WATER AND SEWER INFRASTRUCTURE: CORRECTING UNDERINVESTMENT WITH SMART SPENDING

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Purpose

Following our analysis of ARPA plans for water and sewer investments, we interviewed city officials in four cities to gain a deeper understanding of their water and sewer plans. We asked them to explain their water and sewer investment strategy and the long-term vision for their system, looking at how their strategy matched with equity goals (Figure 1). We discussed how they identified underserved communities and asked what major barriers they faced in implementing these visions. The cases below provide a look into what has allowed these agencies to succeed in leveraging ARPA to achieve their vision.

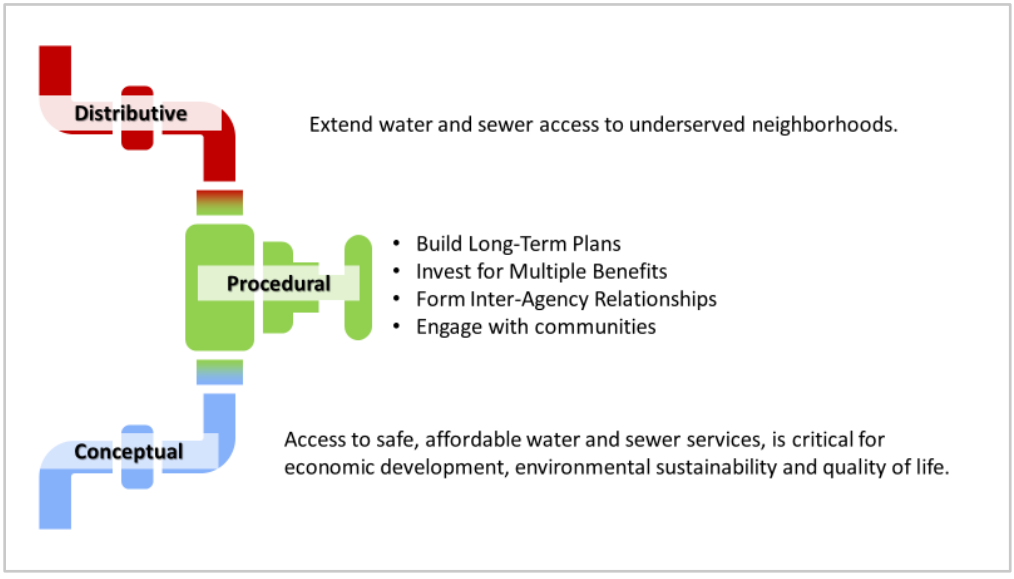

Figure 1: Equity in water and sewer infrastructure

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Case I - Buffalo, NY

In May 2021, Buffalo received $331 million in ARPA funds from the federal government. In their initial investment allocation, the city invested around $63 million in projects related to water and sewer infrastructure for nearly a fifth of their total funding. For their climate and public health goals, the City of Buffalo has been working across agencies and in collaboration with stakeholder organizations to address water and sewer challenges. For example, city representatives actively participated in Health Foundation of Western and Central New York sessions with various field researchers, community leaders, health care specialists, and housing advocates to broaden and deepen their understanding of ARPA as a potential solution to these concerns. In addition, the city conducted a city-wide survey to better reflect residents' views on ARPA funding priorities, and then, the city merged existing research findings with these survey results.

Buffalo's Replacing Old Lead Lines (ROLL) program, started in 2019, is the city's key ongoing water and sewer project, and $10 million in ARPA funds will be spent on expanding ROLL. In Buffalo, like in other cities, property owners bear responsibility for repairing lead service lines. Since renters account for 60% of Buffalo's housing market and the poverty rate exceeds 30%, long-term lead line replacement has been a challenge. To prevent escalating burdens on households, the funding for the ROLL pilot program came through state grant initiatives totaling $822,000, which allowed Buffalo Water to replace lead service lines and repair leaks in approximately 180 households. Thanks to ARPA, the city will be able to accelerate its original seven-year timeline and make a meaningful impact on its citizens' quality of life. The program was sparked by the 2016 discovery that children in the city had significant rates of elevated lead levels in their blood, and replacing lead pipes helps extend the lifespan of the elderly and create better life outcomes for children.

To continue protecting the most vulnerable communities from the consequences of lead poisoning, Buffalo aspires to go beyond mere pipeline repair and replacement, by also improving water treatment. Buffalo is trying to build a water and sewer system that can lead the country by restricting lead levels to 5 ppb(parts per billion), which is 1/3 of the EPA's

average permitted threshold of 15 ppb. In addition to replacing aging lead lines, Buffalo has a pipeline of projects to address the city's stormwater challenge.

To invest in multiple benefits, the city of Buffalo has allocated $40 million to a transportation plan, which includes smart sewer and water infrastructure buildout. The plan seeks to improve the efficiency and quality of service in those neighborhoods most affected by the pandemic. This includes a residential affordable water program that leverages smart meter technology to facilitate equitable water use management to address stormwater concerns through street design strategies in their Raincheck Buffalo Program. In our interview, machine learning techniques were mentioned as a way to keep constant metrics on the city's success in program delivery. Within these Raincheck projects, Buffalo created its own "equity index" to account for the indirect benefits of investing in green infrastructure systems.

Additionally, $13 million will be spent to lower the financial burden for vulnerable users in the water and sewer system, including a forgiveness plan. 33,000 low-income residents, mostly from black and brown neighborhoods, are eligible for debt relief for service fees under the program. The target residents receive the advantage of not having to apply separately, but instead can automatically see on their bill, where the program lowered their burden. The city's robust programs demonstrate the benefits of long-term multidimensional water and sewer planning. The city sees the long-term impact their ARPA investment can have and has set ambitious goals to create a great 21st-century sewer system, by looking at how to protect public health, improve disaster resilience, and make the economics of their system work.

