



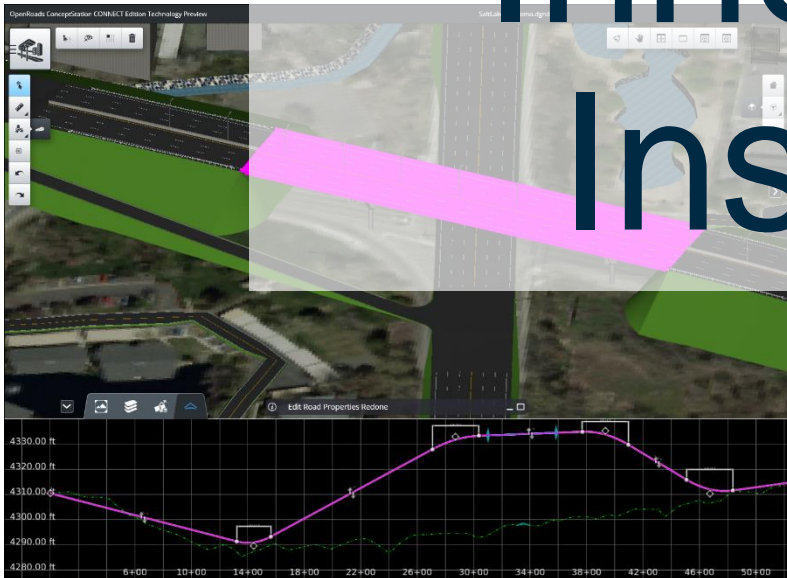
OpenRoads ConceptStation

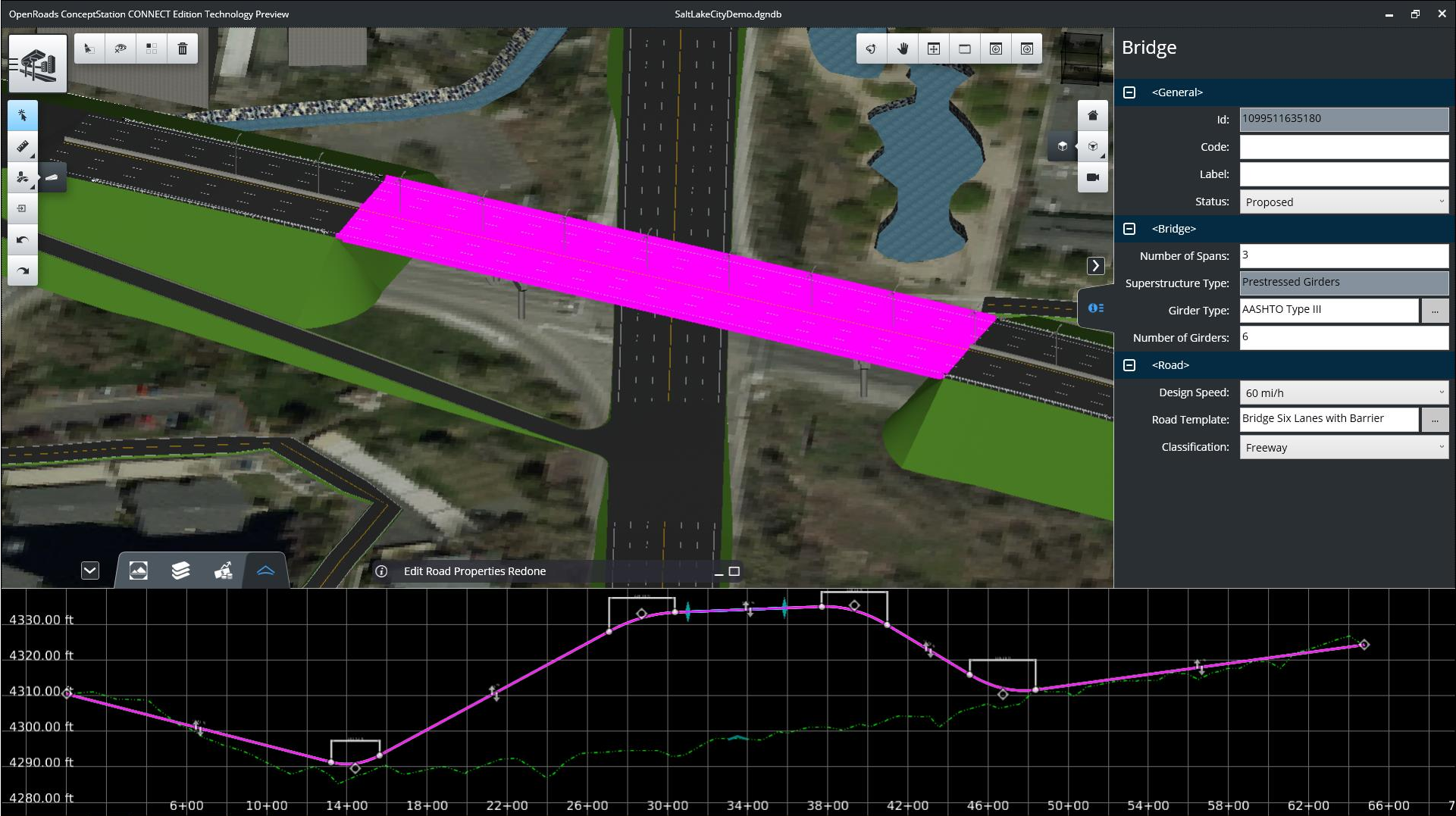
Dan Ahern, Content Development Manager
Bentley Systems





