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# Better, Faster, Easier: Solutions For Asia Pacific's Most Pressing Water Challenges

# Better, Faster, Easier

## Solutions For Asia Pacific's Most Pressing Water Challenges

With a growing population, rapid urbanisation, and climate change, water resources in Asia Pacific are increasingly under pressure. Country and local governments across the region are experiencing significant challenges as they endeavor to provide clean, safe water to more than 4 billion people. And, with more than half of the population projected to live in Asia Pacific's urban areas by 2030, problems caused by water scarcity and exacerbated by climate change will only worsen as demand increases*.

Yet, these challenges can be addressed. New water technology solutions are quickly becoming available and can play a critical role in improving water distribution, treatment, and quality in the region.

Governments, utilities and those who are working to improve the management of, and access to, water resources can benefit from a comprehensive understanding of some of these solutions and the benefits that they provide.

In the following pages, we examine just a few of the ways you can address your water-related challenges by approaching them with technology solutions and tools that can help you strengthen your water distribution and treatment systems, forecast and mitigate the impact of severe weather events, meet and exceed environmental compliance requirements, manage assets more effectively, and improve plant operations -- in short, making your work better, faster and easier.


*Source: https://www.adb.org/news/events/asia-water-forum-2022*

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# Solutions For Water Distribution

# Network Management and Live Modelling

### The Challenge: Predict Performance

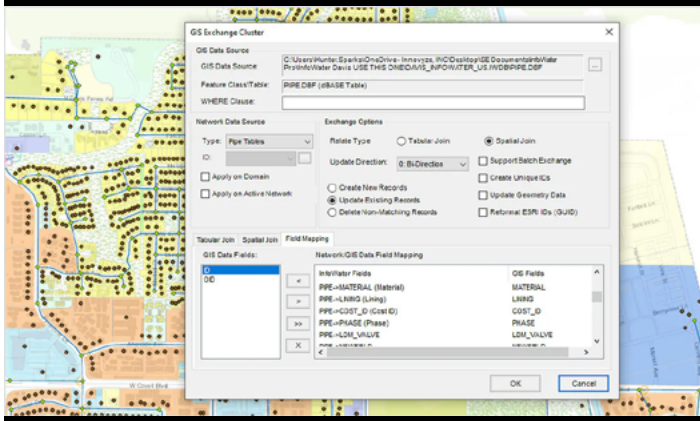
How do you operate a water network effectively and efficiently? You must maintain water pressure, reduce water loss, respond quickly to incidents, and maintain safe water quality – all within budget, and under the threat of fines if you fail. To achieve this, you need to know what's going on, and what will likely happen next, across your networks – in some detail. And, since demand and network conditions change continuously, you need live information to make good decisions.

### The Solution: Live modelling

A live hydraulic model of the network predicts its behavior according to the expected demand. The model can bring in a prediction of demandand live telemetry/SCADA data, such as how full a reservoir is, to set the initial conditions. It can also predict what's likely to happen in the gaps between sensors, giving a fuller picture of the network without further investment in field monitoring equipment.

This means that water utilities can control pumps remotely to save energy, obtain warnings about issues in the field and other important data about the network, manage incidents and customer's expectations, and improve operations accordingly.

### Know How with Hydraulic Modelling Software



Autodesk's advanced hydraulic modelling software improves the performance and cost-effectiveness of water distribution networks, so you can offer customers better service.

Our comprehensive offering, featuring InfoWater and InfoWater Pro, is designed to meet the needs of water distribution companies, whether you are working with Esri, workgroups or need live modelling technology for greater insight into what's happening now.

