



BOND FINANCING DISTRIBUTED WATER SYSTEMS:

How to Make Better Use of Our Most Liquid Market for Financing Water Infrastructure

September 2014

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Acknowledgements:

This report was funded with support from the Surdna Foundation and the Walton Family Foundation. It was prepared and principally authored by Sharlene Leurig, the director of Ceres' Sustainable Water Infrastructure Program, and Jeremy Brown, a research fellow at the Center for Global Energy, International Arbitration, and Environmental Law at The University of Texas School of Law. Mary Ann Dickinson of the Alliance for Water Efficiency contributed research and writing on accounting treatments.

The report would not have been possible without the insights and expertise of advisory bond counsel, including: Stephen Spitz, Scott Schickli, and Mayling Leong from Orrick, Herrington & Sutcliffe LLP (respecting California and federal tax law issues); Jeff Leuschel from McCall, Parkhurst & Horton L.L.P. (respecting Texas issues); and Matthew Nichols from Sutherland Asbill & Brennan LLP (respecting Georgia issues).

Throughout its development, the report benefitted from a generous team of reviewers, including: Brooke Barton, Peyton Fleming and Siobhan Collins of Ceres; Michael Gerrard and the participants at the 2014 Sabin Colloquium on Innovative Environmental Law Scholarship, hosted by Columbia Law School's Center for Climate Change Law; and Jerry Kyle from Andrews Kurth LLP (respecting Texas issues). In addition, the report was fortunate to have the research and contributions of Ceres interns Matias Healy and Kate Schaffner.

Report design by Patricia Robinson Design.

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Ceres is a nonprofit organization mobilizing business and investor leadership on climate change, water scarcity and other sustainability challenges. Ceres directs the Investor Network on Climate Risk (INCR), a network of over 100 institutional investors with collective assets totaling more than \$12 trillion. For more information, visit www.ceres.org or follow Ceres on Twitter @CeresNews.

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Executive Summary

Water utilities are at a crossroads. In the years ahead, they will have to invest billions in their infrastructure simply to catch up on backlogged repairs—and billions more to accommodate growing demands and changing hydrologic conditions.

Across the country, communities are experiencing more extreme hydrology. In some places, this takes the form of deepening drought that necessitates stronger commitments to conservation. In others, it takes the form of more frequent flooding that overwhelms water infrastructure, sending raw sewage into urban rivers or even into city streets. Some places are experiencing both intensifying drought and flood.

As a growing number of water planners across the country are recognizing, these challenges cannot be solved solely by building new reservoirs, pipelines and treatment plants. Given current financial and ecological constraints, utilities will have to embrace a new form of infrastructure if they intend to provide reliable, reasonably priced water services.

This new type of infrastructure exists and represents an increasingly important strategy in water resource management plans, from Philadelphia to Phoenix. It includes the many improvements, practices, and devices that conserve water and retain stormwater onsite. Unlike conventional infrastructure that is centralized and owned by utilities, this new infrastructure is often distributed across many properties, some of them privately owned. It could come in endless forms: drought-resistant landscaping, permeable parking lots, water-efficient appliances, building and manufacturing systems and even point-of-use water catchment and treatment systems. In the aggregate, this distributed infrastructure serves the same purposes as conventional infrastructure: extending the life of water supplies and preventing pollutants from entering waterways.

Yet while the acceptance of this new expanded definition of water infrastructure grows, the statutory definitions governing our nation's water systems as they seek to finance this infrastructure remain grounded in the past.

For many water utilities, these distributed approaches to managing water demand and mitigating strain on taxed stormwater and wastewater systems are less expensive than entirely centralized solutions requiring construction of new infrastructure. Numerous cities have already concluded that decentralized approaches to water management are economically competitive. Philadelphia, for instance, found that a \$1.2 billion investment in green infrastructure could achieve the same pollution control benefits as a \$6 billion investment in traditional gray infrastructure. Similarly, Los Angeles plans to add 50,000 acre-feet of water each year until 2030 with water saved through conservation and reuse, and to use distributed infrastructure to redirect up to 280,000 acre-feet of stormwater into its local aquifer. Columbus, Ohio plans to defer construction of a sanitary sewer overflow tunnel in favor of redirecting stormwater flows on private properties through pipe retrofits and improvements on vacant lots. Yet while the acceptance of this new expanded definition of water infrastructure grows, the statutory definitions governing our nation's water systems as they seek to finance this infrastructure remain grounded in the past.

In the United States, water utilities are primarily public entities, and municipal bonds are their financing instrument of choice. But public finance laws were written with conventional rather than distributed infrastructure in mind, and many public finance professionals still view the laws as though they only apply to 20th century concepts of water infrastructure: centralized pipes and pumps owned outright by the utility funding them. As a result, most water

utilities continue to rely exclusively on cash financing of water conservation and green stormwater infrastructure programs, reserving debt financing only for conventional water infrastructure. With limited cash available for innovative programs, it is no surprise that investments for innovative infrastructure programs struggle to keep pace with debt-financed centralized infrastructure.

In some places, utilities are looking at other mechanisms for putting capital to work on distributed infrastructure models. Philadelphia, for example, has examined attracting private equity to fund the reduction in impervious surface area on hundreds of land parcels across the city, as part of its Green City, Clean Waters initiative. Yet without a sufficient number of projects to attract institutional capital, there is not yet a liquid market to readily fund this 21st century water management approach.

Whether utilities can use bonds to finance distributed infrastructure on private property remains something of an open question, which this report attempts to answer. In doing so, we examine the legal authority to apply enterprise revenue bond proceeds toward distributed infrastructure on private property in seven representative states: California, Georgia, New York, Ohio, Oregon, Texas and Wisconsin. While legal frameworks vary across these states, specific key themes emerge:

- 1 First, utilities must have the legal authority to issue bonds for distributed infrastructure on private property.** In the seven target states, Ceres found that public finance laws did not expressly address the topic but could be interpreted as granting the requisite authority. As reasonable as such interpretations are, however, they are not conclusive. An element of uncertainty remains. In some states, the uncertainty is greater than in others. Overcoming that uncertainty will require committed utilities, creative bond counsel, and perhaps, in some cases, legislative clarifications.
- 2 Second, to use enterprise revenue bonds to finance distributed infrastructure on private property, utilities must not be legally constrained from exercising this authority.** There are two principal sources of constraints. The first is covenants in existing financial documents that restrict utilities from acquiring certain additional debts until existing debts are repaid. Ceres has identified common covenants that could pose obstacles, but each utility will be bound by its own sets of documents.

The second is state constitutional clauses that prohibit states and their political subdivisions from using public funds or credit for private benefit; these prohibitions, commonly known as “gift clauses,” exist in virtually every state. In certain states, such as Georgia, the prohibitions are stronger than in others, such as Oregon. States could amend their gift clauses to clarify that they do not prohibit the financing of distributed infrastructure. Washington did just that by adding a new clause that expressly allows utilities to use operating revenues “to assist the owners of structures or equipment in financing the acquisition and installation of materials and equipment for the conservation or more efficient use of water, energy, or stormwater or sewer services in such structures or equipment.”¹ Additionally, legislatures could expressly declare that bond-financing distributed infrastructure serves a public purpose. Utilities themselves could reduce the risk of violating gift clauses by structuring financings that preserve some sort of ownership interest or at least contractual control over distributed infrastructure investments.

- 3 Third, utilities must take care when structuring distributed infrastructure bonds to maintain federal income tax exemption.** This report explains the relevant tests, which, in brief, limit the amount of assistance that utilities may provide to private businesses.
- 4 Fourth, utilities must take care to establish control of the asset being financed in order to conform to Generally Accepted Accounting Principles.**

In each of the seven states we evaluated, statutory amendments could clarify authority and facilitate financing of distributed infrastructure. But this statutory revision is not necessarily required for utilities to proceed.

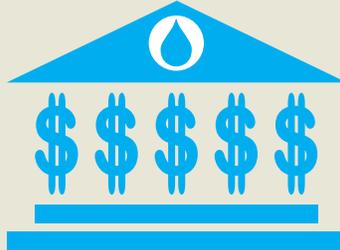
In fact, numerous U.S. cities have already made use of bonds for water conservation and green stormwater infrastructure on private property (**see Figure 1**). Other utilities that are committed to expanding investments in customer-side water solutions can use the analysis provided in this report to determine whether to consider bond financing for distributed infrastructure. Utilities that do move forward with such financing can establish an important precedent for their peers that will help generate more projects utilizing critical bond financing for financing can help us put the liquidity of the municipal bond market to work for our next generation of water infrastructure.

Figure 1: Bonds for Water Conservation & Green Stormwater Infrastructure on Private Property



New York City

New York City has used bonds to fund toilet buybacks² as well as its Ten Year Capital Strategy, which, as a conservation measure, calls for the installation and replacement of water meters.³



Las Vegas

The Southern Nevada Water Authority has bond-financed its Water Smart Landscapes Program, which converts turf to drought-resistant landscaping and protects the investments with conservation easements. From 2009-2013, more than \$30 million of bond proceeds have been used for the Water Smart Landscapes Program.



Seattle

For twenty years, Seattle Public Utilities has used bond proceeds for distributed infrastructure much as it has for conventional infrastructure. Such financings peaked in 2003, at about \$5 million.



Introduction

In the 20th century, when federal, state, and local agencies worked together to build our current water systems, they acted upon the engineering conventions and policy priorities of the era. They built an epic network of dams, reservoirs, canals, pipelines, aqueducts, pumping stations, and treatment plants. And they provided enough clean and reliable water to irrigate arid valleys and nurture desert metropolises.

In parallel, many of our nation's oldest cities developed their core stormwater infrastructure when urban precipitation was considered waste. They built systems that run stormwater and sewage through the same pipes and, in heavy precipitation events, flush water into urban waterways. Along with that water comes millions of gallons of raw sewage. This pollution and vulnerability to flooding hobbles cities and their ambitions for growth in a competitive landscape in which natural assets and livability are now top-tier concerns. Upgrading storm systems to meet the discharge mandates of the Clean Water Act will require significant investments in green infrastructure that retains stormwater onsite.

The challenges of the 21st century cannot be addressed in the old ways. Population and economic growth will strain water supply systems, particularly in the arid West and the increasingly water-stressed Southeast. Where there was once a bounty of unclaimed water there are now dropping groundwater levels, over-appropriated river systems, and imperiled in-stream species.

The nation's water utilities will need new tools and new strategies. Many of them have already pursued water conservation. Some have achieved admirable conservation goals, reducing their per capita usage in ways that would have once been unthinkable. Others have invested millions of dollars into green infrastructure improvements such as green roofs and rain gardens that have reduced urban runoff

while transforming urban landscapes. But for as much as public water utilities have done, there is vastly more they need to do. They will have to develop supply systems that more effectively conserve water and retain precipitation and that exploit the connectivity among potable water, graywater, stormwater, and wastewater.

This will require not just new pieces of infrastructure, but new types of infrastructure. Utilities will need to invest in improvements that some people today might not even consider infrastructure but that by the 22nd century will seem as natural and essential to utility systems as dams, aqueducts and deep tunnel pipes do today.

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This new infrastructure will include drought-resistant landscaping, low-impact development, water-efficient appliances, building and manufacturing systems and even point-of-use catchment and treatment systems. Frequently, it will be installed not on utility property but on the property of utility customers. Compared to conventional infrastructure, this new infrastructure will consist of small and diffuse units. In the aggregate, though, these units will serve the same purpose as grand public works do. Water secured by a utility through conservation can be put toward the same beneficial uses as a supply that has been piped in from a distant reservoir. A patchwork of pervious lots and parcel-scale stormwater detention tanks can cumulatively provide the storage of an extra two inches of centralized tunnel.

If utilities intend to invest in distributed infrastructure on a scale even close to that on which they have historically invested in conventional infrastructure, they will have to reach out to the same source of financing: capital markets.

These diffuse water management approaches implemented on private land are what we refer to in this report as “distributed infrastructure.” Soon, it may become as common a concept as distributed generation is in the electric utility sector.

Of course, many water utilities already have conservation and green stormwater programs. To date, these programs have generally been modest pay-as-you-go operations. Utilities have funded them with cash. But if utilities intend to invest in distributed infrastructure on a scale even close to that on which they have historically invested in conventional infrastructure, they will have to reach out to the same source of financing: capital markets.

In cities that have already identified distributed infrastructure as playing a significant role in water supply or management plans, water utilities have attempted to attract private capital to provide off-balance sheet funding pools for large-scale retrofits. One such place is Philadelphia, where the Water Department is working with EKO Asset Management to design a revenue model for participation by institutional capital in the large-scale transformation of the urban core into a green grid capable of capturing and retaining stormwater. Such opportunities, while exciting, have been slow to scale.

In this country, most water utilities are public. Municipal bonds are their instrument of choice for raising capital, and Ceres believes that there is untapped capacity within the municipal bond market to finance scaled-up conservation and green stormwater infrastructure programs. In this report, Ceres focuses on what it believes will be the most promising type of bond for distributed infrastructure: enterprise revenue bonds that are repaid through general system revenues (rather than specific project revenues).

Financially, enterprise revenue bonds would allow utilities to pay fully for distributed infrastructure without having to encumber their general credit. Logistically, the bonds would allow utilities to repay their debt without having to attribute particular water savings or stormwater retention to particular pieces of distributed infrastructure.

For this report, Ceres reviewed laws in seven states to determine if utilities there could issue enterprise revenue bonds to finance distributed infrastructure. The selected

states—California, Georgia, New York, Ohio, Oregon, Texas, and Wisconsin—include some of the largest and fastest-growing in the country and are home to cities with legacy paved landscapes and impaired waterways. They represent a range of hydrologic conditions and water pressures. And together, they account for more than a third of all Americans.

This is a gray area of the law. Legal authorities in the seven targeted states do not expressly permit—or expressly prohibit—the practice of using enterprise revenue bonds for development of distributed infrastructure on private property. That should not be surprising; distributed infrastructure represents a relatively novel strategy, and all laws—even the most forward-looking among them—are rooted in the circumstances and expectations that existed in the past.

The ambiguity of existing laws as they relate to distributed infrastructure creates both opportunity and uncertainty. The authority of a utility to act in a particular way could be viewed as falling on a spectrum:

- 1 Authority is clear enough for bond counsel to give an unqualified opinion that the issuer has the authority.
- 2 The better reading of the law is that the issuer has the authority (the issuer should be able to do the act), although a reasonable court could conclude otherwise.
- 3 The law is unclear and good arguments can be made either way.
- 4 The better or clear reading of the law is that the issuer does not have the authority.

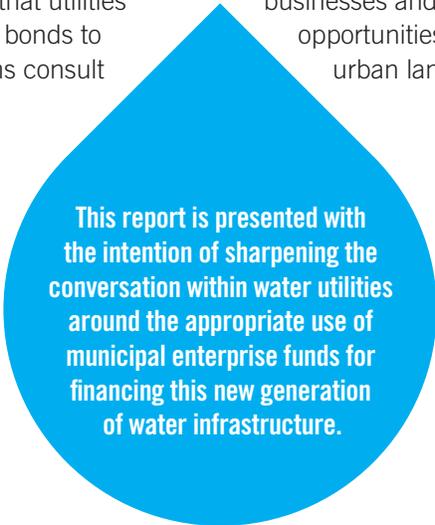
In the seven states, the authority for water utilities to bond-finance distributed infrastructure is sometimes in category (1), but it generally comes out as a (2) or a (3). The precise ranking could vary according to the particular types of water utilities that would be issuing the securities and even the interpretations of individual bond counsel. While uncertainty does not present a hard legal barrier, it could have a chilling effect.

Fortunately, there are ways to overcome this uncertainty. The most obvious is for utilities to advocate for statutory amendments that clarify their authority. But even without legislative revisions, utilities that are willing to brave the initial uncertainty could establish precedent that legitimates the practice and reassures peers.

The ambiguity of existing laws as they relate to distributed infrastructure creates both opportunity and uncertainty.

Ceres has prepared this report in the hope that it will inform discussions among utilities and other stakeholders and ultimately advance the cause of distributed infrastructure. The report is by nature general, however, and cannot anticipate the unique circumstances of each possible transaction. Ceres recommends that utilities contemplating issuing enterprise revenue bonds to finance distributed infrastructure programs consult their bond counsel early in the process.

This report is presented with the intention of sharpening the conversation within water utilities around the appropriate use of municipal enterprise funds for financing this new generation of water infrastructure. It is also offered as a playbook for use by foundations, cities, utilities, businesses and non-governmental organizations seeking opportunities to create transformative change in our urban landscapes.



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Distributed Infrastructure

“Distributed infrastructure” is a conceptual category rather than a legal term of art. It refers to the improvements, devices, and technologies installed at diffused properties that enhance a utility system by reducing the need for expanding the utility system or the scale of expansion needed. It could function to conserve potable water, capture rainwater, reuse graywater, or reduce wastewater and stormwater. Indeed, given the close relationships among these functions, it could perform several of them simultaneously.

