Bentley Transportation Software Solutions

Built for Infrastructure. Engineered for Transportation.

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Transportation at a crossroads

Transportation infrastructure is facing more pressure than ever. Roads, bridges, railways, ports, and airports, often built many decades ago, weren't designed to handle today's demands. At the same time, budgets are tighter, climate impacts are intensifying, and skilled talent is harder to find.

With over 95% of the infrastructure needed for 2030 already in place, the urgency to modernize, maintain, and optimize what we have, while still building for the future, has never been greater.

For engineers, contractors, and public agencies, it's a constant balancing act: addressing immediate needs, building for long-term resilience, and staying on budget. Traditional methods simply can't keep up.

That's where Bentley comes in. We're here to help you modernize your transportation systems quickly, intelligently, and with confidence. Because it's not just about fixing roads or expanding railways, it's about keeping people safe, connected, and moving forward.

Your partner in smarter, more resilient transportation infrastructure

At Bentley, we know the challenges you face aren't isolated. They're all connected, just like your transportation networks. Solving them takes more than software. It requires smarter data, clearer insights, and a digital-first mindset.

For over 40 years, we've worked side-by-side with transportation professionals to design, build, and operate critical infrastructure. Our tools are built specifically for transportation, above and below ground, and they support the entire project lifecycle, from planning through construction and operations.

In this e-book, you'll see how Bentley helps you simplify the complex, make better decisions faster, and build for the long term. Whatever comes next, you don't have to face it alone. Bentley's solutions are built to help you adapt, respond, and deliver.

Today, Bentley is trusted by:

93%	72%	41,000	93%
of ENR's Top 250 Engineering Firms	of the Top 500 Owners	accounts in 194 countries	account retention rate

Addressing today’s transportation infrastructure challenges

Aging assets, rising demands

It’s not just that infrastructure is getting older—it’s being asked to do more than ever. Highways, bridges, and railways built for a different time are now expected to serve growing populations, operate more efficiently, and meet rising expectations around safety, access, and equity.

As these systems age, they’re constantly exposed to wear and tear, extreme weather, and natural disasters, raising the risk to public safety and creating costly disruptions. In the U.S. alone, over 220,000 bridges are at risk of failure.

How Bentley helps:

Bentley helps you move from reactive fixes to proactive planning, so you’re not just responding to problems, you’re staying ahead of them.

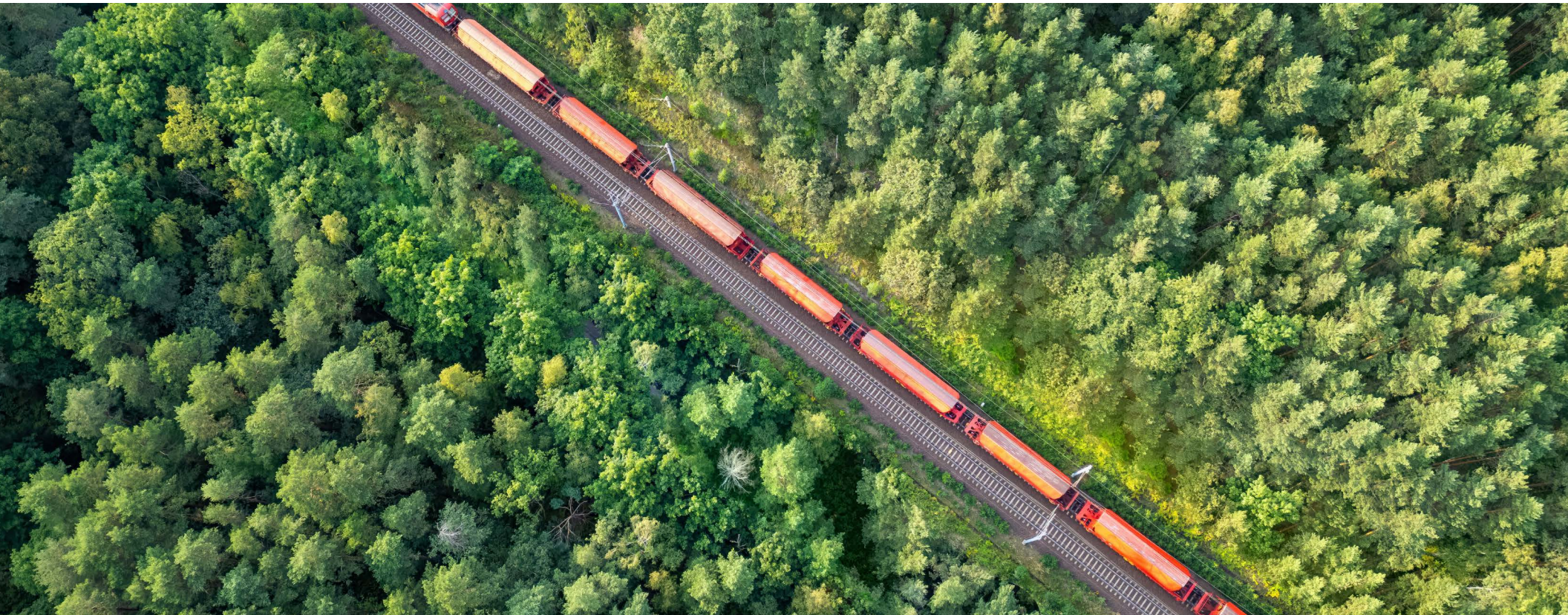
With Bentley, you can conduct digital inspections using drones, mobile mapping, and dashcam footage to quickly assess conditions, often without needing to send crews into the field. That data connects directly to your models, giving you a real-time, accurate view of your assets.

From there, you can track asset conditions over time, run what-if scenarios, and prioritize investments based on real need, not guesswork. These capabilities help extend asset life, reduce risk, and avoid costly surprises.

