Company Release

Águas do Porto, EM

User Name: Águas do Porto, EM

Project Name: H2PORTO Technological Platform for the Integrated Management of Porto's Urban Water Cycle

Location: Porto, Portugal

Overview: Águas do Porto created H2PORTO, a smart water platform with a digital twin, to keep the water system in Porto, Portugal, resilient in the face of growing urban pressures.

Year in Infrastructure 2019 Awards Nominee; **Going Digital:** Advancements in Water, Wastewater, and Stormwater Networks

A water system facing urban pressures

As the city of Porto's water system aged, it faced a variety of urban pressures, including infrastructure development, pollution, supply interruptions, pipe bursts, and sewer collapses. Water company Águas do Porto (AdP) knew they had to improve their access to systemwide information, which would help them quickly identify problems and ensure that a more reliable system is in place. Additionally, system data had become housed in dozens of siloed applications. To improve access to their information and resolve problems, AdP decided to develop a sustainable smart water platform to manage the water cycle, forecast flood risks and water quality issues, and improve decision-making and system resilience.

Combining system data into a smart water platform

To develop the smart water platform, known as H2PORTO, AdP retained a consortium of vendors that included Bentley Systems. Together, AdP and the consortium integrated all data sources, including geospatial infor-


City of Porto's ageing water system faced increasing urban pressures including infrastructure development, tourism, pollution, supply interruptions, pipe bursts, and sewer collapses. Image courtesy of Águas do Porto, EM.

mation systems, real-time network sensors, household meters, supervisory control and data acquisition, laboratory, billing, work orders, and logistics into a single platform. AdP helped create a digital twin of the water system that could automatically model water levels and flow based on real-world condi-

tions and weather forecasts to predict flooding, service interruptions, or water quality problems.

Simulating hydraulic scenarios to stay prepared

AdP used Bentley's OpenFlows applications as
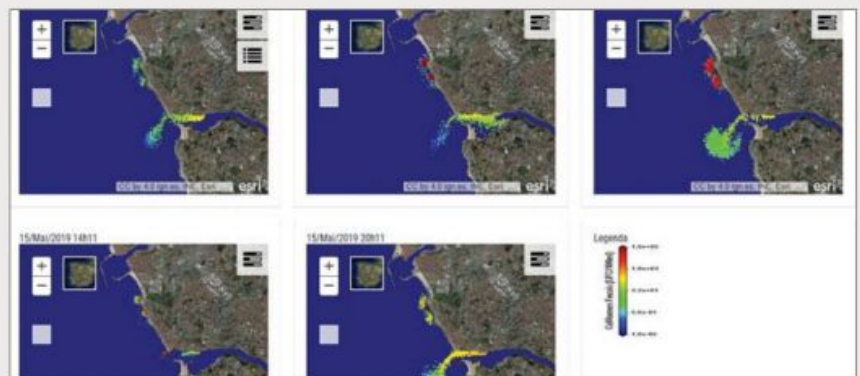
Since implementation, the city of Porto has seen significant improvements to its water supply, with supply interruptions falling by 22.9 per cent and the number of sewer collapses decreasing by 54 per cent. Image courtesy of Águas do Porto, EM.

Their smart water system ensures a reliable source of water for residents and tourists. Image courtesy of Águas do Porto, EM.

the basis of the H2PORTO platform. Open-Flows FLOOD helped the team use spatially distributed numerical models to simulate all hydrological processes in the natural environment, including rivers and coasts. OpenFlows SewerGEMS provided engineering capabilities for managing wastewater systems, as well as the ability to model what-if scenarios. The two applications formed the basis of comprehensive flood modelling of the entire water system. OpenFlows WaterGEMS also provided numerous capabilities for water network analysis and decision-making.

Preventing problems with improved information access

With H2PORTO fully operational, the city of Porto has made its water system more resilient and ensured a reliable source of water for residents and tourists. Supply interruptions fell by 22.9 per cent and the number of sewer collapses decreased by 54 per cent. Repairs for pipe bursts and sewer and service connec-

tions improved as well, by 8 per cent and 44.5 per cent respectively. These improved repairs allow for a consistent water supply in the region. Also, the volume of non-revenue water dropped by 3.6 per cent. By providing access to water system conditions in near real time, AdP experienced operating gains of 25 per cent. Automated water system modelling allows AdP to quickly respond to potential problems. By unifying the data produced by formerly siloed systems, AdP has improved the accuracy of the data produced from sensor readings to nearly 99 per cent. With more accurate data, the organisation has improved overall decision-making.

Project Playbook: OpenFlows FLOOD, Open-Flows WaterGEMS, OpenFlows SewerGEMS

Outcome/Facts

- The city of Porto's ageing water system faced increasing urban pressures including infrastructure development, tourism, pollu-

tion, supply interruptions, pipe bursts, and sewer collapses.
- Since implementation, the city of Porto has seen significant improvements in its water supply, with supply interruptions falling by 22.9 per cent and the number of sewer collapses decreasing by 54 per cent.
- Their smart water system ensures a reliable source of water for residents and tourists. ◗

Author: Sandra DiMatteo, Director, Industry Marketing, Water, Bentley Systems

Sandra DiMatteo is the Industry Marketing Director, Water Infrastructure at Bentley Systems. She has more than 25 years of experience in reliability and asset performance management software, asset life cycle information management, and is an expert in digital twin cloud solutions in the water and wastewater, energy and process industries. Sandra holds an honours degree in accounting and is a Certified Reliability Leader. She sits on the Reliability Leadership Institute Board of Advisors and founded the Ontario Chapter of the Society of Maintenance and Reliability Professionals. ◗

"H2PORTO is an important catalyst for digital transformation, supporting changes in people, process and technology and, most importantly, helps us with operational mobility and the provision of information in real time on any device."

Pedro Vieira, IT and Innovation Director, Águas do Porto