

Greater Johnstown Water Authority

Using machine learning to find where non-revenue water was going, before sending a crew to look for it.

NON-REVENUE WATER

LEAK TARGETING

LIKELIHOOD OF FAILURE

21,000

customers served

303

miles of distribution pipe

6.5 MGD

average daily consumption

10 MGD

peak summer consumption

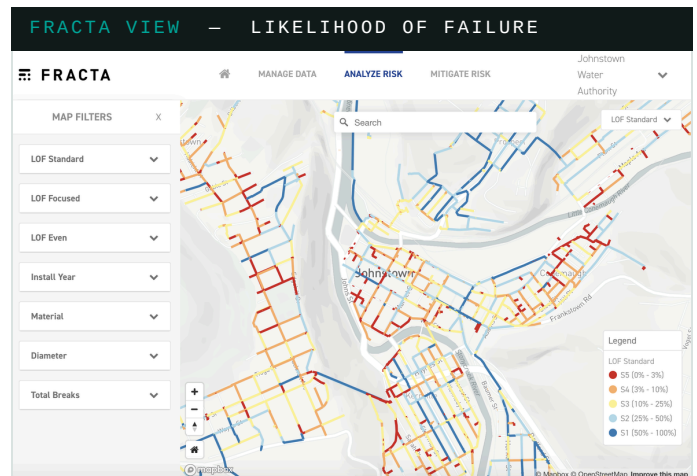
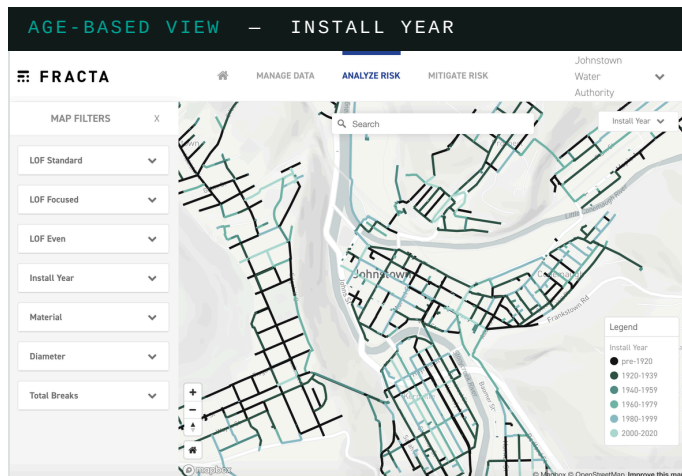
THE UTILITY

The Greater Johnstown Water Authority was incorporated under the Municipality Authorities Act in 1964 by the city of Johnstown and the boroughs of Westmont and Southmont, as a joint municipal authority providing potable water to the Greater Johnstown area. It operates three dams, two wells, two water treatment plants, and numerous storage tanks and pump stations.

THE CHALLENGE — REDUCING NON-REVENUE WATER LOSS WITH LIMITED RESOURCES

Reducing non-revenue water loss is difficult because it is not apparent where in the network it is happening, or what is causing it. Pumping stations can signal that water is being lost somewhere in the distribution network, but not where. **Sending a crew out to hunt for the source is time-consuming, costly, and often inconclusive.** Over time leaks become breaks, which present a far greater risk to community safety and business operations.

THE SOLUTION — MACHINE LEARNING IDENTIFIES LIKELY SOURCES OF LOSS



The same section of the network, two ways. With cast iron installed as early as 1867, an age-based view flags most of the older network; Fracta predicts that many of those pipes are still in good condition.

When the 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 identify which pipe segments are most likely contributing to the loss. Fracta's machine learning evaluates each segment and its physical attributes against spatially explicit environmental variables, learning from historic break events across the combinations of conditions present at each segment.

Once Jim identifies the segments likely contributing to the loss, he deploys the team to the field with a correlator to find leaks in pressurized water. Acoustic technology then validates the area of leakage before a crew digs up the pipe. **The prediction comes first, so time and money are spent only where they are likely to pay off.**

“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

THE IMPACT — TARGETING LEAKS SAVED 20% IN NON-REVENUE WATER LOSS

75%

of leaks correctly identified by Fracta's LOF maps

15

pipe segments targeted

20%

reduction in non-revenue water loss

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

LOOKING AHEAD

Greater Johnstown has committed a dedicated resource to using Fracta alongside its other tools to target pipes for replacement and repair. Beyond Likelihood of Failure, the authority plans to use Cost of Failure, Total Risk, and Job Planner to better understand its network of assets and take a more proactive approach to maintenance management.

“We predict that we will reduce our non-revenue water loss, and we will also gain greater insight into other risks associated with our water mains by using Fracta.”

JIM KUKURA · ASSISTANT PUBLIC WORKS DIRECTOR

WHAT MADE IT WORK

- The model narrowed 303 miles to 15 segments worth testing
- Age alone would have sent crews to pipe scored as sound
- Crew time went to validation, not searching
- Correlators and acoustics still confirm the leak

ABOUT FRACTA

Fracta applies machine learning to drinking water infrastructure, scoring every segment of the distribution network for Likelihood of Failure and Consequence of Failure so utilities can prioritize renewal against a finite capital budget. Fracta is a member of the Kurita Group.