OpenFlows™

The Savings Are Flowing with OpenFlows™

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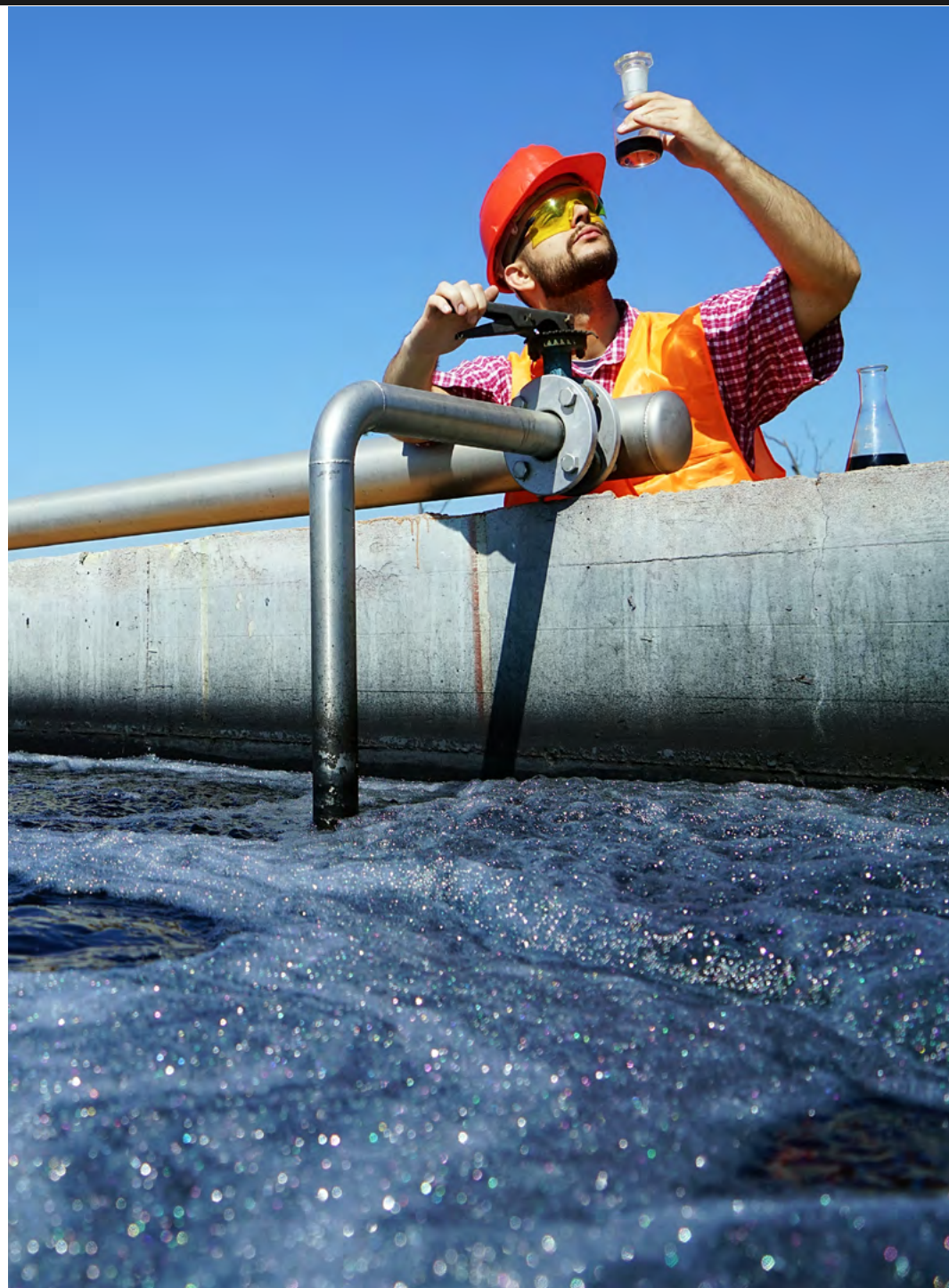


Not Getting the Results You Need?

Are you struggling with cumbersome spreadsheets to perform intricate hydraulic modeling and analysis? Not getting the results you need quickly and efficiently? Or maybe you are unhappy with your current hydraulic modeling software, and you want to stop wasting time creating models without being able to analyze your results.

Non-optimized workflows will create hidden costs for you, your clients, and your community. Working under conservative designs leads to inefficient operations, increased construction costs, and poor-quality service.

