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**Missouri Section**  
American Water Works Association



# Asset Management: In a Digital World, Nothing is Static Anymore

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## STATE-OF-THE-INDUSTRY – WATER INFRASTRUCTURE

For water and wastewater utilities, the passing of the *Bipartisan Infrastructure Law* signals movement and interest toward making clean water a pillar of America's infrastructure. While the plan to invest \$55 billion to expand access to clean drinking water is positive, it's only a drop in the bucket to address the three main issues facing water utilities today:

- Firstly, America is laden with aging infrastructure, as the average pipe in the US is 45 years old, with 1/3 of all pipes in critical condition. So, it's no surprise that the total reinvestment gap for water infrastructure is expected to be \$434 billion by the end of 2029. Mind you, these numbers represent not just a financial gap but a time and resources gap that will force utility planners to do more with less in already tight and volatile budgetary conditions.

- Secondly, wet weather events have appeared more frequently, with five '1,000-year storms' in a five-week span occurring in the US in 2022 alone (e.g., St. Louis, MO; Death Valley, CA; Springfield, IL; Dallas, TX; and Kentucky). With intense, regular, and shifting rainfall models – what is considered a 10, 50, or 100-year storm – the deluges will have an enormous impact on our current infrastructure and future design.
- Thirdly, water utilities are often plagued by data siloes and a lack of fact-based insights. Utilities are collecting thousands of data points every minute with their technology, but these are often managed by different systems – and in many cases, by different departments within an organization. Few utilities have the means or know-how to synthesize their data and leverage it to its full potential to solve major challenges.

## SHAPING THE FUTURE – DATA COLLECTION & DYNAMIC ANALYSIS

These three main challenges can change by the day and often are out of a utility organization's control. However, there are integrations that utilities can develop to control and secure their operation via the collection and analysis of existing data. In fact, the effective leverage of existing data is the next step in a utility's technological evolution, which will help with futureproofing against deteriorating assets, extreme weather, and budgetary restraints. Data is like oil: you may be sitting on an abundance of it, but if you don't know how to refine it effectively, you're losing out on a lot of potential value.

- A true data analytics platform utilizes existing collection systems like GIS, SCADA, CMMS, etc., and applies cutting-edge technology such as Artificial Intelligence (AI) and Machine-Learning (ML) to provide a



comprehensive picture of network assets that will help prioritize inspection and replacement.

- These platforms help break down communication issues within an organization since everyone has a common and dynamic tool. We've seen how a single shared platform can be used to develop the smartest capital planning strategy possible while working to discover OPEX reductions in the utility network.

The good news is that there are specialist data analytic firms that possess the rare value-add capabilities to swiftly incorporate these tools, best practices, and capacities for water utilities. By leveraging these tested resources, utilities can influence the efficiency of their operations and find savings.

#### **CASE STUDY – ARWOS WATER**

##### **Challenge: Inflow and Infiltration (I/I)**

Arwos Water is a multi-utility in southern Denmark serving 53,000 people, with more than 700 miles of sewer network and 150 miles of drinking water network. Arwos is dealing with the same three challenges mentioned above – aging infrastructure, extreme weather, and data siloes. However, their most pressing issue stemmed from increased operational costs due to inflow and infiltration (I/I) complications. This I/I seemed to be heavily influenced by rainfall; in fact, the difference in operational cost in years with high precipitation versus



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years with low precipitation was \$1.5 million. As stated by Finn Reese, the Planning Department Head of Arwos Water: *"With limited staff resources and our traditional engineering approach to the tasks at hand, we could not get started or complete the project planning at the pace required."*

Due to limited staffing, issues that could have been handled proactively were turning into reactive maintenance, which for Arwos is roughly three times more expensive. I/I is also an example of an operational asset management issue. Often, data analytics tools are viewed only through the lens of capital planning, but there are plenty of opportunities to reduce OPEX budgets through data analysis and project prioritization.



**Solution: Dynamic I/I Analysis for Project Prioritization**

By integrating lift station flow sensor data into the data|APX data analytics platform, Arwos was able to accurately map their I/I and track them in real-time. In 2021, they transported and treated roughly 4 billion gallons of I/I at an estimated cost of \$2.55 million (\$48 per citizen). By mapping I/I in their network, they were able to identify catchment areas considered 'low-hanging fruit' - small areas with high I/I.



*"We decided to do CCTV inspections [in small subdivisions], based on findings from data|APX®, that were not otherwise planned. In this case, we were able to renew [those areas] in time to avoid sewage breakdown. We've gone from conducting extensive physical surveys of the pipeline network to using [a digital approach] to prioritize catchment areas. This has given us a much faster planning/project start." - Finn Reese, Arwos*

**Savings**

Between 2021 and 2022, the integration of the data|APX platform helped Arwos reduce approximately 31 million gallons of wastewater, resulting in an annual savings of \$200,000 (8% reduction in I&I cost). They can expect year-over-year savings here and an extra \$1 million back in their budget in five years, which can be used to drive more I&I reduction projects or to fund a new project.

*"By using data|APX®, we now have a common tool in the operations, planning, and project departments - our organization, when discussing*

*various projects internally, has improved by having a fact-based analytic tool supporting us." - Finn Reese, Arwos*

**CONCLUSION**

Data and data analytics are meant to be just a tool to empower water professionals to do their job better and optimize their operations. They're an instrument for human enablement, attracting new talent, and building a resilient utility. There are often political or environmental factors out of utilities' control, but the most effective platforms are ones that help navigate the unexpected or unseen and help maximize professionals in their final decision-making process.

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