And by integrating that intelligence into your design and planning process, Bentley helps you accelerate project delivery. When your data, modeling, and design all live in one system, there’s less time spent on rework or transferring files, and more time making decisions that move projects forward.

"There are other CAD programs out there that surveyors can [use to] create a survey and a 3D model, but the optimization comes when the survey-based data and existing conditions model is incorporated into the design, and it works in one package instead of just bringing in a lot of data from different software. At the end of the Bridging Kentucky program, our field guys really only needed two or three days, and the CAD technician only needed two to three days to model a bridge. We can now do a standard bridge survey in a quarter to a fifth of the time that it would normally take."

Ben Shinabery, Survey Director, QK4, Inc.



Scale, complexity, and fragmented data

Transportation infrastructure projects are complex and massive. They stretch over years, involve multiple disciplines, and bring together countless stakeholders. These projects include millions of assets and billions of components. But the data supporting them often isn't as connected as it should be.

From siloed systems and inconsistent formats to broken handoffs and duplicated work, it's common for teams to lack a full, accurate picture of the project. When data is fragmented, mistakes multiply. Insights are missed. Projects get delayed. The risk of rework rises.

In an environment where every decision matters, fragmented data isn't just inefficient, it's a serious liability.

How Bentley helps:
Bentley helps solve this problem by unifying complex data environments. We bring together geospatial information, engineering models, asset records, and real-world conditions into one federated platform. This makes it easier for teams to access a complete and current picture of the project, no matter their role. Here's how Bentley helps simplify and connect everything:

- **Connected workflows:** Keep all stakeholders aligned, from engineers to contractors and owners with one source of truth. All disciplines can act earlier, reducing rework, minimizing redesign fees, and keeping things on track.
- **Integrated modeling:** Model both existing and future conditions in 3D, so every discipline is working from the same data. As a result, you'll get consistent analysis, design, and decision-making across the project.
- **Design-to-operations continuity:** Ensure data integrity from the earliest planning stages all the way through construction and into long-term operations. The information that you create today evolves into a living digital twin, enabling better performance, easier maintenance, and more informed decisions over time.

By connecting every phase, discipline, and decision-maker, Bentley helps you deliver better infrastructure, on time, on budget, and built to last.

"By having the entire project modeled in 3D and having the digital twin, we have increased the efficiency of the communication and approval process by leaps and bounds. Construction segment directors no longer have to wait for a finalized 2D plan and then sit down for days and try to understand it."

Carlos Gonzalez, Vice President, Engineering Services, Design Operations Lead North America, Ferrovial Construction

"A picture is worth a thousand words and a model is worth a book. It allows you to see on a computer screen the reality of that environment from behind a desk. You can share that on a Teams meeting with people halfway across the country to figure out where you are going to put your cranes, where you can store your materials while you're building the project, and you can do this with anybody now instead of having to actually meet in the field."

Royce Meredith, PE, Program Manager, Kentucky Transportation Cabinet

Workforce gaps and the need for speed

Transportation engineering is facing a growing talent shortage. As experienced professionals retire faster than new talent can join the field, firms are finding themselves stretched thin, forced to turn down projects or scramble to meet tight schedules and demanding scopes.

How Bentley helps:
Bentley's software is designed to align with the way engineers work, helping firms do more with their existing teams. By combining automation, generative design, and AI with our infrastructure-focused tools, we take time-consuming, repetitive tasks off engineers' plates, reduce the need for extensive fieldwork, and give teams more time to focus on the high-value, creative aspects of their work. Here's a few examples of how Bentley makes it happen:

- **Smarter design workflows:** Automate routine tasks by using smart components and discipline-specific objects, accelerating design while cutting down on manual effort and error-prone work.
- **AI-driven insights:** Use AI to identify defects, such as cracks, rust, or missing signage in 2D images, mapping them to 3D models for faster, more accurate condition assessments. No more time-consuming manual inspections.
- **Remote asset tracking:** Turn dashcam footage into a powerful tool for asset management, letting teams keep track of infrastructure remotely, without the need for large field crews. This reduces both costs and time spent in the field.
- **Construction efficiency:** Automatically organize photos and videos into geo-tagged, searchable grids, making it easy to find exactly what you need when you're on-site, so no time is wasted.
- **Comprehensive design capabilities on one platform:** Everything you need from start to finish is integrated into one platform. This means no more switching between multiple systems, transferring files, or worrying about compatibility issues.

Beyond technology, Bentley is committed to closing the talent gap by investing in future professionals. Our academic program provides universities with free access to Bentley software and is empowering students with industry-relevant skills through STEM initiatives. Through internships, partnerships, and career opportunities, we connect emerging talent with transportation engineering firms, cultivating a robust pipeline of skilled professionals to shape the industry's future.

"AI doesn't replace jobs, it changes jobs. It will allow us to look at projects in a much deeper depth than we looked at before. And by combining design and routine tasks into one powerful platform, it eliminates the need to switch between multiple programs. It streamlines our workflow, automates repetitive tasks, and ensures accuracy as we make changes in real time. This means faster project completion with superior results, helping Pennoni stay ahead of the curve in both technology and innovation."

Joe Viscuso, Senior VP and Director of Strategic Growth, Pennoni

"This is the first time I've seen software think like an engineer."

Kyle Rosenmeyer, Model Based Design Leader, VHB

Unexpected ground conditions

Subsurface surprises are the second leading cause of construction claims, and they're rarely just about the ground itself. These issues often stem from critical data not being in the right hands at the right time. Limited visibility into soil conditions, water tables, and geological risks can lead to delays, budget overruns, and safety hazards, especially during construction when stakes are highest.

Managing this complexity means more than collecting data. It's about making that data clear, connected, and accessible across teams. When subsurface information is siloed or hard to interpret, teams are left reacting instead of planning, and small gaps in insight can lead to big problems on site.