In a 2010 report on making water utilities climate-ready, the National Drinking Water Advisory Council (NDWAC)—an EPA-run work group of water sector stakeholders—found that “[a]n expanded concept of ‘water system infrastructure’ is a key element of utility climate readiness... utilities will need to expand their communities’ understanding of the value of the level of water services, as well as the concept of water infrastructure to include repurposing of existing

infrastructure, integrated management of currently independent infrastructure components, and the use of distributed and green technologies.”⁴

In essence, the NDWAC called for increased use of what Ceres refers to as “distributed infrastructure.”⁵ Ceres has chosen this term because it plays upon the interdependencies of utility systems and customer practices, and it conveys the unique role that those

Examples of Distributed Infrastructure



CONSERVATION INFRASTRUCTURE

Conservation improvements could come in many forms. The flatness of a farmer’s field, the cooling process that an industrial facility uses, and the design of an office building’s toilets all influence the amount of water that utility customers use and the amount of water that the utility may provide to other customers.



GREEN INFRASTRUCTURE (STORMWATER)

Water utilities have historically dispensed with precipitation by flushing it offsite into the stormwater system. In older cities, urban runoff and raw sewage often share the same tunnels, which overflow into waterways during major storm events. This practice burdens infrastructure and misses the opportunity to put the precipitation to beneficial use. Low-impact development, or green infrastructure, incorporates design features such as rain gardens, permeable pavements, and bioretention facilities that retain and manage the precipitation onsite.

practices play in providing customers with services (or the equivalents of services) that utilities would have traditionally been responsible for distributing through their systems.

“Distributed infrastructure” is defined in terms of function rather than technology. Just as “infrastructure” could refer to public works as varied as treatment plants and aqueducts, so “distributed infrastructure” could refer to improvements as varied as commercial water recycling systems and conservation easements to maintain water retention improvements on urban parcels. Because of this variety, different forms of distributed infrastructure could interact with public finance laws in different ways.

As a general rule, the greater the interest a utility retains in or over an improvement, the more likely that improvement would be to comply with existing public finance laws. Improvements that bear some legal resemblance to conventional infrastructure—such as conservation easements—would be that much more likely to comply.

Seattle Public Utilities offers an example of the ways that distinctions in property type influence eligibility for bond financing. It has debt-financed its water efficient equipment rebate program for two decades. But it applies bond proceeds only to property that it can own directly or indirectly through a contractual interest. The property must be of the sort that could serve as collateral for a bank loan.

Distributed Infrastructure: Potential Property Types	
Real Property	Many Western water utilities run cash-for-grass programs under which they pay property owners to remove water-hungry turf and replace it with drought-resistant landscaping. ⁶ The utilities may seek to preserve these investments through landscaping easements, as the Southern Nevada Water Authority now does. ⁷ Because the easements would amount to recordable real property interests—and resemble other types of easements that utilities already have the authority to finance—they would fit more readily within the scheme of existing public finance laws than other forms of distributed infrastructure would.
Fixtures	In some instances, distributed infrastructure would attach to a customer’s real estate. It would become a fixture ⁸ and part of that real estate. ⁹ The utility could file a U.C.C. statement ¹⁰ to establish a floating lien on the infrastructure. ¹¹ Such a lien could serve as a security interest but may not provide the degree of ownership needed to satisfy public finance laws.
Personal Property	Certain types of distributed infrastructure—like efficient clothes washers or drip irrigation sprinklers—may be removable and thus remain personal property. ¹² In those instances, the utility could retain title to the infrastructure but allow a customer to use it. Legally, this sort of distributed infrastructure would be analogous to meters that are stationed on customer property but that utilities own. ¹³ Another precedent would be the Ma Bell-era telephones that AT&T continued to own even as customers used them. ¹⁴
Contractual Interest	For certain forms of distributed infrastructure, utilities may not have the ability or inclination to preserve a property interest but may instead rely on a contractual interest. The San Antonio Water System (“SAWS”), for example, operates a program under which it offers rebates to commercial customers who install qualifying water-saving equipment. To receive the rebates, customers must enter into an agreement that obligates them to install and maintain the equipment and that reserves for SAWS the right to inspect the equipment upon providing written notice. ¹⁵ At present, SAWS does not use bonds to finance this program.



States Reviewed

In this report, Ceres examines the opportunities for and obstacles to using enterprise revenue bonds to finance distributed infrastructure in seven states: California, Georgia, New York, Ohio, Oregon, Texas, and Wisconsin. Although public finance laws vary in their particulars from one state to the next, the selected states are consequential in their own right and revealing as a group.

The states represent several regions of the country—the Southwest, the Southeast, the Northeast, the Northwest, and the Midwest. They account for the three most populous states,¹⁶ and five of the ten most populous. The states have varying economic bases, political leanings, and fiscal positions. And while they include a range of hydrologic conditions, they have all grappled with the challenges of water scarcity and water impairment.

Water Supply Challenges

In 2013, California suffered its driest year on record.¹⁷ In 2014, the United States Drought Monitor considered every inch of the state as being in moderate to exceptional drought.¹⁸ Rivers were so low the state hauled young salmon downstream in tanker trucks,¹⁹ and gold prospectors were given access to riverbeds they had not been able to reach in decades.²⁰ Meteorologists have warned that the twentieth century was abnormally wet and that California could be entering a mega-drought lasting decades.²¹

Texas has long grappled with drought, so much so that the Texas Supreme Court once observed that “[t]he story of water law in Texas is also the story of its droughts.”²² Still, in 2011, Texas had its driest year on record.²³ The agricultural sector suffered as much as \$7.6 billion in direct losses as a result of the drought.²⁴ As the drought persisted, state leaders warned that the shortage of water for power generation could lead to rolling blackouts.²⁵ By 2014, the drought had still not fully lifted, with virtually all of

the state in some stage of drought²⁶ and certain regions at their driest points in centuries.²⁷ Indeed, by the summer of 2014, Wichita Falls—a city with a population of more than 100,000—was within 180 days of running out of water²⁸ and had instituted drought contingency restrictions that barred restaurants from serving unrequested water and swimming pools from being filled with potable water.²⁹

But drought is defined by deviation from normal conditions rather than simply by a limited amount of precipitation.³⁰ Even states in the comparatively wet regions can have brushes with scarcity. In early 2014, the United States Drought Monitor classified the entire state of Oregon as being in drought.³¹ In 2012, virtually all of Georgia was in drought or abnormally dry,³² with more than a quarter classified as being in exceptional drought.³³ Just three years earlier, the state emerged from a historic³⁴ drought that left lake levels in the primary reservoir for metro Atlanta so low that at one point it had only three months of supply left in it.³⁵ A growing population, climate change,³⁶ and the ongoing water wars with Florida and Alabama³⁷ could add further complications.

Similar water pressures are playing out across the country. Great Lakes states like New York, Ohio, and Wisconsin have at their doorsteps one of the greatest freshwater resources in the world. Indeed, the Great Lakes offer such a bounty of water that surrounding states have compacted to prohibit wholesale exports.³⁸ Still, the lakes refill at a rate of only about one percent per year, and excessive diversions could harm ecosystems and interfere with shipping lanes.

Even under average or above-average rainfall conditions, the limited capacity of existing infrastructure can raise supply issues.³⁹ In recent years, New York City has sought to improve its water conservation practices in part because the Delaware Aqueduct, which supplies as much as 60 percent of its water, is due for repairs.⁴⁰

Water Quality Challenges

Water quality acts as yet another constraint on supply. Although water law frequently regards quality and quantity as separate spheres, with the federal government setting quality standards and states managing water supplies,⁴¹ the two are closely linked.⁴² Drought amplifies water quality issues because, as lake levels and river flows decrease, concentrations of contaminants increase.⁴³ Similarly, water quality problems can lead to scarcity even in regions where water may have been abundant.⁴⁴ Indeed, the 1972 passage of the Clean Water Act helped to give rise to modern water conservation policies by imposing pollution control standards that could only be met by reducing discharges, which correlated closely with water usage.

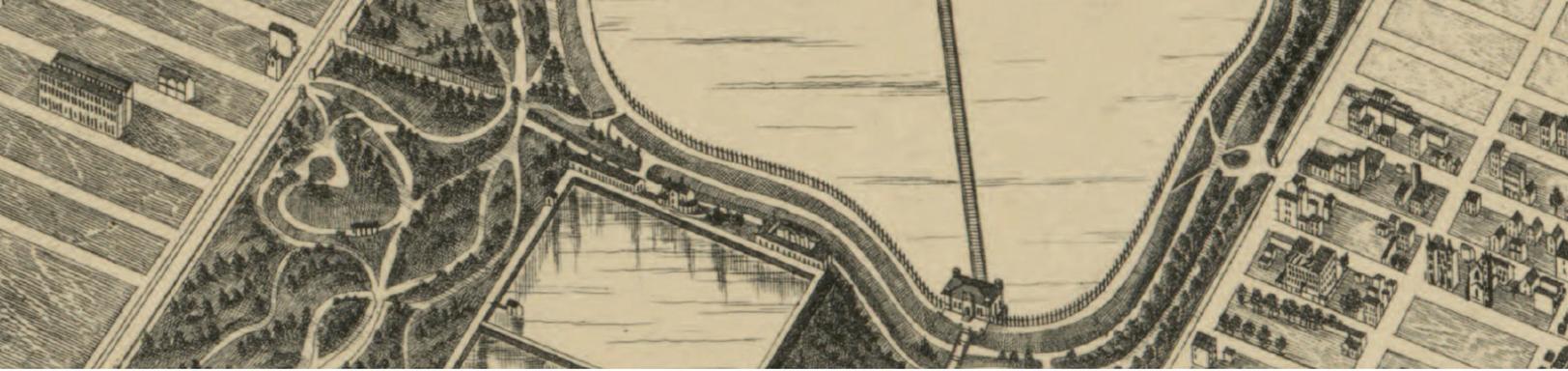
Utilities can comply with water quality standards—and can reduce the need for expensive new treatment facilities—by promoting distributed infrastructure. Improvements aimed at retaining precipitation onsite can offer a particularly significant benefit. In developed areas,

precipitation runs across surfaces like rooftops, streets, and yards, gathering oils, pesticides, animal waste, and other contaminants.⁴⁵ Stormwater has been recognized as “one of the most significant sources of water pollution in the nation, at times comparable to, if not greater than, contamination from industrial and sewage sources.”⁴⁶

More than 700 American communities, particularly in the Midwest and Northeast,⁴⁷ have combined sewer systems (“CSS”) that funnel stormwater and wastewater into the same pipes and route them together to treatment plants. The systems are designed so that, when they reach capacity, they discharge their overflow directly into receiving waters without first treating it.⁴⁸ Many CSS communities have been sued for violating Clean Water Act mandates⁴⁹ and have entered into consent decrees with the EPA⁵⁰ that require greater use of low-impact development.⁵¹

In the seven states discussed in this report, for instance, such utilities as the City of Dallas, the Metropolitan Sewer District of Great Cincinnati, and the Northeast Ohio Regional Sewer District have been required by consent decrees to invest in low-impact development. The improvements can reduce stormwater flows—and the concomitant risk of overflow events—by retaining and filtering precipitation onsite. Additionally, the improvements can act as a supply-side solution by recharging aquifers⁵² and even by providing properties with rainwater that can be used for purposes such as landscaping irrigation.





Debt Financing

American water planners first turned their attention toward water efficiency in the early 1980s, a time that is generally regarded as the end of the era of reclamation and the start of an era of reallocation and conservation. In the time since, total American water use has declined about 5 percent even as the national population has grown by about 30 percent.⁵³ The decrease in per capita use has been even more dramatic.

The net and per capita drops in water use have been driven by a range of factors, but utility conservation programs have played an important role.⁵⁴ Although utilities have at times received state⁵⁵ and federal subsidies⁵⁶ for their programs, they have generally funded them with system revenues.⁵⁷ Frequently, utilities have established dedicated revenue streams for their conservation programs by adding water bill surcharges.⁵⁸ These revenue structures have served conservation programs well. But in coming decades, utilities will be forced to expand the scale of their programs.⁵⁹

At the same time, wastewater utilities will have to develop increasingly ambitious green infrastructure programs. These programs will raise many of the same legal and financing challenges that conservation will. In many ways, the City of Philadelphia offers a glimpse of what is to come. It has a CSS prone to overflowing and, earlier this decade, entered into consent orders and agreements with both the Pennsylvania Department of Environmental Protection and the EPA. Under the agreements, Philadelphia adopted a plan promising to invest \$1.2 billion (in 2009 dollars) in green infrastructure.⁶⁰ The city estimated that achieving the same results through conventional infrastructure would have required a \$6 billion expenditure.⁶¹ While using green infrastructure brought the city a significant cost savings, it still required financing

on a scale that was unprecedented for such a strategy and hints at the sums that wastewater utilities in other jurisdictions may have to raise.

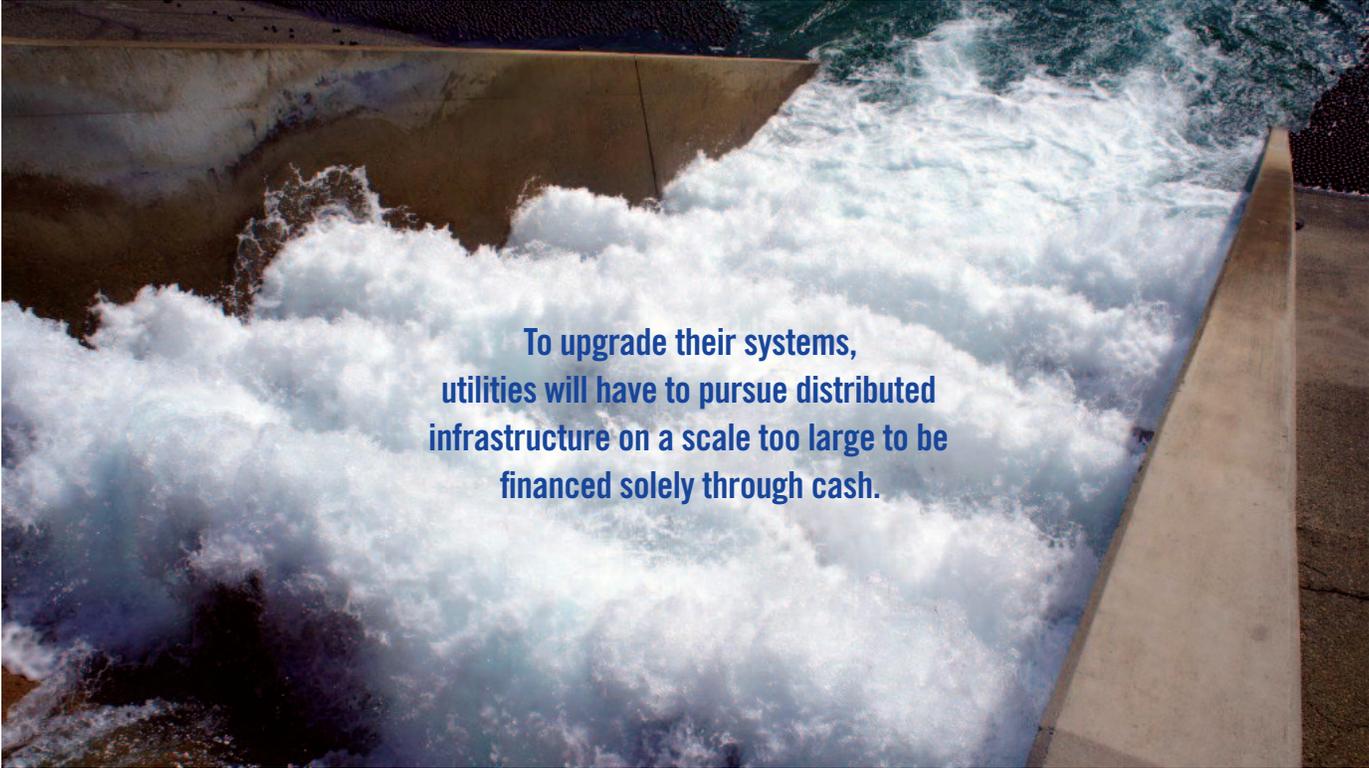
The limits of CSSs and the fears of water demands outstripping supplies implicate different issues but touch upon a common problem. Across the country, utilities rely on infrastructure built in the nineteenth and twentieth centuries, when federal subsidies were greater, natural resources were more abundant, and climate change posed a less immediate threat.

In the years ahead, water systems face hundreds of billions of dollars worth of backlogged repairs and replacements.⁶² To that bill, utilities will have to add the cost of preparing their systems for a climactically challenging future.

Across the country, utilities rely on infrastructure built in the nineteenth and twentieth centuries, when federal subsidies were greater, natural resources were more abundant, and climate change posed a less immediate threat.

