



# Rogers Water Utilities

## Reducing Water Loss with Continuous Monitoring Sensors

### PROJECT OVERVIEW

Rogers Water Utilities (RWU) is one of four distribution utilities in the Beaver Water District in northwest Arkansas. Due to the age of pipes, leaks are common throughout RWU's service territory, but the leaks had been particularly difficult to find in miles of rolling hills and natural springs between the City of Rogers and Beaver Lake. In addition to lost revenue, leaks made it difficult to maintain water pressure in the area, and water storage levels often fell low during peak demands. In 2019, RWU installed continuous monitoring acoustical leak sensors in the area as the first major step in a water loss program.

### THE SYSTEM

After confirming the effectiveness of Itron leak sensors with a small pilot, RWU installed roughly 650 of the sensors at water meters spread across the territory. The sensors "listen" at night when background noise is lowest and have an effective range of approximately 500 linear feet of metal pipe (<12") or 100 linear feet of PVC pipe (<6").

The sensors transmit acoustical data via RWU's existing automated meter reading (AMR) system, which consists of Itron 100W+ Water ERT Modules communicating with Itron Mobile Radios (IMR) and Itron Mobile apps. RWU backhauls the data to Itron's mlogonline software, which analyzes

**"Leak sensors were an easily implementable, relatively low-cost initial step to finding and repairing leaks."**

**- Johnny Lunsford,  
operations manager, RWU**

### CUSTOMER

#### *Rogers Water Utilities*

- » Headquartered in Rogers, AR
- » Serves ~77,000 customers
- » One of four utilities in the Beaver Water District

### GOALS

- » Reduce water loss

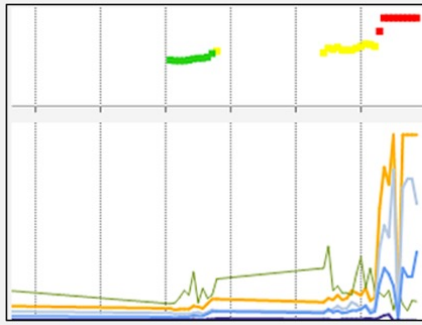
### RESULTS

Non-revenue water (NRW) loss reduced:

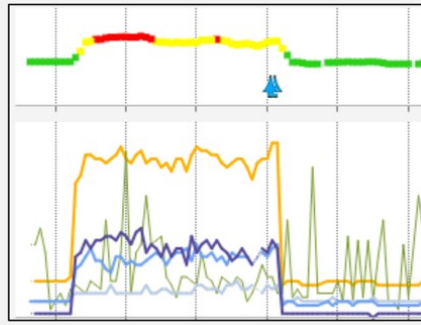
- » By 150 million gallons annually
- » From 18% to 5%
- » By an estimated \$200,000 annually

### SOLUTION

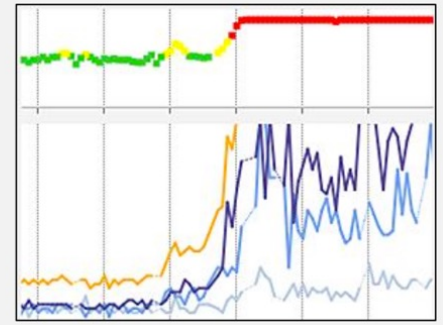
- » Itron Leak Sensor
- » mlogonline™
- » 100W+ Water ERT® Module
- » Itron Mobile Radio (IMR)
- » Itron Mobile



**Water main  
large-diameter pipe**



**Water main  
small-diameter pipe**



**Service  
lateral**

Noise profiles reveal the severity of a leak and the pipe size.

the acoustic signals, and reports potential leaks and their mapped locations. Based on the noise profile, mlogonline estimates not only the location, but also the size of the affected pipe and whether the leak is just beginning to develop or is nearing a full break. RWU used the initial data it received from the network of sensors to prioritize the work of crews who investigated and repaired the leaks in the field.

“Knowing the size of the pipe before digging allows our repair crews to arrive on site with the correct clamp size, which speeds up the work,” said Johnny Lunsford, operations manager for RWU.