How Bentley helps:

Seequent®, the Bentley Subsurface Company, is the global leader in subsurface software. Understanding what lies beneath isn't just part of what we do, it's our sole focus and our deepest expertise. By bringing geotechnical data directly into your civil design workflows, our solutions give you a unified view of conditions both above and below ground. You'll get more accurate insights earlier in the process, allowing you to anticipate risks, respond faster, and keep projects on track. Smarter insights. Safer outcomes. Fewer surprises.

"We're not going back to the traditional way; modeling is fantastic. Within a big project like a tunnel, every project is really stressed for time and budget. What I find about 3D modelling is that when we get unexpected ground conditions, which is inevitable, we can quickly adjust, see what's going on, maybe do some additional studies or investigations, and come to a solution really quickly."

Phillip Kirk, Technical Director, Ground and Underground Engineering, Aurecon

Sustainability, resilience, and budget pressure

Transportation infrastructure must evolve to withstand climate challenges, reduce environmental impact, and support cleaner, more sustainable modes of travel. But tight budgets and outdated systems make long-term sustainability hard to prioritize.

How Bentley helps:
Bentley enables more sustainable infrastructure decisions by improving visibility, coordination, and foresight across the project lifecycle.

- **Carbon analysis:** Measure carbon emissions, both embodied and operational, during design and construction, so you can make smarter choices and optimize your designs before construction begins.
- **Reduce waste:** By minimizing rework and field time through better modeling and simulation, you can reduce material waste and site disturbance.
- **Sustainable transit:** From rail electrification to multimodal corridor planning, our solutions support the shift toward cleaner, more resilient mobility systems.
- **Digital twins for lifecycle efficiency:** With real-time performance data, teams can maintain infrastructure more efficiently, reducing unnecessary replacements and extending asset life.
- **Model contaminants:** Understand how contaminants intersect with your project over time, avoiding health risks, environmental harm, and costly regulatory delays.

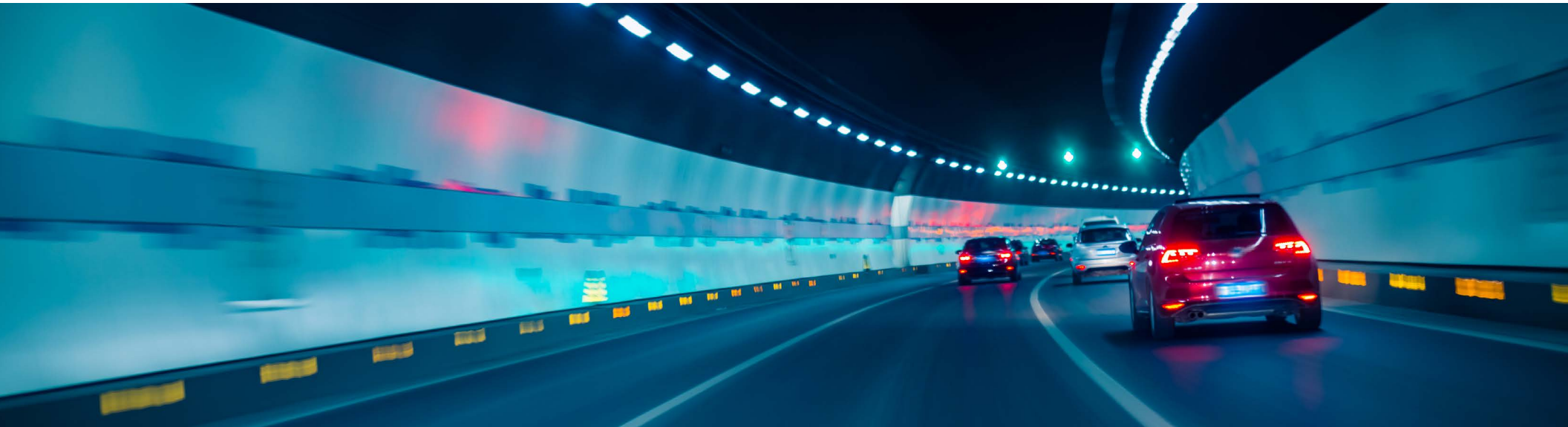
> "Countrywide, there will be a higher and more homogenous level of safety. Future maintenance will be more economical, and the system will provide an unprecedented foundation for better centralized traffic control, energy optimization, and on-time passenger information. Additionally, the system will provide a foundation for continued electrification, further lowering carbon emissions generated by older trains."
>
> *Farzad Aknooni, BIM Specialist, Banedanmark*

Bentley's approach: connecting every phase for better outcomes

Transportation projects are inherently interconnected, and so are the challenges they face. Planning affects design. Design shapes construction. And construction determines long-term performance. Bentley's platform is built to connect it all.

What sets us apart is our ability to unify people, data, and disciplines across every phase of the infrastructure lifecycle. With open, interoperable tools purpose-built for transportation, we help you reduce risk, eliminate inefficiencies, and deliver infrastructure that lasts.

- **Open:** Works with your existing systems to streamline coordination and reduce rework.
- **Comprehensive:** Supports planning, design, construction, operations, and maintenance, above and below ground.
- **Insight-driven:** Transforms complex data into clear, actionable insights.
- **Purpose-built:** Designed specifically for the challenges of transportation infrastructure.
- **Future-ready:** Innovative and adaptable, with digital twins, AI, GIS, and more, you're prepared for whatever comes next.



