The Year in Infrastructure 2020 Conference

Project Delivery Industry Briefing

Digital Twins Goes Mainstream
Introductions

**Victor Alvarez**  
Director, Marketing Programs, Project Delivery  
Bentley Systems

**Ken Adamson**  
Vice President, Design Integration  
Bentley Systems

**Dustin Parkman**  
Vice President, Project Delivery  
Bentley Systems
Watch For These Icons

Advancement Insights  iTwin Enabled Applications
We know you will have questions!
Let’s Talk About…

• Industry Trends
• Latest Innovations
• User Successes
• Sessions you Don’t Want to Miss!
Industry Trends

• Hyper-distributed project teams

• Acceleration of Going Digital initiatives

• Industry momentum around Digital Twins
Digital Twins Going Mainstream

Digital Advancement from Planning to Performance

Also available in the Press Kit

bentley.com/going-digital-roads

bentley.com/going-digital-rail

bentley.com/going-digital-cities
Latest Innovations for Project Delivery
### DESIGN
- Mapping and Surveying
- Modeling and Visualization
- Reality Modeling
- Bridge Design
- Building Design
- Communications Network Engineering
- Communication Tower Design
- Electrical Design
- Geotechnical Engineering
- Offshore Structure Design
- Plant Design
- Rail Design
- Road Design
- Site Design
- Steel and Concrete Design and Detailing
- Substation Design
- Tunnel Design
- Utility Network Design

### SIMULATE
- Bridge Analysis
- Building Energy Analysis
- District Heating Analysis
- Electrical Network Analysis
- Flood Analysis
- Gas Network Pressure Analysis
- Geotechnical Analysis
- Hydraulics Analysis
- Hydrology Analysis
- Mobility Simulation and Analysis
- Offshore Structure Analysis
- Pedestrian Simulation and Analysis
- Pipe Stress and Vessel Analysis
- Structural Analysis
- Transportation and Land Use Analysis

### CONSTRUCT
- 4D Modeling and Scheduling
- Advanced Work Packaging
- Construction Project Management
- Field Management

### OPERATE
- Asset Reliability
- Bridge Load Rating and Analysis
- City Digital Twin
- Electric Network Digital Twin
- Geotechnical Information Management
- Machine Learning and Predictive Analytics
- Process Plant Digital Twin
- Rail Assurance
- Rail Network Management and Analysis
- Road Network Management and Analysis
- Routing and Permitting
- Water Infrastructure Digital Twins

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**Multi-discipline Collaboration** • **Contractual Deliverables Management** • **Project Coordination** • **Project Insights** • **Asset Lifecycle Information Management**
OpenRail Overhead Line Designer

- **New Product** - First comprehensive contact line design modeling application for rail electrification.
- Deliver BIM compatible models and support creation of Digital Twins.
- Benefits: ensure design standards, automate plan production, dynamic change management, meet BIM requirements.
• View your civil quantities directly in iTwin Design Review
• Always current and accessible to all
• Run report any time and view historical changes
• One less deliverable to print
### PROJECT DELIVERY

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- Multi-discipline Collaboration  
- Contractual Deliverables Management  
- Project Coordination  
- Project Insights

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**INFRASTRUCTURE DIGITAL TWINS**
OpenBridge Designer

- Combines modeling, design, and analysis in one application
- 3D Rebar Modeling
- Bridge beyond BIM to digital Twin
- Global adoption accelerating
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**Multi-discipline Collaboration** • **Contractual Deliverables Management** • **Project Coordination** • **Project Insights** • **Asset Lifecycle Information Management**
OpenGround Cloud

- Centralize cloud base geotechnical information management
- Complementing gINT and Keynetix products
- Cover complete geotechnical information lifecycle
- Integrated with world leading geotechnical analysis tool PLAXIS
- Integrated with the civil engineering design tools
### Project Delivery

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*Multi-discipline Collaboration*  
*Contractual Deliverables Management*  
*Project Coordination*  
*Project Insights*  

**Infrasctructure Digital Twins**
OpenBuildings Station Designer and LEGION Simulator

- Purpose built for rail station and platform design
- Pedestrian modeling, analysis and simulation through entire lifecycle of asset
- New social distancing enhancements to deliver safe and efficient rail stations
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### Multi-discipline Collaboration • Contractual Deliverables Management • Project Coordination • Project Insights

