



# 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.



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## 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%**  
of ENR's Top 250  
Engineering Firms

**72%**  
of the Top 500 Owners

**41,000**  
accounts in 194 countries

**93%**  
account retention rate

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# 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.

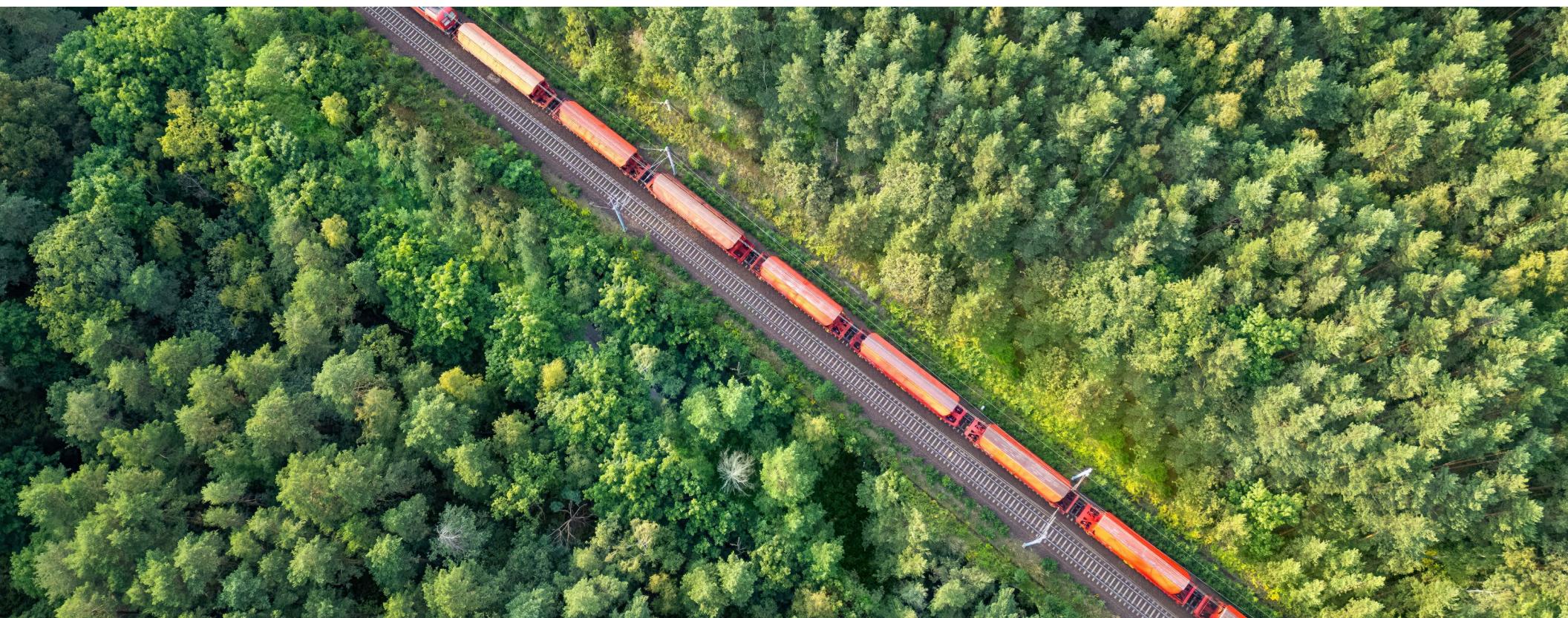
With Bentley, you can conduct digital inspections using drones, mobile mapping, and dashcam footage to quickly assess conditions, often without needing to send crews into the field. That data connects directly to your models, giving you a real-time, accurate view of your assets.

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 Shinaberry, 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.

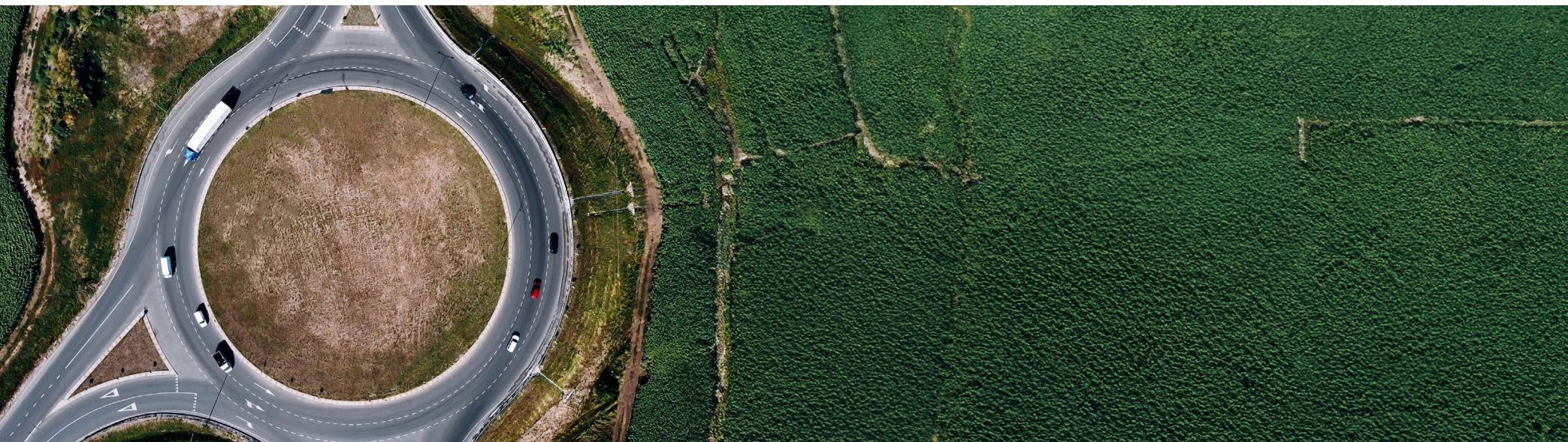
By connecting every phase, discipline, and decision-maker, Bentley helps you deliver better infrastructure, on time, on budget, and built to last.

