

# Bentley Civil Keynote and Product Update

Ian Rosam,  
Director Product Management, Civil Engineering

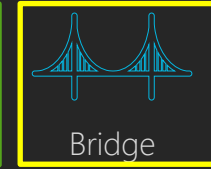
**Bentley**<sup>®</sup>  
Advancing Infrastructure

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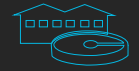


# Solutions for Infrastructure Project Delivery and Asset Performance

Bentley's mission is to provide *innovative software and services* for the enterprises and professionals who *design, build, and operate* the world's infrastructure – sustaining the global economy and environment for *improved quality of life.*



Water  
Network



Water  
Treatment Plant



Wind Turbine



Cell Tower



Substation



Power Plant



Digital Cities

Bentley®

# Digital Workflow Challenges

Inefficient Design  
Handover Processes

Complex Construction  
Projects

Safety

Maximizing Uptime

Environmental

Workforce Shortages

Big Data Insights

Digital Automation

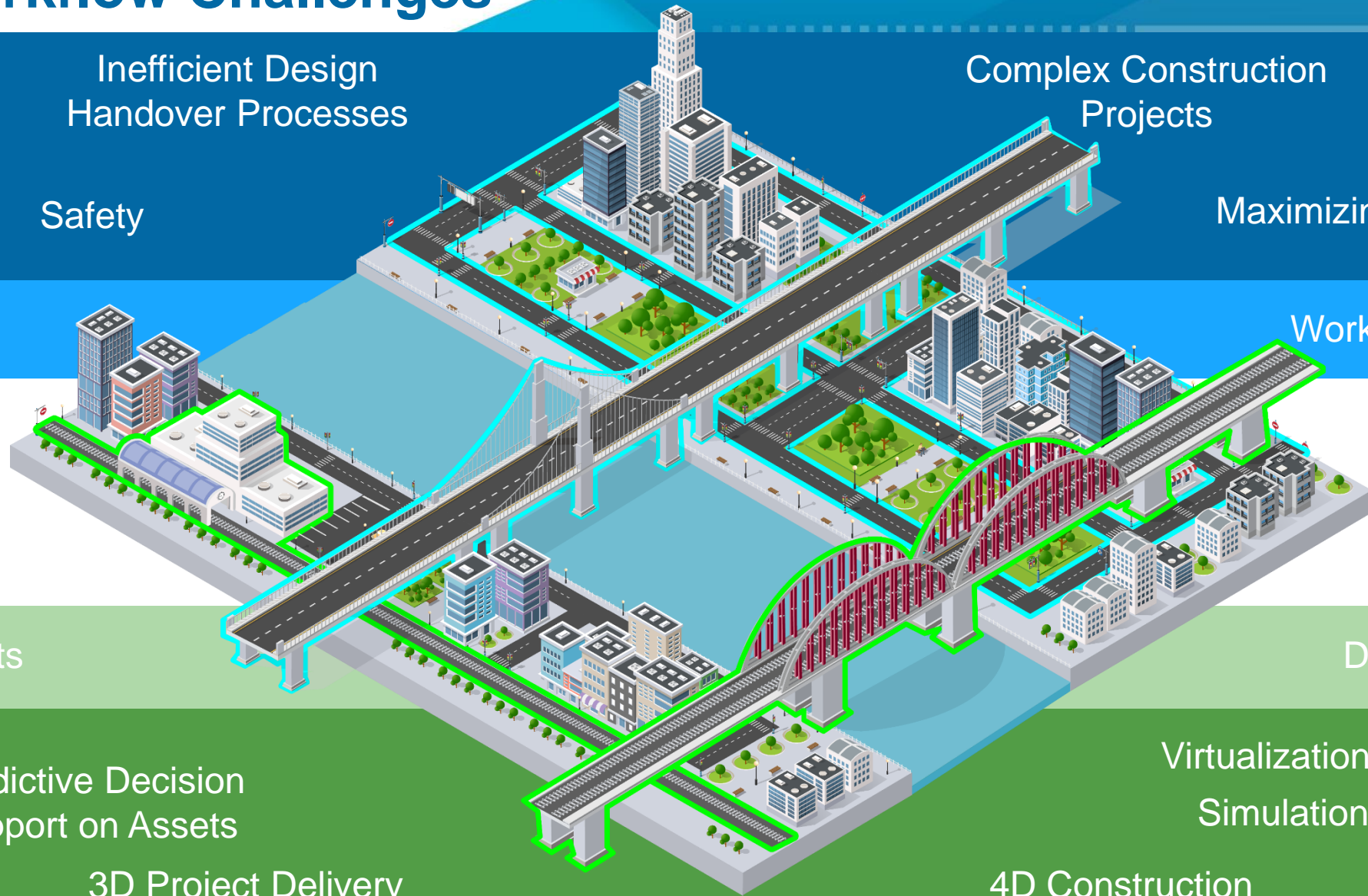
Predictive Decision  
Support on Assets

Virtualization &  
Simulation

3D Project Delivery

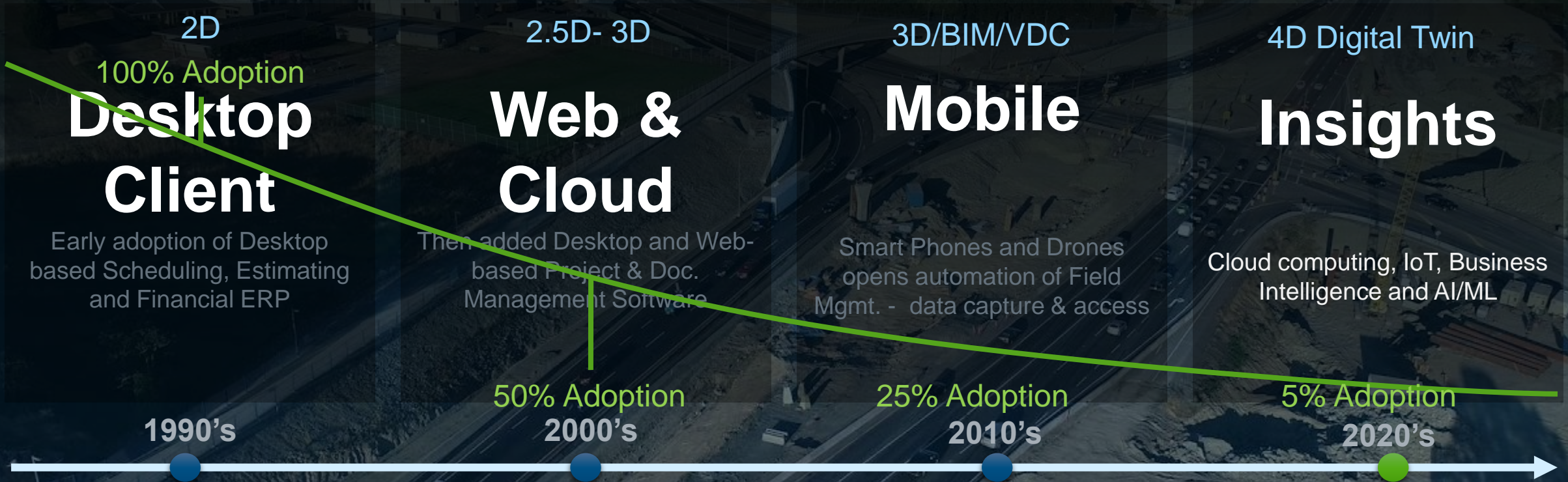
4D Construction

3D Model Validation





# Technology Evolution



Technology is evolving rapidly... Adoption is beginning to ramp up

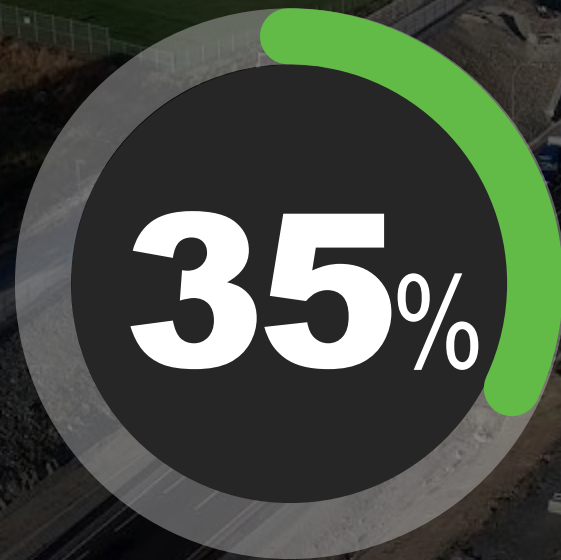


# Going Digital

Top Outcome Improvements through ProjectWise



REDUCTION  
IN  
DESIGN COSTS



IMPROVEMENT  
IN  
MODELING EFFICIENCY



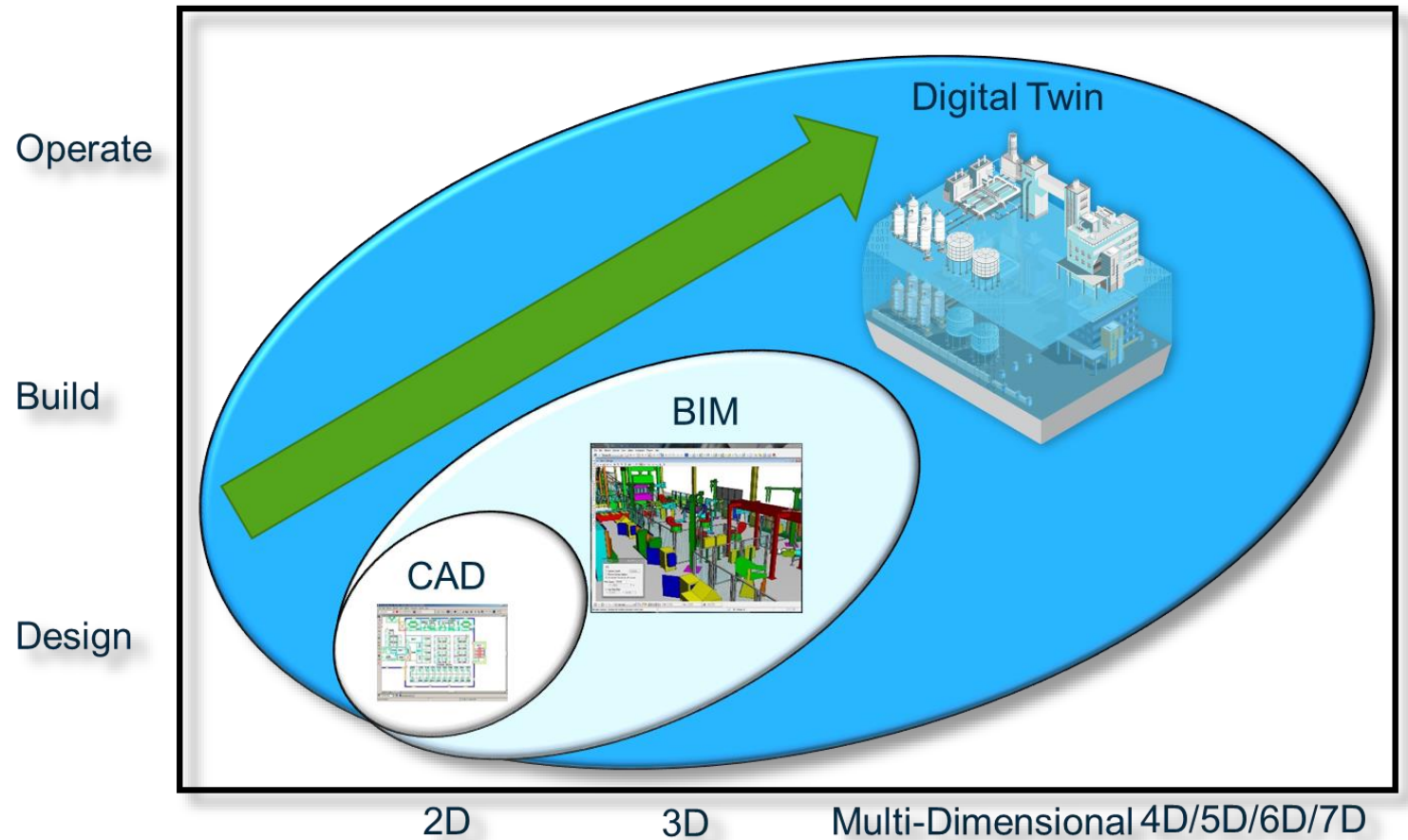
DECREASE  
IN  
DELIVERY TIME



REDUCTION  
IN  
DESIGN ERRORS



# Project Delivery Evolution





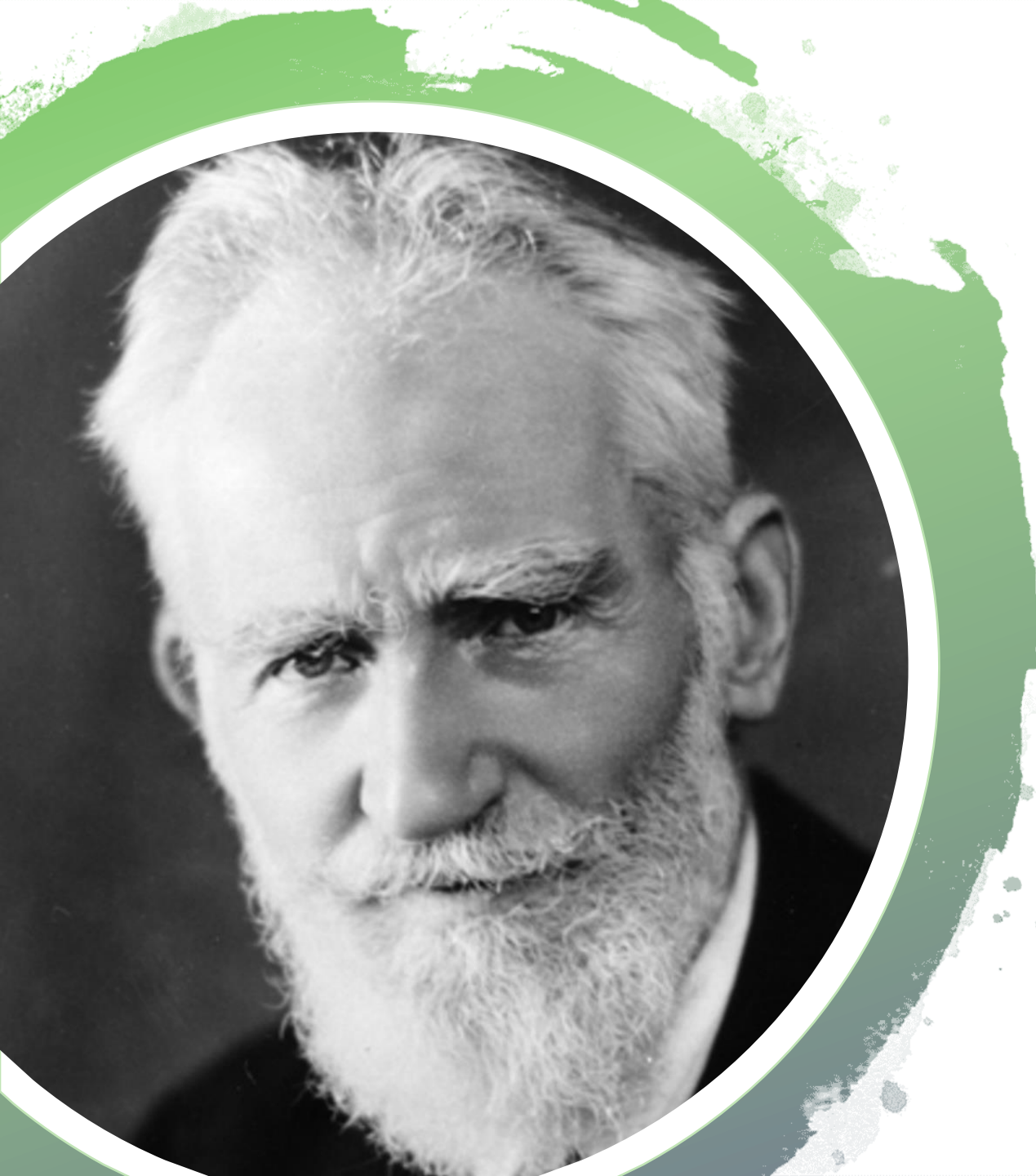
**Its all about...**





People need to understand the whole process, so that valuable information is not rejected by someone who is blind to the future uses of that information





