



Civil Update - Whats new in the latest product release

Presented by:

Ian Rosam, Director Civil Product Management, Bentley Systems, Inc.



Learning Objectives

- Cover the main product release highlights for civil product lines
 - OpenRoads Conceptstation (update 6)
 - OpenRoads Designer CE (update 2)
 - OpenRail Conceptstation (update 1)
 - OpenRail Designer CE (EAP)
 - Companion products
 - gINT Civil Tools CE (Update 1)
 - Descartes CE (Update 2)
 - LumenRT Designer
 - Product Roadmaps

OpenRoads ConceptStation What's New (Update 6)

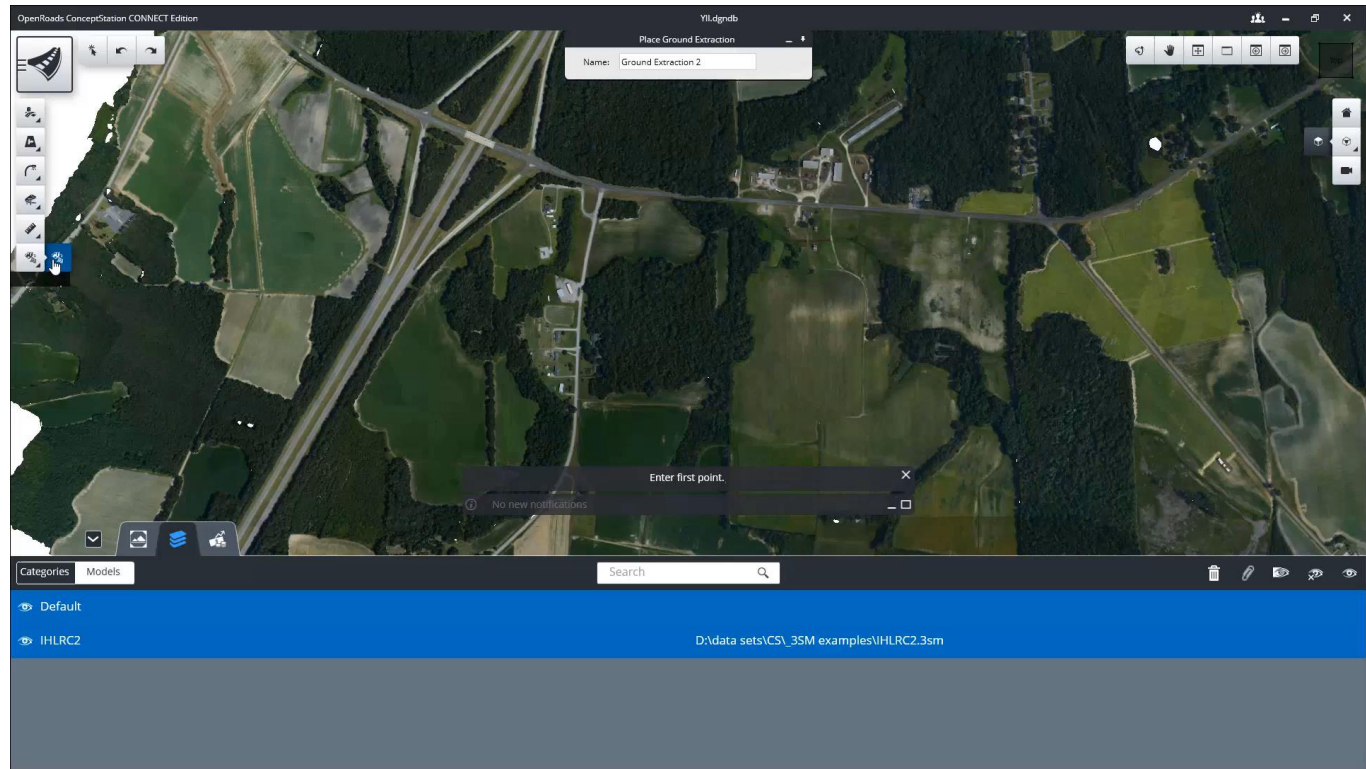
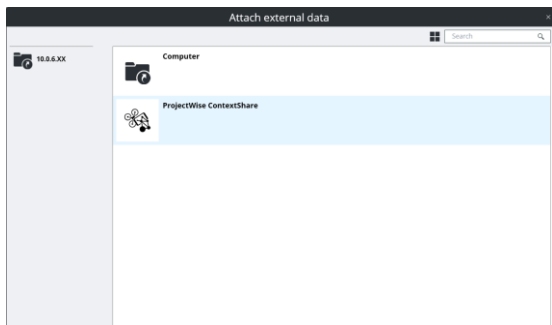
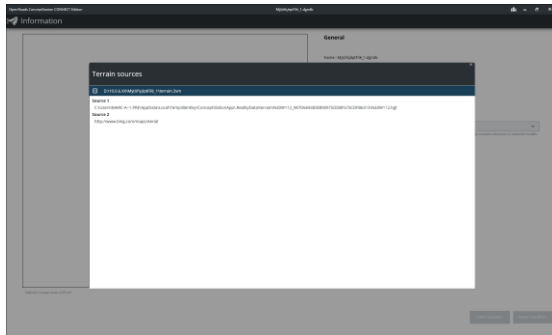


Key Benefits and features of Update 6

- Improved reality model and geocoordination capability
 - Streaming Scalable Mesh (ContextShare integration)
 - Streaming imagery from Bing
 - Scalable mesh provenance feedback (where data originated)
- More efficient conceptual design in less clicks
- General Improvement Areas
 - File management
 - Import/Export Enhancements
 - Template Enhancements
 - Intersection Enhancements
 - Grading Enhancements
 - Ramp Enhancements
 - Bridge Enhancements
 - Tunnel Enhancements

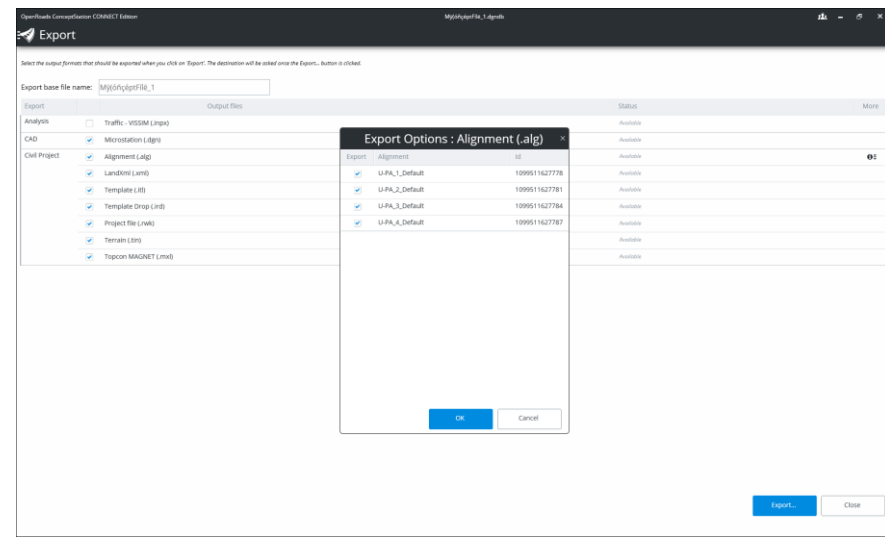
Scalable Mesh

- Scalable mesh provenance feedback (where data originated)
- When attaching 3SM, users can now select from new option
 - Requires user to be logged into CONNECTED project



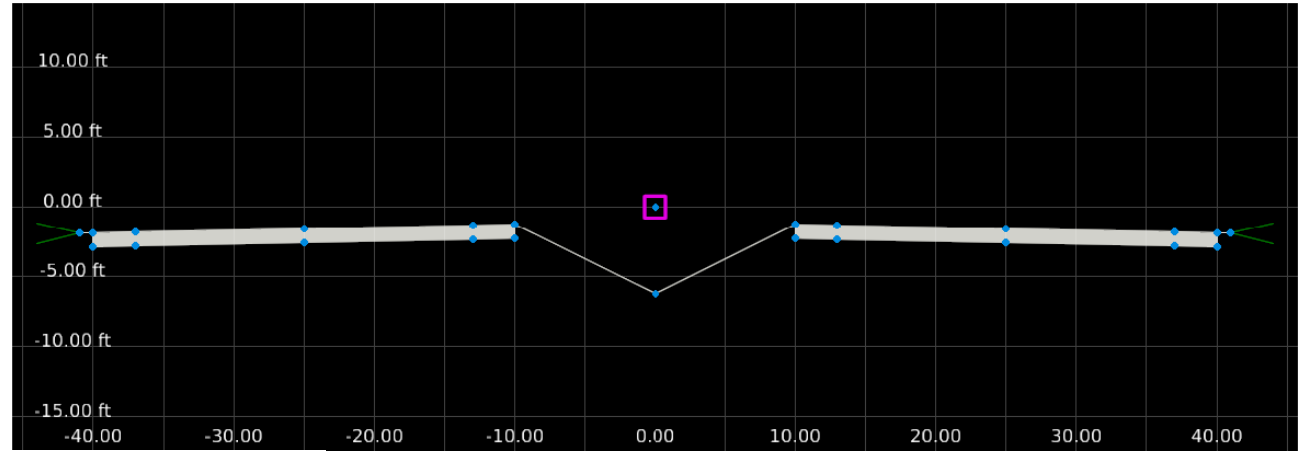
Import/Export Enhancements

- Reprojection during import (TIN, DTM, ALG)
 - If coordinate system of import is known to be different than project's, user can specify/identify so that imported data lands in project area
- Choose specific alignments to import/export
- Alignment overwrite on import
 - Enables users to work in “working files” then bring alignments into master project file



Template Enhancements

- Divided Highway support



🗑️ 🔍 🔍 🔍 🔍 Striping: No striping pattern 1 :1 ↕+ ↕- + 👤 🔍 🔍 🔄 Editor 3D View

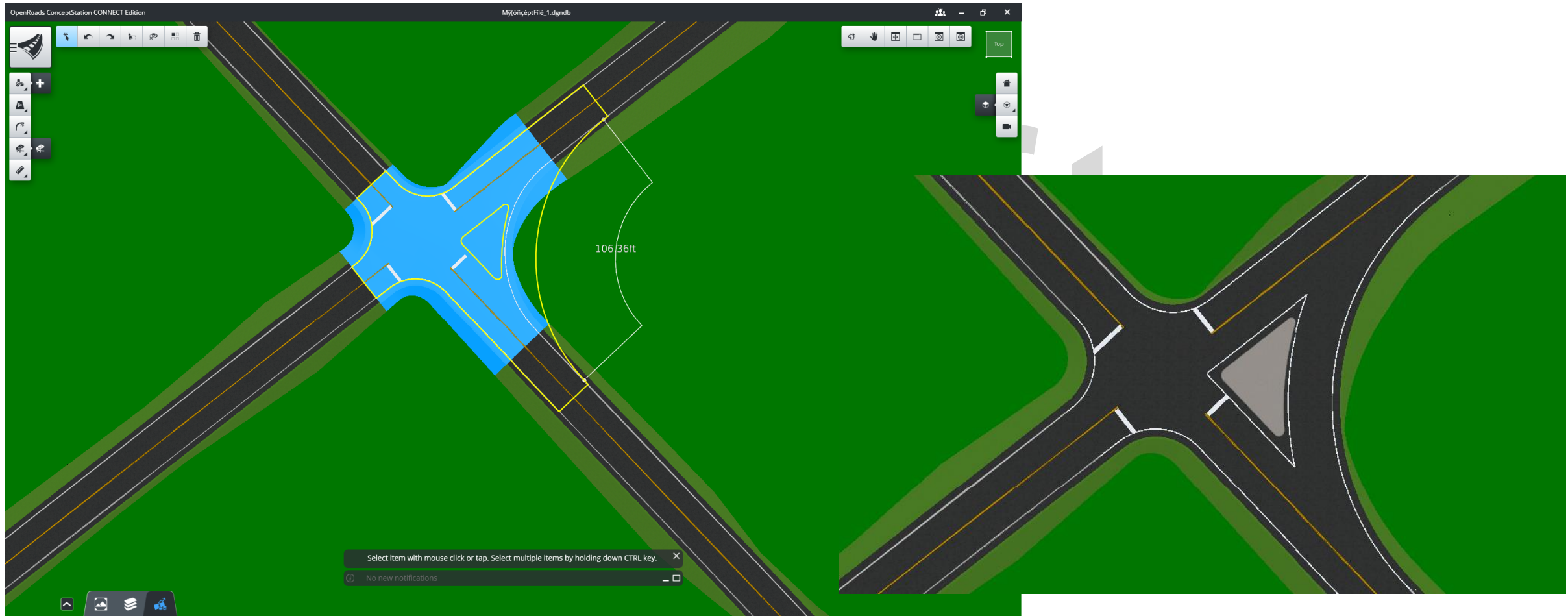
A 3D view of an MSE wall structure. The vertical axis represents elevation in feet, ranging from -6.00 ft to 1.00 ft. The horizontal axis represents distance in feet, ranging from -11.00 to 13.00. The wall is shown as a grey structure with blue dots at key points. A pink square marker is placed at the top of the wall, which is at an elevation of 0.00 ft and a distance of 0.00 ft.

Walls					
Label	Height (H1) (in)	Height (H2) (in)	Height (H3) (in)	Height (H4) (in)	Material
MSE Wall (Fill) 2.0	-24.00	-12.00	-17.72	-11.81	Concrete

- New MSE Fill Wall

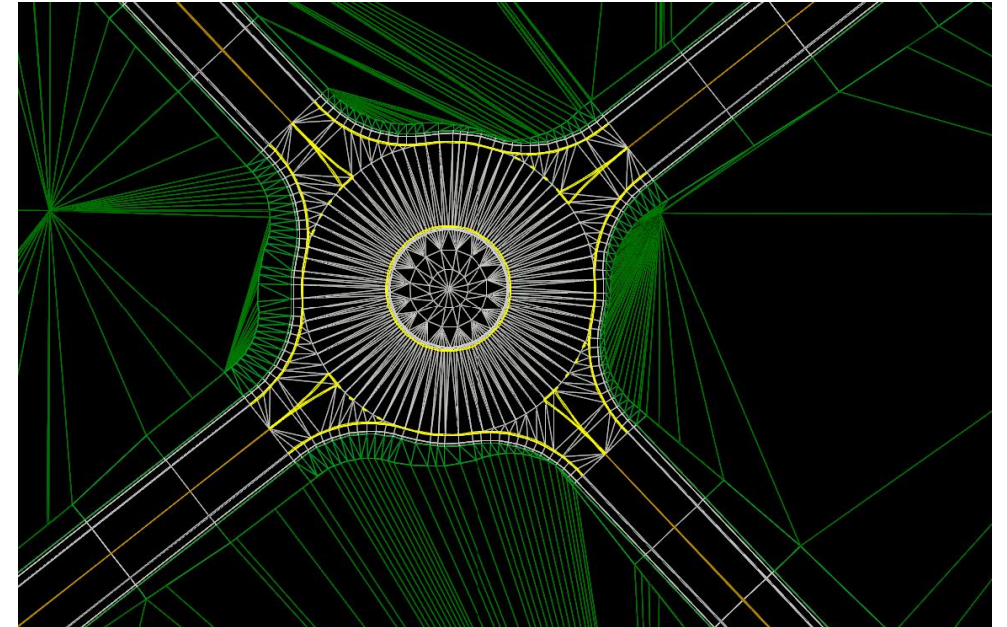
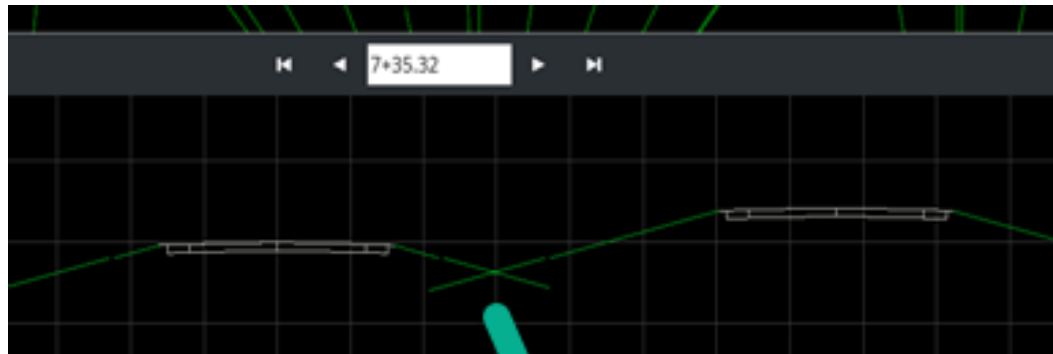
Intersection Enhancements