"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 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*



## 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:

Bentley helps you understand what lies beneath before breaking ground. 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 with tight budgets and outdated systems, it makes 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*

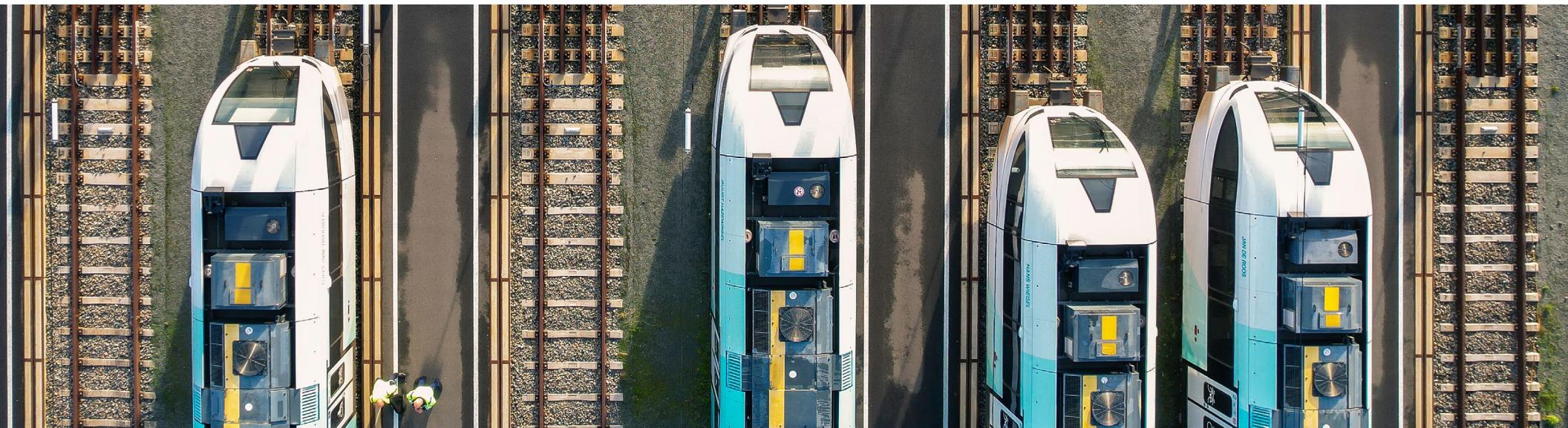
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## Bentley's approach: connecting every phase for better outcomes

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



**Infrastructure is built to last. Bentley helps ensure your data and enhances your impact.**

<b>Leader in transportation design solutions above and below ground</b>  Over <b>20%</b> design time acceleration	<b>Advancing digital delivery through seamless integration of construction planning solutions</b>  Up to <b>40%</b> reduction of time spent developing quantities	<b>Incorporates AI for predictive maintenance and efficient asset management</b>  Up to <b>90%</b> savings on manual inspection costs
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"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*



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## 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

