Rail Engineering Solution

Connect Your Data, Design, and Deliverables

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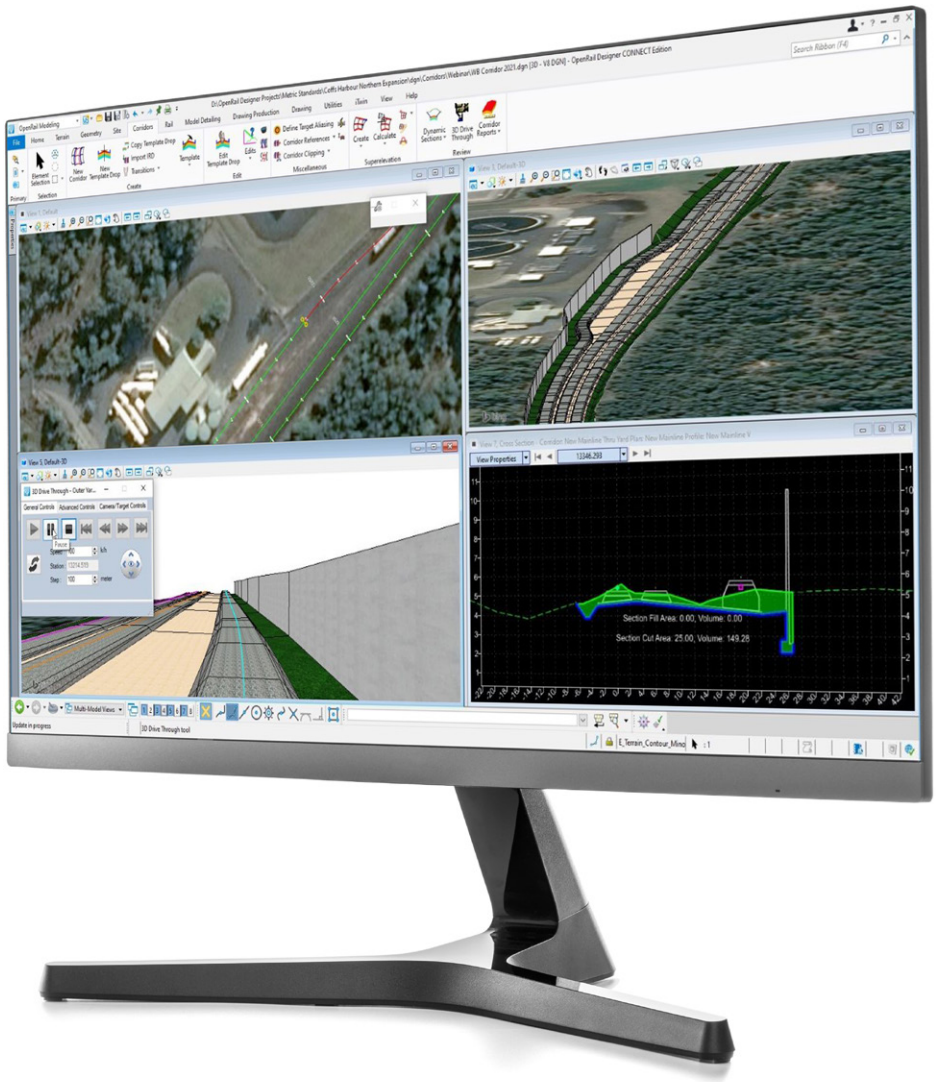


Bentley's Rail Engineering Solution

Efficient and resilient rail networks are an essential part of a sustainable future for passenger and freight mobility.

In the face of shorter deadlines, tighter budgets, and a workforce that is both limited and increasingly remote, delivering and maintaining the world's rail and transit infrastructure poses significant challenges. To overcome these obstacles, owner-operators and engineering consulting firms are embracing digital technologies and processes.

By going digital, organizations can manage increasing demands with their existing staff and capitalize on funding opportunities aimed at upgrading aging infrastructure for safer, more resilient rail networks.