### INFRASTRUCTURE DIGITAL TWINS
Multi-discipline Coordination

iTwin Analytical Services

- Enhanced cloud-based interoperability
- Simultaneous design and simulation for real world conditions
- Full roundtrip from digital twin back to design to resolve issues
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**Multi-discipline Collaboration • Contractual Deliverables Management • Project Coordination • Project Insights**

**Asset Lifecycle Information Management**
"In the past few years, we have successfully applied Bentley OpenWindPower Fixed Foundation in designing all our monopile and jacket offshore wind farms. With the fast growth in deep water wind market, ECIDI has already engaged in several design and research projects for floating wind turbine foundation. We expect that the new OpenWindPower Floating Platform would continue to support ECIDI in designing the floating wind turbine platforms and consolidate our leading position in this area."

Dr. Bin Wang, Deputy Chief Engineer, ECIDI new energy department
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### Multi-discipline Collaboration
- Contractual Deliverables Management
- Project Coordination
- Project Insights
- Asset Lifecycle Information Management
Bentley Has Your Back
Support for Working Remotely
Wherever You Are

Multi-discipline Collaboration
ProjectWise 365

• Announcement – Continuation of the Bentley Has Your Back program
• No cost, risk-free introductory offer
• Hundreds of design firms taking advantage of offer
• Program extended into 2021

Bentley Has Your Back Support for Working Remotely Wherever You Are
“It is only by using such platforms as ProjectWise 365 that we are able to compete more favorably and ready ourselves for the future.”

Thami Mpala
Managing Director
Hydro-Utilities Consulting Engineers
Multi-discipline Collaboration

ProjectWise 365

- Major product update
- New task-based interface to streamline workflows
- Stoplight dashboards keep participants on schedule
- Comprehensive 2D/3D design review workflows to accelerate collaboration
Compare and aggregate performance across portfolios of projects

**Project Insights**

**ProjectWise 365**

- **New capabilities**
- Engineering work status versus schedule
- Portfolio and program insights
- Enabling proactive risk management and best practices monitoring
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- Multi-discipline Collaboration
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- Asset Lifecycle Information Management
4D Modeling for Construction Planning and Project Management

- **New** cloud-based collaboration capabilities
- Model-based QTO for faster and more accurate proposals
- iTwin enabled 4D/5D preconstruction planning for faster and better decisions
- Project management and controls in 4D/5D model context to access and manage tasks more efficiently
Digital Applications Help Design Team Improve Management Efficiency by 15% and Collaboration by 45% on the Renovation and Expansion of the Beijing-Harbin Expressway
Construction Cost Management

SYNCHRO Cost

- **New** product
- Aligns bid management process to other construction management workflows
- **Streamlined sourcing** with automated bid solicitation and analysis
- **Reduced risk and better compliance** with proactive contract management
Acquisition NoteVault

• Extends SYNCHRO and the value of digital twins across construction

• Voice-based field automation

• Combine 4D progress models with up-to-date resource expenditure

• More effective management of cost, schedule, and risk
Construction Field Management

SYNCHRO Field

- **New** field mobility capabilities
- Voice-based automation to speed field reporting
- Combine 4D progress and resource expenditures reports for accurate status
- 4D simulation and 3D models in the field for better and faster decisions
- Quality, real-time structured inspection data from the field to keep projects in control and get paid
Construction Field Management

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### Additional Features
- Multi-discipline Collaboration
- Contractual Deliverables Management
- Project Coordination
- Project Insights
- Capital Project Management
- Asset Lifecycle Information Management
Acquisition GroupBC

• UK Leader in cloud services for Capital Project Management

• Federate CDEs for project, engineering, and construction management

• To advance collaborative BIM via “evergreen” digital twins for the lifecycle
Capital Project Management
Business Collaborator

- **New** product – *Business Collaborator Projects* for small and mid-sized projects

- **New** capabilities - iTwin integration for scalable visual-based information access

- **New** capability ProjectWise integration federates CDEs for engineering and capital project management
Highways England
Capital Project Management with Business Collaborator

- Easily and reliably find trusted documentation
- Quickly stand up consistent, repeatable environments for project collaboration
- Allow projects and program structures to evolve without significant effort or data risk
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### Multi-discipline Collaboration
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- Project Insights
- Capital Project Management

