CASE STUDY #6

Construction at Bryn Estyn water treatment plant.

COVER YOUR ASSETS

PROJECT:
TasWater asset management

REGION:
Tasmania

STARTED:
2021

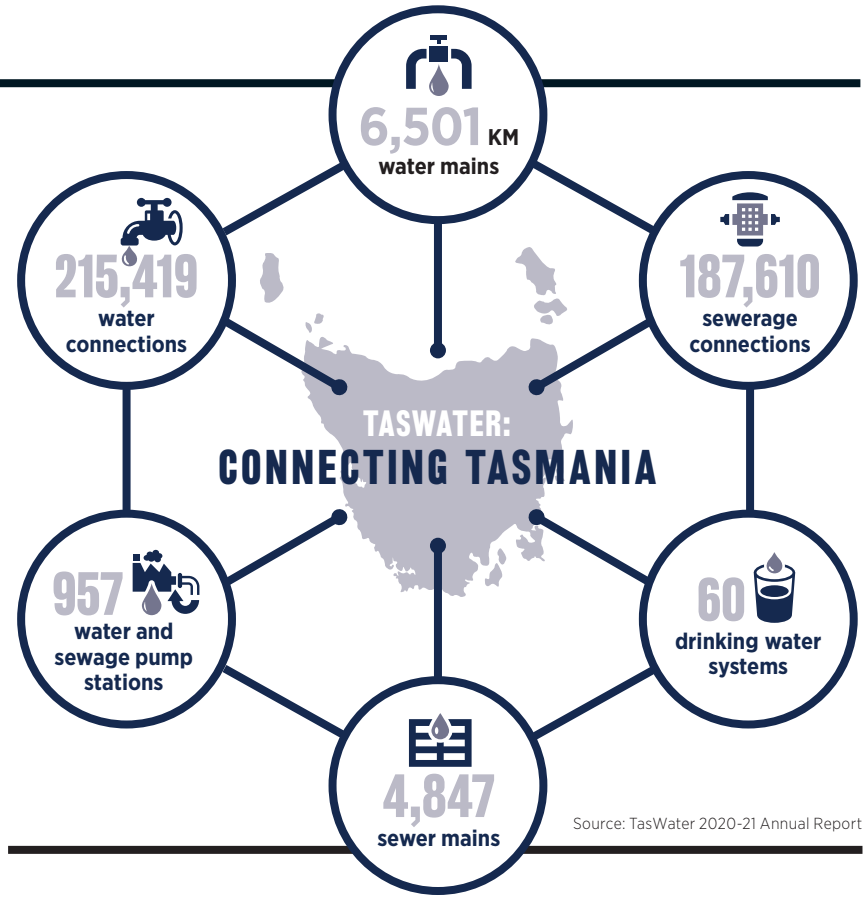
A merger of three utilities almost a decade ago left TasWater with a diverse array of assets across the state. A whole-of-business approach, coupled with new technology, helped the utility align its goals.

By Martin Kovacs

With its diverse and geographically dispersed asset portfolio, TasWater continues to face unique infrastructure management challenges.

In recent years, the utility has been transitioning to a whole-of-business asset lifecycle management (ALM) approach, with new digital technologies enabling integrated planning. As explained by TasWater General Manager Asset Management Services, Matt Derbyshire, TasWater's asset base spans the largest number of water and sewage treatment plants in Australia, servicing over 214,000 connections across Tasmania (see infographic on page 105).

While the New South Wales utility Hunter Water oversees similar lengths of water and sewer mains, TasWater has five times the number of sewage



Source: TasWater 2020-21 Annual Report

treatment plants, and 10 times as many water treatment plants.

"The diversity and age of the infrastructure, along with the cost of capital, means we must be innovative in how we manage our infrastructure to achieve our business outcomes," he said. "The largest challenge we have is the sheer number of plants we operate and maintain, with a limited revenue base to support an upgrade to modern standards."

A WHOLE-OF-BUSINESS APPROACH

Against a backdrop of ALM digitalisation and increasingly proactive long-term planning, Derbyshire said TasWater's shift to a whole-of-business approach has helped provide further clarity on investment benefits and priorities.