Leader in transportation design solutions above and below ground

Over
20%
design time acceleration

Advancing digital delivery through seamless integration of construction planning solutions

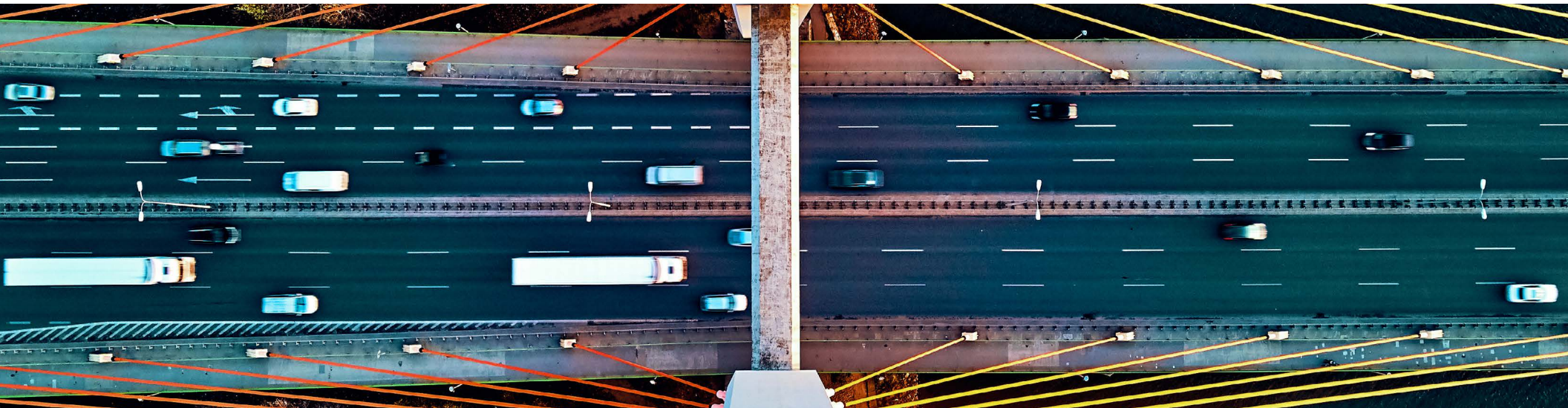
Up to
40%
reduction of time spent developing quantities

Incorporates AI for predictive maintenance and efficient asset management

Up to
90%
savings on manual inspection costs

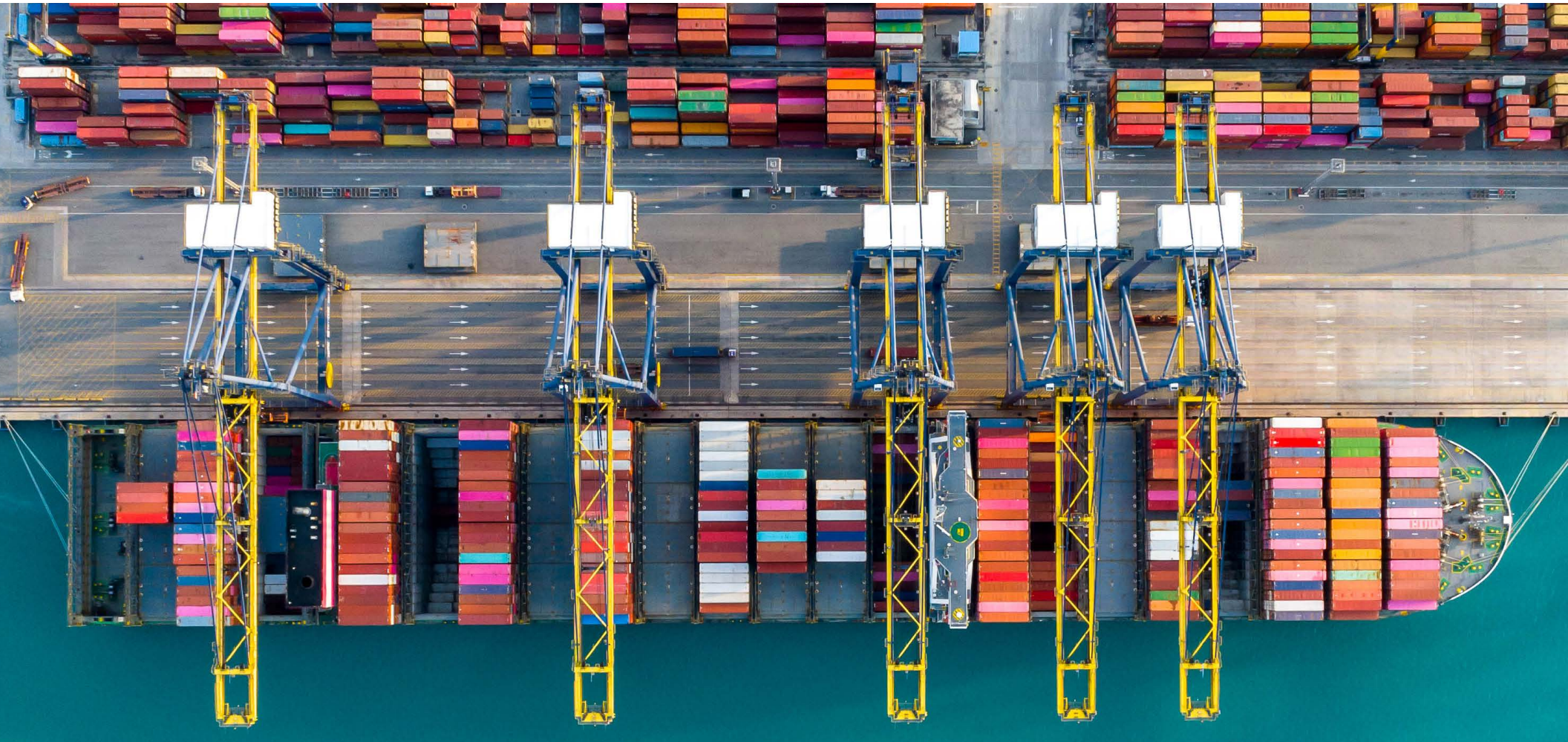
"Infrastructure is built to last. "Our users must assure that this data, their data, remains accessible for decades to come, and we believe this is only possible with a truly open approach."