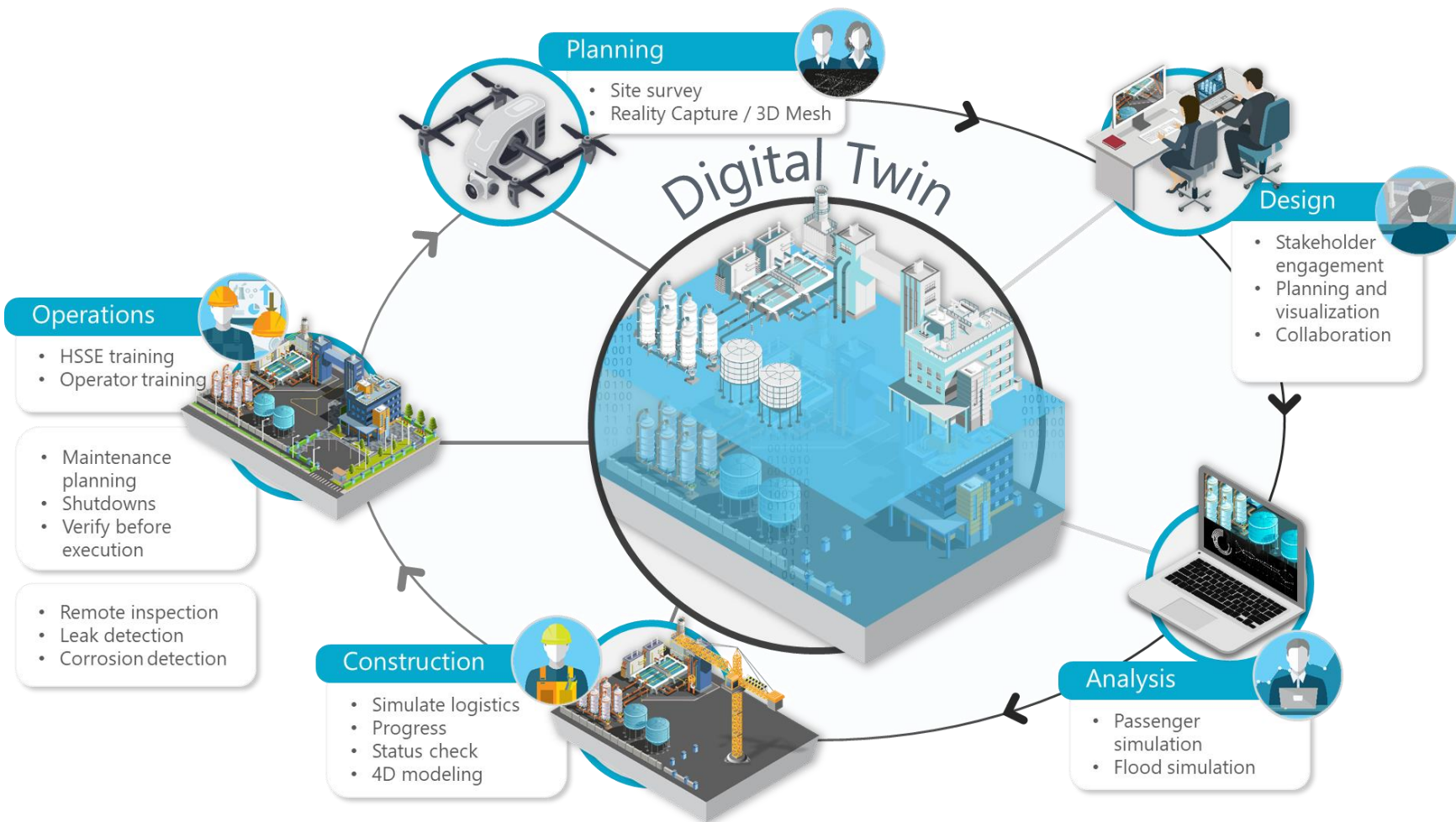
*The single biggest  
problem in communication  
is the illusion that it has  
taken place*

*George Bernard Shaw.*

**We are kidding ourselves.  
Information is all over the place**



# Why Digital Twins?



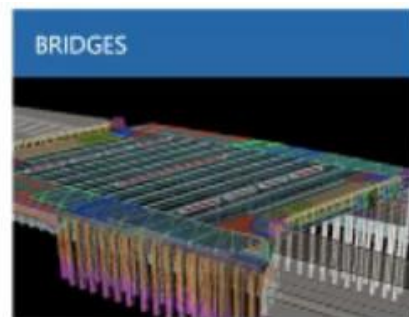
- **Single source of truth**  
*Harness and leverage digital assets to improve accuracy and quality*
- **Seamless collaboration**  
*24/7 communication anywhere in the world*
- **Improve decision making**  
*Solve small problems before they become big problems*
- **Speed project delivery**  
*Shorten the delivery schedule and reduce handover latency*





The Year in **INFRASTRUCTURE**  
and **GOING DIGITAL AWARDS**

2021 finalists crediting iTwin Platform



**BRIDGES**  
East 138th Street over the Major Deegan Expressway

New York State Department of Transportation  
*United States of America*

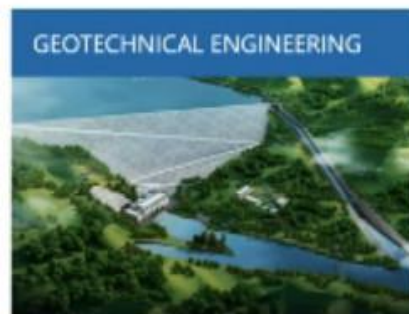


**BUILDINGS & CAMPUSES**  
High-tech Multifunctional Medical Complex

Volgogradnefteproekt, LLC  
*Russian Federation*



**DIGITAL CITIES**  
Ezhou Huahu Airport Project  
Hubei International Logistics Airport Co., Ltd., Shenzhen S.F. Taisen Holdings (Group) Co., Ltd., Airport Construction Engineering Co., Ltd.  
*China*



**GEOTECHNICAL ENGINEERING**  
Geological Survey of Water Conservancy and Hydropower Eng.

China Water Resources Beifang Investigation, Design and Research Co. Ltd.  
*China*



**POWER GENERATION**  
Wuqiangxi Hydroelectric Power Station Expansion Project

PowerChina ZhongNan Engineering Corporation Limited  
*China*



**PROJECT DELIVERY INFO MNGMT**  
HS2 Phase 1 Main Civil Construction Works

Mott MacDonald Systra JV with Balfour Beatty Vinci  
*United Kingdom*



**PROJECT DELIVERY INFO MNGMT**  
Port of Melbourne - Port Rail Transformation Project

WSP  
*Australia*



**RAIL & TRANSIT**  
MRT Jakarta Phase II

PT MRT JAKARTA (Perseroda)  
*Indonesia*



**RAIL & TRANSIT**  
Transpennine Route Upgrade

Network Rail + Jacobs  
*United Kingdom*



**REALITY MODELING**  
Diablo Dam Digital Twin Modeling

HDR  
*United States of America*



**ROAD & RAIL ASSET PERFORMANCE**  
Stone Arch Bridge Rehabilitation

Collins Engineers, Inc.  
*United States of America*



**UTILITIES & COMMUNICATIONS**  
Digitization of Koh Kong 230/22kV Substation

PESTECH INTERNATIONAL BERHAD  
*Malaysia*



**UTILITIES & COMMUNICATIONS**  
Suixian & Guangshui 80MWp Ground-Based Photovoltaic Power Project of Hubei Energy Group  
PowerChina Hubei Electric Eng. Co., Ltd.  
*China*



**WATER & WASTEWATER TREATMENT PLANTS**  
F. Wayne Hill Water Resources Center Membrane Improvements

Jacobs Engineering  
*United States of America*



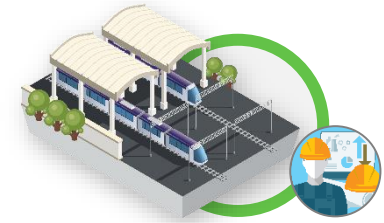
**WATER & WASTEWATER TREATMENT PLANTS**  
Implementing Digital Twins on a Fully Collaborative Project

Brown and Caldwell  
*United States of America*

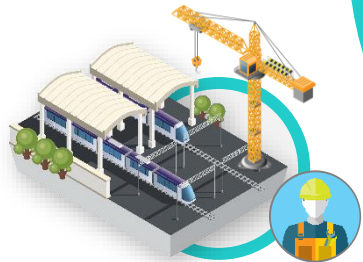


# Digital Twin Workflows

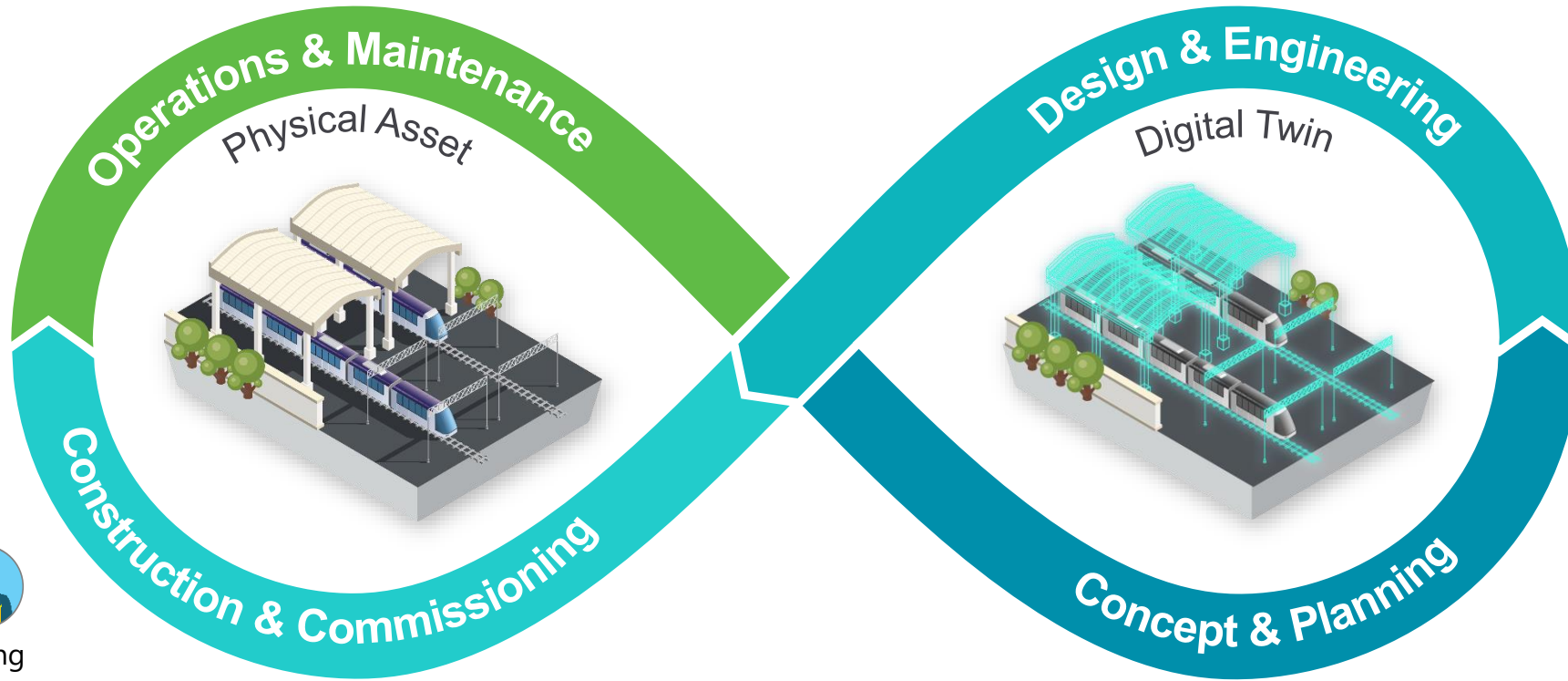
Digital twins enable you to visualize the asset, track change, and perform analysis to better understand and optimize asset performance.



- Asset Management
- Inspection
- Condition Monitoring
- Maintenance
- Compliance
- IoT Sensor Data



- 4D construction modeling
- Simulate logistics
- Track progress / status
- IoT Sensor Data



- Stakeholder engagement
- Planning and visualization
- Design collaboration



- Site survey
- Reality capture



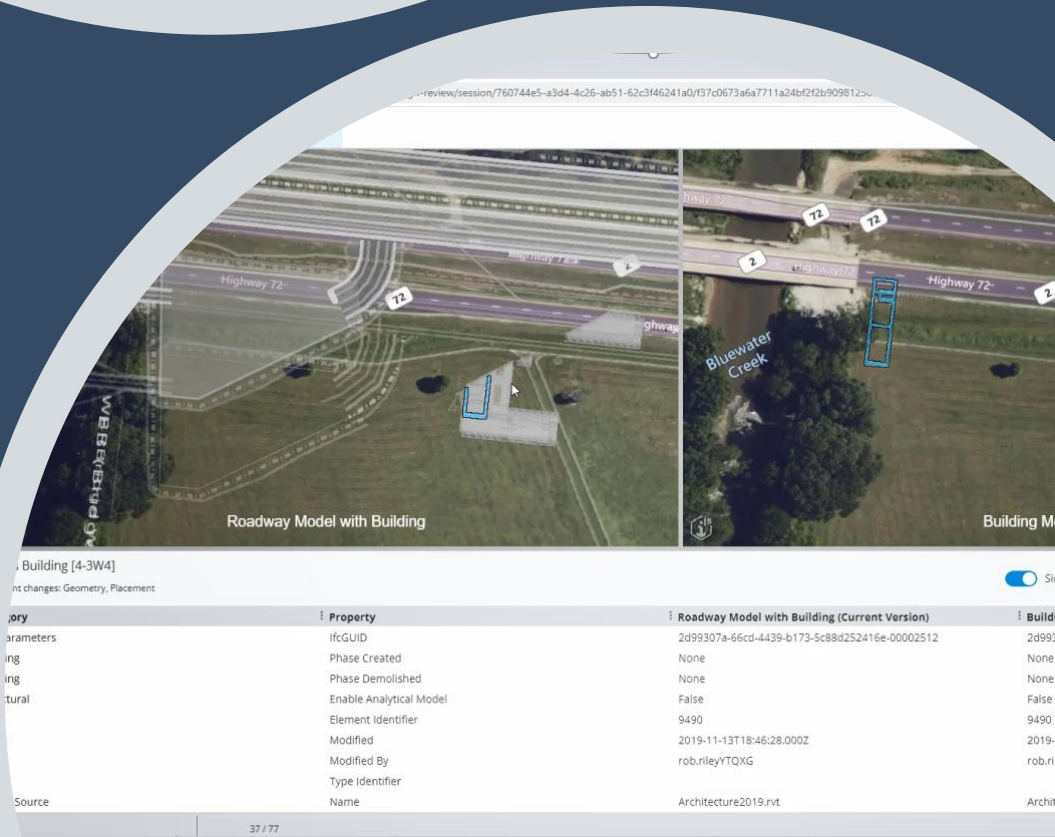
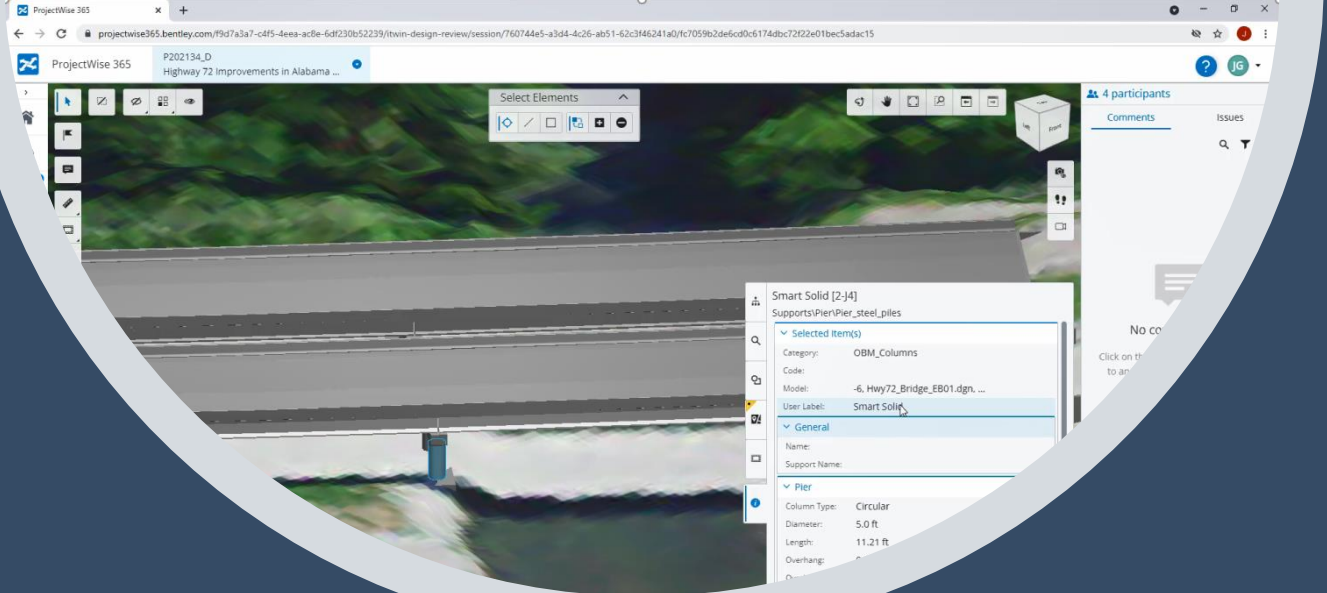
# Digital Delivery