- Support for raised islands



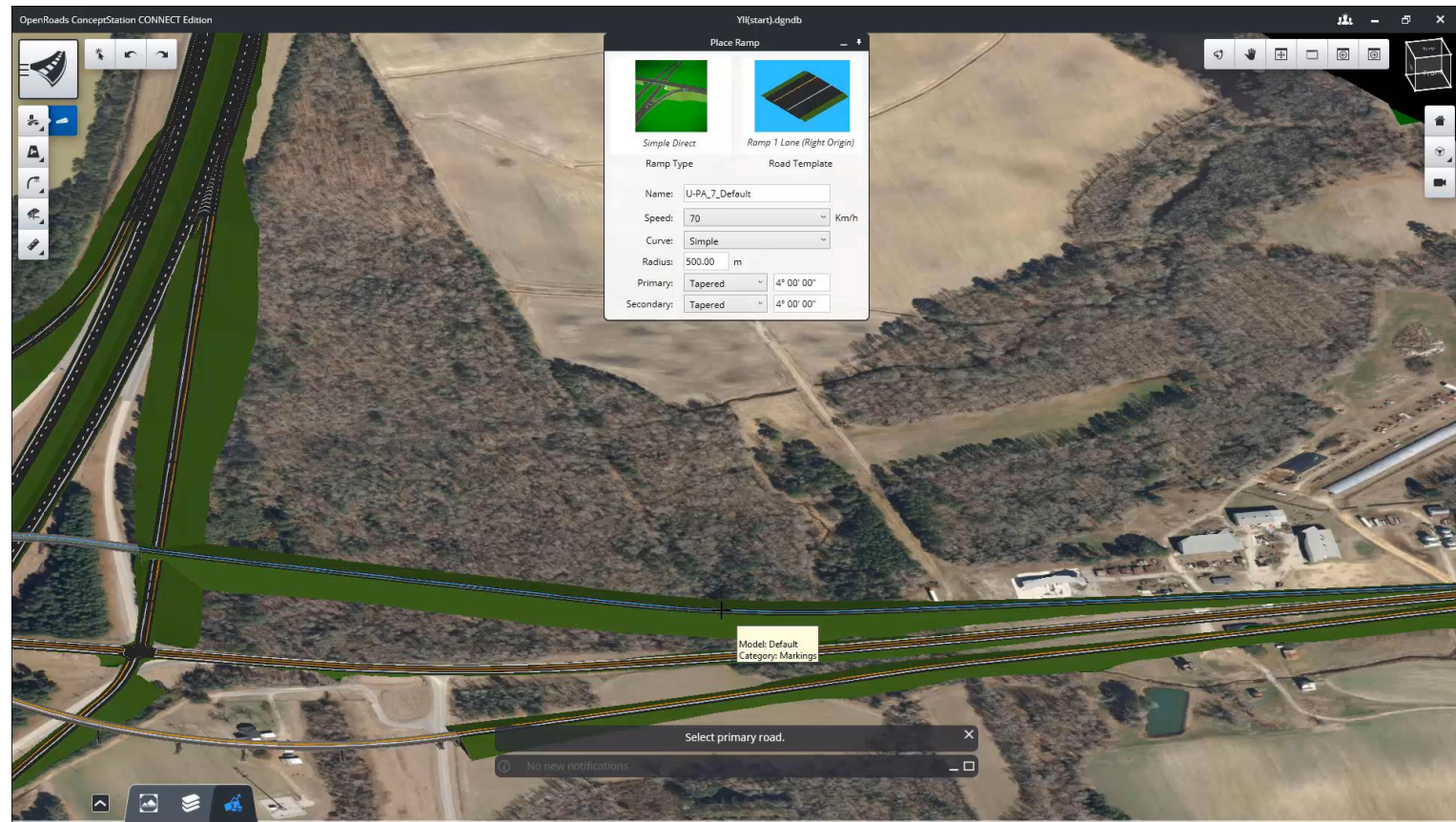
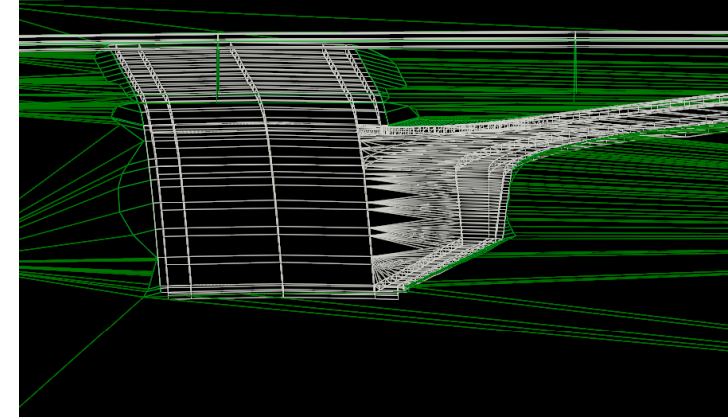
Intersection Enhancements

- Improved Grading
- Overlapping side slope resolution



Ramp Enhancements

- Vertical grade at gore matching primary road
- Complete vertical design with reverse parabolic curves



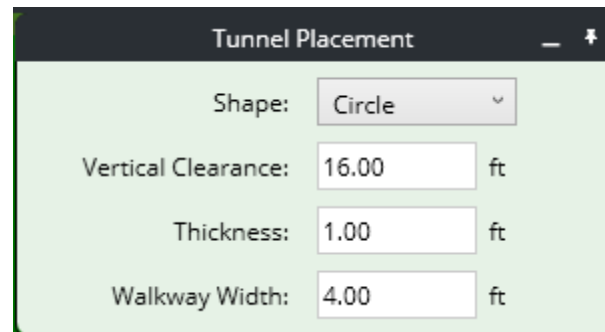
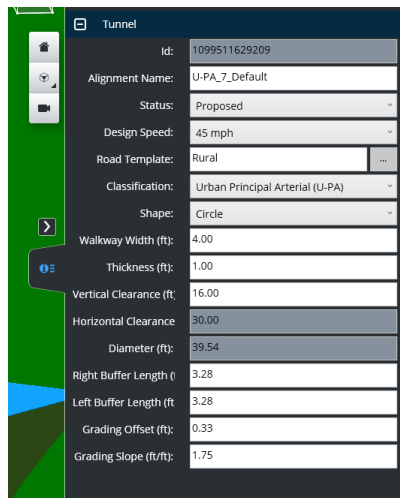
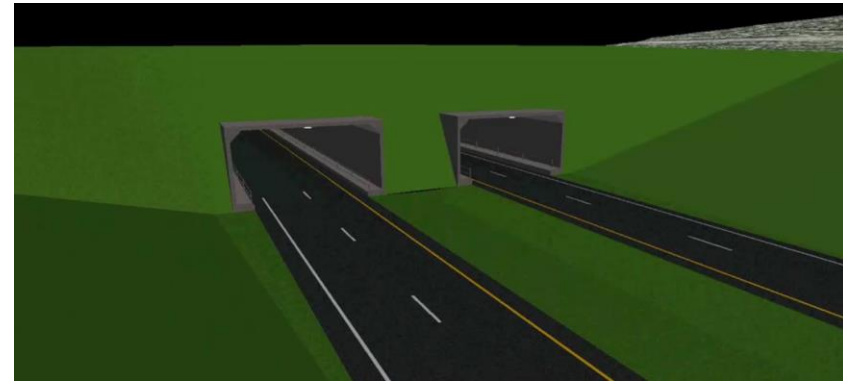
Bridge Enhancements

- Support for Divided Highways
- Build bridge template (just like new divided highway template) for twin bridges



Tunnel Enhancements

- Twin tunnels matching new divided highway template (no need for special templates)
- Additional shapes support (box, horseshoe, curvilinear (3 radii))

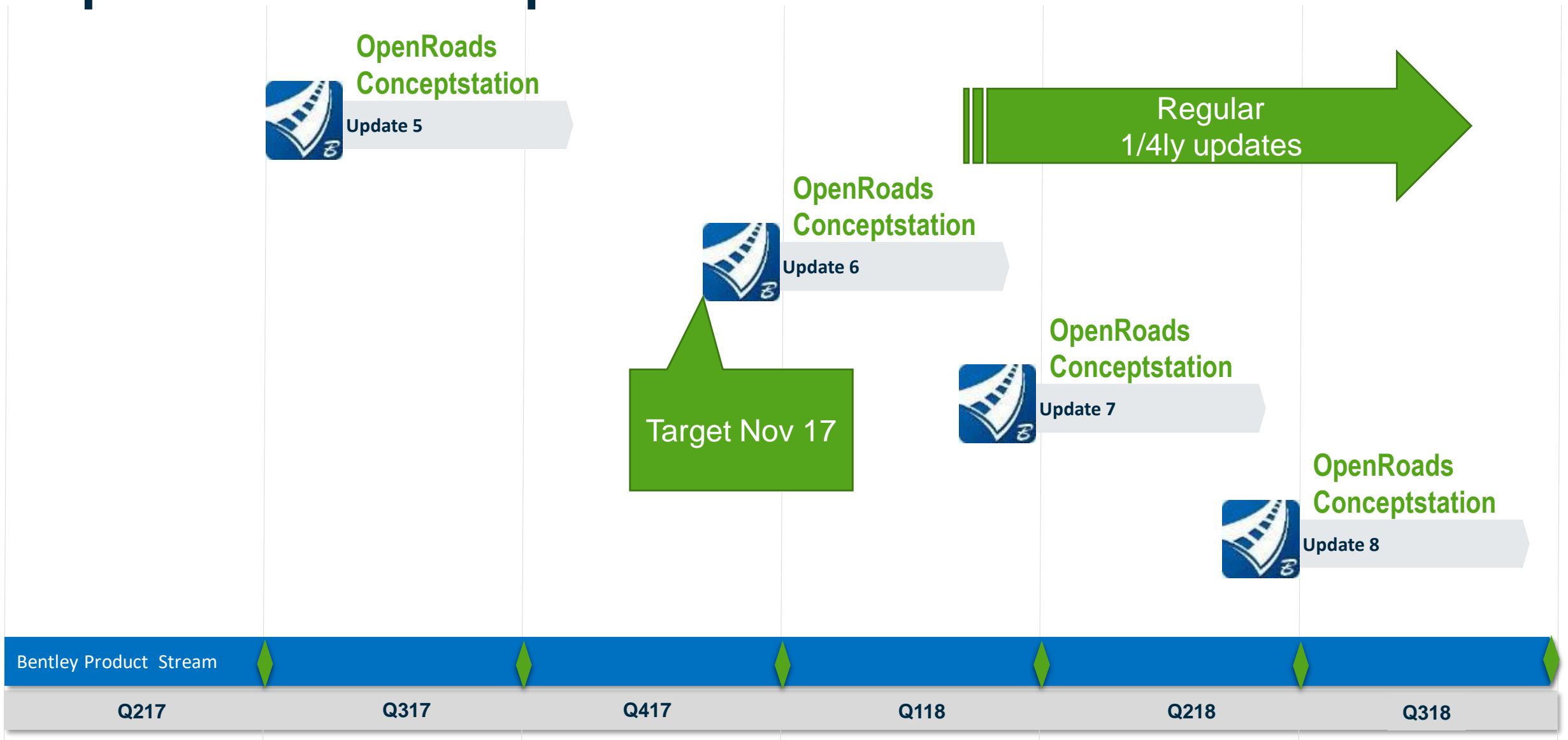


- Additional parameters to help size the tunnel

OpenRoads ConceptStation Roadmap



OpenRoads Conceptstation CONNECT Edition



OpenRoads Designer What's New (Update 2)

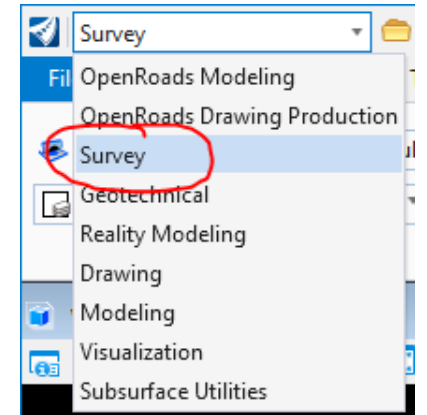
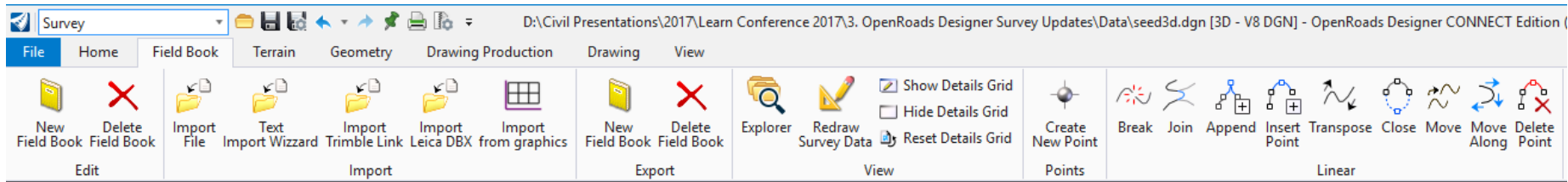


Key Benefits and features of Update 2

- Topographic Survey
- Enhanced Geometry workflows
- Extended drawing production capability
- New Analysis tools
- Technical Previews
- Workspace enhancements for more 3d model detailing
- Companion product updates
 - Descartes
 - gINT Civil Tools
- Regional support
 - Language packs
 - Regional standards and datasets shipping against Update 2

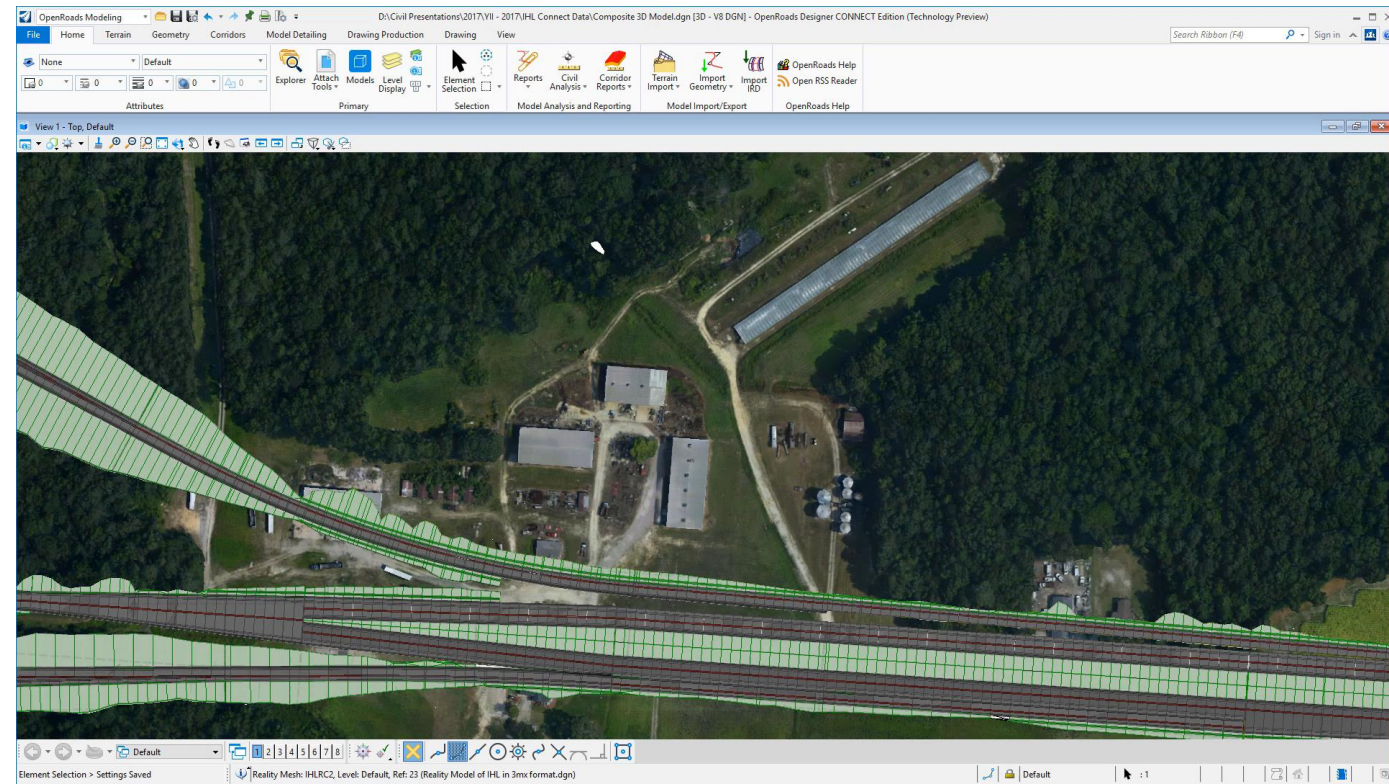
Openroads Designer Survey

- ***New Survey Workflow***



- ***Familiar tools***

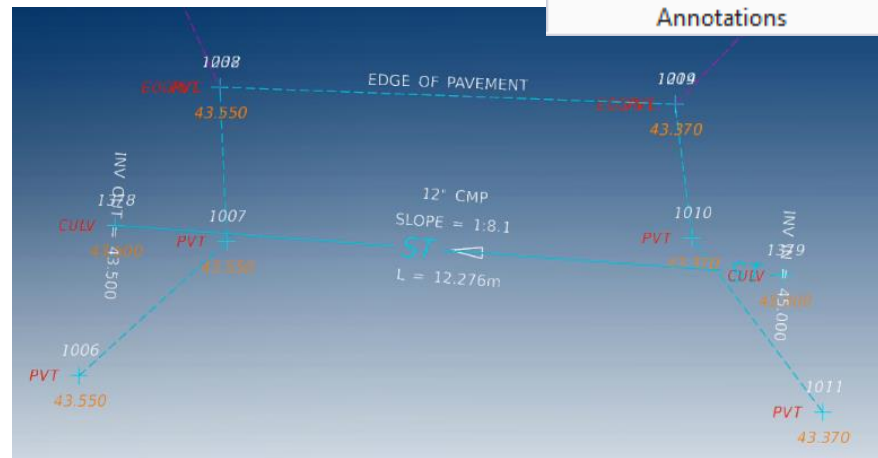
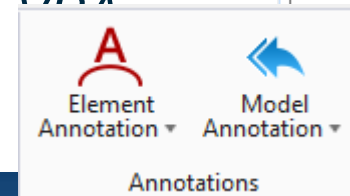
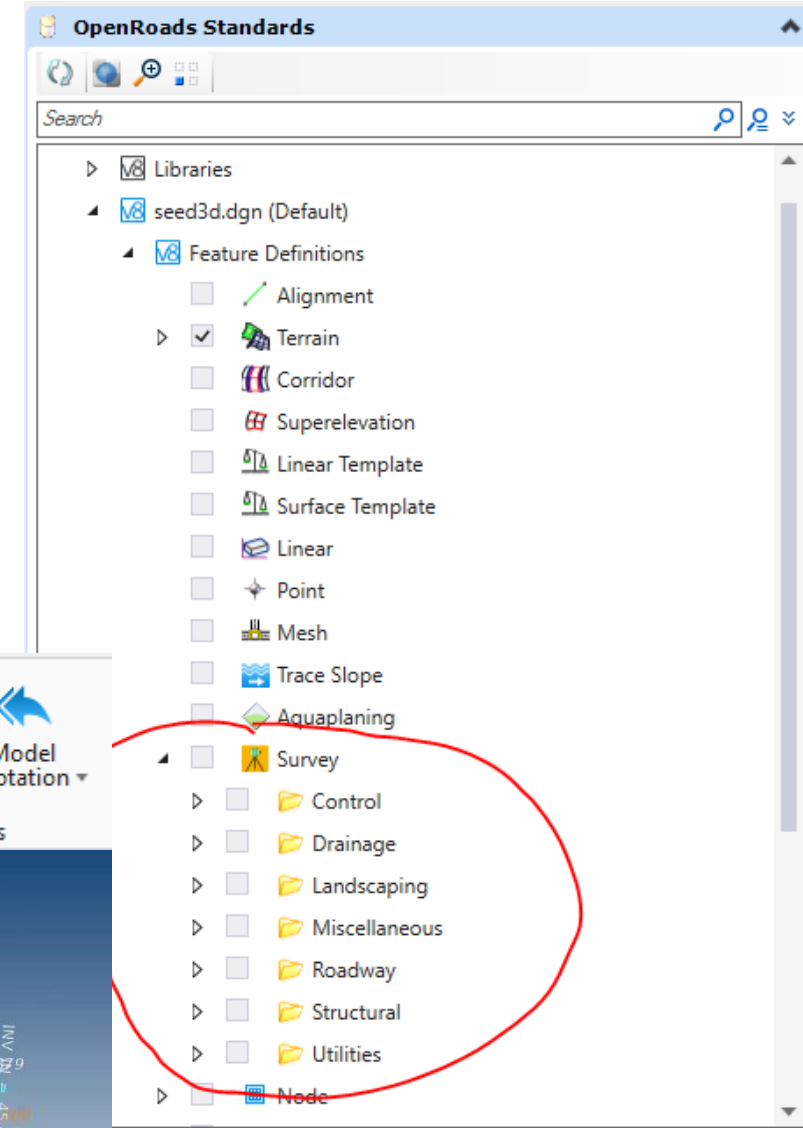
- *resides in Project Explorer*
- *Right-click options*
- *Drag-n-Drop*