Julian Moutte, Chief Technology Officer, Bentley



Solutions for every mode of transportation

Transportation infrastructure is as diverse as the systems that keep our communities connected. Roads and highways, rail and transit, bridges and tunnels, airports, ports, and waterways all come with unique challenges and requirements. Bentley's solutions are purpose-built for each domain, delivering the tools, insights, and technology needed to support every stage of the project lifecycle.



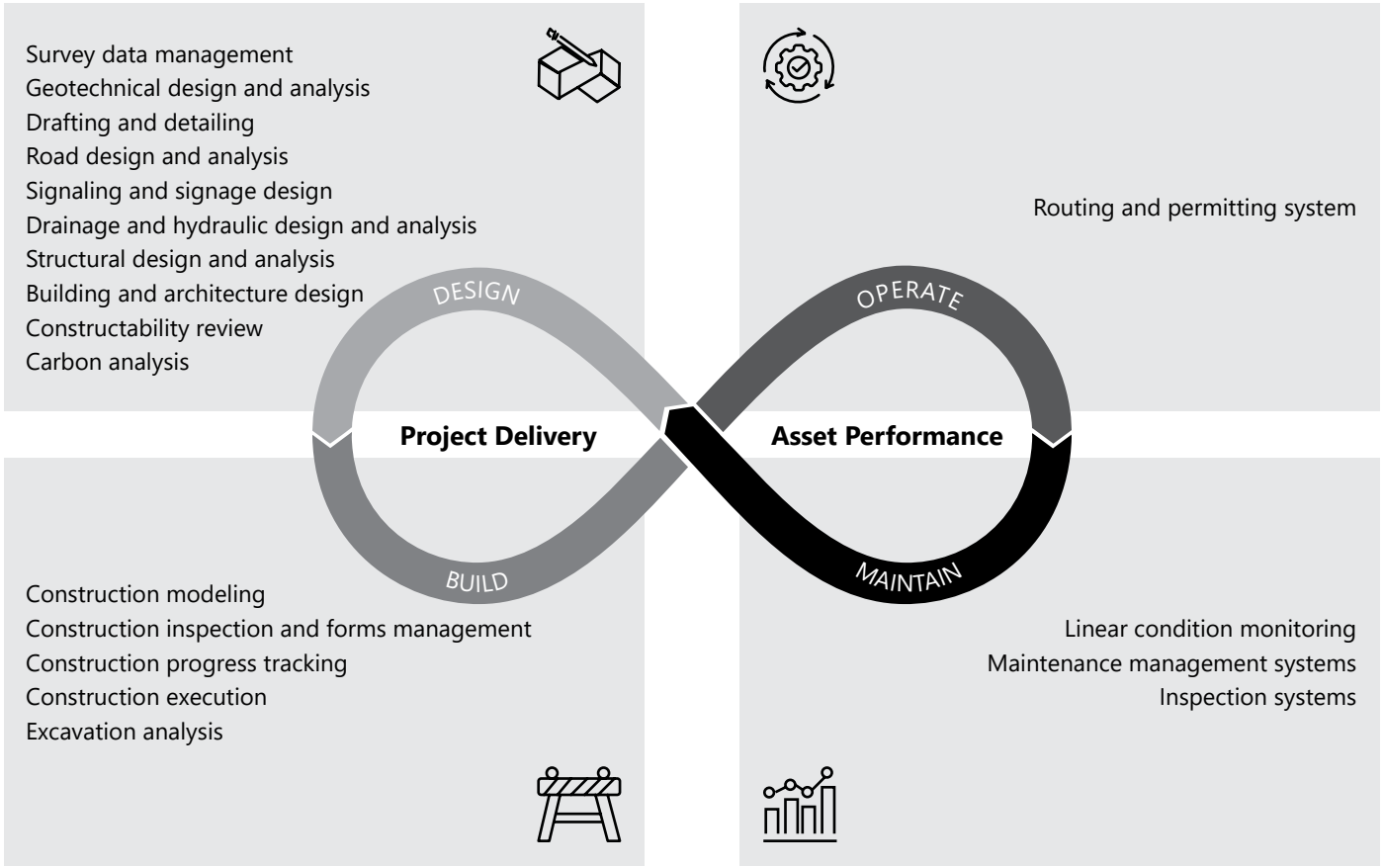
Roads and highways solutions

Full lifecycle

Document management system
Connected data environment
Geographic information systems (GIS)
Engineering geological modelling

Mobility simulation
Geotechnical data management
Requirements/compliance management
Condition monitoring system (Internet of Things)

Enterprise data management
Reporting and dashboarding system
Imagery and field data collection management



51,680	75%	9,000	97%	90%
estimated hours of work saved	reduction in rebar design time	hours saved in generating and managing sheets	reduction in visualization creation time	reduction in time for team onboarding

Case study reference: AtkinsRéalis, 1-70 Floyd Hill project, Idaho Springs, Colorado, United States

