Water Funding:

CHALLENGES & SOLUTIONS

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In San Diego and across the arid West, local water providers are making significant investments in infrastructure to diversify water supplies, replace aging components, and improve the resiliency of our water systems for the future. While ongoing services and maintenance are meant to be covered by the ratepayers, providers often need support for major capital investments, and many are seeking new approaches to funding and financing projects. Local water providers have seen opportunities to leverage billions in state and federal funding to complete local infrastructure projects, but they also face mounting financial challenges, driven by escalating infrastructure needs, inflationary pressures, regulatory compliance, and the impacts of climate change. This report highlights some of the challenges water utilities are facing and a range of funding and financing strategies, from grants and loans to venture capital and revenue-generating strategies, that utilities may employ to make necessary investments in their infrastructure.

Executive Summary

WATER UTILITY CHALLENGES

Water utilities must navigate three competing priorities: ensuring affordability for consumers; maintaining fiscal stability; and investing in reliable, resilient infrastructure. These challenges are exacerbated by:

- **Rising costs** in energy, construction, materials, and labor make water provision more expensive.
- **Regulatory restrictions** both add to the cost of providing water and prevent utilities from developing equitable, affordable rate structures.
- **Climate change** makes both supply of and demand for water more volatile.
- **Fragmentation** and limited staff capacity limit efforts to pursue grants and recruit financing.

WATER FINANCING SOLUTIONS

This report also identifies actionable solutions to address these challenges, categorized into direct funding strategies and best management practices, described briefly below.

Direct Funding Strategies

- **Rate adjustments:** Employing incremental and tiered rate structures to balance affordability and revenue stability.
- **Leveraging assets:** Generating revenue from surplus lands, recreational programming, and resource repurposing such as energy from wastewater.
- **Private financing:** Utilizing municipal bonds and public-private partnerships to secure capital.
- **Grants and low-interest loans:** Accessing federal and state programs such as the Water Infrastructure Finance and Innovation Act (WIFIA), Drinking Water State Revolving Fund, and Clean Water State Revolving Funds to support infrastructure projects.

Best Management Practices

- **Partnerships and regionalization:** Encouraging both formal and informal collaboration among utilities to share resources, reduce costs, and improve technical capacity without full consolidation.
- **Data-driven insights:** Leveraging modern tools to optimize operations, enhance predictive maintenance, and develop equitable rate-setting mechanisms.
- **Asset life cycle management:** Implementing long-term planning and strategic investments to maintain infrastructure functionality and align costs with benefits.

This report, intended for local water utility audiences, emphasizes the need for innovative financial tools, enhanced data systems, and collaborative partnerships to balance infrastructure investments and water delivery costs. By adopting these strategies, water utilities can help to address both immediate and long-term challenges.

Introduction

Securing the nation's current and future water supply is expensive. The federal Environmental Protection Agency (EPA) estimates the 20-year capital improvement need for drinking water systems at $629 billion.[1] It estimates the need for sewage treatment, stormwater, nonpoint source pollution control, and decentralized wastewater treatment at an additional $630 billion.[2]

When local agencies make these capital investments, they create high fixed costs (in the form of debt payments) typically passed along to consumers in the form of fees. For example, the fixed share of San Diego County Water Authority's costs for providing water to local utilities exceeds 90% (as opposed to volumetric costs, which vary based on the amount of water provided). To reduce consumer costs, innovative and diverse funding sources are needed; it is often unclear, how water utilities will raise the capital necessary to cover rising fixed costs[3] while keeping consumer costs affordable.

This report provides an overview of the challenges and risks that utilities face in making long-term infrastructure investments and offers a range of actionable solutions.

From grants and loans to revenue-generating strategies and creative partnerships, agencies can employ a range of approaches to make needed investments in their infrastructure, and thereby maintain safe, resilient water services and mitigate impacts on consumer water bills.

To identify these challenges and solutions, we conducted a literature review, surveyed local water agencies to understand challenges and priorities, and conducted interviews with water finance experts across the country.

This report aims to provide a broad overview of the types of funding mechanisms that may be available to local agencies or organizations for infrastructure projects related to water, stormwater, wastewater, or energy generation from water resources (rather than a list of specific grants or funding opportunities). Some of the specific water-related financing strategies, including state and federal grants or loans, are highlighted in PIC's Water Innovations Navigator, and the Brookings Institution's Federal Infrastructure Hub offers an overview of what funding opportunities are included in the Inflation Reduction Act and Infrastructure Investment and Jobs Act.

Water Utility Challenges

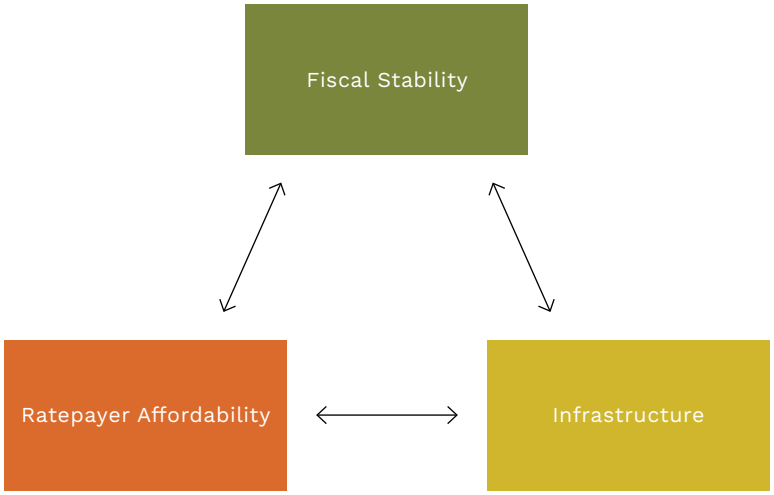
Water utilities face a variety of challenges in the short, medium, and long terms. As shown in Figure 1, utilities have three key financial priorities: (1) maintaining their own fiscal stability to ensure reliable operations and service delivery; (2) investing in infrastructure to meet regulatory standards and provide safe, reliable, high-quality water to customers; and (3) ensuring that water remains affordable for households, particularly those with limited financial means.[4] With the aim of delivering reliable, affordable water services, water utilities must consider, balance, and prioritize these factors. Moreover, each of these factors is impacted by national, state, and regional pressures, such as inflation, compliance costs, climate change, and fragmentation, as described below.