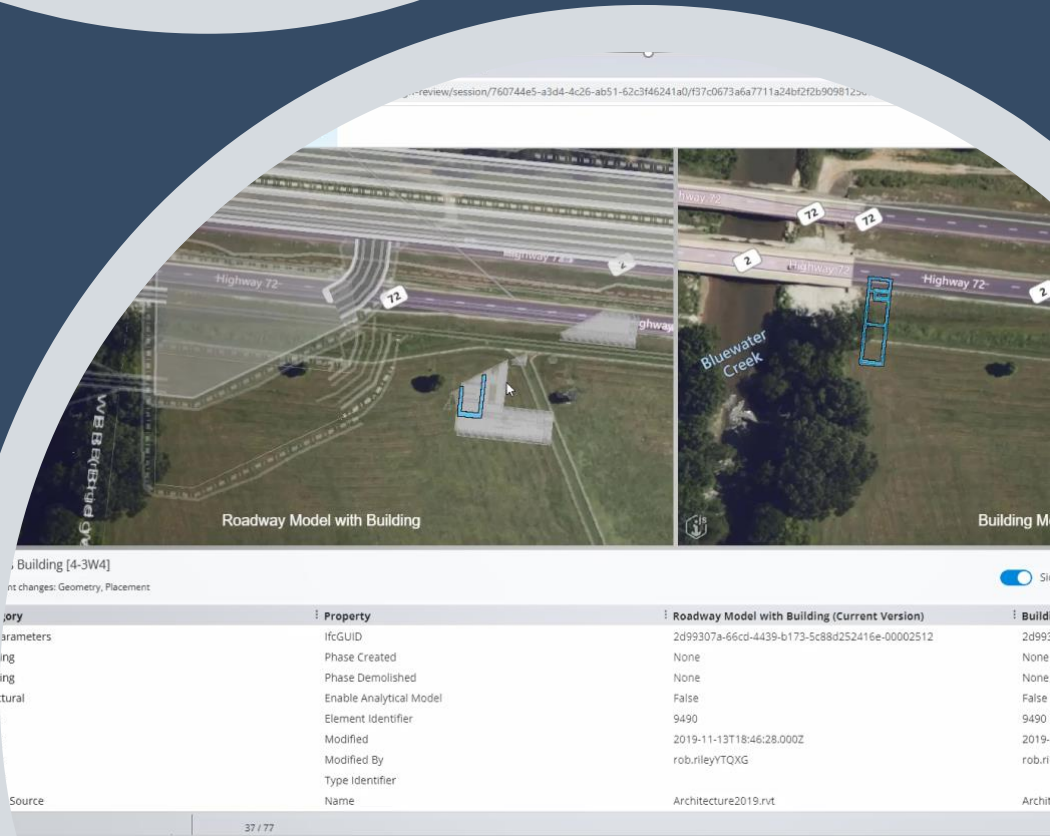
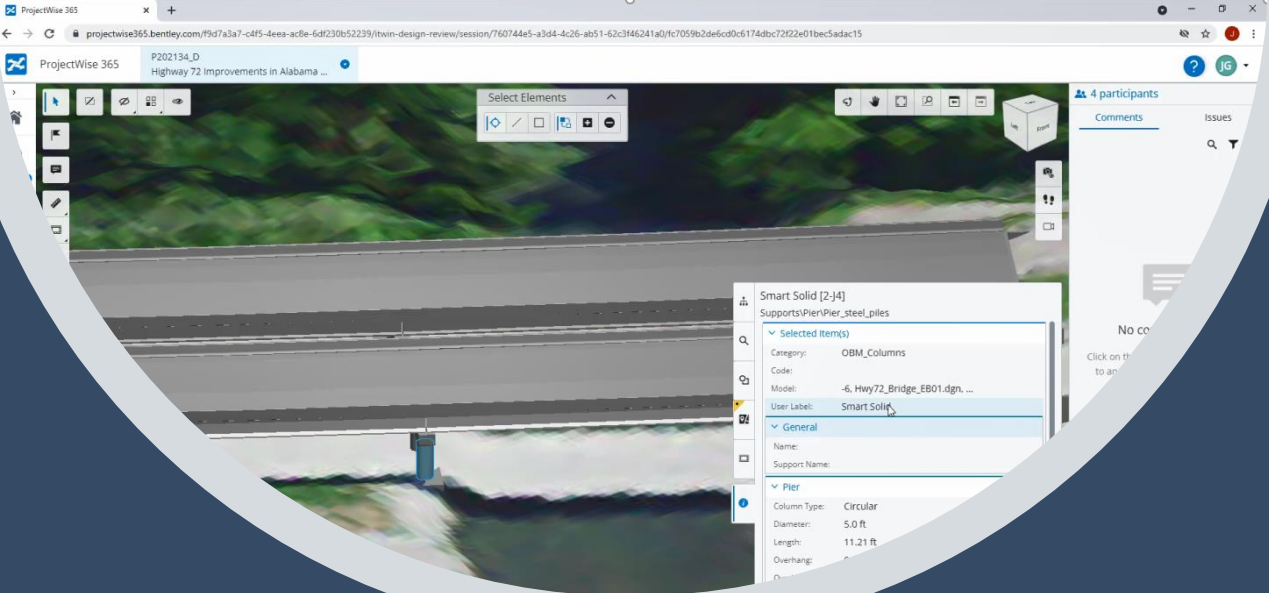
# ProjectWise 365 Design Review - Capabilities

- Web/cloud based
- Issues resolution
- Clash detection
- BIM data checking
- Named design versions compare
- Open data through iTwin open-source platform



# ProjectWise 365 Design Review - Benefits

- Improves collaboration among stakeholders
- Reduces risks, fewer errors and omissions
- Reduces need for drawing production, review, submittal and storage
- Shortens the design time by use of common data environment (CDE)
- Provides reliable and open data exchange for downstream use (construction, inspection, maintenance)



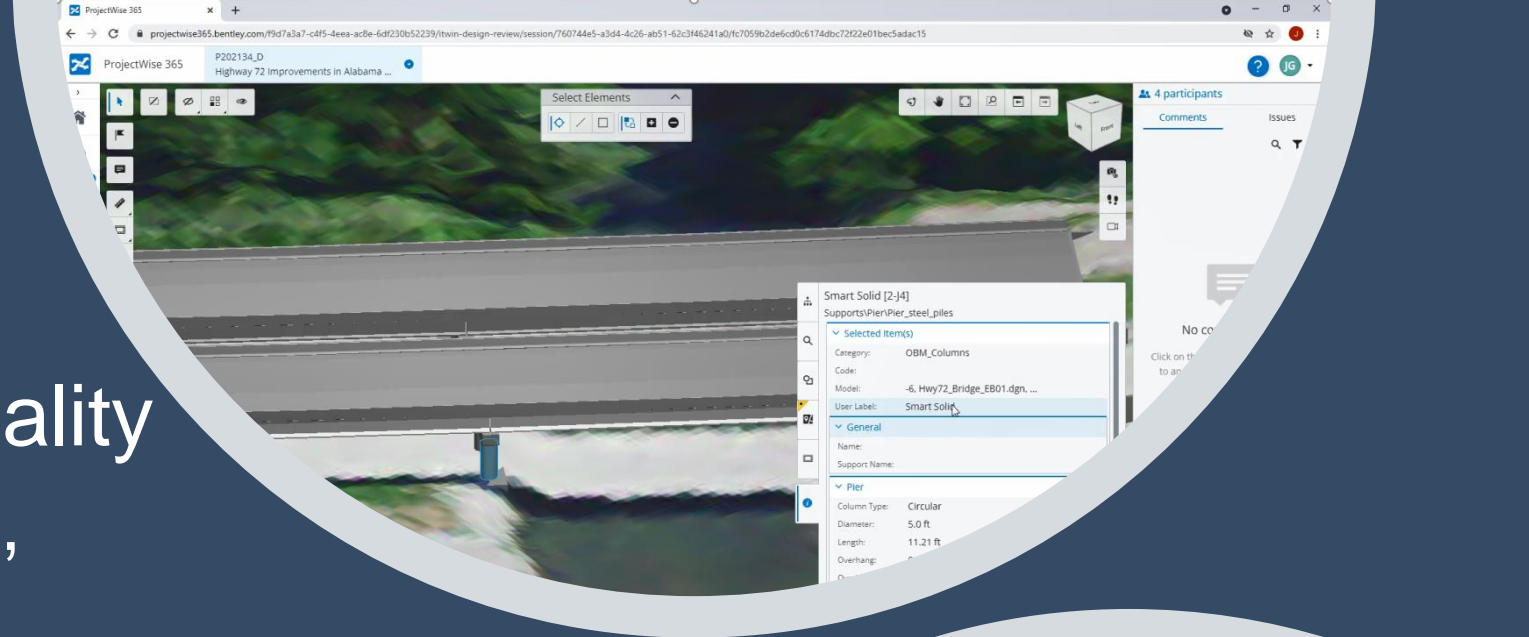


# ProjectWise 365 Design Review - Capabilities

- Civil specific functionality
  - Profile, cross-section, station and offset
  - Civil quantities reporting
  - Geometry reporting

Early  
Access  
Program

Chris Andrew, AECOM - Quote 'We're not aware of any other tool that allows review of alignments for road / rail without the need for the design software with the likes of profile and reporting that are being provided'



## Early Access

### Itwin model review providing

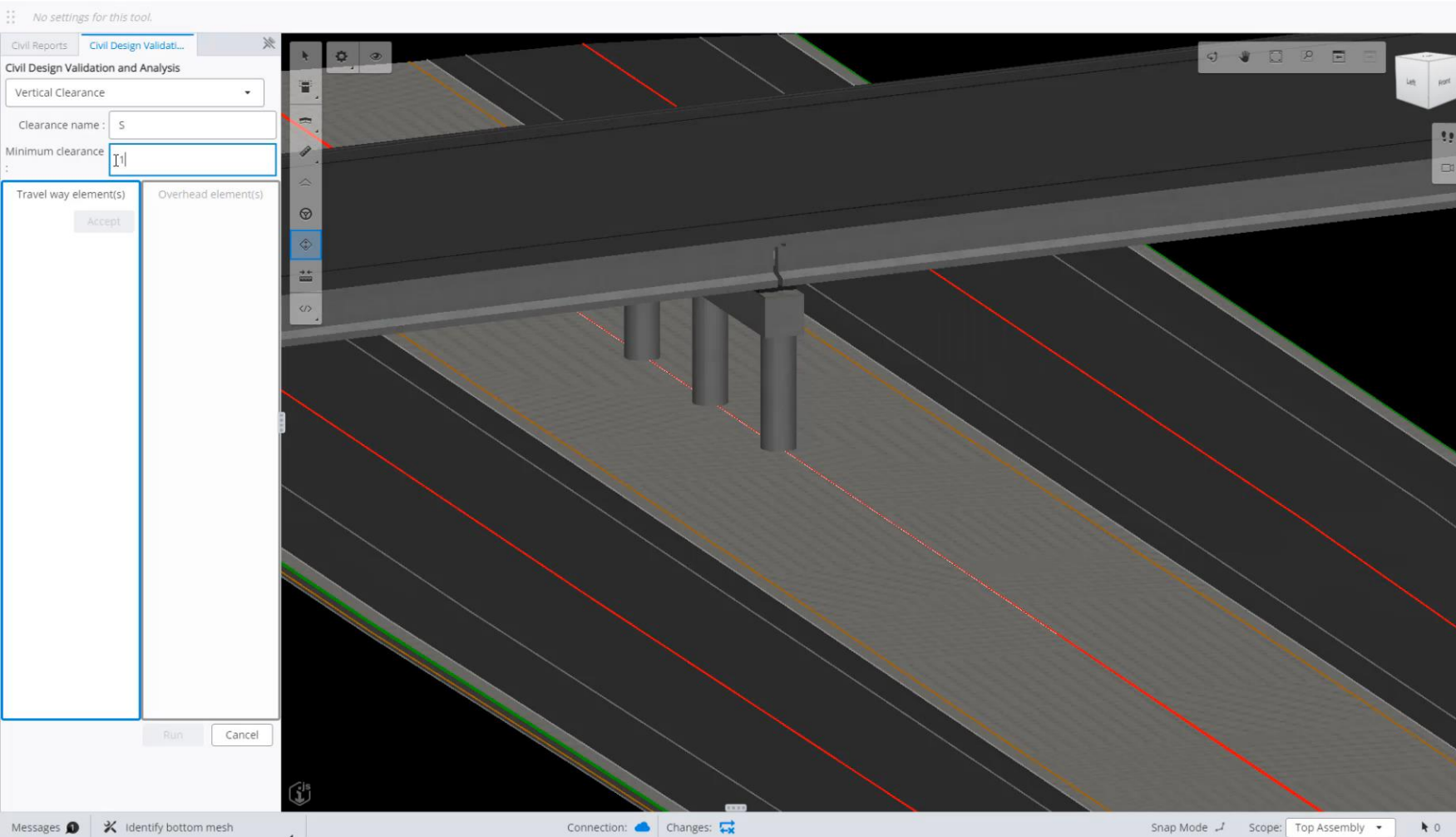
- Independent civil context model reviews for geometry, superelevation, earthwork quantities
- Multiview and tracking capability
- Issue resolution workflows with OpenRoads Designer and other applications





## Early Access

- **Bridge Clearance Checks**
  - Smart Object check between surfaces for clearances and sectional views with measure tools for further validation checks*
  - Vertical Clearances*
  - Top / bottom meshes*
  - Understands 'Bridge objects' to identify lowest surface supplemented by Manual object selection*
  - Minimum desired clearance*
  - Colour coded 3D clearance*
  - Direct access to mim vertical section location*
  
  - Minimum 3D clearance for lateral checks*
  - Works in Drive mode for quick lateral checks*



Early  
Access  
Program

# Early Access Program



## Civil Design Validation with Projectwise 365 - Early Access Program (EAP)

We're excited to open up participation in a Civil Design Validation EAP.  
The program duration is anticipated at running through to end of October 22.

In order to gain access to the new civil validation tools and supporting training dataset, it will be necessary to add you as a named user to the Projectwise 365 Project. Please complete the form (will take approximately 2 minutes to complete) providing some basic contact information to allow weblinks to be shared for direct access to the project, tools and supporting material - Note no software installation is required.

Towards the end of the EAP links to an online survey to provide feedback will be circulated.

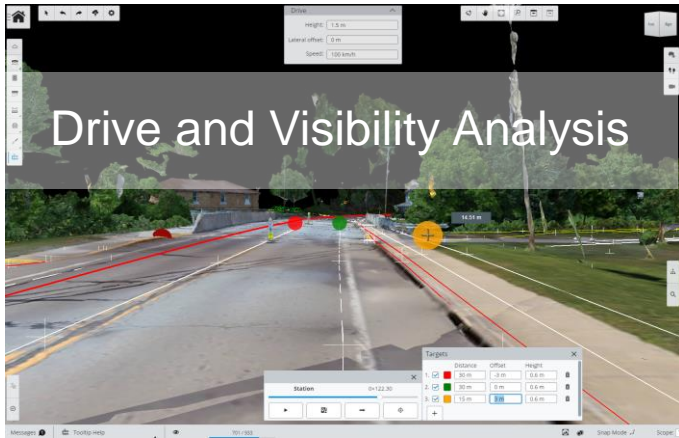
Thankyou for your interest and participation

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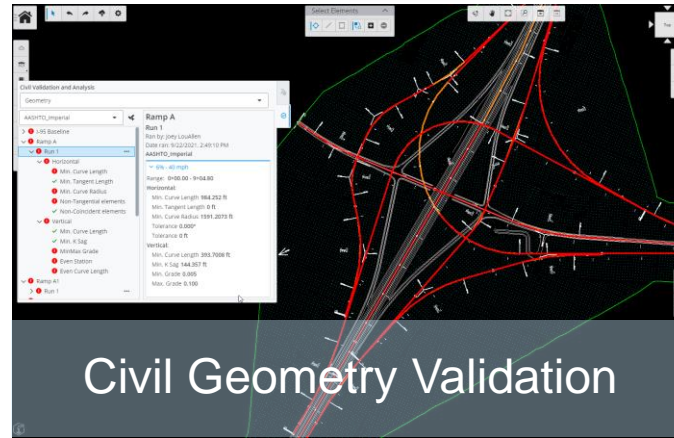
<https://forms.office.com/r/Ak6TXPKpgF>



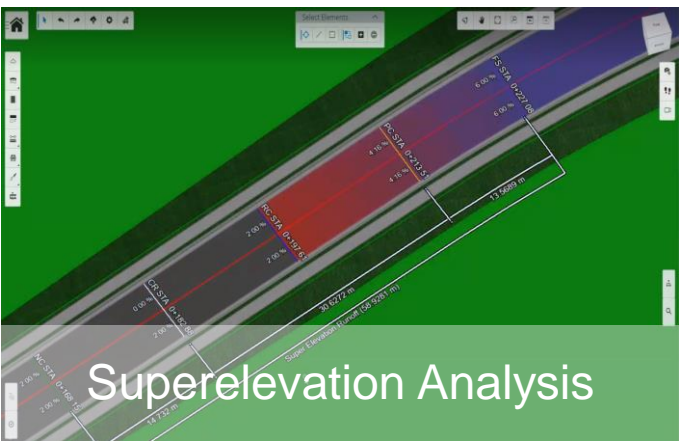
# EAP Tooling Overview



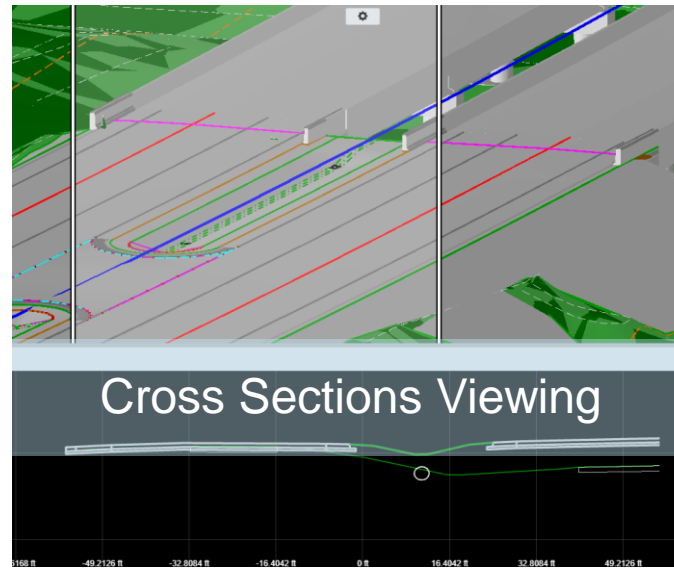
## Drive and Visibility Analysis



## Civil Geometry Validation



## Superelevation Analysis

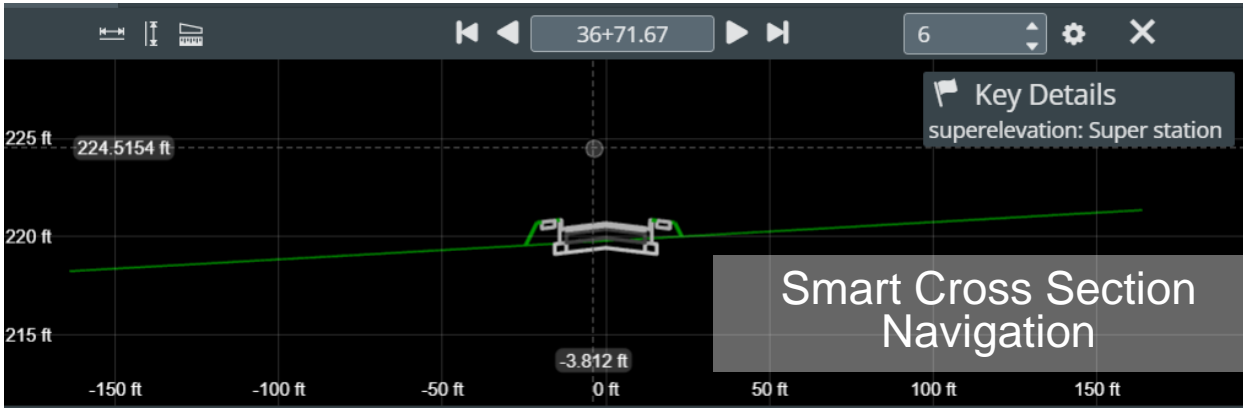


## Cross Sections Viewing

## Early Access

- **Drive and Visibility Analysis**  
*Interactive drive-throughs for line-of-site validation*
- **Superelevation Analysis**  
*Examine and validate roadway elevations*
- **Civil Geometry Validation**  
*Support for civil-specific geometry and notations*
- **Cross Sections**  
*Create corridor cross sections with ease for design validation*