Openroads Designer Survey

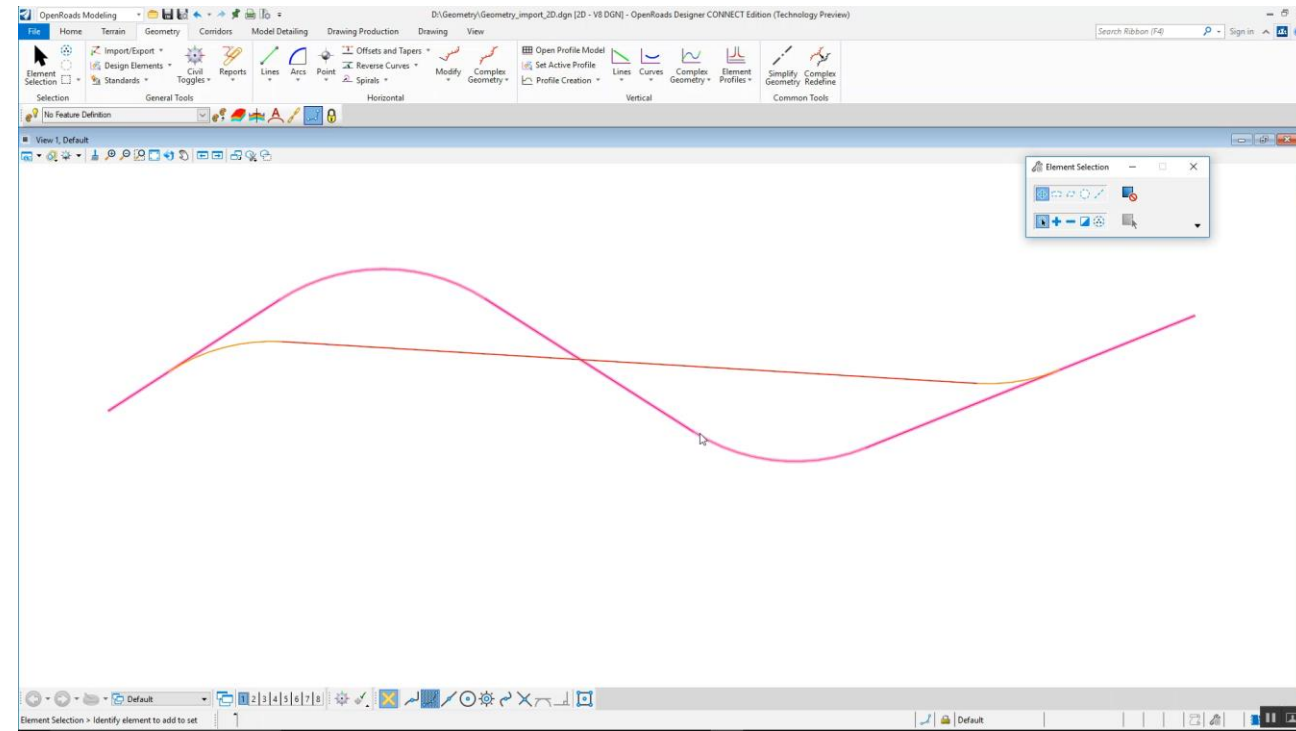
Expands and Improves Openroads capability

- *Extends Feature definitions*
 - *DTM stroking controls for survey as override to general*
- *Customizable structure*
- *Uses Openroads Annotation*
 - *Annotate linear or attributes no longer requires VDA*



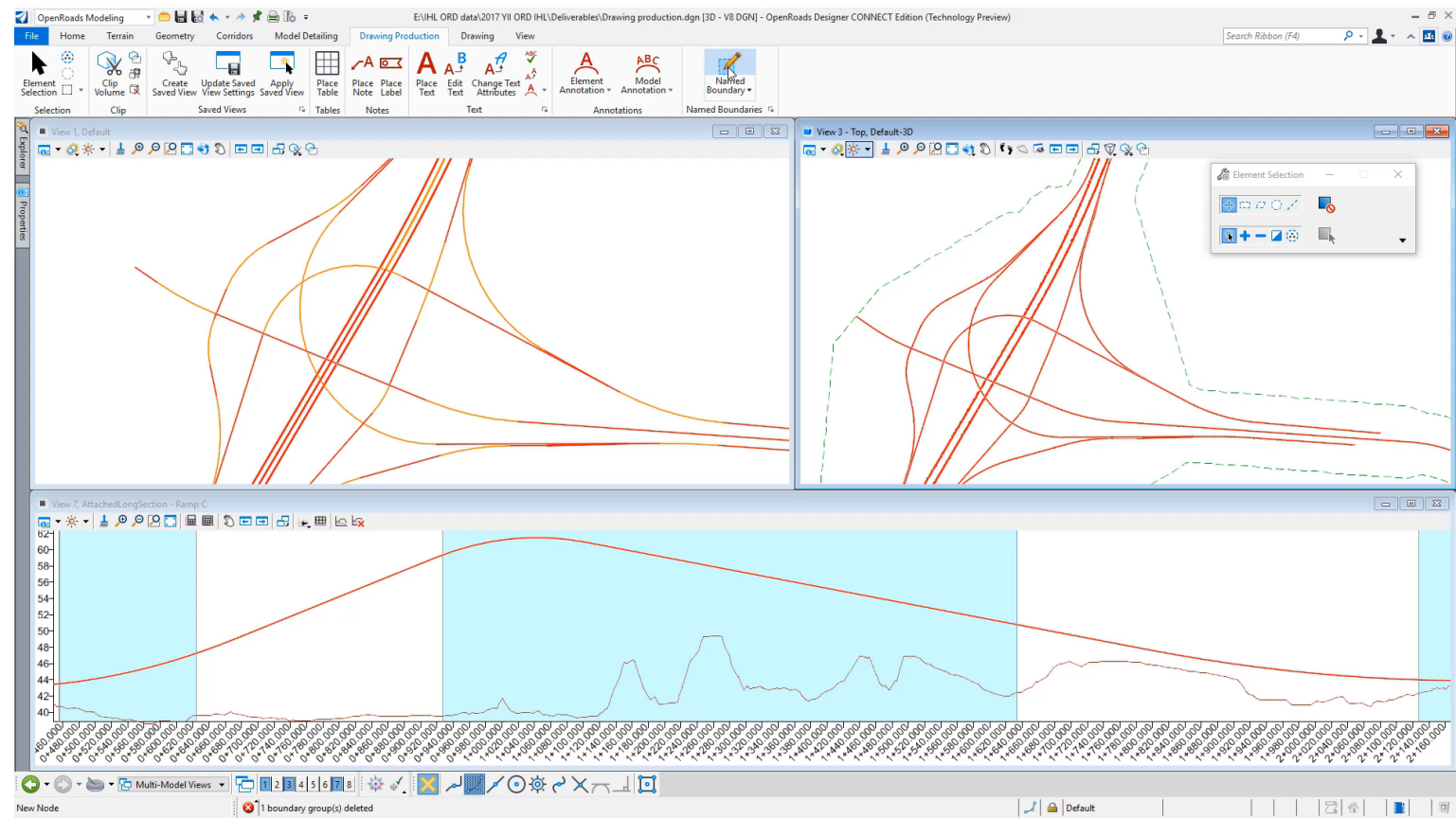
Openroads Designer – Enhanced Geometric Workflows

- IFC Alignment 1.1 support
- Simplify geometry for Horizontal and Vertical
- Redefine complex for Horizontal and Vertical
- Remove snap rule for Horizontal and Vertical



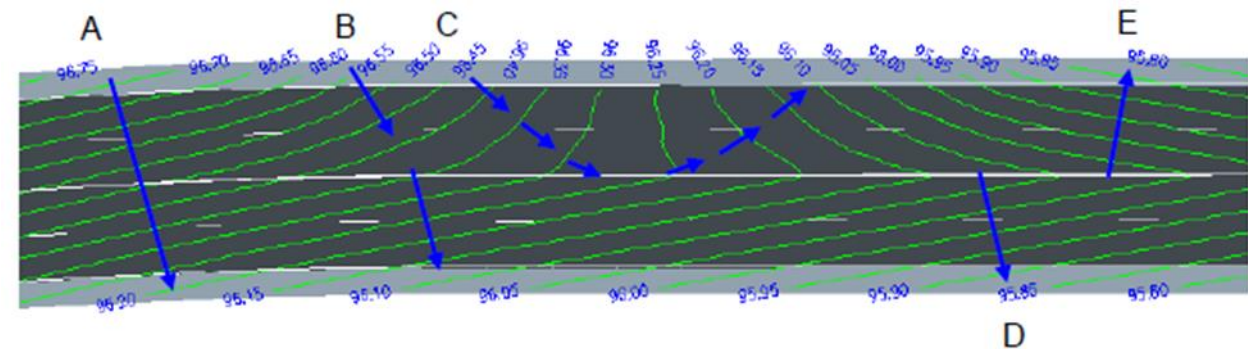
Openroads Designer – Extended drawing production capability

- Tabular annotation for profiles and sections
- Plan and profile subsurface Utilities annotation
- Additional annotation



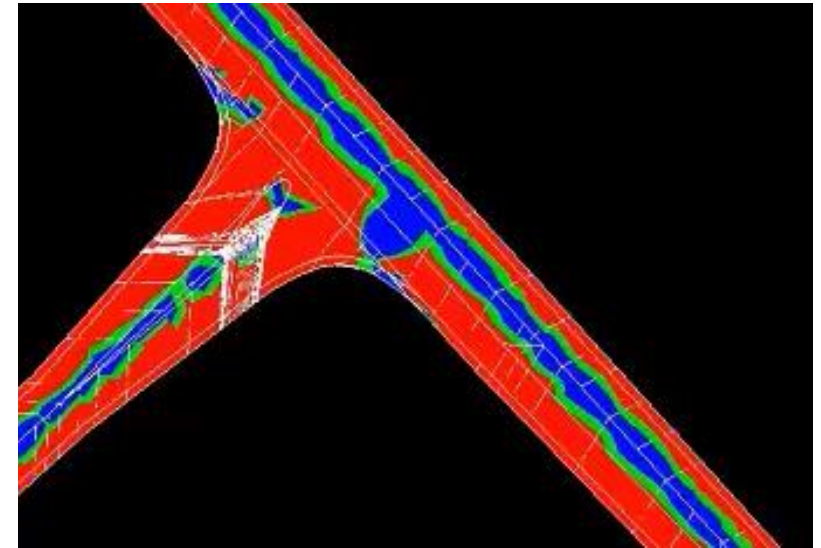
Openroads Designer – New Aquaplaning Analysis tools

- Aquaplaning occurs when tyres don't grip the road surface. One cause of this is because of water on the surface, so the road design must keep the water film depth to a minimum.
- Problem areas include superelevation, entry and exit ramps (which increase road width) and approaches to junctions (braking).



Openroads Designer – New Analysis tools

- Analyses a terrain model
- Calculates water film depths
- Use Gallaway or Road Research Lab formulae
- Produce a film depth thematic
- Report selected flow paths



Aquaplaning Report

Report Created: 06 September 2017
Time: 15:42:46

Note: All units in this report are in meters unless specified otherwise.

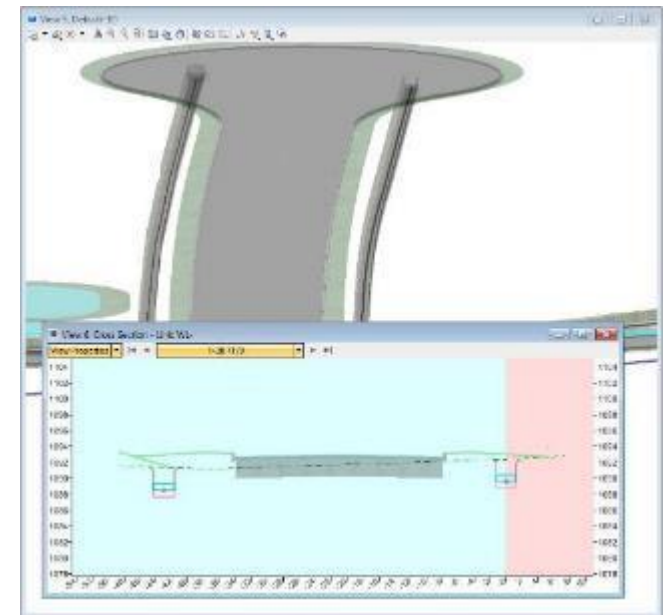
Flowline Rainfall Intensity: 200.000000000
Texture Depth: 0.000500000
Formula: %Go Gallaway
Using Equal Area Slope?: True
Surface Name: EB

----- Flowline Points -----

Gallaway Film Depth	Road Research Lab Film Depth	Film Depth Difference	Slope	Distance Along	X	Y	Z (original surface)
0.000000000	0.000000000	0.000000000	0.000000000	0.000	37948.953902682	11353.719989699	317.848063831
0.005738956	0.001975452	-0.003763504	0.671318298	7.862	37954.860937224	11348.531029280	317.795281660
0.007541775	0.002577599	-0.004964176	0.606884429	12.857	37958.445149085	11345.053211556	317.730298479

Openroads Designer – Subsurface Utilities

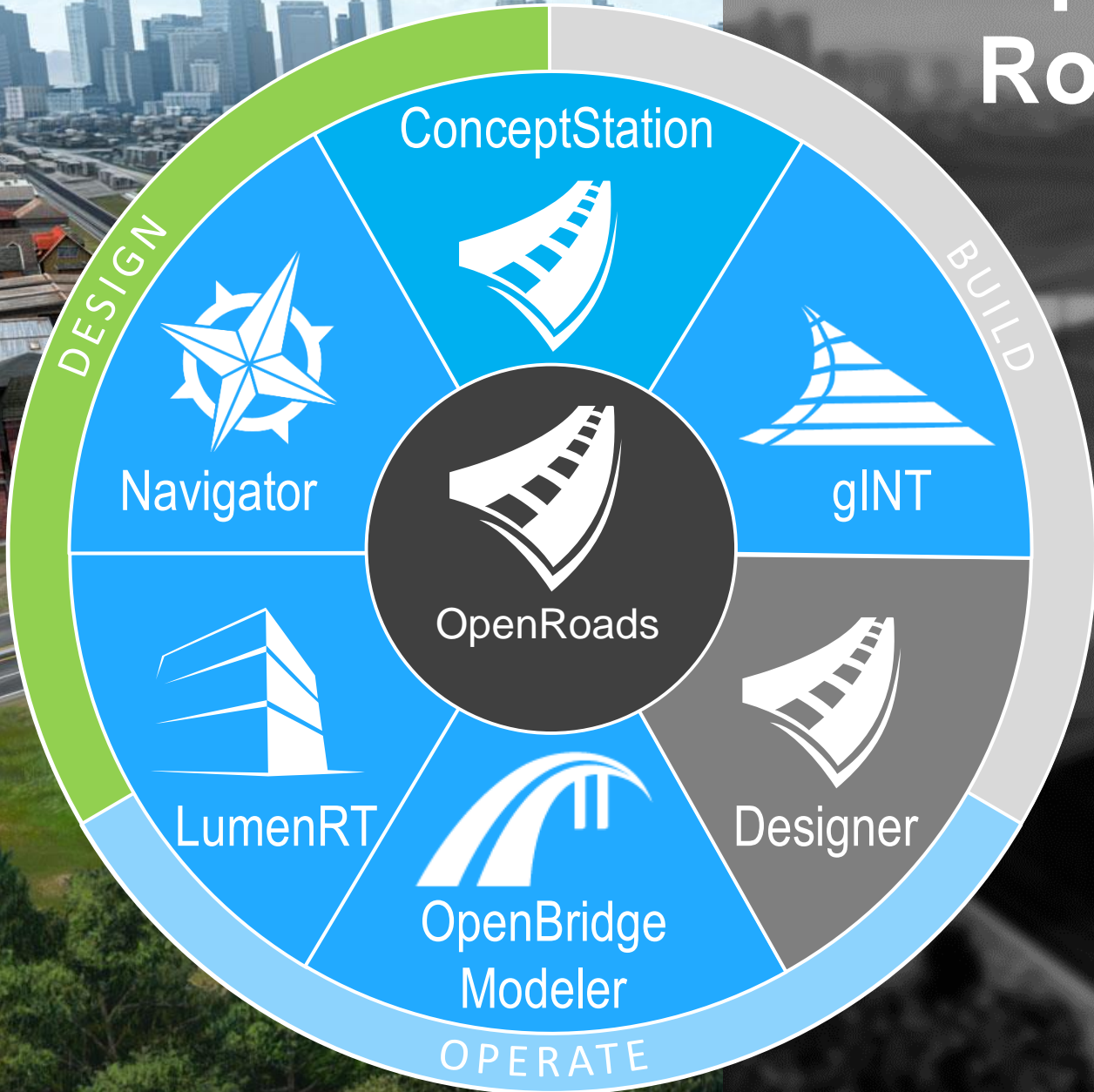
- **What's new in Update 2?**
 - Storm Scenario Wizard
 - Critical Scenario Analysis
 - One-dimensional overland flow paths from flooded nodes
 - Dynamic Profile showing crossing utilities and slices any other 3D data
 - Design calculations now match the Wallingford Procedure (UK)
 - Support for the WinDes “MDX” file format (UK)



