DESIGNING FOR COMPLETE STREETS WITH

OpenRoads™ Designer

virtuosity

Modern Street Design for Sustainable Communities

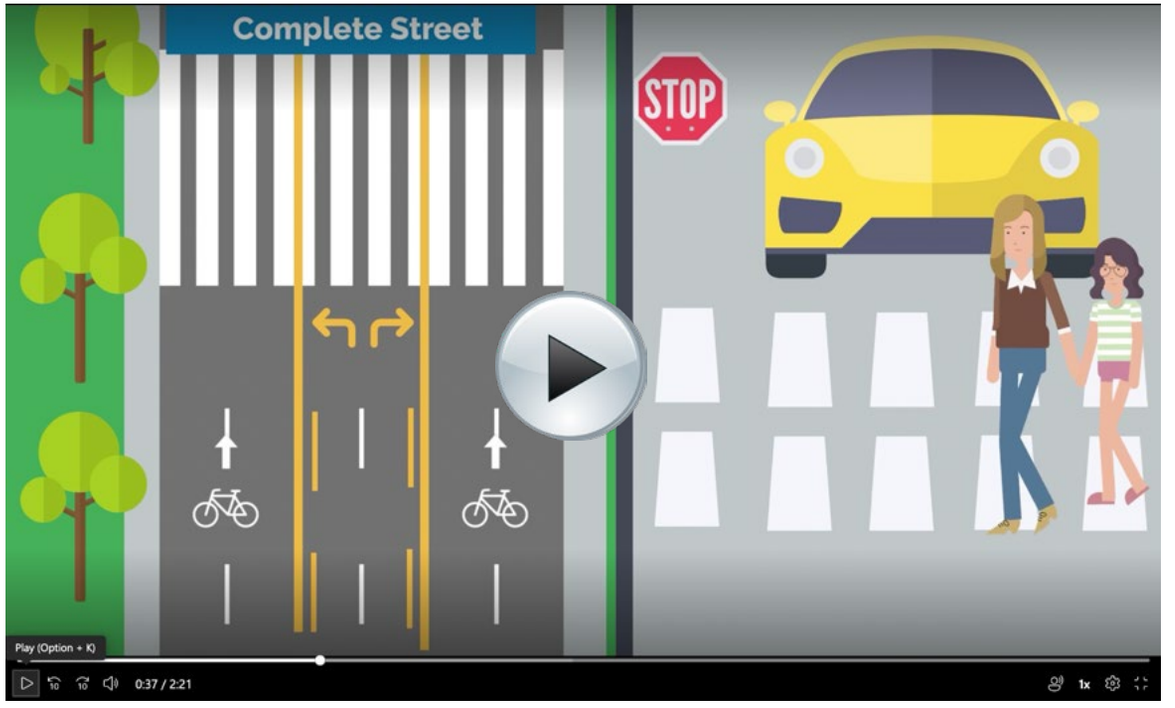
As a road engineer you take pride in delivering responsive, innovative, and sustainable transportation solutions.

And as the industry changes and grows so does the need for road projects to enhance mobility, increase the safety of people and roadways, and deliver complete solutions that respect the needs of the community you serve. Now is the time for complete streets.

What are Complete Streets ?

Complete Streets are streets for everyone. The ‘complete streets’ movement is reshaping urban boulevards, small-town main streets and even rural highways. It is an approach to planning, designing, building, operating, and maintaining streets that enables safe access for all people who need to use them, including pedestrians, cyclists, motorists, and transit riders of all ages and abilities.

Complete Streets projects can be challenging for design and engineering teams as they can incorporate a wide range of elements, from sidewalks, bicycle lanes, bus lanes, crossing opportunities, median islands, roundabouts, accessible pedestrian signals, curb extensions, to streetscape, and landscape treatments as well as upgrades to existing drainage and utilities.



How do you deliver? Software built to work the way you work and compatible for who you work with is what you need. We’re going to tell you exactly what that means ››

Enter OpenRoads

To Improve Efficiency and Productivity

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

OpenRoads Designer Delivers Start to Finish

- One design application for survey, site, road, drainage, utilities, plan production, and more
- Simplified change management
- Built-in user-friendly automation for repetitive tasks
- Easier collaboration across disciplines
- 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.

DELIVERABLES FOR TODAY AND TOMORROW

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

Create accurate, georeferenced 3D designs with real-world context through the seamless integration of reality data and design information. Work with all data types for less rework and simplified data collection and design within a model-centric plan that connects 3D models and 2D plans. Spend less time connecting the dots between data, disciplines, and teams and more time designing and delivering your civil infrastructure projects with software that does the collaborating for you, in one application.

