



FRACTA CASE STUDY

Using Artificial Intelligence to reduce non-revenue waterloss in Pennsylvania

THE UTILITY GREATER JOHNSTOWN WATER AUTHORITY

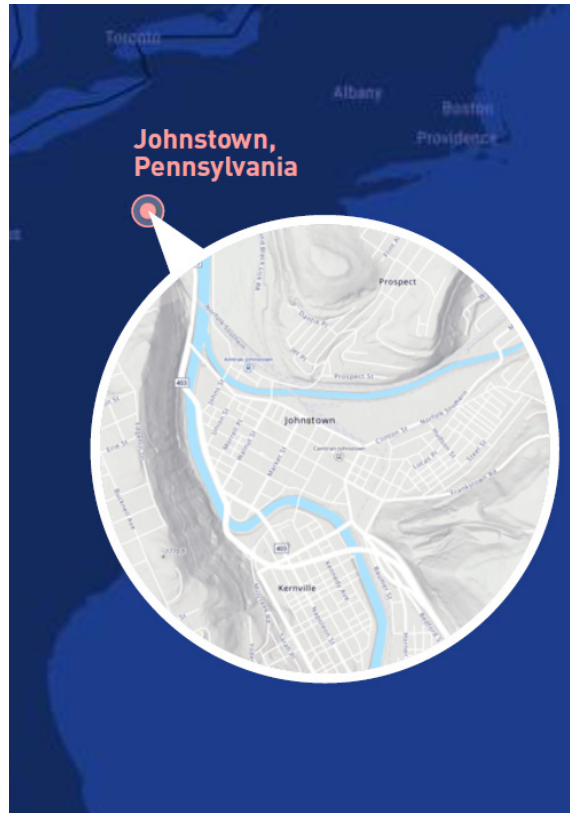
The Greater Johnstown Water Authority (GJWA) in Pennsylvania was incorporated under the Municipality Authorities Act in 1964 by the city of Johnstown and boroughs of Westmont and Southmont as a joint

municipal authority to provide potable water to the Greater Johnstown area.

GJWA serves a base of more than 21,000 customers through 303 miles of water distribution pipes. The average consumption is approximately 6.5 million gallons per day (MGD) with peak consumption in the summer at 10 MGD. It operates three dams, two wells, a water

treatment plant at Riverside, a water treatment plant at the Saltlick Reservoir, and numerous storage tanks and pump stations. pipe being 75-100 years old.

- 21,000 CUSTOMERS**
- 303 MILES**
- 6.5 MGD AVERAGE CONSUMPTION**
- 10 MGD SUMMER CONSUMPTION**



THE CHALLENGE REDUCING NON-REVENUE WATER LOSS WITH LIMITED RESOURCES

Reducing Non-Revenue (NRW) water loss is challenging since it is not apparent where it is happening within the network, or what could be causing it.

While pumping stations can signal when water loss may be happening somewhere in the distribution network, the precise location of that loss is not known. Sending a crew out to hunt for the source of loss can be time-consuming, costly, and often inconclusive.

Over time, leaks can become breaks which present an even greater risk to community safety and business operations. As a challenge, managing pipeline integrity is as important to address as it has been difficult to address--up until now.treatment plant at Riverside, a water treatment plant at the Saltlick Reservoir, and numerous storage tanks and pump stations. pipe being 75-100 years old.

THE SOLUTION

Machine Learning Identifies Likely Sources of NRW Loss

When GJWA's pumping station signals a potential water main leak, Assistant Public Works Director Jim Kukura uses the Fracta platform to search across the distribution network and discover which pipe segments are most likely contributing to the NRW loss. Using Fracta's Likelihood of Failure (LOF) maps, Jim can visualize and identify which are the likely culprits within the larger network.

Fracta's machine learning algorithms evaluate each pipe segment and its physical attributes against more than fifty spatially explicit environmental variables. Over time, the model 'learns' by evaluating his-toric break events across the millions of combinations of environmental variables present at each segment. This approach results in predictions indicating where else pipe segments are likely to fail.



Is This Pipe Segment Leaking?

Age-based models suggest that older parts of the network are likely sources of leaks. With cast iron pipes installed as early as 1867, Greater Johnstown's water distribution network has many segments predating 1900.



Not Likely

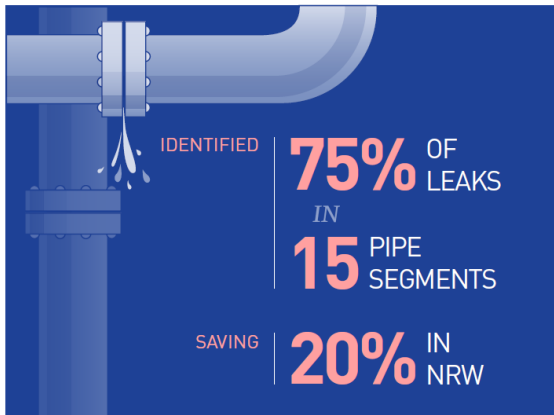
Fracta's model predicts some of the older pipes are still likely to be in good condition, allowing Jim to focus his time, budget, and resources testing segments with higher risk instead.

“As with most other water utilities, we have to rely on a number of tools to make smart CIP decisions and Fracta is an important part of that mix.”

Jim Kukura | Assistant Public Works Director

Fracta's holistic, data-driven approach provides Jim with a more granular, nuanced view of where water loss is likely coming from. This is done well before time and money are spent to send the crew into the field to validate the prediction.

Once Jim identifies the segments likely contributing to NRW loss, he deploys the team to the field with a correlator to find leaks in pressurized water. Acoustic technology is then used to validate the area of leakage before sending a team to dig up the pipe.



THE IMPACT

Targeting Leaks Saved 20% in Non-Revenue Water Loss

Within the first seven to eight months, GJWA relied on Fracta's Likelihood of Failure (LOF) maps to correctly identify 75% of the leaks in 15 pipe segments, saving the utility 20% in NRW loss.

Looking ahead, Greater Johnstown has committed to assigning a dedicated resource to use Fracta along with other tools to target pipes for replacement and repair. In addition to the Likelihood of Failure (LOF), Greater Johnstown plans to use Fracta's additional features—Consequence of Failure (COF), Business Risk Exposure (BRE), and Job Planner—to better understand its network of assets and take a more proactive approach to maintenance management moving forward.



BRINGING ARTIFICIAL INTELLIGENCE TO INFRASTRUCTURE

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