Recent Brookings Institution research highlights the immense financial strains local water utilities face, noting these entities account for 98% of direct spending on sewage and 99% on water supply, with state agencies accounting for a tiny fraction.[5] Unlike state counterparts, these local utilities heavily depend on their own-source revenues to manage rising operational, maintenance, and capital expenses. These revenues primarily come from volumetric rates and fixed fees charged to customers. However, even as these fees have steadily increased nationwide, utilities continue to face significant challenges in generating sufficient funds to meet the escalating demand for infrastructure investment and system upgrades.

INFLATIONARY IMPACTS

Inflation is exerting significant pressure on water utilities across the US, increasing both capital and operational costs. Utilities undertaking major infrastructure projects, such as new water supply initiatives and aging pipeline replacements, are particularly vulnerable to these economic shifts. Over the past five years, the estimated costs for large-scale investments such as desalination plants, advanced treatment facilities, and water conveyance systems in the Western US have doubled.[6] Even with the influx of federal funding from the American Rescue Plan Act and Infrastructure Investment and Jobs Act in 2021, water utilities have had to defer or reduce the scale of their projects as costs for certain materials rose significantly. In 2022, costs for concrete pipe (16.2 percent), copper pipe (20.8 percent), fabricated steel (39.8 percent), and PVC pipe (35.6 percent) all jumped considerably.[7] While rates of increase in the prices of these materials have moderated, those prices are not expected to decrease overall, posing ongoing challenges for utilities managing these critical projects.[8] Additionally, labor shortages and rising wages in the construction sector have further compounded project expenses.

Figure 1: Economic Trilemma for water providers



Another major factor is the impact of higher interest rates on financing. As the Federal Reserve raised interest rates to combat inflation, borrowing costs increased. Utilities are thus experiencing increased financial burdens when issuing bonds or securing loans to fund long-term projects. This has significantly affected utilities' ability to maintain affordable water rates while ensuring service reliability. Smaller utilities and those in rural areas are particularly strained, as they often lack the financial flexibility of larger, urban systems and face greater challenges in securing grants or low-interest financing.

For many utilities, inflationary impacts create a long-term fiscal challenge, as the need for critical investments in water infrastructure—especially in regions grappling with drought, climate change, and population growth—remain urgent. To adapt, some utilities are turning to innovative financing mechanisms, public-private partnerships, and efficiency-enhancing technologies to manage rising costs without overburdening ratepayers. However, the balance between ratepayer affordability, fiscal stability, and infrastructure investment remains precarious.

COMPLIANCE COSTS

Regulatory requirements, including new standards for Per- and Polyfluoroalkyl Substances (PFAS) and the Environmental Protection Agency's (EPA) updated Lead and Copper Rule as well as stormwater runoff and sewer upgrades, are placing considerable financial strain on utility capital programs across the US.[9, 10, 11] These requirements compel utilities to undertake costly compliance measures, such as advanced water treatment upgrades, widespread testing, and infrastructure overhauls. The financial burden is particularly acute in regions facing additional environmental challenges such as prolonged drought, saltwater intrusion, or contamination from industrial pollutants.[12] For smaller or resource-constrained utilities, meeting these regulatory mandates can be financially overwhelming, often diverting funds from other critical infrastructure needs or long-term resilience projects.

These stringent compliance obligations often reinforce a conservative, risk-averse culture within utilities. With regulatory deadlines looming and penalties for noncompliance, utilities feel forced to prioritize short-term actions to meet standards over innovative or transformative infrastructure investments. For instance, utilities may delay or scale back modernization projects, such as digital water monitoring systems or renewable energy integrations, to focus on achieving regulatory benchmarks. This stifles innovation and limits utilities' ability to pursue forward-looking solutions that could enhance operational efficiency and environmental sustainability over time.[13]

Compounding these challenges are political and policy challenges. Elected or appointed boards that oversee utilities often resist raising rates due to public opposition, particularly in areas where communities are already grappling with

affordability concerns. This resistance can lead to chronic underfunding of utility budgets, making it even more difficult to absorb the high costs of regulatory compliance. Unfunded mandates—where federal or state agencies impose costly requirements without providing financial assistance—further exacerbate this issue, leaving utilities to navigate compliance obligations with limited resources.[14]

The tension between utilities and regulators grows when utilities struggle to secure funding for mandates that provide broad public benefits but disproportionately burden their budgets. This imbalance can hinder collaboration and strategic planning, creating a reactive environment focused on immediate compliance rather than proactive investment in long-term water system resilience. Addressing this issue requires a multifaceted approach, including increased federal and state funding for compliance, transparent communication with stakeholders about the necessity of rate adjustments, and the development of innovative financing solutions to ease the financial pressures utilities face. Without such measures, the growing costs of regulatory compliance will continue to strain utilities, limit innovation, and undermine efforts to modernize the nation's aging water infrastructure.