Navigation Options

- Station Increment
- Key Stations
- Superelevation
- Earth Work
- XYZ

## Early Access

- Smart Cross Section Navigation**

*Interactive navigation for station intervals, key stations, superelevation key stations etc*

- 3D Contextual Text**

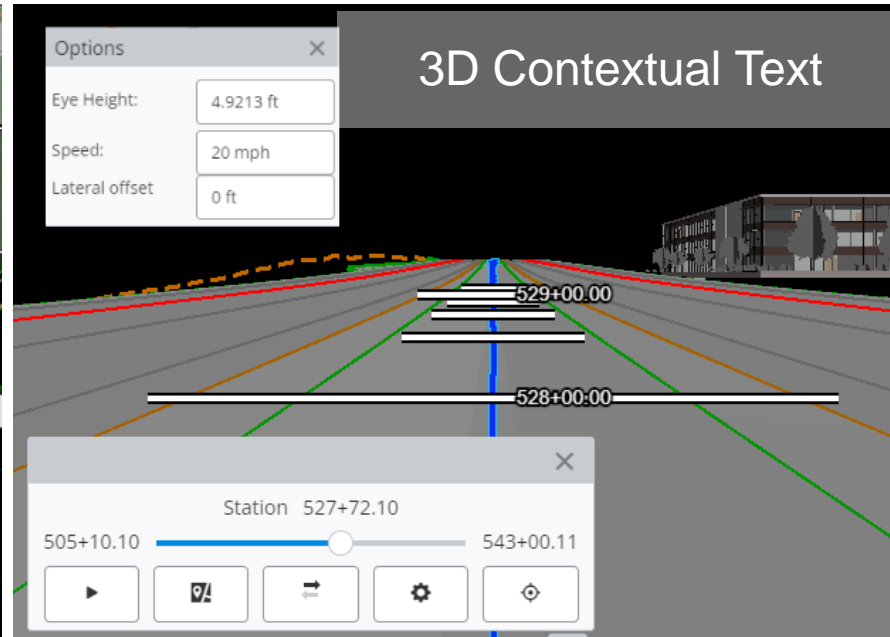
*Billboarding for stationing text when in 3D options including Drive*

- Point Analysis**

*Similar to ORD point analysis for spot checks*

- Bridge Clearance Checks**

*Smart Object check between surfaces for clearances and sectional views with measure tools for further validation checks*



Early  
Access  
Program

# Early Access Program



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OpenRoads

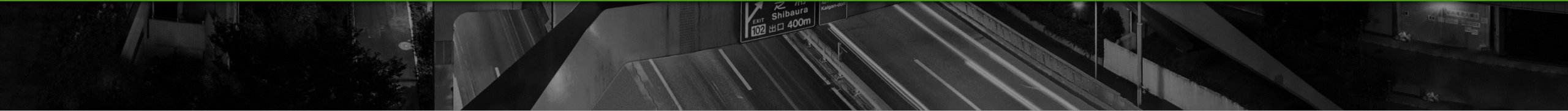
OpenBridge

OpenSite

OpenRail



# OpenRoads



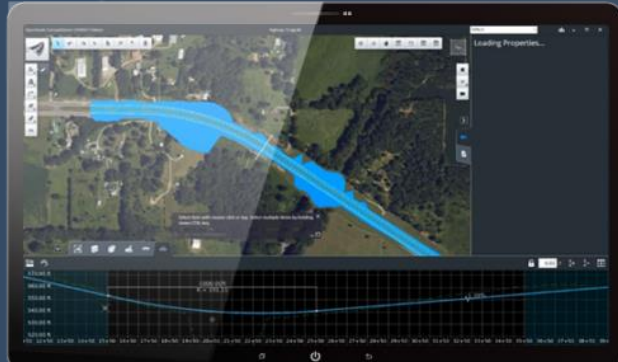
# OpenRoads

OpenRoad  
Conceptstation

OpenRoad  
Designer

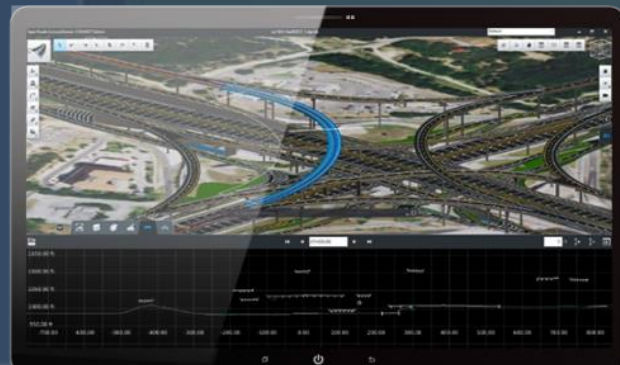
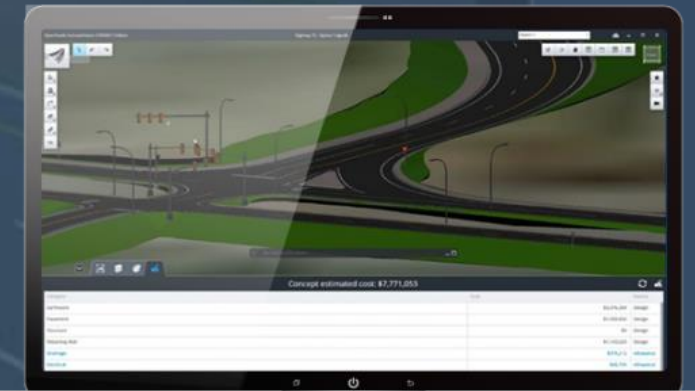


# OpenRoads ConceptStation



- **INCORPORATE CONTEXTUAL INFORMATION**
- Jumpstart your conceptual design process by locating and downloading data-rich contextual information for a given location to model in a real-world setting. You can readily import data from your GIS to create intelligent 3D models in context with minimal effort.

- **UNDERSTAND FINANCIAL IMPLICATIONS EARLY**
- Identify high-cost items and potential risks with the ability to generate project estimates that dynamically update as design modifications are made. You'll win more business by generating better, more cost-effective designs



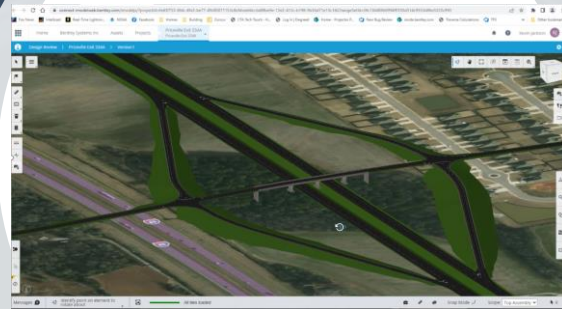
- **GO FROM IDEA TO 3D FASTER THAN EVER**
- Simplify 3D modelling with easy-to-use engineering sketching capabilities to quickly conceptualize road and bridge infrastructure.

# OpenRoads ConceptStation CE Update 15 – What's new?

Overlay



Widening  
Templates



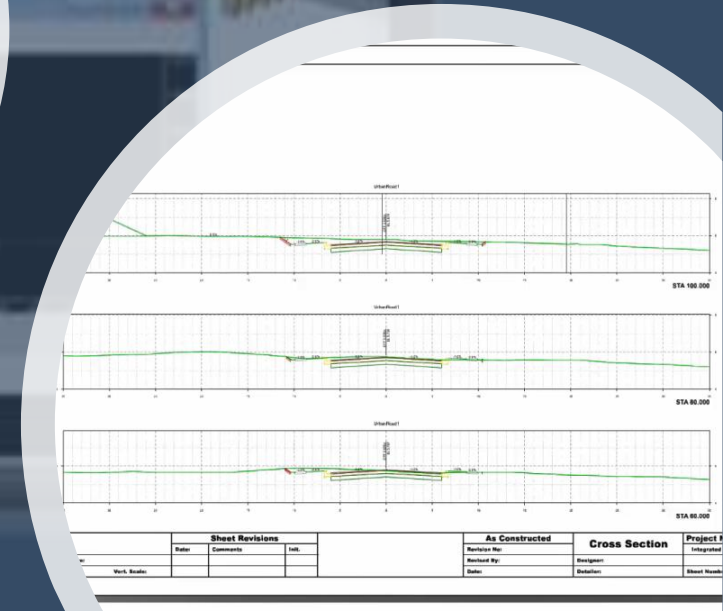
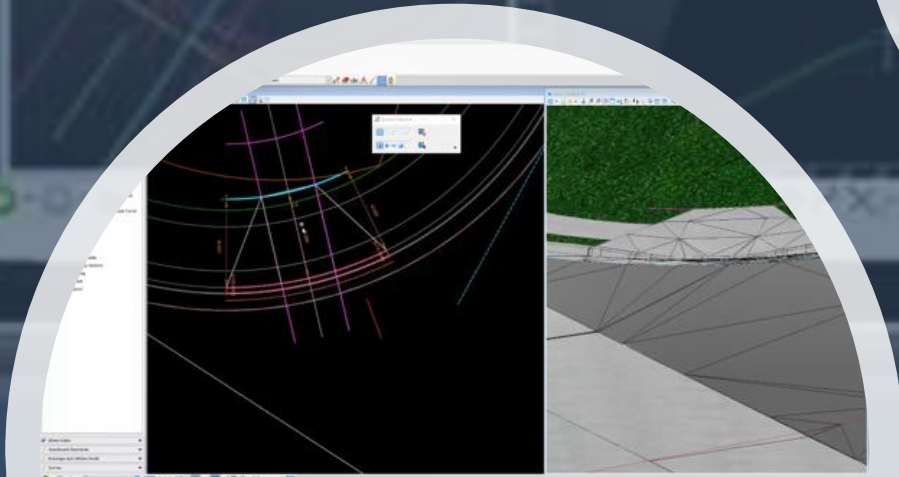
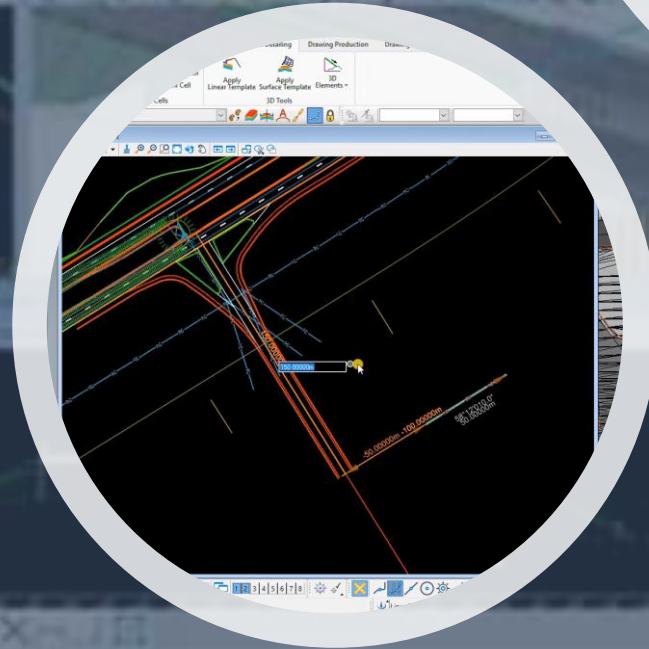
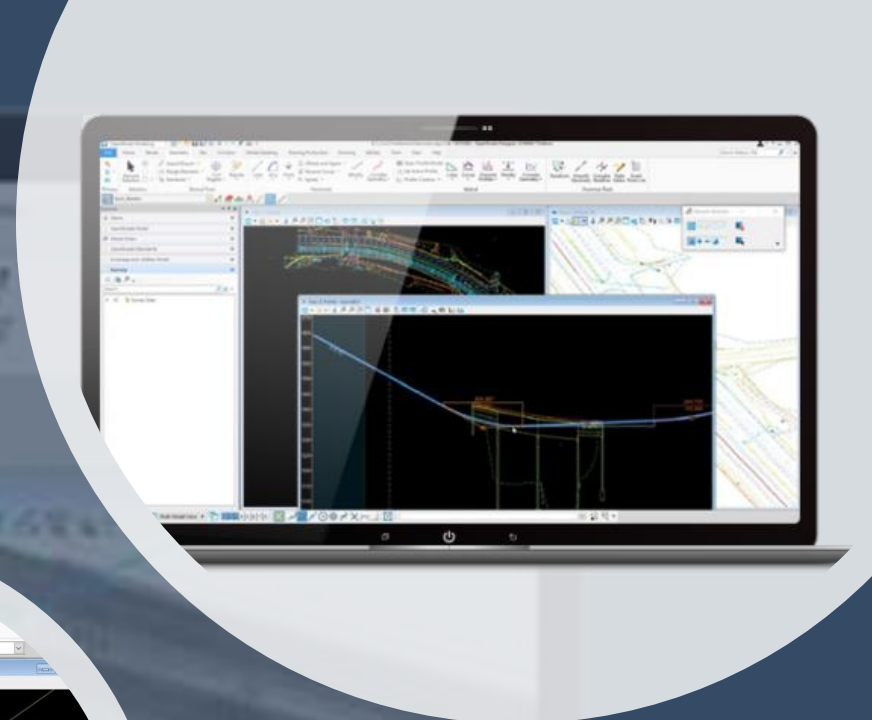
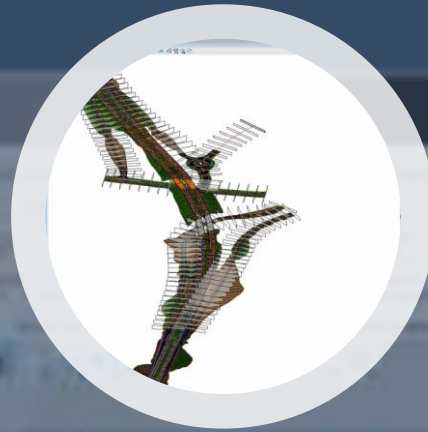
- Widening and Overlay Template workflows
- Connector to iTwin
- Released Q2 2022





# OpenRoads Designer

- Intelligent parametric civil design
- Work in 2D to create 3D
- Federated capabilities for cross discipline collaboration and live drawing production



Limited  
Access  
Program

# OpenRoads Designer CE 2022 Release 1

Released 21<sup>st</sup>  
Sept 2022

Available to  
download now !!

[https://www.youtube.com/playlist?list=PLnJUnxLwu\\_N67mfsglQQ-Zllajd8MZjHc](https://www.youtube.com/playlist?list=PLnJUnxLwu_N67mfsglQQ-Zllajd8MZjHc)

A screenshot of a web browser displaying a YouTube playlist. The browser's address bar shows the URL: [https://www.youtube.com/playlist?list=PLnJUnxLwu\\_N67mfsglQQ-Zllajd8MZjHc](https://www.youtube.com/playlist?list=PLnJUnxLwu_N67mfsglQQ-Zllajd8MZjHc). The YouTube interface includes a search bar, navigation icons, and a list of six video thumbnails. The first video is titled "OpenRoads Designer 2022 Release 1 Civil Labeler Usability" with a duration of 1:37. The second is "OpenRoads Designer 2022 Release 1 Civil Properties in Expression Builder" (2:00). The third is "OpenRoads Designer 2022 Release 1 Classifications Integration with Create Templates" (3:38). The fourth is "OpenRoads Designer 2022 Release 1 Closed Mesh Improvements" (3:17). The fifth is "OpenRoads Designer 2022 Release 1 Computing Station Offset with Expressions" (2:19). The sixth is "OpenRoads Designer 2022 Release 1 Conditional Pick Lists" (0:57). Below the list, the channel name "Bentley OpenRoads" is visible with a "SUBSCRIBED" button. The bottom of the screenshot shows the URL: [https://www.youtube.com/watch?v=jBxisCO1bY&list=PLnJUnxLwu\\_N67mfsglQQ-Zllajd8MZjHc](https://www.youtube.com/watch?v=jBxisCO1bY&list=PLnJUnxLwu_N67mfsglQQ-Zllajd8MZjHc).



Limited  
Access  
Program

# OpenRoads Designer CE 2022 Release 1

Released 21<sup>st</sup>  
Sept 2022

Available to  
download now !!