#### FOR BEST RESULTS...

Sensors should not be installed near sources of noise or vibration, such as:

- » Pad-mounted transformers
- » Generators
- » Busy intersections

#### THE RESULTS

Within two months of the roll-out, RWU found and repaired nearly a dozen major breaks, the largest of which had an

estimated flow rate of 392 gallons per minute (gpm) and had likely lost more than 50,000,000 gallons and \$63,000 in revenue over the course of several years.

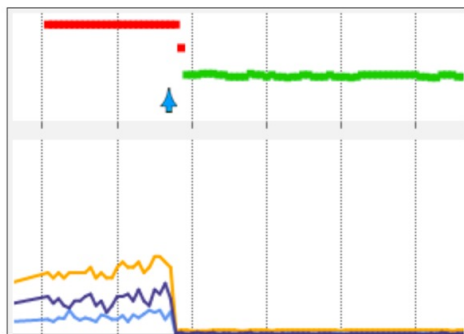
Main Type	Estimated Flow Rate	Estimated Duration	Estimated Loss (gallons)
4" CI beam break	392 gpm	> 4 years	> 50,000,000
6" CI beam break	280 gpm	60 days	24,220,512
6" CI beam break	166 gpm	90 days	20,513,600
2.25" CI beam break	108 gpm	90 days	14,014,944
4" CI beam break	101 gpm	90 days	13,089,600
2.25" CI beam break	98 gpm	60 days	12,717,648
2.25" CI beam break	71 gpm	90 days	9,259,920
2.25" CI beam break	98 gpm	90 days	8,495,712
2.25" CI beam break	71 gpm	30 days	3,086,640
6" CI beam break	524 gpm	12 hrs	377,280
2.25" CI beam break	2 gpm	90 days	259,200
1" Service	3 gpm	60 days	228,960
1" Service	3 gpm	-	129,600
1" Service	1 gpm	-	86,400
6" clamp Leak	0.5 gpm	90 days	64,000
4" CI beam break	127 gpm	14 days	42,672
6" CI beam break	198 gpm	7 days	33,264

A sample of RWU's discoveries



The running NRW 12-month rolling average continues to decrease.

After repairing the biggest leaks in the area—and quieting the noise they produced—the sensors began picking up smaller leaks that repair crews went about fixing. The sensor network also immediately identified new leaks that were caused by ongoing installation of underground fiber optic cables in the area.



Noise levels drop back to normal following leak repair

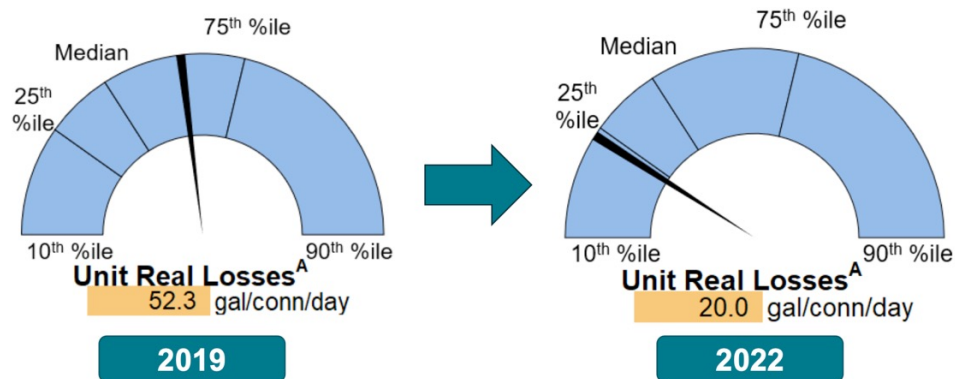
Following leak repairs that took place between 2019 and 2022, non-revenue water (NRW) loss decreased by 150 million gallons annually, from 18% to just 5%. With a wholesale purchase cost of \$1.54/1000 gallons, the NRW reduction represents a cost savings of over \$200,000 annually, and the NRW 12-month rolling average continues to decrease. The return on investment (ROI) paid for the sensor deployment in just two months, and ongoing revenue savings continue to contribute to the ROI of the foundational AMR network.

Unit real losses\* decreased by more than 30 gallons per connection a day (gal/conn/day) and put RWU into the top 25th percentile of water utilities, according to figures from the American Water Works Association.