Innovative Inspiring





More efficient prototyping

OpenRoads ConceptStation CONNECT Edition Technology Preview

SaltLakeCityDemo.dgn

Concept estimated cost: \$15,929,169

Category	Cost	Source
Earthwork	\$8,431,880	Design
Pavement	\$885,668	Design
Structure	\$2,721,544	Design
Drainage	\$755,653	Allowance
Electrical	\$93,175	Allowance
Incidental Items	\$1,910,097	Allowance

Smarter trade-off



Better communication

Assemble Context Data

- Import from local files
 - Terrain Models
 - Raster DEM
 - Images
 - GIS (SHP, Esri File Geodatabase, OpenStreetMap)
 - Can be mapped to ConceptStation objects and attributes
 - Filter based on project extent, view, all
 - DGN
 - Reference Reality Meshes (.3MX) from Bentley ContextCapture

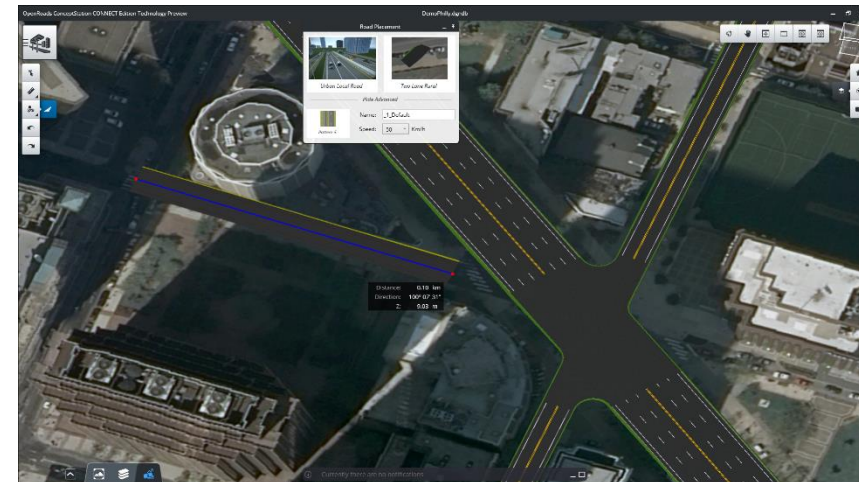
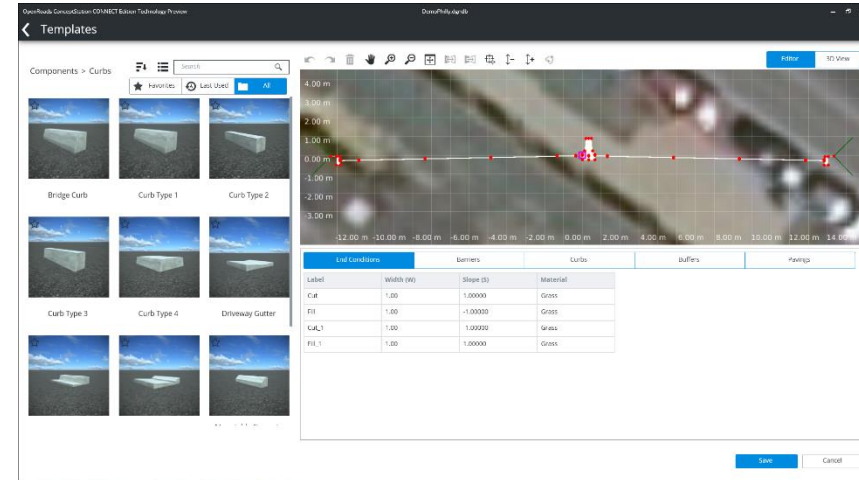
Reality Data Services