# Leak Detection

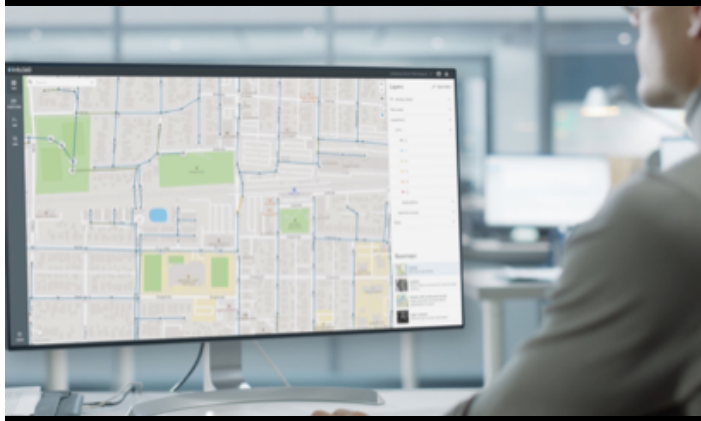
### The Challenge: Non-Revenue Water & Leakage

Non-revenue water (NRW) is water that has been produced and is "lost" before it reaches the customer through prolonged leaks and pipe breaks, as well as apparent losses including metering inaccuracies and unauthorised consumption. Further challenges include prioritising risk to inform better rehabilitation and repair (R&R) initiatives, pinpointing areas prone to leaks or pipe bursts, and identifying the contributing factors so leaks don't continue to occur in the same place.

### The Solution: Leakage Detection Software

Ensure the leakage detection software you choose connects to near-real-time data sources and provides a single repository for analysis. Additionally, it should offer advanced analytics that can extract the right KPIs that drive action and provide hydraulic models that are quickly calibrated and accurately represent system-wide performance and health. Finally, it should proactively inform R&R initiatives to fix pipes that are prone to leakage.

### Prevent Water from Running ... Away



Learn how to improve your water leakage assessments and easily separate actual demands from background leakages. InfoWater Pro is a hydraulic modelling application built in ArcGIS Pro that allows users to simulate countless scenarios and perform a wide range of analysis, including fire flow, valve criticality, pipe break, water quality, system curves, and energy usage.

# Water Quality and Pollutant Tracking

**The Challenge: Keeping Water Safe is Difficult**

Managing, tracking and ensuring water quality stays constant is extremely difficult in Asia Pacific due to population expansion, rapid growth, industrialisation, climate change, lack of infrastructure, and poverty. Additionally, the lack of consistent water quality standards within and across geographies complicates the challenges for utilities.

**The Solution: Water infrastructure design, modelling, and planning software**

This software provides a complete set of tools for ecologically sound water resources management. Utilities can use these capabilities to manage, track, and trend both water distribution and collection systems to deliver healthy water to consumers, and minimise pollutant discharges to receiving water systems. Specifically, when you're looking for a water quality management solution, you should consider:

- Its ability to model chemical concentration, source tracing, and water age for your distribution network
- Whether it accurately models all components of your storm, sanitary, and combined sewer networks
- Its capability to conduct comprehensive and flexible equations for the generation of pollutants and their fate prediction as they are routed in the network
- Whether live modelling is available to provide an indispensable tool for engineers and operators to prevent overflow events

**High Quality Software for Ensuring Water Quality**


Autodesk's water distribution, collection systems modelling, and drainage design products empower you to measure, track, predict, and subsequently minimise released pollutants using advanced design and simulation techniques.

You can prolong asset longevity, improve service to residents, and reduce impacts on the local environment while meeting regulatory requirements.

# Data Available vs. Insights

**The Challenge: Data Is Not Insight**

You have scads of data … but are you on track to meet your KPIs? Are your pumps performing as expected? What do you need to keep an eye on as you go through any major operational change? Which part of your system do you need to pay attention to – are there leaks or water quality issues? And, are you spending too much time creating reports and trying to determine meaningful relationships between hundreds or thousands of discrete data points?

