

The Itron logo is located in the top left corner. It consists of the word "Itron" in a white, sans-serif font, with a yellow lightning bolt icon above the letter 'o'. The logo is set against a red rectangular background.

Itron

The background of the slide is a photograph of a large water fountain in a park. The fountain is spraying water high into the air, creating a large, misty plume. The water is dark and turbulent at the base, where it meets a paved area. The surrounding area is lush with green trees and foliage. The sky is bright and clear.

Water Operations Management

INTRODUCTION

Water: The Universal Necessity for Human and Ecological Sustenance

Itron is dedicated to creating a more resourceful world. We believe that the way energy and water are managed will define this century. By working with our customers to ensure their success, we can improve the quality of life, ensure the safety and promote the well-being of people around the globe.

Empowering Communities through Efficient Water Management

Public health protection, food production, power generation—**water** plays a central role in these processes and is tightly connected to the economic growth of cities. Through daily activities, humans consume fresh water, from agriculture to industry and the needs of everyday life. The use of this resource increases with population growth and its exponential needs. While our water footprint continues to increase, it is critical that we—efficiently and effectively—manage every drop of clean water that is extracted, pumped, treated, distributed or sourced from a third-party provider. Global water demand is expected to continue increasing until 2050, accounting for 20% to 30% above the current level of water use, mainly due to rising demand in the industrial and domestic sectors (UN, 2019)¹. Over 2 billion people live in countries experiencing high water stress, and about 4 billion people experience severe water scarcity during at least one month of the year. Stress levels will continue to increase as demand for water grows and the effects of climate change intensify.

“Water scarcity already affects every continent. Water use has been growing globally at more than twice the rate of population increases in the last century, and an increasing number of regions are reaching the limit at which water services can be sustainably delivered, especially in arid regions” (UNWater)².

Water is also deeply related to energy through an inextricable link called the ‘water-energy nexus’. They are mutually dependent, with each affecting the other’s availability. Water is needed for energy development and generation, and energy is required to supply, use and treat drinking water and wastewater. Water utilities are typically one of the highest consumers of energy. This is the reason why efficient management of the water supply has a direct impact on the reduction of CO₂.

DRINKING WATER—EVERY DROP COUNTS

As a water utility, you are expected to meet the ever-increasing regulatory requirements of relevant authorities and the expectations set by the responsible bodies in conjunction with the other stakeholders, while ensuring the long-term sustainability of the uninterrupted service. Constrained by resources in terms of manpower and finances, it is critical for water utilities around the world to operate and manage their drinking water systems optimally, especially with respect to water losses.

Impacts of Water Losses

Water losses are a clear obstacle to sustainability:

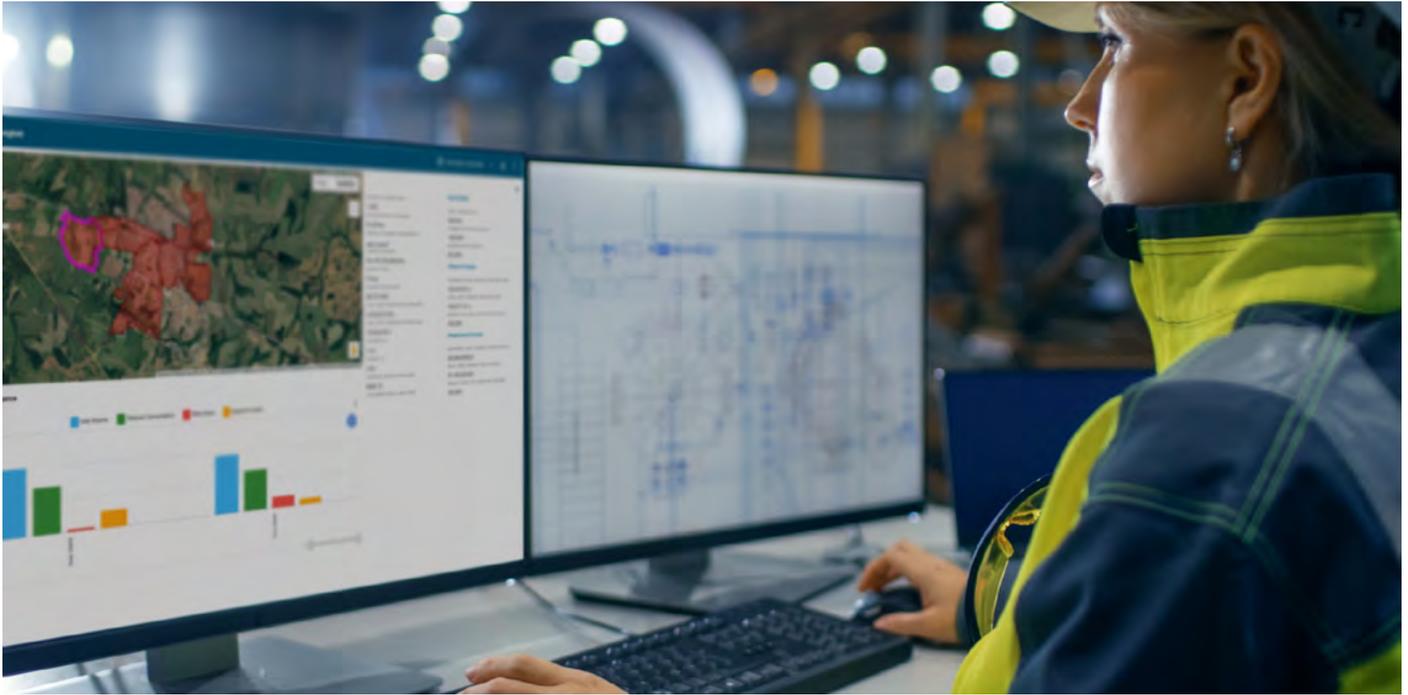
- » *Economic impacts:* Treating and transporting water, which is then lost, represents high costs that generate no revenue for the utility. Costly work is required to repair network incidents, pipe bursts and leakages. In countries where water scarcity is a concern, the economic impacts of water losses could be so high that it can impact the investment in other critical infrastructure developments.
- » *Technological impacts:* High leakage levels provide a barrier to meeting existing water demand. In some cases, this causes outages as the water distribution system can no longer operate continuously. Water distribution systems with an intermittent supply can face technical problems as air enters the pipes.
- » *Social impacts:* Poor supply due to failures, low pressure or service interruptions affects the end customer. Health risks can also rise as infiltrations into low pressure and intermittent supply systems occur. Education levels can also be impacted in countries where children are required to search for and collect water instead of going to school.
- » *Ecological impacts:* When water losses are not sufficiently reduced, water extraction needs to be increased. This creates additional stress on water resources and requires the input of energy which results in greater carbon dioxide emissions.

“The aim of water utilities is logically to offer services to everybody in the area of responsibility of the utility, and to provide users with a continuous supply of drinking water under economic and social conditions that are acceptable to the users and to the utility” (ISO 24510, 2007)³.

¹ <https://www.unwater.org/publications/world-water-development-report-2019/>

² <https://www.unwater.org/water-facts/scarcity/>

³ <https://www.iso.org/obp/ui/#iso:std:iso:24510:ed-1:v1:en>



WATER LOSS CONTROL—THE PATH TOWARDS AUTOMATING DISPARATE DATA STREAMS

Water Operations Management focuses on delivering measurable results that address the non-revenue water losses within your water distribution system. From reducing operating costs and improving operational efficiency to enhancing reliability and resiliency, we provide the technology and expertise to help you succeed. By integrating disparate utility data, we enable you to get additional value and insight out of your existing information and systems and provide a holistic view of your water distribution operations. Leveraging advanced algorithms and forecasting tools in our platform allows you to gain quantifiable results that helps improve your Key Performance Indicators (KPIs).

OPERATIONAL VISIBILITY—BUILDING A SOLID MONITORING FOUNDATION

Everything is interconnected. The invisible line that connects disparate systems is often missing in advanced analytics. There is an abundance of data within your water utility. However, this data is often siloed prohibiting you from gaining valuable insights into your water distribution system. Extracting and bringing data into onto one single platform is a key step towards water digitalization. This will allow you to enable greater operational efficiencies, better plan for maintenance, provide better performance predictability, optimize your workforce and maximize your return on investment.

With Operational Visibility, data from field sensors, supervisory control and data acquisitions system (SCADA), hydraulic modelling software, geographic information systems (GIS) and customer information systems (CIS) are brought together under one single platform that allows visualization of all available information of the water supply system to support decision making. When these technologies converge, it can accelerate your digital water transformation. This helps reduce the time and effort to create and disseminate valuable insights throughout your utility.