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Case II - Polk County, FL

Polk County has been one of the fastest growing counties in the United States for decades, which often leaves legacy communities behind as infrastructure development focuses on new growth. With climate change leading to increased rain in the State of Florida, Polk County's Roads and Drainage division works on projects that serve to alleviate flooding and improve water quality in the County. They maintain a long unfunded list with decades worth of projects developed from community complaints that provide a clear plan for meeting the needs of the county to respond to present and future climate trends. The limitations of county funding often mean that projects only get funded in response to the damage from a large flood. ARPA provides Polk County an opportunity to proactively invest in stormwater infrastructure that will lower the costs of future repairs and help clear more funding for new investment. By keeping a thorough long-term vision, the County can immediately allocate ARPA funding to investments that lower future costs and improve the quality of life for residents.

ARPA funds provide Polk County opportunities to address projects long on the backburner. As drainage systems are often invisible, people only think about them when problems with flooding or plugging occur. Thus, many drainage projects in Polk County fall behind the priority list. Polk County hires consultants to conduct specific pre-engineering analysis to look at potential alternatives and develop proposals for these unfunded projects. Thus, when ARPA funds were offered, they could identify 15 projects with the Polk County council that would make the most effective investment targets.

Polk County's unpredictable tropical climate and frequent hurricanes mean that flooding should always be expected and half of Polk County is designated as a Special Flood Hazard Area. With their ARPA funding, Polk County intends to develop a network of stormwater wetlands to control flooding issues. In addition, this stormwater infrastructure will also improve the water quality of local water bodies, which suffer from high concentrations of nutrients and E. coli. Improving water quality is very important for public health in the rural areas of Polk County, where algal blooms can damage the entire ecosystem.

Polk County's continued population growth puts it in a state of rapid urbanization. It is located in the middle of Tampa and Orlando and attracts over 15,000 new residents per year. The increasing demand for residential neighborhoods imposes heavy burdens on protecting natural wetlands and providing drainage services, and Polk County coordinates with local municipalities to implement stormwater projects that enhance the regional adaptation to extreme rainfall and improve water quality for residents.

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Case III - Geneva, NY

Geneva, NY is a small city of 12,787 people in Upstate New York, which faced strong challenges from the COVID-19 pandemic. During the pandemic, a sharp reduction in water usage led to revenue losses from water utilities, which placed large strains on municipal finances. This shortfall could have set the system into a cost spiral. The absence of funding for expected maintenance would have damaged affordability for the system, as well as restricted the ongoing works on a range of water and sewer projects that were identified as essential to enable access to good quality water for all residents.

Some of these projects in the pipeline included new roofing for the chlorine building, replacing the micro filter tank, an additional digester for the wastewater treatment plant, replacing any lead lines, and capital renewal for the Marsh Creek Pump Station, which greatly expanded the city's ability to stop the infiltration of stormwater. Geneva used the ARPA funds to replenish revenue loss as well as prioritize operations and maintenance and capital expenditure for water and wastewater projects that were needed. By doing so, they were able to cover losses without requiring an increase in rates, as well as provide aid to delinquent payers in the system. Additionally, it improved the ability of the city to serve a growing population on the city's northside. ARPA allowed Geneva to avoid long-term damage from the pandemic while helping finance new and old capital projects that improve its service to citizens.

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Case IV - St. Augustine, FL

The West Augustine area near St. Augustine is set to receive connections to sewer pipelines through St. Augustine's septic to sewer conversion project. Out of the $7.6 million received from ARPA, St. Augustine is utilizing $2 million to connect households with septic tanks to adjacent sewer lines. St. Augustine is prioritizing spending outside its municipal boundaries on the community of West Augustine, a heavily black and historically underinvested neighborhood, completing the goal of bringing full sewer service to the area for the first time. These investments break the history of underinvestment in these areas and ensure all households can receive an adequate minimum level of service.

In the late 2000s, Trunk lines were connected to cater to the residents of the West Augustine area. However, the project had failed to account for the expenses of hooking up and installing new plumbing, often costing upward of $15000 per home, which were out of the reach of local residents, leaving the newly built sewer lines unused for over a decade.

ARPA funds were recognized as a way to accelerate the ongoing effort to remedy the service gap, by paying the cost of connecting all unhooked houses to adjacent sewer lines. Beyond this project, the city is prioritizing expanding and improving its infrastructure for the transmission, distribution, and storage of water. With this investment, they expect to significantly reduce residents' recurring expenses on frequent sewer maintenance by about $500 per month. Beyond these promising fiscal savings, a sewer connection for households brings further benefits by reducing concerns of malfunctioning septic systems and protecting houses and streets from wastewater flowing back into water lines. This has ill effects on the environment as well as residents' health because it breeds bacteria and mosquitoes, damages homes, and limits access to water for drinking and showering.

The authorities in St. Augustine are building community trust in their water and sewer infrastructure plans, through monthly interactions with local community associations about ongoing pipeline projects. By combining community input with analysis of past water and sewer (under)investment, the authorities are developing a St. Augustine sewer master plan. This momentum requires support from legislative councils, and by building this relationship they are getting more support for their grant proposals. The team is distributing the workload

efficiently between a grant manager, engineers, and external consultants, to allow for faster progress and quality control. They also coordinate with the roads and highway department to ensure the road maintenance is managed concurrently with the delivery of water and sewer infrastructure.

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