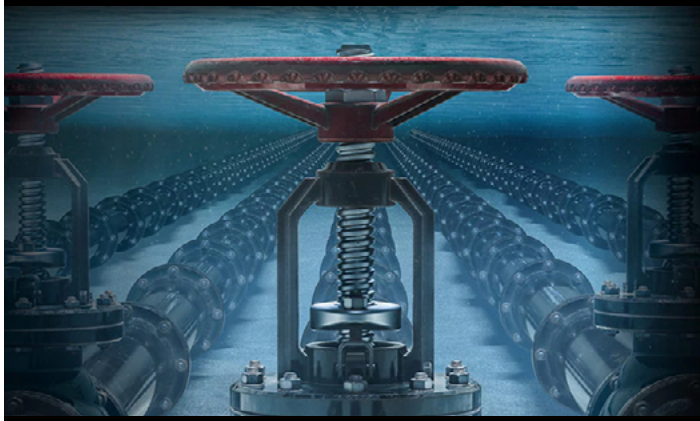
**The Solution: Make Insight Stand Out**

The information you need to answer questions like these can be provided by dashboarding and reporting software. It picks out information from sensors, meters, weather, water quality, customer service, and asset management systems, and presents it in a usable, shareable format.

When you look for a dashboard and reporting solution, check that the software you're considering is:

- Built out-of-the-box for water and wastewater utilities
- Fully configurable via a browser (allowing anywhere access)
- Compatible with your hydraulic models


**Know How...And More Importantly, Know What To Do.**



Designed for online applications with existing SCADA systems and metering systems, Info360 Insight helps water utility operators monitor and manage water operations more effectively.
It lets you configure and tailor your dashboard applications and key system performance indicators to your business needs, and track your alert notifications in real time.

# Asset Management

**The Challenge: A Unique Combination**

Water asset management is the process of understanding performance and prioritising resources for the maintenance of networked wet infrastructure throughout its lifecycle. The difficulties involved in prioritising budgets, fixing problems, satisfying customers, stakeholders and regulators, and capital/improvement planning can be difficult to surmount individually, let alone collectively.

**The Solution: All your data in one place**

It's easiest to manage your pumps, valves, pipes and other water assets if you have all the data about them in one place.

Ideally the data should be asset-centric, enabling you to track the condition and performance of individual assets over their entire lifetime. No need to piece together the life history of an asset from its maintenance/ survey records or repair tickets. Then you can visualise, query, and report on assets in ways that suit different roles in a water utility, local authority, or consultancy.

**Get It Together with Info360 Asset**

Info360 Asset software from Autodesk, enables you to manage your assets easily and effectively.

You can better review inspections to assess accuracy of asset condition grading, determine business risk using the latest asset and condition data, and justify your intervention decisions and asset investment plans to stakeholders.

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# Solutions For Severe Weather Events

# Flood Forecasting and Risk Assessment

**The Challenge: It's the Weather**

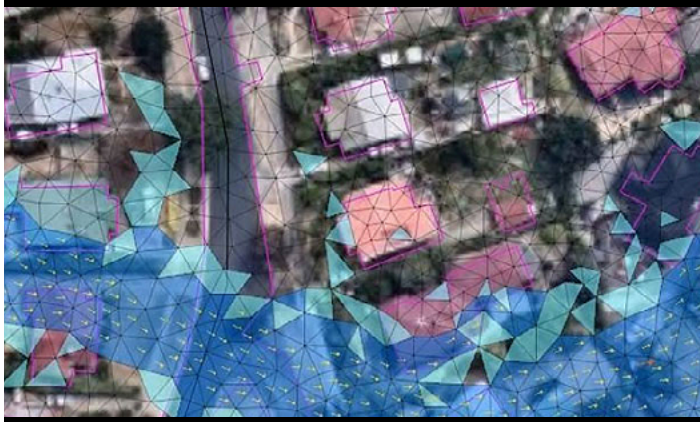
The complex nature of weather patterns, lack of data, human factors, limited resources, and unforeseen circumstances make accurate flood forecasting and risk assessment a daunting task.