CLIMATE RISKS

Climate impacts are increasingly influencing water utilities' financial viability. Utilities face growing financial strain as climate risks, such as prolonged drought, water scarcity, and extreme weather events reduce water availability and alter consumption patterns. These climate impacts force water utilities to navigate trade-offs between demand reduction, revenue loss, and the need for significant investments in supply-side enhancements. Addressing these challenges requires substantial investment, which is difficult to do when revenues are declining, and operational costs are rising.

Climate-driven financial pressures can lead to short-term decision-making that has long-term consequences. For example, utilities may defer maintenance or rely on short-term funding solutions to avoid accumulating debt. While this approach may provide temporary relief, it can result in deteriorating infrastructure, ultimately jeopardizing public safety, environmental sustainability, and system reliability. Deferred investments can exacerbate existing vulnerabilities, increasing the risk of infrastructure failures and associated health impacts.

WATER SCARCITY

Climate change worsens water scarcity, creating the need for water agencies to build a resilient supply of water. One key tension arises between environmental management practices—such as promoting conservation—and financial sustainability.[15] While water conservation initiatives are essential to manage scarcity and support environmental goals, they can result in reduced customer demand. Lower water usage translates to reduced utility revenues, even though the fixed costs of delivering safe and reliable water remain high. This revenue shortfall can exacerbate financial stress, as utilities struggle to cover operating expenses and repay debts.

Further compounding these challenges is the high cost of developing new water supply sources. Infrastructure projects like desalination plants or long-distance pipelines are often pursued in response to water scarcity but are significantly more expensive than traditional surface or groundwater sources. These costly investments raise utilities' overall expenditures, but their ability to recover these costs through rate increases is politically and practically constrained. Affordability concerns, particularly for low-income ratepayers, create resistance to rate hikes, leaving utilities with limited options to balance financial and environmental priorities.

Utilities must also navigate competing demands on limited water resources, including serving residential customers, industrial and agricultural users, and environmental needs. Balancing these priorities becomes increasingly difficult as water scarcity intensifies. Unlike acute issues such as lead contamination, where the risks and solutions are more concrete, the solutions for running out of water are harder to define. This ambiguity makes it challenging to evaluate trade-offs between financial investments and environmental considerations.

FRAGMENTATION

The fragmentation of water utilities into many small, independent districts creates financial and operational challenges. Smaller districts, often serving limited customer bases, struggle to generate sufficient revenue to fund infrastructure investments and ongoing operations. Their smaller scale also makes it more difficult to issue and service debt, limiting their ability to finance critical projects or have programmatic flexibility.[16] Additionally, many small districts (both urban and rural) are managed by volunteer boards or have limited staffing capacity, which makes it difficult to address complex challenges such as infrastructure financing, long-term planning, and regulatory compliance. Without sufficient administrative capacity, technical expertise, or connections, these utilities struggle to navigate the complex application processes associated with applying for federal and state grants, securing loans, or pursuing refinancing options that could alleviate financial burdens.

Staffing shortages impact water utilities of all sizes. In 2023, the Centers of Excellence for Labor Market Information released a report detailing shortages and staffing gaps among water and wastewater occupations in California.[17] The jobs in that report could also be shared across water utilities, not because utilities can't support the cost, but because there are too few trained workers in the area. The COE report offers recommendations for utilities and community colleges to expand or build local training pipelines for these occupations.

Case Study

San Diego's water supply has long been under threat to climate change. With limited local water supply, the last three decades have seen large infrastructure investments to ensure a diverse, resilient water source.

The unfortunate consequence of these investments is that both the County Water Authority and local utilities carry a heavy burden of locked-in costs from past infrastructure expenses (see PIC's report on the Story of San Diego's Water). While these investments were viewed as necessary to insure against drought risks, they were developed to meet a projected level of demand that never materialized. Projects such as the Carlsbad Desalination Plant often involve long-term contracts, such as pay-for-purchase agreements, which obligate utilities to buy water regardless of actual demand. As water efficiency and conservation efforts have reduced consumption, utilities are now financially tied to infrastructure commitments that no longer align with usage patterns.

This imbalance between supply-side investments and shrinking demand has created a revenue shortfall, as the fixed costs of maintaining infrastructure remain high even while sales decline.

It is important to note, however, that while the investment in infrastructure has resulted in a water system that is larger than what is necessary to meet current demand, the extra capacity may help the region to maintain water supply during worsening climate change. With the western United States still experiencing an ongoing megadrought (as of January 2025), extreme heat (the 10 warmest years on record have all occurred since 2015), and increasing fire risk and extreme weather event frequency and severity (e.g., atmospheric rivers), the importance of a secure water supply is paramount to regional stability.[18, 19, 20]

Moreover, with the world on pace to miss Paris Agreement targets of reducing global average temperature increases to 1.5˚C above pre-industrial levels, made more likely with the United States' withdrawal from the accords, the climate challenges described above likely will worsen in terms of frequency and severity over the coming decades.[21, 22] With current uncertainty in the global, national, and state economies, these infrastructure investments will reduce San Diego's reliance on external water supplies and reduce the risk of economic disruptions due to price fluctuations associated with importing water or water shortages.

