



## eBook: OpenRoads Designer

One Application – Start to Finish – and  
Everything in Between

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ONE APPLICATION –  
START TO FINISH

# OpenRoads<sup>TM</sup> Designer

*AND EVERYTHING IN BETWEEN*

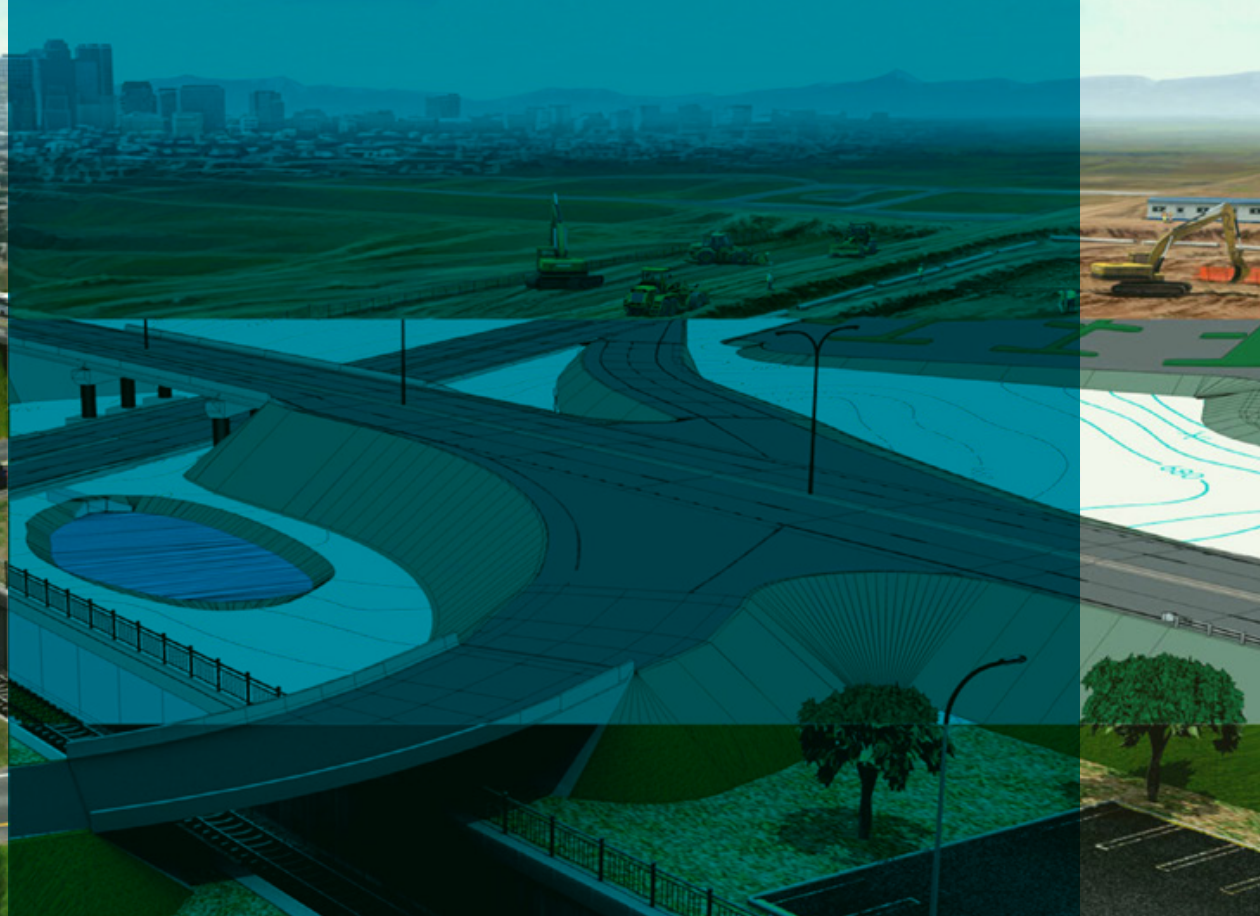


# AS ENGINEERS WE GET IT!

Each day, you face an increase in demand for engineering accuracy, contract compliance, and the production of a variety of deliverables. All within firm deadlines. **No Pressure!**

**You need an application that makes your job easier, not harder.** That's why we built OpenRoads – all aspects of road design, in ONE application so you can easily meet project requirements on time, every time, regardless of change.