# It's all been about... You!

# OpenRoads Designer CE 2022 R1 by the numbers

**5x**

IMPROVEMENT

Up to 5X increase  
in Closed Mesh  
performance

**701**

DEFECTS

Out of 701 total defects:

- 200 (general user reported)
- 233 (Drainage & Utilities)
- 165 (Stability)
- 62 (Drawing Production)
- 41 (Others)

**97**

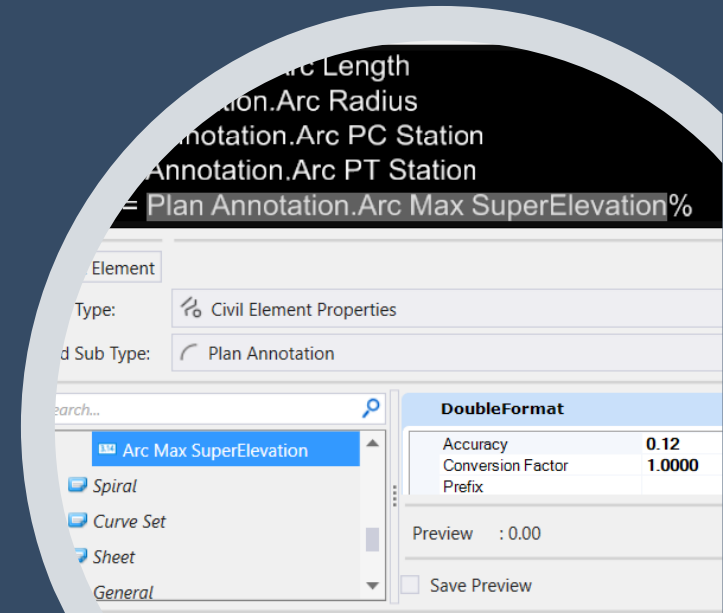
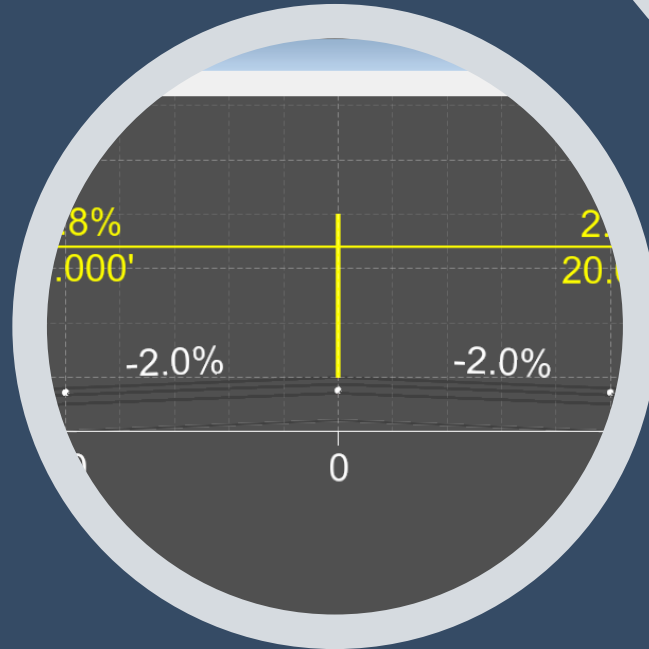
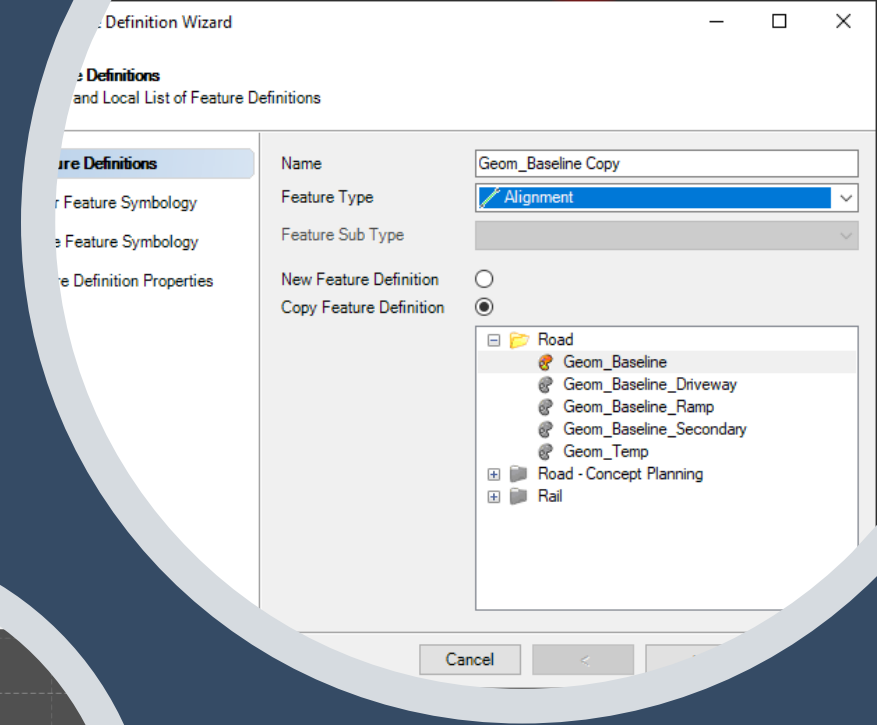
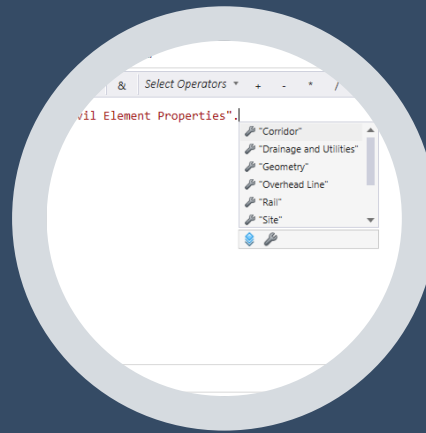
ENHANCEMENTS

We addressed 97 user  
requested enhancements  
across the product



# OpenRoads Designer CE 2022 R1 What's new

- **Plans Production**
  - Annotation Enhancements
  - Civil Labeler Usability Enhancements
- **Configuration/Workspace**
  - Feature Re-mapper enhancements
  - New Feature Definition Wizard
- **Smarter Model**
  - Item type Enhancements
  - Classification Properties (IFC Support)
- **Modeling**
  - Closed mesh improvements
  - Geometry & Terrain Improvements
  - LandXML Scripting
  - Drainage Enhancements



Early adopters'  
feedback on the  
Feature  
Remapper

James Burke, FHWA

“The Civil Feature Remapper **allowed our organization to update old, and current, projects to the latest workspace.** Our organization had recently changed all the feature definition names and locations since the original workspace release.”

Scott A. McMasters, Senior Highway Designer – Digital Delivery Design Lead, PennDOT

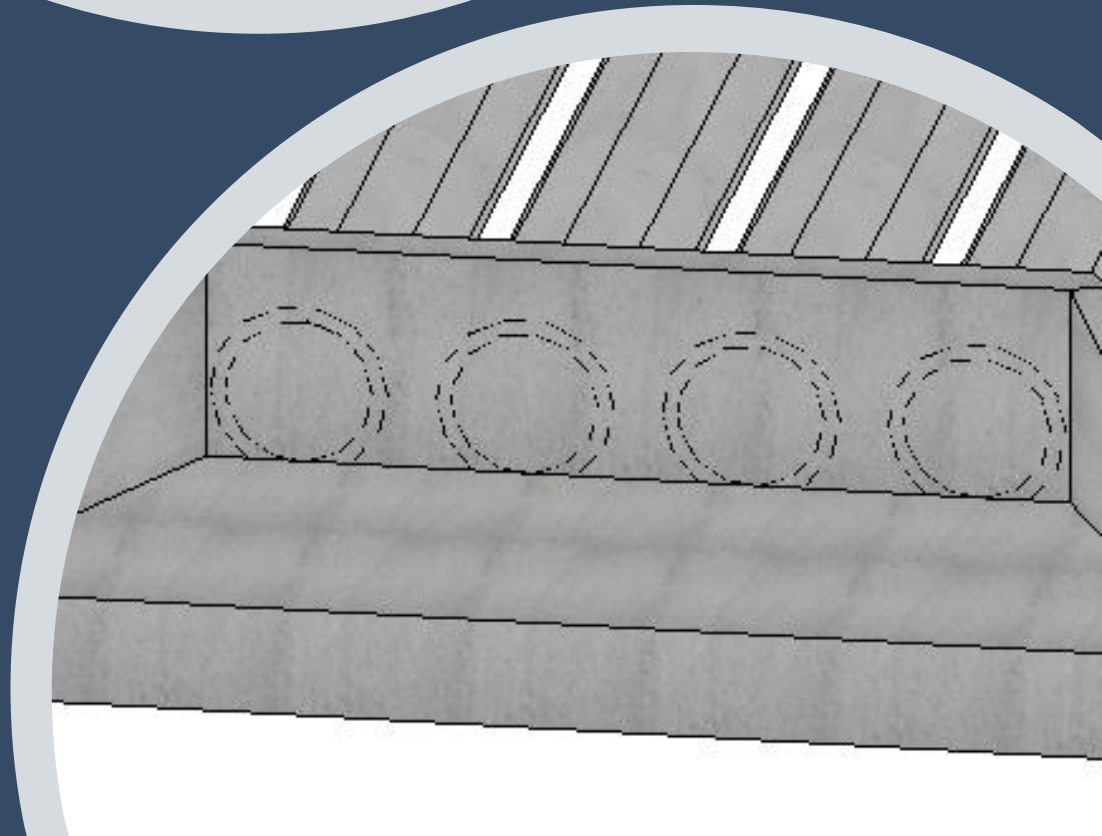
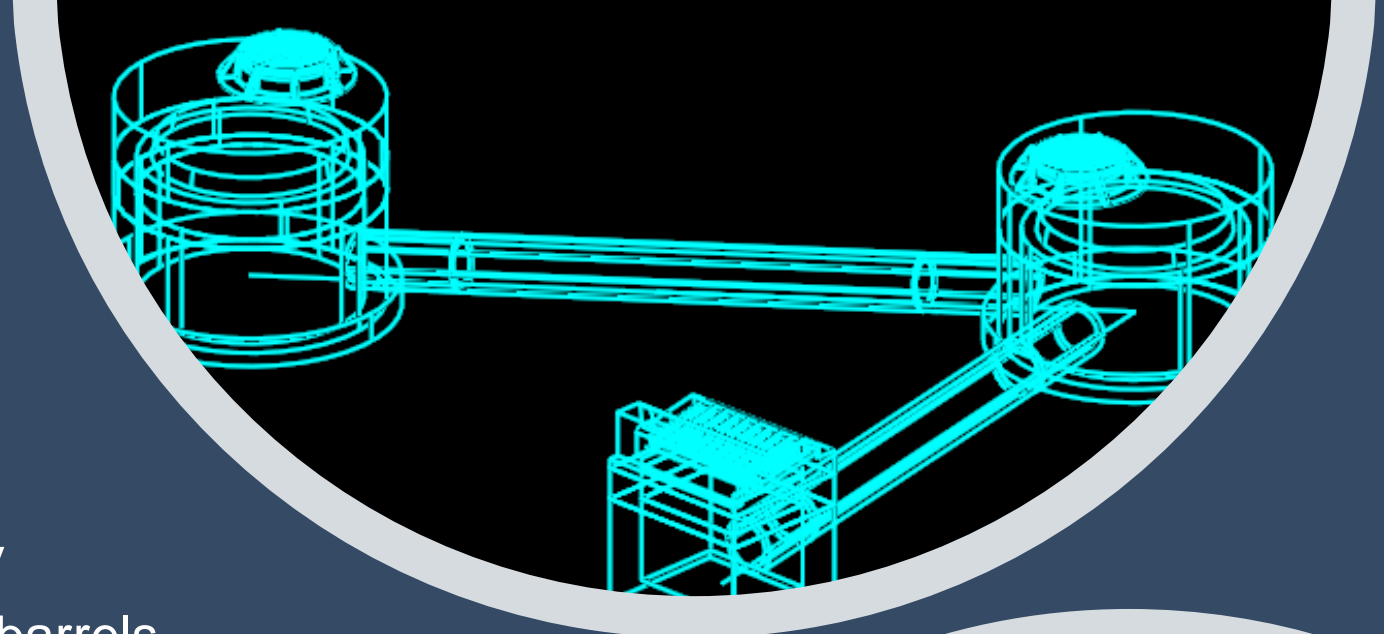
“OpenRoads Designer’s new Civil Feature Remapper was very timely with moving projects forward to our current workspace standards after major workspace updates were push out. **Without this feature, the task would have been EXTREMELY painful.**”



# OpenRoads 2022 R1

## What's new (cont.)

- **Drainage and utilities**
  - Improved item type support
  - Enhanced conduit symbology
  - Implemented a gap between barrels
  - New functionality to identify different land use areas. Catchment areas inherit from land use areas, and calculate a weighted runoff coefficient
  - Added functionality to delineate catchment areas for existing inlets
  - Added a connection point, as opposed to a connection ring or region
  - Conflict detection enhancements



# Roadmap Alert



# Disclaimer Statement

Release plans and timelines are forward-looking estimates and projections only. There can be no assurance that Bentley will be able to meet such estimates or projections by the dates specified, or at all. Do not make purchase decisions based on forward looking roadmaps.

# Civil Design | Upcoming enhancements

## *Export SHP*

- *Problem/Pain* | Users had no ability to export to Shapefiles without first installing another product.
- *For* | Engineers, Designers and Drafters
- *Value* | Eliminates the need for a 2<sup>nd</sup> product, saving our users time and money.
- *When* | 2022 R 2

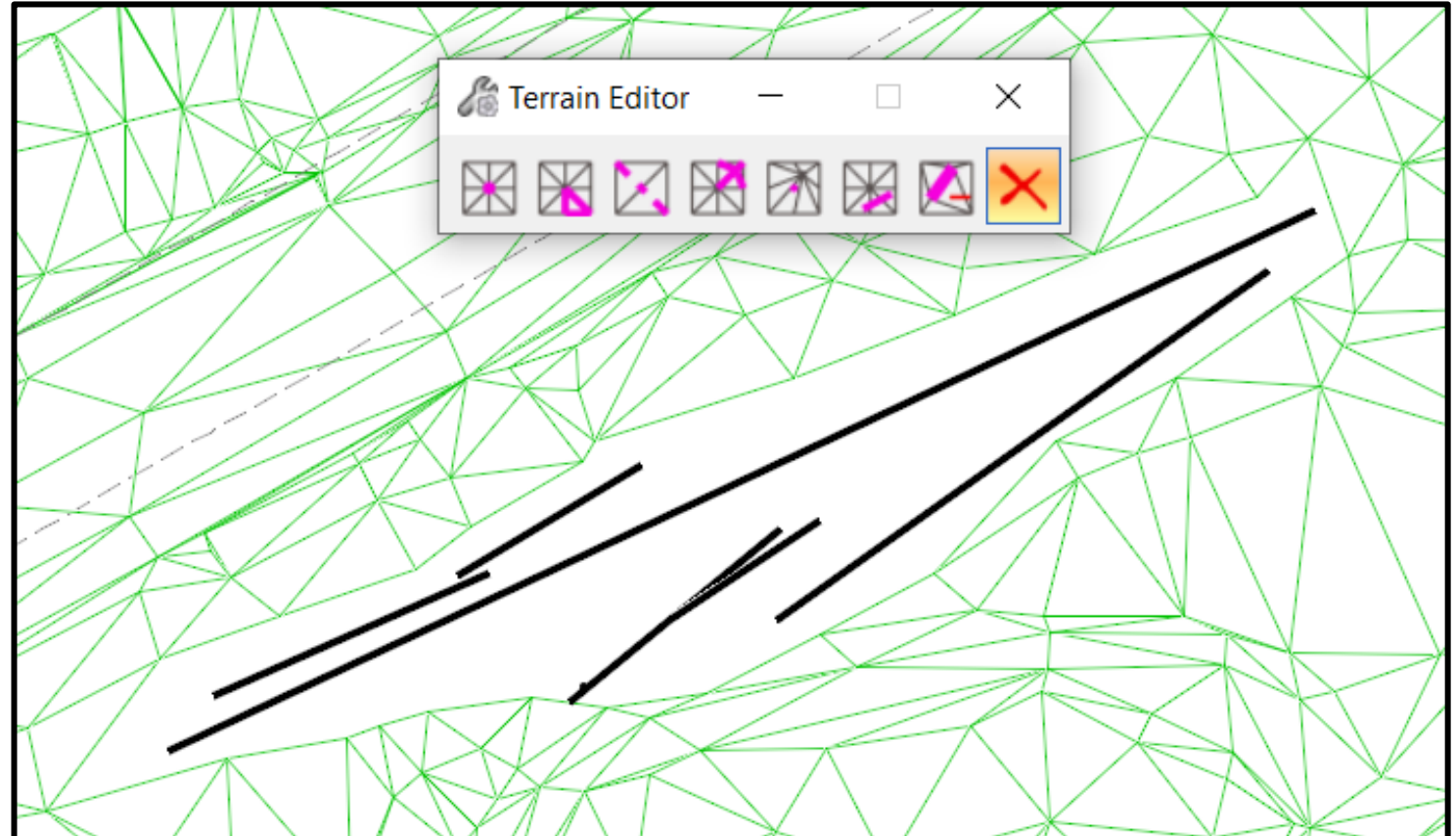




# Civil Design | Upcoming enhancements

## *Terrain Editing*

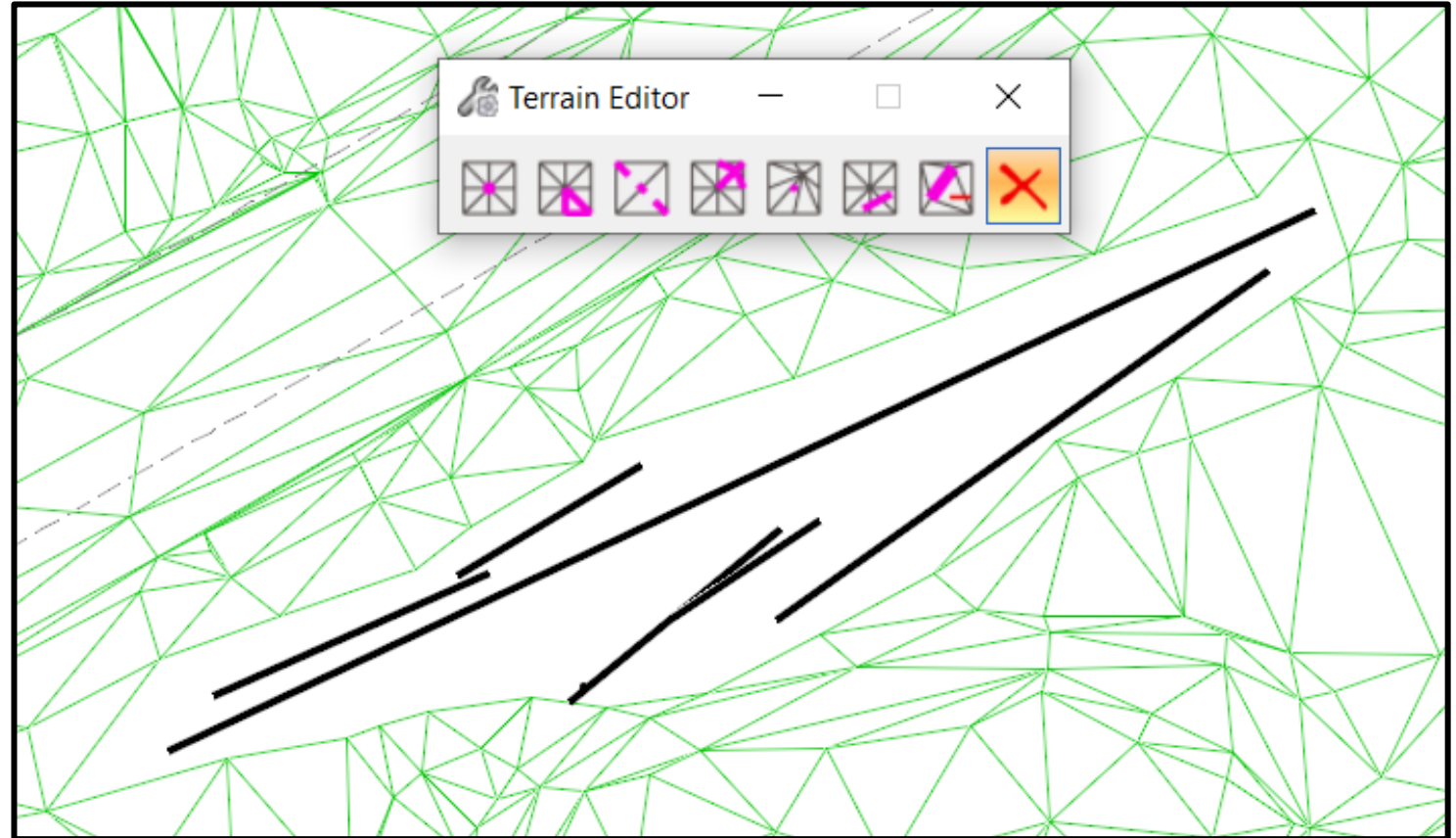
- *Problem/Pain* | Previously, users could not edit a ruled terrain, and if the terrain was re-processed the edits would be lost.
- *For* | Engineers, Designers and Drafters
- *Value* | Edits now work on ruled terrains and in addition, the edits are saved with the terrain. This allows the terrain to be re-processed without losing work.
- *When* | 2022 R 2