Image courtesy of AtkinsRéalis

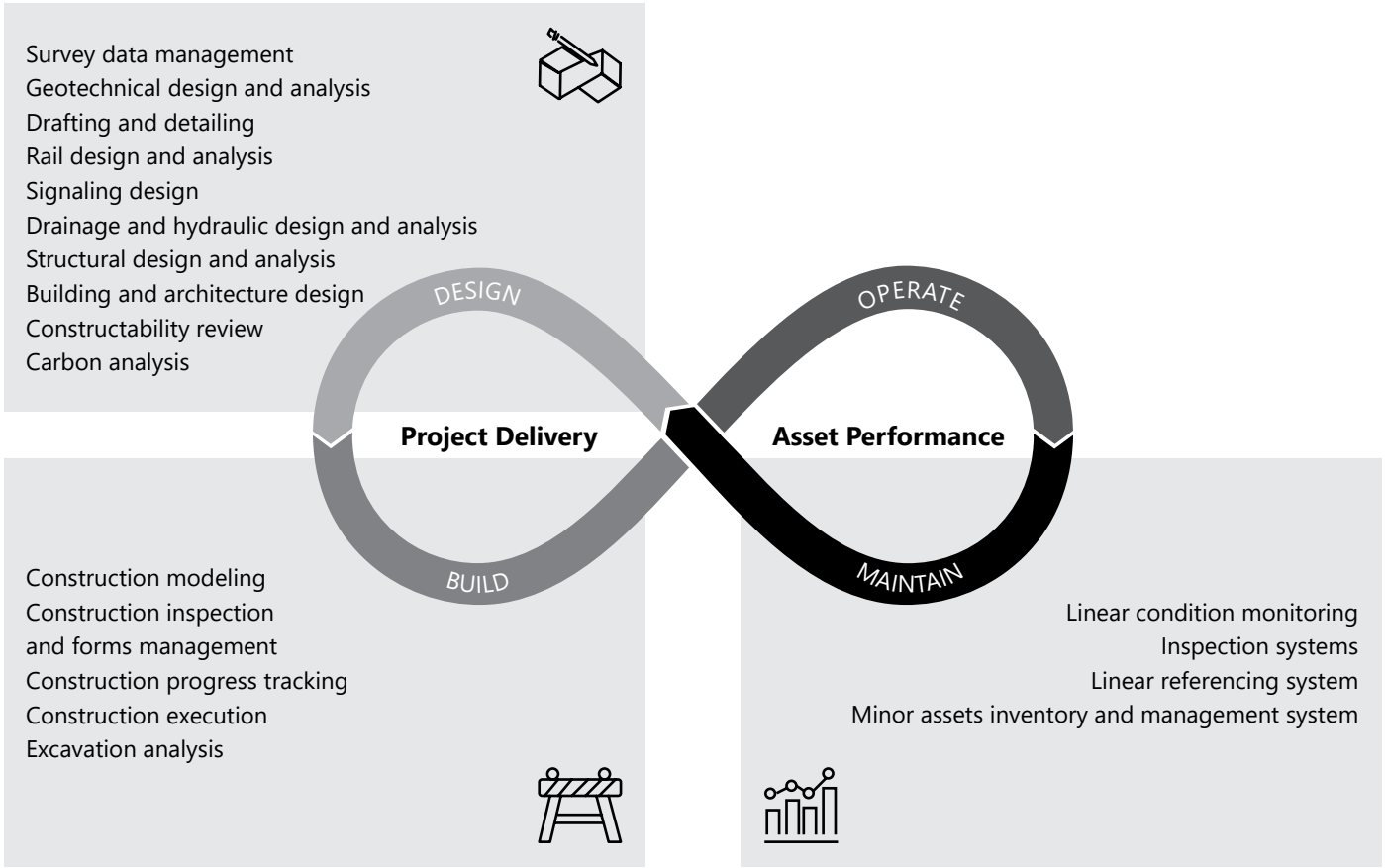
Rail and transit solutions

Full lifecycle

Document management system
Connected data environment
Geographic information systems (GIS)
Engineering geological modelling

Mobility simulation
Geotechnical data management
Requirements/compliance management
Condition monitoring system (IoT)

Enterprise data management
Reporting and dashboarding system
Imagery and field data collection management



USD 30,000
estimated savings in rental and operational costs per month

90%
savings in operational inspections

95%
savings in soil modeling and stratigraphy

50 tons
savings in CO2 emissions

70%
savings in software data exchange

Case study reference: PT Hutama Karya (Persero), Jakarta, South Jakarta, Indonesia
Navigating the complexities of Jakarta MRT phase 2A CP203 with digital solutions

Image courtesy of PT Hutama Karya (Persero)