Solution Capabilities at a Glance

Good engineering adds significant value to rail infrastructure assets. With linear and horizontal elements (track, bridge, and tunnel) and vertical elements (buildings), rail projects are complex and multidiscipline. Bentley's rail engineering solution enables your team to focus on creating intelligent design models with faster revision times and improved plan production. For metro, light rail, commuter rail, freight, or high-speed rail infrastructure, you can deliver:

Improved Design Collaboration
Create, visualize, automate, and instantly modify designs with the most up-to-date models. Link people, processes, and standards across the project, incorporating and delivering both proprietary and open data sources. Many disciplines with one solution, one workspace, and one set of information produce one successful project.

Industry-leading Capabilities across all Disciplines
Increase design efficiency and reduce project risks with a complete set of interoperable design and engineering capabilities that enable end-to-end BIM workflows.

- Track and overhead line design
- Bridge design and analysis
- Tunnel design
- Drainage and utilities
- Station design and analysis

Solution Capabilities at a Glance

Simplified Compliance with Industry Standards

Safety is an essential consideration of any rail design. Rail companies cannot afford to take an improvised, reactive approach to risk. User-defined design rules ensure projects follow the local requirements, leaving engineers free to focus on the design process. As every project is different, standards are user-customizable and not specific to any one system or country.

Streamlined Deliverables Creation and Management

Maximize the value of your 3D model. You can generate a variety of deliverables, including 2D drawings, discipline-specific reports, and real-world visualizations, to meet all stakeholder requirements with one solution. Use federated 3D models as the foundation for digital twins. Simplify handover by delivering rich and validated data-driven models to construction and asset managers.

Resources to Upskill Your Workforce for Increased Productivity

With increasing pressure to do more with less, get access to resources that upskill your workforce. Support from experts will help you increase efficiency and productivity. You can leverage mentoring from Bentley project experts, best practice implementation guides, and on-demand training for your team.

Benefits of Better Rail Engineering

Lack of collaboration limits the potential for optimal design, as there is no shared vision to help teams understand what they want to achieve. A limited view of what each team member can contribute leads to poorer quality design that does not meet requirements. Disconnected workflows between disciplines and project phases are a major reason to make the shift to 3D model-based workflows.

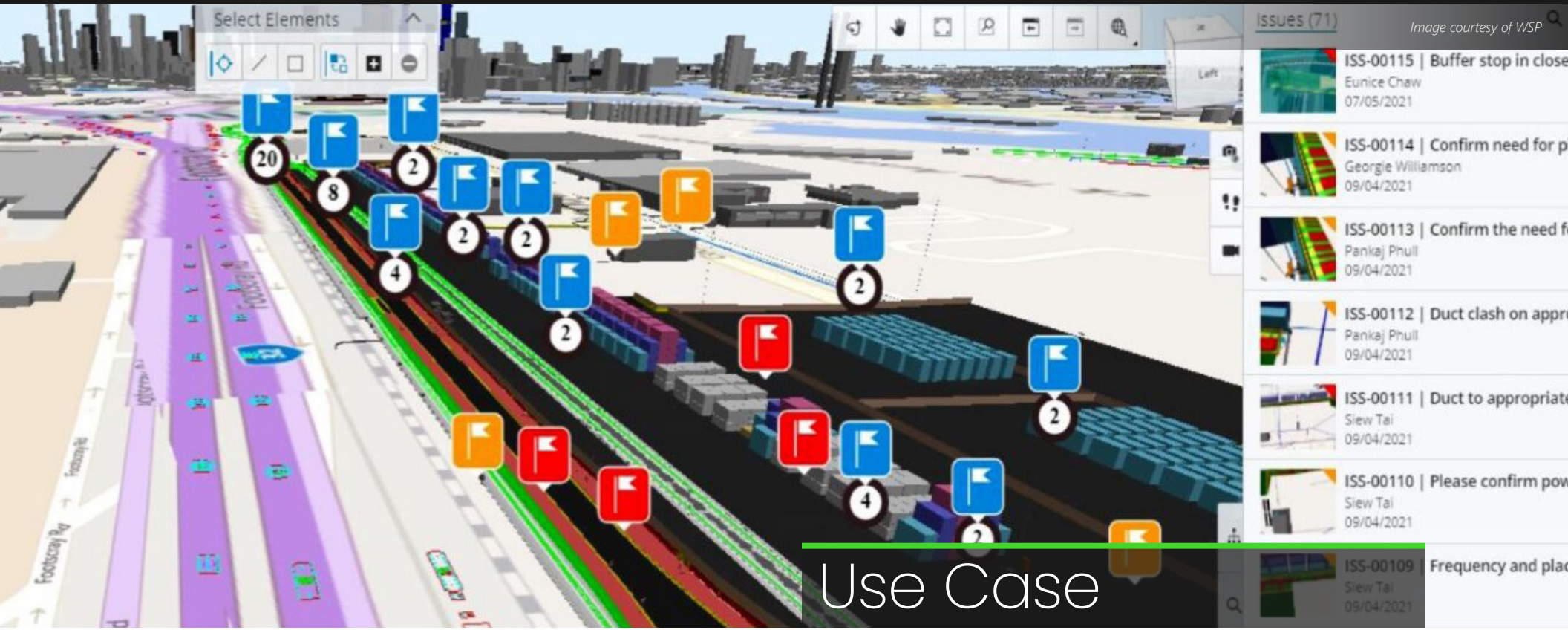
By implementing a collaborative, multidiscipline approach, the ability to create 3D models and undertake clash detection is just the beginning. The real benefit of comes from the technical data that can be embedded into every model. This data that can be used throughout the asset lifecycle for design optimisation, clash detection, costing, quantities, programming, phasing, fabrication, and facility management.