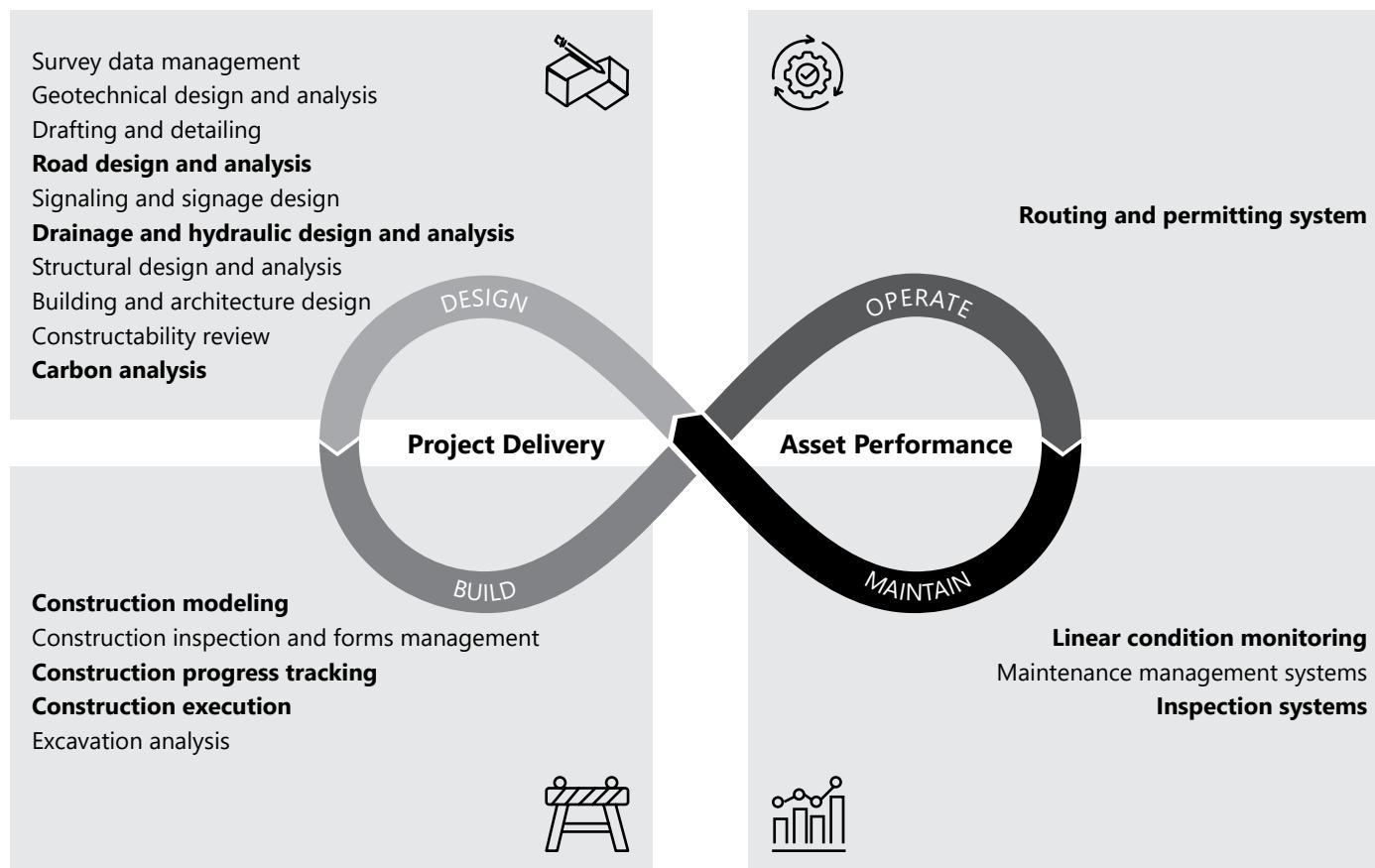
Requirements/compliance management

Condition monitoring system (IoT)