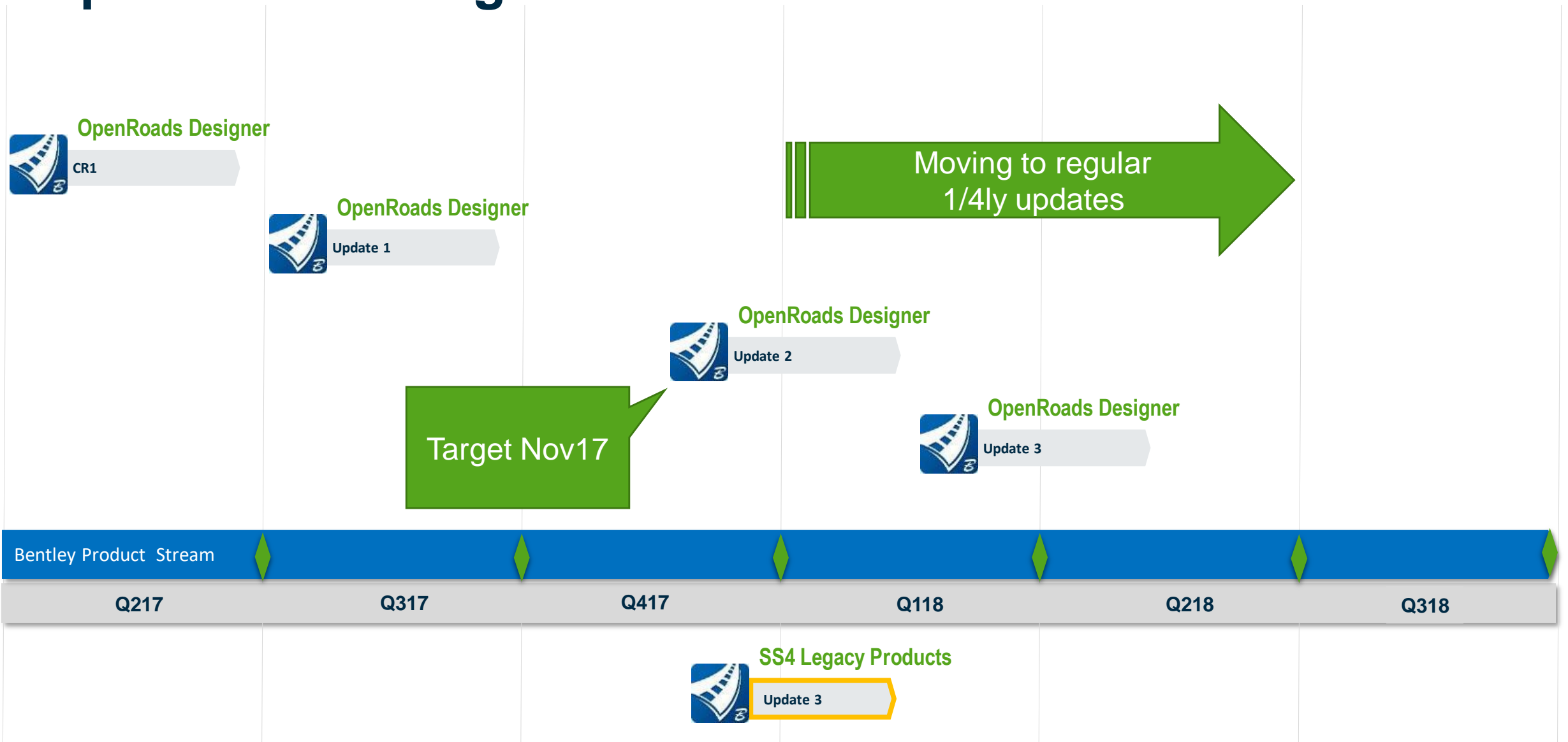
Openroads Designer – Regional Languages and Standards

- Multiple Language packs available
 - English / French / German / Chinese / Polish / Spanish
 - More to come...
- Regional standards and datasets shipping against Update 2
 - UK / Australian / Hong Kong / Chinese / India / French / German / Polish / Spanish / Danish / Swedish / Dutch / Japanese / South African
 - More to come...

OpenRoads Designer Roadmap



OpenRoads Designer CONNECT Edition





OpenRail

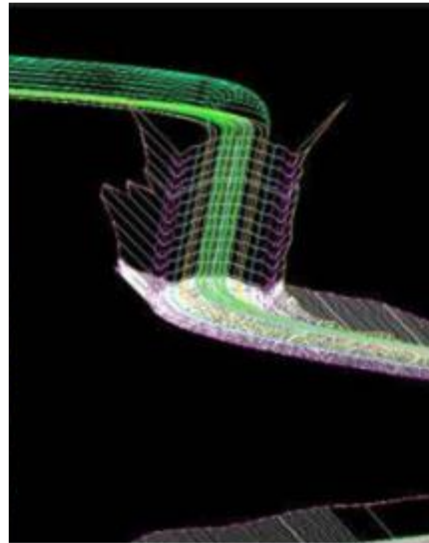
Planning

Conceptual Design

Detailed Design

Construction

Operate & Maintain



ProjectWise

AssetWise "OpTram"

Bentley Rail Track

PowerRail Overhead Line

Solutionware

gINT

Promise.e

ProStructurers

Current Solutions

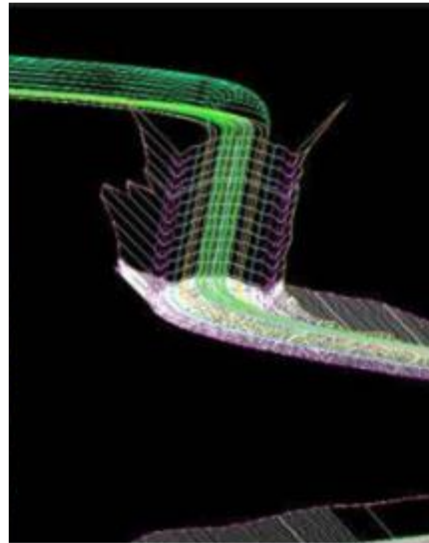
Planning

Conceptual Design

Detailed Design

Construction

Operate & Maintain



ProjectWise

AssetWise "OpTram"

OpenRail ConceptStation

OpenRail Designer

gINT

Promise.e

OpenBridge Modeler

ProStructurers

Futures

OpenRail Design Products

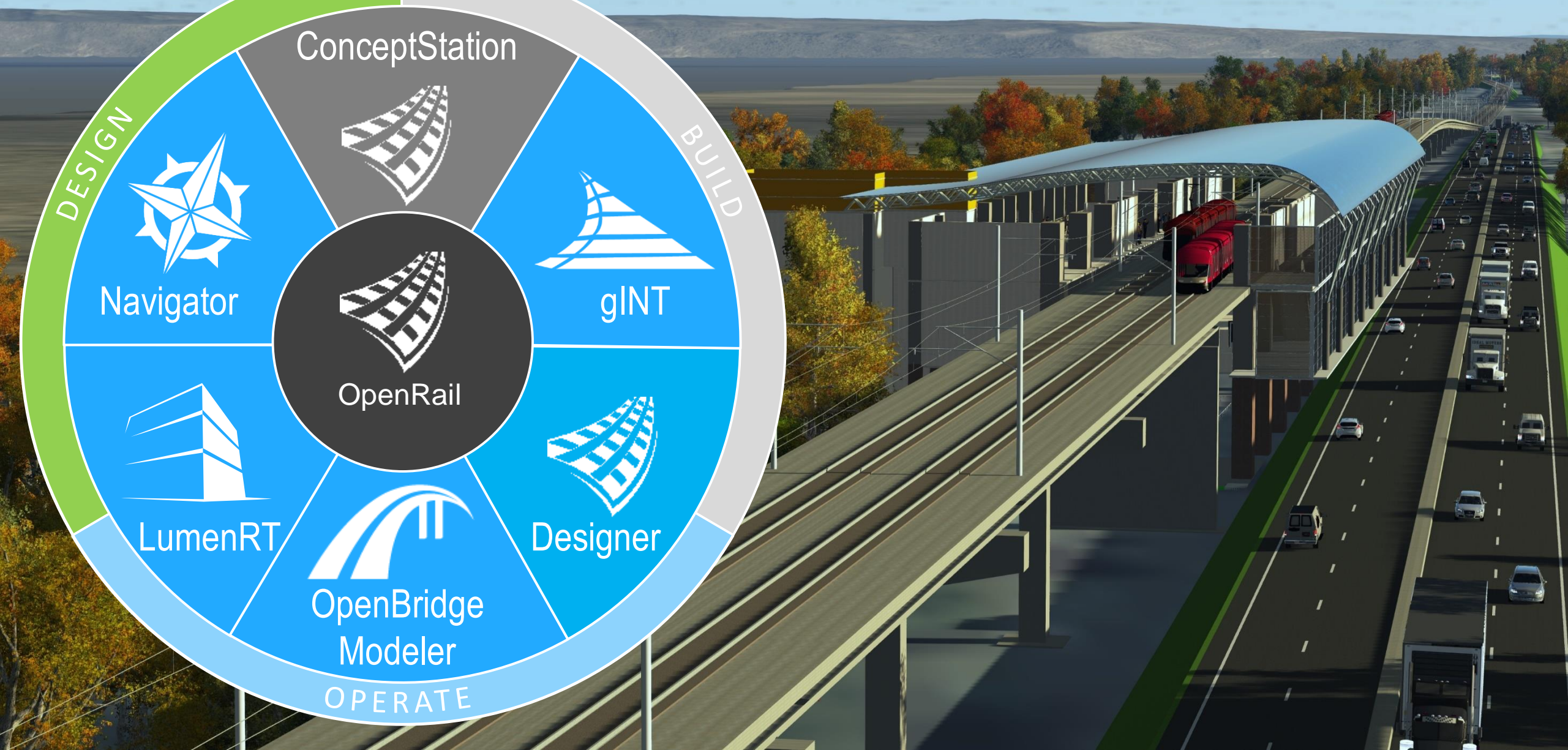
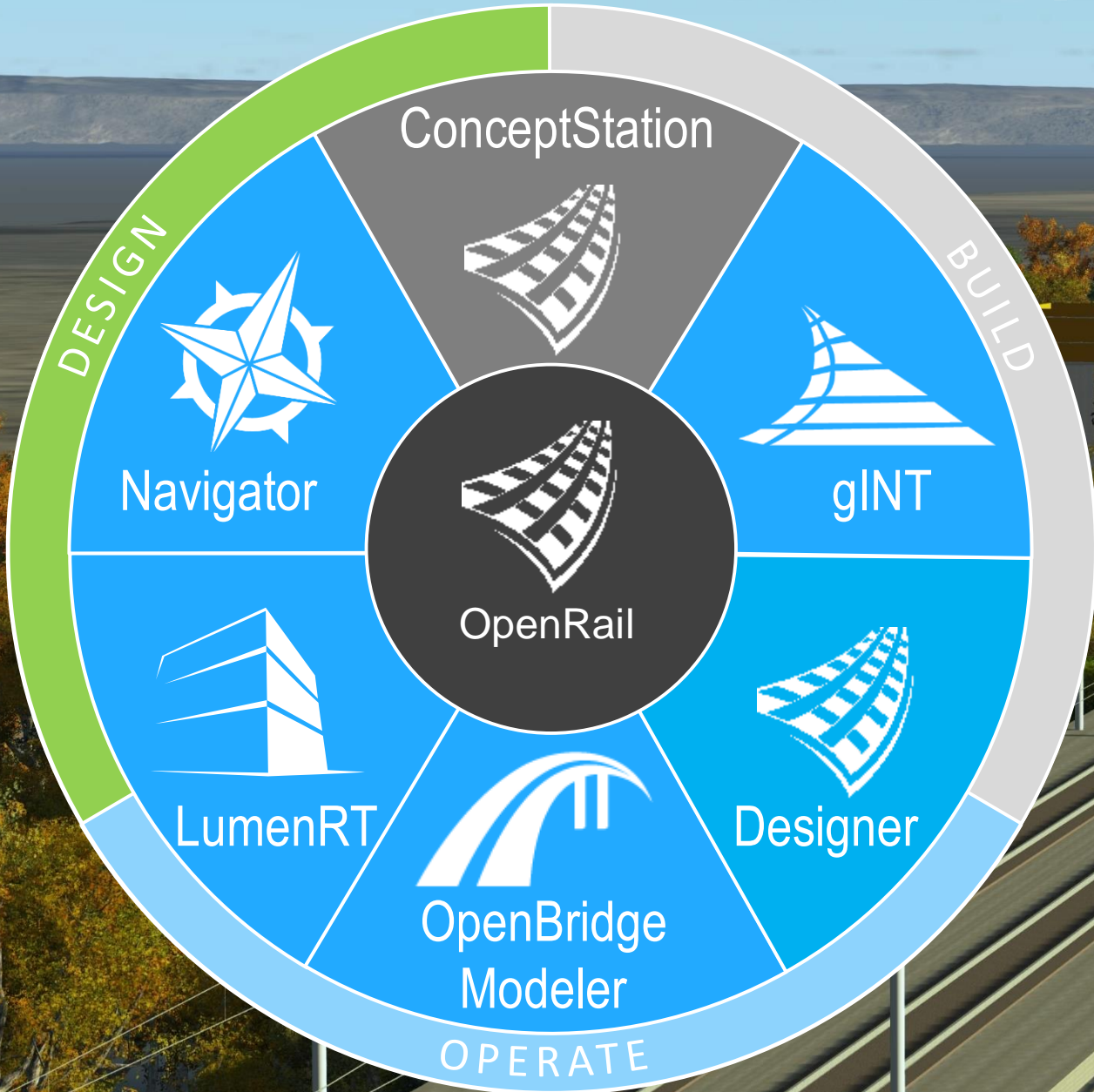


OpenRail ConceptStation
CONNECT Edition



OpenRail Designer
CONNECT Edition

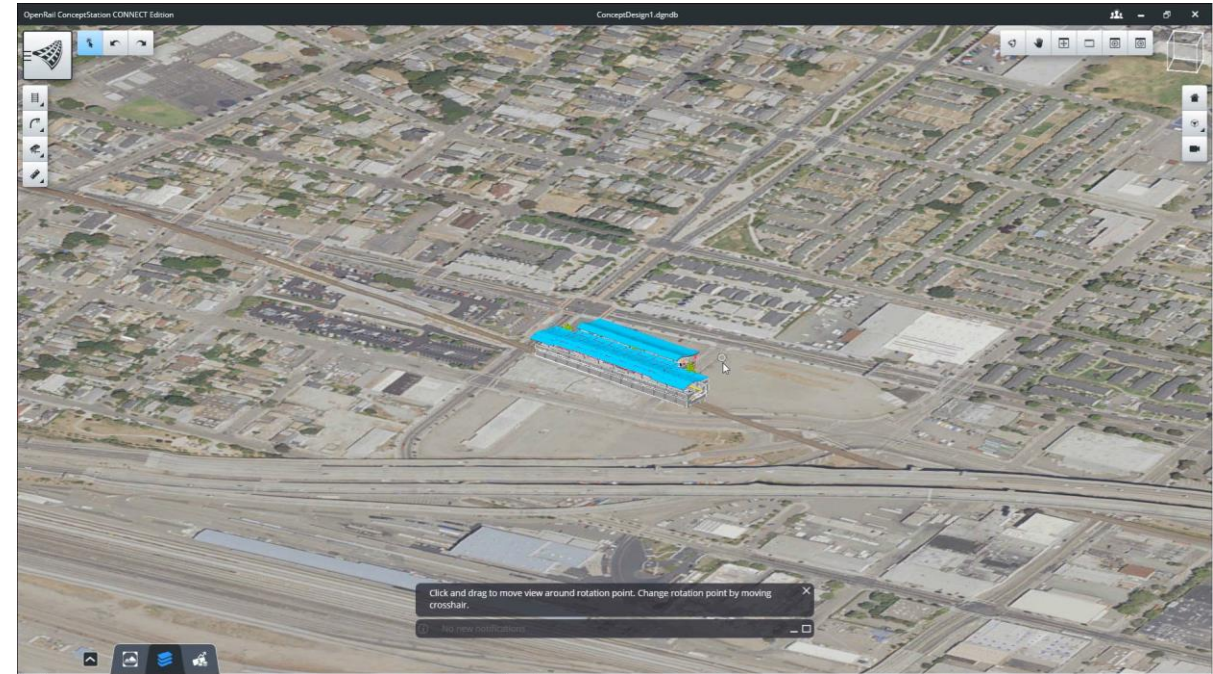
OpenRail ConceptStation



OpenRail ConceptStation



- Builds on Openroads Conceptstation
- Adds
 - Track geometry
 - Rail Standards
 - Yard/Siding locations
 - Turnouts
 - Rail template catalog
 - Tunnels
 - Bridges
 - Signals
 - Concept design of Electrification & Overheadline (OLE) Systems
 - OLE Standards, OLE Structures
 - Schematic reports and quantities