Additional emphasis was placed on the diversity of decision-making, spanning both internal and external stakeholders, allowing TasWater to holistically address its respective investment drivers.

"The whole-of-business approach ensures our interventions are integrated and aligned, and provides a clear line of sight between asset-level interventions and customer outcomes," Derbyshire explained.

Meanwhile, the ongoing deployment of digital tools not only provides critical real-time operations insight, but also contributes long-term strategic planning.

TasWater has strategically invested in technologies which provide an enhanced understanding of asset data and support feedback on infrastructure performance.

"With respect to updating our plans, digital transformation is driving the ability to be more agile with planning," he said.

"Reflecting changes in short periods of time allows TasWater to better understand investment triggers and act before an event occurs, which results in a reduction in service to our customers."

HARNESSING DIGITAL TECHNOLOGY

With ALM flexibility critical in balancing evolving priorities – including customer preferences, regulatory, environmental and climate considerations – TasWater adopted an increasingly proactive approach, harnessing digital technologies to better understand asset risk at a macro and micro level.

Digital asset class management plans (ACMPs) – drawing on data from TasWater's Maximo Enterprise Asset Management system, along with financial and key attribute data – enable TasWater to develop lifecycle management strategies across its assets.

"The implementation of digital ACMPs has allowed us to better understand our required renewal investment and compare this to our existing plans," said Derbyshire.

"We are also able to identify criticality at the asset level, and understand variations in risk, criticality and probability of failure across several different classifications – including by asset class, region, asset classification or asset subtype."

TasWater plans to directly link its digital ACMPs to Maximo and other corporate systems to provide live insights, allowing it to update and capture changes as its capital program delivers new infrastructure.

Derbyshire also highlighted the key role online growth and capacity planning plays in TasWater's broader ALM approach.

"Our online growth and capacity plans allow us to utilise planning and Australian Bureau of Statistics data to understand where and when ➤

CASE STUDY #6

Longford Sewage Treatment Plant upgrade.

> *Soon, TasWater will incorporate criticality along with likelihood of a functional failure being observed to allow risk assessment of the program to take place.*
>
> **Matt Derbyshire, General Manager Asset Management Services, TasWater**

development will occur, and how it will impact the future capacity of both hydraulic and organic loads on our infrastructure," he said.

NETWORK DECISION SUPPORT TOOLS

As part of its digital transformation, TasWater deployed a host of water and sewer network decision support tools across its operations, facilitating more complex risk assessments and scenario planning.

Tools such as the Pipeline Asset Risk Management System (PARMS) and Arcadis Gen's Water Asset Optimiser assist with investment decisions and the delivery of network-based corporate objectives.

"PARMS allows TasWater to set levels of service and understand the impact on our water network infrastructure risk profile, as well as understand investment requirements to deliver on our regulatory customer metrics," he said.

Similarly, the Water Asset Optimiser allows TasWater to set service requirement levels from sewerage network infrastructure.

Other tools include PI Historian, which allows TasWater to collect time series data and set dashboards on the performance of its assets from its supervisory control and data acquisition, IoT devices and third-party information.

Nexus Global's Strategy Optimiser is also used to develop corporate maintenance strategies, which aligns tasks to failure modes and justifies every activity in the program.

"Soon, TasWater will incorporate criticality along with likelihood of a functional failure being observed to allow risk assessment of the program to take place," he said.

"This will ensure we can moderate our maintenance program when our risk profile changes, when capital interventions don't deliver the lowest lifecycle risk reduction, or the business requires us to seek operational efficiencies."

FUTURE FOCUS

TasWater's next goal is better integration of its evolving technology suite across the respective processes in the coming years, with a view to improve ALM decision-making efficiency and effectiveness.

The utility plans to integrate real-time SCADA data from its PI Historian, paving the way for intuitive asset management.

"This will allow setting and automation of service levels against specific asset types, enabling assets to indicate when they are unable to deliver a service," Derbyshire said.

"Machine learning can also be investigated, with data structures and information supporting analysis for common defects or indicators that an asset is beginning to move along the failure curve, reducing its ability to deliver its function."