Enterprise data management

Reporting and dashboarding system

#### Imagery and field data collection management



**Case study reference:** AtkinsRéalis, 1-70 Floyd Hill project, Idaho Springs, Colorado, U.S.

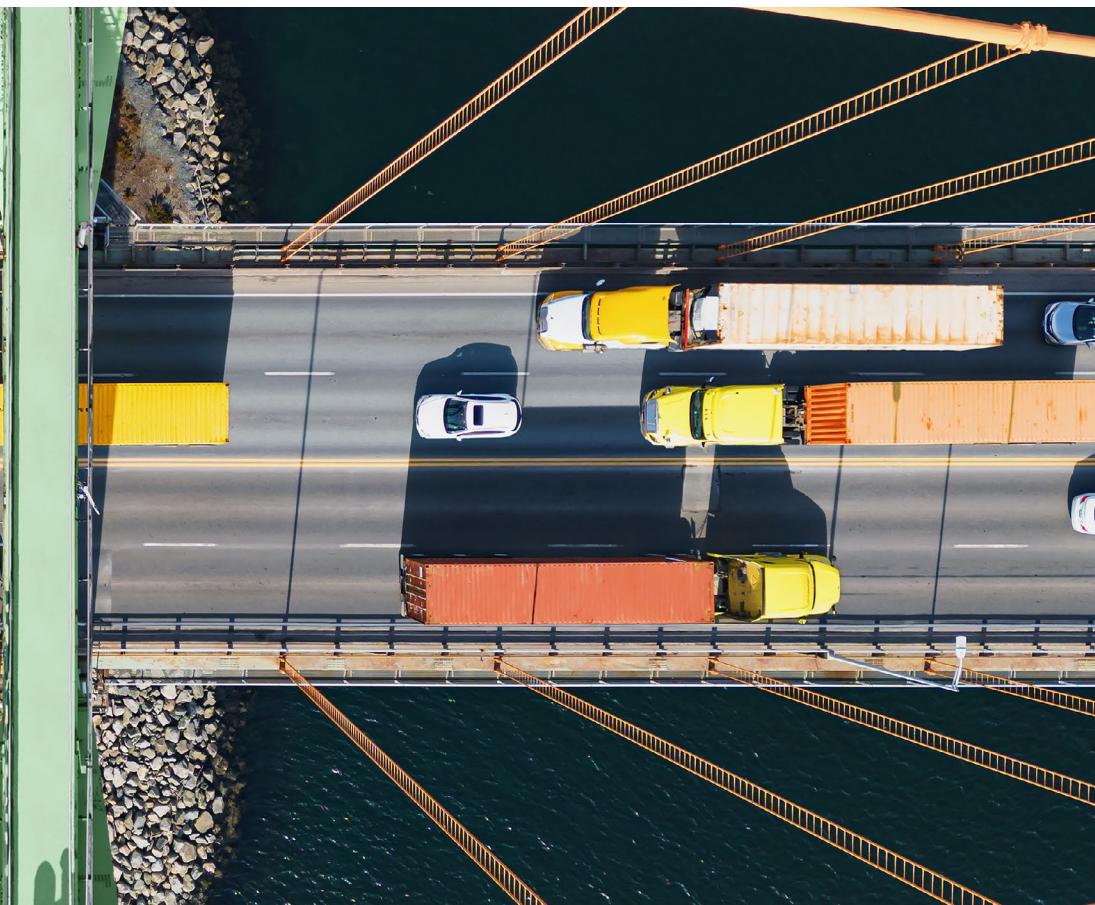
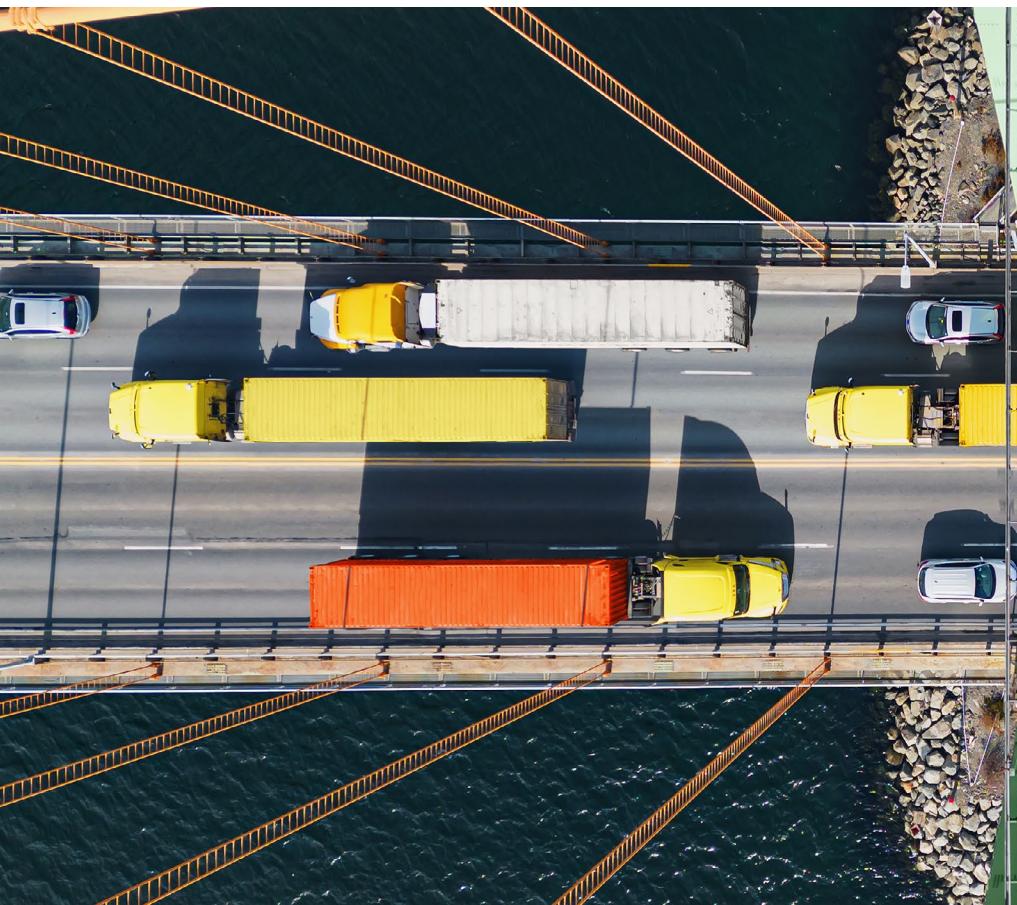
**51,680**  
estimated hours  
of work saved