- Allowing to find, download, import, transform to 3D
- Indexing data from different sources
 - USGS
 - Terrain
 - Images
 - OpenStreetMap
 - Roads, Bridges, Hydro, Buildings



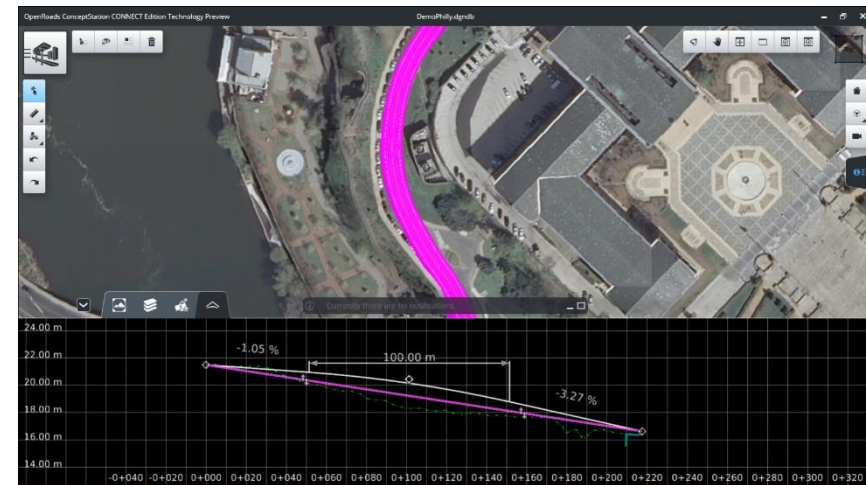
Place Roads

- Following AASHTO standards
 - Class, design speed, default curve radius
- Best fitting existing ground vertically
- Template (typical cross-section) based approach
- Superelevation determined automatically (method 5)
- Roads are named



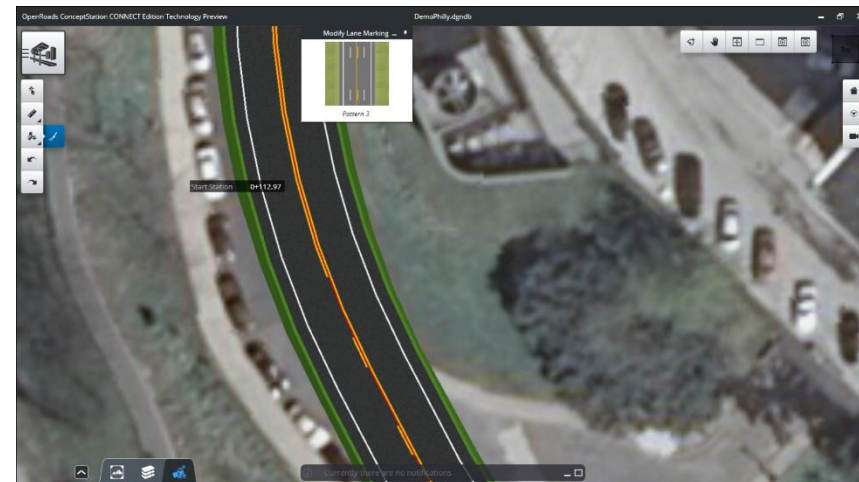
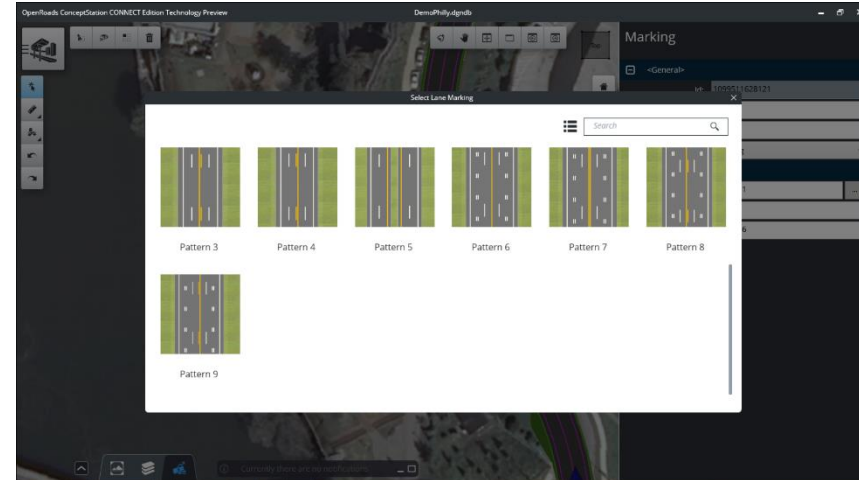
Edit Roads