**The Solution: Now, even the impact of weather can be more accurately predicted**

Effective flood risk assessment solutions are available. When evaluating options, you may wish to consider the following questions:

- Can it handle complex networks – including all natural and constructed elements?
- Does it quickly and accurately model all flow paths from underground infrastructure to overland flooding?
- Does it allow you to establish spatial floodplain mapping that is direct and consistent with expected flooding?
- Will it enable you to provide results that stakeholders are confident in for risk assessment and emergency planning?

**When, Where and How Will It Rain?**



Autodesk's flood modelling solutions are trusted worldwide to provide accurate and timely flood forecasts simulations and risk assessments. You can accurately simulate rainfall and storm events to evaluate preparedness and plans of action before flooding occurs. Advanced 1D/2D modelling provides a detailed representation of where flooding may occur, when, and the severity of the flood.

# Sanitary and Combined Sewer Overflows

**The Challenge: It Rolls Downhill**

The same overall conditions that impact water distribution, drainage and other issues mentioned in this guide also make preventing Sanitary Sewer Overflows (SSOs) andCombined Sewer Overflows (CSOs) difficult. Rapid development, limited infrastructure, poor investment, lack of public awareness and patchwork regulatory frameworks all contribute to overflow problems in many Asia Pacific cities.

**The Solution: Stay Ahead of Overflow Events**

You can stay ahead of overflow events by carefully evaluating options for modelling and planning. When considering an approach, you should strive to:

- Simulate wet weather conditions to identify risks
- Find blockages or sources of infiltration and inflow (I&I)
- Use live modelling to incorporate field and weather forecast data
- Apply live alerts from your model to inform field operations
- Evaluate system costs for capacity management and remedial actions

With the right information, you can take preventative measures to reduce overflow volume and frequency – protecting property and the receiving water systems.

**Keep a Lid on It.**

Autodesk's portfolio of hydraulic and hydrologic modelling solutions empowers better sanitary and combined sewer network management to address SSOs and CSOs. Work from models you are confident in to evaluate current performance and effectively plan for maintenance, operations, and emergency response. Use live alerts to inform the right actions in the field and provide transparency to the public.

# Stormwater, Sewer, and Flood Modelling

**The Challenge: Multiple Variables**

Stormwater, sewer, and flood modelling are challenging because they involve a wide range of factors, other water sources such as rivers, groundwater and coastal zones – making it difficult to measure and predict the impact of any given event.

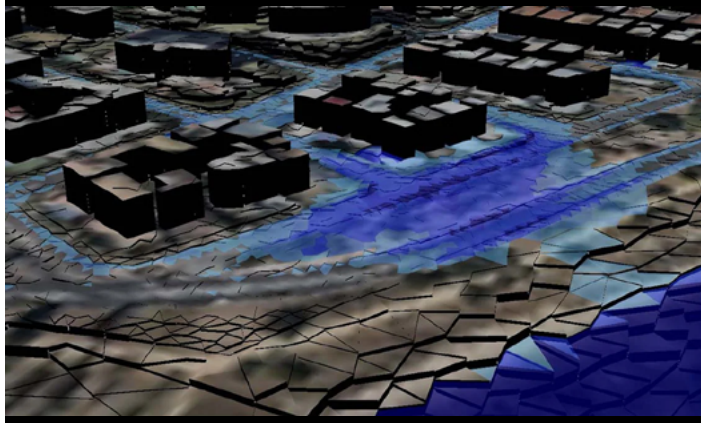
Additionally, the behavior of stormwater, sewer, and flood systems is highly dependent on weather and climate conditions. These conditions can be highly variable, making it challenging to accurately model and predict the behavior of these systems over time or in response to a specific storm.