When you have optimized software, you can improve your efficiency by reducing project uncertainties to deliver faster and better projects. The perceived fixed cost savings on the initial project can cause much more significant recurring savings during operation. Software with advanced hydraulic analysis capabilities can provide the solution to your struggles.

The Value of a Good Analysis Solution

When using advanced hydraulic analysis software that includes OpenFlows Water, OpenFlows Sewer, and OpenFlows Storm, cost savings will be realized instantly and during the entire infrastructure lifecycle, from planning, analysis, and design to operations and maintenance. You will receive the benefit of intuitive and automated workflows that can significantly reduce overall costs by working efficiently and effectively under tight deadlines and margins.

The faster you learn the software, the faster you deliver projects and spend more time prospecting or working on newer projects. A small investment in highly efficient software like Bentley's OpenFlows Water can deliver a very quick return on investment with:

Automated Model-building

The Power of Analysis

Small Tweaks to System Operations

Dive into the Details

OpenFlows software is user-friendly with superior interoperability. You can choose your preferred platform and increase hydraulic modeling capabilities with more power to do georeferenced analysis and drawing to save time and avoid the hassle of switching between different platforms. Easy to use means you and your new hires will be up and running quickly to get the job done.

Learn more about OpenFlows solutions.

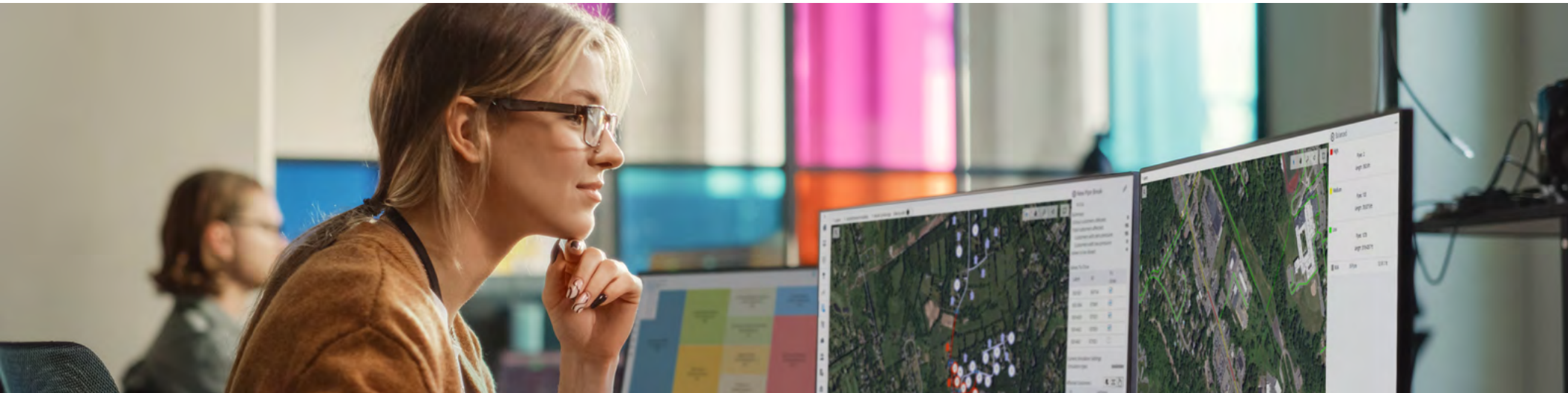
- **OpenFlows Water**
- **OpenFlows Sewer**
- **OpenFlows Storm**

OpenFlows™ Water

OpenFlows Water provides an easy-to-use environment for you to confidently plan, design, and optimize your water distribution systems and pressure systems. It features advanced interoperability, geospatial model building, optimization, and asset management capabilities.

OpenFlows Water supports your engineering workflows with:

- Model building
- Transient simulation and analysis
- Fire flow and water quality analyses
- Advanced calibration methods
- Advanced automatized design methods
- Advanced operation optimization methods



OpenFlows™ Sewer

OpenFlows Sewer is an easy-to-use advanced engineering application for you to plan, design, and analyze sanitary and combined sewer systems. You can decrease decision risks by ensuring that the model uses the best available data, built-in hydraulic and hydrology capabilities, and a variety of wet-weather calibration methods.