- Editing of Horizontal Alignment
 - Insert PI, Delete PI, Move PI
 - Edit curve radius graphically or precisely using heads-up text editing
- Editing of Vertical Alignment
 - Insert PVI, Delete PVI, Move PVI
 - Edit vertical curve length graphically or precisely using heads-up text editing
- Easy editing of template drops, editing transition stationing



Lane marking

- Place lane marking
 - Default placed
- Edit lane marking
 - Change the lane marking for the full road
 - Change the lane marking for portion of the road independently of the road template itself



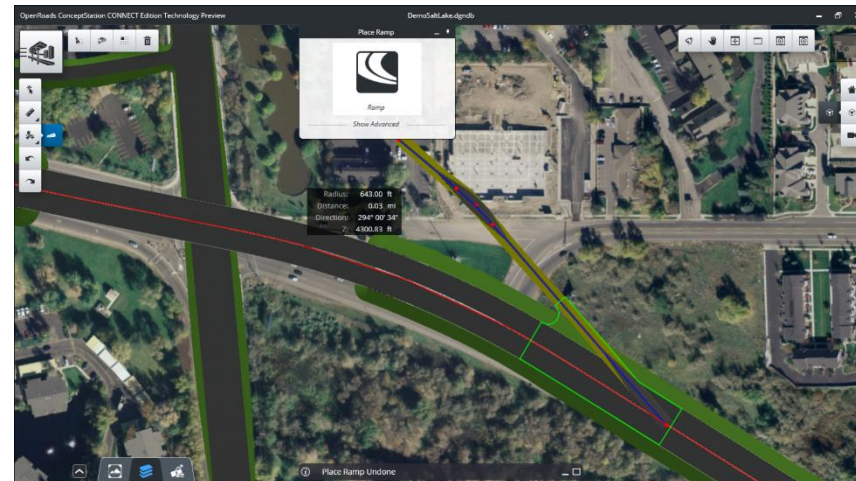
Design Intersections

- Place intersections
 - Simple placement
 - First roads selected decides sets the elevation of the second roads
 - Default radius and taper
 - Default intersection marking
- Edit intersections
 - Modification of taper length and width
 - Modification of radius