ENGINEERING  
IS COMPLICATED.  
**YOUR SOFTWARE  
DOESN'T HAVE  
TO BE.**

- > Why does it have to be so manual and tedious?
- > How can I ensure accuracy across thousands of components every time there is a design change?
- > How do I know this is going to work with other team members on the project?
- > Why do I need multiple applications and data translations for one project?

**THERE IS A BETTER WAY...**





# Enter OpenRoads

## To Improve Efficiency and Productivity

Traditional 2D methods are manual and tedious, full of communication and data gaps, leaving you frustrated, exhausted, and with a project that is costing you accuracy, time, and money.

### De-stress with OpenRoads:

- One design application for survey, site, road, drainage, utilities, plan production, and more
- Dynamic change management
- Open modeling environment
- Automated drawing production





# ONE APPLICATION. START TO FINISH. AND EVERYTHING IN BETWEEN



## > DATA & DESIGN INTEGRATION

You don't work in a silo and neither should your software. From integrating existing real-world conditions, to working with other project partners, OpenRoads makes it easy to work with different data types, disciplines, and distributed teams.



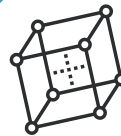
## > DETAILED ROAD DESIGN

OpenRoads is all you need for geometrics, survey, drainage, utilities, quantity takeoff, cut and fill, site grading, lane configurations, and mobility.



## > DRAINAGE & UTILITIES

From the creation of models from 2D artifacts and external data, through steady and unsteady state hydraulics and hydrology, to BIM and plans production, you'll reduce design time with a complete toolset in one application.



## > 2D, 3D, & BEYOND

Whether you need to produce traditional 2D deliverables, advance to 3D modeling, support digital transformation, or all the above, OpenRoads does it all.



# DATA & DESIGN INTEGRATION

OpenRoads is making collaboration on both 2D and 3D models easier and more efficient than ever. From team-level, work-in-progress collaboration to project-level, multidiscipline coordination, project managers, reviewers, site workers, and inspectors can view designs, perform virtual walkthroughs, query model information, and analyze embedded property data. This can all be done directly in the OpenRoads application or using a web browser.

**WATCH VIDEO >>**

## > OPEN MODELING ENVIRONMENT

Project team members can incorporate data types from an array of disciplines, which means less manual work and errors. Users benefit from full data/design transparency.

## > MANAGE DATA WITH EASE

OpenRoads' flexibility offers team members the ability to organize project files and data as needed, further removing discipline and organization silos.

## > MAINTAIN DESIGN INTENT

Easily maintain rules and relationships because every design update will reflect the most recent and accurate representation of your project.

## > SHARE THE WEALTH OF DATA

OpenRoads accommodates today's project needs and provides users with accurate information that benefits team members throughout the asset lifecycle.



# DETAILED ROAD DESIGN

Roadway designers and engineers require software that seamlessly collaborates across disciplines, addresses growing industry demands, and includes automation to remove tedious manual work. Whether you need to produce traditional 2D deliverables or advance to 3D modeling, OpenRoads is the single application that addresses all your critical business issues so you can meet project requirements for your road design and maintenance projects.

**WATCH VIDEO >>**

## > **START WITH REAL DATA**

Create accurate, georeferenced 3D designs with real-world context through the seamless integration of reality data and design information.

## > **CREATE, REUSE, AND SAVE TIME**

Create commonly used geometric layouts that can maintain constraints and relationships. Store, access, and place at any time and watch your design update.