OpenFlows Sewer provides:

- The ability to work in multiple platforms
- 1D/2D hydraulic analysis
- Model building and management
- Advanced analysis
- What-if-scenarios
- Five hydraulic solvers for simulations considering static, extended period, dynamic, and 2D simulations
- Automatized gravity pipes design

We have bundled the best of both products in our **Water WorkSuite**. With Water WorkSuite, you receive both OpenFlows Water and OpenFlows Sewer at a discounted price. It is now offered in three sizes: *1,000 pipes, 5,000 pipes,* and *unlimited pipes* at a 40% discount.

OpenFlows™ Storm

OpenFlows Storm is a multiplatform hydraulic and hydrologic modeling solution developed for engineers to analyze complex stormwater systems, improve pond design, and gain workflow efficiency. Detect system bottlenecks, improve capacity, and limit stormwater flooding to comply with regulations. Minimize capital investments with optimized network designs and master plans for your entire system.

OpenFlows Storm provides:

- Scenario management
- Interoperable hydraulic modeling
- Multiple 1D hydraulic solver options
- 1D/2D hydraulic analysis

Analysis Features to Save Time and Money

Here are the many streamlining benefits you will receive from OpenFlows software that allow you to solve your water and wastewater challenges.

Scenario Management

The OpenFlows applications can efficiently evaluate several designs and compare the results, or analyze operations of an existing or planned system under numerous extreme and typical conditions. This analysis enables engineers, designers, and operators to test "what-if" conditions to better foresee and predict the impacts of changes in the system, even small operational actions.

Easy Model Building

Jumpstart the model-building process and manage your model effectively to make the best engineering decisions. You can leverage and import many well-known external data formats, which maximizes the return on investment for geospatial and engineering data and automates input data generation. OpenFlows also allows access to and comparison with record drawings and live GIS asset and background data. Leverage numerous data sources and avoid manual tasks that will make your work harder and more time-consuming, as well as place you at risk of typing mistakes.

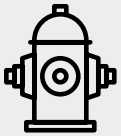
Great Visualization:

You can use capabilities, such as color coding, annotation, profiling, and graphs, to create a better visualization experience in your modeling application. The ability to easily implement background images, such as Bing Maps, helps you create and present information in an interesting way.

From fire flow and water quality simulations to criticality and energy cost analysis, OpenFlows Water has everything you need. You can identify and mitigate risks with the following benefits:

Criticality Analysis

Do you know which sections of your systems are more critical? Can you start your rehabilitation plan and prioritize replacements? With OpenFlows Water, you can find the weak areas or links in water distribution systems and assess the adequacy of isolation valves. Evaluate the ability to isolate portions of the system, generate network segments, and serve customers using different valve locations.



Fire Flow

Access and identify inadequacies in fire protection and design improvements to meet fire flow and protection requirements. You can modify the sizing and location of pipes, pumps, and tanks. Automated fire flow analysis capabilities eliminate the need for manually creating scenarios and iterations to evaluate every hydrant location.

Pump Optimization

Model pumps accurately using hydraulic modeling, including complex pump combinations and variable speed pumps, to understand the impact that different pump operational strategies have on energy usage. You can minimize energy related to pumping costs while maximizing system performance. OpenFlows Water has several features that enable this analysis, including the ability to generate a quick comparison of a pump's operation to its intended design and efficiency.

Assess Water Quality

Carry out water quality analysis easily using simulations to help solve water quality problems. You can create water quality simulations for chlorine decay, water age, source tracing, and multispecies analysis (MSX). Enable a comprehensive thematic display of the results, both within and apart from GIS platforms, to get a clear understanding of how and where problem areas develop in your system.

Flushing Analysis

Optimize flushing programs with multiple conventional and unidirectional flushing events in a single run. Increasing velocity in mains can flush out solids and stale water, with the primary indicator of success being the maximum velocity achieved in any pipe during the flushing operation. OpenFlows Water includes automated capabilities for flushing analysis, including the ability to print a sequenced report for use in the field.

OpenFlows Water's Automated Capabilities

Examples of OpenFlows Water's automated capabilities include:

Automated Design

Automatically find maximum benefit or minimum-cost designs and rehabilitation strategies based on available budget, construction cost, and pressure and velocity constraints. You can also analyze energy consumption to identify the most energy-efficient pump scheduling strategy.

OpenFlows can help you optimize:

- The operations of fixed- and variable-speed pumps.
- Tank storage by minimizing energy usage or energy cost, based on pressure, velocity, pump start, and tank level constraints.
- Energy costs by aggregating them across pumping stations and factoring in complex tariffs and non-model-related energy costs, which results in a net present value analysis of your operating scenarios.