### Asset Lifecycle Information Management
USER
PROJECTS
Sweco Implements a Connected, Digitalized Approach across Their Global Projects, Saving 10% in Efficiency on Project Programs

Sweco

Digitalization with BIM

• 3,500 internal and 500 external users across 400 projects
• Mitigating risk, improving overall quality
• Saving 10% in efficiency on project programs

Digitalisation with BIM | Insights

Our Data Model

Digitalisation with BIM | Insights

Our Projectwise Data Model is used as a ‘one-stop shop’ making process to digitally approve & deliver products rather than a document management system; providing up to 10% efficiency savings for clients and projects.

Real-time Time Project Performance

Real-time insights track Classification and Information Attributes against the project programmes which provide early warnings for teams to highlight and mitigate potential risks to the project delivery.

Our Benefits Realisation | With over 40000 document drawings, models and documentation created to date, our multi-disciplinary teams have digitally approved & signed-off over 1500 products inc. 50 intelligent models across 33 major schemes. Sweco have implemented our Preproject Data Model as a Design Process rather than a tool for product; supporting over 800 staff across 10 organisations and 11 offices.
NYS Department of Transportation Delivers First Model-based Contracting 3D Project in New York State DOT History

Digital Twin

- First Model-based Contracting 3D Project in New York State DOT History
- Saving 15% in Design Time
- Restoring a Critical Bridge to the Community
PT. Waskita Karya (Persero) Tbk is Transforming Project Delivery in Indonesia on Phase II of Jakarta’s Manggarai Station Revitalization

Manggarai Station Revitalization

- New bridge expanding platform capacity to 2 levels
- Tight design review and construction schedule
- IDR 1 billion per month in additional time/cost avoided
- Digital twin and workflows to optimize construction schedule
- ProjectWise 365 key to project delivery modernization
MCC CERI Implements Digital Factory Approach on World’s Largest Relocation of an Iron and Steel Plant

- World’s largest relocation project
- Digital factory delivered alongside physical factory
- 75% reduction in commissioning time
- 60-70% reduction in energy consumption
YII Awards Finalists

Project Delivery

• **Aegea Saneamento**  
  Infra Inteligente Program (Smart Infra Program)

• **Shanghai Water Engineering Design & Research Institute Co., Ltd**  
  The Integrated Delivery and Application of BIM Technology in the Design, Construction, Supervision and Management of Shanghai Water Pump Sluice Project

• **Sweco**  
  Sweco | Digitalization with BIM
YII Awards Finalists

4D Digital Construction

• DPR Construction
  2019 LSM DS Tech Upgrade

• Mortenson | McCarthy - a Joint Venture
  Allegiant Stadium

• Office of the Renovation and Expansion Project of the Beijing-Harbin Expressway Section from Lalin River to Harbin, Heilongjiang Construction Technological Innovation & Investment Co., Ltd.
  Application of 4D Digital Technology in the Management of the Renovation and Expansion Project of the Beijing-Harbin Expressway Section from Lalin River to Harbin
Takeaways
Key Reference Materials

• Project Delivery Update Report
• Design Integration Update Report
• Advancement Insights
  • Digital Applications Help Design Team Improve Management Efficiency by 15% and Collaboration by 45% on the Renovation and Expansion of the Beijing-Harbin Expressway
  • Sweco Implements a Connected, Digitalized Approach across Their Global Projects, Saving 10% in Efficiency on Project Programs
  • NYS Department of Transportation Delivers First Model-based Contracting 3D Project in New York State DOT History
  • PT. Waskita Karya (Persero) Tbk is Transforming Project Delivery in Indonesia on Phase II of Jakarta’s Manggarai Station Revitalization

• Going Digital videos

Find this and much more in the YII Virtual Press Kit
If you want to attend another Industry Press Briefing session, they are available on-demand.
Key Takeaways

• Bentley has significantly extended the breadth and depth of its Project Delivery capabilities

• All these investments are in support of a digital twin lifecycle

• Helping digital twins go mainstream via “iTwin Enabled” applications

Find this and much more in the YII Virtual Press Kit at: https://yii.bentley.com/press
THANK YOU!