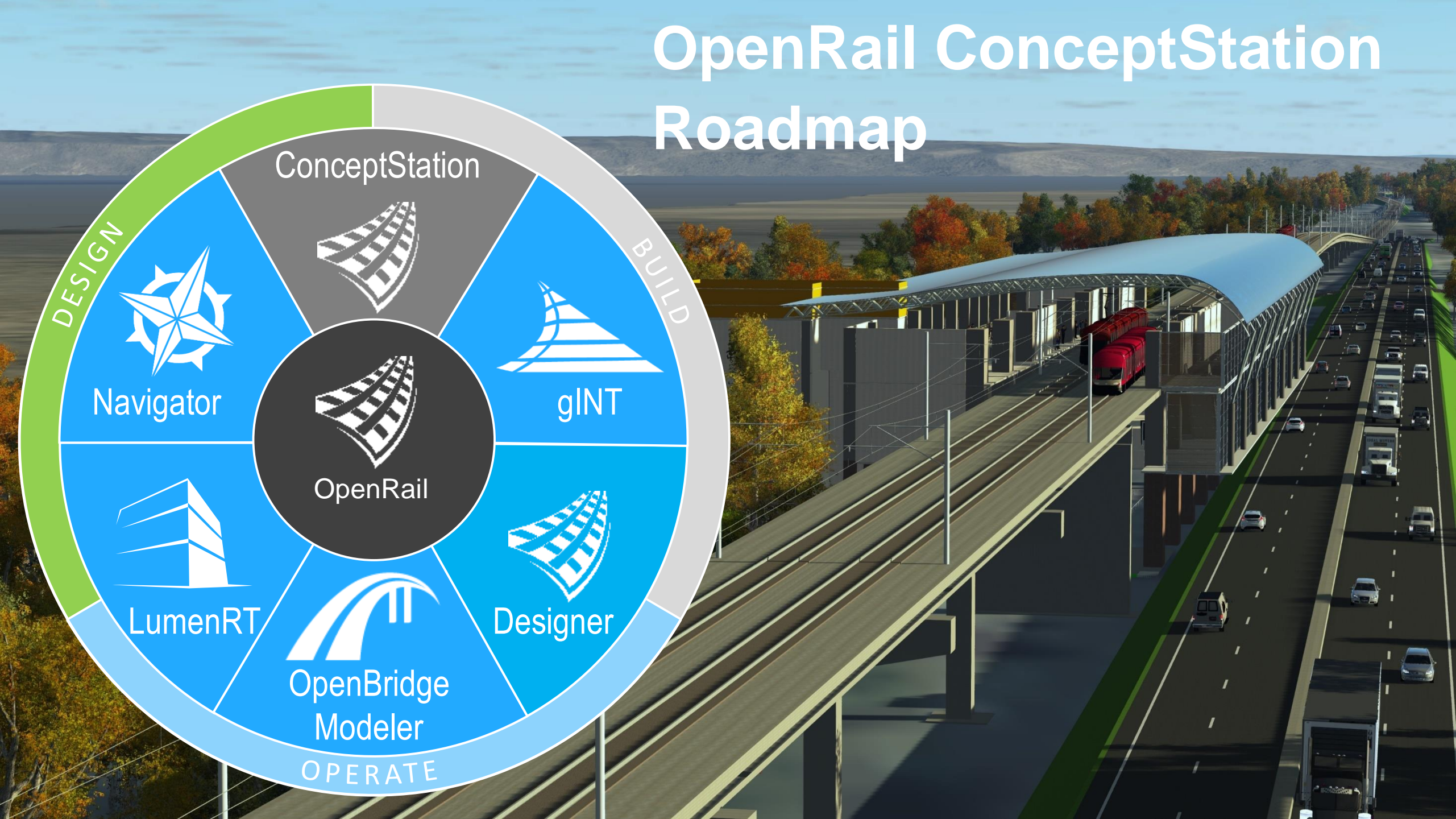
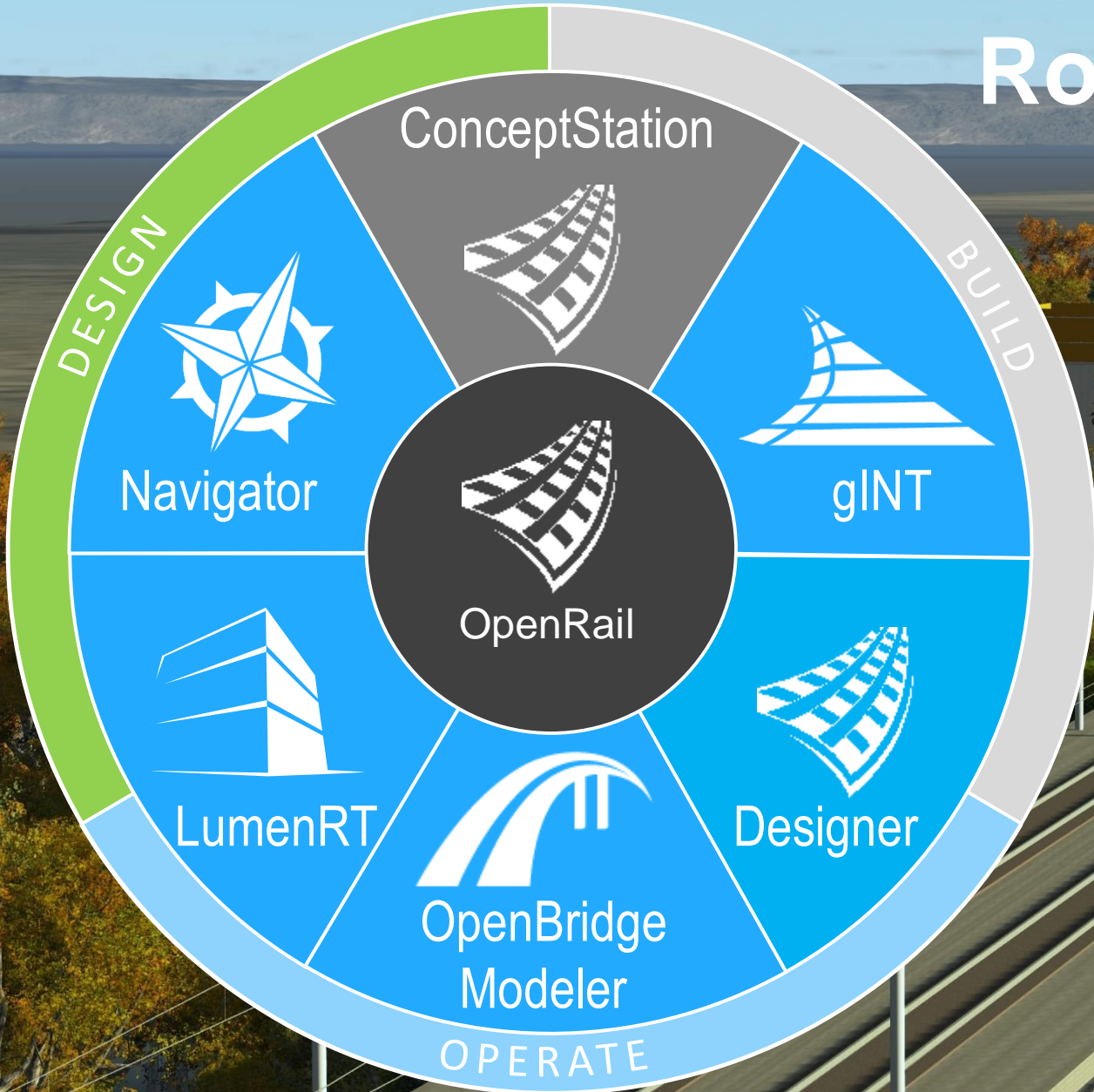


Benefits



- More Efficient Prototyping
 - Different options can be considered with ease
 - Identification of greater cost savings
- Higher precision in early stages
 - Better modelling
 - Better quantity takeoff
 - Reduce cost variance
 - Track quantities, rail, turnout, material costs..
 - Tunnel and bridge quantities
 - Calculation of overheadline costs; mast, portal, cantilever quantities, wire lengths...

OpenRail ConceptStation Roadmap



OpenRail Conceptstation CONNECT Edition



OpenRail
Conceptstation



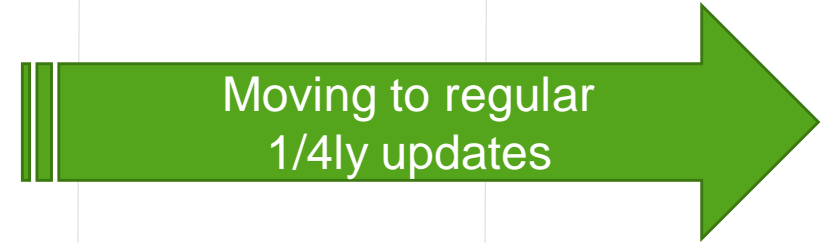
OpenRail
Conceptstation
Update 1



OpenRail
Conceptstation
Update 2



OpenRail
Conceptstation
Update 3



Aligned with OpenRoad
Conceptstation release cycle

Target Nov17



Q217

Q317

Q417

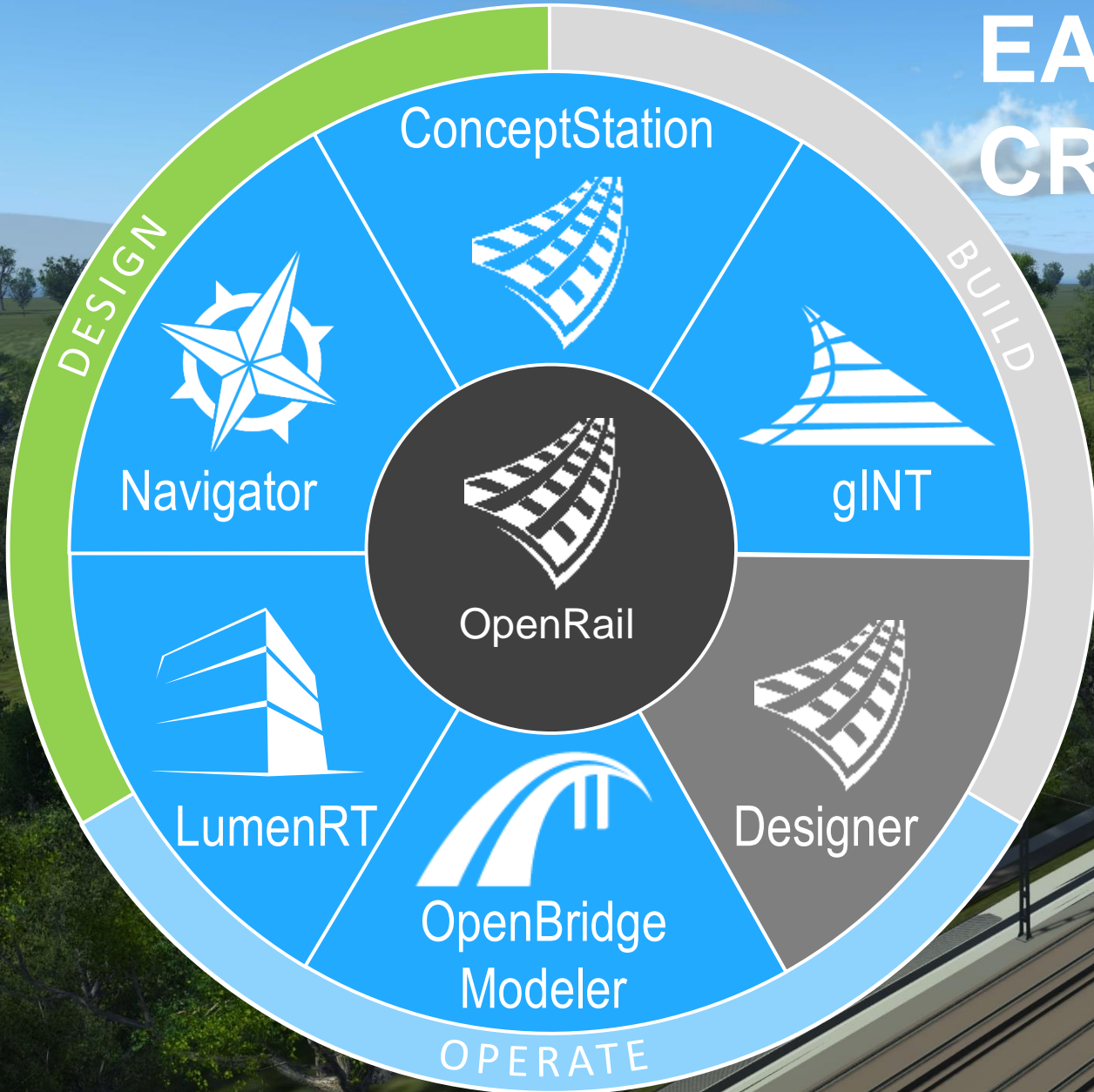
Q118

Q218

Q318

OpenRail Designer

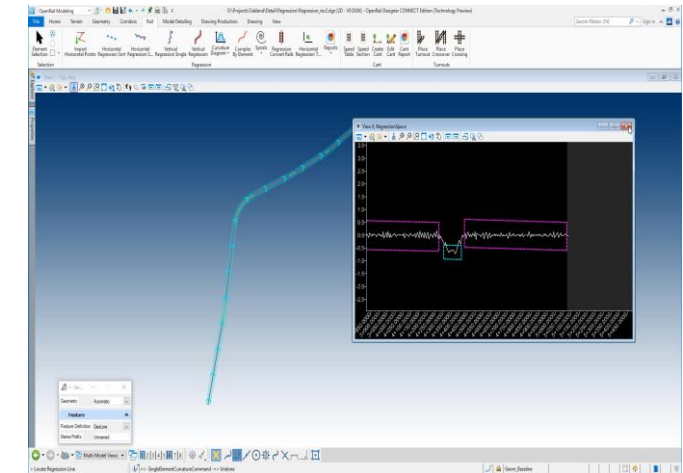
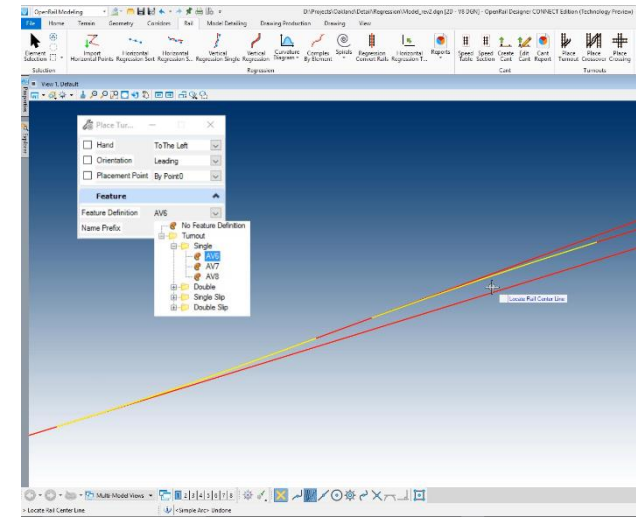
EAP Q4/17
CR Q1/18



OpenRail Designer



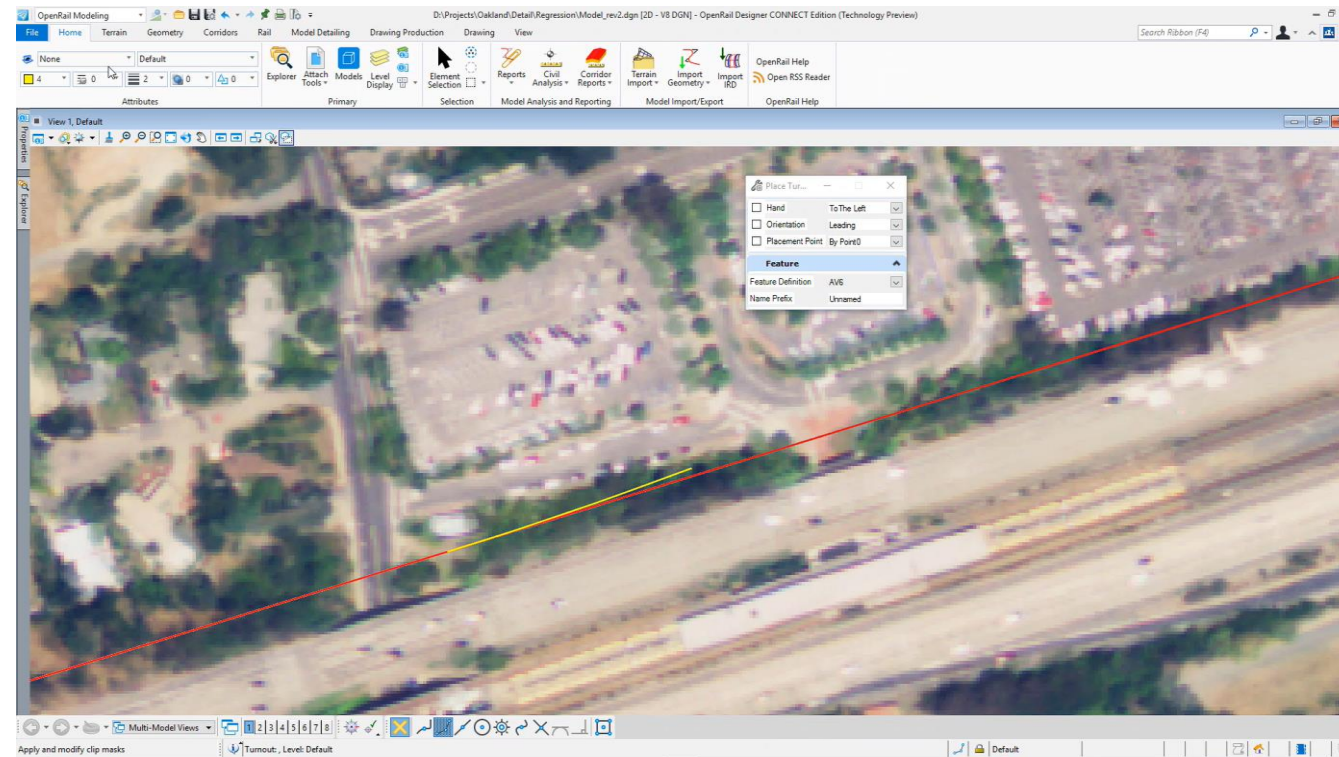
- Consolidates and Incorporates core functionality from;
 - Bentley Rail Track /Power Rail Overhead Line (PROL) with OpenRoads Designer
- To provide Detail Design Rail Solution that
 - Consumes conceptual design
 - Provides detailed geometry solution
 - Circular vertical arcs
 - Multiple spiral transition definitions, including:
 - Clothoid, Bloss, Biquadratic parabola..
 - Rail alignment calculations
 - Integrates with Promise.e for electrical design
 - Integrates with asset management systems