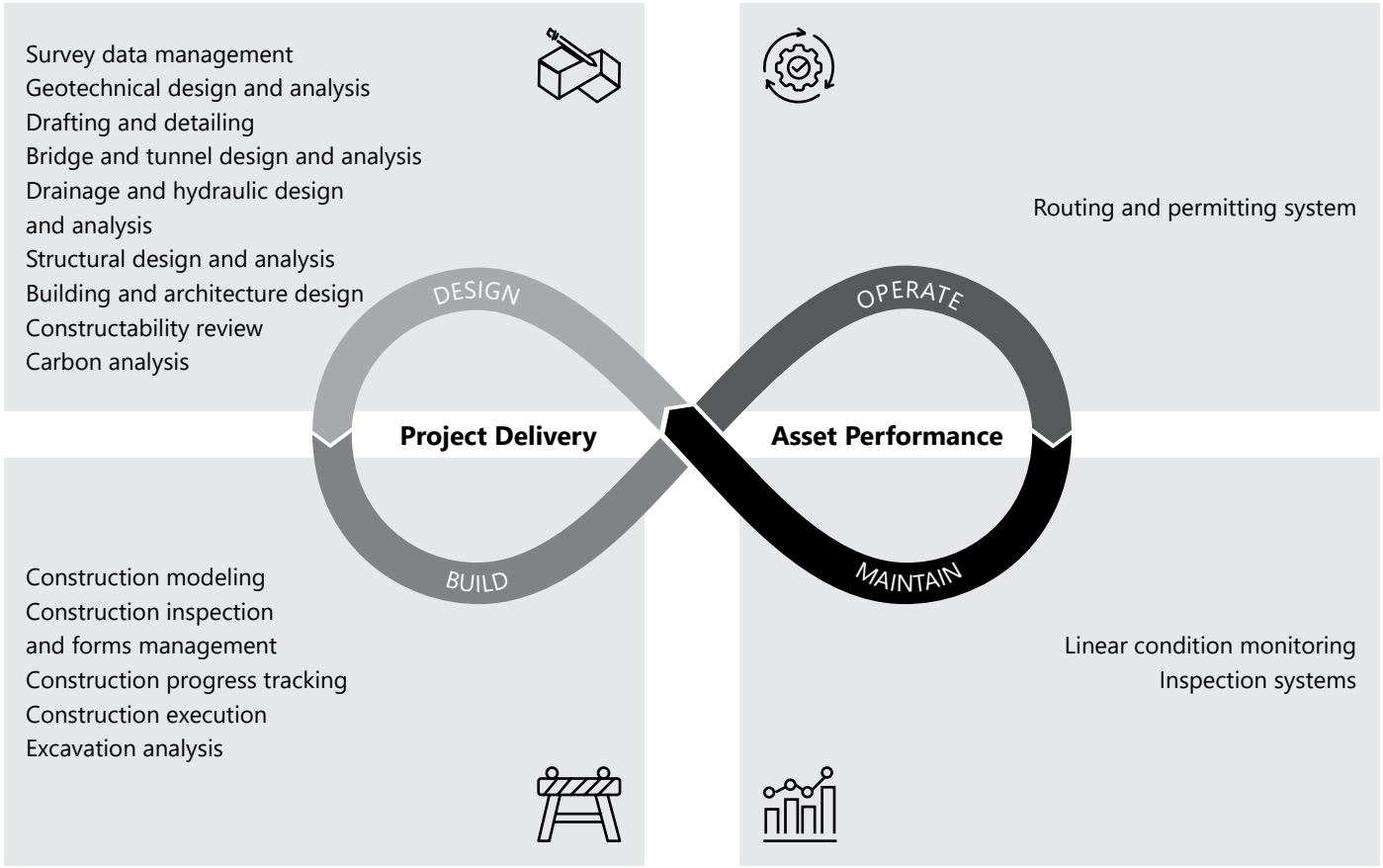
Bridge and tunnel solutions

Full lifecycle

Document management system
Connected data environment
Geographic information systems (GIS)
Engineering geological modelling

Mobility simulation
Geotechnical data management
Requirements/compliance management
Condition monitoring system (IoT)

Enterprise data management
Reporting and dashboarding system
Imagery and field data collection management



851	25%	21.5%	30%	30%
estimated saved work hours	savings in modeling and design	savings in project deliverables	savings in survey interpretation and verification	savings in clash detection

Case study reference: Tecne Systra-Sws Advanced Tunneling Srl, Italy
Digital implementation in tunnel assessment and rehabilitation

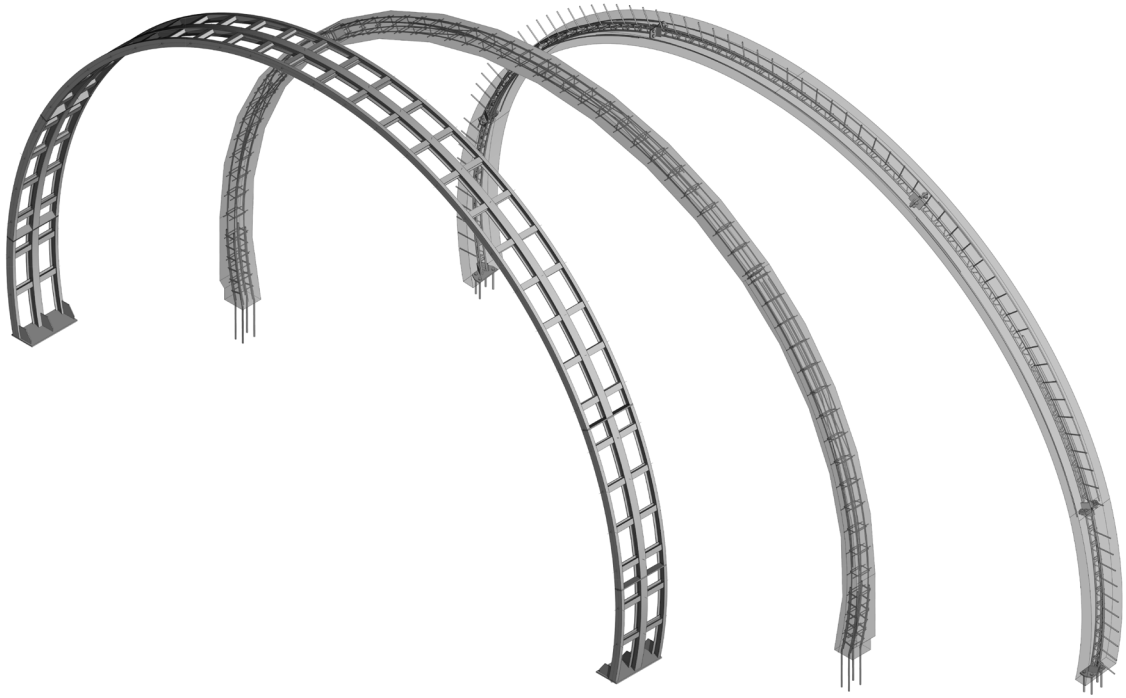


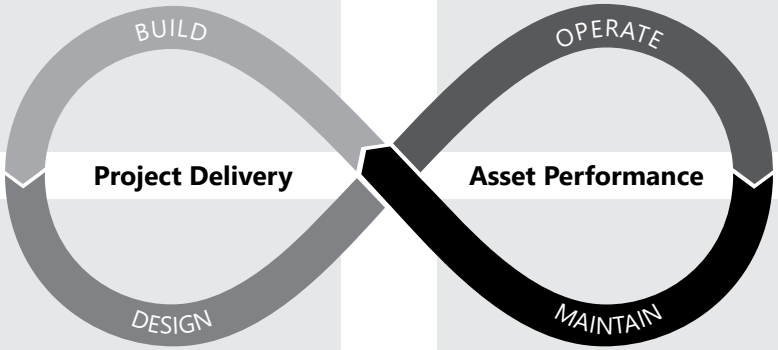
Image courtesy of Tecne Systra-Sws Advanced Tunneling Srl