**The Solution: Advanced Hydrologic and Hydraulic Assessments**

You can conduct advanced hydrologic and hydraulic assessments with today's software and associated digital tools. These tools allow you to analyse and model complex water systems, simulate various hydrologic scenarios, evaluate the impact of climate change, and generate precise flood maps and risk assessments. Be sure to find a solution that enables you to:

- Build fully integrated 1D/2D models, or specify 1D only
- Integrate live modelling for real-time data and forecast visualisations
- Work from existing GIS or model data sets to save time
- Collaborate across workgroup environments for team or consultant involvement on models
- Perform thorough pollutant analysis and evaluate the effectiveness of green infrastructure

**Powerful Tools for Difficult Challenges**



Autodesk provides the industry's largest global offering of stormwater, sewer network, and flood modelling solutions – designed to meet the needs of your project and organisation. InfoWorks ICM is an advanced integrated catchment modelling software for modelling complex hydraulic and hydrologic network elements quickly, accurately, and collaboratively for water and wastewater.

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# Solutions For Drainage

# Solutions for Drainage

**The Challenge: Water, Water Everywhere**

Rapid urban expansion, poor infrastructure, climate change and ensuing natural disasters have put extreme pressure on drainage systems, which are often unable to cope with the increased volume of water. As a result, flooding and other water-related problems have been growing in frequency and severity in the region.

**The Solution: Drainage Design and Analysis**

Software tools are now available to help users work with both traditional and sustainable elements and optimise for land use, performance, and cost. And you can experiment – drag and drop positioning enables you to test alternative designs quickly and easily, with sophisticated simulation, vivid graphics, and comparison reporting functionality.

**Don't Let Design Challenges Drain Your Energy**

Autodesk's InfoDrainage software is quick to learn, with intuitive controls and clear visualisations.

It's suitable for both frequent and infrequent users and can help them achieve more and produce better designs, delivering projects in a fraction of the time of traditional systems.

# Sustainable Drainage Design

**The Challenge: Drainage Systems Often Present Environmental Challenges**

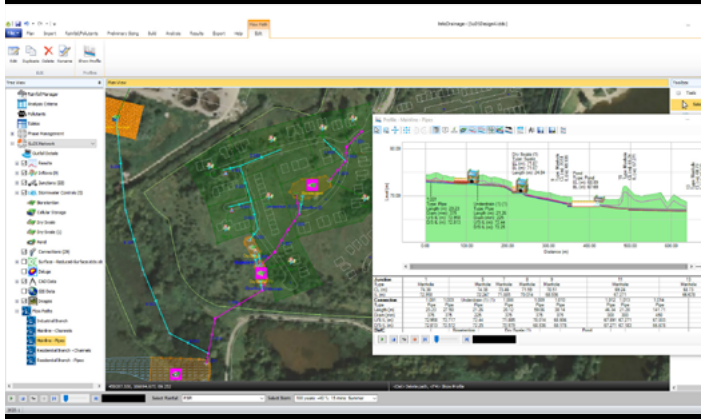
The inadequate drainage systems in Asia Pacific pose significant health risks to the population, entail significant economic costs and have a significant environmental impact. The wastewater that overflows from the drainage systems pollutes rivers and other water bodies, leading to water contamination and loss of aquatic life.

**The Solution: Environmentally Sensitive Drainage Solutions**

Low Impact Developments (LIDs) reduce inundation of traditional stormwater drainage networks and help mitigate flood risks.

Sustainable drainage systems (SUDs) help prevent flooding by lengthening the time required for stormwater to reach traditional drainage or river channels. By retaining water and encouraging infiltration, environmentally sensitive drainage structures can prevent pollutants from entering watercourses and help improve water quality.

**Finally, Drainage Design As Green As The Land**



InfoDrainage enables data exchange with CAD and GIS platforms to shorten the design time. Sustainable drainage - SuDS, Water Sensitive Urban Design (WSUD) and LIDs - can reduce the risk of flooding downstream. InfoDrainage shows how water will flow through the structures you choose based on their physical parameters, enabling you to better understand the effects of your decisions.

# Compliance Issues for Drainage

**The Challenge: Complying with national and/ or local regulations is difficult**

Different standards and calculations apply in different countries, so it's difficult to get scale or align on metrics when trying to solve drainage issues in a consistent way.