OpenRail Designer Turnouts



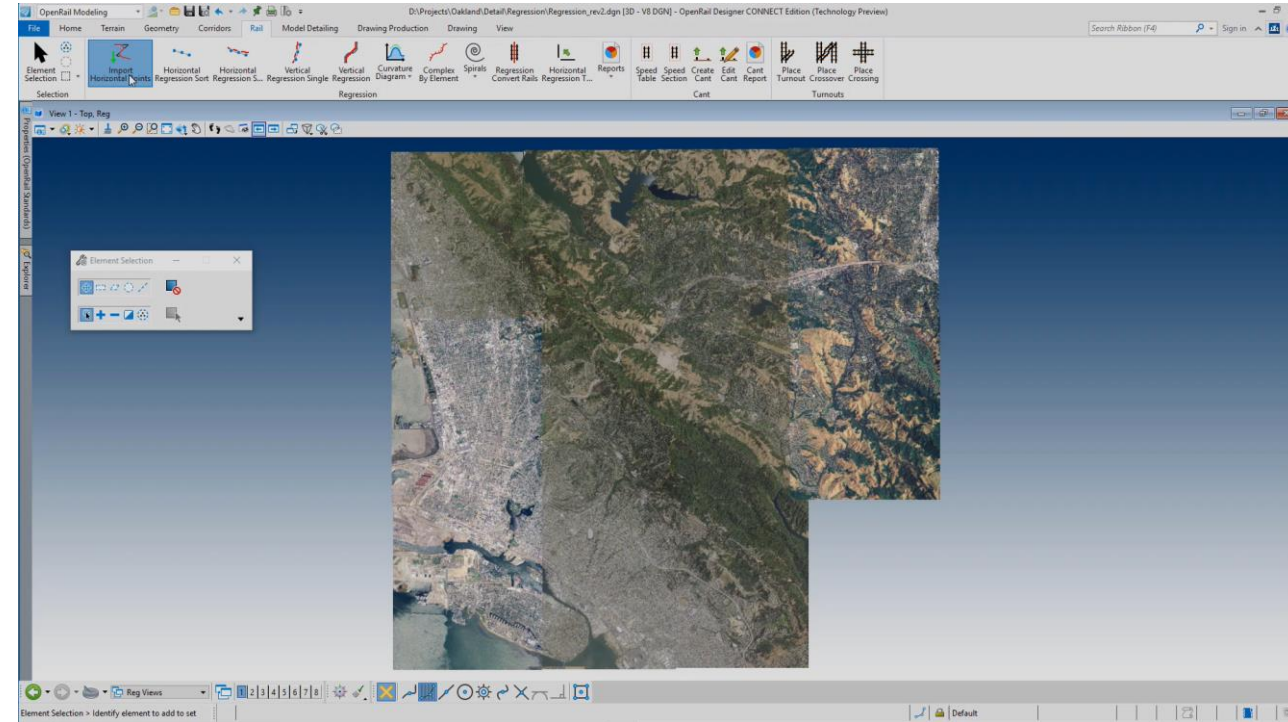
- Rule based application
- Automatic healing of geometry
- Turnout application on curves
- Types
 - Single, Double
 - Single Slip, Double Slip
- Diamond Crossings
- Extensive Library
 - AREMA, German, UK, France, Russian, UIC ...
 - User defined turnouts can be added



OpenRail Designer Regression



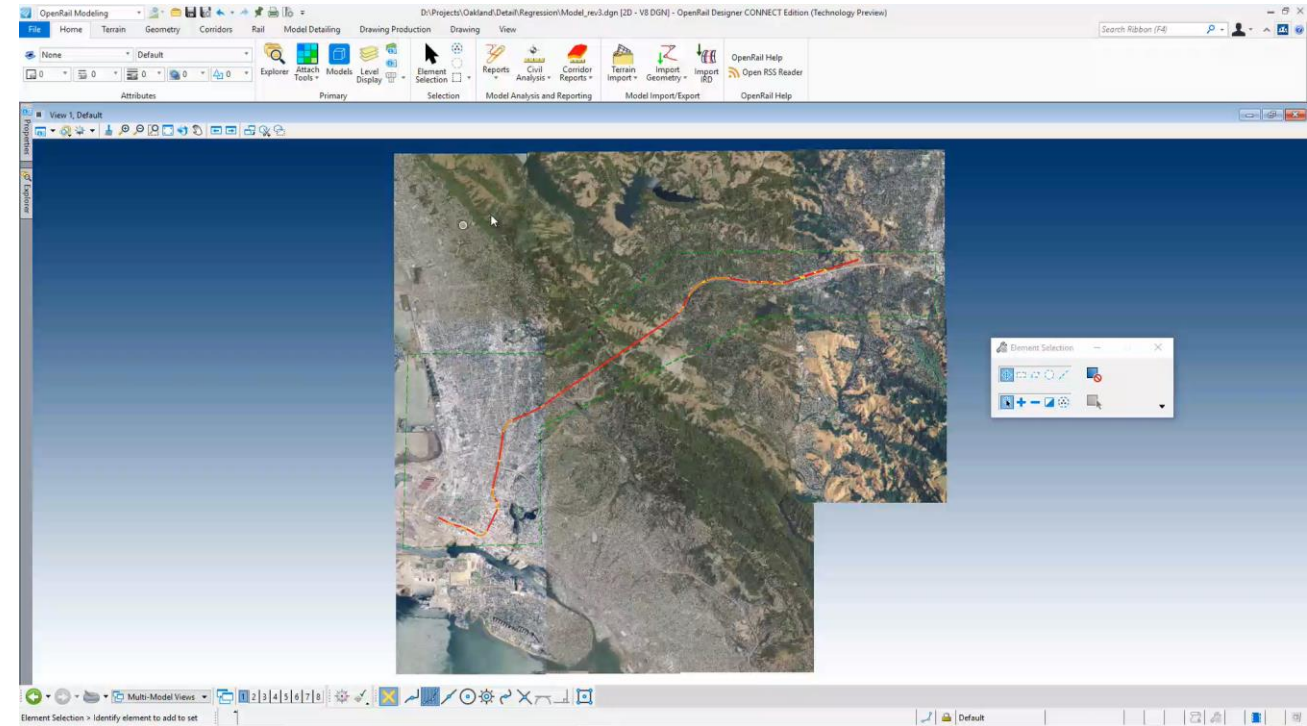
- Sorts point readings
- Easy selection tools for regression points both on plan and curvature view
- Horizontal and Vertical regression
- Automatic placement of spirals
- Curvature Diagram; easy identification of curves and lines
- Automatic or manual selection of object type
- Convert rail readings to centreline, calculate existing vertical and cant



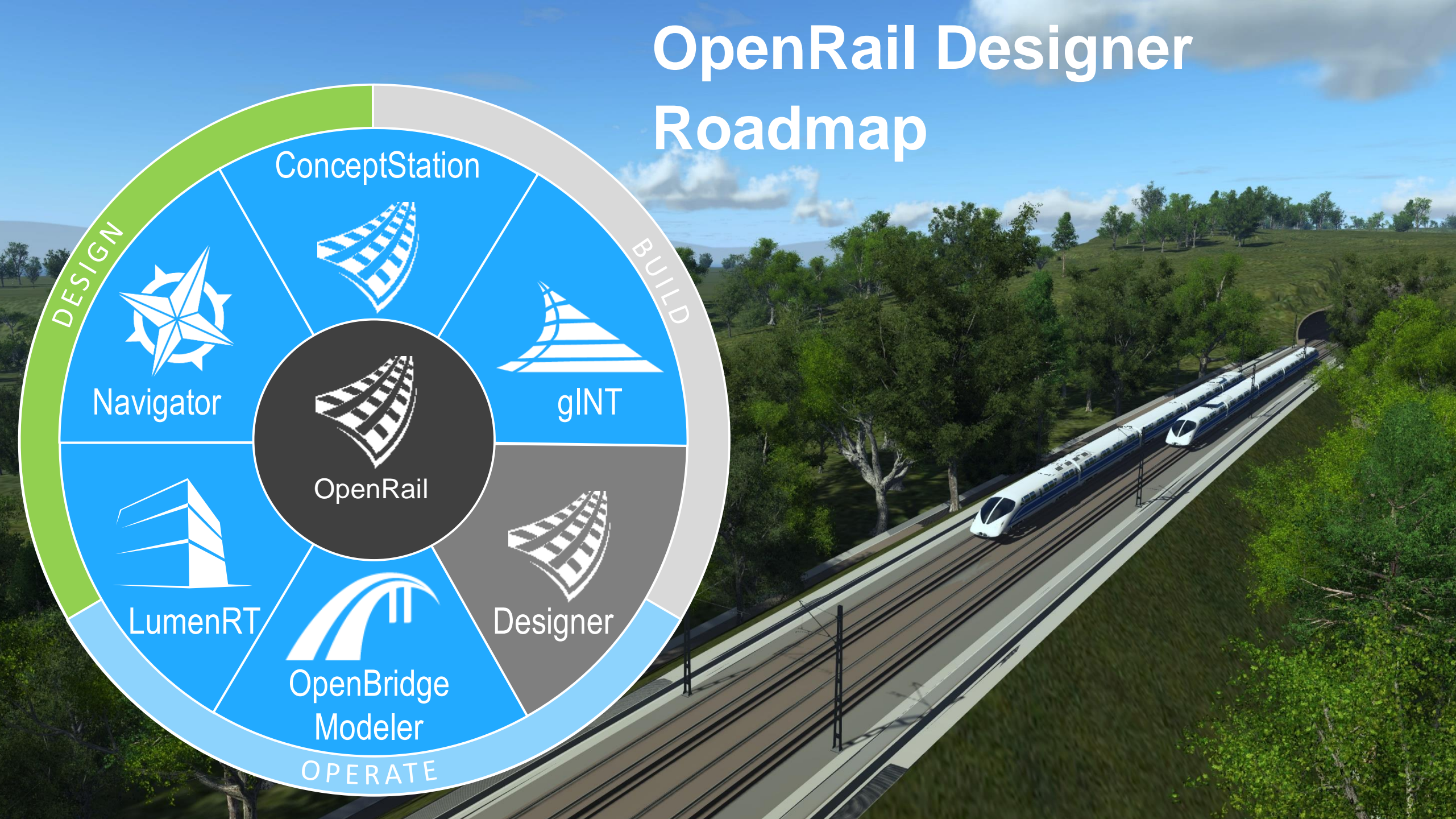
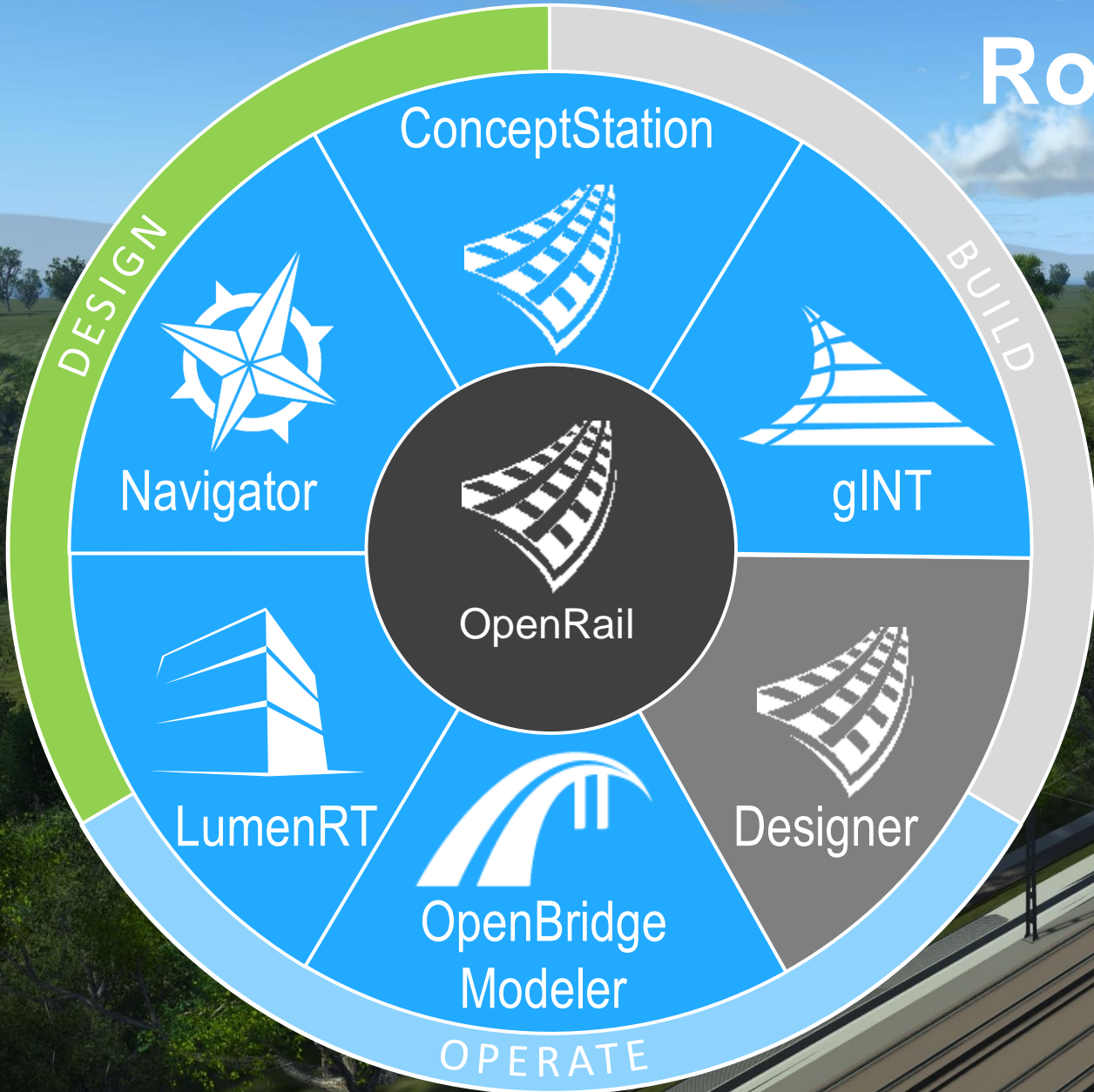
OpenRail Designer Cant (Rail Superelevation)



- Cant formula based calculation, applied and equilibrium constant
- Speed table driven cant calculation
 - Speed assignment for different sections of the track
 - Speed transition
 - Alternative speed selection; commuter rail, freight rail, express...
 - Automatic or manual creation
- Cant diagram
- Automatic identification of design problems
- Virtual transitions



OpenRail Designer Roadmap



OpenRail Designer CONNECT Edition



OpenRail Designer

Limited Access



OpenRail Designer

Early Access



OpenRail Designer

Comercial Release
(NLT 1st April 18)



OpenRail Designer

Update 1

Moving to regular
1/4ly updates

Aligned but not constrained to
OpenRoad Designer release cycle

Bentley Product Stream

Q317

Q417

Q118

Q218

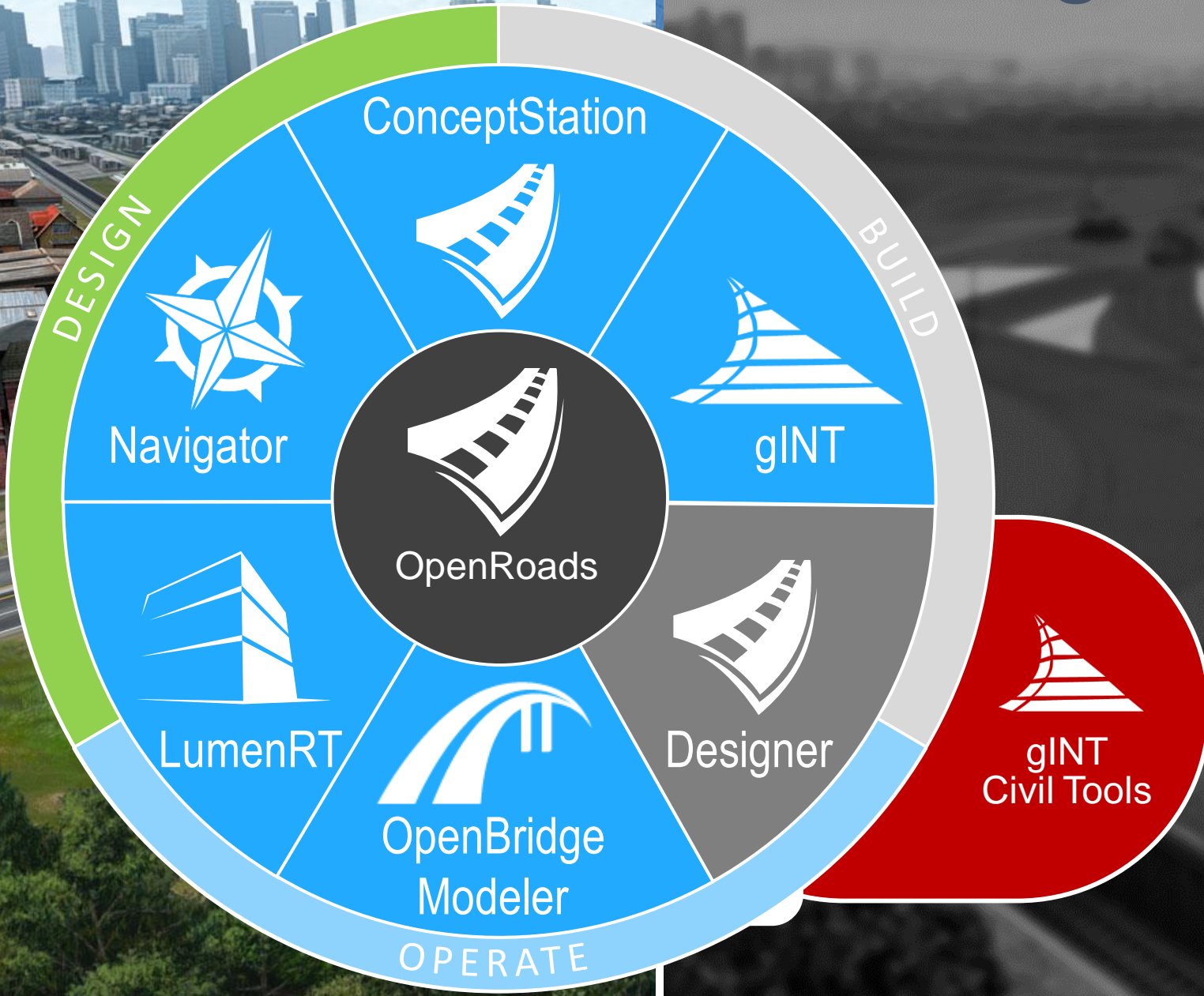
Q318

Q418



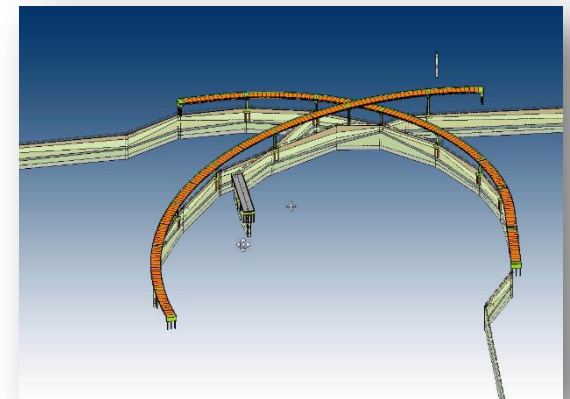
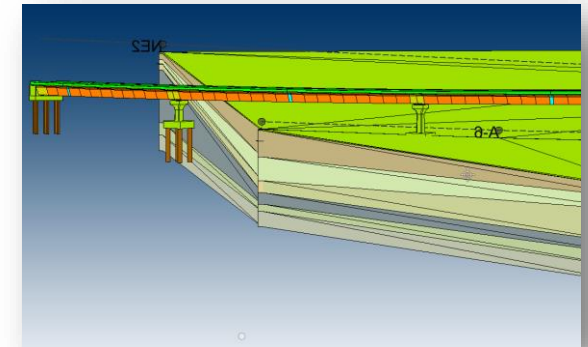
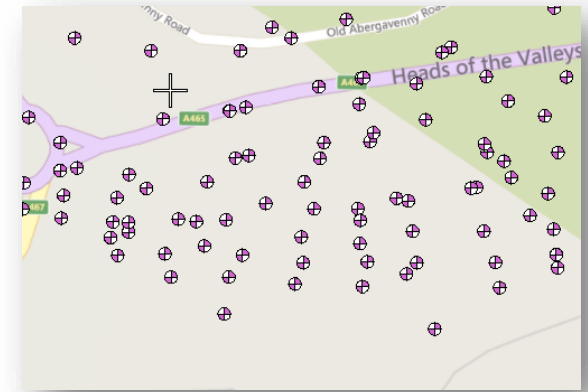
Companion Product Updates

Integrated Capabilities

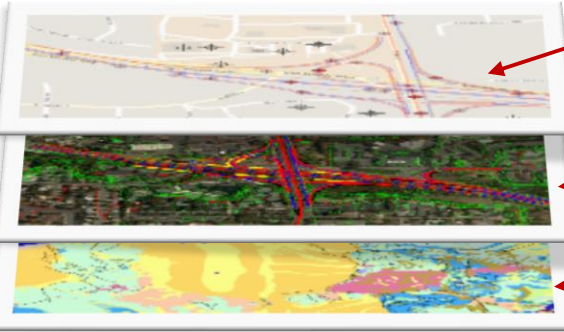


What is “gINT Civil Tools” ?