Water Funding & Financing Solutions

Utilities have a robust history of predicting water use and modeling financial performance (to learn more about modeling efforts in San Diego, see PIC'S Story of San Diego's Water report).[23] With a changing climate, both environmentally and economically, water utilities require innovative solutions to tackle these and other challenges. More specifically, water utilities are exploring alternative revenue sources and strategies to enhance financial resilience and meet growing operational (and capital) demands. Examples of this include changes in stormwater fees, reallocating budget, and leveraging utility-owned land for revenue generation.[24] Importantly, rate adjustments remain the most turned-to tool for stabilizing revenues, including incremental increases in volumetric rates and tiered structures to balance affordability and sustainability (to learn more about the impacts of high-water rates on San Diegans, see PIC's Water Affordability report).[25] Utilities are using data-driven tools and systems to improve efficiency and optimize their asset management. Other promising, emerging options include regional collaboration and federal funding, which can further support small, fragmented utilities by pooling resources, facilitating access to low-interest loans, and enabling sustainable financial and operational management.

RATE ADJUSTMENTS

Rate adjustments are a primary mechanism that water utilities use to address financial challenges and infrastructure needs, particularly in response to higher costs brought on by inflation or evolving regulatory compliance requirements. Utilities are increasingly using data platforms like the American Water Works Association's Water and Wastewater Rate Surveys to evaluate their financial health, rate affordability, and other operational information, both internally and when compared to others across the country.[26] By implementing regular and strategic rate adjustments, utilities can maintain their overall financial stability and credit quality, ensuring they have the capacity to secure funding for necessary future projects.[27] Proactively adjusting rates also enables utilities to absorb financial shocks, such as unexpected expenses or inflationary pressures, without compromising the reliability of water services.

Utility companies can adopt rate adjustment strategies to balance revenue stability with affordability.[28] Incremental rate increases allow for gradual changes over time, avoiding sudden, large hikes in rates that could create sudden, substantial affordability challenges for customers. Adjustments to base charges, such as connection charges, provide a consistent revenue stream even when water consumption declines. Additionally, tiered rate structures, in which users pay higher rates as they use more water, encourage conservation, and ensure that lower-income households are less affected by price increases.

Many utilities face legal and policy constraints in rate design. In California, for instance, Proposition 218 limits utilities' ability to base rates on factors such as income, instead requiring rates to reflect the direct cost of providing service.[29] Despite these challenges, innovative models are emerging nationally to address affordability concerns. For example, Detroit has created an income-based water affordability plan, demonstrating an alternative pathway for ensuring equitable access to water while maintaining financial sustainability.[30] These efforts highlight utilities' growing recognition of the need for solutions that balance fiscal responsibility with social equity. (See PIC's report on Customer Assistance Programs for more information about what can be done to assist low-income residents with their water bills under Proposition 218.)

Transparent communication with the public remains essential throughout the rate adjustment process. Engaging customers in clear, open dialogues about the reasons for rate changes may help utilities build trust, foster understanding, and increase community support.

REVENUE FROM EXISTING ASSETS

Municipal and water utilities often own a range of physical and recreational assets that can simultaneously provide public access to recreational opportunities and generate revenue.[31] These assets not only provide potential funding streams for operations and maintenance but may also unlock grant and financing opportunities for investments, though caution should be heeded to avoid obfuscating the true "cost" of water among consumers.

Utilities can establish mitigation banks for habitat restoration, wetland preservation, or conservation easements. Mitigation banking involves protecting land owned by municipal water agencies and selling mitigation credits to developers seeking to offset adverse impacts of their project development.

Similarly, utility-owned land, such as areas surrounding reservoirs, can be evaluated for revenue potential by leasing land for solar development, cell towers, or other productive uses. The Philadelphia Water Department has conducted land valuations to explore these opportunities, providing a model for maximizing the utility of land holdings.[32]

Recreational programming is another viable revenue stream. By enhancing or developing facilities such as parks, trails, or water-related activities like fishing and kayaking, utilities can attract users and collect fees. These efforts not only support financial goals but also foster community engagement and promote the public's connection to water resources.

Resource repurposing allows utilities to generate additional revenue. For example, energy produced from wastewater treatment processes can be harnessed and sold, providing a supplementary income stream. The US Department of Energy has developed a national map of individual treatment plants that are reclaiming and repurposing resources, including dozens in California and the Southwest.[33]

Selling surplus or underutilized land offers an immediate financial boost that utilities can reinvest into critical infrastructure projects. This approach enables utilities to unlock capital while addressing pressing operational or maintenance needs.

Utilities are also incentivizing businesses to invest in water-efficient technologies and practices, which can lead to cost savings and new revenue opportunities. Milwaukee's Water Council[34] exemplifies this approach, fostering collaboration between local utilities and businesses and other partners to drive technological innovation in water management. (Readers can find more information about water-saving technologies and practices, along with their benefits and ideas about how to fund them in our Water Innovations Navigator.)

BONDS & PRIVATE FINANCING

The municipal bond market provides local governments and utilities with readily accessible financing options. Bonds remain particularly attractive due to the stable nature of water utility revenues. Typically, investors view water utility debt as low risk, allowing water utilities to access favorable interest rates and pricing. However, investor perceptions may be changing and issuing these bonds to leverage capital requires voter approval. A major advantage of municipal bonds is their tax-exempt status, which significantly reduces the overall cost of capital. This makes municipal bonds an efficient and affordable option for funding water infrastructure projects.

