![Bentley logo]

Building a Sustainable Future with Bentley: 10 Innovative Approaches

Part 2

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Introduction

Infrastructure professionals across the globe are looking for ways to transform how they design, build, and operate infrastructure to prepare for a changing climate. Solutions from Bentley Systems are helping industry leaders make more sustainable choices. From designing energy-efficient buildings to mapping and protecting groundwater, our applications are helping future-proof aboveground and belowground infrastructure.

Here are the remaining five of the 10 innovative ways that we're helping city planners, engineering teams, and other infrastructure professionals reduce the ecological footprint of infrastructure and adapt to the changing climate.
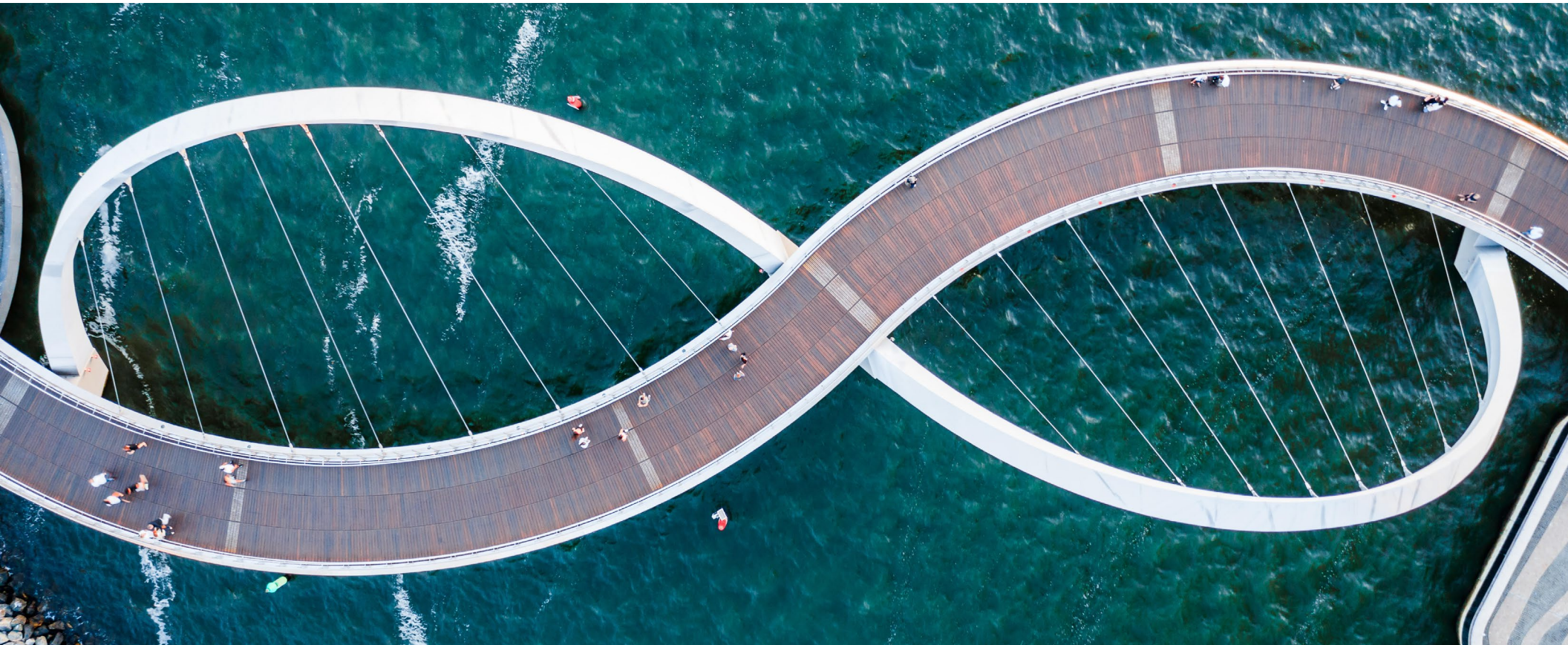
Improving Mobility Planning through Simulation Tools

Optimizing Foot Traffic On and Off Public Transport

People are more likely to use public transit if it's easy for them to enter and exit. This tendency is especially true of transit terminals like railway stations. That's why engineering teams use LEGION® to simulate and optimize pedestrian flow. The application can also be used to test evacuation strategies. Learn how LEGION was used to assess and improve the accessibility of London's Bank-Monument rail station.