- Two gINT sister applications, available for gINT Professional users and gINT Professional Plus users : gINT Civil Tools Professional and gINT Civil Tools Professional Plus
- Standalone applications that work with
 - Existing gINT installation (no upgrade requirement)
 - Existing gINT projects (.gpj and SQL)
- Also delivered in Open Roads Designer



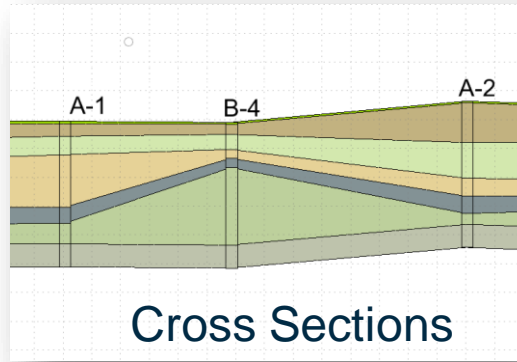
At-A-Glance



Drilling plan

Raster and vector data

Online mapping

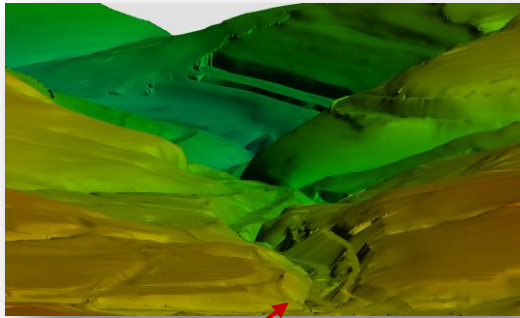
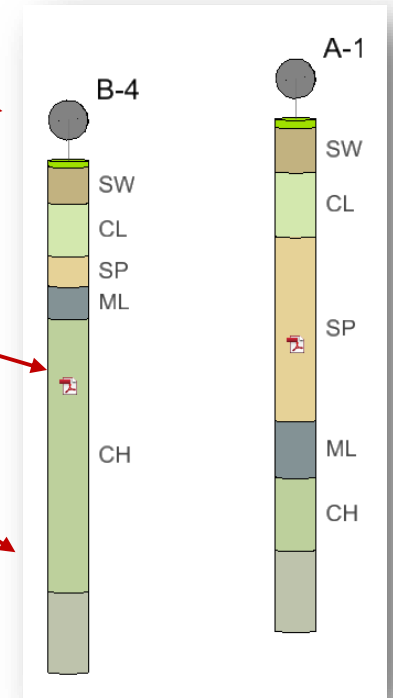


Cross Sections

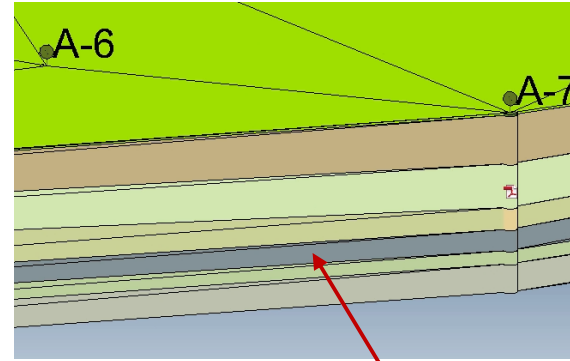
Boreholes

Links to Logs

Lithology

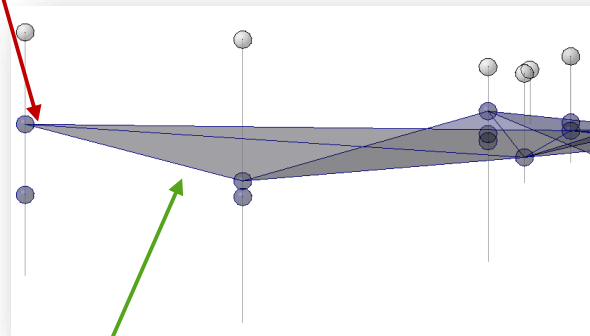


3d models of existing ground

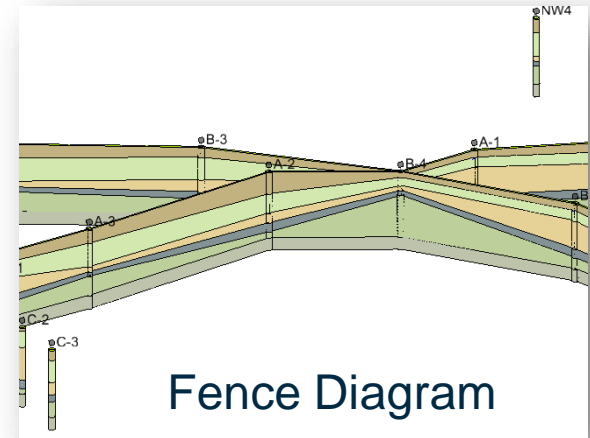


Volumes

Water level



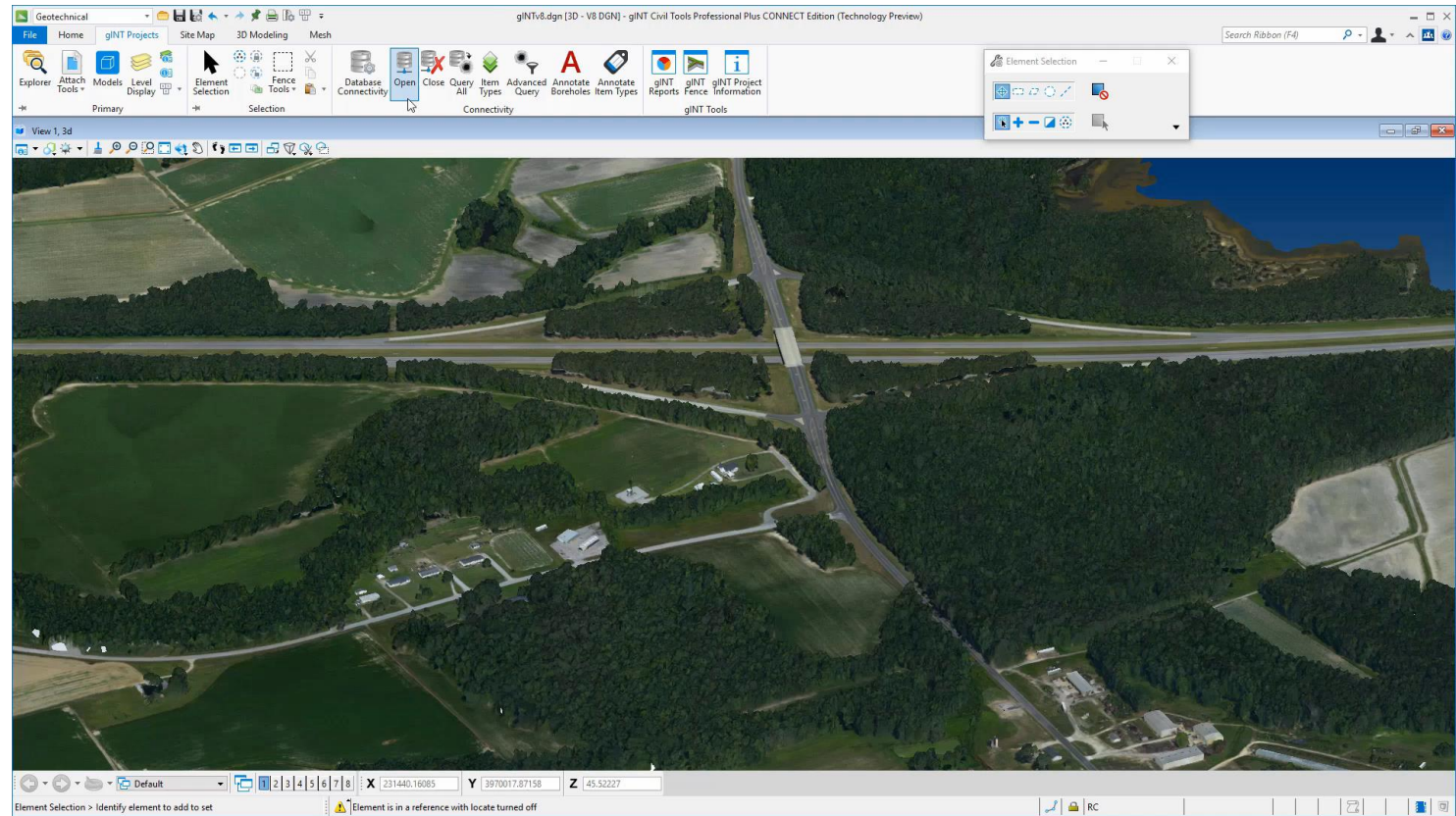
Surfaces



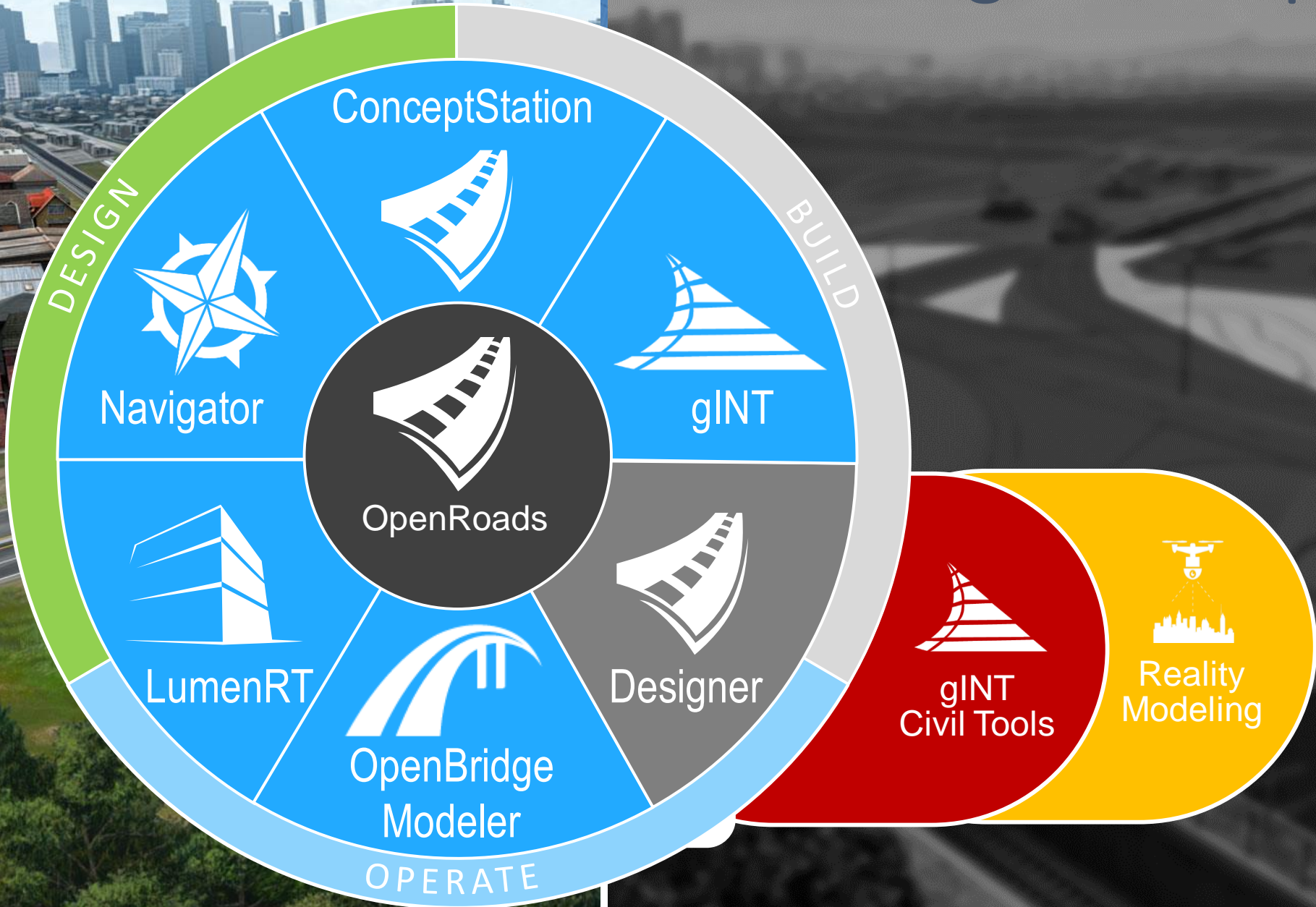
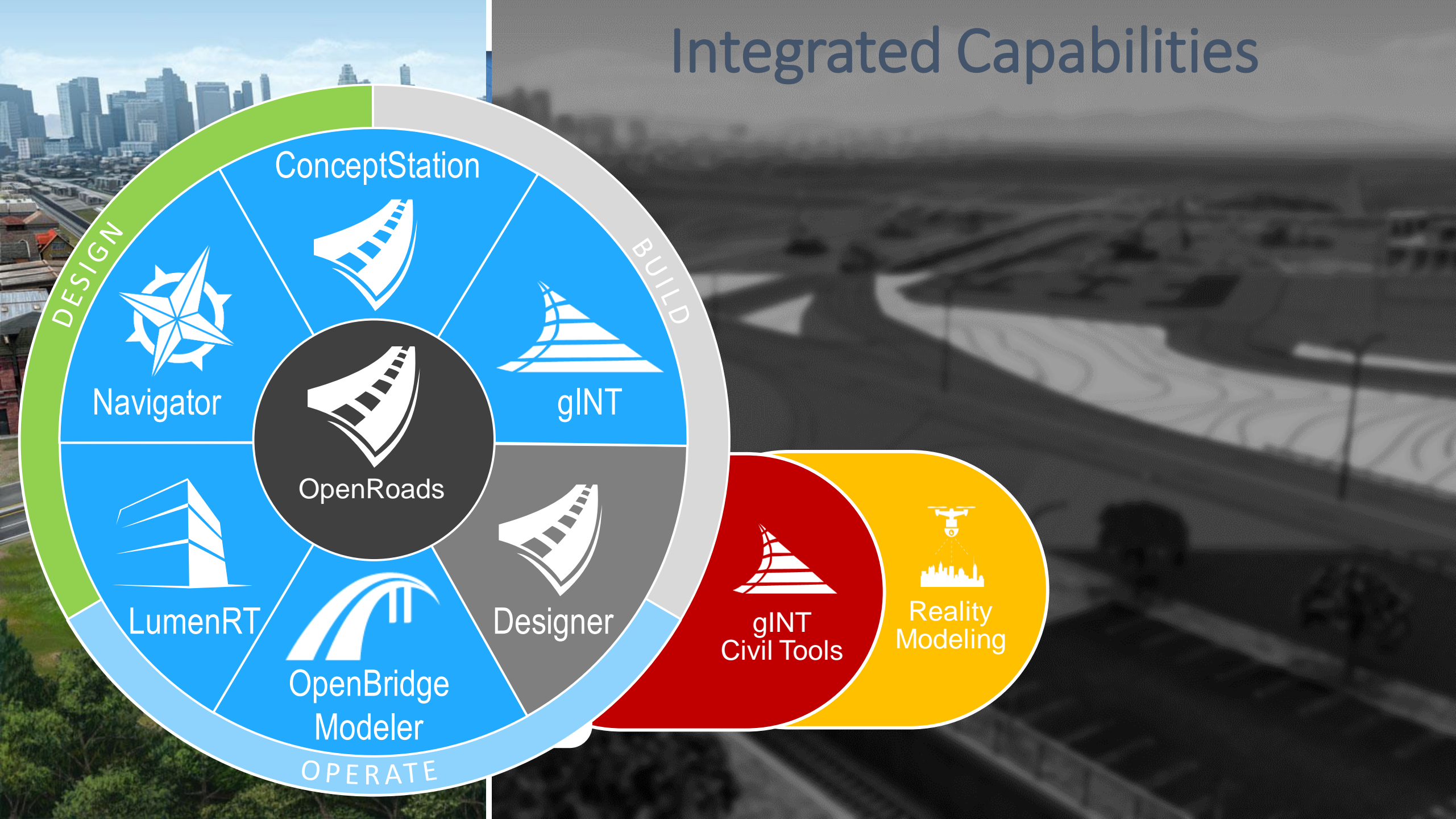
Fence Diagram

New in gINT Civil Tools Update 1

- Loading data
 - Oriented display for fractures (rock drilling)
 - Environmental readings / logarithmic
- New data type
 - N-value calculation
 - Continuous data reading
- Working with gINT
 - gINT commands
 - Query All projects from SQL server
- Interoperability
 - Export to LandXML
 - MS Excel data source
- 3d Modeling
 - Create Mesh
 - Create Cross Sections
 - Create Fence Diagrams
 - Edit terrain from cross section

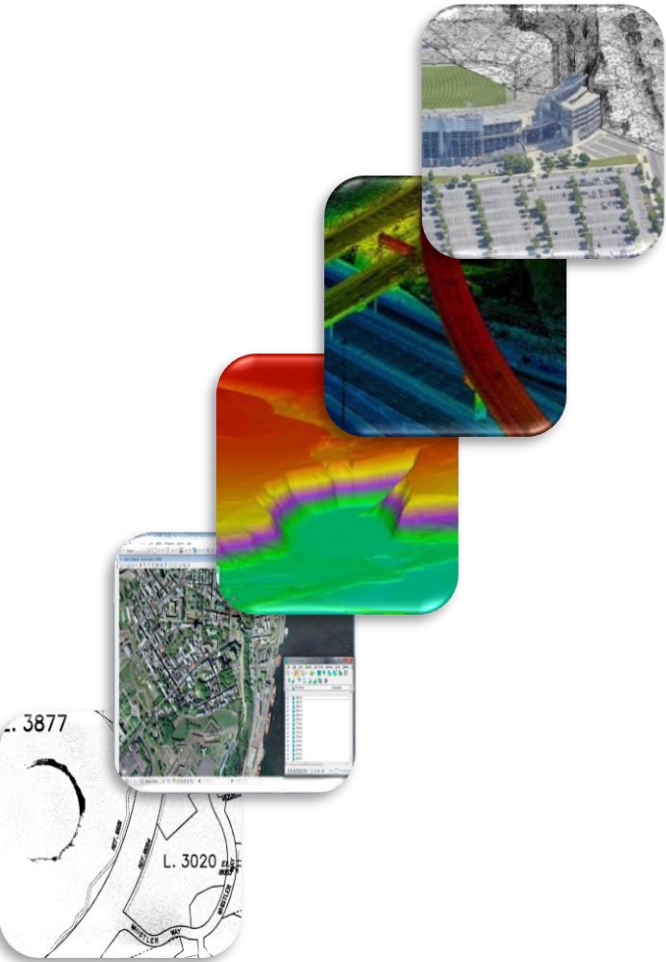


Integrated Capabilities



What is Reality Modeling ?