# Civil Design | Upcoming enhancements

## *Terrain Editing*

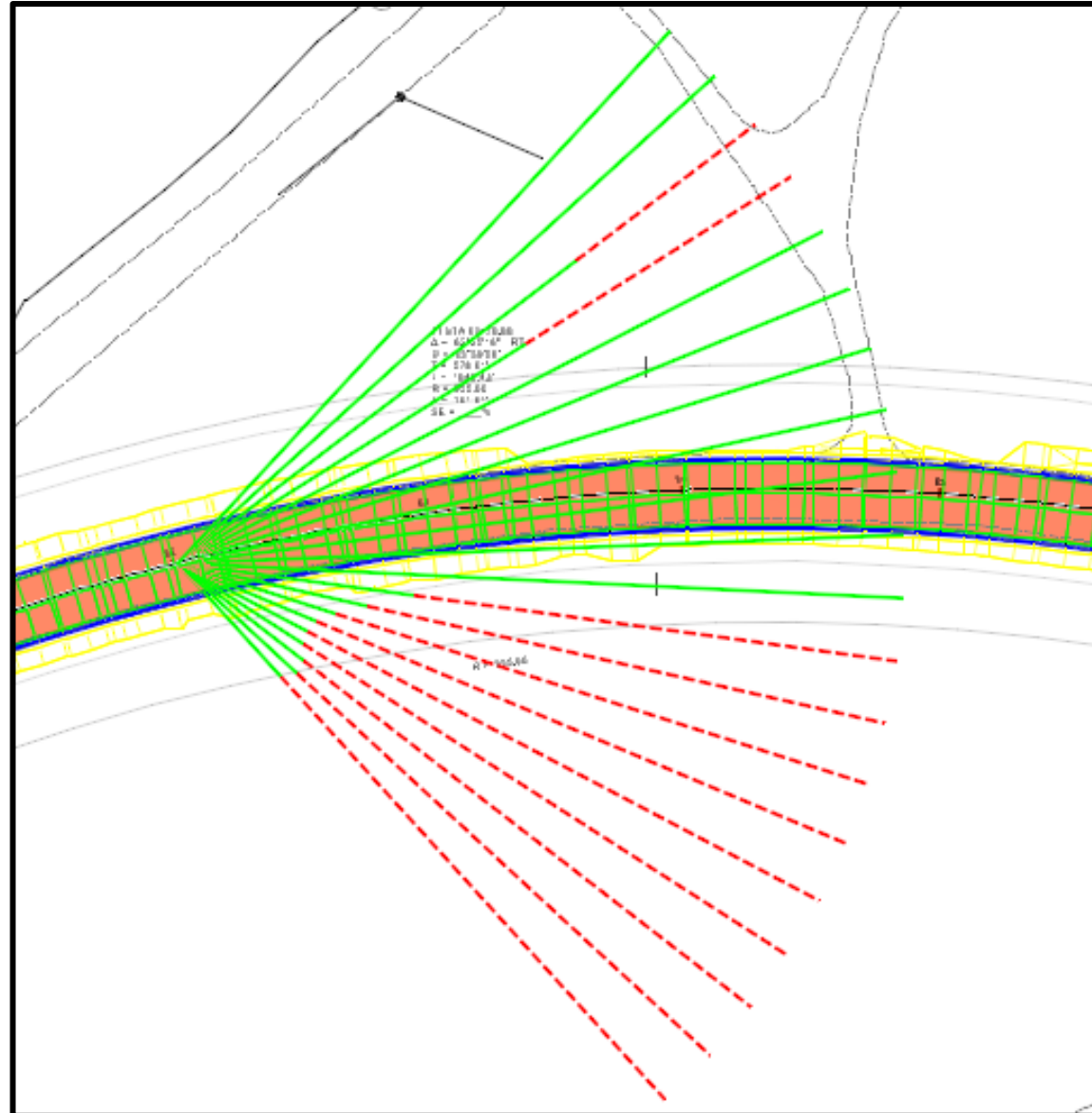
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- *When* | 2022 R 2



# Civil Design | Upcoming enhancements

## *Line of Sight*

- *Problem/Pain* | Users had no way to analyze line of sight.
- *For* | Engineers, Designers and Drafters
- *Value* | This tool uses both terrains and corridors to analyze line of sight, replacing a technology that users had in our legacy products.
- *When* | 2022 R 2

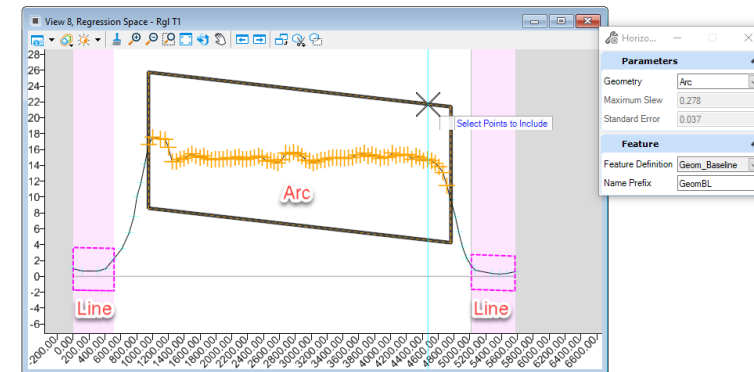
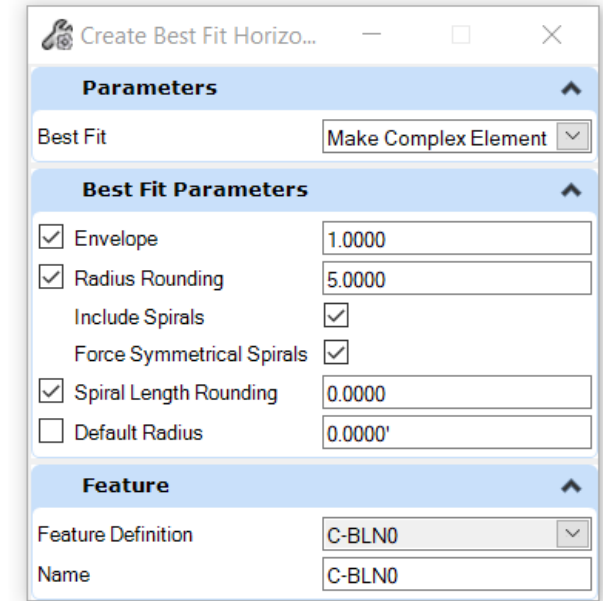
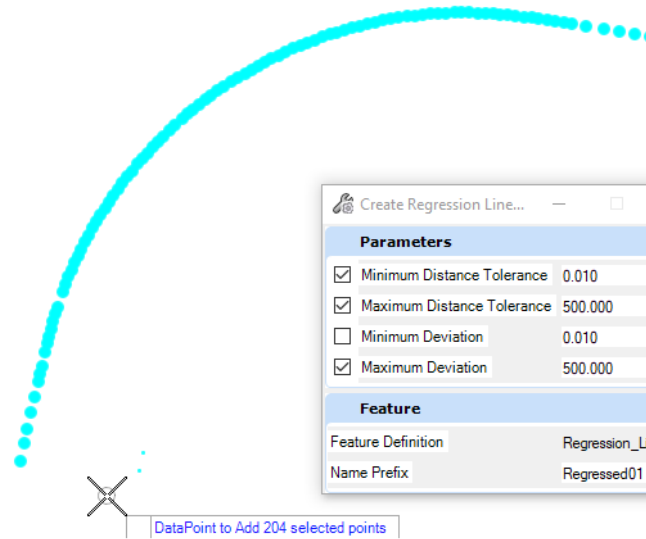




# Civil Design | Upcoming enhancements

## Horizontal Regression Tools

- *Problem/Pain* | Users had to install Rail in order to access the more comprehensive regression tools.
- *For* | Engineers, Designers and Drafters
- *Value* | The tools have been moved back to Road, giving our users access to tools they had in our legacy products.
- *When* | 2022 R 2





# OpenRail



# OpenRail

OpenRail  
Conceptstion

OpenRail Designer

OpenRail Overhead  
Line Designer



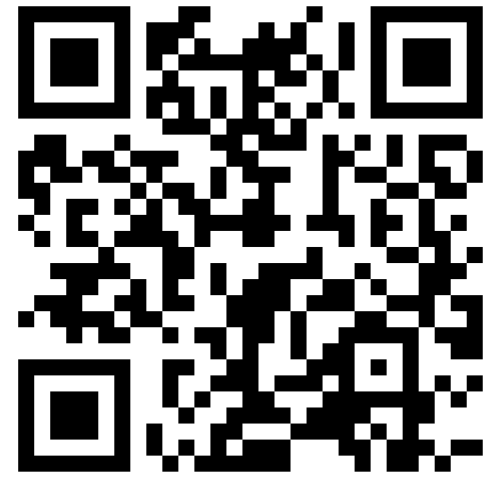
Limited  
Access  
Program

# OpenRail Designer CE 2022 Release 1

Released 21<sup>st</sup>  
Sept 2022

Available to  
download now !!

[https://www.youtube.com/playlist?list=PLOMh7B\\_-fX0x3ERtY3insRLBJ-PL0oTGm](https://www.youtube.com/playlist?list=PLOMh7B_-fX0x3ERtY3insRLBJ-PL0oTGm)

A screenshot of a web browser displaying a YouTube playlist. The browser's address bar shows the URL: https://www.youtube.com/playlist?list=PLOMh7B\_-fX0x3ERtY3insRLBJ-PL0oTGm. The page title is "OpenRail Designer 2022 Release 1". The playlist contains 17 videos, with the first seven visible. Each video title includes "OpenRail Designer 2022 Release 1" followed by a Low Voltage Assets (LVA) topic number and description. The channel name "Bentley OpenRail" is visible below each video thumbnail. The channel page shows "17 videos · 2 views · Updated today" and a "SUBSCRIBED" button. The Bentley OpenRail logo is also present at the bottom left of the channel page.

OpenRail Designer 2022 Release 1

17 videos · 2 views · Updated today

Bentley OpenRail SUBSCRIBED

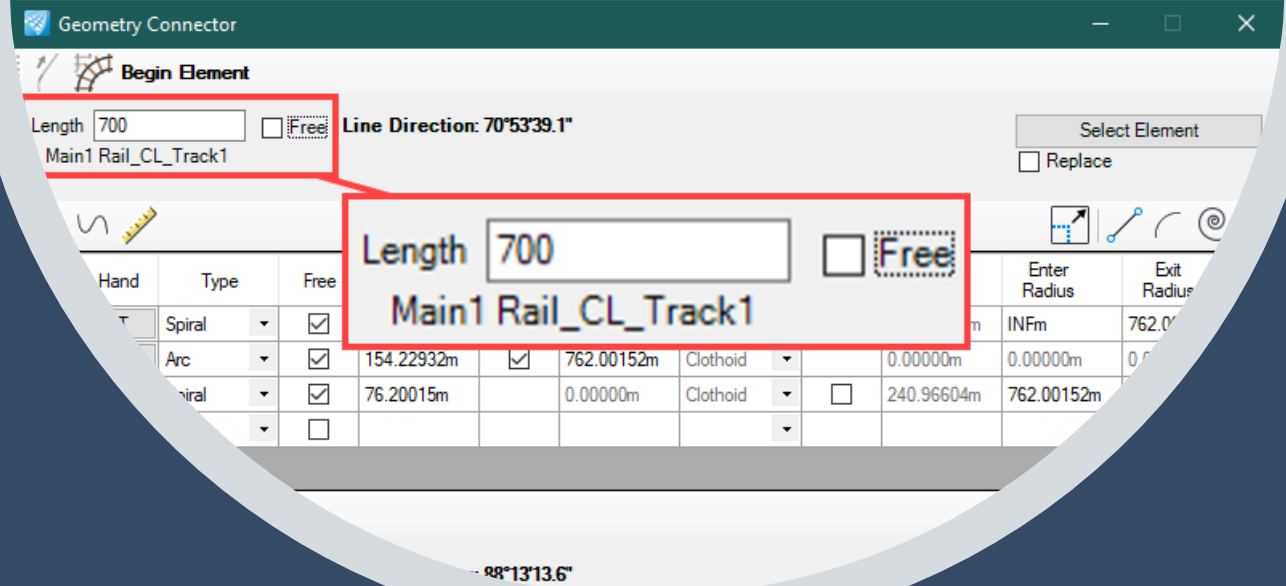
- 1 OpenRail Designer 2022 Release 1 LVA(1) Low Voltage Assets Signaling Introduction
- 2 OpenRail Designer 2022 Release 1 LVA(2) Low Voltage Assets/Signaling Models and Feature Symbology
- 3 OpenRail Designer 2022 Release 1 LVA(3) Federation of the Topology and Schematic model
- 4 OpenRail Designer 2022 Release 1 LVA(4) Clearance Point
- 5 OpenRail Designer 2022 Release 1 (LVA5) Low Voltage Signaling Equipment
- 6 OpenRail Designer 2022 Release 1 LVA(6) Equipment Assemblies
- 7 OpenRail Designer 2022 Release 1 LVA(7) Schematic Model Edge is Enabled for Drawing Production

# OpenRail Designer 2022 R1

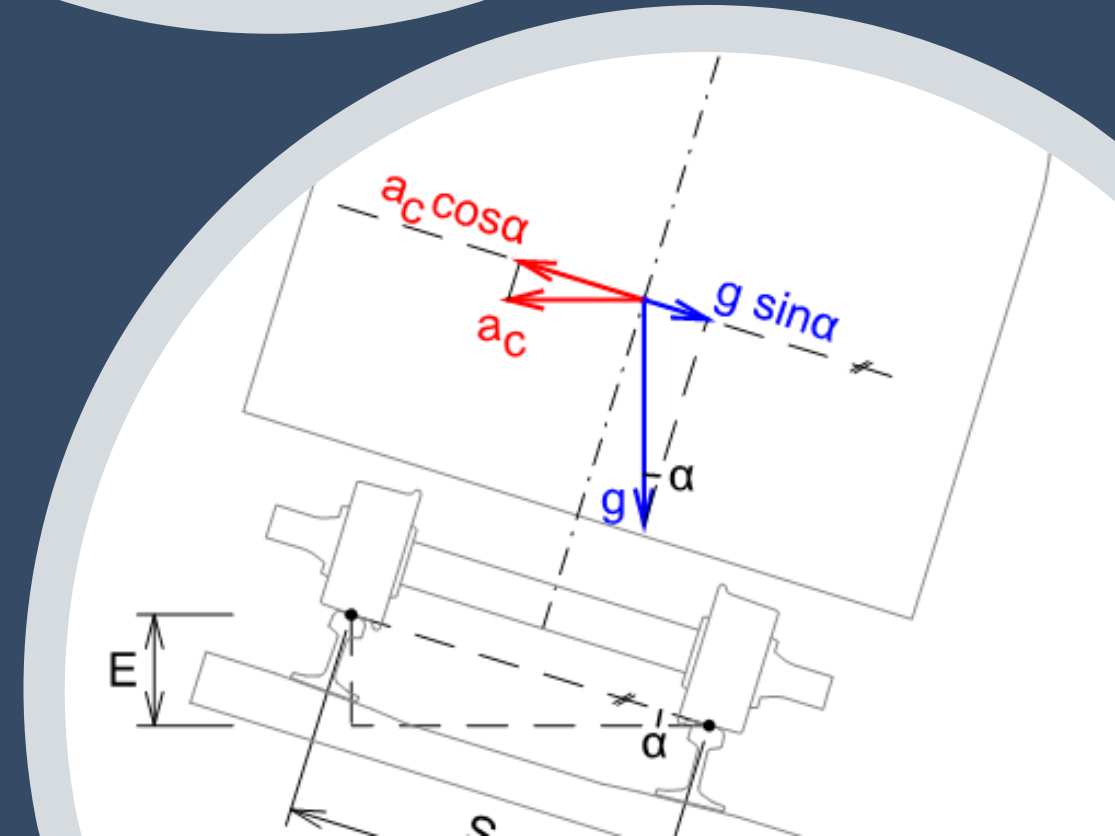
- **LV Signaling**
  - Objects, Equipment/Trenches/Cables
  - Modeling, Plan/Schematic/3D
  - Modeling, Geometry updates
  - Federate Topology/Schematic
  - Clearance Point tool
  - Schematic model is enabled for Drawing Production
- **Deliverables**
  - Additional Export Formats, Plasser & Theurer
  - Milepost Stationing Format Support



# OpenRail Designer 2022 R1 – Cont...



- Track Design & Maintenance
  - Improved Regression – minimum deviation parameter
  - Vertical Nudge tool
  - Geometry connector Improvements – Start/End element length
- Detail Modeling
  - Improved rail creation, mirrored rails
  - 2D swept path shape creation rails