Multimodal Transportation and Traffic Flow

As cities continue to grow, local governments need ways to manage added traffic from cars, bikes, scooters, and buses. City planners and engineers use OpenPaths™, our mobility simulation software, to find answers. It helps identify ways to reduce multimodel traffic, forecast how an aging population will change mobility needs, and estimate how much pollution will be generated under different scenarios. Learn how OpenPaths CUBE™ was used to plan a new rail infrastructure in Beijing.

Planning and Managing Sustainable, Resilient Cities

City planners are looking for ways to manage cities more holistically to create a sustainable urban environment. Bentley's OpenCities® Planner and iTwin® Experience help by combining different types of information behind a "single pane of glass." These solutions integrate to make it easy to visualize a cityscape.

It All Starts with a Surface Model

Bentley's iTwin Capture can create a detailed 3D map of a city using collected data from sources like drones, cars, or satellites. The solution can help engineering teams find objects with feature extraction, see more details, or build other models using the data. City planners use iTwin Capture to visualize urban development, preserve historic sites, and design public spaces.

Floods

Teams can create 3D visual scenarios for city-scale flood risks with OpenFlows™ FLOOD or OpenFlows Sewer. Learn how the Sultanate of Oman is using these solutions to improve national security and preparedness for climate-related disasters.

Energy Management

Visualizing the solar potential of different buildings can improve how energy is managed and generated. Learn how Helsinki, the capital of Finland, is using Bentley's digital twin technology for infrastructure planning and development.

Urban Heat and Sidewalk Safety

Better tree maintenance can reduce urban heat and improve sidewalk and road safety. Start by building a 3D mesh model of a city's trees to help monitor tree health and reduce the risk of damage from tree roots. Learn how digital twins and tree mapping can help cities manage the impact of climate change.

Monitoring Critical Infrastructure Assets

Hydropower dams play a critical role in managing the risk of extreme climate by producing clean energy and helping manage floods. Safety engineers use Bentley's Dam Monitoring solution to create highly detailed 3D models from drone imagery and other data. The models help assess aging infrastructure remotely and perform virtual inspections. Computer vision and AI help automate crack detection, and IoT sensors help develop early warning systems for ground shifts or rising water levels. Learn how this technology is being used to monitor the structural health of a 50-year-old concrete dam in northern California.
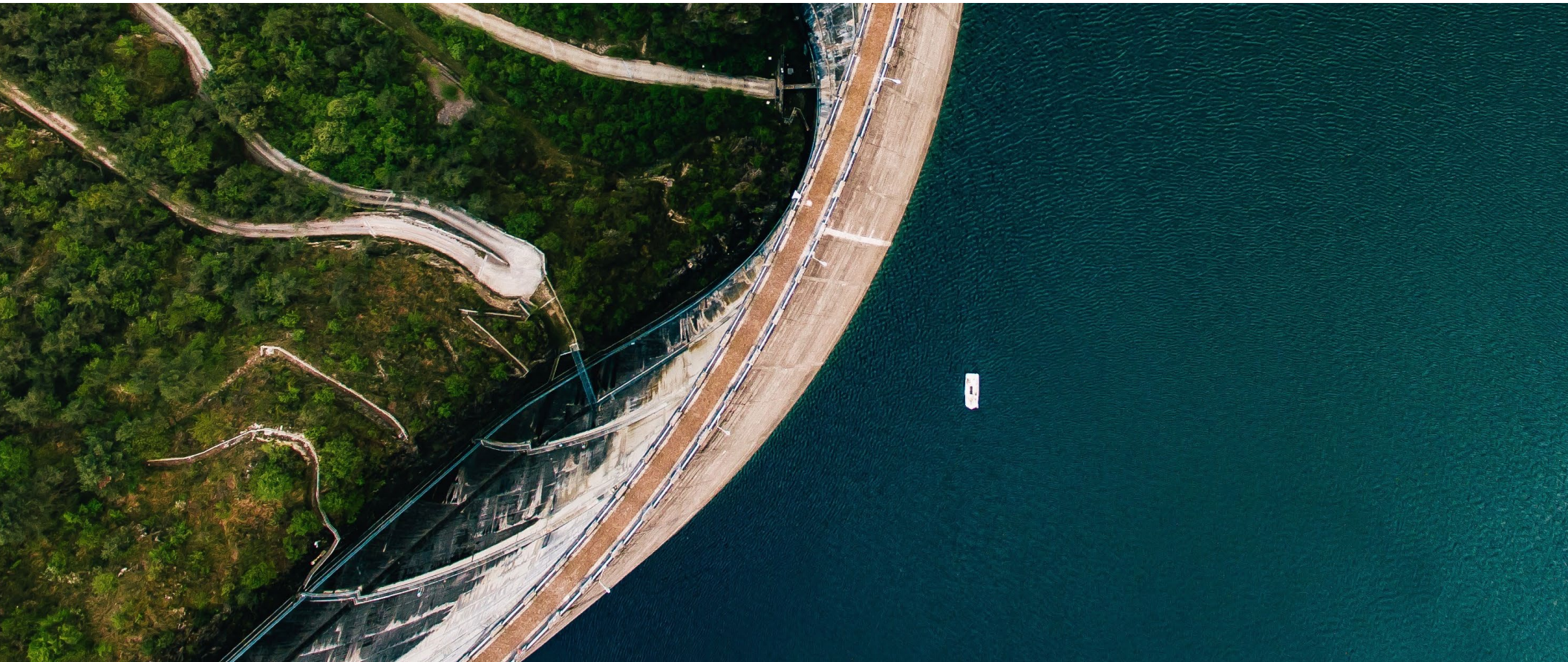
Managing Water Distribution Systems