Another option is the use of public-private partnerships (PPPs), which are gaining attention as a politically expedient way to address financial challenges, particularly for regional water infrastructure projects where utilities may lack capital or face significant uncertainty. PPPs in the water sector are a partnership between a local government and a private entity. They often differ from traditional partnerships, as water is considered a public good rather than a typical revenue-generating asset. This creates unique revenue and risk profiles that require careful evaluation. Since PPPs that create a public good rather than revenue generating assets are an evolving model, water utilities must assess whether PPPs align with their specific financial needs and constraints to ensure the partnerships are effective and sustainable.[35] Engaging with venture capital and private equity investors offers the potential to support innovative pilot programs and early-stage technologies, fostering public-private partnerships that align with long-term infrastructure and sustainability goals. Climate-focused funds, such as Greenhouse Gas Reduction Funds,[36] further expand these opportunities by offering low-interest or forgivable loans to scale commercially viable technologies.

ENHANCED DATA & ANALYTICS

Data-driven decision-making is an increasingly important component to address affordability challenges and ensure equitable, sustainable, and effective water financing strategies.[37] Enhanced data collection on service areas and customer demographics strengthens utilities' ability to evaluate financial capabilities accurately. This alignment requires a commitment to investing in data and technology infrastructure, which often includes modernizing metering systems, improving leak detection, and integrating advanced tools like Geographic Information Systems (GIS).[38] GIS provides a centralized platform to coordinate and manage both physical and land-based assets, allowing utilities to assess spatial relationships, prioritize preventive maintenance, and improve cross-departmental coordination. These capabilities reduce costs, enhance efficiency, and support long-term asset management decisions.

Investments in data systems also enable predictive maintenance, leveraging real-time data to anticipate repairs and avoid unexpected failures that could disrupt services or inflate costs. Despite the critical role of these systems, utilities frequently deprioritize funding for data and technology during revenue shortfalls, undermining operational efficiency and transparency. To avoid this pitfall, utilities should allocate dedicated budget line items specifically for technological advancements and data management systems. Clear and consistent funding for these areas ensures that utilities can maintain high levels of operational efficiency while improving financial transparency. Ultimately, this focus on data-driven insights not only supports fiscal sustainability but also reinforces the trust and accountability that utilities must uphold with their stakeholders.

Metrics such as Income Dedicated to Water Services (IDWS) offer detailed insights into the financial burdens faced by households, moving beyond representative income measures like median or low-income thresholds.[39] By analyzing the proportion of income that households across different income levels allocate to water services, utilities can identify the depth and distribution of affordability challenges for a broader range of customers within their service areas. This granular approach enables more informed rate-setting decisions and helps utilities design assistance programs to alleviate financial strain across a wider customer base. Robust data collection and evaluation also allows for water utilities to better model revenue generation from low-income and disadvantaged communities as well as more effectively set rates that balance affordability and fiscal stability.[40, 41, 42] (For more on these subjects, see PIC's reports on Water Affordability and Customer Assistance Programs.)

ASSET LIFE CYCLE MANAGEMENT

Asset life cycle management includes maintenance, rehabilitation, and replacement of infrastructure based on long-term planning to maintain and extend the value of water infrastructure and ensure long-term functionality.[43] Utilities can adopt strategies that prioritize proactive and data-driven decision-making to align infrastructure costs with revenue impacts while adapting business practices to changing conditions.

Predictive maintenance is a critical, and long established,[44] part of asset lifecycle management, enabling utilities to use real-time data to anticipate repairs, minimize unexpected failures, and optimize asset performance. By conducting regular assessments to evaluate the condition and remaining lifespan of assets, utilities can make informed decisions about when to repair or replace critical components and reduce the likelihood of costly emergency interventions.

Strategic capital planning further supports asset life cycle management by directing investments towards critical needs and aligning long-term service goals. This approach ensures that utilities allocate resources effectively, balancing immediate operational requirements with future demands.

Financing mechanisms like pay-as-you-use borrowing, such as municipal bonds, provide a practical means to fund larger projects. By spreading repayment over the lifespan of the asset, utilities can ensure that the costs are manageable and aligned with benefits derived from the infrastructure, alleviating short-term financial pressures, and ensuring that current and future users share the costs equitably.

STATE AND FEDERAL LOW-INTEREST LOANS

Low-interest loans offered at the Federal and State levels provide another mechanism for local utilities to access the capital needed for water, sewer, and stormwater infrastructure projects. Notably, these loans are susceptible to change during political transition, particularly as related to the Infrastructure Investment and Jobs Act. Table 1 shows some programs that offer these loans.

Federal and state programs, such as State Revolving Funds (SRFs) and other low-interest loan options, enable utilities to reduce borrowing costs and debt service burdens, particularly for smaller systems that may struggle with limited resources. To be sure, application and reporting requirements still pose challenges for smaller water utilities. Yet by leveraging these programs, utilities can finance essential infrastructure improvements, including innovative projects like advanced metering systems, without placing added cost burdens on ratepayers. Table 2 includes examples of WIFIA projects in the San Diego region that are currently underway, applied to, or paused.[45]

FEDERAL AND STATE GRANTS

Approximately a dozen state and federal agencies provide grant funding to local entities for various water, wastewater, and stormwater infrastructure (see Table 3). Importantly, federal grants are diverse in their design, and may be awarded as any of the following:[46]

- Mandatory grants—awarded to any entity that applies and meets the minimum eligibility requirements established in the authorizing law.
- Formula grants—a type of mandatory grant, with authorizing legislation and regulations that define awards based on statistical criteria.
- Block grants—generally awarded to states or directly to local governments for a broadly defined function.
- Discretionary grants—awarded to recipients based on merit and eligibility on a competitive basis.
- Cooperative agreements—differ from grants in that they include substantial involvement from the federal awarding agency.