OpenRoads

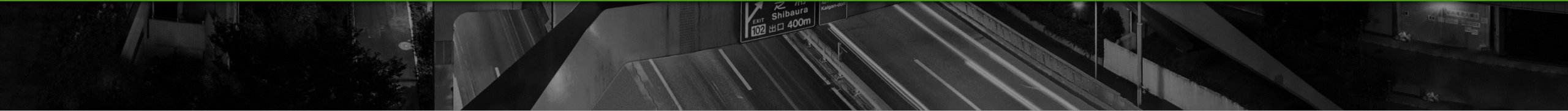
OpenBridge

OpenSite

OpenRail

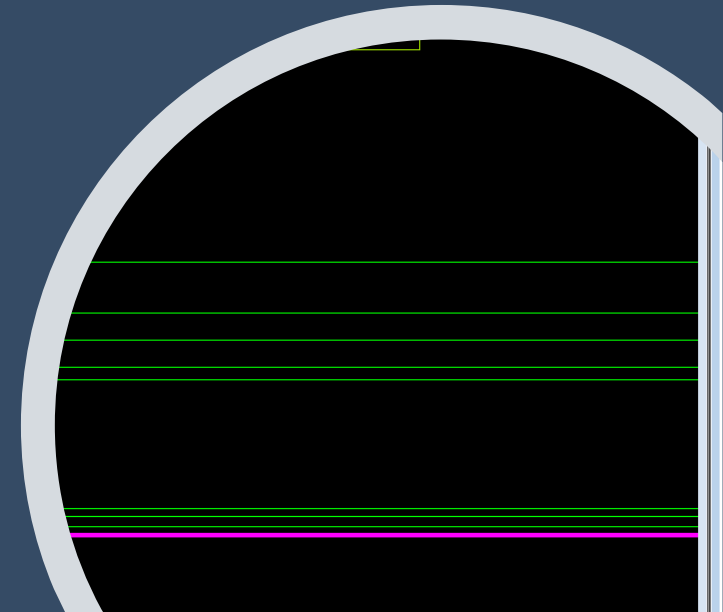
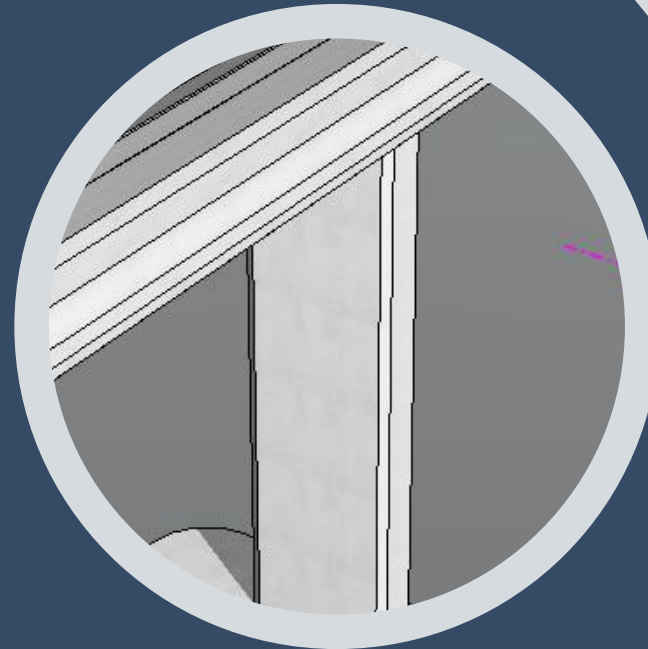
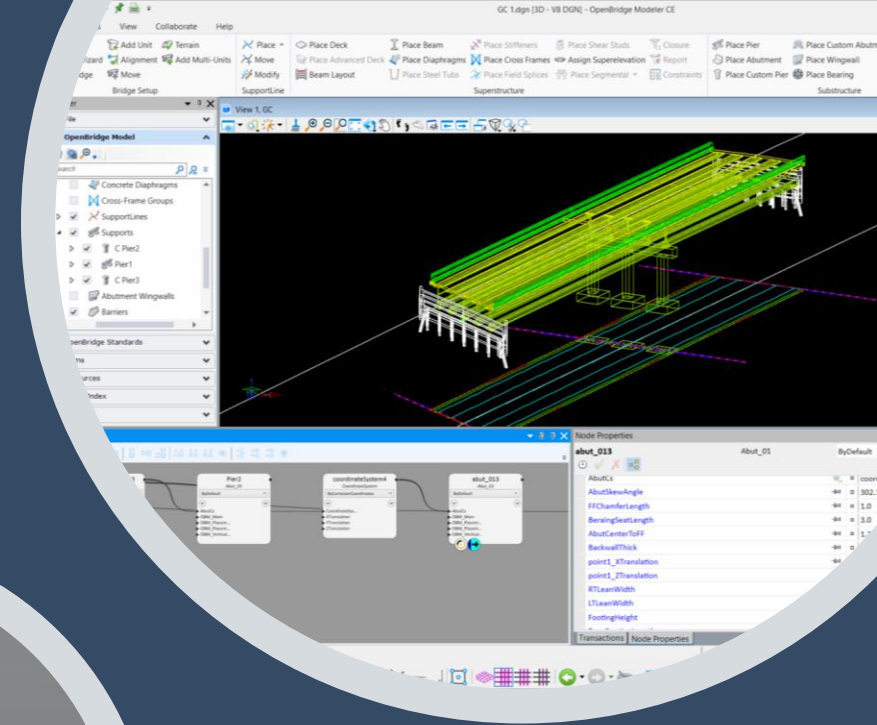
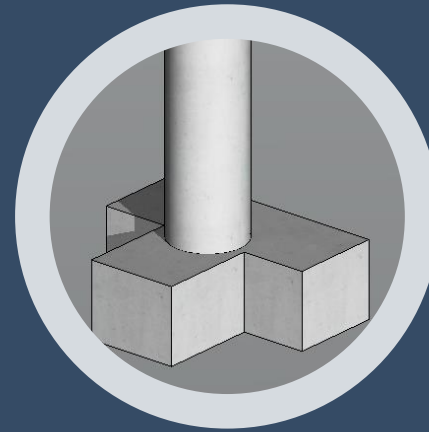


# OpenBridge



# OpenBridge

- OpenBridge Modeler
  - Allows full bridge modeling
- OpenBridge Designer
  - Combines analysis and modeling
  - Analysis is based on the physical model



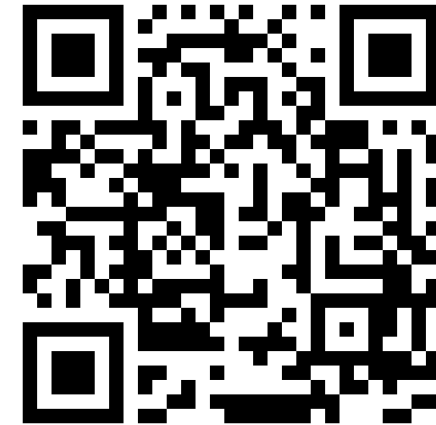
Limited  
Access  
Program

# OpenBridge CE 2022 Release 1

Released 21<sup>st</sup>  
Sept 2022

Available to  
download now !!

<https://www.youtube.com/playlist?list=PLTXGGjuaGiciR1rTb8ppDB6BaLTUOvEqv>

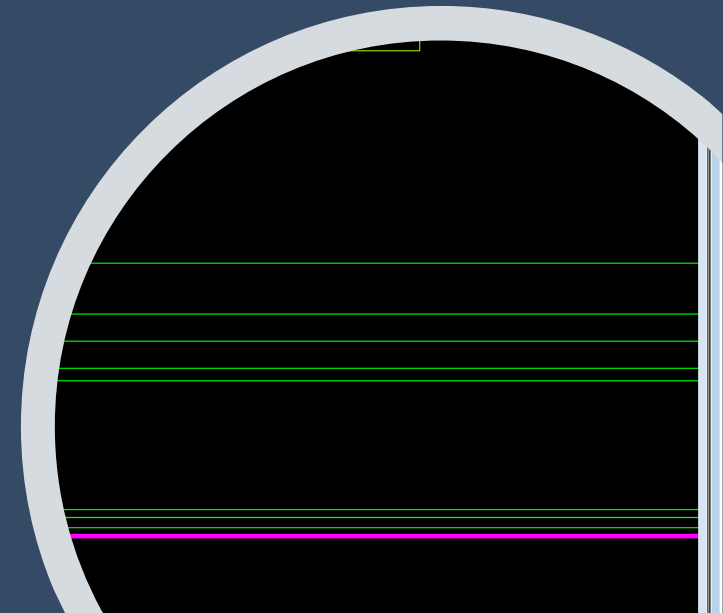
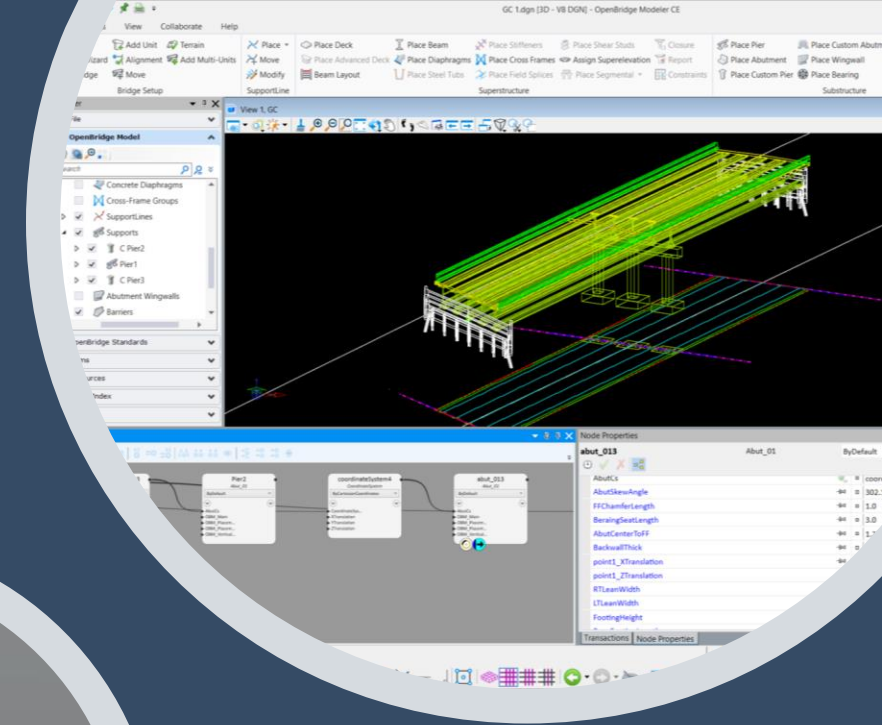
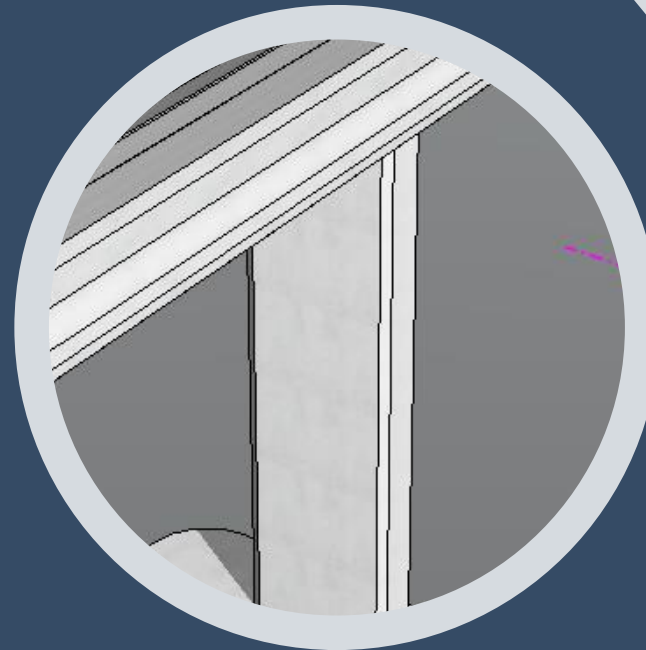
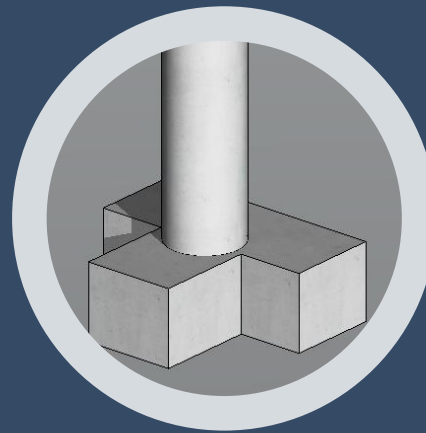
A screenshot of a web browser displaying a YouTube playlist. The browser's address bar shows the URL: [youtube.com/playlist?list=PLTXGGjuaGiciR1rTb8ppDB6BaLTUOvEqv](https://www.youtube.com/playlist?list=PLTXGGjuaGiciR1rTb8ppDB6BaLTUOvEqv). The page title is "(140) What's New in OpenBridge". The YouTube interface shows a search bar, navigation icons, and a list of videos. The main video featured is "20. Input Echo Report - Custom Pier or Custom Abutment" with a "PLAY ALL" button. Below it, the playlist title "What's New in OpenBridge 2022 Release 1?" is shown, along with statistics: "10 videos • 127 views • Last updated on 1 Sept 2022". The channel name "Bentley OpenBridge" and a "SUBSCRIBED" button are visible. The video list includes:

- 1. What's New in OpenBridge 2022 R1 (19:31)
- 2. 01 Deck Breakbacks (11:06)
- 3. 06 Wingwall Enhancements (7:27)
- 4. 05 Barrier Enhancements (3:54)
- 5. 04 Deck Report Enhancements (5:15)
- 6. 03 Bridge Wizard Enhancements (4:01)
- 7. 02 Custom Footings Templates



# OpenBridge 2022 R1 - What's new

- Deck Breakbacks (Squared ends at Skewed Supports)
- User Defined Templates for Footings
- Running Generative Components inside OpenBridge (Tech Preview)

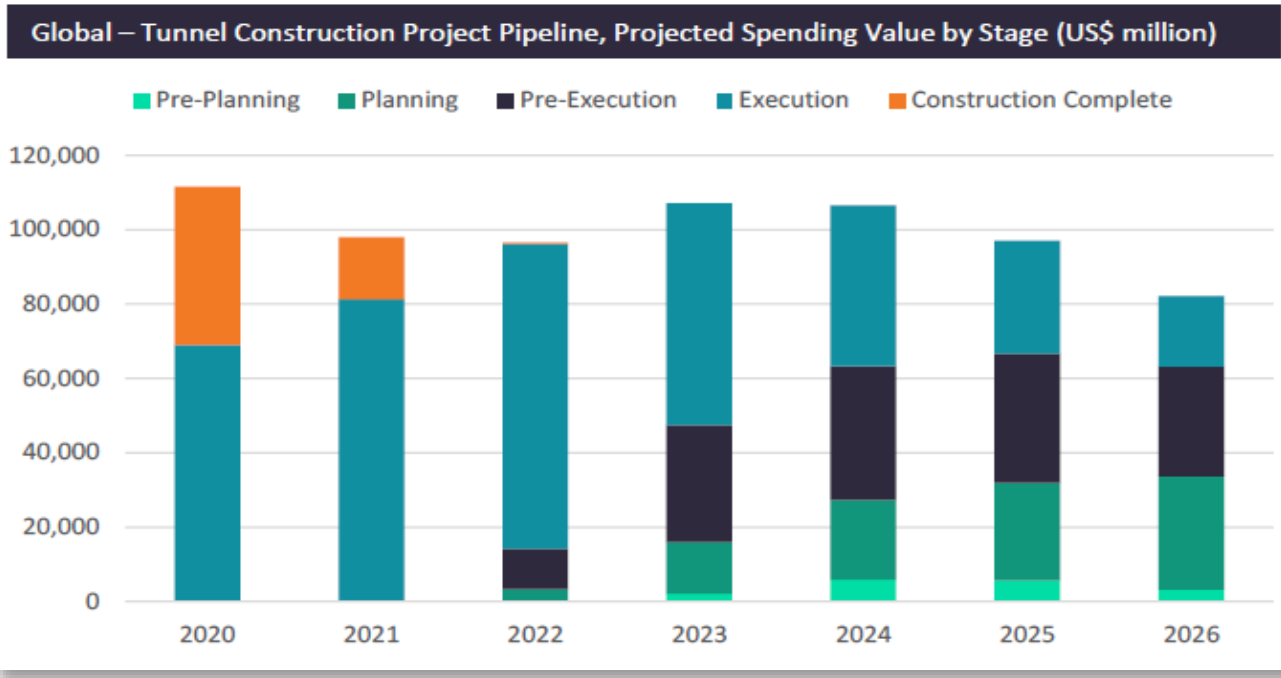


New  
Product  
Launch

OpenTunnel



# Tunnel Construction Market

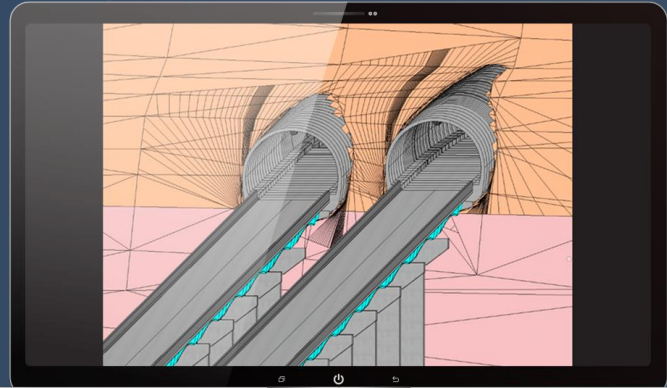


**2022 forward, around \$100B to be spent every year in tunnel construction\***

\*GlobalData, Q2 2022 **Bentley**



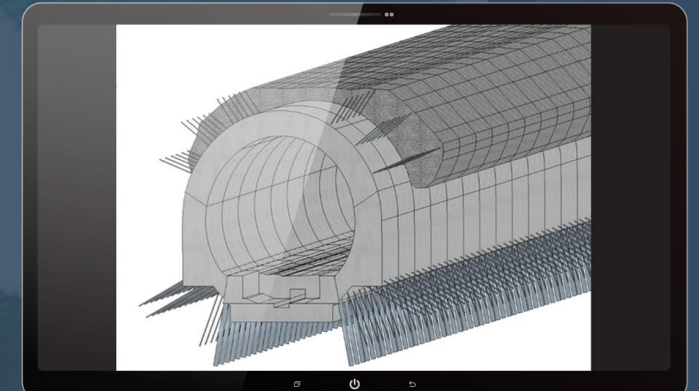
# OpenTunnel Designer



- **INCORPORATE ALL YOUR DATA**
- Make better decisions from the start of your project with the ability to combine, organize, and manage geotechnical and existing conditions data faster without sacrificing accuracy. Consume soil strata and linear infrastructure data with ease. Reference road and rail corridors, and bridge structures in your OpenTunnel Designer model and quickly import soil meshes with IFC versions 4.0 and 4.3.