The most rapid population growth is occurring in the most water-stressed parts of the country.⁶³ There, climate change could exacerbate conditions by making weather patterns more extreme and less predictable and by testing infrastructure that was built around a hydrologic system that no longer exists.⁶⁴

Additionally, extreme rainfall events—which have become more common in the last 20 years⁶⁵—have imposed unanticipated burdens on wastewater systems. In April 2014, Illinois Farmers Insurance Co. filed class-action lawsuits against Chicago and dozens of



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its suburbs. The suits alleged the cities knowingly failed to adapt their systems to a changing climate and should be held liable for damages that homeowners suffered as the result of system backups during a 2013 rainstorm.⁶⁶ Farmers later withdrew the lawsuit,⁶⁷ but the litigation represents the type of pressures that utilities will be under.

To upgrade their systems, utilities will have to pursue distributed infrastructure on a scale too large to be financed solely through cash. Texas, for instance, recently created a new water infrastructure bank and capitalized it with a \$2 billion appropriation that may be leveraged to provide up to \$30 billion in state aid to local utilities.⁶⁸ The statutory framework governing the bank requires that at least 20 percent of financial assistance must be put toward conservation or reuse projects,⁶⁹ and it envisions that utilities will use the assistance to support their debt financings.

Conservation programs of the magnitude that the new Texas bank contemplates, and that increasingly ambitious conservation targets will require, will impose upfront costs that can be met only through debt-financing. In addition, as utilities begin to view conservation improvements and green infrastructure as yet another form of infrastructure, the same policy rationales that justified the financing of conventional water and wastewater infrastructure will be seen as justifying the financing of distributed infrastructure.



Municipal Bonds

Most American households receive water and wastewater services from public utilities.⁷⁰ For these utilities, municipal bonds are the debt instrument of choice.⁷¹ As a general rule, municipal bonds are a highly effective financing tool for building water infrastructure for several reasons: (1) they allow water systems to raise sufficient funds to pursue capital improvement programs; (2) they are highly liquid and therefore channel capital to public water systems at reasonable cost; and (3) they are often long-lived in their maturity, affording public water systems as much as 30 or 40 years to repay investors, and spreading costs across all customers who use the improvements.

Thus, while certain utilities may seek financing through other means,⁷² their capacity to finance water system expansions, repairs, and improvements will depend in large measure on their ability to issue municipal bonds for such undertakings.

Despite these benefits, it is still rare for municipal bond proceeds to be directed toward distributed infrastructure. Several large utilities have used proceeds for distributed infrastructure, though the amounts in play have often represented relatively small portions of larger bond offerings or have been put toward distributed infrastructure on publicly owned property.

Direct Precedents

Still, this is a practice that has been tested. For twenty years, Seattle Public Utilities has used bond proceeds for distributed infrastructure much as it has for conventional infrastructure. Such financings peaked in 2003, at about \$5 million. The Southern Nevada Water Authority has bond-financed its Water Smart Landscapes Program, which converts turf to drought-resistant landscaping and protects the investments with conservation easements.

Utilities have at times bundled conservation costs into broader programs that they have funded through municipal bond issuances. New York City, for one, has used bonds to fund toilet buybacks⁷³ as well as its Ten Year Capital Strategy,

Year	Number of Projects	Amount
2009	562	\$1.1 million
2010	2,900	\$8.7 million
2011	2,700	\$8.3 million
2012	2,400	\$7.1 million
2013	2,300	\$6.2 million

which, as a conservation measure, calls for the installation and replacement of water meters.⁷⁴ Bundling helps to ensure that conservation expenditures comply with the federal tax requirements outlined below. It also reflects the extent to which conservation has generally been viewed as operationally important yet perhaps still a relatively small piece in a utility’s overall capital puzzle.

Indirect Precedents

Additionally, utilities have financed distributed infrastructure using methods that are distinct from the proposed enterprise system revenue model but that could serve as indirect precedents. Together these examples suggest that using enterprise revenue debt to finance distributed infrastructure does not represent an overly bold or imprudent departure from established practices.

- **Watershed Lands:** State agencies and political subdivisions have issued bonds to preserve watershed lands that provide ecosystem services similar to those that conventional infrastructure would.⁷⁵ While such lands would fall within the definition of distributed infrastructure,⁷⁶ they resemble traditional land acquisitions and would not necessarily have any nexus to utility customers.
- **Energy Conservation Bonds:** In 2008, Congress created the Qualified Energy Conservation Bonds program to provide low-cost funding for reducing energy consumption in publicly owned buildings.⁷⁷ Although generally oriented toward energy, the program could be used to finance water conservation. Up to 30 percent of proceeds could be used to provide loans, grants, and other financial support to private businesses and private property owners without implicating the federal tax issues discussed later in this report.⁷⁸ Under the program, local governments issued bonds to pay for distributed infrastructure; but, because of the program's volume cap, its 30 percent limit on using proceeds on private property, and its energy focus, it would not support ongoing, broad-scale investment in water conservation.

The reorientation of enterprise revenue bonds around distributed infrastructure would represent only one more step in the evolution of American public finance law.

- **PACE:** A number of local governments have created Property Assessed Clean Energy (PACE) programs capable of financing distributed infrastructure.⁷⁹ PACE frameworks vary from one jurisdiction to the next but, in some places, have been capitalized with municipal bond proceeds. In these PACE programs, however, local governments loan property owners funds to pay for conservation improvements; they do not pay for the improvements themselves. The bonds are repaid through property assessments, secured through a lien, rather than utility bills. This factor, among others,⁸⁰ distinguishes PACE from a policy under which a utility recognizes distributed infrastructure as part of its system and finances it.

While distributed infrastructure remains novel, innovations in infrastructure have hinged on innovations in public finance. It was the enactment of home rule authority laws and the creation of special districts in the 1880s,⁸¹ for instance, that channeled funding into the country's first wave of water quality projects.⁸² The reorientation of enterprise revenue bonds around distributed infrastructure would represent only one more step in the evolution of American public finance law.⁸³



Legal Issues

In every state, utilities wishing to bond-finance distributed infrastructure will face a common set of issues. The issues will play out differently in each state, and this report includes sections that discuss the issues in the seven target states in greater detail. At a high level, though, these global issues could be seen as falling into three categories.

Authority

First, utilities must have the requisite authority. Generally, state constitutions or statutes will give utilities the authority to issue revenue bonds, but only for certain purposes. None of the legal authorities that Ceres studied expressly address distributed infrastructure. They could give rise to arguments for and against distributed infrastructure financing.

The Ohio Revised Code uses language that is representative in many respects. It empowers municipalities “to provide for a supply of water, by the construction of wells, pumps, cisterns, aqueducts, water pipes, reservoirs, and water works for the protection of such water supply and to prevent the unnecessary waste of water and the pollution thereof.”⁸⁴ Distributed infrastructure would have to fall within the scope of this authority for utilities to have the power to issue enterprise revenue bonds to finance it.

Limitations

There must not be legal limits that prevent utilities from exercising their authority. The most common limitations are: (A) covenants in existing documents that restrict the ability to issue future bonds; and (B) state constitutional provisions that prohibit political subdivisions from using their funds or credit to benefit private parties.

Bond Documents

The concern here would be covenants that limit the issuer’s ability to incur additional debt to finance improvements to the issuer’s system where the “system” is defined as

property owned or operated by the issuer, as opposed to additional debt tests that allow financings for facilities that benefit the system or do not impose limits on the use of additional debt proceeds.

“Water System” is often defined in bond documents using language such as “owned by the City, or works hereafter acquired and constructed by the City and determined to be part of the Water System.”

If, under the section describing the conditions under which a local agency may issue additional bonds or debt as above, there is language such as “City may incur Parity Debt only to finance or refinance additions, improvements, etc. to the Water System,” a local agency could not issue such debt to finance property not owned by the local agency.

If, by contrast, the local agency may issue additional bonds or debt for improvements that benefit the Water System or if the only requirement is satisfaction of particular financial metrics, the bond documents should not be a problem.

Constitutional Provisions

Virtually all state constitutions include provisions that prohibit the state and/or its political subdivisions from using their funds or credit to benefit private parties. These provisions were originally adopted in response to dubious investments in internal improvements such as rail and canal projects and were intended to protect state and local governments from losing money in similar ventures in the future.

Over time, these “gift clauses” have evolved into catch-all provisions that guard against graft and cronyism. But the clauses do not prohibit all expenditures that may

indirectly or even directly benefit private parties. State and local governments routinely entice companies to relocate or expand with financial incentives, and use public funds for new sports arenas and redevelopment projects.

Such expenditures rely either on jurisprudential exceptions or constitutional exemptions. Courts have generally formulated rules that allow state and local governments to use their credit or funds if doing so will serve a public purpose. An act will serve a public purpose, in turn, if it provides a public benefit.

Across the board, courts recognize that determinations of public purpose and public benefit are best made by legislatures. Certain courts may be more deferential than others, however. In 2010, the Arizona Supreme Court held that public entities may only treat “the objective fair-market value of what the private party has promised to pay” as a public benefit.⁸⁵ They may not consider potential or speculative value. Interpretations such as in Arizona could pose a high hurdle for distributed infrastructure investments for which the precise long-term water savings—and the market value of those water savings—may be somewhat uncertain.

By contrast, judges in states like Oregon have found that the clauses do not even apply to revenue bonds because they do not, unlike general obligation bonds or certain other form of assistance, implicate a jurisdiction’s tax revenues or credit.

Additionally, in some instances, state constitutions include provisions that declare the protection of natural resources or the environment to be official policy. Such a declaration could lend support to arguments that distributed

infrastructure serves a public purpose, though it would require an additional logical step to contend that bond-financing distributed infrastructure serves that purpose.

Courts have generally formulated rules that allow state and local governments to use their credit or funds if doing so will serve a public purpose. An act will serve a public purpose, in turn, if it provides a public benefit.

The constitutional exemptions are amendments that were enacted to create targeted carve-outs to gift clauses. The Texas Constitution, for one, includes an exception for economic development; it allows the state (but not political subdivisions) to make both loans and grants.⁸⁶ The Washington Constitution, meanwhile, includes an amendment that allows any political subdivision (but not the state itself) to use public funds or credit derived from operating revenues (but not tax revenues or general obligations) “to assist the owners of structures or equipment in financing the acquisition and installation of materials and equipment for the conservation or more efficient use of water, energy, or stormwater or sewer services in such structures or equipment.”⁸⁷ The amendment assists utilities in pursuing distributed infrastructure—but it still requires that, unless an expenditure otherwise satisfies the gift clause, “an appropriate charge back shall be made for such extension of public money or credit and the same shall be a lien against the structure benefited or a security interest in the equipment benefited.”⁸⁸

Tax Limitations

Utilities must comply with federal tax laws. The next section of this report discusses the interaction between tax law and distributed infrastructure in greater detail.

Tax Limitations

To be issued on a tax-exempt basis, a bond issue for distributed infrastructure improvements will generally need to be an issue of governmental bonds (not “private activity bonds”), which means that the bond issue will have to fail either the private business use test or the private payment or security test.⁸⁹

Private Business Use Test

If more than 10 percent of the cost of the improvements financed by a particular bond issue are used in a private trade or business or belong to non-owner occupied housing, a bond issue will pass the private business use test.⁹⁰ As a result, it will need to fail the private payment or security test to qualify as tax-exempt. To avoid passing the test, the New York City Department of Environmental Protection requires its bond documentation to include a provision stating that “[n]ot more than five percent (5%) of the Proceeds of the Notes or [a dollar amount] be used directly or indirectly in a trade or business carried on by a natural person, or in any activity carried on by a person other than a natural person (‘Private Use’).”

Private Payment or Security Test

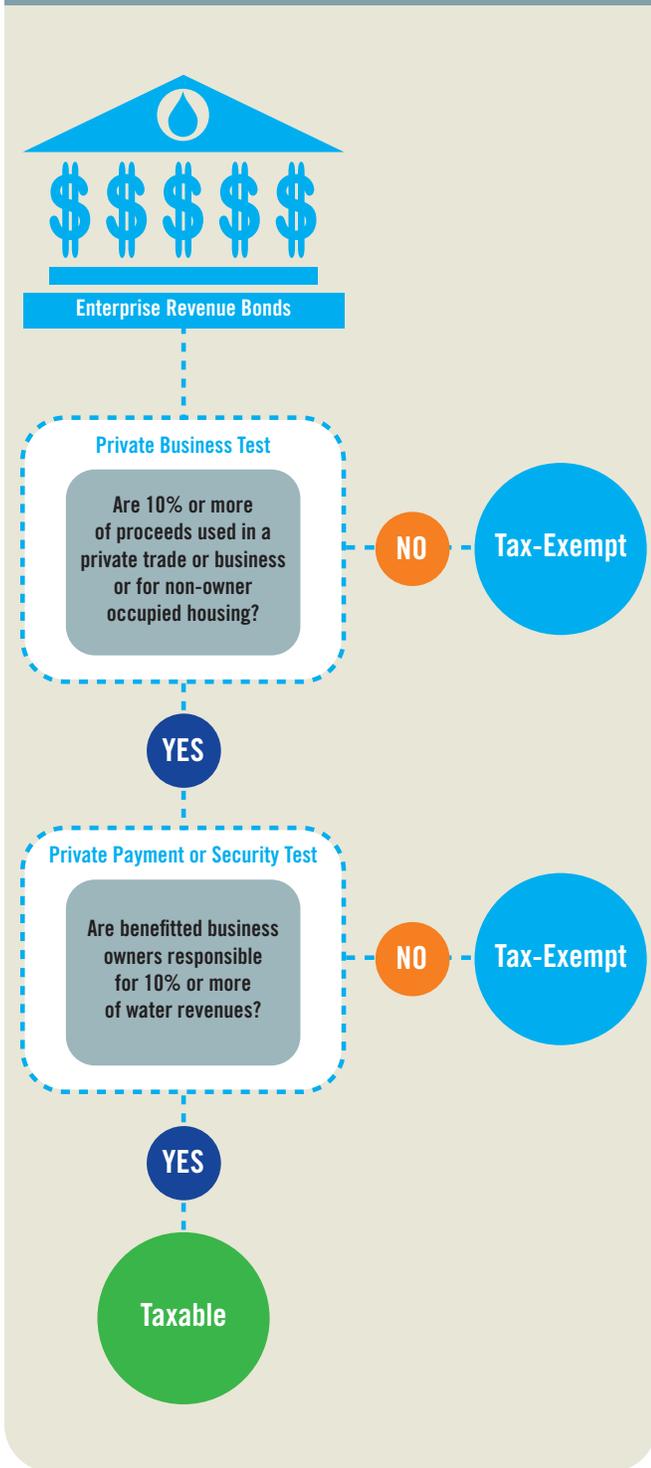
The private payment or security test focuses upon payments from businesses that receive the financed improvements. In order to apply this test one first needs to determine what portion of water bills covers bond debt service.⁹¹

It is likely (though not certain) that, in applying the private payment test, one should only count payments from business owners receiving improvements, and then only to the extent they are allocable to the specific improvements financed by the issue. Unless benefited business owners are responsible for more than 10 percent of water revenues, such payments would never exceed 10 percent, the private payment test would be failed, and the bonds generally could be issued on a tax-exempt basis.

It will also be necessary to conclude that no facts are present that would justify the IRS in disregarding the specific rules on the grounds that the financing is abusive, i.e., that it violates the spirit of the rules.

We have identified one particular fact pattern that may raise tax questions under the anti-abuse rules. It could arise if a utility intends to finance improvements for a large percentage of the utility’s customers’ property. In this case, if (1) more than 10 percent of water revenues derive from business users and (2) a very high percentage of business customers will receive water improvements commensurate in value with their overall water usage, the private payment test will be passed if all of the bonds are delivered as part of a single issue, because more than 10 percent of the improvements are made to business property and more than 10 percent of the payments will be made by businesses who receive improvements. While a utility normally could avoid the problem by splitting a single bond issue into multiple separate bond issues (which would keep the private payment percentage below 10 percent in each case), the IRS could conclude that the structure was abusive, because an issuer should not be able to accomplish with a series of bond issues what it could not accomplish with a single bond issue. This fact pattern might never occur, is likely to be rare even if it does, and would require detailed case-by-case factual analysis.

“Private Business Use” & “Private Payment or Security Test”



Three other factors are worth noting:

- 1 First, the 10 percent limits are reduced to \$15 million for bond issues greater than \$150 million.⁹²
- 2 Second, the weighted average maturity of a bond issue may not exceed 120 percent of the reasonably expected average lives of the financed improvements.⁹³ If the improvements had an expected average life of 10 years, then the weighted average maturity of the bond issue could not exceed 12 years. While the specific components of distributed water infrastructure may often have relatively short economic lives, the effect of this restriction can be mitigated by combining distributed infrastructure with conventional, longer-lived assets in the same financing in order to result in a longer *average* life.
- 3 Finally, if a bond issue would not, under the facts, satisfy the requirements for a governmental tax-exempt issue, it could possibly still be able to be issued on a tax-exempt AMT basis as a private activity bond for water facilities.⁹⁴ The private activity water facility bond requirements are complex and fact specific and really can only be analyzed on an individual transaction basis.



