not want to create another division that worked exclusively on stormwater," she says. "The dollars are divided among all the divisions, with the majority going to the Department of Public Utilities and some going to the Department of Public Service or Streets Department. Under the Department of Public Utilities, we have Engineering Services. They created a Stormwater Utility Group, which has three engineers full-time and an additional engineer that works half-time, exclusively on stormwater, reviewing stormwater plans, updating the stormwater credit manual, and reviewing applications that come in. Environmental Services manages the MS4 program, and the Sewer Department is responsible for maintaining the storm sewer system, whether that is the creeks or the actual piping."

One of the first municipalities in the nation to put a stormwater utility on the books, Toledo has used the stormwater fees to support efforts targeting the minimum control measures spelled out in its MS4 permit. In addition, says Bannister, "It allows us to work on different projects that we might not have been able to fund otherwise, such as green infrastructure projects and water-quantity projects to get people out of the floodplains." These, she says, might include ditch widening projects or "retention ponds that are built or a larger tidal system." Furthermore, Bannister explains that having a consistent influx of funding has allowed the city of Toledo to develop strategies to leverage the local funds generated by the stormwater utility to pursue other funding opportunities such as federal grants, state grants, and Great Lakes Restoration Grants, among others. "If they are offering a grant match where they give us 50% of the funding, but we have to come up with 40%, we can take that 40% out of our stormwater utility and get a project completed."

With the entire budget for stormwater management drawn from the approximately $9 million dollars collected annually via the stormwater utility, the city uses the money to cover materials and services,
equipment, and personnel, with allocations going to the water reclamation plant for wet-weather facilities. Bannister notes it’s important to steward the fund with care. “When we go over our capital improvement budget, a lot of thought goes into making sure we keep our fund as viable as possible and do not drain our stormwater utility budget.”

She adds, “Everyone comes in with their big project lists that they would like to see—things that they would like to do.” During discussions, she says, these lists get narrowed down by looking at whether each item amounts to “a real capital improvement project that will improve water quality or alleviate water quantity problems in the area.” Other considerations include how many residents a particular project will benefit and whether a project has secured partial funding and only needs an additional allocation from the stormwater fund to reach completion. According to Bannister, the vetting of projects so far has programmed prospective capital improvements out to 2022 and overall has been very collegial. She notes, however, “There are people who would like to do more, but everybody realizes that in order to keep the fund stable, there is only so much that we can do at a time.”

Groundwork for a Utility

In Baltimore, MD, for several years stormwater infrastructure projects and activities were financed either from the general fund or motor vehicle funds. “They had to compete with other public programs—transportation, parks and recreation, and schools—in the budget,” says Kim Grove, chief of the Office of Compliance and Laboratories for Baltimore City Department of Public Works.

Grove says that with 1,100 miles of piping and conveyance, Baltimore's stormwater infrastructure rivaled its drinking water and sewer infrastructure in size, yet, “as recently as 2011, there were zero dollars available for capital improvements related to stormwater,” an obvious mismatch between the magnitude of the task and funding.

In 2012, the Maryland General Assembly passed the Watershed Protection and Restoration Program, requiring the 10 largest and most urban jurisdictions in the state to set fees to address their polluted runoff problems. While citizens and interest groups from several jurisdictions in the region expressed objections to what was sometimes termed “the rain tax,” Baltimore City continued work on a feasibility study that had begun around 2009 for the implementation of its own stormwater fee.

The initial goals of the study were to determine what options would be available, “what kind of fund the city was going to create, whether it would be an enterprise fund or a special revenue fund, the protections that would be available as a result of that choice, as well as the debt service options,” explains Grove. Finally, as part of that feasibility study, officials examined the options for the fee rate structure itself.

In 2012, a ballot referendum was passed by popular vote, changing the city charter to establish the enterprise fund that would serve as a stormwater utility fund. The ballot initiative was called Proposition J, and the campaign endorsing the measure encouraged residents to voice their approval with the slogan “Vote yes on J.” With the approval of the fund, the Baltimore City Department of Public Works went before the city council in 2013 to obtain approval to create the fee that would provide revenue to that fund, and Baltimore City’s stormwater fee went into effect.