TABLE 1: SAMPLE OF STATE AND FEDERAL LEVEL LOW-INTEREST LOANS

Program Name	Description of Program
California Clean Water State Revolving Loan Fund	Offers low-cost financing for a wide variety of water quality projects.
Drinking Water State Revolving Loan Fund	Assists public water systems in financing the cost of drinking water infrastructure projects needed to achieve or maintain compliance with the Safe Drinking Water Act.
California Infrastructure and Economic Development Finance Bank	California's iBank has broad authority to issue tax-exempt and taxable revenue bonds, provide financing to public utilities, provide credit enhancements, acquire or lease facilities, and leverage State and Federal funds. IBank's current programs include the Infrastructure State Revolving Fund (ISRF) Loan Program, Expanding Venture Capital Access Program, the Climate Catalyst Revolving Loan fund, Small Business Finance Center, and the Bond Financing Program.
Water Infrastructure Finance and Innovation Act of 2014 (WIFIA)	A federal credit program administered by the US Environmental Protection Agency for eligible water and wastewater infrastructure projects. Local, state, tribal, and federal government entities, partnerships, corporations, and trusts are eligible to apply for long-term, low-cost supplemental loans for water treatment and distribution; wastewater conveyance and treatment; energy efficiency projects at drinking water and wastewater facilities; desalination, aquifer recharge; and water recycling projects; and property acquisition integral to the project or to mitigate environmental impacts of a project.

TABLE 2: EXAMPLE OF WIFIA-FUNDED PROJECTS OR APPLICATIONS IN SAN DIEGO REGION

Project/Program	Description
City of San Diego Pure Water Project	The City of San Diego, backed by a $120 million loan, will construct a new water reuse/recycling facility to produce 30 million gallons per day (MGD) of purified water. This is the first phase in its multi-year Pure Water Program that will use proven technology to clean non-potable reused/recycled water into safe, high quality, drinking water and provide one-third of the City's water supply by 2035. This purified reused/recycled water will blend with imported and locally sourced water and will be treated again at the Miramar Water Treatment Plant before being distributed to the public.
East County Advanced Water Purification Project	The Advanced Water Purification Project, backed by a $388 million loan, will create a new, local, sustainable drinking water source in a water-stressed area, reducing the region's dependence on imported water and increasing climate resilience. The project treats East County's wastewater locally for reuse by producing purified water that is sent to the Lake Jennings Reservoir, the county's local drinking water supply source, for surface water augmentation. The project will treat up to 16 MGD of wastewater and produce purified water to meet up to 30 percent of East County's drinking water demand.
Helix Water District Drinking Water Reliability Project	The Drinking Water Reliability Project in San Diego County, backed by a $19 million loan, will increase the region's drinking water source resiliency by expanding water reuse opportunities and reducing reliance on imported water. It will replace 30% of water needs currently met by increasingly strained regional sources with purified water conveyed from the East County Advanced Water Purification project.
City of San Diego Stormwater Capital Improvement Program	The Stormwater Capital Improvement Program in San Diego, backed by a $255 million loan, will protect water quality, enhance water supply, and restore natural habitats to help meet water quality goals required under the municipal separate storm sewer system (MS4) permit. This WIFIA loan supports the design and construction of both traditional and green infrastructure projects. Captured stormwater flows will be directed to innovative multi-benefit stormwater management technologies to reduce untreated runoff entering the Pacific Ocean.
Pure Water Oceanside & Lower Recycled Water Distribution System Expansion Project	The City of Oceanside's Pure Water Oceanside Project, backed by a $69.1 million loan, will purify recycled water to create a new, local source of high-quality treated water that is clean, safe, drought-proof and environmentally sound. This water reuse project includes constructing a new Advanced Water Purification Facility and expanding the existing recycled water distribution system. The project will recharge the Mission Basin with highly purified recycled water to improve overall water quality in the aquifer, relieve over-pumping conditions, and reduce discharges to the Pacific Ocean.
City of Escondido Lake Wohlford Dam Replacement Project (Applied)	The project entails the replacement of the existing Lake Wohlford Dam, which is a City-owned facility located in the rural foothills of the unincorporated County of San Diego, approximately 0.5 miles east of the City's incorporated boundaries and 5 miles northeast of the City's downtown center. The City proposes to construct a new dam downstream (west) of the existing dam and partially deconstruct the existing dam.
City of Oceanside Buccaneer Sewer Lift Station & Force Main Project (Paused)	The Buccaneer Sewer Lift Station and Force Main Project will optimize and enhance the City's wastewater system by redirecting sewage flows from the aging La Salina Wastewater Treatment Plant to the existing San Luis Rey Water Reclamation Facility for treatment and injection into the Mission Groundwater Basin. The purpose of the project is to increase the local production of potable and recycled water to enhance supply reliability and reduce imported water purchases.

TABLE 3: FEDERAL AND STATE AGENCIES WHICH PROVIDE WATER INFRASTRUCTURE GRANTS

Federal Agencies *(Opportunities posted on Grants.Gov)*	**State Agencies** *(Opportunities posted to California Grants Portal)*
US Environmental Protection Agency	California Department of Water Resources
US Dept of the Interior, Bureau of Reclamation	California State Water Resources Control Board
US Department of Commerce, NOAA	California Coastal Commission
US Department of Agriculture	California Coastal Conservancy
US Fish and Wildlife Service	California Ocean Protection Council
US Department of Homeland Security, FEMA	California Environmental Protection Agency
US Army Corps of Engineers	California Wildlife Conservation Board

BEST MANAGEMENT PRACTICES

Identifying priority projects and aligning those projects with potential opportunities can maximize water utility resources and impact. Water utilities can also leverage regionalization practices, data insights, and asset life cycle management to optimize their operations and reduce costs.