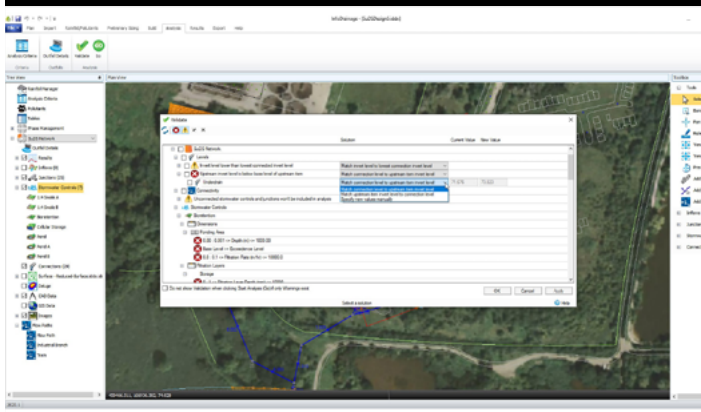

**The Solution: Sustainability, Simplified.**

Whether you're designing WSUD in Australia, SuDS in the UK, or LIDs in other countries, InfoDrainage simplifies the process.

**Simpler Regulatory Compliance**

Whether you're an engineer preparing for submission to a regulatory authority or a reviewer approving drainage designs, having the ability to audit a design is going to help get work started on site. Auditing reports in InfoDrainage simplifies compliance, and you can save customisable templates for local regulations and requirements. There is also a choice of languages and units.

**New headline: Succeed with Sustainable Drainage Design**



Autodesk has tailored its solutions to fit the unique requirements of each of our markets in order to deliver robust, proven designs in all of them. Around the world, Autodesk software is used to design all the components of sustainable or low impact stormwater projects to meet regional requirements – from deluge 2D analysis to calculators for quick stormwater control design. It's trusted for a good reason – it performs!

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# Solutions For Operational Analytics

# Operational Analytics

**The Challenge: Incidents Happen Without Asking Permission**

Levels of service and quality of customer experience are dramatically impacted when network incidences remain unresolved within a water utility.  Customer satisfaction hinges on you having visibility to issues and the ability to derive optimal action plans quickly and effectively.

**The Solution: Cloud-based Incident Management**

Deploy a cloud-based incident management solution with designed workflows for operations, response teams, network managers and customer service resources to be aware, make sense and optimally act on network incidences as a cohesive water organisation.

**Use the Right Tools for the Job**

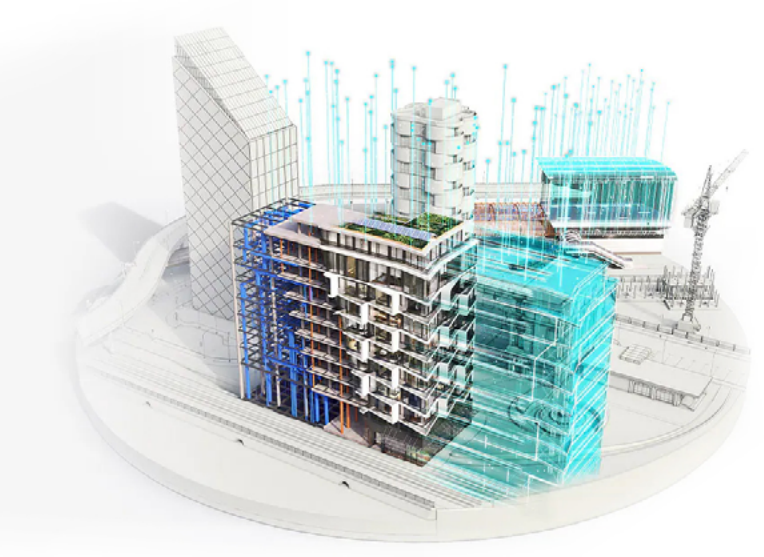
Autodesk's Info360 Plant is a cloud-based operational analytics solution within the Info360 platform. Designed specifically for water and wastewater treatment plants, it allows you to improve real-time data analysis and enable workflows associated with performance, compliance, and improvement planning.