Automated Model Calibration

Evaluate millions of possible solutions to let you quickly find a calibration hypothesis that best matches measured flows, pressures, and on/off status. This hypothesis will empower you to make reliable decisions based on accurate hydraulic simulations of the real world.

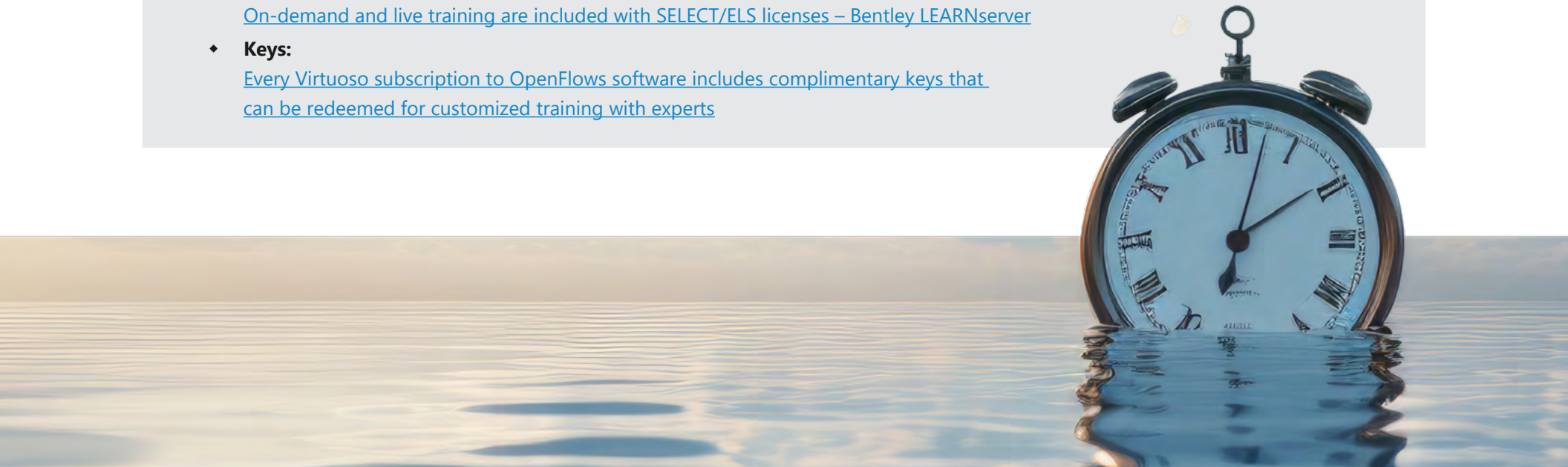
Time Is Money

Due to a workforce shortage, utilities, contractors, and other industry entities often find themselves reactively replacing assets that fail. Hydraulic modeling could aid as a proactive strategy that is far more cost-effective in the long term. Finding the solution that will help you optimize your designs, increase profits, save time, and keep your consumers happy is only the first step.

Successful integration through consistent and reliable support, including access to water and wastewater industry experts, ensures you will accelerate your productivity.

All new users receive a New User Learning Resources Guide that gets you up and running quickly. In addition, our hydraulic and hydrology experts provide in-depth content such as webinars, blogs, tutorials, and more. You can use:

- **On-demand Training:**
  Courses and learning paths database – Find Training (bentley.com)
  Virtual classroom – Bentley Systems Learning Opportunities Listing
- **Formal Expert Training:**
  On-demand and live training are included with SELECT/ELS licenses – Bentley LEARNserver
- **Keys:**
  Every Virtuoso subscription to OpenFlows software includes complimentary keys that can be redeemed for customized training with experts



Get Your Savings Flowing Today

We often encounter growing utility companies and consultants that initially relied on conservative and outdated methods for design and operations. These professionals were content with these methods until they realized what they were really missing out on—daily opportunities to properly identify and leverage modern hydraulic models to find hidden savings.

No matter the size of your business, investing in innovative and efficient technology solutions today enables you to reap greater efficiencies and profitability into the future.

> We applied OpenFlows Water software in a water loss control and reduction project in the Passo Fundo region, which suffers from severe drought. The existing water distribution system had a loss of approximately 60 percent. The goal was to reduce that loss to 40 percent, which we achieved.
>
> *Matheus Viegas, Owner, Tecnologia em Saneamento Ambiental (TSA), Brazil*