WATER FUNDING STRATEGY

Knowing what resources are available for funding water infrastructure projects is an important start to creating a water financing strategy or a Financial Capability Assessment to understand the economic impacts to public entities and their customers. Financial Capability Assessments are important tools to "support affordable utility rates while planning investments in water infrastructure that are essential for Clean Water Act implementation."[47] The next steps should include identifying priority projects and considering which potential funding sources might be a good fit for those projects, conducting pre-planning and scoping activities, and engaging potential partners and collaboration strategies.

PARTNERSHIPS & REGIONALIZATION

For water utilities, regionalization means building formal and informal partnerships across utilities in the same geographic area. Regionalization provides tangible financial benefits, capacity building, and resource sharing, but requires building relationships and trust across utilities with different responsibilities and interests.[48]

Through regionalization, small water systems can access financing options that would otherwise be out of reach. Small utilities, for example, can collaborate through shared staffing arrangements or regional partnerships. Through the pooled resources, utilities can hire or contract specialized personnel—such as grant writers, financial analysts, or engineers—who can focus on identifying and applying for available funding opportunities, such as federal infrastructure grants or low-interest loans to tackle critical infrastructure projects. By sharing resources, small systems are better positioned to explore shared infrastructure initiatives and operational efficiencies, reducing overall costs and debt burdens.

The benefits of regionalization extend beyond finances. Collaborative efforts create opportunities for small systems to access technical assistance and capacity-building programs that can improve financial management and long-term planning. Additionally, regionalization fosters partnerships and social cohesion, empowering water systems to address broader environmental and systemic challenges.

Importantly, regional collaboration does not require full consolidation. States and regions are experimenting with innovative administrative models that overlay existing boundaries, such as groundwater control districts. These models preserve local autonomy while enabling the resource-sharing and coordination necessary to meet financial and environmental goals.

Efforts to embrace regionalization are particularly evident in the Western and Southwestern United States, where financial hardships have spurred water utilities to collaborate. In these regions, water systems are adopting data-driven decision-making and conservation programs to improve operational efficiency and ensure long-term sustainability. For example, regional water utilities are developing conservation practices that enhance financial planning for environmental and resiliency initiatives.

Several successful examples of regionalization highlight its transformative potential. In California, Joint Powers Authorities (JPAs) allow jurisdictions like Los Angeles and its 20 sanitation districts to collectively manage water reservoirs and wastewater systems, demonstrating how shared governance can lead to sustainable resource management.[49] Similarly, the Oklahoma Water Resources Board hosts quarterly meetings that provide a platform for water systems of all sizes to connect with funding sources, technical assistance providers, and potential partners.[50] Another example is the San Diego County-Imperial County JPA, which produced the Quantification Settlement Agreement (QSA), which has resulted in San Diego diversifying its water supply while also improving resilience.[51] In Northern New Mexico, the formation of the Aguas Del Norte Alliance showcases the power of grassroots regionalization.[52] The alliance began when a single struggling water system reached out to neighboring communities for support. Together, they established a unified mission, developed a collective identity, and brought in state partners like the New Mexico Environment Department to bolster their efforts. This alliance has since inspired other small systems to pursue similar collaborative models.

As seen in the Enhanced Data & Analytics section above, data-driven decision-making is also playing a critical role in strengthening regionalized utilities. The San Francisco Public Utilities Commission (SFPUC) has embedded data into its operations, refining rate-setting processes and optimizing water use tracking.[53, 54] By relying on robust data, SFPUC ensures financial sustainability while promoting responsible resource management.

Finally, collaboration on conservation programs can help build resilience and maintain a durable water supply. For instance, the Moulton-Niguel Water District in California has implemented efficiency measures to better manage its medium-sized utility.[55] These efforts not only reduce operational costs but also support environmental stewardship and long-term financial planning.

In summary, regionalization is not just a financial solution nor a formal merging of utilities; it is a flexible framework for building stronger, more sustainable water systems that continues to evolve as regions explore what regionalization means for them. By fostering partnerships, leveraging data, and prioritizing conservation, regionalized systems can overcome financial barriers and contribute to the environmental and social well-being of their communities. The experiences of regions like the West and Southwest demonstrate how tailored strategies can address the unique challenges of local water utilities while paving the way for a more sustainable future.

Conclusion

The financial landscape for water utilities across the United States is becoming increasingly complex, shaped by a confluence of rising infrastructure demands, inflationary pressures, regulatory compliance costs, and climate change impacts. As outlined in this document, these challenges require innovative solutions, proactive planning, and a commitment to balancing affordability, sustainability, and fiscal responsibility. Smaller utilities in particular face unique hurdles stemming from limited staffing, volunteer governance boards, and insufficient expertise to access funding opportunities.

Regional collaboration and innovative financing mechanisms are emerging as critical pathways to address these challenges. Shared staffing models, regional partnerships, and Joint Powers Authorities (JPAs) enable smaller and fragmented utilities to pool resources, reduce costs, and increase access to low-interest loans, grants, and technical assistance. These collaborative efforts also foster trust, operational efficiency, and resilience in the face of environmental and financial pressures.