**75%**  
reduction  
in rebar  
design time

**9,000**  
hours saved in  
generating and  
managing sheets

**97%**  
reduction  
in visualization  
creation time

**90%**  
reduction in  
time for team  
onboarding



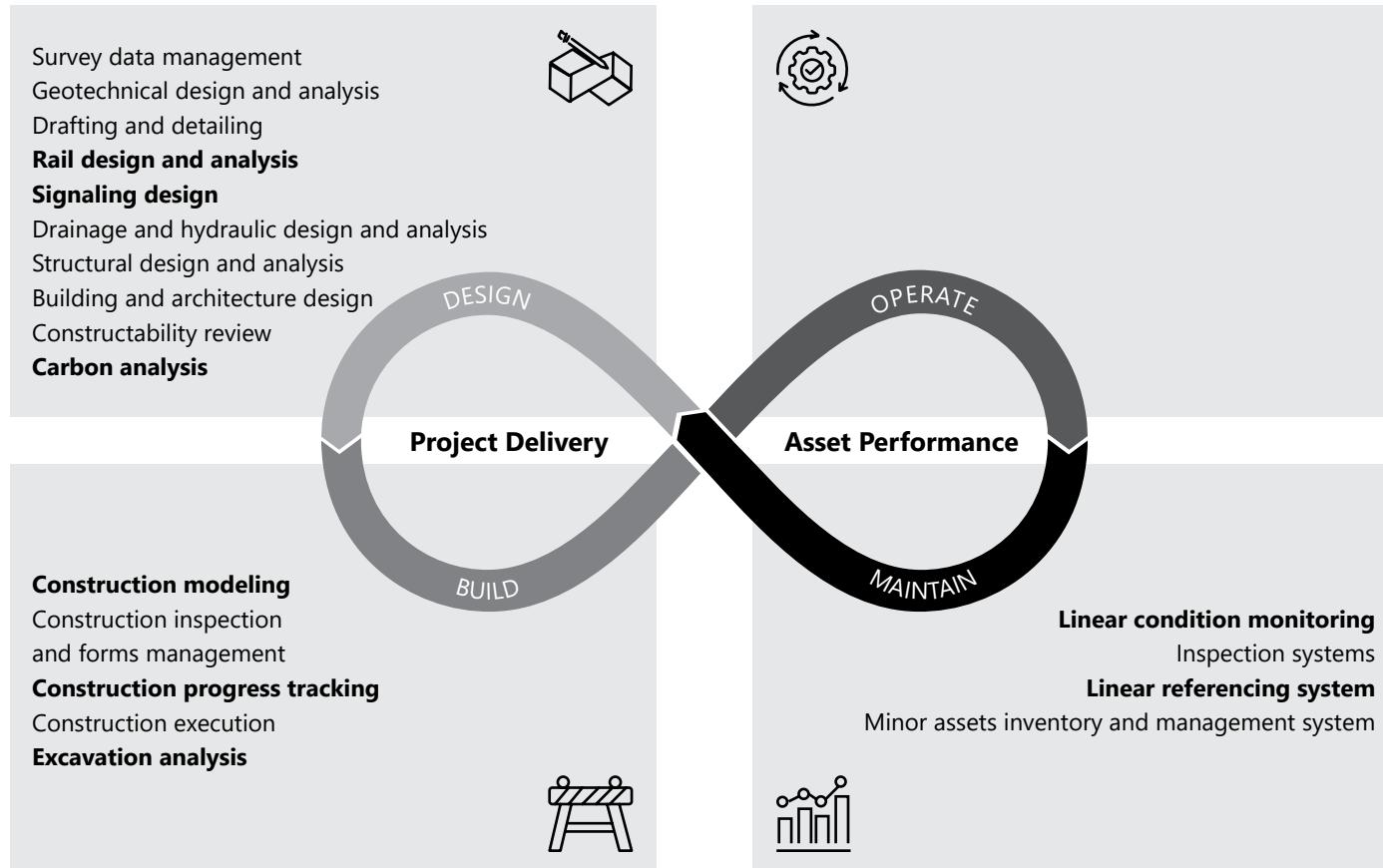
## Rail and transit solutions

### 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**



**Case study reference:** PT Hutama Karya (Persero), Jakarta, South Jakarta, Indonesia

Navigating the complexities of Jakarta MRT phase 2A CP203 with digital solutions

**USD 30,000**

estimated saved rental  
and operational costs  
per month

**90%**

savings in  
operational  
inspections

**95%**

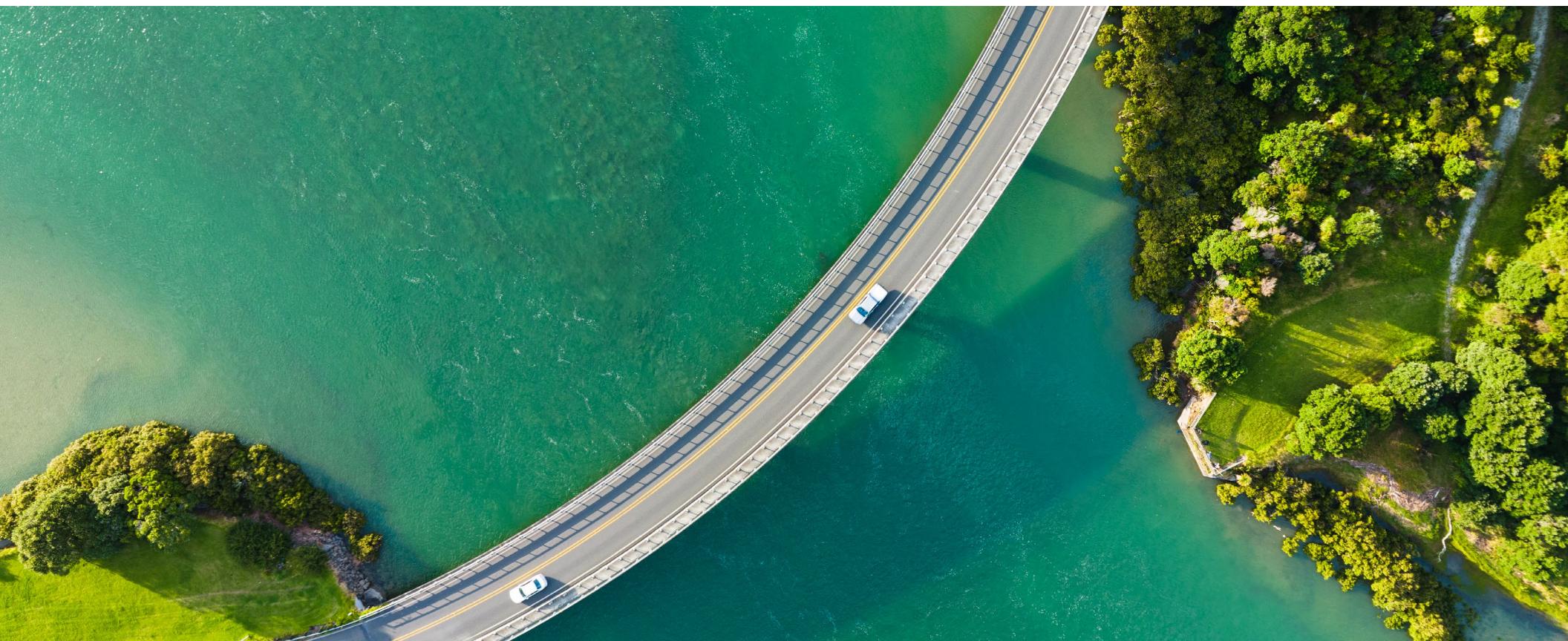
savings in  
soil modeling  
and stratigraphy