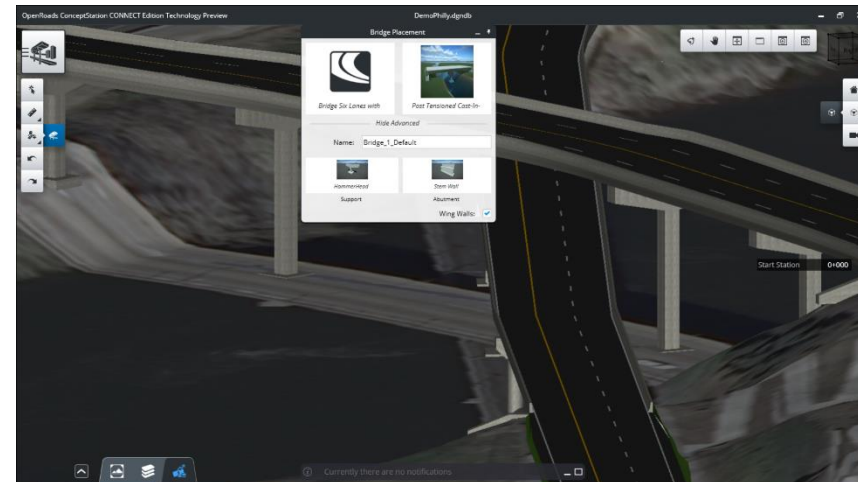
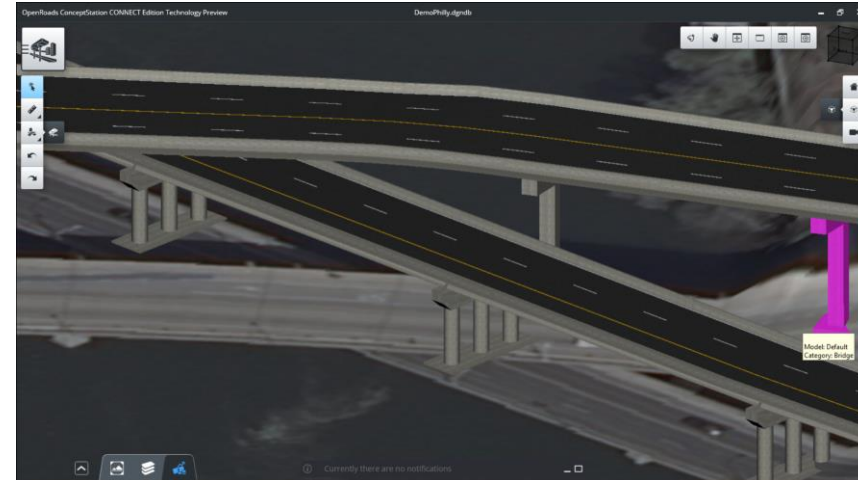
Design Ramps

- Place ramps
 - Connects two roads with the desired alignment
 - Automatic auxiliary lane creation based on design speed
 - Default taper length, taper width design radius, gore radius
 - Default marking
- Edit ramps
 - Modification of taper length, taper width design radius, gore radius



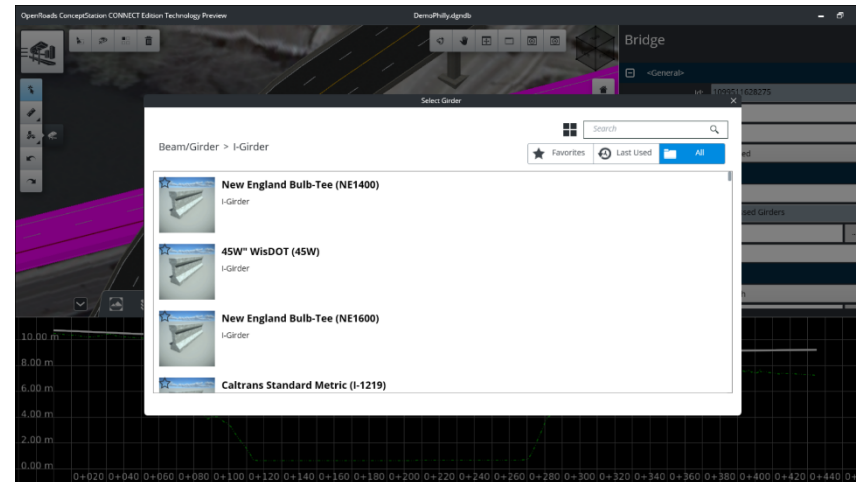
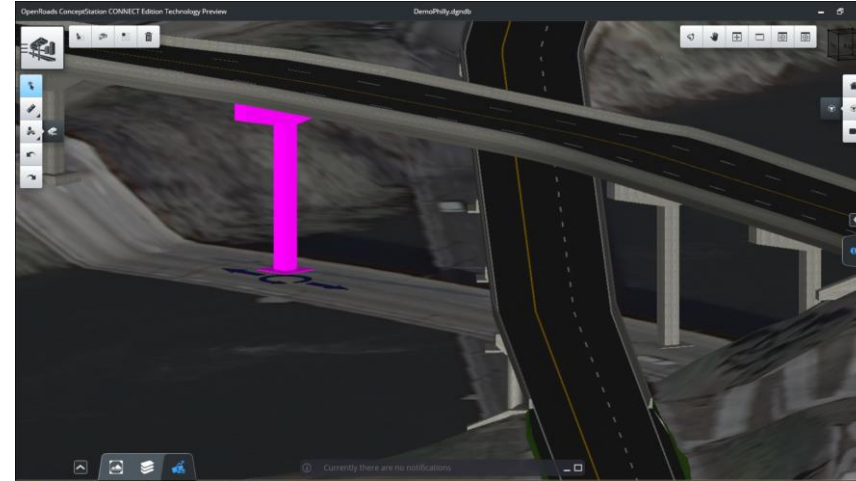
Place Bridges