### OPERATIONAL BENEFITS

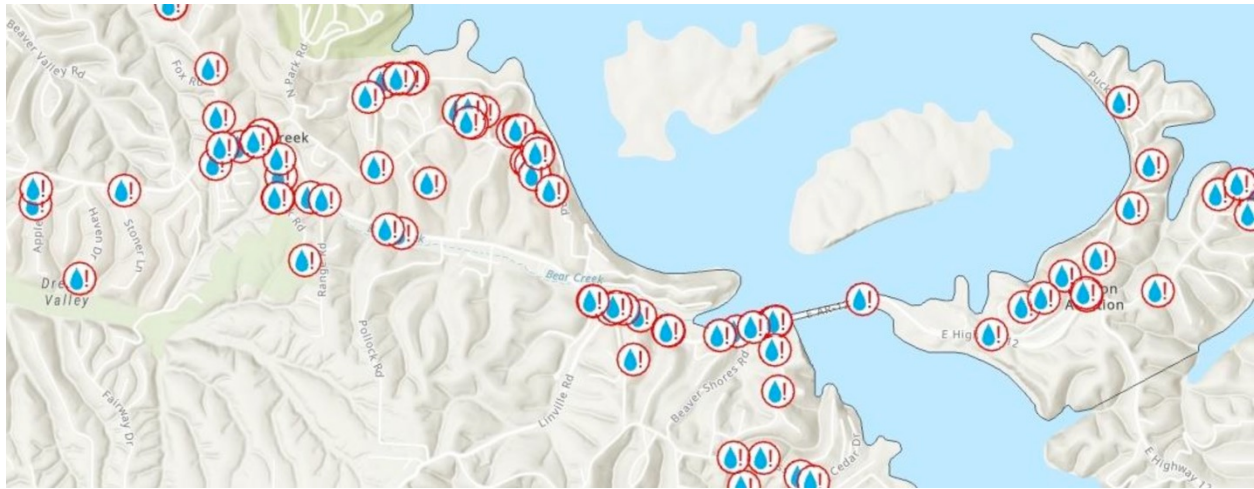
The reduction of water loss in the area also had direct effects on the water distribution service in the area. Previously, the elevated storage tank that fed the area would nearly empty during summer months. After the discovery and repair of major leaks, RWU's data shows the tank is typically 50% to 85% full, year-round. Low tank levels made it difficult to maintain the 20 psi of water pressure, below which RWU is required by regulators to issue boil warnings. "We used to hover around the regulated 20 psi," Lunsford said. "Now we never even get close to it. We haven't dropped below 42 psi."

RWU also uses the data from mlogonline to map problem areas, prioritize aging pipe replacements and justify capital expenses.



Unit real losses decreased by >30 gal/conn/day from 2019 to 2022

\* Real, or physical losses (as opposed to "apparent" losses), resulting from inaccurate metering or unauthorized consumption. Real Losses: These are physical losses of water from the distribution system due to leaks, bursts and other infrastructure failures. Apparent Losses: Apparent losses refer to water that is inaccurately measured or billed often resulting from metering errors, theft, unauthorized consumption or illegal connections.



A map of leak repairs identifies RWU's problem areas.

### CONTINUOUS VS. ONE-TIME MONITORING

Continuous acoustical monitoring has several major advantages over one-time, lift-and-shift monitoring. Most importantly, RWU said it could take five to seven years to piece together a survey of its territory by shifting leak loggers from location to location. “A new leak could develop two weeks after we monitored a section of the network, and we wouldn’t know it until we got back out there years later, or until a major break occurred,” Lunsford said. “Now we catch them as soon as they develop, and we fix them on our time, before it’s an emergency.”

The utility deployed 650 continuous-monitoring sensors in less than a month and immediately had a holistic view of problems, allowing them to proactively schedule maintenance. In addition, the sensor network has a 20-year lifespan—four times longer than some competitors in the market—and communicates via RWU’s existing AMR network.

#### Benefits:

- » Holistic visibility
- » Immediate leak awareness
- » Proactive maintenance scheduling

### LOOKING FORWARD

RWU intends to install Itron Leak Sensors throughout its entire service territory by 2026. The utility expects it will require approximately 2,200 sensors to cover the growing network, which is expected to serve approximately 80,000 customers by that time. In addition, RWU has plans to implement district metered areas (DMAs) in the challenging eastern region of its territory to more easily monitor, isolate and improve service on those sections of the network.

To learn more visit [itron.com](https://www.itron.com)

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