Bentley OpenFlows WaterSight® is helping water utilities reduce energy needs and minimize water losses.

Pump Optimization Meets Energy Efficiency

Energy costs often comprise 25% to 30% of a utility's total operation and maintenance costs, and pump energy specifically can account for as much as 50% of a water utility's total electricity consumption. Using digital twins made from Bentley applications reduces energy costs.

Our software creates a digital replica of the water system, making it easy to track and analyze pump performance. By integrating readily available SCADA or other telemetry data, the digital twin can calculate efficiencies, energy consumed, and potential inefficiency costs. This easily available data can help operators identify priority pumps for intervention and provide clues to correct the problem, improving energy efficiency while reducing energy costs and carbon emissions.

Reduce Non-revenue Water

Recent data estimates 126 billion cubic meters of global, annual non-revenue water, which roughly translates to USD 40 billion in annual losses—a significant economic impact. Digital twins can help monitor flows and pressures to better understand water losses and prioritize areas for replacement. The result is reducing non-revenue water by 20% or more. Learn how these solutions are helping a Brazilian utility improve leak detection and optimize operational workflows.

Mapping, Detecting, and Managing Groundwater

Finding safe, clean water is already a challenge in many parts of the world. We expect water scarcity to grow as climate change creates longer and more intense droughts. Groundwater, the water stored in aquifers, is an essential natural resource. In fact, groundwater accounts for an average of one-third of the freshwater consumed by humans. In some parts of the world, this ratio can reach 100%. Groundwater is also the primary source of water for irrigation and the food industry. Leapfrog and Oasis montaj support groundwater mapping, detection, and management in several ways.

Identifying

Our solutions help water engineers identify potential resources. The software integrates and analyzes groundwater data so it can be used to create 3D maps of underground bodies of water.

Assessing

The software can assess the quality and quantity of groundwater resources, including wells and aquifers, and estimate seawater intrusion, as well as how much water is entering and leaving an aquifer.

Planning and Protecting

Our solutions can optimize groundwater use patterns to minimize the impact on groundwater resources, ensure long-term sustainability, and help protect groundwater from pollution and depletion.

Learn how our solutions are helping Groundwater Relief provide water access to impoverished communities.

Did you miss the first five of the 10 innovative approaches to building a sustainable future? Then check out Part 1 of this report.

Ready to get started? It is easy, and we can help.

Start a chat