*Advanced Processing for Imagery and Reality Modeling Data
Provided by Bentley Descartes*



Reality Mesh Processing

Point Cloud Processing

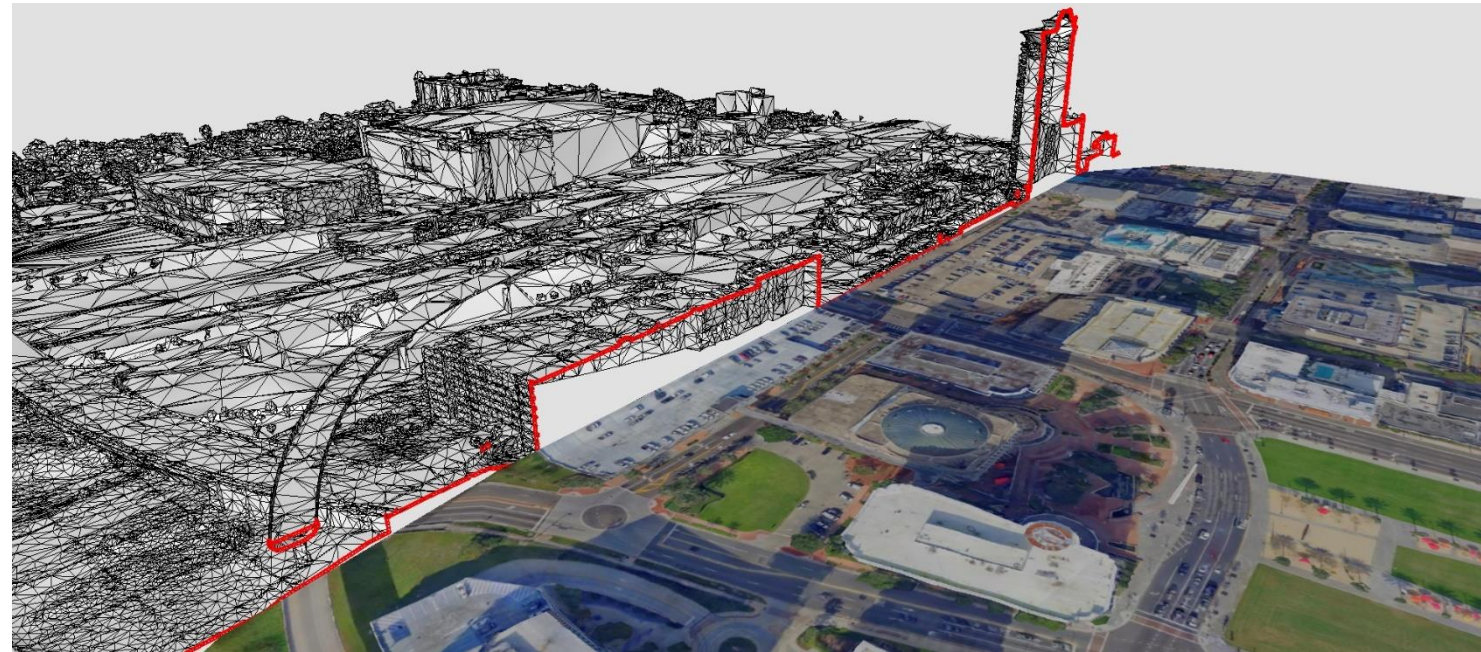
Scalable Terrain Modeling

Image Processing

Hybrid Raster/Vector

Why you need Descartes *CONNECT* Edition?

- Leverage Reality Meshes, Terrain Models and Point Clouds made of Billions of points and Triangles
- Extract features from both Point Cloud and Reality Meshes
- Extract ground models and Ortho images from Reality Meshes
- Extract ground models and classify ground points from Point Clouds
- Integrate Reality Modeling data and Engineering data
- Produce deliverables such as i-models, 3D PDF, Ortho Images in any direction.



Key Reality Modeling capabilities

Descartes CONNECT Edition Update 2

- **64 bit architecture and Ribbon User interface**
- **Point Clouds**
 - Ground extraction
 - Point Cloud colorizing from Ortho images
 - Point Cloud classification editing
 - Piping Feature extraction
 - Breaklines and linear feature extraction
 - 3D Modeling by Section
 - Clip and Section manager
 - Batch Snapping and Draping of elements
- **Scalable Terrain Model**
 - Creation of scalable terrain models (STMs)
 - High-performance display of very large digital terrain models (DTMs) with numerous display modes
 - High-resolution image draping on STM
 - STM update and synchronization with various terrain data sources
 - Viewshed analysis
- **Reality Mesh**
 - **New** Quick ground extraction
 - **New** Export to Terrain Element
 - **New** 3MX to 3SM conversion
 - Retouch ContextCapture Meshes
 - Ground extraction
 - Generation and manipulation of cross sections
 - Breakline extraction
 - Real time Mesh classification to enrich mesh with data from many sources
 - Orthoimage extraction on any axis from RealityMesh

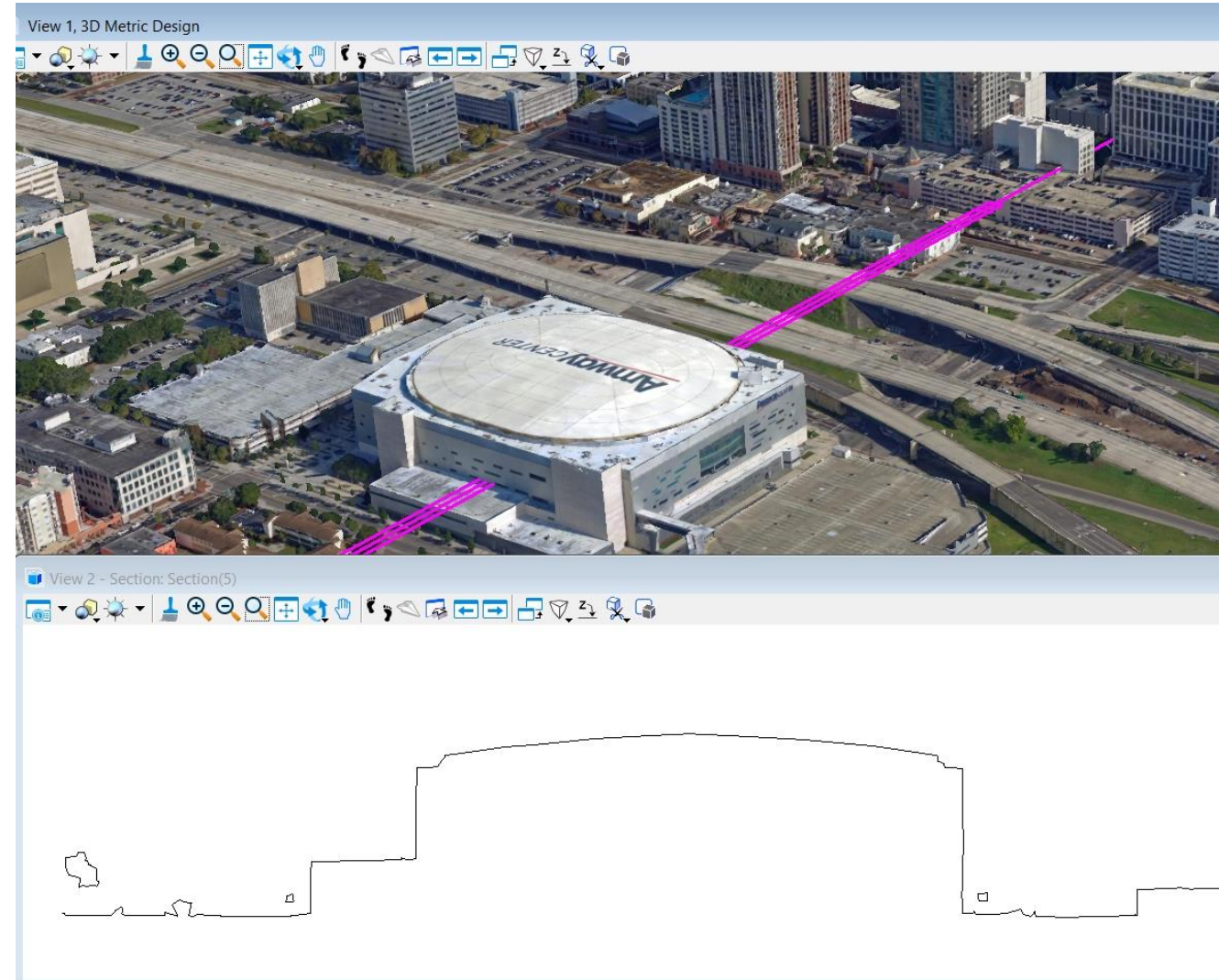
Generate cross sections with Reality Meshes

- **What is it?**

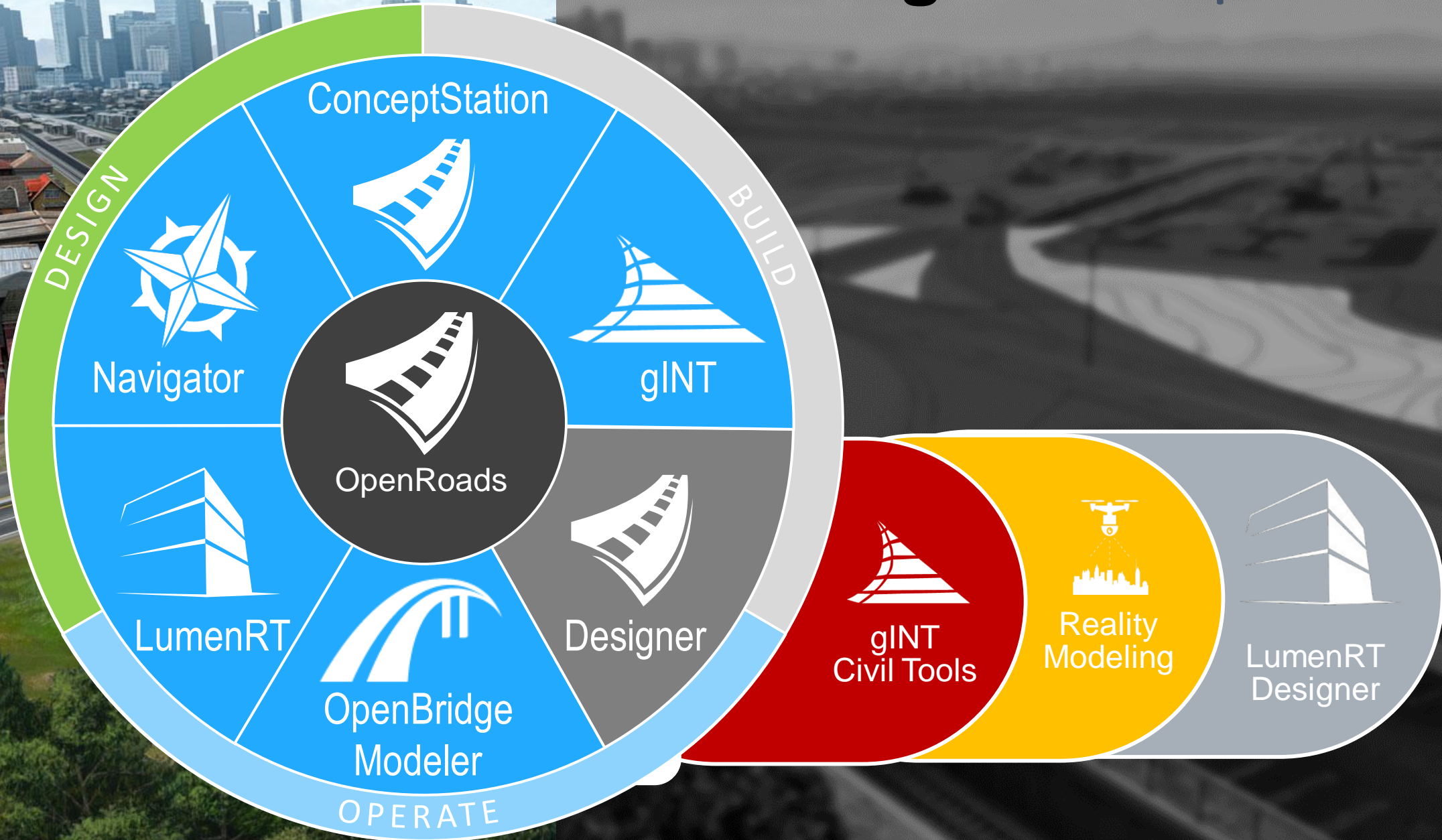
- “2 clicks” cross-sections
- Automatic adjustment of View Rotation and View Auxiliary Coordinate Systems from Sections

- **Benefits?**

- Enable easy analysis of 3D Reality Mesh through x-sections
- Simplify 3D Modeling and feature extraction to measurements in x-sections



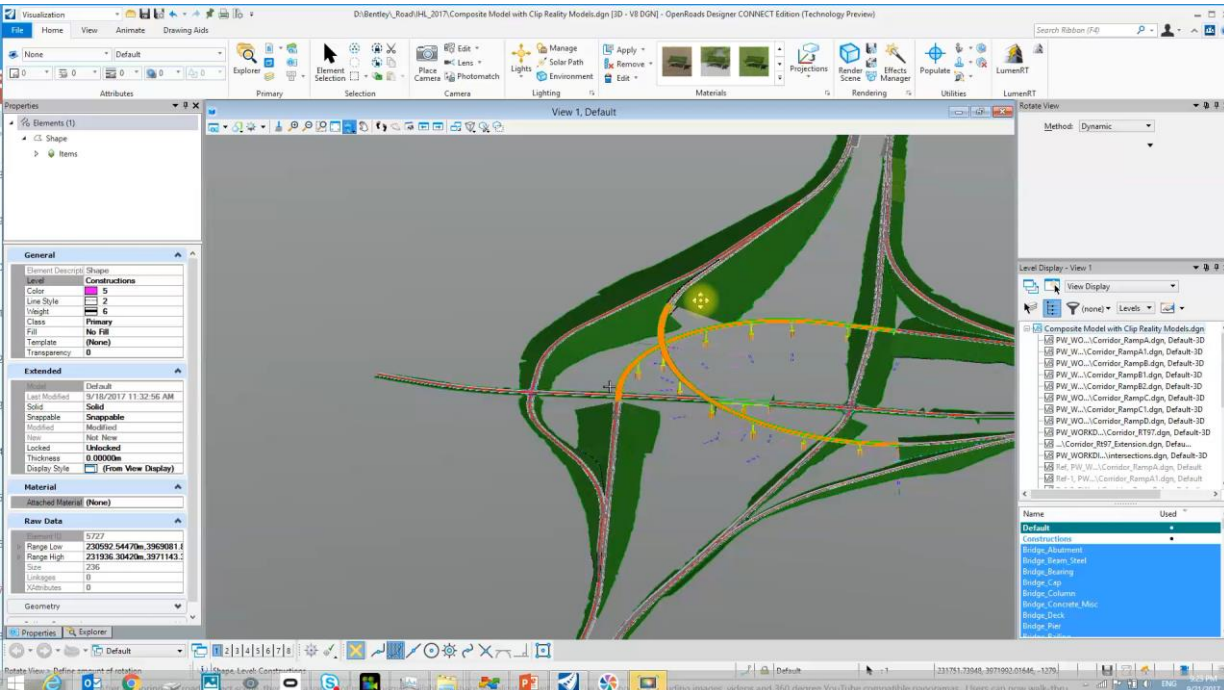
Integrated Capabilities



LumenRT Designer

• What is it?

- New “Free license’ with any entitled CONNECT product
 - Microstation CE / Openroads Designer CE / AECOsim Designer CE
 - Otherwise 30day trial mode
- Go Pro option to upgrade



	LumenRT Designer (embedded)	LumenRT Pro (Full Version)
Window Area Size	1920 x 1080	Unlimited
Video Export Max Size	1920 x 1080	8,000 x 4,000
VR Export	No	Yes
Publish LiveCubes	No	Yes
Logo	Bentley LumenRT Logo	Custom or None
Exporters	Bentley MS Connect	Bentley, Revit, Sketchup, ArchiCAD, CityEngine
Content Library	Partial (approximated 1/3rd of the library) cloud download	Full - cloud download
ExePayload Size	Web-downloadable through new MS modular installer	Web-downloadable & Bentley Select



Civil Update - Whats new in the latest product release

Presented by:

Ian Rosam, Director Civil Product Management, Bentley Systems, Inc.



Learning Objectives

- Cover the main product release highlights for civil product lines
 - OpenRoads Conceptstation (update 6)
 - OpenRoads Designer CE (update 2)
 - OpenRail Conceptstation (update 1)
 - OpenRail Designer CE (EAP)
 - Companion products
 - Descartes CE (Update 2)
 - gINT Civil Tools CE (Update 1)
 - LumenRT Designer
 - Product Roadmaps



Thank You!