Operational Visibility provides an automated water balance table per the International Water Association (IWA)/American Water and Wastewater Association (AWWA) and is based on your entire water distribution system or District Metered Areas (DMAs) within the system. The monitored interval of the water balance table is dependent on the consumption data granularity availability for your water distribution system or DMAs.

This view provides critical information on the split between real (leaks) and apparent (metering inaccuracies and theft) losses in each of the DMAs and establishes critical water loss KPIs that can be tracked. With continuous enhanced monitoring, we can help you prioritize and focus your resources and budget on specific areas within your water network (that are in need of critical action) to better provide for the communities you serve.

Water distribution infrastructure is underground so events can occur instantaneously without operator awareness. Having insights to the type and frequency of these events (such as bursts, leaks, inadequate hydraulic maneuvers, DMA mixes and frauds) through near real-time warning alarms allows the appropriate tracking of the actions needed to close out these events. Depending on the type of events, we can apply an effective set of investigative and corrective workflows to ensure the swift and efficient resolution of these occurrences.

OPERATIONAL EFFICIENCIES—THE WHERE, WHEN AND WHAT OF WATER LOSSES

Operational Visibility provides a snapshot of the health of the water distribution. It identifies **WHERE** and **WHEN** you have a high amount of water loss in your distribution network. It also provides **WHAT** the split of the water loss is in relation to real and apparent losses.

Once you have information on what is attributing to your water losses, you will be able to assess your plan of action on how to address any water loss issues.

Visualization, Simulation and Calibration

Gaining an understanding of your distribution network and moving away from tribal knowledge allows you to better optimize resources to meet increasing needs. We can take CAD or GIS data and generate a digital twin of your water infrastructure. Hydraulic modelling can then be used to optimize the network, help identify leaks and help with seasonal demand fluctuations. Additional functionality allows you to simulate the effects of:

- » Increase/decrease in demand
- » Opening/closing valves
- » Pressure reduction optimization

These simulations are done within the confines of a digital twin before implementation in the real world.

Reducing Losses

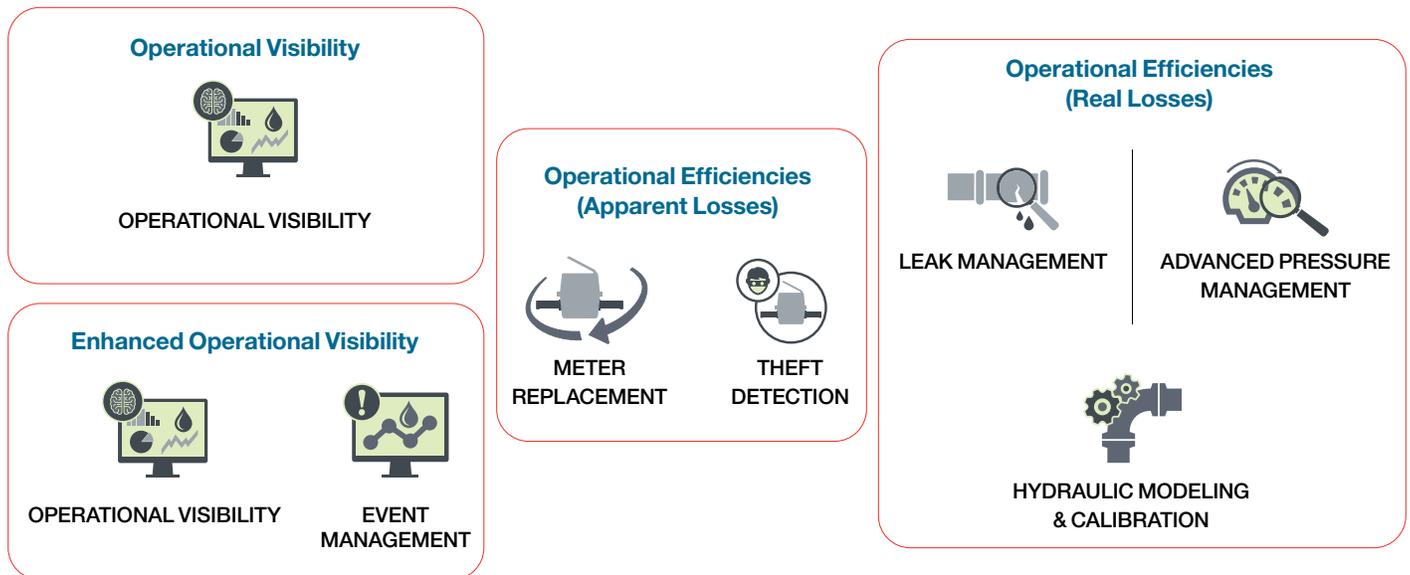
The reduction of water loss, whether real or apparent, is another outcome we provide. A meter replacement program can be tailored to identify the most critical meters for replacement.