## > **WIN THEM OVER**

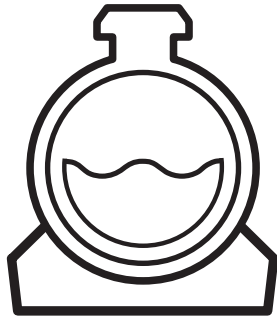
Dynamic change management and visualization capabilities give you the confidence to make any design change and get stakeholder buy-in.

## > **MITIGATE RISK**

Reduce errors, omissions, and changes during construction thanks to easy design, reviews, and approvals associated with a model-based project approach.







# DRAINAGE & UTILITIES

3D models of drainage and utilities are quickly becoming a necessity. However, road design, drainage design, and utilities modeling are often completed by separate team members utilizing different software. Working in a vacuum leads to a lack of coordination across disciplines, costly mistakes from out-of-date data, and missed opportunities to address conflicts.

**WATCH VIDEO >>**

## > EXISTING UTILITIES

Create existing utilities using Extract from Graphics, or leverage ModelBuilder to import utilities from a variety of external file formats and databases.

## > PROPOSED DRAINAGE

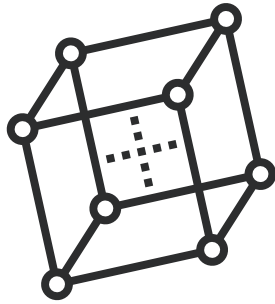
Not only can you create new drainage systems, but changes made to the road project automatically and accurately update the drainage design as well.

## > STEADY STATE FLOW ANALYSIS

Compute peak flows for an analysis scenario or compute a design scenario. Switch between scenarios and see your model update.

## > UNSTEADY STATE FLOW ANALYSIS

Conduct critical storm analysis, show overflows, see pond hydraulics, compare scenarios with graphs and symbology, and utilize analytic symbology.



# 2D, 3D, & BEYOND

Even as the transportation industry is moving toward the creation of 3D models, the need for a variety of deliverables continues to be part of the project workflow. With OpenRoads, you can create whatever deliverables you may need. Whether it's 2D or 3D, plans or models, digital or paper, OpenRoads is designed to allow you to work in all these arenas simultaneously, leveraging information from one to help populate the other.

[WATCH VIDEO >>](#)

## > PLANS AND PROFILES

Create profiles and cross sections from any point within your design. Reflect design change automatically and include details like surface features.

## > DIGITAL DELIVERABLES

Export digital deliverables to support industry BIM workflows. Include component attribution for a more efficient, data-rich design, while having the ability to create all traditional 2D and 3D design deliverables.

## > DIGITAL TWINS

OpenRoads is a digital twin authoring environment. Your federated 3D models serve as the foundation for digital twins, and with the iModelHub, assets will have an ever-evolving audit trail.

## > TODAY AND TOMORROW

3D models can be leveraged for 4D scheduling and 5D cost estimation, bringing your design to constructed fruition, on time and on budget.





# OpenRoads Designer

## CAPABILITIES AT A GLANCE

### SURVEY



- > Read/write standard raw survey formats
- > Survey data reduction
- > Feature coding for custom survey feature connectivity, display, and annotation
- > Adjustments: least squares, compass, crandall, and transit
- > Dynamic graphical and tabular editing of survey field book data
- > Terrain modeling
- > Export common data formats

### SITE



- > Reality data integration (point clouds, reality mesh, terrain data, imagery, geospatial information)
- > Surface creation, design, and analysis
- > Parcel layout
- > Grading
- > Horizontal and vertical alignments
- > Profiles and cross sections
- > Terrain modeling and analysis

### ROAD



- > Horizontal and vertical geometry
- > Profiles and cross sections
- > Advanced roundabout design
- > Roadway and site feature modeling and analysis
- > Earthwork and quantities
- > Civil cells for standard compliance and templates and automation
- > Real-time design visualization

### DRAINAGE & UTILITIES




- > Allocate and estimate stormwater loads
- > H&H modeling and analysis
- > Culvert design and analysis
- > Stormwater network design and analysis
- > Sanitary network design and analysis

### PLAN PRODUCTION & DOCUMENTATION



- > Plan, profile, and cross section sheet generation
- > Quantity and earthwork calculations
- > Construction documentation
- > BIM deliverables





# INFRASTRUCTURE INDUSTRY TRENDS **WHY MOVE NOW?**

Engineering firms and contractors are seeing over half of new business requests requiring digital project delivery.