In 2015, the Maryland State Legislature rescinded the explicit mandate directing the 10 largest jurisdictions in the state to adopt a stormwater fee; however, it nevertheless held each jurisdiction to the requirement of demonstrating, through a biannual financial assurance plan, the means to finance its MS4 obligations. While some nearby jurisdictions opted to phase out their local stormwater fees and turned instead to funding stormwater-related projects through general revenues, Grove says that Baltimore City, having invested significant effort to establish its fund and fee structure, decided to keep the stormwater fee in place.

“We wanted to make sure any type of funding that was going to come about from the stormwater fee was going to be dedicated and protected,” she says.

Something for Everyone

Under Baltimore City’s stormwater fee, single-family properties are charged on a monthly basis one of three rates. Tier 1 properties are those that have no more than 820 square feet of impervious surface area; they pay $3.33 per month. Tier 2 properties, those with more than 820 square feet but no more than 1,500 square feet of impervious surface area, pay $5 per month, and Tier 3 properties, those having more than 1,500 square feet of impervious surface area, pay $10 per month.

Non-single-family properties are billed on the property's ERU, which is based on the size of the impervious surface area (1,050 square feet) of the median-sized house in the city. The larger the impervious surface area of a parcel, the higher the stormwater fee for the property. Non-single-family properties pay $60 per ERU per year.

Single-family property customers are able to reduce their fees through credits for implementing measures that reduce demand upon the city's drainage system or reduce the city's cost of stormwater management. These credits can be earned through a number of activities or practices, ranging from individual participation in stream cleanups or tree-planting events to the installation of rain barrels or rain gardens on one's property and all the way up to the installation and maintenance of sophisticated
BMPs meeting the standards of the Maryland Stormwater Design Manual. Likewise, there are several different credits and fee-reduction programs available to businesses, churches, nonprofit organizations, and industries. "We created a credit program that allowed every customer some way that they could control their fee," says Grove.

**Sustainable Funding**

"Currently, we have sufficient funding to complete the projects and programs that will keep us in compliance for this permit, and that's been demonstrated by our financial assurance plan," says Grove, referring to the city's current MS4 permit cycle in force through 2020.

Grove says the fee has helped the city meet a wide variety of water-quality and stormwater management goals. For instance, she says, the street sweeping program has been a notable beneficiary of funding from the stormwater fee. Before implementation of the fee, she says, "It never had a chance to grow. It was never certain whether or not they be able to replace their fleet or be able to do any of the large maintenance. So having a sense of sustainability of the revenue has helped."

In addition to providing much-needed funding for capital improvements, the fee has helped finance stormwater management activities ranging from planning to maintenance. "Related to our plans review, which helps the development community and helps us develop partnerships to reach our goal, we've been able to substantially increase our staff available for this operation. We've been able to increase our staff for pollution source tracking to reduce the pollution, and also for inlet cleaning."

**Separating Funds and Sewers**

Catherine Ellis, water resources support services specialist with the City of Portland, ME, says the biggest driver of the city's stormwater infrastructure improvement program is the consent decree from EPA. "We have a lot of combined sewers, so taking out some of those CSOs [combined sewer overflows] is part of most of what we're doing." The objective, she says, "is to make sure it's not overflowing into the Casco Bay."

Initially, she says, "All of the funding we had was based on the sewer rate. The sewer money went to the general fund, and it was weird—we really weren't getting the money we should have been getting. So a lot of the work we were doing at the time was through the State Revolving Loan fund [SRF]. We're still doing a lot of SRF work, but we're paying that back with the stormwater utility now."

Ellis says it was a five-year process to devise a comprehensive plan to put the stormwater utility in place. "There are a lot of other places in the state that have a utility, but we wanted to do it right." She says Bangor was the first big city in Maine to implement a utility, but they "got sued and had a lot of problems, and they basically had to restart over; we didn't want to have that problem."

It wasn't always easy. When the program finally hit the streets, Ellis says, "I got yelled at on the phone for a year and a half about it." And that was despite an extensive effort to prepare people for what was going to happen. "Not everyone yelled," she says, but "the ratepayers were unfamiliar with the idea of a stormwater utility. We did a lot of outreach and put information out, but not everybody got the message." In fact, Ellis says, a letter and a sample bill, sent out six months before the program was to go into effect, may have had an effect opposite to the one intended.