- Simple two clicks bridge placement
- Number of supports automatically determined from the bridge length
- Can set girder type, support type, abutment type, wing walls
- Can set bridge deck template
- Superelevation determined automatically (method 5)



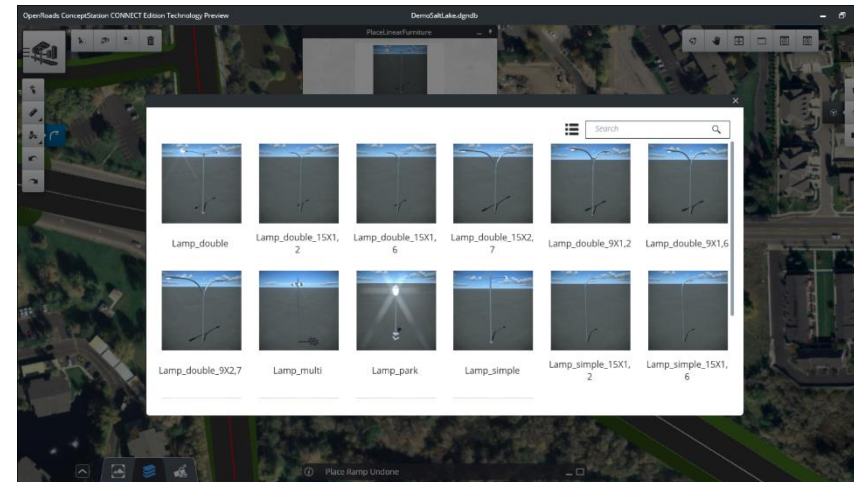
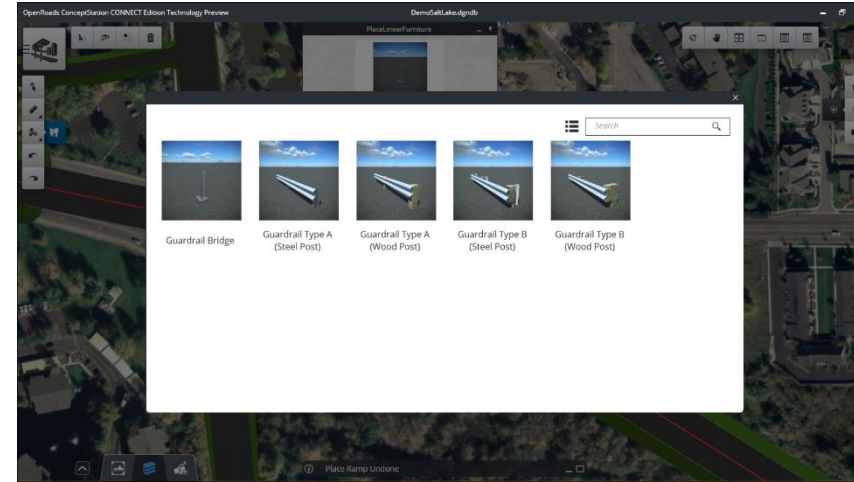
Edit Bridges