Bentley's rail engineering solution enables teams to:

- Better understand existing conditions
- Share and consume large datasets
- Keep constructability top of mind
- Meet design and customer requirements
- Reduce errors and rework
- Simplify data handover
- Keep on budget and on schedule
- Improve public engagement
- Plan sustainability into projects and lower carbon footprint

Use Cases

Examples from Industry Leaders Like You



WSP Port of Melbourne Rail Transformation Project

Digitizing Workflows and Information Management to Optimise Design

To optimize design and efficiently meet the Australian community's needs for mobility, connectivity, sustainability, and resilience, WSP set out to digitize workflows and information management across the project. Bentley's software allowed the team to share their design models with stakeholders on a weekly basis, enabled visual design reviews, establish a right-first-time design approach, and resolve issues much earlier in the design process. Working in the connected data environment streamlined workflows and stakeholder communications and automated 3D model coordination. Teams resolved 3,200 issues throughout the preliminary and final design phase, saving 475 hours, and realized a total return on investment of over 67%.

Arcadis Hurontario Light Rail Transit

Faster Design and Simplified Change Management

Arcadis was tasked with conducting the track alignment, structure, drainage design, and route-wide ducting design for the Hurontario light rail transit (LRT) project. With tight timelines and a team located across six different time zones, they would needed close cross-discipline collaboration to deliver this complex project. After previous methods proved difficult and time-consuming, Arcadis converted to 3D modeling, enabling a semiautomated workflow that significantly reduced modeling time and improved visualization. Leveraging a common data environment enhanced data management and communication. Bentley software quadrupled the speed at which they could adjust 3D design models, while dynamic visualization capabilities helped team members identify and resolve clashes.

Image courtesy of Network Rail & Jacobs

Use Case

Network Rail and Jacobs Transpennine Route Upgrade

Big Data and a Scattered Team Demand a Connected Digital Solution

To bring together all data and disciplines, Network Rail tasked Jacobs with implementing a route-wide digital twin. The digital ecosystem, based on Bentley's iTwin® Platform, enables users to follow, feed, and analyze the design and asset data in real time. Team members could identify potential clashes early and optimize construction scheduling to minimize passenger disruption. The increased data accessibility and enhanced efficiency enabled better decision-making, reducing cost and risk. The solution improved information accessibility for over 1,300 staff by 40%, saving GBP 1 million in the first six months of implementation.

Getting Started

Whether your company is working directly on a rail project or you are partnering with another firm to get the job done, discipline-specific software, automated workflows, and the free flow of accurate, up-to-date data are crucial elements of a successful project.

Making the move to a new way of working can be daunting, but with the right support to execute, the benefits are considerable. By blending traditional engineering workflows for plan, profile, and cross-sections with 3D modeling and connected workflows, the rail engineering solution makes the transition easier than ever.

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Contact us to learn more about the rail engineering solution.

Learn More >