Accounting Treatment

Distributed water measures including water efficiency and green stormwater approaches have proven to be cost-effective solutions that reduce long-term capital costs, in turn lowering long-term rate increases, to the benefit of utility customers.²²⁴ A growing number of water utilities and states recognize the financial value of distributed approaches. Washington State, for example, recognizing the ratepayer benefit of managing demand on water utilities' infrastructure, issued law through the Revised Code of Washington which clarifies that water efficiency and green stormwater investments that are more cost effective on a per gallon basis than securing additional water supply or upsizing centralized stormwater facilities are eligible for capitalization and bond financing.

Yet in many places, investments in assets on the customer side of the meter that would be more cost-effective than centralized infrastructure are not paid for with debt capital, thus providing a negative incentive to instituting programs that have clear long-term benefit similar to other capitalized water resource investments. Funding these programs with current operating revenues causes short-term increases in rates, even as rates are lower long-term as a result of the investment. Thus, the period of benefit from distributed water management approaches greatly exceeds the period of time funding that benefit, which runs converse to good financial planning.

This was not always the case. Water efficiency programs funded in the 1990's and early 2000's were debt-financed where long-term benefit could be proven. The current practice of funding water efficiency out of same year operating revenues is a direct result of standards set by the Governmental Accounting Standards Board (GASB), an independent organization that establishes and improves standards of accounting and financial reporting for U.S. state and local government agencies. Established in 1984 by agreement of the Financial Accounting Foundation (FAF) and 10 national associations of state and local government officials, GASB is recognized by governments, the accounting industry, and the capital markets as the official source of generally accepted accounting principles (GAAP) for state and local governments.²²⁵

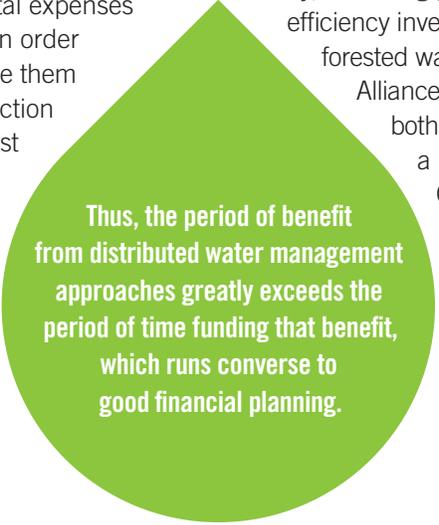
Revisions to GASB statements in recent years have created uncertainty for the capitalization of assets not wholly owned by utilities in their financial filings. The primary issue at hand for GASB is "control of the asset" that is debt-financed. GASB standards require that the utility be in control of the asset being financed, usually in the form of contractual right or legal ownership of the asset. Where the asset is on utility property or in a utility right of way, "control of the asset" by the utility is clear. Replacing a water main or a building a new pump station falls into this category. But where a public utility is providing efficiency products or stormwater management interventions to consumers, the "control of the asset" may not be interpreted as being with the utility. If the asset cannot be deemed to be in the utility's control, it cannot be considered an asset for debt financing. This is not a problem of law or public policy, but of accounting definitions.

Utilities who have bond-financed water efficiency and green stormwater infrastructure on private property have used various methods to demonstrate control of the asset being financed. Conservation easements, such as those used by Southern Nevada Water Authority, are intangible assets that are created by legally binding agreement with the landowner. Similarly, Seattle Public Utilities has structured its bond-financed water efficiency program such that all rebates are constituted as contracts with the customer.

Despite these controls, revision to GASB rules may be necessary to create a level of comfort that would normalize capitalization and bond financing of distributed water infrastructure. The prevailing interpretation of GASB rules leaves some utilities in a position of having to justify discrepancies in presentation of assets and expenses across financial filings with the market, regulators and their own boards. For example, utilities in Washington State must treat water efficiency investments as capital expenses in the water plans they file with the state in order to clearly establish authority to debt finance them or recover funding for them in their connection charges. Yet to comply with GASB, they must book them as operating expenses in their financial filings, leading to complications when undergoing annual review by credit rating agencies.²²⁶ In the view of GASB staff, unless water efficiency programs actually increase overall

water production, the new saved water cannot be considered an asset under the GASB rules.²²⁷ This is clearly an issue that needs a more satisfactory resolution, and discussions with GASB are underway.

A number of groups are engaging GASB on revision of accounting principles to allow for capitalization of decentralized assets that may be the property of another entity, including green stormwater infrastructure, water efficiency investments and natural capital such as forested watersheds. These groups include the Alliance for Water Efficiency and Earth Economics, both of whom are working in partnership with a number of water utilities. Revision of the GASB standards may be facilitated through the work of the Sustainability Accounting Standards Board, which is expected to launch its working group on water utilities in June 2015, with standards expected for release in April 2016.



Thus, the period of benefit from distributed water management approaches greatly exceeds the period of time funding that benefit, which runs converse to good financial planning.

California



In California, most utilities arguably have the authority to issue enterprise revenue system bonds for distributed infrastructure. But under existing law, as applicable to many utilities, that authority is probably not clear enough to support an unqualified bond counsel opinion. The California gift clause should not restrict the types of distributed infrastructure that utilities may pursue.

California law allows numerous types of public entities to deliver water and wastewater services. While these entities may seem like interchangeable utilities to some customers, their power—including their power to apply the proceeds of enterprise revenue bonds toward distributed infrastructure—will turn on their precise legal structure and authority. This report is too high-level in scope to provide a detailed survey of each individual type of entity; instead, it discusses the power of cities (both charter and general law) and special districts in general.

Governmental Issuer Power—Overview

The California constitution gives broad powers to charter cities, but other types of local governmental entities—including general law cities and special districts (e.g., water districts, irrigation districts)—cannot take actions unless they have positive statutory authority to do so. This authority may be express or necessarily implied.

Express authority would specifically provide that an entity may finance improvements on private property. Absent such authority, the local governments would be dependent on implied authority. Implied authority could exist if statutes provide: (1) broad authority to do and finance things of benefit to the enterprise system; or (2) authority to finance facilities defined without an express or implied requirement that the facilities be part of the system or publicly owned.

In California, different local agencies have different governing statutes. As a result, it is difficult to articulate a general rule applicable to all agencies. Additionally, the powers of all local government entities may be limited by the California Constitution and by contract (e.g., covenants made to holders of outstanding debt).

In general, under existing statutes, California utilities arguably have authority to finance distributed infrastructure. But for many utilities that authority is not clear enough for

bond counsel to give an unqualified opinion that the issuer has authority. California could overcome this uncertainty by adopting a new statute that clearly provides authority.

Charter Cities

California charter cities have broad powers in “municipal affairs,” subject to charter limitations. Cal. Const. Art. XI, Section 5 (“It shall be competent in any city charter to provide that the city governed thereunder may make and enforce all ordinances and regulations in respect to municipal affairs, subject only to restrictions and limitations provided in their several charters and in respect to other matters they shall be subject to general laws. City charters adopted pursuant to this Constitution shall supersede any existing charter, and with respect to municipal affairs shall supersede all laws inconsistent therewith.”)

General Law Cities

Although the statutes governing general law cities appear to give broad authority to improve an enterprise system, they do not state expressly that local agencies can do all things that would benefit the enterprise system.

For example, general law cities can acquire, construct, repair and manage pumps, aqueducts, reservoirs or other works necessary or proper for supplying water for the use of the city or its inhabitants or for irrigating purposes in the city.⁹⁵ General law cities can use any portion of revenues from any water works or water supply or distribution facilities to pay principal and interest on bonds issued to acquire or construct any water works or water supply or distribution facilities within the city.⁹⁶

“Works” of “facilities” are not defined. While it is possible that an expansive reading could include improvements to private property, words like “acquire,” “construct,” “repair” or “manage” imply ownership.

In addition, inconsistencies in use of terms make it difficult to find express authority to finance facilities that are not part of the system or publicly owned. For example, under the chapter relating to bonds for general law cities,⁹⁷ general law cities can incur indebtedness for any municipal improvement.⁹⁸ Municipal improvement is broadly defined to include works, property or structures necessary or convenient to carry out the objects, purposes, and powers of the city.⁹⁹ However, within the same chapter, “public improvement” appears to be used interchangeably with “municipal improvement.”¹⁰⁰

Special Districts

Each district is governed by a different set of statutes. Some districts have a more explicit description of broad authority to do things that will benefit the system. For example:

- **Municipal Water Districts:** A municipal water district can do all acts necessary for the full exercise of its powers, which may include undertaking a water conservation program to reduce water use or require that reasonable water saving devices and water reclamation devices be installed to reduce water use.¹⁰¹
- **Irrigation Districts:** An irrigation district can do any act necessary to furnish sufficient water in the district for any beneficial use or in order to put to any beneficial use any water under its control.¹⁰²
- **Public Utility Districts:** A public utility district can, in addition to acquiring, constructing, owning, operating, controlling, or using works for supplying its inhabitants with water, do all things necessary or convenient to the full exercise of the powers granted to it.¹⁰³ It may use revenues from the system to pay operating expenses of the utility, interest on indebtedness incurred to acquire, construct and complete the utility, and provide for repairs, replacements and betterments.¹⁰⁴ It may issue bonds for the purpose of acquiring or constructing any waterworks necessary or proper for carrying out the objects and purposes of the district. And it may pledge the revenue, income, receipts, and profits from the operation of the waterworks to the payment of the principal of and interest on the bonds.¹⁰⁵ “Works” and “facilities” are generally not defined. While it is possible that an expansive reading could include improvements to private property, words like “acquire” or “construct,” when the subject of the sentence is the district, imply ownership.

Sometimes, the presence of statutes that provide explicit authority for some other purpose makes it difficult to give an expansive interpretation of a district’s authority. The code sections governing a municipal utility district provide that the district has authority to engage in programs to encourage more efficient use of light, heat or power.¹⁰⁶ The language may be broad enough to encompass providing equipment to private persons (“the supply of equipment for use in connection therewith, and may do all things necessary or convenient to the full exercise of the powers herein granted”).¹⁰⁷ Because the Legislature has been so specific in granting this authority and no counterpart exists for water conservation efforts, arguably, there is no authority unless otherwise specified.

Financing Structure Concerns

Most California governmental entities cannot issue bonds (even revenue bonds) without voter approval. To avoid having to seek voter approval, such entities generally finance capital improvements to enterprise systems through their power to purchase property (i.e., through an installment sale agreement). For example, a city has the power to purchase, lease, receive, hold, and enjoy real and personal property, and control and dispose of it for the common benefit.¹⁰⁸ Similar statutes exist for the other special districts discussed above.¹⁰⁹ A common practice has been to use one of the two financing structures:

- Another related government entity, usually a joint exercise of powers authority, which can issue revenue bonds and “acquires” the project. The city/district acquires the project from the financing authority and makes installment sale payments to the financing authority. The installment sale payments are made from revenues of the system. The principal/interest payments on the bonds are made from the installment sale payments.
- The city/district acquires the project from a third party pursuant to installment payment agreement. The third party obtains funds for the project by assigning the right to receive the installment payment to a trustee who executes and delivers certificates of participation evidencing the right to receive installment payments, which certificates of participation are sold to investors.

Using such an approach for distributed infrastructure would require creative structuring, as privately owned property does not fit neatly into this paradigm.

Constitutional Limitations

California utilities could face two constitutional constraints on their financing of distributed infrastructure. The first is a gift clause that prohibits the state and its political subdivisions from using public credit and public funds for private benefit.¹¹⁰ The second is the limits that voter initiatives have placed on utility charges.¹¹¹

Gift Clause

The constitutional prohibition against the gift of public funds is articulated in Section 6 of Article 16 of the California Constitution. That provision is less restrictive (and more flexible) than its counterparts in many other states. It has been construed to limit the use of public credit to those uses which are for “public purposes.”¹¹² The general principle is that an expenditure will be for a valid public purpose when some genuine interest of the local agency as a political subdivision is advanced.

California courts have not published opinions considering distributed water infrastructure within the strictures of Section 6, but such an arrangement is not without precedent. In a 1934 case, for instance, a state appellate court found the gift clause did not prevent a chartered city from purchasing stock in a private water company in order to obtain additional domestic water supplies.¹¹³ Other courts have held that public entities could give subsidies to promote affordable housing¹¹⁴ and urban redevelopment.¹¹⁵

The California Attorney General has opined that local governments may use public funds to build fallout shelters on privately owned land as long as the “property is dedicated to the public entity for public use and if the public entity maintains requisite control over the use of and access to the facility.”¹¹⁶ The fallout shelters could be considered analogous to distributed infrastructure in which public entities retain a property or even contractual interest.

Given the language and prevailing interpretations of Section 6, it should be satisfied if: (1) the benefitting property owners use the financed improvements to reduce water consumption or sewer or stormwater services; and (2) the governmental issuer has determined that the cost savings to the enterprise are greater than the amount expended by the issuer (e.g., the payment is less than the cost of developing additional water supply or treatment capacity).

Propositions 218 and 26

California’s Proposition 218 (Articles XIIC and XIID of the Constitution) and Proposition 26 generally treat water and sewer charges as “taxes” (subject to voter approval) if they exceed the cost of providing the service.

A charge that is imposed for a specific government service or product provided directly to the payor that is not provided to those not charged (such as a charge for the provision of water or sewer service), and which does not exceed the reasonable costs to the local government of providing the service or product, is not a tax and therefore not subject to voter approval. Cal. Const. Art. XIIC, Section 1(e)(1).

The system charges needed to repay distributed infrastructure bonds would satisfy these criteria and not be deemed a tax if the issuer determines the cost savings to the enterprise would be greater than the amount expended. In other words, taking into account the financial benefit of the expenditures and the cost of the debt to provide the funds for them, the net cost to the system (and the rates necessary to support it) would be less.

Distributed Water Infrastructure in Action¹¹⁷



The water challenges of Southern California are legendary,¹¹⁸ with Los Angeles importing more water from outside its watershed than any other major city in the world.¹¹⁹ Its population has continued to grow, however, even as drought, climate change, and ecological concerns have cut into water supplies.¹²⁰ To account for its supply-side constraints, the City of Los Angeles first instituted water conservation programs in the 1980s. These programs led to the installation of hardware improvements that now save nearly 110,000 acre-feet per year.¹²¹

In 2008, Los Angeles Department of Water and Power (“LADWP”) adopted its **Water Supply Action Plan (“WSAP”)**, in which it committed to meeting new demand through conservation and reuse, with about 50,000 acre-feet per year projected to be saved through conservation by 2030.¹²² By 2010, the city used less water than it did in 1979, even though it had added a million residents in the intervening years.¹²³ Notable current programs include:

- **Water \$mart Rebate Program (Residential):** Under this program, which LADWP runs in conjunction with the Metropolitan Water District of Southern California (“MWD”), residential customers may receive rebates for qualifying high-efficiency clothes washers, high-efficiency toilets, weather-based irrigation controllers, rotating sprinkler nozzles, rain barrels, soil moisture sensor systems and turf removal.¹²⁴
- **Water \$mart Rebate Program (Commercial):** Under this program, which like its residential counterpart is a joint effort with MWD, commercial and multi-family properties may receive rebates for installing qualifying plumbing fixtures (high-efficiency toilets, ultra and zero waste urinals, and plumbing flow control valves), landscaping equipment (irrigation controllers, rotating nozzles for pop-up spray heads, large rotary nozzles, in-stem flow regulators, soil moisture sensor systems), food equipment (connectionless food steamers and air-controlled ice machines), HVAC equipment (cooling tower conductivity controllers and cooling tower ph controllers) and medical and dental equipment (dry vacuum pumps and laminar flow restrictors).¹²⁵
- **California Friendly® Landscape Incentive Program:** The program, originally launched in 2009, offers both residential and commercial/multifamily property owners rebates in exchange for replacing turf grass with mulch, permeable walkways, and preapproved, drought resistant plants. As of May 2014, rates for residential and multifamily or commercial customers were \$3.00 and \$2.00 per converted square foot, respectively. To date, the program has resulted in 7.4 million square feet of replaced turf.¹²⁶ LADWP reported consequent water savings of 350 acre-feet in 2012 and now saves approximately 675 acre-feet per year on average.

At the same time, LADWP has moved to reduce stormwater and the engineering and environmental burdens it imposes. In 2011, the Los Angeles City Council built upon the WSAP by adopting the **Low Impact Development Ordinance**, which generally mandates that projects requiring building permits incorporate green infrastructure strategies.¹²⁷ Currently, LADWP captures about 27,000 acre-feet of stormwater per year, which it uses to recharge groundwater supplies. The City is now developing a **Stormwater Capture Master Plan**, slated for completion in 2015, that aims to increase that total to between 170,00 and 280,000 acre-feet per year, with the help of distributed infrastructure.¹²⁸

Georgia



In Georgia, utilities arguably have the authority to issue enterprise revenue system bonds for distributed infrastructure. But the state’s constitutional gift clause and revenue bond laws would require that utilities retain ownership. The state and even local issuers themselves could improve the likelihood that distributed infrastructure financings will comply with the gift clause by adopting findings declaring that distributed infrastructure provides a substantial public benefit.

General State Law Considerations

Types of Entities

Three general types of governmental bodies operate water, sewer and/or storm water systems in Georgia.