According to Ellis, some of the most vocal complaints surrounding the implementation of Portland's utility arose when a communication went out that promised reductions in sewer rates would accompany the new stormwater utility, reducing overall costs for all residents. However, some residents, because they lived in areas not served by the municipal sewer system, did not have preexisting sewer fees at all. For these residents, the stormwater fee represented a net increase in costs. The effect of the miscommunication was to leave some of these residents ruffled. Ellis says this situation played out most prominently on Peaks Island, where residents were being served by a local sewage treatment facility on the island and therefore had never been billed for sewer services by the city.

Although the sewer fee for most of Portland's residents did go down for a while after implementation of the stormwater fee, as the early publicity had promised, subsequent to that, "sewer rates came back up." She considers it prudent to avoid relying on potential rate reductions as a central selling point when introducing a stormwater utility to the public. Ultimately, as a consequence of the fee, Ellis says, "Some people saved money; some people paid more."

Overall, however, she believes Portland residents appreciate the equitable administration of the fee, distributing costs among property owners based on their impermeable footprint. As she explains, the stormwater utility applies to all properties with 400 square feet or more of impervious surface with a fee that scales with the impermeable surface area of the property. The fee is assessed on all types of properties, including those owned by nonprofit organizations and religious institutions.

According to Ellis, when it comes to land use in the area, it takes technical sophistication to keep up to date on impervious cover. In the beginning, "A lot of people didn't understand how we know how much impervious surface they had. We did that through aerial mapping. When we first started, we had 2012 photos, and the fee went into effect in 2016. Now we're up to 2017. Things change all the time. When new developments come in, we're measuring the roof space and the parking spaces. Some people have
large patios around their pools, and that will be charged for. The computer calculates it for us, and that's the square footage we go with." Nonetheless, she says, owners can appeal their individual assessment. If they feel it is in error they can apply to have it reevaluated by filling out a form they can access online. To accompany their appeal, they need measurements of the area In question and backup documentation, such as photos of the property, "and then our engineer will go check it out," she says.

However, to soften the impact of the fee and provide an incentive for individuals and businesses to be proactive in addressing stormwater issues, a stormwater credit system provides all property owners with options for lowering their fees by enrolling in either residential or non-residential credit programs. "We have a credit manual for up to four-unit residential owners. They get a reduction depending on how much water they're treating," says Ellis.

The non-residential credit applies to property owners that comply with chapter 500 standards, from the city's code of ordinances. "If they meet the standard, they get the credit. If they exceed the standard requirements, they can get extra credit."

Access to the funds generated by the fee has accelerated capital improvements since the fee went into effect. "Most of the work we're doing is separating sewers. We've been doing this work for 20 years, but it wasn't at the pace it is now," says Ellis.

She says top priority goes to responding to EPA decrees, directing funds toward water quality projects such as "separating sewers, street sweeping, and holding tanks, and reducing overflows into Back Cove just outside of downtown." But she says the funds also allow the city to meet costs associated with capital improvement projects that are ineligible for coverage through SRF CSO funds. These expenses include items such as "buying lunch for union workers on overtime or funds to repurchase right of way." As a result of the stormwater fee, Ellis says, "We have money for neighborhood drainage issues."

Passing a Budget

There are a number of ways to fund stormwater projects, but it is nevertheless a challenge to find enough money to cover the need. "When I started work with Austin 20 years ago, the department had very limited funding for capital improvement projects," says Glen Taftinder, supervising engineer for the City of Austin, TX. "We were funded by a drainage utility fee, but the vast majority of that funding was being used for operating budget."

When the city adopted its master plan for watershed protection in 2001, the city council approved a 25% increase in the drainage utility fee. That adjustment raised the available funds from "almost no money to between $8 million and $10 million," notes Taftinder, "which doesn't seem like a lot, but when you have pretty much nothing, that's a lot of money."

 nonetheless, this funding pales in comparison to the city's stormwater management and infrastructure needs. "Over the years we've realized that it's not really sufficient when we have anywhere from $1 billion to $5 billion in need, depending on who you ask. The official figure in the watershed master plan was $800 million, but that didn't include a lot of things like pipe condition assessment. We weren't even looking at the condition of our storm drainage infrastructure to see when it would need to be renewed, rehabbed, or replaced. That issue alone could have a $2 billion price tag for the next 20 years."