Rate adjustments, despite their challenges, remain a necessary tool to ensure utilities can maintain operations while investing in long-term infrastructure needs. Transparent communication and equitable rate structures, such as tiered rates and income-based affordability plans, are crucial to gaining public support and ensuring fairness. Innovative revenue-generating strategies, including leveraging existing assets, stormwater fees, and public-private partnerships, can further help utilities diversify income sources and reduce financial vulnerability.

Data transparency and advanced technology adoption are equally essential in modern water utility management. Investments in Geographic Information Systems (GIS), predictive maintenance, and metering systems can improve efficiency, lower costs, and provide critical insights for decision-making. These technologies not only enhance operational performance but also build public trust by demonstrating accountability and sustainability.

This report also highlights the critical role of state and federal funding programs, such as the State Revolving Funds and Water Infrastructure Finance and Innovation Act (WIFIA), in supporting local utilities. These programs reduce borrowing costs, particularly for smaller utilities, and enable essential investments in water, wastewater, and stormwater systems. Case studies, such as San Diego's Pure Water Project and the East County Advanced Water Purification Project, underscore the importance of leveraging these funding opportunities to address water scarcity, climate adaptation, and system resilience.

In conclusion, the challenges facing water utilities are significant, but they are not insurmountable. By adopting a multifaceted approach—integrating regional collaboration, innovative financing, equitable rate structures, advanced technology, and federal support—utilities can navigate the complexities of water management in the 21st century. Proactively addressing these challenges will ensure the long-term sustainability of water systems, protect public health, and support economic and environmental resilience. The strategies outlined here provide a framework for utilities to build a more robust, equitable, and future-ready water sector, benefiting communities across the United States for generations to come.

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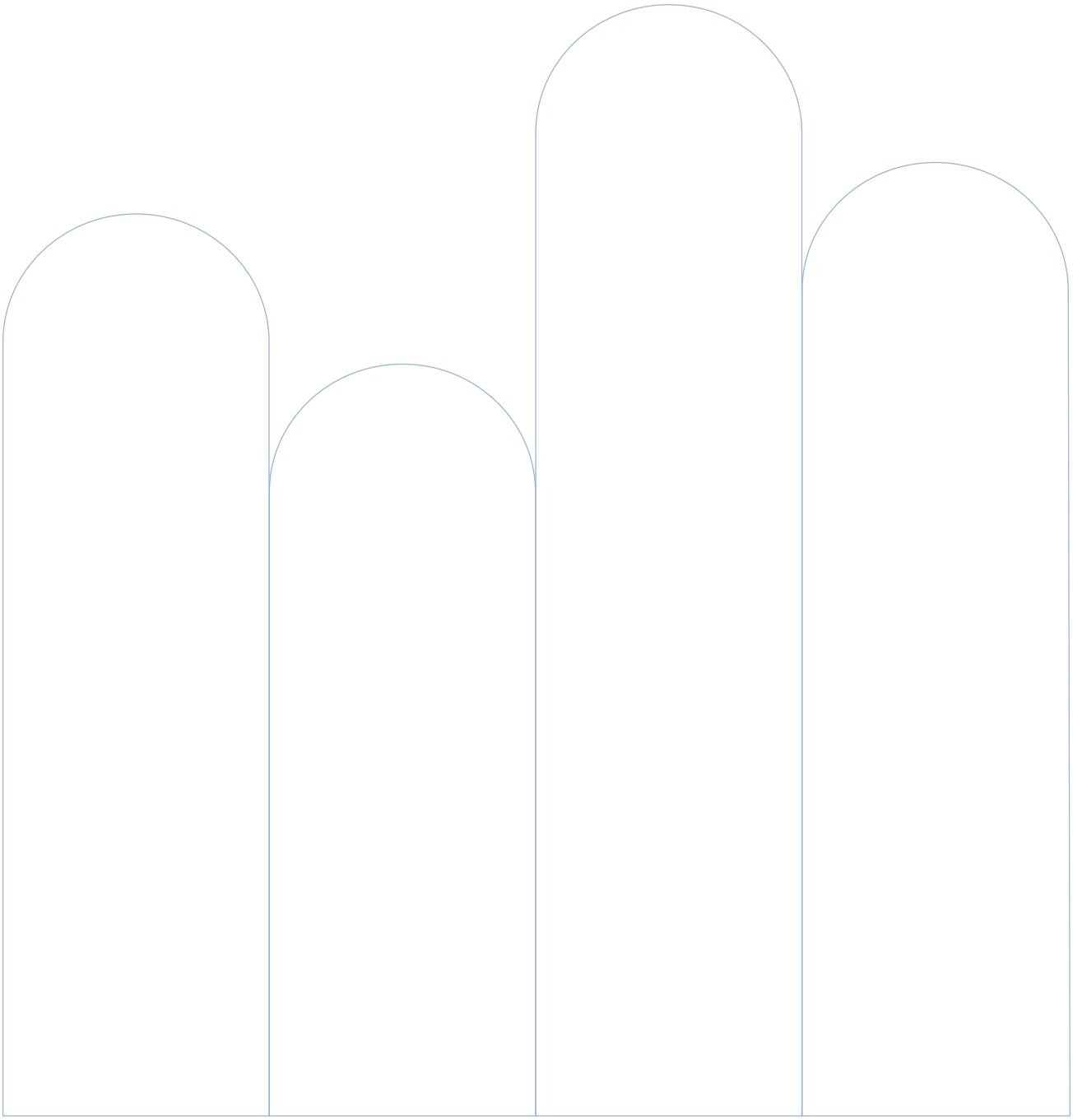

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