Airport solutions

Full lifecycle Digital Twin

Advanced project delivery
Airport planning and coordination
Asset informationmanagement

Airport planning and coordination
Asset information management
Runway monitoring



Airport planning and coordination
Asset information management
Airport engineering
Surveying and mapping

Airport planning and coordination
Asset information management
Runway monitoring

65
work hours saved per week

5,700
hours saved per year

42%
reduction in time for standard audits

Case study reference: Sydney Airport, Sydney, Australia
Maps@SYD – new gateway for spatial data to improve operations

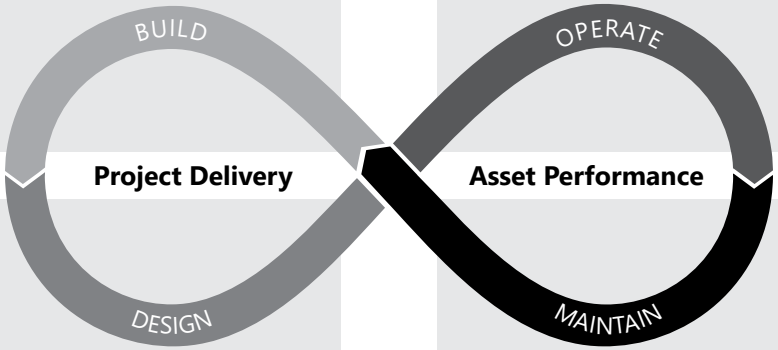
Image courtesy of Sydney Airport

Ports and waterways solutions

Full lifecycle Digital Twin

Advanced project delivery
Port planning and coordination

Port planning and coordination



Port planning and coordination
Port engineering
Surveying and mapping

Port planning and coordination

Improve understanding of environmental impact by visualizing the Port Authority's ports with digital twins

11 new anchorage locations were determined due to improved collaboration, improving marine ecology and biodiversity

Create a safe, environmentally responsible, and efficient shipping channels

Case study reference: Port Authority of New South Wales, New South Wales, Australia
Digital twin technology enables the sustainable development of the blue economy

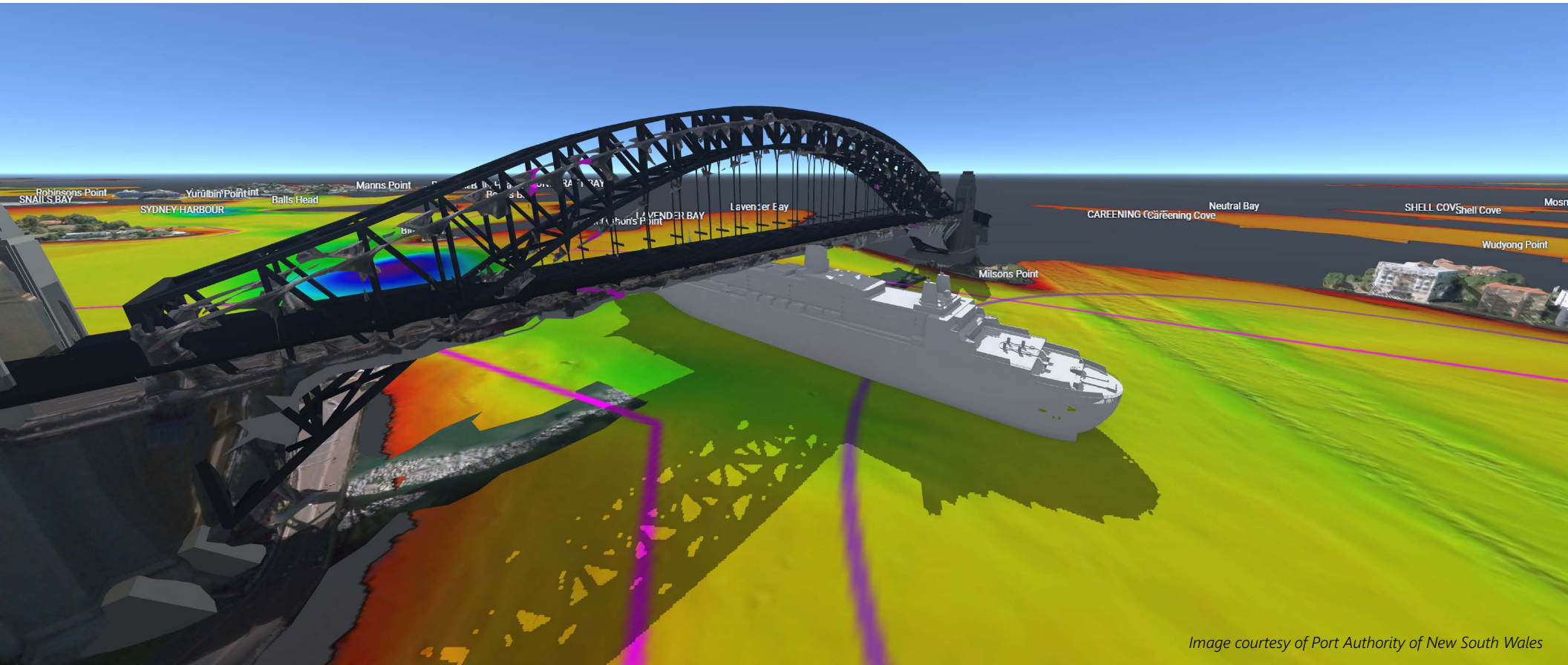


Image courtesy of Port Authority of New South Wales

Building resilient transportation infrastructure, together

The challenges facing transportation infrastructure today are significant, but they also create opportunities for us to collaborate and innovate. At Bentley, we are committed to working alongside engineers, contractors, and public agencies to take on these issues and deliver software solutions that help make transportation networks stronger, smarter, and more sustainable.

Together, we can move projects forward, reduce risk, and build infrastructure that's ready for the future.

Want to see how we can help with your next project?

Learn more

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