- **Counties:** The state is divided into 159 counties. All counties are created by general statute and have the same sets of powers and restrictions.
- **Municipal corporations,** or “municipalities,” are created by charter—which in Georgia takes the form of local legislation enacted by the General Assembly—and their powers and restrictions are generally provided for by charter. The Georgia Constitution and the Georgia Code also contain certain powers and restrictions that apply to all municipalities regardless of grants and limitations contained in their specific charters. Thus, while a municipality’s charter must be examined closely before committing to a course of action, for planning purposes there is a general set of ground rules that apply to most, if not all, municipalities.
- **Local authorities,** like municipalities, are created by local legislation enacted by the General Assembly. As a general matter, their powers are governed exclusively by the local legislation that created them; however, the Revenue Bond Law, discussed below, purports to grant certain powers to all governmental bodies, including authorities created by local law. Moreover, it is more common than not that a local authority’s enabling legislation will grant that local authority the right to exercise all powers granted to a governmental body by the Revenue Bond Law.

Revenue Bond Law Powers

Georgia’s Revenue Bond Law provides a framework for powers and restrictions on the exercise of power that as a general matter apply to all counties, municipalities and local authorities. The Revenue Bond Law¹²⁹ authorizes “governmental bodies,” which includes counties, municipalities and local authorities, to:¹³⁰

- acquire, construct, improve and extend any “undertaking”;
- operate and maintain any undertaking for its own use and for the use of public and private consumers and other users;
- prescribe and collect rates, fees and charges for the services, facilities or commodities provided by any undertaking;
- issue revenue bonds to finance, in whole or in part, the cost of the acquisition, construction, reconstruction, improvement, betterment or extension of any undertaking;
- pledge the “revenue of the undertaking” to the payment of such revenue bonds; and
- enter into contracts with respect to undertakings, provided that no encumbrance, mortgage or other pledge of property of the governmental body may be created by any such contract.

“Undertaking” is used in the same way that other jurisdictions often use the terms “enterprise.” It simply means a water, sewer and/or storm water system that is operated as a separate enterprise by a governmental body. It is defined to include any number of revenue-producing facilities or a combination of two or more undertakings, and specifically includes water, sewage and storm water facilities. “Revenue of the undertaking” means all revenues, income and earnings arising out of or in connection with the operation or ownership of an undertaking. The Revenue Bond Law requires an undertaking to be either owned or operated by a governmental body.

Given the broad powers given to governmental bodies to enter into contracts reasonably necessary to the operation of an undertaking, facilities owned by others could be operated by a governmental body pursuant to a contract with the owner as part of the governmental body’s overall undertaking. Going further, it would not be unreasonable to conclude that facilities owned and operated by a private entity on a governmental body’s behalf pursuant to a contract between the governmental body and that private entity would be permissible.

Prohibition Against Gratuities

The “Gratuities Clause,” by its specific terms, prohibits the General Assembly from granting any donation or gratuity.¹³¹ While the provision speaks specifically to actions by the Georgia General Assembly, it also applies to cities and counties.¹³² In many decisions, the courts have held that payments made by a governmental body pursuant to a valid contract, whereby the governmental body receives consideration in return for such payments, are not gratuities. This long line of cases would support a payment for distributed water infrastructure when there is a contract in place that obligates the customer to do something in return for the payment.

Georgia’s Attorney General has, on the other hand, issued many restrictive opinions on the Gratuities Clause over the years that indicate that simple contractual consideration is not enough. Although these opinions generally involve state departments and agencies, rather than local governments, the principles embodied by these opinions would apply to local governments.

As an example of the Attorney General’s restrictive view, one opinion expressed that expenditures by a state agency for improvements on real property to which the agency does not hold title are illegal as gratuities.¹³³ In a later opinion, this analysis was refined to provide that the use of state funds to provide improvements to property the state does not own may be permissible, but only if the improvements are of such a nature or character to be subject to either recoupment or removal by the state at the time the state’s use of the property terminates.¹³⁴ The attorney general opinions do not establish binding precedent for local governments; still, they serve as persuasive authority.¹³⁵

Under the line of opinions discussed above, a local government cannot make payments to a private person for the acquisition of distributed water infrastructure unless the local government has the right to acquire such infrastructure when the local government’s right to use such property terminates. This theory, of law, could be implicated if the local government did not have the right to remove the infrastructure if, for example, a vendor or a mortgage holder on the structure had the right to foreclose or otherwise recover the property paid for by the local government.

In another line of opinions that has implications for the use of local government funds to pay for distributed water infrastructure, the Attorney General has opined that the local government must receive full value for any property

it conveys.¹³⁶ A corollary to this legal theory is that the government may not pay more for property than its value. In practice, this theory has been used to prohibit state agencies from paying more for real property than its appraised fair market value, even if the agency could establish that the property had a particular benefit to the agency that outweighed the value at which it could be appraised. Thus, assuming the other requirements could be met, a local government would be required to establish that it was not paying more for distributed water infrastructure than the acquisition cost or other objective appraisable value, regardless of its particular value to the local government as part of an overall water conservation effort.

While there are cases holding that a payment is not a gratuity if the state receives a “substantial benefit” from such payment, those cases, unlike the cases justifying payments made in return for traditional contractual consideration, are very fact-specific and generally rely on legislative findings as evidence of the “substantial benefit.” We do not believe that legislative findings at the state level currently exist with such specificity as to justify a payment at other than market value on a “substantial benefit” analysis. However, each governmental body can, in its authorizing resolution, make certain findings. If supported by some level of evidence, such findings could be probative of a substantial benefit in a contested case.

Therefore, under the Gratuities Clause restrictions, a governmental body cannot simply make a payment to a customer, whether or not fashioned in the form of a rebate or bill credit, as a reward to that customer for acquiring and installing distributed water infrastructure. There must be an obligating contract requiring the customer to operate the infrastructure in a particular manner until, according to some sort of procedure or formula set forth in the contract, the payment to the customer has been amortized.

Ideally, the payments to the customer would be made over time to ensure that the governmental body would not be at a loss if the customer left the conservation program prior to the amortization of the governmental body’s investment in the distributed water infrastructure. This concern may be mitigated if the obligating contract requires the customer to keep the distributed water infrastructure in service during the life of the contract, to permit the governmental body to enter its premises to ensure that the distributed water infrastructure remains in service, and if not still in service, to pay back the governmental body the unamortized portion of the initial payment.

Payments from Revenue Bond Proceeds

If payments for distributed water infrastructure are to be made from bond proceeds,¹³⁷ such payments have to satisfy not only the concerns discussed above (most particularly the gratuities clause issues), but also the requirements particular to the use of proceeds of revenue bonds.

It is not required that each component of an undertaking financed with revenue bonds itself be revenue producing or self-liquidating.¹³⁸ Rather, revenue bonds payable from the revenues of the entire system can be used to finance distributed water infrastructure, which, in and of itself, is not revenue-producing.

Payments from revenue bond proceeds must be for expenditures that constitute part of “the cost of the acquisition, construction, reconstruction, improvement, betterment or extension of any undertaking.”¹³⁹ In addition, revenue bonds may only be issued for a definite undertaking—the governmental body’s resolution

authorizing revenue bonds “must reasonably show the nature, kind, and location [of the undertaking to be financed] and such other facts as will with reasonable fullness and definiteness describe and define the undertaking including the estimated costs thereof.”¹⁴⁰

This means that, in order for distributed water infrastructure to be financed with revenue bonds, it must be owned by the governmental body. It may be possible to establish ownership by use of a contract with the customer, accompanied by a bill of sale (referencing the specific equipment by serial number) and, to ensure that the governmental body’s property is not subject to forfeiture, by a recorded easement that permits the governmental body to install and maintain the infrastructure at each location where the equipment is to be located and installed. Ideally, landlord’s or mortgagee’s waivers would also be required, although doing so would likely make the program impracticable for all but the most significant types of equipment.

Distributed Water Infrastructure in Action



The Department of Watershed Management (DWM) provides “professional stewardship of Atlanta’s drinking water, wastewater and stormwater systems.” Since the late 1990s, DWM has incorporated several green infrastructure strategies into its water quality and stormwater management. These shifts in practice occurred subsequent to several federal and state consent decrees, chiefly a 1998 CSO consent decree¹⁴¹ with the EPA, which included green infrastructure strategies among its best management practices.

The Greenway Acquisition Project,¹⁴² a **Supplemental Environmental Project** under the 1998 consent decree, allocated \$25 million to the acquisition of land along impaired waterways. Between 2001 and 2007, the Project established 155 greenways over 1,887 acres as properties or conservation easements to be held in perpetuity “for the purpose of protecting streamside property, water quality, and riparian habitat.”

More recently, the City amended its 2004 **Post-Development Stormwater Management Ordinance** to promote green infrastructure.¹⁴³ Under the revised 2013 Ordinance, DWM requires commercial projects to capture 1.0 inch of precipitation via infiltration, evapotranspiration or on-site reuse. New single-family residential developments are also required to manage the first 1.0 inch of precipitation on their site. The City offers a list of acceptable strategies, including but not limited to vegetated buffers, pervious pavers, and rain gardens, in its Stormwater Guidelines, **Green Infrastructure for Single Family Residences**.¹⁴⁴

New York



Most major New York water utilities issue revenue bonds through an associated municipal water finance authority. Municipal water finance authorities are generally created under and subject to special laws that vary in certain particulars but employ roughly similar language.

Through its financing authority, New York City probably has the power to issue enterprise revenue bonds for distributed infrastructure. To the extent that the relevant special law provisions for the financing authorities associated with other utilities are similar, those utilities would also have authority.

Authority

As a practical matter, most major New York water utilities do not issue revenue bonds directly but rather through an associated municipal water finance authority.¹⁴⁵ Municipal water finance authorities are generally created under and subject to special laws that vary in certain particulars but employ roughly similar language.¹⁴⁶ This analysis focuses on the New York City Municipal Water Finance Authority (NYCMWFA), which may serve as an approximate guide to similar analyses for other water finance authorities.

NYCMWFA's special laws empower it to enter into agreements with the New York City Department of Environmental Protection (NYCDEP) for the financing of "water projects."¹⁴⁷ A "water project" is defined to mean "any water facility, including the planning, development, financing, or construction thereof."¹⁴⁸ A "water facility," in turn, is defined to mean "any plants, structures and other real and personal property acquired, rehabilitated, or constructed or planned for the purpose of supplying, distributing or treating water, including but not limited to surface or groundwater reservoirs, basins, dams, canals, aqueducts, standpipes, conduits, pipelines, mains, pumping stations, water distribution systems, compensating reservoirs, intake stations, water-works or sources of water supply, wells, purification or filtration plants or other treatment plants and works, connections, water meters, rights of flowage or diversion and other plants, structures, equipment, conveyances, real or personal property or rights therein and appurtenances thereto necessary or useful and convenient for the accumulation, supply, treatment or distribution of water."¹⁴⁹

From this definition, the terms "structures," "equipment," and "personal property" could perhaps encompass distributed infrastructure. Additionally, related provisions¹⁵⁰ include the term "water system," which could inform the interpretation of "water projects" even if it does not appear

within that definition. A "water system" refers to "the water supply and distribution system or systems owned by, in the possession of the city or the water board or under the jurisdiction, control and regulation of the city, including all additions, increases, enlargements, extensions or improvements thereto."¹⁵¹ "Jurisdiction, control and regulation" would presumably allow for investments in distributed infrastructure that would not be possessed but that would be within the utility's jurisdiction and would be controlled through contractual rights.

Assuming that the NYCMWFA has the power to enter into an agreement for that purpose with the NYCDEP, it must then have the power to actually issue revenue bonds and use the proceeds for that purpose. To that end, the NYCMWFA's enabling statutes generally empower the authority to issue bonds and to "acquire... and use any real or personal property or any interest therein, as the authority may deem necessary, convenient or desirable to carry out the purpose of this title."¹⁵²

Arguably, this language does not require it to "own" or even "control" distributed infrastructure. Rather, an improvement only needs to be "acquire[d]" (a condition that may be satisfied by financing the purchase) and "use[d]" (a condition that may be satisfied if the improvement is connected to the utility system and thus serves its intended purpose of reducing the demand for water, wastewater or stormwater services).

Additionally, "real or personal property" could encompass most forms of distributed infrastructure. NYCMWFA need not own that property outright; it only has to acquire "any interest therein," which could include a contractual interest.

Constitutional Limits

Article VIII, Section 1 of the New York Constitution provides that "[n]o county, city, town, village, or school

district shall give or loan any money or property to or in aid of any individual, or private corporation or association, or private undertaking.”

Section 1 does not expressly apply to water finance authorities. Water finance authorities, however, can only improve water systems by working with their affiliated water utilities, which will generally be associated with cities or counties that are subject to Section 1. As a result, any expenditure on distributed infrastructure would need to comply with Section 1.

Whether an expenditure does in fact comply is a fact-specific determination that could vary from one case to the next.¹⁵³ Still, the Section 1 gift clause is intended only to “curb raids on the public purse for the benefit of favored individuals or enterprises furnishing no corresponding benefit.”¹⁵⁴ It is not meant “to regulate the price or the adequacy of the consideration of sales of public property made in good faith”¹⁵⁵ or to prohibit an “incidental benefit to private interest.”¹⁵⁶

So long as a utility determines that financing distributed infrastructure would serve the public interest—by reducing environmental impacts, promoting economic development, or providing utility services at lower costs—and it operates its distributed infrastructure in good faith, it could regard the benefits private property owners receive (water-saving improvements) as incidental.¹⁵⁷ To carry out its program in good faith, for instance, the utility could conduct audits, run projections, and design contracts that improve the likelihood that the distributed infrastructure will indeed serve its intended purpose.

If the state legislature adopted findings that both distributed infrastructure and the bond-financing of distributed infrastructure serve a public interest, it could further ensure that such programs comport with Section 1. In support of such findings, the legislature could point to the New York constitutional provision¹⁵⁸ that declares that the policy of the state is to conserve and protect natural resources.

In Ohio, most water revenue bonds are issued by city utilities or by regional water and sewer districts.¹⁶⁰

Distributed Water Infrastructure in Action



NYCDEP created its **Green Infrastructure Program** in 2010 to integrate distributed GSI projects into its stormwater mitigation strategy. This followed the pilot of the **Parking Lot Stormwater Program**, which charged a stormwater runoff fee to standalone parking lot owners, with exemptions for owners who installed green infrastructure measures to manage runoff from their property. The Program remains active: the DEP billed 380 parking lots in 2012, generating \$274,773 in revenue, and total parking lots billed climbed to 455 in 2013.

The Green Infrastructure Program abides by goals set in a 2012 **New York State Department of Environmental Conservation CSO Order on Consent** pursuant to a 1992 CSO Consent Decree. Principally, the Order of Consent requires DEP to mitigate “the equivalent of stormwater generated by one inch of precipitation from 10 percent of impervious surfaces citywide within combined sewer areas by 2030” using a combination of green and gray infrastructure measures distributed citywide. As of fiscal year 2013, DEP committed \$192 million to the Green Infrastructure Program, which implemented 223 projects, resulting in 28.9 managed acres of impervious surfaces near high priority tributaries. An additional 5,950 GSI assets are slated for implementation by December 31, 2014, increasing the total area of managed impervious surfaces to 530 acres. Projects include but are not limited to right-of-way bioswales, green streets, and blue roofs.

A competitive **Green Infrastructure Grant Program** is available for New York City private property owners to design and construct their own green infrastructure projects. Some \$11.5 million in grants were awarded between 2011 and 2013.

Ohio



Ohio utilities arguably have authority to issue enterprise revenue bonds for distributed infrastructure. Because the state is home to numerous Combined Sewer Systems, some of which are subject to consent decrees requiring reductions in stormwater overflow discharges, its utilities may be particularly interested in financing green infrastructure improvements.

Municipal Utilities

Article XVIII of the Ohio constitution gives municipalities¹⁶¹ broad powers, subject to charter limitations¹⁶² and state general laws.¹⁶³ It expressly authorizes municipalities to operate public utilities and, without further authorization, to raise money for their utilities by issuing revenue bonds.¹⁶⁴

Title 7 of the Ohio Revised Code sets forth general laws applicable to municipalities. Section 715.08 of the code empowers municipalities “to provide for a supply of water, by the construction of wells, pumps, cisterns, aqueducts, water pipes, reservoirs, and water works for the protection of such water supply and to prevent the unnecessary waste of water and the pollution thereof.” Section 717.01(B) empowers municipalities to “[e]xtend, enlarge, reconstruct, repair, equip, furnish, or improve a building or improvement that it is authorized to acquire or construct.”

Read together, these statutes come across as relatively accepting of distributed infrastructure. Section 715.08 only empowers municipalities to “construct” certain specific types of projects. Of those types, the only one that might leave room for distributed infrastructure is “water works,” though its traditional definition is squarely oriented toward conventional infrastructure. And of course, even if “water works” were interpreted broadly, municipalities would not necessarily be “constructing” the distributed infrastructure.