- Simple editing of Horizontal and Vertical
- Change girder type, support type, abutment type, wing walls
- Change number of spans/supports, number of girder
- Rotate supports, move/skew abutment
- Change bridge deck template



Place City Furniture

- Place and edit guardrails
 - Ability to choose what symbol to use
 - Ability to set offset from alignment
 - Ability to set angle from alignment
- Place and edit street lights
 - Ability to choose what symbol to use
 - Ability to set offset from alignment
 - Ability to set angle from alignment



Roadway template

- 300 typical cross-sections available and can create your own
- Create new template
 - Easy component based creation
 - Types: Lanes, barriers, curbs, segments, cut, fill
 - Parametric can modify dimension for all of those
 - Component material determines quantities and cost
- Manage template
 - Duplicate, Delete, Copy/Paste, Rename
- Modify template
 - Modify template
 - Save change as a copy
 - Modify the entire design (can take time)

Bridge deck template

- Create new template
 - Easy component based creation
 - Specialized road template with different components adapted to the bridges
 - Types: Lanes, barriers, curbs
 - Parametric can modify dimension for all of those
 - Component material determine quantities and cost
- Manage template
 - Duplicate, Delete, Copy/Paste, Rename
- Modify template
 - Modify template
 - Save change as a copy
 - Modify the entire design (can take time)

Estimate Cost and Quantities

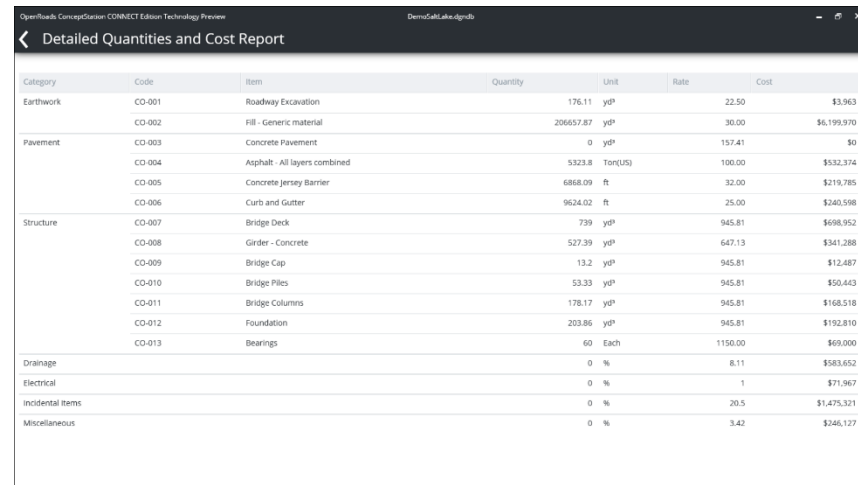
- Project Cost Overview
 - High level no details
 - Includes allowance by default
- Detailed Quantities/Cost
 - Establish high level quantities and cost
- Configuration



OpenRoads ConceptStation CONNECT Edition Technology Preview

Concept estimated cost: \$15,923,169

Category	Cost	Source
Earthwork	\$6,419,890	Design
Pavement	\$885,668	Design
Structure	\$2,721,544	Design
Drainage	\$765,663	Allowance
Electrical	\$93,175	Allowance
Incidental Items	\$1,910,007	Allowance



OpenRoads ConceptStation CONNECT Edition Technology Preview

Demo\GalLaha.dgn

Detailed Quantities and Cost Report

Category	Code	Item	Quantity	Unit	Rate	Cost
Earthwork	CO-001	Roadway Excavation	176.11	ydP	22.50	\$3,963
	CO-002	Fill - Generic material	206657.87	ydP	30.00	\$6,199,970
Pavement	CO-003	Concrete Pavement	0	ydP	157.41	\$0
	CO-004	Asphalt - All layers combined	5323.8	Ton(US)	100.00	\$532,374
	CO-005	Concrete Jersey Barrier	6868.09	ft	32.00	\$219,785
	CO-006	Curb and Gutter	9624.02	ft	25.00	\$240,598
	Structure	CO-007	Bridge Deck	739	ydP	945.81
CO-008		Girder - Concrete	527.39	ydP	647.13	\$341,288
CO-009		Bridge Cap	13.2	ydP	945.81	\$12,487
CO-010		Bridge Piles	53.33	ydP	945.81	\$50,443
CO-011		Bridge Columns	178.17	ydP	945.81	\$168,518
CO-012		Foundation	203.86	ydP	945.81	\$192,810
CO-013		Bearings	60	Each	1150.00	\$69,000
Drainage			0	%	8.11	\$683,652
Electrical			0	%	1	\$71,967
Incidental Items			0	%	20.5	\$1,475,321
Miscellaneous			0	%	3.42	\$246,127