- Get advanced monitoring and analysis
- Manage and mitigate operational risks
- Deliver consistent and efficient reporting

# Solutions For Operating Cost Reduction

**The Problem: Models Are Good, But ...**

In the past, water engineers used models for one-off simulations – for example, to design the right size pipes for a new subdivision/ development. Information that was held in silos such as asset registries, water supply, wastewater, and flood control repositories could not be easily integrated, if at all. Models can be often an imperfect representation of reality and can guide you to the wrong decisions.



**The Solution: Digital Twins Are Better**

Digital twins take simulations to the next level. They combine models, comprehensive asset information, live operational data, and forecasts, giving decision-makers new ways to assess their networks.

Digital twins deliver the greatest benefits for large, complex systems. With networked systems, such as water distribution and wastewater collection systems, the twin can factor in the hydraulic connections between the elements and their geospatial positioning. Then they can add information about the physical assets - their age, construction materials, current condition and so on; usage patterns of consumers and businesses; weather conditions; and other factors.

A digital twin brings all this information together, giving you broad insights on which to base robust, defensible decisions.

**See digital twins in action**

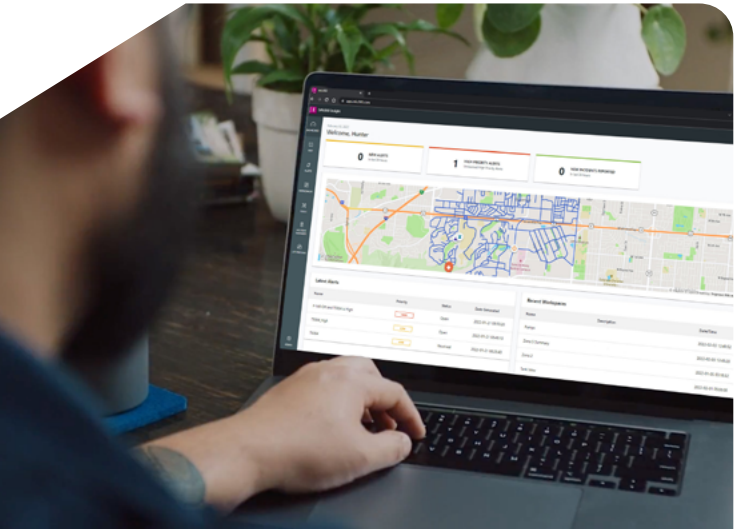
The Smart Canal developed for Scottish Canals, Glasgow City Council & Scottish Water uses InfoWorksICM to manage water levels in the Firth & Clyde canal. An award-winning project using InfoWorksICM has helped Anglian Water prevent pollution incidents that threatened public safety and the environment

At Bristol Water, InfoWorksICM Pro runs automatically every morning to predict flows and pressures. It can manage operations such as water quality incidents, in- and out-of-service boreholes, and rerouting and zoning of pumping stations.
**Read more >**

# Better vs. More

**The Challenge: Too Much Data**

The overwhelming amount of information generated by the monitoring and analysis of water systems creates problems for many organisations who lack the technology and skills to manage it effectively. The collection of data has become easier with the advent of sensors and remote monitoring systems, leading to a significant increase in the volume, variety, and velocity of data being generated. Difficulties in processing and analysing large amounts of data, the lack of standardisation in collection, storage and analysis, and the inherent complexity of water systems make it challenging to employ data in decision-making.



**The Solution: Pairing data with proactive system management and maintenance**

Water utilities, local councils, and supporting consulting companies have entered an era where vast amounts of data are produced from sensors that monitor water networks. If accessed, configured, and analysed in real time, this data helps water industry organisations create constantly evolving operational insights.

But data can do much more. It can foster greater integration between operations, engineering, and management teams.

Pairing data with proactive system management and maintenance can uncover solutions for the complex challenges confronting the industry with a degree of execution and response previously beyond reach.