Most users report that they are experiencing value from the application of 3D modeling techniques.

Users see a very high influence from BIM on their ability to offer services and increase their win rates for new work.

Bentley applications support multiple data exchanges, providing benefit across the project lifecycle.



# OpenRoads Designer **SOFTWARE OF CHOICE FOR ROAD DESIGN**

**35<sup>+</sup>**

YEARS  
EXPERIENCE

**44**

US DOT  
AGENCIES

**37**

EUROPEAN  
COUNTRIES

**50%**

CANADIAN  
MOTS

**29**

CHINESE  
PROVINCES

**50%**

AUSTRALIAN  
STATES

# SEE WHAT **LEADING DESIGN FIRMS** HAVE ACCOMPLISHED



## **FOTH INFRASTRUCTURE & ENVIRONMENTAL**

*Connects and Revitalizes Corridor in Cedar Falls, Iowa*

OpenRoads delivered alternatives, with the team selecting roundabouts to meet Complete Streets requirements, saving the client and community USD 32 million over 25 years as a result of the innovative design solution.

## **SHENZHEN MUNICIPAL DESIGN & RESEARCH INSTITUTE CO., LTD.**

*Rapid Transformation of 4th Ring Road and Dahe Road in Zhengzhou, China*

OpenRoads was used to build a parametric library of road sections for more than 10 road model types within a 95-kilometer route and helped detect and resolve more than 100 clashes for a comprehensive network design.

## **CDM SMITH INC.**

*Digital Roadway Design, Connecting Dubai and Al Ain, UAE*

Use of an integrated design suite allowed the global team to reduce design hours 50% as a result of a streamlined approach with a single model, utilizing OpenRoads as the central hub.



# ADDITIONAL SOLUTIONS FOR ROAD DESIGN PROJECT DELIVERY



## FOR PROJECT MANAGERS

*iTwin Design Review*

You no longer need native desktop apps to share and review design files. iTwin Design Review is web/cloud-based and always current:

- > Run reports any time and view historical changes
- > View civil quantities from within the tool
- > One less deliverable to print
- > Accessible to all team members

## FOR BRIDGE DESIGN

*OpenBridge Modeler*

The cyclical relationship between roads and bridges is why they should be modeled together:

- > Design and model any type of bridge
- > Easy-to-use for roadway engineers
- > Includes Bentley's library of civil data
- > Interoperable with OpenRoads, ProStructures, MicroStation, and more

## FOR COLLABORATION

*ProjectWise 365*

A cloud-based connected data environment that allows you to easily manage, store, and share information:

- > Leverages Microsoft 365 technology
- > Makes collaborative BIM accessible and affordable
- > Eliminates paper-based workflows
- > Includes third-party PDF review capabilities

# END-TO-END SOLUTIONS FOR INFRASTRUCTURE PROJECTS



## FOR SURVEYORS/INSPECTORS

*ContextCapture*

Rapidly capture the as-built condition of an existing site or asset using ContextCapture to quickly produce engineering-ready 3D models from photographs.

## FOR CONSTRUCTION

*SYNCHRO*

Improve safety, reliability, and predictability of construction projects, saving money by avoiding rework and identifying schedule issues ahead of time with SYNCHRO.

## FOR ASSET MANAGEMENT

*AssetWise*

Collect, analyze, and control relevant asset information, to mitigate risk, increase operational efficiency, and ensure regulatory compliance with AssetWise.



# PARTNERSHIP FOR SUCCESS

Your success goes beyond software. It is also dependent on doing business the way that best serves your organization. That is why we have a variety of subscription and license options as well as 24/7/365 support to ensure you are up and running on your software quickly and continuously.

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