Visualization

- Real time rendering
- Adding trees, cars, people
- Changing atmospheric conditions, time (night), seasons
- Output
 - High-End Images
 - Videos
 - Live Cube





Seamless interoperability with OpenRoads and legacy Bentley Civil products

Interoperability with Detailed Civil Design

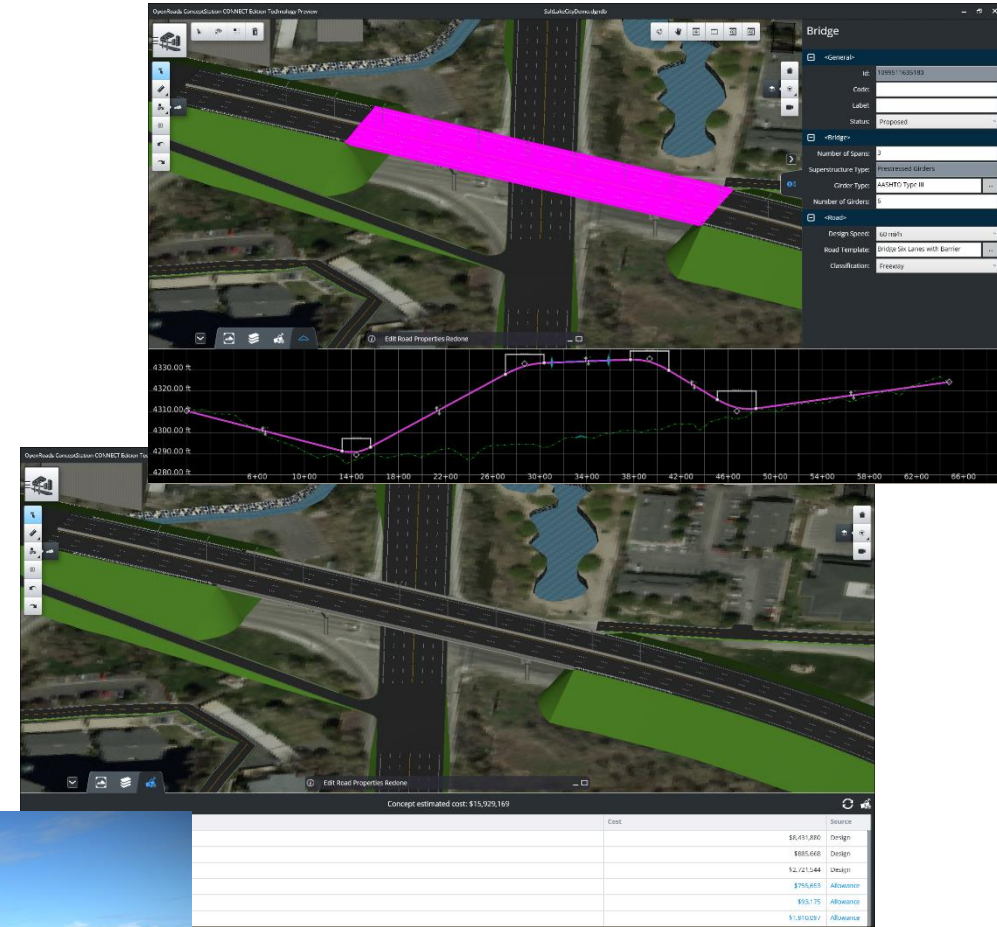
- Export to OpenRoads, Microstation
 - Export , DGN, TIN, ALG, IRD, ITL, RWK
 - Supports geometry, template, template drop transition, super elevation, Terrains, Cross Sections



Live Demo

In a nutshell

- More efficient prototyping
- Smarter trade-off
- Better communication



Questions ?