**Work Smarter, Not Harder**

Info360 Insight is a fully managed SaaS platform that's purpose-built to support water utilities, eliminating the need for complicated installations and expensive customisations. Now, you can focus on your core expertise and deliver service that exceeds customer and board member expectations.

# #IRT Makes a Difference

### The Challenge: Lack/Barriers of Data Adoption

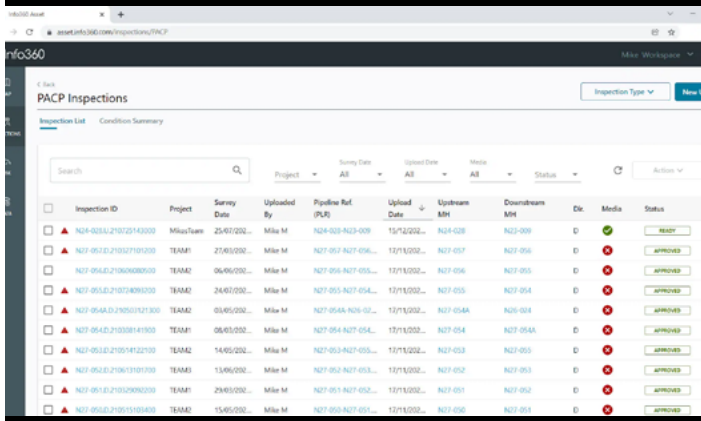
Legacy data storage systems have stymied the water industry's desired data culture. The inefficient systems can't scale for growth of data and are not built to be transformed as business needs change. For most utilities, the problem isn't a lack of data—it's unmanageable data, siloed data sets and teams, shortages of skills and tools, and the time to use tools effectively.

### The Solution: Invest in Real-Time Data Capture

Many newer technologies for water services will help organisations acquire masses of data. Smart, automated technologies—such as smart meters, SCADA system data, and automatic meter readers— provide water consumption metrics (authorised and unauthorised), variability in pressures across multiple zones, real-time asset performance, and much more.

Today's technology solutions for water utilities' operational management integrate disparate data sets and apply sophisticated analysis, modelling, and workflow tools to streamline your operation and prevent problems before they happen.

### Do Better with Your Data




By leveraging high-performance cloud computing, broad data access, and hydraulic model integration, Info360 Insight brings real-time awareness to operational performance and highlights key utility performance indicators like non-revenue water, pump efficiency, and mission critical alerts.

# Successful Water Stories from Asia Pacific

By using InfoWorks ICM, Arcadis, a global design, engineering, and management consulting firm, was able to provide an efficient, top-down assessment of risk for multiple spatial and detail scales, enabling a practical understanding of comparative risk and mechanisms in Hong Kong.

Read the story

Wellington Water, a New Zealand-based utility, used Info360 Insight to develop a preventative asset maintenance program, enabling it to maximise its vast storehouse of raw SCADA data to better understand its operational performance.

Read the story

In 2016 and 2018, devastating floods affected Tasmania, resulting in millions of dollars in damage and leaving communities recovering from significant losses.
Autodesk's own InfoWorks ICM has been used to create a digital twin to model flood events and provide the right tools and intelligence to SES and its emergency management partners.

Read the story

# Protect Every Drop

In over 100 countries, local authorities, municipalities, utilities, consultants and a wide variety of other users rely on Autodesk's software to optimise their work.

Autodesk's comprehensive suite of products is designed to work together, as well as to integrate with other standard architecture, engineering and construction (AEC) software and systems. Enabling the design and delivery of critical services in water and wastewater, Autodesk solutions support system resiliency, maximise the value of assets, and help to protect and enhance the environment.

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**About Autodesk**

Autodesk is changing how the world is designed and made. Our technology spans architecture, engineering, construction, product design, manufacturing, media, and entertainment, empowering innovators everywhere to solve challenges big and small. From greener buildings to smarter products to more mesmerising blockbusters, Autodesk software helps our customers to design and make a better world for all. For more information visit autodesk.com or follow @autodesk.