But Section 717.01(B) authorizes municipalities to take additional types of actions, to “furnish” and “improve” any “improvement that it is authorized to acquire or construct.” Distributed infrastructure could be viewed as an “improvement” to a utility’s system—that is, to the collection of “wells,” “pumps,” “cisterns,” “aqueducts,” “water pipes,” “reservoirs,” and “water works” authorized under Section 715.08. The language in Section 715.08 regarding “waste” and “pollution” could support interpretations such as this that would promote water conservation and reduce stormwater pollution.

Regional Water and Sewer Districts

Chapter 6119 of the Ohio Revised Code governs regional water and sewer districts. Section 6119.12 provides that “[a] regional water and sewer district may, from time to time, issue water resource revenue bonds and notes of the district in such principal amount as, in the opinion of the board of trustees of the district, are necessary for the purpose of paying any part of the cost of one or more water resource projects or parts thereof.”¹⁶⁵

Section 6119.011(G) defines a “water resource project” as “any waste water facility or water management facility acquired, constructed, or operated by or leased to a regional water and sewer district... including all buildings and facilities that the district considers necessary for the operation of the project, together with all property, rights, easements, and interest that may be required for the operation of the project.”

As a group, the terms “acquired,” “constructed,” “operated,” and “leased” imply that a district must have some sort of enduring ownership or control over whatever water resource projects it finances. But the projects could include “property,” “rights,” “easements,” and “interest[s]”—terms that, among them, are broad enough to encompass all forms of distributed infrastructure.¹⁶⁶

Limitations

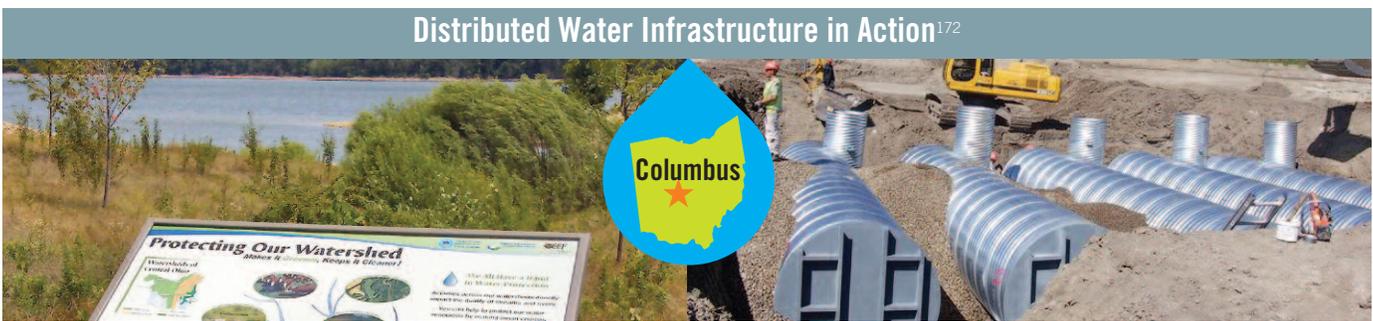
Article VIII, Section 6 of the Ohio Constitution prohibits counties and municipalities from raising money for or loaning their credit to a joint stock company, corporation, or association.¹⁶⁷ Because regional water and sewer districts are organized by counties and municipalities, Section 6 would apply to them as well.

Ohio courts have not considered whether distributed infrastructure—let alone the financing of it—serves the public welfare. But the existing interpretations of Section 6 set a standard that a prudently run distributed infrastructure program should meet.

The Ohio Supreme Court has observed that Section 4 and a parallel gift clause applicable to state government “have not been applied to programs undertaken for public welfare. Rather, these sections have been uniformly held to prohibit governmental involvement only in ventures that subsidize commerce or industry.”¹⁶⁸

Ohio courts have generally found that revenue bonds will not violate the gift clause if the proceeds are put toward a public purpose and if debt payments are met with revenues collected from the general public.¹⁶⁹

Article VIII, § 2o of the Ohio constitution declares that “environmental and related conservation, preservation, and revitalization... are proper public purposes of the state and local governmental entities.”¹⁷⁰ It defines “conservation purposes” to include “water... and other natural resource management projects.”¹⁷¹ Utilities could thus invoke § 2o as evidence that financing distributed infrastructure serves a public purpose.



The Department of Public Utilities is currently developing and implementing pilot projects for **Blueprint Columbus**, a comprehensive green infrastructure plan launched in anticipation of imminent federal policy shifts toward integrated management of stormwater and sewer overflows. Proposed strategies focus on recapture of stormwater from private and public properties. After assessment of stormwater flows from residential properties, Columbus homes would be refitted with sump pumps and repairs to leaky sanitary sewer service lines, or laterals, to properly direct stormwater runoff. Pilot assessments of laterals are underway in the Clintonville Area, which contributes to runoff into nearby Adena Brook, to explore best options for infrastructure updates. Blueprint measures may also include partnerships with the parks and recreation department to repurpose vacant properties as sites for green stormwater infrastructure projects, which city officials have lauded as opportunities for long-term job creation and improved civic engagement.

Blueprint Columbus signals a change in direction from the City’s 2005 Wet Weather Management Plan (WWMP), which does not explicitly address stormwater and calls for expansion of gray infrastructure assets. These include the 4.5-mile **CSO OARS Deep Sewer Tunnel**, with a total budget of over \$300 million to date, and an additional 28 miles of Sanitary Sewer Overflow (SSO) tunnels. Construction on the OARS Deep Sewer Tunnel is underway and slated for completion in 2017, but progress on the new SSO tunnels has been postponed indefinitely in favor of green strategies with additional civic and economic benefits. To this end, the City secured a delay of its SSO consent decree with the Ohio Environmental Protection Agency to develop these strategies further.

Blueprint Columbus is scheduled for completion in September 2015. Funding requirements are projected to match the billions forecast for gray infrastructure improvements outlined in the original WWMP.

Oregon



Of the seven target states, Oregon may be the ripest for financing distributed infrastructure. Its public finance laws grant water and wastewater utilities broad revenue bonding powers, and more than 30 years ago, a state court upheld a strikingly precedential practice: the use of revenue bond proceeds to finance energy efficiency improvements on privately owned property.

Oregon Revised Statutes (ORS) Chapter 287A grants cities, counties, and other political subdivisions (collectively, “public bodies”)¹⁷³ the power, on top of any powers they derive from other authorities, to issue revenue bonds for a “public purpose.”¹⁷⁴ It does not define or otherwise attempt to limit the term “public purpose.”¹⁷⁵

The chapter thus leaves it to public bodies to determine what may be considered a public purpose. Presumably, public bodies may reasonably consider any actions within the scope of their authority to serve public purposes.

Under Oregon law, multiple types of public bodies may provide water, including cities,¹⁷⁶ domestic water supply districts,¹⁷⁷ and sanitary districts and water authorities.¹⁷⁸ These different types of public bodies are governed by separate statutory schemes that set forth different powers, and cities may be subject to charters.¹⁷⁹ Nevertheless, under these varied authorities, water utilities may operate conservation or green infrastructure programs, and distributed infrastructure could be regarded as an extension of these existing programs.

Oregon statutes give further reason for confidence. Most water revenue bonds in Oregon are issued by cities.¹⁸⁰ In two separate provisions, ORS Chapter 225 states that cities may own “water rights and water.”¹⁸¹ This distinction between “water rights” and “water” could be read as empowering public bodies to obtain water that is not part of a water right. Arguably, by investing in distributed infrastructure, cities would be doing just that: the distributed infrastructure would be a means to the end of “water.”

Limits on Authority

Oregon water utilities could face a procedural obstacle to bond-financing their distribution infrastructure, in the form of a voter approval requirement. Compared to other states, though, the constitutional gift clause should not pose a challenge.

Revenue Bond Voter Approval

Chapter 287A requires that a public body, after adopting a resolution authorizing revenue bonds, must publish a notice describing the purposes for which the bonds will be sold.¹⁸² Voters within the public body’s jurisdiction then have 60 days to file a petition, with signatures from at least five percent of voters, requiring that revenue bonds be put on the ballot at the next election date.¹⁸³

Gift Clause

Article XI, Section 9, of the Oregon Constitution prohibits cities and counties from lending their credit or making gifts to private parties. The Oregon Supreme Court has held, however, that this prohibition does not apply to revenue bonds.¹⁸⁴

The Oregon Court of Appeals has even upheld the use of revenue bonds to finance customer-side energy efficiency improvements, which in purpose and design parallel distributed water infrastructure.¹⁸⁵ In the 1981 case *Nicoll v. City of Eugene*, Eugene, without express statutory or charter authority, created a program that, among other things, provided matching grants to residential customers for energy efficiency and renewable energy improvements. The program was funded with enterprise revenue bonds.

A customer challenged the program and argued that subsidizing residential energy efficiency improvements did not serve a public purpose. Eugene invoked the federal National Energy Conservation Policy Act as evidence of a public purpose. The court found this evidence adequate. It observed that determinations of public purpose are properly within the province of the legislature and that “[t]he judiciary should invalidate expenditures only where reasonable men could not differ as to their lack of social utility.”¹⁸⁶



The **Portland Bureau of Environmental Services' Stormwater Management Program** was formed to monitor the performance and design of pilot stormwater projects, and to provide technical assistance to developers who are incorporating stormwater measures into site designs. This program has expanded to citywide green infrastructure standards and neighborhood scale applications. Municipal agencies are required to incorporate effective and innovative stormwater management techniques into routine sewer and road projects, and to encourage developers to build water quality protection into new construction. These standards have been put in place to capture stormwater runoff, remove pollutants, and reduce the likelihood of overflow events and the pressure on the city's aging sewer.

Results show that these projects can reduce peak flows by 80-85 percent, retaining 60 percent of the storm volume of a CSO design storm. In the last 10 years, Portland has reduced over 1.2 billion gallons of runoff from reaching sewers. Examples of specific projects include a **Downspout Disconnection Program** that encourages residents to disconnect downspouts from the combined sewer system and redirect roof water to gardens and lawns. The **Clean River Rewards** system for ratepayers is designed to incentivize residents to keep stormwater from leaving their property. The **Green Streets** policy incorporates green infrastructure to manage stormwater in all municipally funded development, redevelopment, or enhancement projects. Any project that does not incorporate Green Infrastructure could be required to contribute to a Green Streets fund. The **Innovative Wet Weather Program** uses green infrastructure to manage stormwater in the urban environment and contribute to a healthy watershed.

The **Sustainable Stormwater Management Program** provides funding for stormwater management projects through various grant and matching grant programs. Federal grants are used for Innovative Wet Weather Projects and the **Office of Sustainable Development** offers **Green Investments Funds**, all of which can be used to implement sustainable stormwater management practices. Between 2002 and 2009 the EPA granted the city \$3.4 million to fund over 30 innovative public and private projects that demonstrate sustainable, low-impact stormwater management solutions.

Texas



Texas presents a promising frontier for distributed infrastructure. Voters there recently approved the creation of a new water infrastructure bank and capitalized it with a \$2 billion appropriation, which state leaders expect can be leveraged to nearly \$30 billion. The legislature has mandated that at least 20 percent of all assistance from the bank go toward conservation and reuse projects; thus, significant expenditures on distributed infrastructure could be on the horizon.

In Texas, depending on the facts and circumstances of the proposed financing, utilities arguably have constitutional and statutory authority to finance distributed infrastructure. The ability to finance distributed infrastructure through the issuance of public securities would, however, be subject to review and approval by the state attorney general, and whether the attorney general would in fact grant approval remains uncertain. As in other states, financings for distributed infrastructure would have to comply with covenants in existing financing documents delivered by such entities.

Authority

In Texas, there are three general types of issuers that would be likely to pursue distributed infrastructure: (1) the Texas Water Development Board (TWDB); (2) conservation and reclamation districts formed as regional water authorities or districts (“regional water issuers”); and (3) cities. Each is subject to different legal authority and is granted different powers.

As in other states, the viability of financing for distributed infrastructure could turn in part on the particular manner of distributed infrastructure to be considered. Texas law, for instance, authorizes the acquisition of conservation easements by a governmental body empowered to hold an interest in real property under the laws of the state or the United States.¹⁸⁸ A “conservation easement” means a nonpossessory interest of a holder (including governmental bodies) in real property that imposes limitations or affirmative obligations designed to, *inter alia*, protect natural resources of the state.¹⁸⁹ A conservation easement might face better odds than other forms of distributed infrastructure such as water-efficient appliances in being financed.

Texas Water Development Board

The principal state agency to provide financial assistance for water infrastructure projects is the TWDB. The TWDB may make funds available to political subdivisions or bodies politic and corporate in the State of Texas in the conservation and development of the state’s water resources.¹⁹⁰ Constitutional and statutory changes that

occurred in 2013 established two funds, the State Water Implementation Fund for Texas (SWIFT)¹⁹¹ and the State Water Implementation Revenue Fund for Texas (SWIRFT).¹⁹² SWIFT was established to provide \$2 billion in funds for “bond enhancement agreements” to provide additional security for general obligation or revenue bonds of TWDB, the proceeds of which are used to finance state water plan projects. SWIRFT authorizes TWDB to issue bonds and enter into related credit agreements that are payable from revenues available to SWIRFT, which may include money disbursed to SWIRFT from SWIFT as authorized under general law.

State law provides that during the five-year period between the adoption of a state water plan and the adoption of a new plan, TWDB shall undertake to apply not less than 10 percent of SWIFT to support projects included in the state water plan that are for rural political subdivisions, or for agricultural water conservation, and not less than 20 percent of SWIFT to support projects in the state water plan, including agricultural irrigation projects, that are designed for water conservation or reuse.¹⁹³ Water infrastructure—whether distributed or otherwise—would be eligible for SWIFT and SWIRFT financial assistance so long as it is included in the state water plan. The TWDB may not utilize SWIFT or SWIRFT prior to the end of 2014.¹⁹⁴

The TWDB possesses the authority to issue general obligation bonds to provide financial assistance to economically distressed areas of the state,¹⁹⁵ including the *colonias* in the Rio Grande region of the state. Under the economically distressed areas program, financial assistance

often is in the form of grants, and arguably the TWDB can fund distributed infrastructure, consistent with the public purposes underlying this program.

Regional Issuers

Regional water issuers, such as river authorities, act under authority of the state constitution and, frequently, specific enabling legislation. The Texas Constitution gives regional water issuers the authority to effect the conservation and development of the natural resources of the state, and it declares the preservation and conservation of water to be a public right and duty.¹⁹⁶ Statutorily, regional water issuers often act under their enabling legislation and Texas Water Code provisions that address the financing of water infrastructure.

General powers of a regional water issuer typically include the functions, powers, authority, rights, and duties that will permit accomplishment of the purposes for which it was created or the purposes authorized by the constitution, the Texas Water Code, or any other law.¹⁹⁷ To that end, a regional water issuer may purchase, construct, acquire, own, operate, maintain, repair, improve, or extend inside and outside its boundaries any and all land, works, improvements, facilities, plants, equipment, and appliances necessary to accomplish the purposes of its creation or the purposes authorized by law. Terms such as “equipment” and “appliances” are broad enough to encompass distributed infrastructure.

A regional water issuer may issue bonds, notes, or other obligations to borrow money for any corporate purpose or combination of corporate purposes only in compliance with the methods and procedures provided by applicable law. Since a regional water issuer has the authority to purchase distributed infrastructure, it may issue revenue bonds to finance that purchase, subject to the imposition of controls and safeguards that will ensure the accomplishment of the issuer’s public purpose (discussed below).

Cities

Cities possess authority under state law to finance water and wastewater improvements.¹⁹⁸ A city may acquire, purchase, construct, improve, enlarge, equip, operate, or maintain any property, including channels or bodies of water known as resacas, interests in property, buildings, structures, activities, services, operations, or other facilities, with respect to a water system or a sewer system, or a combined water and sewer system. A city

also may authorize the execution and delivery of contracts between the city and any person to accomplish any purpose described above.

A city may provide funds to acquire, purchase, construct, improve, renovate, enlarge, or equip property, buildings, structures, facilities, or related infrastructure for a water and sewer system. These purposes are sufficiently broad to encompass distributed infrastructure.

In connection with exercising this authority, the governing body may provide funds to acquire, purchase, or otherwise obtain any interest in property, including additional water or riparian rights. A city may issue public securities and incur obligations under contracts for any purpose authorized by law in connection with providing funds for these purposes.

A city may transfer to its general fund revenues of any city-owned utility system in an amount and to the extent authorized in the indenture, deed of trust or ordinance providing for and securing the payment of utility system revenue bonds issued by the city.