Municipal bonds offer one alternative for raising the funds for capital improvements. The department took that route, most recently in 2006, raising $110 million, of which all but $8 million has by now been expended. However, raising money through municipal bonds adds debt to a municipality's obligations and is subject to the complexities involved in political approval. Depending on how the referendum is worded, the funds thus obtained can't always be counted upon to provide ongoing revenue targeted to all aspects of a specific task or project.

While Austin currently has around $30 million available in the capital improvement budget, some of it raised through the bond issue, Taftinder says, "That gets parceled out, and all of our equipment is also included as part of that capital budget, and only a small percentage is left available for storm drain improvement projects."

Partnerships for the Win

However, Taftinder believes there is another way to fund capital improvement projects that doesn't involve increasing fees for residents and businesses or adding debt to the city's obligations. "When developers come in and need to discharge their stormwater, especially in our downtown areas, we look for opportunities to partner with them." He explains that under stormwater regulations, if developers "have an increase in drainage or an increase in impervious cover, they have to mitigate for that increase or that change."

According to Taftinder, a traditional measure used to mitigate has often been the installation of stormwater retention and detention facilities, but these take up space. Developers, when they have access to downtown real estate, would generally prefer to use any available space on a project site to generate revenue. When it comes to seeking ways to meet the regulatory requirements, he says, "They would rather put the money into something that is in the right of way rather than use valuable land for
a retention pond." This logic could lead developers to consider the alternative of upsizing stormwater conveyance piping draining their projects as a means of mitigating their impervious footprint.

While regulations designate the diameter of piping the developer would need to install for a given project, he says, the city also has a perspective on infrastructure upgrades that are constructed in the right of way. According to Taffinder, it makes little sense to disrupt the right of way with major construction to increase piping by merely one diameter when the drainage criteria master plan calls for an eventual upgrade to much larger pipe in the long run. According to Taffinder, that's when the city can come forward and say, "Here's the size you need to go up to, but what we really need is this larger size."

The city can then offer to cost-share for the upgrade to the larger-diameter pipe, with the developer paying a portion of the cost that would be equivalent to what it would take to meet the regulatory requirements, and the city paying the balance to install infrastructure that will have the capacity to meet the city's long-term stormwater drainage needs for the area.

"Let's say that improving the storm drain system to meet our current drainage manual criteria would amount to a $1 million project, but the developer, to meet their own project's stormwater requirements, only needs to increase the diameter slightly, by maybe one pipe diameter, going up from perhaps a 24-inch-diameter to a 30-inch-diameter pipe, and the cost for them to do that might be $400,000.

"If the cost to meet the criteria of the drainage manual for the area had been projected at $1 million, the City of Austin would say, 'We're going to cost-participate by providing $600,000,' covering the difference between the amount the developer would need to pay and the total cost of a the master-plan-compliant drainage upgrade. To further outline the scope of such an agreement, Taffinder says, "In some cases, the developer might agree to let the city build and install the piping upgrade." In other cases, "If the developer says, 'We're on a tight timeline. We want to build it,' then the developer would build the upgrades. The legal agreement would be worded to state who is the lead and who is providing money," spelling out the roles and responsibilities of each of the parties in the partnership.

Taffinder believes public-private partnerships can play an important role in the quest to upgrade and modernize the city's stormwater infrastructure, especially where the city can focus efforts in targeted areas, such as transit-oriented development zones, of which six have been designated by the City of Austin.

"The numbers have to make sense to the developers; they are not likely to spend a lot more than what it would cost them onsite in terms of loss of land space and the cost to build onsite controls. But then again, it also depends on the developer. If they plan on not just developing it, but also being the owner of that property, then there are some longer-term benefits." For example, he says, if a developer is operating a multifamily or commercial development, they are required to maintain onsite stormwater controls at their cost. So they've got long-term operation and maintenance costs associated with that stormwater management unit. Even if it is slightly more costly, entering a partnership to upgrade the downstream system can be very attractive to them because that's one less thing that they have to maintain long-term."

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