**50 tons**

savings in  
CO<sub>2</sub> emissions

**70%**

savings  
in software  
data exchange



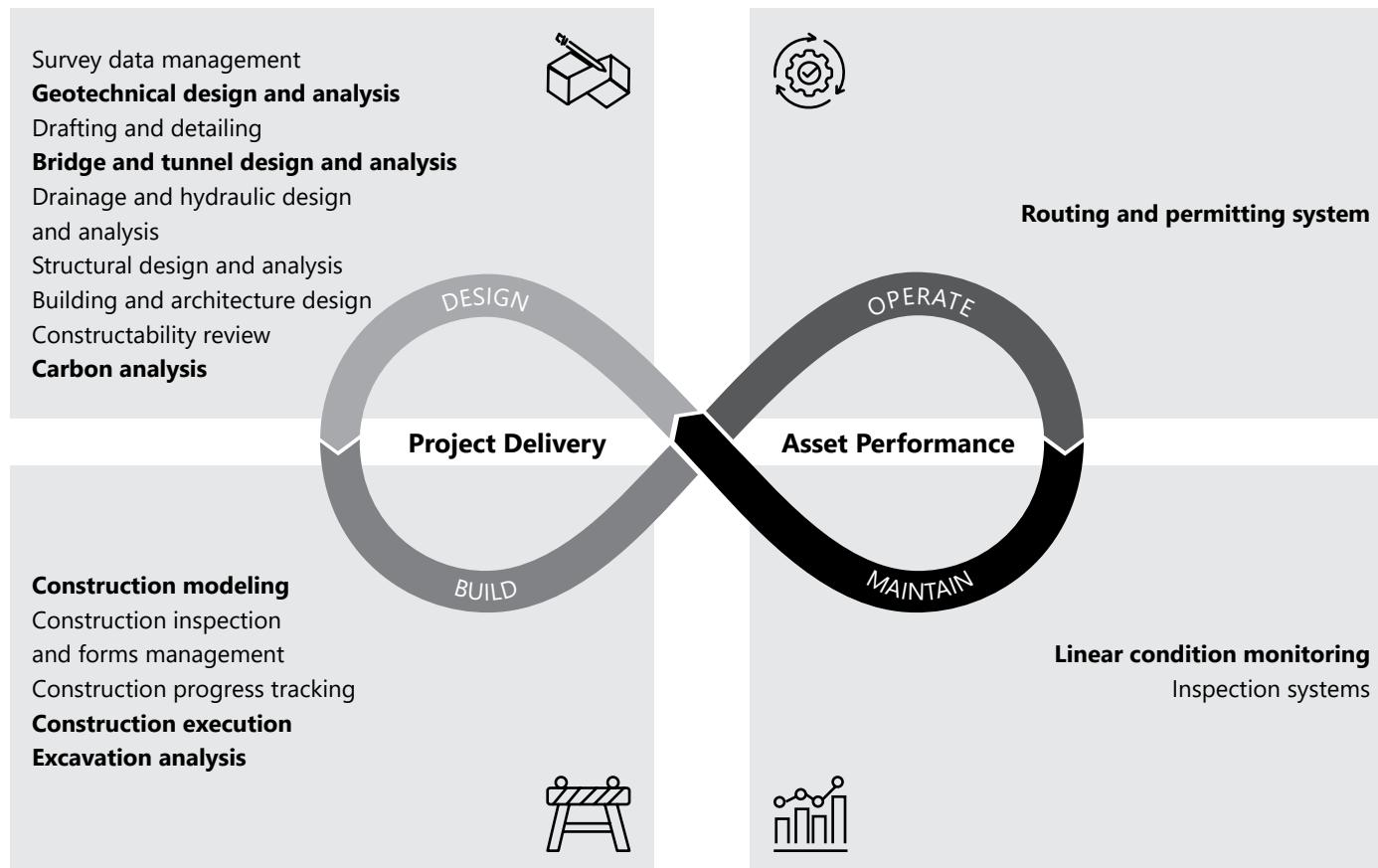
## Bridge and tunnel solutions

### 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**



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

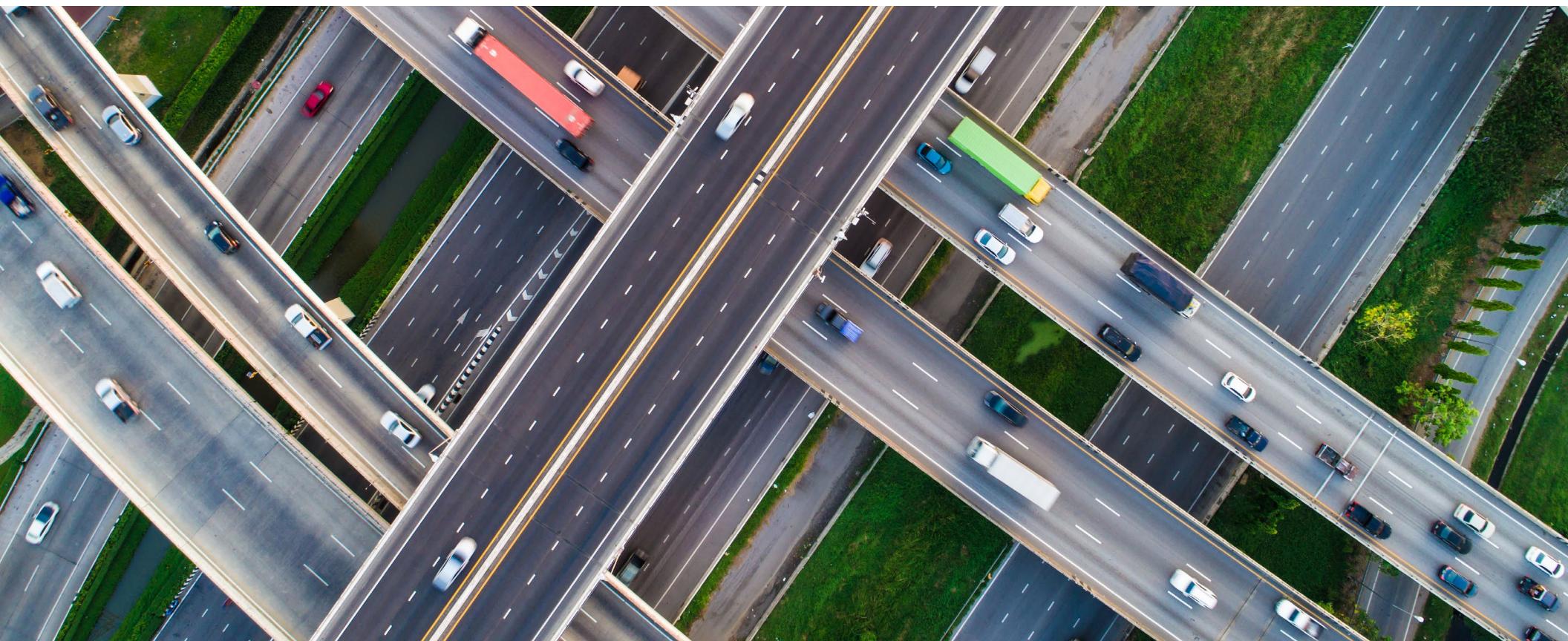
**851**  
estimated saved  
work hours

**25%**  
savings in modeling  
and design