Loans and Grants of Public Money

The state constitution recognizes that loans and grants of public money may be made to private users. Until 1987, the state constitution generally prohibited the state legislature from authorizing any county, city, town or other political corporation or subdivision of the state to lend its credit or to grant public money or thing of value in aid of, or to any individual, association or corporation whatsoever.¹⁹⁹ Since 1987, the state constitution recognizes that the legislature may provide for the creation of programs and the making of loans and grants of public money for the public purposes of development and diversification of the economy of the state, the elimination of unemployment or underemployment in the state, the stimulation of agricultural innovation, the fostering of the growth of enterprises based on agriculture, or the development or expansion of transportation or commerce in the state.²⁰⁰

Should a city provide in the authorizing instrument relating to the sale of utility system revenue bonds that surplus revenues can be used for any lawful purpose, a grant program could be established by city action to fund distributed infrastructure as consistent with the conservation of water, upon a finding that the program would enhance the development or expansion of commerce in the state.²⁰¹

State agencies and political subdivisions can make funds available to private entities without violating constitutional lending of credit prohibitions if four conditions are satisfied in order for an expenditure of public funds that may benefit private parties to not constitute an unlawful lending of credit: (1) does the expenditure serve a public purpose; (2) are there sufficient controls on the expenditure to ensure that the public purpose will be carried out; (3) is the public protected in the use of the public funds to accomplish the intended result; and (4) has adequate consideration passed to the political subdivision making the expenditure.²⁰²

As previously noted, the conservation and development of water resources is a public right and duty identified by the state constitution as a purpose for which the legislature may enact laws, and thus arguably is a public purpose.

Attorney General Validation

State law requires that public securities issued or incurred by an issuer under the issuer's borrowing power are subject to review and approval by the state attorney

general. The attorney general reviews a transcript of proceedings to determine if the public securities have been lawfully authorized under state law. Upon approval of the public securities as having been authorized in accordance with law, the attorney general renders an opinion to that effect. Once the opinion has been issued, the public securities and any contract the proceeds of which are pledged to the payment of the public security are valid and incontestable in a court or other forum.²⁰³

The issuance of public securities by state agencies and political subdivisions to finance distributed water infrastructure may be a case of first impression, so pre-clearance by the public finance division of the office of the attorney general is advised. Outstanding covenants governing public securities heretofore issued by state agencies and political subdivisions may impose restrictions on the ability of the issuer to finance distributed water infrastructure projects.

Distributed Water Infrastructure in Action²⁰⁴



Water stored in a series of reservoirs on the Colorado River provides the sole source of drinking water for Austin. The combined storage of these reservoirs is at the lowest point in history, the result of low inflows from on ongoing severe drought. With the objective to reduce outdoor water use and extend the capacity of existing infrastructure to serve demand for service provided, Austin Water implemented the **Waterwise Landscape** program, to encourage techniques to reduce or eliminate the need for supplemental irrigation.

Austin Water encourages these types of landscapes by offering a **WaterWise Landscape rebate** program. When residential customers either use compost or mulch to retain soil moisture and prevent water loss, use drip or low-flow irrigation methods, or plant native plants that don't require as much water, they can receive \$25 for every 100 square foot of turf grass converted to a WaterWise Landscape. The rebate program's goal is to incentivize customers to change their irrigation habits while maintaining a healthy and attractive landscape.

Wisconsin



Wisconsin utilities arguably have authority to apply enterprise revenue bond proceeds toward distributed infrastructure. As elsewhere, however, a legislative amendment to that effect could clarify this authority.

Unlike other target states, Wisconsin does not have a constitutional gift clause, though it does have a judicially created prohibition against using public credit and public funds for private benefit. This doctrine should not impede the funding of distributed infrastructure.

Authority

Under Wisconsin Statute § 66.0621, a “municipality” may issue revenue bonds to finance a “public utility.”²⁰⁵ These terms are defined broadly enough to catch within their sweep most if not all public water utilities in the state.

By statute, “municipality” includes municipal water districts, metropolitan sewerage districts, town sanitary districts, cities, villages, towns, and counties.²⁰⁶ “Public utility,” in turn, refers to a revenue-producing facility or enterprise that a municipality owns and operates for a “public purpose.”

“Public purpose” means “any power or duty of the issuing municipality.”²⁰⁷ Municipalities have relatively broad powers under Wisconsin constitutional and statutory provisions²⁰⁸ and case law.²⁰⁹ One statute empowers a town, village, or city to “extend and improve... a plant and equipment... for the furnishing of water.”²¹⁰ Another grants identical “extend” and “improve” authority for sewage and stormwater.²¹¹

Similarly, Section 66.0621 authorizes a municipality to put bond proceeds toward “purchasing, acquiring, leasing, constructing, extending, adding to, improving, conducting, controlling, operating or managing a public utility.”²¹² The Wisconsin code does not define these terms, and no published case has construed these words in a way that would limit them to requiring that infrastructure be on public property or publicly owned.

The plain meanings of those words²¹³ are broad enough to accommodate distributed infrastructure, which would “extend” and “improve” a public utility and contribute toward its “conduct,” “control,” “operation,” and management.”

In contrast to Section § 66.0621, the code permits municipalities to issue public improvement bonds only to finance a “public improvement which a municipality may lawfully own and operate.”²¹⁴ That the legislature did not impose similar constraints on the use of revenue bonds

suggests that it did not intend to limit municipalities to financing only publicly owned and operated improvements through revenue bonds.²¹⁵

Limitations

The Wisconsin Constitution does not include a clause expressly stating that public funds and credit may only be used for a public purpose.²¹⁶ Wisconsin courts, however, have consistently held that a doctrine to that effect exists.²¹⁷

They have followed the standard formulation of that doctrine, under which the legislature has the initial authority to determine what constitutes a public purpose. “If any public purpose can be conceived which might rationally be deemed to justify the statute or serve as a basis for the... expenditure, the test is satisfied and the court cannot further weigh the adequacy of the need or the wisdom of the method. Only if it is clear and palpable that there can be no benefit to the public is it possible for a court to conclude that no public purpose exists.”²¹⁸

Although no published cases have applied the doctrine to distributed infrastructure, the Wisconsin Supreme Court has held that a state program aimed at improving the environment by reducing waste streams served a public purpose even though it included provisions that benefitted private parties.²¹⁹ Those provisions required a newly created waste recycling authority to use private industry “to the maximum extent feasible.”²²⁰ The court observed: “The provisions of the act seeking to promote development of private enterprise do not detract from its public purpose, since promotion of a private enterprise is a valid public purpose in itself, especially when any benefit to particular private businesses is an incident corollary to the primary purpose.”²²¹ The court rested its holding in part on extensive legislative findings on the public purpose that the waste program would serve.²²²

Distributed Water Infrastructure in Action²²³



In an effort to reduce water pollution and improve rivers and Lake Michigan, the Milwaukee Metropolitan Sewerage District (MMSD) has embraced water reclamation and resource recovery. Its **Regional Green Infrastructure Plan** sets a goal of capturing the first 740 million gallons of water in each rainfall event by 2035 and identifies suitable best management practices.

To promote green infrastructure improvements, MMSD has developed multiple funding initiatives, including the **Green Infrastructure Partnership Program**, which provides reimbursements based on the number of square feet of green infrastructure improvements that participants install.



Conclusion

Across the United States, water pressures are mounting. The particular mix of challenges may vary from one region to the next and even one system to the next, but certain issues recur: climate change, fragile ecosystems, water quality concerns, aging infrastructure, unstable revenues, and shrinking federal subsidies.

Utilities cannot solve these problems solely by building new reservoirs or deep tunnel systems. They must develop business models that are nimble and holistic and that tap into the water management opportunities presented at the point where customers receive water, wastewater, and stormwater services. Existing water conservation and green infrastructure programs offer a template. But scaling these efforts will require considerable financial resources. Utilities will have to turn to capital markets, as they have historically done for conventional gray infrastructure.

Because they are highly liquid, enterprise revenue bonds could be an important part of the financing mix to raise the upfront capital that a significant investment in distributed infrastructure will require. On top of this, growing demand for “green” bond products in the institutional and retail marketplace might make for a seller’s market for this new wave of enterprise revenue debt.

Because they are highly liquid, enterprise revenue bonds could be an important part of the financing mix to raise the upfront capital that a significant investment in distributed infrastructure will require.

In each of the seven states Ceres examined for this report, existing law arguably permits public utilities to issue bonds to finance distributed infrastructure. The certainty of this authority varies from one state to the next, however, as does the certainty that public finance laws and practitioners may require in order to move forward with an issuance.

In all the target states, statutory amendments could clarify authority and facilitate financing of distributed infrastructure. Similarly, guidance and possible revision to GASB standards would resolve uncertainty over when distributed assets can be capitalized in financial filings. But either way, utilities that are committed to conserving water and reducing their wastewater and stormwater burdens, and that are willing to bear a measure of uncertainty, could attempt to issue distributed infrastructure bonds, marking themselves as pacesetters and establishing a comfortable precedent for their peers.

Endnotes

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- 63 For more than half a century, the fastest-growing states have been in the South and West. *E.g.*, Jordan Wiessmann, *The Fastest-Growing States in America (and Why They’re Booming)*, *THE ATLANTIC* (Dec. 22, 2012), <http://www.theatlantic.com/business/archive/2012/12/the-fastest-growing-states-in-america-and-why-theyre-booming/266541>; Damien Cave, *Recession Slows Population Rise across Sun Belt*, *N.Y. TIMES* (Dec. 23, 2009), <http://www.nytimes.com/2009/12/24/us/24census.html>; Edward L. Glaeser and Kristina Tobio, Alfred A. Taubman Center for State and Local Government, *The Rise of the Sunbelt* (May 2007), http://www.hks.harvard.edu/var/ezp_site/storage/fckeditor/file/pdfs/centers-programs/centers/taubman/sunbelt.pdf. Although the West has always been drier and its water challenges have always been somewhat better known, both regions are expected to face resource scarcity issues. U.S. Environmental Protection Agency, *Climate Impacts in the Southeast*, <http://www.epa.gov/climatechange/impacts-adaptation/southeast.html> (last visited July 5, 2014); U.S. Environmental Protection Agency, *Climate Impacts in the Southwest*, <http://www.epa.gov/climatechange/impacts-adaptation/southwest.html> (last visited July 5, 2014). See also Michael Wines, *Colorado River Drought Forces a Painful Reckoning for States*, *N.Y. TIMES* (Jan. 5, 2014), <http://www.nytimes.com/2014/01/06/us/colorado-river-drought-forces-a-painful-reckoning-for-states.html>; *The Drying of the West: Drought is Forcing Westerners to Consider Wasting Less Water*, *ECONOMIST* (Feb. 22, 2014), <http://www.economist.com/news/united-states/21596955-drought-forcing-westerners-consider-wasting-less-water-drying-west>; *Study: Climate Change Could Put Millions More at Risk of Water Scarcity*, *U.S. NEWS* (Dec. 16, 2013), <http://www.usnews.com/news/articles/2013/12/16/study-climate-change-could-put-millions-more-at-risk-of-water-scarcity>; *Southeastern U.S., with Exception of Florida, Likely to Have Serious Water Scarcity Issues*, *SCIENCE DAILY* (Dec. 14, 2010), <http://www.sciencedaily.com/releases/2010/12/101213184436.htm>; Corelia Dean, *Southeast Drought Study Ties Water Shortage to Population, Not Global Warming*, *N.Y. TIMES* (Oct. 1, 2009); and Tim Gaynor and Steve Gorman, *Fast-Growing Western U.S. Cities Face Water Crisis*, *REUTERS* (Mar. 11, 2009), <http://www.reuters.com/article/2009/03/11/us-water-cities-idUSTRE52A1WY20090311>.
- 64 *E.g.*, California Resources Agency and Department of Water Resources, *Managing an Uncertain Future: Climate Change Adaptation Strategies for California’s Water* (Oct. 2008), <http://www.water.ca.gov/climatechange/docs/ClimateChangeWhitePaper.pdf>.
- 65 EPA, *Heavy Precipitation*, <http://www.epa.gov/climatechange/science/indicators/weather-climate/heavy-precip.html> (last visited June 14, 2014).
- 66 Evan Lehmann, *Insurance company sues Ill. Cities for climate damage*, *CLIMATE WIRE* (May 14, 2014), <http://www.eenews.net/stories/1059999532>.
- 67 John Roach, *Insurer’s Message: Prepare for Climate Change or Get Sued*, *NBC NEWS* (June 4, 2014), <http://www.nbcnews.com/science/environment/insurers-message-prepare-climate-change-or-get-sued-n122856>.
- 68 Press Release: Gov. Perry Encourages Support of Prop. 6 to Fund State Water Plan, Office of the Governor (Oct. 2, 2013), <http://governor.state.tx.us/news/press-release/18923/>.
- 69 *Tex. Water Code* § 15.434(b)(2). The chairman of the agency charged with running the bank has said that that figure should be considered a floor and that the agency should try to channel a higher percentage of dollars toward such projects. Rabeea Tahir, *Water Planners Set Bar for Conservation Funding*, *TEX. TRIBUNE* (Mar. 6, 2014), <http://www.texastribune.org/2014/03/06/prop-6-funds-what-does-conservation-mean/>.
- 70 Congressional Budget Office, *A CBO Study: Future Investment in Drinking Water and Water Infrastructure* xix (2002) <http://www.cbo.gov/sites/default/files/cbofiles/ftpdocs/39xx/doc3983/11-18-watersystems.pdf>.
- 71 *E.g.*, Sharlene Leurig, Ceres, *The Ripple Effect: Water Risk in the Municipal Bond Market* 5 (Oct. 2010), <http://www.ceres.org/resources/reports/water-bonds>.
- 72 *E.g.*, Stephen A. Spitz and Devin Brennan, *Orrick, Water and Wastewater Projects: Financing with Tax-Exempt Bonds* 31-46 (2012), <http://www.orrick.com/Events-and-Publications/Documents/Water-and-Wastewater-Projects-Financing-with-Tax-Exempt-Bonds.pdf>. See also Newsha Ajami and Juliet Christian-Smith, Pacific Institute, *Beyond Water Pricing: An Overview of Water Financing Options in California* (2013), <http://pacinst.org/wp-content/uploads/sites/21/2013/11/beyond-water-financing-pacinst-full.pdf>.
- 73 Sharlene Leurig, Ceres, *Financing Conservation* (2014), <https://www.utexas.edu/law/centers/energy/wp/wp-content/uploads/centers/energy/Leurig-SWIFT-Slides.pdf>.
- 74 *E.g.*, Official Statement, New York City Municipal Water Finance Authority, Water and Sewer Second General Resolution Revenue Bonds, Fiscal 2014 Series CC, Consisting of \$241,240,000 Fiscal 2014 Subseries CC-1 and \$110,000,000 Fiscal 2014 Subseries CC-2 20 (Jan. 28, 2014), http://nycbonds.org/NYW/pdf/2014/NYW_2014_CC.pdf.
- 75 *E.g.*, Christine Albano, *Pair of Billion-Dollar Deals Jump-Start Primary, Bond Buyer* (June 3, 2013); Bob Bendick, *Tony Soprano, Atlantic City, and... Conservation*, *NATURE* (Dec. 10, 2009), <http://blog.nature.org/2009/12/new-jersey-conservation-nature-green-acre/>