Leak detection using spatial analysis of flow, consumption and pressure is another way to reduce losses. The localization of potential high leakage areas can be visualized using the Water Operations Management offering. This provides you the ability to target defined areas for leak pinpointing on a weekly basis, rather than waiting for the leak to surface or implementing manually intensive leak surveys.

Pressure management, using advanced pressure-reducing valves (PRVs), provides a method to reduce area-wide real losses while maintaining adequate pressure to your consumers. The location of the PRV, settings and impact of pressure management can be constantly monitored through Water Operations Management.

Wherever you are in your journey to reduce non-revenue water, our dedicated subject matter experts will have continuous engagement with you to deliver measurable results.

CORE OFFERINGS



WOM Core Offerings		Description	
Operational Visibility	Operational Visibility	Integrates data obtained from existing meters, sensors and data systems (on a single platform) that allows for visualization of all available information from the water supply systems to support decision making.	
	Event Management <i>(included in Enhanced Operational Visibility)</i>	Allows for the detection of anomalies outside the normal pattern of operation. Detects pressure, flow and tank level thresholds outside of set limits. Detects burst/leak alarms. Identifies unexpected hydraulic fluctuations using forecasting capabilities. All events are tracked through a workflow manager and logged for resource management.	
Operational Efficiencies	Real Losses	Leak Management	Detects and tracks pipe leaks or bursts within a utility's distribution network. Using hydraulic modelling and operational visibility, leak detection capabilities are offered as an integrated single-platform solution.
		Advanced Pressure Management	Delivered through intelligent operation of PRVs and pumps, maintains desired pressures at critical points in the system at any time of the day, optimally reduces the pressures within the water distribution network, saves power and reduces the probability of new leaks and bursts, as well as reduces the occurrence of current losses due to existing leaks.
	Hydraulic Model Visualization, Simulation & Calibration	Automatically acquires modeling input data, such as service connection consumption, flow and pressure monitoring. Hydraulic modeling, calibration and simulation allows visualization of the digital representation of DMAs.	
	Apparent Losses	Meter Replacement	A detailed multi-criteria analysis of meters and consumption patterns establishes a replacement schedule that maximizes return on investment, protects revenue and maintains metering assets inventoried and updated. When paired with Operational Visibility, water loss and apparent loss (%) improvement can be tracked continuously in the water balance calculations.
Theft Detection		Provided through meter and water consumption data verification and analysis, identifies pattern behavior deviations, possible causes and locations throughout the distribution system.	

PRELIMINARY OFFERINGS



CIVIL ENGINEERING CONSULTING
DMA CREATION



BACK OFFICE ANALYSIS
DMA PRIORITIZATION



DATA ORGANIZATION
GIS, CAD & BILLING FILES



WATER DATA AUDIT



STRATEGIC SENSOR PLACEMENT
IDENTIFY SENSITIVITY LOCATIONS TO TRANSFORM DMAs TO SMART DMAs

At Itron, we have a dedicated team of experts who will work alongside with you in your journey to optimize your operations, reduce your operating costs, manage your assets effectively and ultimately decrease your non-revenue water losses. Through our

preliminary services, we work with you every step of the way to reach your targeted goals. Together, we succeed in making the world a more resourceful place for this generation and many more to come.



COMMERCIAL APPROACH

There are a few commercial approaches for Water Operations Management offerings:

- » *Subscription-based pricing (bundled approach can include hardware, software, delivery & consulting services)*
- » *Pay-for-performance*
- » *Subscription-based pricing with potential pay-for-performance elements incorporated*

Depending on your goals and your need for various commercial approaches, we can create an offer that will meet your needs.

YOUR ACTIONS, OUR FUTURE

Together, we take the actions required to manage, conserve and optimize every drop of clean water that is pumped, treated and distributed. In doing so, we fulfill our duties to our stakeholders, the communities and its citizens we serve and ultimately, we create a better connected, sustainable and more resourceful world.



Join us in creating a more **resourceful world**.
To learn more visit **[itron.com](https://www.itron.com)**

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