**21.5%**  
savings in project  
deliverables

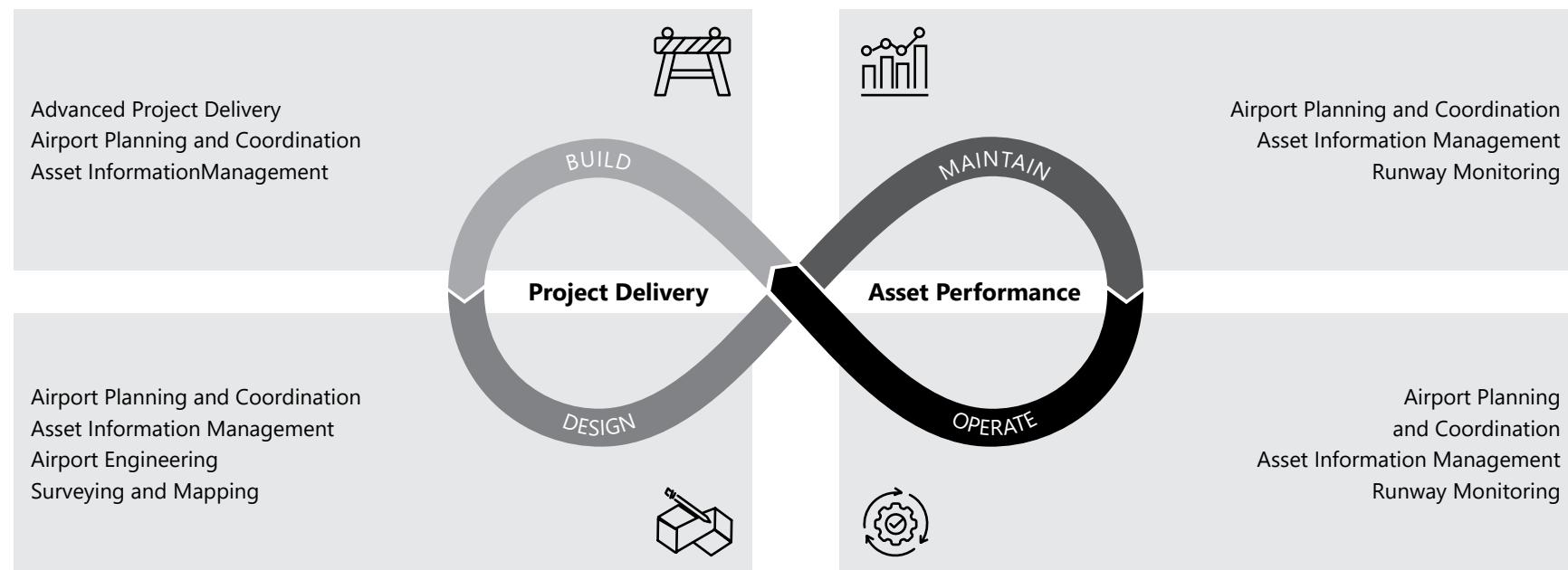
**30%**  
savings in survey  
interpretation  
and verification

**30%**  
savings in  
clash detection



## Airport solutions

### Full lifecycle Digital Twin



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

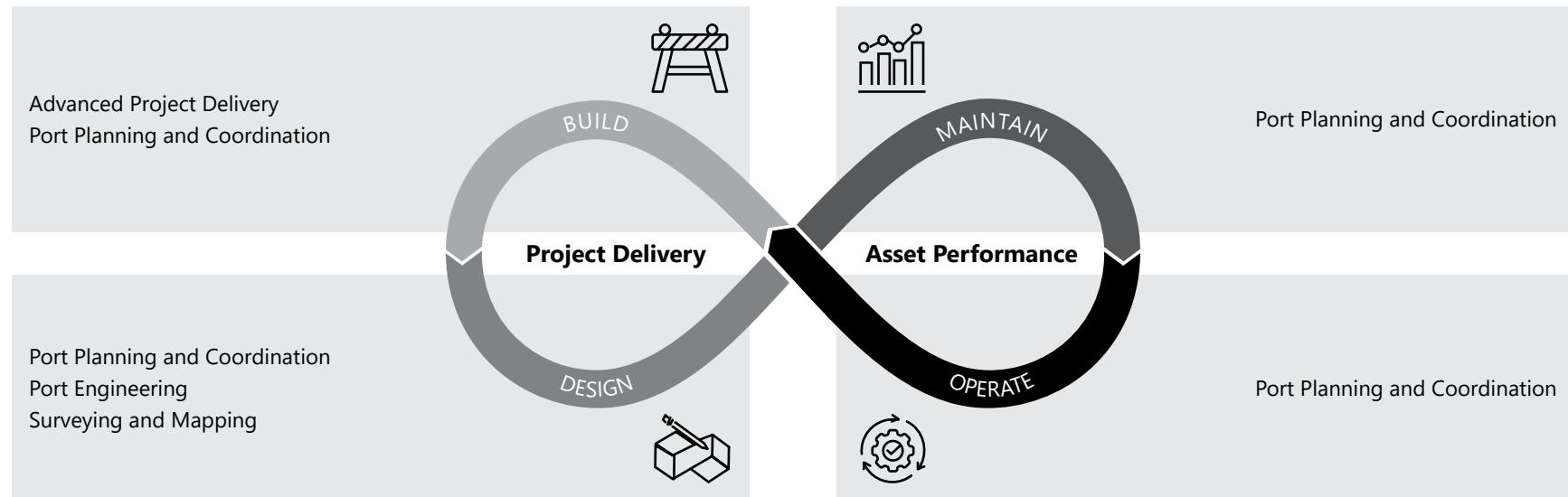
**65**  
resource hours saved per week

**5,700**  
hours saved per year

**42%**  
reduction in time for standard audits

## Ports and waterways solutions

### Full lifecycle Digital Twin



**Case study reference:** Port Authority of New South Wales, New South Wales, Australia

Digital twin technology enables the sustainable development of the blue economy

**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

## 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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