- 76 See The Johnson Foundation at Wingspread, *Charting New Waters: Financing Sustainable Water Infrastructure* (Jan. 2012), http://www.johnsonfdn.org/sites/default/files/reports_publications/WaterInfrastructureFullReport.pdf.
- 77 26 U.S.C. § 54D.
- 78 26 U.S.C. § 54D(e)(3); IRS Notice 2012-44, Qualified Energy Conservation Bonds.
- 79 E.g., Jeremy Brown, Center for Global Energy, International Arbitration, and Environmental Law, *PACE in Texas: The Future of Contractual Assessment Financing for Conservation Improvements* 12-13 (April 2013), available at https://www.utexas.edu/law/centers/energy/wp/wp-content/uploads/centers/energy/property_assessed_clean_energy_texas.pdf.
- 80 Notably, tax law views PACE bonds and enterprise revenue bonds differently, and current Federal Housing Finance Authority policies restrict the degree to which PACE can be applied to residential property.
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- 82 Judy Wesalo Temel, *Fundamentals of Municipal Bonds* 207 (2001) (describing Supreme Court cases in 1895, 1913 and 1920 that encouraged municipal financing). In 1895, the Supreme Court decided *Pollock v. Farmers' Loan and Trust Company* and found that the federal government could not collect income taxes on interest on municipal securities. David Cutler and Grant Miller, *Water, Water Everywhere: Municipal Finance and Water Supply in American Cities* (2005).
- 83 Christine Sgarlata Chung, *Municipal Securities: the Crisis of State and Local Government Indebtedness, Systematic Costs of Low Default Rates, and Opportunities for Reform*, 34 CARDOZO L. REV. 1455, 1463-68 (2012-2013) (describing the quickening pace of change in public finance since the 1970s).
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- 85 *Turken v. Gordon*, 224 P.3d 158, 166 (Ariz. 2010).
- 86 TEX. CONST. art. III, § 52-a.
- 87 WASH. CONST. art. VIII, § 10 (2013).
- 88 *Id.*
- 89 Internal Revenue Code Section 141(a)(1).
- 90 I.R.C. Section 141(b)(1) and Treasury Regulations Section 1.141 3.
- 91 I.R.C. Section 141(b)(2) and Treasury Regulations Section 1.141 4.
- 92 I.R.C. Section 141(b)(5).
- 93 Treasury Regulations Section 1.148 1(c)(4)(B)(2).
- 94 I.R.C. 142(a)(4) and Treasury Regulations Section 1.103-8(h).
- 95 *Cal. Gov't Code* § 38742.
- 96 *Cal. Gov't Code* § 38742.
- 97 *Cal. Gov't Code* § 43600 et. seq.
- 98 *Cal. Gov't Code* § 43602.
- 99 *Cal. Gov't Code* § 43601.
- 100 See *Cal. Gov't Code* §§ 43605, 43610.
- 101 *Cal. Water Code* §§ 71592, 71610.5.
- 102 *Cal. Water Code* § 22075.
- 103 *Cal. Pub. Util. Code* § 16461.
- 104 *Cal. Pub. Util. Code* § 16467.
- 105 *Cal. Pub. Util. Code* § 16575.
- 106 *Cal. Pub. Util. Code* §§ 12819 and 12815.
- 107 *Cal. Pub. Util. Code* § 12825.
- 108 *Cal. Gov't Code* § 37350.
- 109 *Cal. Pub. Util. Code* § 16431 for public utility districts; *Cal. Water Code* § 22425 for irrigation districts; *Cal. Water Code* § 71690 for municipal water districts; and *Cal. Pub. Util. Code* § 12771.
- 110 CAL CONST. art. XVI, § 6.
- 111 CAL CONST. art. XIII C and art. XIII D.
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- 119 Brett Walton, *Study: Water Stress Affects Fewer Cities Than Previously Thought*, CIRCLE OF BLUE (June 5, 2014), <http://www.circleofblue.org/waternews/2014/world/water-stress-affects-fewer-cities-previously-thought>.
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- 125 *SoCal Water \$mart for Commercial Water Customers*, <http://www.socalwatersmart.com/index.php/qualified> (last visited July 6, 2014).
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- 128 LA Stormwater, *LADWP Announces Stormwater Capture Master Plan*, <http://www.lastormwater.org/blog/2014/03/ladwp-announces-stormwater-capture-master-plan/> (last visited June 6, 2014).
- 129 Article 3 of Chapter 82 of Title 36 of the OFFICIAL CODE OF GEORGIA ANNOTATED.
- 130 O.C.G.A. § 36-82-62(a).
- 131 GA. CONST. of 1983, Article III, Section 6, Paragraph 6.
- 132 *Grand Lodge v. City of Thomasville*, 226 Ga. 4, 172 S.E.2d 612 (1970).
- 133 1962 Op. Atty Gen. p. 588.
- 134 1967 Op. Atty Gen. No. 67-115.
- 135 *E.g., Moore v. Ray*, 499 S.E.2d 636, 637 (Ga. 1998)
- 136 1971 Op. Atty Gen. No. U71-17.
- 137 This report does not use the term “debt” in this section, as that word has a particular meaning under Georgia law. Debt may be incurred only with voter approval; revenue bonds (except in limited circumstances not applicable here) may be issued without voter approval.
- 138 *See Carter v. State*, 93 Ga. App. 12, 90 S.E.2d 672 (1955).
- 139 O.C.G.A. § 36-82-62(a)(2)(A).
- 140 *Miller v. State*, 83 Ga. App. 135, 62 S.E.2d 921 (1951).
- 141 Consent Decree, *Upper Chattahoochee Riverkeeper, Inc. v. City of Atlanta*, and *United States v. City of Atlanta*, 1:95-CV-2550-TWT (N.D. Ga. 1998).
- 142 DWM, Greenway Acquisition Project, <http://www.atlantawatershed.org/inside-dwm/offices/watershed-protection/greenway-acquisition/> (last visited July 7, 2014).
- 143 Atlanta, Ga., Ordinance 12-O-1761, <http://www.atlantawatershed.org/default?linkServID=95836454-BAB0-48DC-AABE36297717215C&showMeta=2&ext=.pdf>; DWM, *Implementing Green Infrastructure: Atlanta’s Post-Development Stormwater Management Ordinance* (Mar. 13, 2013), <http://www.atlantawatershed.org/default?linkServID=513ADAB0-6965-4F92-AEBB38FC264C3DF6&showMeta=2&ext=.pdf>.
- 144 DWM, *Green Infrastructure for Single Family Residences: City of Atlanta Stormwater Guidelines* (Nov. 2012), <http://www.atlantawatershed.org/default?linkServID=32A08C06-9D55-4889-97FACA852EBE559E&showMeta=2&ext=.pdf>.
- 145 As of July 6, 2014, the Municipal Securities Rulemaking Board’s Electronic Municipal Market Access (EMMA) database returned 64 issues, dating to 2000, from New York State containing the terms “revenue” and “water.” <http://emma.msrb.org> Of those issues, 56 were from the NYCMWFA. The remaining issues were from the New York State Environmental Facilities Corporation, the Niagara Falls Public Water Authority and the Wayne County Water and Sewer Authority.
- 146 *See N.Y. Pub. Auth. Law* art 5.
- 147 *E.g., N.Y. Pub. Auth. Law* §§ 1045-d.
- 148 *N.Y. Pub. Auth. Law* § 1045-b(20).
- 149 *N.Y. Pub. Auth. Law* § 1045-b(19).
- 150 *E.g., N.Y. Pub. Auth. Law* §§ 1045-g(4), 1045-g(9).
- 151 *N.Y. Pub. Auth. Law* § 1045-b(21).
- 152 *N.Y. Pub. Auth. Law* §§ 1045-d (setting forth the powers of the New York City Municipal Water Finance Authority).
- 153 *Lecci v. Nickerson*, 313 N.Y.S. 2d 474 (Sup. Ct. 1970).
- 154 *Taylor v. McGuire*, 420 N.Y.S.2d 248, 251 (Sup. Ct. 1979).
- 155 *Landmark West! V. City of New York*, 802 N.Y.S. 2d 340, 348 (Sup. Ct. 2005).
- 156 *N.Y. Tel. Co. v Secord Bros., Inc.*, 309 N.Y.S. 2d 814 (Sup. Ct. 1970)
- 157 *Hamptons Resort & Tourism Ass’n v County of Suffolk*, 639 N.Y.S. 2d 422 (Sup. Ct. 1996) (upholding the lower court dismissal of a complaint for failing to show that a challenged tax had a private benefit as its “primary object”). *See also Matter of La Barbera v Town of Woodstock* 814 N.Y.S. 2d 376 (Sup. Ct. 2006) (finding that a town could convey a conservation easement to a nonprofit because “preservation of the Comeau property as an undeveloped park and recreational facility provides a clear public benefit in perpetuity”).
- 158 *N.Y. Const.* art. XIV, § 4.
- 159 *See generally* New York City Department of Environmental Protection, *NYC Green Infrastructure: 2013 Annual Report* (2013), <http://www.nyc.gov>; New York City Water Finance Authority, *Water and Sewer System Second General Resolution Revenue Bonds Fiscal 2014 Series CC* (Jan. 2014), <http://nycbonds.org>. In the Matter of Violations of Article 17 of the Environmental Conservation Law and Part 750, et seq., of Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York, DEC Case No. C02-2011051225 (2012), http://www.nyc.gov/html/dep/pdf/harbor/cso_consent_order_amended_03082012.pdf.
- 160 As of July 6, 2014, the EMMA database returned six issues, dating back to August 2011, from Ohio containing the terms “revenue” and “water.” <http://emma.msrb.org>. Of these, five were from cities (Cincinnati, Lancaster, Lebanon and Ohio) and one was from the Northwestern Water and Sewer District, a regional water and sewer district.
- 161 *Ohio Const.* art. XVIII, § 1 divides municipalities into cities and villages. All municipalities with populations of 5,000 or greater are considered cities. All municipalities with smaller populations are considered villages.

- 162 *Ohio Const.* art. XVIII, § 7.
- 163 *Ohio Const.* art. XVIII, § Section 3.
- 164 *Ohio Const.* art. XVIII. § 12. See also *In re Application for Exemption of Real Property from Taxation*, 147 N.E.2d 625, 626 (Ohio 1958).
- 165 See also *Ohio Rev. Code Ann.* § 6119.06(J) (empowering regional water and sewer districts to issue bonds and notes as provided in Chapter 6119).
- 166 But see *District v. Bath Township*, 999 N.E.2d 181 (Ohio Ct. App. 2013) (interpreting narrowly the statutory authority Chapter 6119 gives the Northeast Ohio Regional Sewer District).
- 167 See also *Markley v. Village of Mineral City*, 51 N.E. 28 (Ohio 1898) (finding that the prohibition extends to the state).
- 168 *State ex rel. Tomino v. Brown*, 549 N.E. 2d 505, 508 (Ohio 1989).
- 169 *State ex rel. Allen v. Ferguson*, 97 N.E. 2d 660 (Ohio 1951).
- 170 *Ohio Const.* art. XVIII, § 2o(A).
- 171 *Ohio Const.* art. XVIII, § 2o(A)(1).
- 172 See generally City of Columbus, *Blueprint Columbus* (2014), <http://columbus.gov/publicutilities>; *City of Columbus OARS Deep Sewer Tunnel* (2014), <http://columbus.gov/Templates/Detail.aspx?id=38013>; and Steve Goldsmith, *Water Infrastructure That Delivers More Public Value, Governing* (May 21, 2014), <http://www.governing.com/blogs/bfc/gov-columbus-ohio-combined-sewer-overflow-green-water-infrastructure.html>.
- 173 *Or. Rev. Code Ann.* § 287A.001(14).
- 174 *Or. Rev. Code Ann.* § 287A.150(1).
- 175 *Or. Rev. Code Ann.* Chap. 287A authority may serve as the sole basis for an issuance. Public bodies need not rest upon other sources of authority. See, *E.g.*, Official Statement, \$73,440,000—City of Portland, Oregon, First Lien Water System Revenue and Refunding Bonds, 2010 Series A (Tax Exempt) Base CUSIP: 736754 1 (February 2, 2010) (“The 2010 Series A Bonds will be issued pursuant to the authority conferred by Oregon Revised Statutes 287A.150”), <http://emma.msrb.org/EP394572-EP310352-EP706374.pdf>.
- 176 *Or. Rev. Code Ann.* Chap. 225.
- 177 *Or. Rev. Code Ann.* Chap. 264.
- 178 *Or. Rev. Code Ann.* Chap. 450.
- 179 *Or. Rev. Code Ann.* § 225.020(1).
- 180 As of July 6, 2014, the EMMA database returned 3 issues, dating to 2010, from Oregon containing the terms “revenue” and “water.” <http://emma.msrb.org>. Of these, one is for the City of Hermiston and the other two are for the City of Portland.
- 181 *Or. Rev. Code Ann.* §§ 225.050(1), 225.050(2)(a).
- 182 *Or. Rev. Code Ann.* § 287A.150(4).
- 183 *Or. Rev. Code Ann.* § 287A.150(3).
- 184 *Carruthers v. Port of Astoria*, 438 P.2d 725, 730 (Ore. 1968).
- 185 *Nicoll v. City of Eugene*, 628 P.2d 1213 (Ore. Ct. App. 1981), as modified by 632 P.2d 502 (Ore. Ct. App. 1981).
- 186 *Id.* at 1215.
- 187 Water Environmental Research Fund, *Portland, Oregon: Building a Nationally Recognized Program Through Innovation and Research*, http://www.werf.org/liveablecommunities/studies_port_or.htm (last visited July 5, 2014). Center for Neighborhood Technology, *Green Infrastructure Community Profile: Portland, Oregon* (2007), <http://www.cnt.org/repository/Portland.pdf>.
- 188 *Tex. Nat. Res. Code* Chapter 183.
- 189 In the case of a regional water issuer or city, the acquisition of a conservation easement should also be in furtherance of a public purpose of the issuer.
- 190 *Tex. Const.* art. III, § 49-c.
- 191 *Tex. Const.* art. III, § 49-d-12.
- 192 *Tex. Const.* art. III, § 49-d-13.
- 193 *Tex. Water Code* § 15.434
- 194 Section 2.22(b), Acts of the 83rd Legislature, 2013, Regular Session, requires that not later than March 1, 2015, the TWDB shall adopt rules to implement SWIFT. Funds cannot be made available under SWIFT prior to rules being promulgated. The TWDB has expressed at public meetings its intention to finalize rules prior to December 31, 2014.
- 195 *Tex. Const.* art. III, §49-d-7; see also *Tex. Water Code* Subchapter K, Chapter 17.
- 196 *Tex. Const.* art. XVI, Section 59.
- 197 *Tex. Water Code* Chapter 49.
- 198 See, *e.g.*, *Tex. Gov't Code* Chapter 1502.
- 199 See *Tex. Const.* art. III, § 52. See also *Tex. Const.* art. III, § 50.
- 200 See *Tex. Const.* art. III, § 52-a.
- 201 *Texas Loc. Gov't Code* Chapter 380.
- 202 See, *e.g.*, Texas Attorney General Opinion No. JC0489 (2002); Texas Attorney General Opinion No. JC0353 (2001); Texas Attorney General Opinion No. JM-768 (1987).
- 203 *Tex. Gov't Code* § 1202.006,
- 204 Austin Water, *Frequently Asked Questions about H2O*, <http://www.austintexas.gov/department/frequently-asked-questions-about-h2o> (last visited July 7, 2014); Austin Water, *WaterWise Landscape Frequently Asked Questions*, http://austintexas.gov/sites/default/files/files/Water/Conservation/FAQwaterwiselandscape_0.pdf; Austin Water, *Waterwise Landscape Rebate*, <http://www.austintexas.gov/department/waterwise-landscape-rebate> (last visited July 7, 2014); Austin Water, *What Austin Needs to Know about Drought*, http://www.austintexas.gov/sites/default/files/files/Water/Conservation/DroughtMailer_Sept2013.pdf; and Official Statement, City of Austin, Texas, \$336,820,000 Water and Wastewater System Revenue Bonds, Series 2012 (2012, July 1), <http://emma.msrb.org/EA479269-EA371754-EA768559.pdf>.

- 205 Wis. Stat. § 66.0621
- 206 Wis. Stat. §§ 66.0621(1)(a) and 66.0621(1)(b).
- 207 Wis. Stat. § 67.04(b).
- 208 See *Wis. Const.* art. XI, § 3(1) (“Cities and villages organized pursuant to state law may determine their local affairs and government, subject only to this constitution and to such enactments of the legislature of statewide concern as with uniformity shall affect every city or every village. The method of such determination shall be prescribed by the legislature.”). The Wisconsin legislature has implemented this section by enacting Wis. Stat. § 66.0101, which empowers cities and villages to adopt charters. Such charters may bear on the financing of distributed infrastructure. A review of relevant charters, however, is beyond the scope of this analysis.
- 209 *E.g., Chicago, S. P., M. & O. R. Co. v. Black River Falls*, 214 N.W. 451, 453 (Wis. 1927) (“In its capacity as a governmental agency the city is charged with the duty of determining the necessity and the extent and general character of all public improvements.”); *Behnke v. Neenah*, 266 N.W. 781, 784 (Wisc. 1936) (“Such matters are as completely under the control of the municipal governing bodies”).
- 210 Wis. Stat. § 66.0819(1).
- 211 Wis. Stat. § 66.0821(1).
- 212 Wis. Stat. §§ 66.0621(2), 66.0621(4)(b).
- 213 *Bostco LLC v. Milwaukee Metro. Sewerage Dist.*, 835 N.W.2d 160, 175-76 (Wis. 2013).
- 214 Wis. Stat. § 66.0619(1).
- 215 *Outagamie County v. Town of Greenville*, 608 N.W.2d 414, 417 (Wisc. 2000) (“if a statute contains a given provision, ‘the omission of such provision from a similar statute concerning a related subject is significant in showing that a different intention existed’”).
- 216 The Wisconsin Constitution does include provisions that impose a public purpose requirement on the funds or credit of the state. See *Wis. Const.* art. VIII, § 3, (“the credit of the state shall never be given, or loaned, in aid of any individual, association or corporation,” but for certain constitutional exceptions); and art. VIII § 10 (“Except as further provided in this section, the state may never contract any debt for works of internal improvement, or be a party in carrying on such works.”). See also, *e.g., Libertarian Party v. State*, 546 N.W.2d 424, 441 (Wisc. 1996) (finding that Art. VIII, § 3, applies only to the use of state credit and not to the use of political subdivision credit, let alone the use of political subdivision enterprise revenues.); *State ex rel. La Follette v. Reuter*, 147 N.W.2d 304 (Wis. 1967) (upholding a state program to assist municipalities in leasing water pollution abatement and prevention facilities from nonprofit corporations).
- 217 *E.g., Davis v. Grover*, 480 N.W.2d 460, 474 (Wisc. 1992) (“we need not go into the origin or the validity of the doctrine which commands that public funds can only be used for public purposes. The doctrine is beyond contention.”).
- 218 *State ex rel. Warren v. Nusbaum*, 208 N.W.2d 780, 795 (Wisc. 1973).
- 219 *Wisconsin Solid Waste Recycling Authority v. Earl*, 235 N.W.2d 648 (Wis. 1975).
- 220 *Id.* at 653.
- 221 *Id.* at 659.
- 222 *Id.* at 659.
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