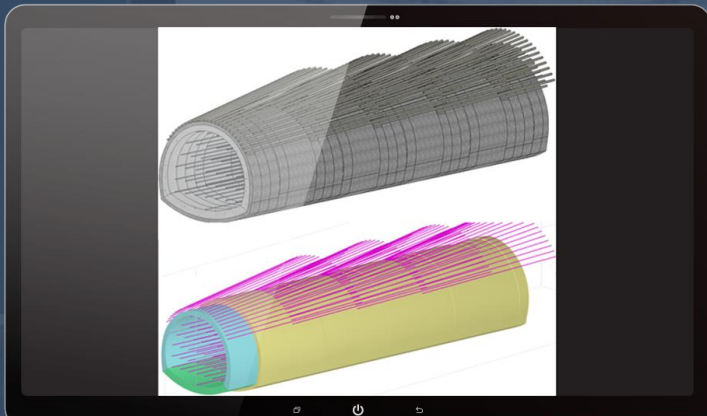
- **MODEL AND SIMULATE TUNNEL CONSTRUCTION**

- Simplify your design process with native modeling tools. Model the full excavation shape, excavation tracks, and the tunnel lining and reinforcement for conventional and mechanized tunnels. Save valuable design time, as your model updates automatically to any change made in the tunnel template or alignment geometry.



- **PERFORM GEOTECHNICAL ANALYSIS**

- Maximize productivity and save time by creating multiple analytical models in minutes not days. Simply specify stations for the cross section as the basis of your 2D analytical model or send entire tunnels from your 3D BIM model to PLAXIS with the push of a button, no coding required..



# OpenTunnel Designer

- **MODEL TUNNEL INTERIOR OBJECTS**

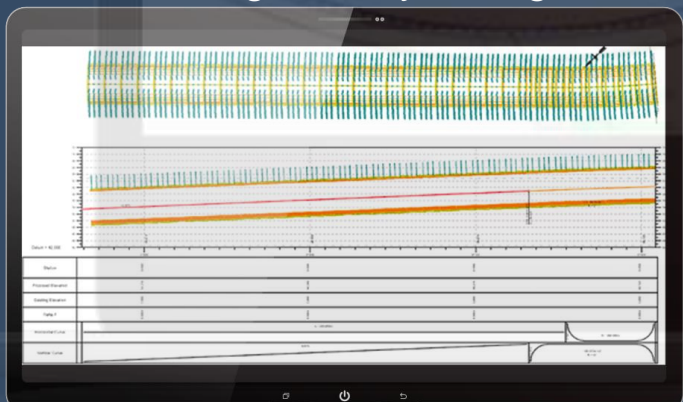
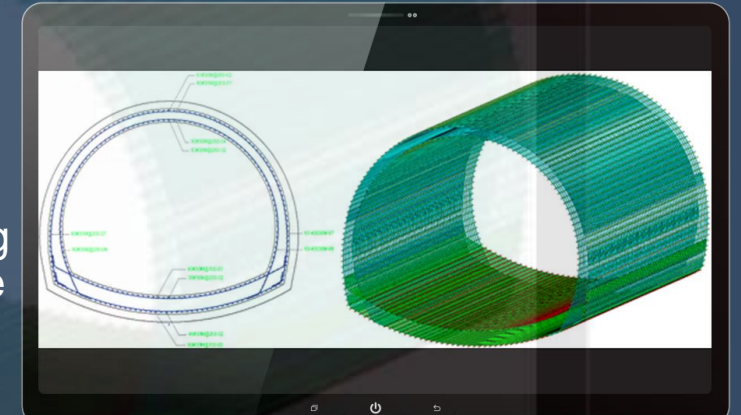
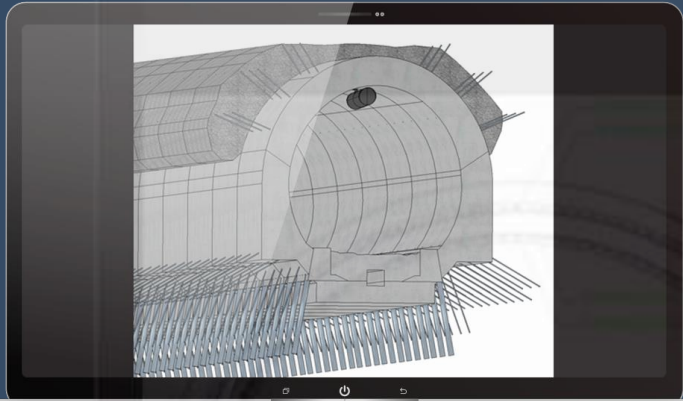
- Model interior objects that are to be extruded along the tunnel length or placed as cells along a specified path, such as sidewalks, ducts, cable trays and more. See them automatically reflected in your visualizations, plan production, and quantities reports, for simplified clash detection and reduced risk of costly onsite rework.

- **MODEL AND DETAIL REBAR REINFORCEMENT**

- Save time and rework as you model and detail the rebar reinforcement for the tunnel lining. Reference your OpenTunnel lining model in ProConcrete and see changes automatically reflected in the reinforcement data and deliverables based on the tunnel lining geometry changes.

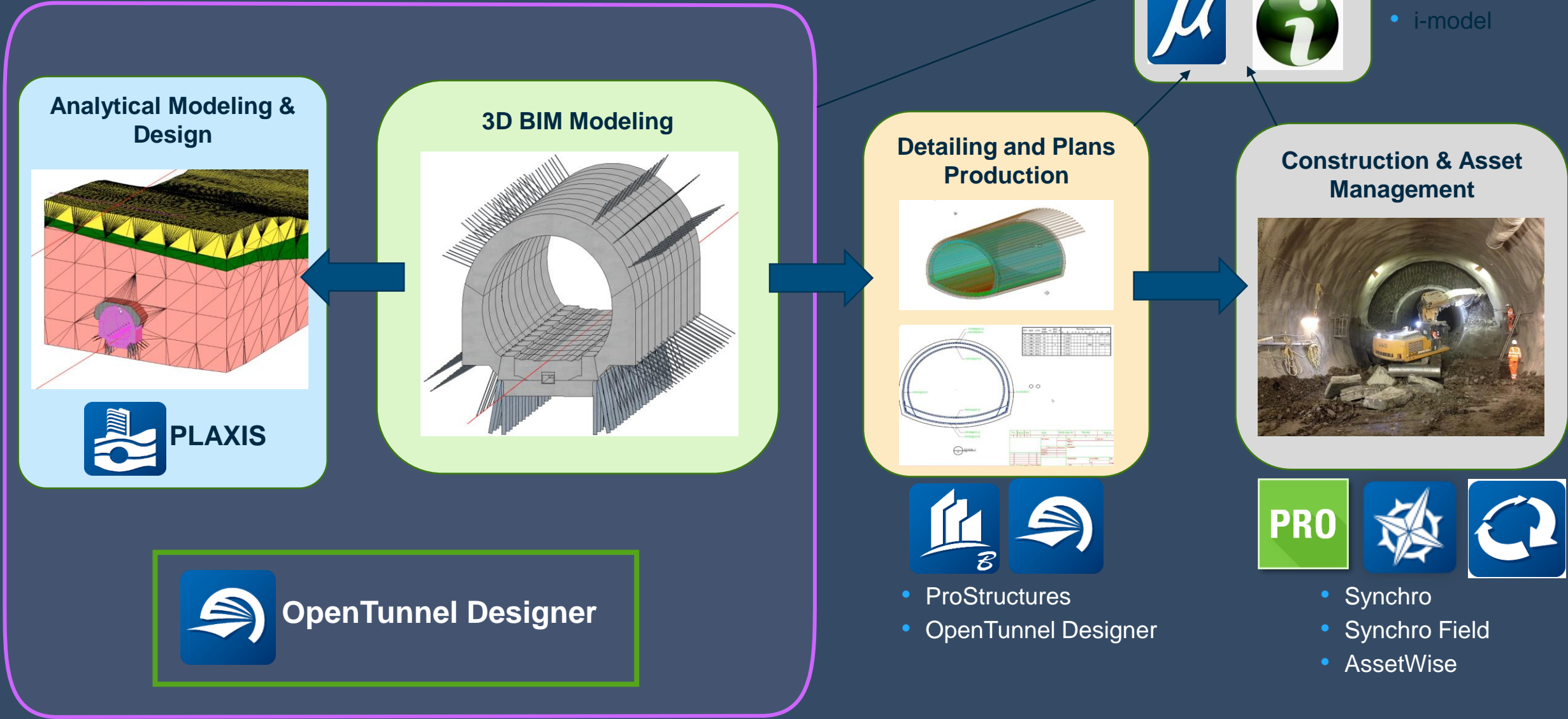
- **TUNNEL DRAWINGS AND REPORTS**

- Streamline your plan production process. Plan, profiles, and cross-section drawings can easily be created using OpenTunnel Designer's powerful drawing production tools. Keep your projects on track with tunnel specific reports based on the latest changes for up-to-date accurate costing and quantities.



# OpenTunnel Designer

## 3D Digital Delivery Solutions for Tunnels





**Bentley**



**OpenTunnel<sup>®</sup> Designer**

CONNECT Edition

# Key Benefits of Bentley's Tunnel Design Solution

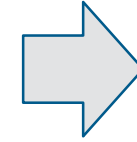
- Reduce modeling time up to 50%
- Reduce the drafting time up to 70%
- Automatically create the geotechnical models for PLAXIS 2D/3D. Time reduction up to 80%
- Easily identify and mitigate risk
- Easy collaboration between different disciplines (geology, road, bridge, geotechnical, drafters, etc.)



**What about IFC?**

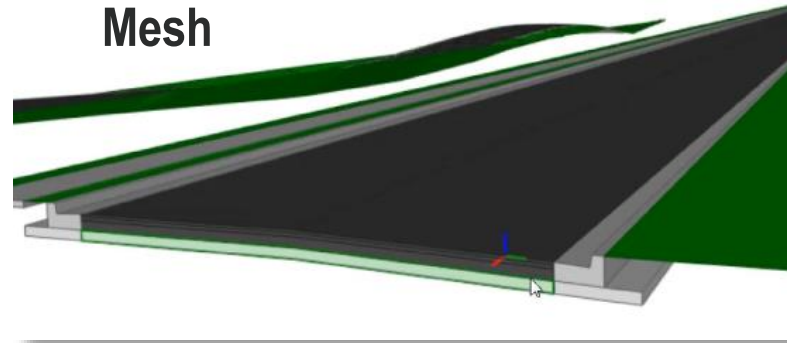


# Industry Foundation Classes (IFC)



## Geometry

Alignments  
Surfaces  
Mesh



## Attributes/Properties

Pavement Course PV-3,  
340-6120, D-GR HMA(SQ)  
TY-D SAC-B PG70-22,  
Asphalt, HMAC TY D,  
Compacted Lift Thickness  
Min 1.50" max 3.00'

## Semantics

Sub-Base Pavement

## Relationships

Pavement Sub Course  
Layer 3, Road PV,  
Station Range 10+32.23  
to 40+20.50 **Bentley**

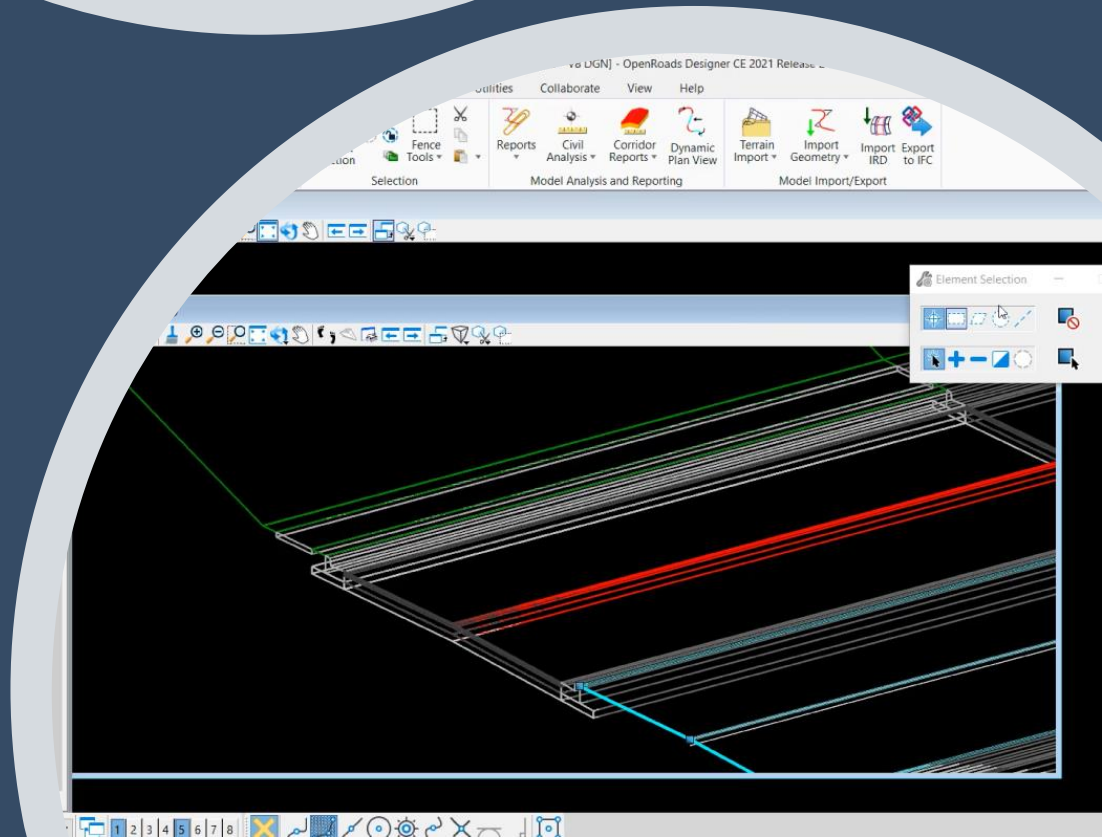
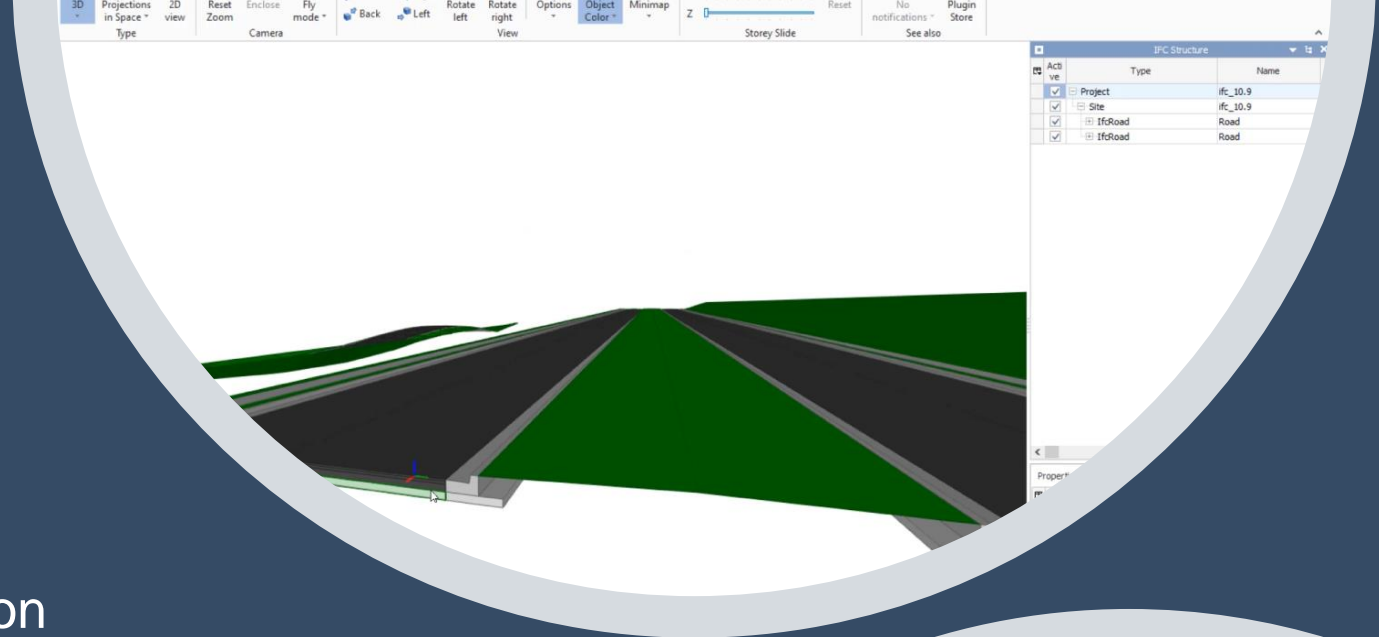
# Bentley IFC/ buildingSMART International involvement

- Bentley is an **international member** of buildingSMART since 2019
- Bentley will be **speaking at the buildingSMART International standards summit** in October 2022 in Montreal, Canada
- We now have **certified IFC professionals** in the product management and software development team
- Civil team is part of
  - An active member of the IFC 4.3 Implementers Forum which includes IFC changes for infrastructure
  - TRB committee - AED80(1) Sub-group on Digital Delivery and Open Standards
  - AASHTO committee - Joint Technical Committee on Electronic Engineering standards
  - And more...



# Bentley IFC implementation

- OpenRoads
  - Build the model
  - Define advanced classification
  - Import/Export
  - Adhoc solution
- iTwin
  - Import/Export
  - Industrialized solution
- Future -> continue to expand both iTwin and ORD





# Experience | Join the digital transformation for Heavy Civil Construction







**Bentley**<sup>®</sup>  
*Advancing* Infrastructure

**Thank You!**