USE REAL DATA FROM THE START

Understanding existing conditions is key to delivering successful projects. Easily import, analyze, and manipulate contextual information from a variety of sources including point clouds, reality meshes, photogrammetry, terrain, and more to bring real-world settings to your project from the start.

ENSURE CONSISTENT DESIGN

Reduce unnecessary rework and ensure design standards are always met with OpenRoads' rule-based design capabilities. Easily maintain rules and relationships knowing every single change made to any element of your design will automatically replicate in other related components.

COLLABORATE EFFECTIVELY WITH EVERYONE

Benefit from openness and leverage full data/design transparency. With OpenRoads' open modeling environment, project teams can incorporate data of all types from an array of disciplines, which means less manual import/export work, resulting in a reduction of errors.

REDUCE YOUR PROJECT RISK

Realistic visualizations help all project stakeholders make informed decisions quickly. 3D modeling and visualizations provide a detailed visual understanding of the design intent, allowing issues and conflicts to be detected among engineering disciplines saving money and time in the process.

Detailed Road Design

Stop wasting time on manual drafting instead of engineering. Working in 2D is repetitive and requires multiple applications to get one design. With OpenRoads you have one solution for every aspect of your complete streets project. Its automation tools and ability to handle large data, accelerates design time, reduces risk, and lowers project costs, saving you a lot of frustration by removing manual rework!

PURPOSE-BUILT TOOLS FOR ROAD ENGINEERING

Use one application with comprehensive design, analysis, simulation, and construction documentation tools. Design projects such as roadways, interchanges, roundabouts, water and sewer facilities, and land development, with ONE application.

WORK SMARTER NOT HARDER

Get it right the first time with built-in user-friendly design standardization and automation workflows that ensure your work always meets contract requirements while reducing labor intensive manual drafting work - no coding required.

CREATE, REUSE, AND SAVE TIME

Save time and ensure design standards with user friendly templates for roadway or other alignment-based design. Create commonly used geometric layouts that can maintain constraints and relationships. Store, access, and place at any time and watch your design update.

SEEING IS BELIEVING

Traditional 2D layouts can be confusing for non project team members and the general public. Simplify the approval process and deliver real time visualization of actual design content without the need for a dedicated visualization specialist or additional software.

Drainage and 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 lack of coordination across disciplines, costly mistakes from out-of-date data, and missed opportunities to address conflicts. Did you know, most of the industry leading drainage functionality in OpenFlows is available inside OpenRoads? You get the best of both worlds – in one product, enabling you to avoid the worry of data loss when transferring between civil and specialist hydraulics packages.

EXISTING UTILITIES

Create existing utilities using Extract from Graphics, or leverage ModelBuilder to import Shapefile of an existing water supply pipe. OpenRoads allows users in include georeferenced 3D designs with real-world context through the seamless integration of reality data and design information.

STEADY STATE FLOW ANALYSIS

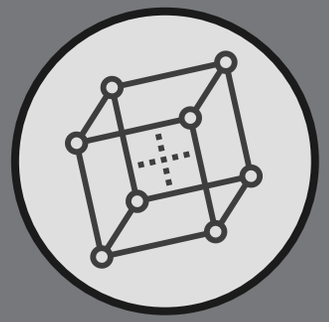
Compute peak flows for an analysis scenario or compute a design scenario. Switch between scenarios and see your model update.

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.

UNSTEADY STATE FLOW ANALYSIS

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



Deliverables for Today and Tomorrow

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.

EFFICIENTLY PRODUCE SHEET SETS

Automate the production of high-quality drawings, including multi-discipline documentation sets, which are consistent across the entire project. Automatic annotation updating helps assure the accuracy of your final construction documents.

Create plan, profile, and cross section sheets by including multiple plan or profile views on a single sheet. Sheet index support also allows for the creation of sheets and sheet numbers in collaboration with other disciplines.

ACCURATE REPORTS FOR BETTER DECISIONS

Powerful reporting capabilities automate the production of a variety of standard and customizable reports, including horizontal and vertical alignments, quantity takeoffs, clearance reports and more.

BRING YOUR DESIGN TO LIFE

Provide clients and the local community with stunning visualizations that typical 2D software cannot deliver. OpenRoads includes LumenRT Designer which turns your project into an amazing model for creating realistic images and videos - no graphic designer required.

FUTURE PROOF YOUR DELIVERABLES

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.

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

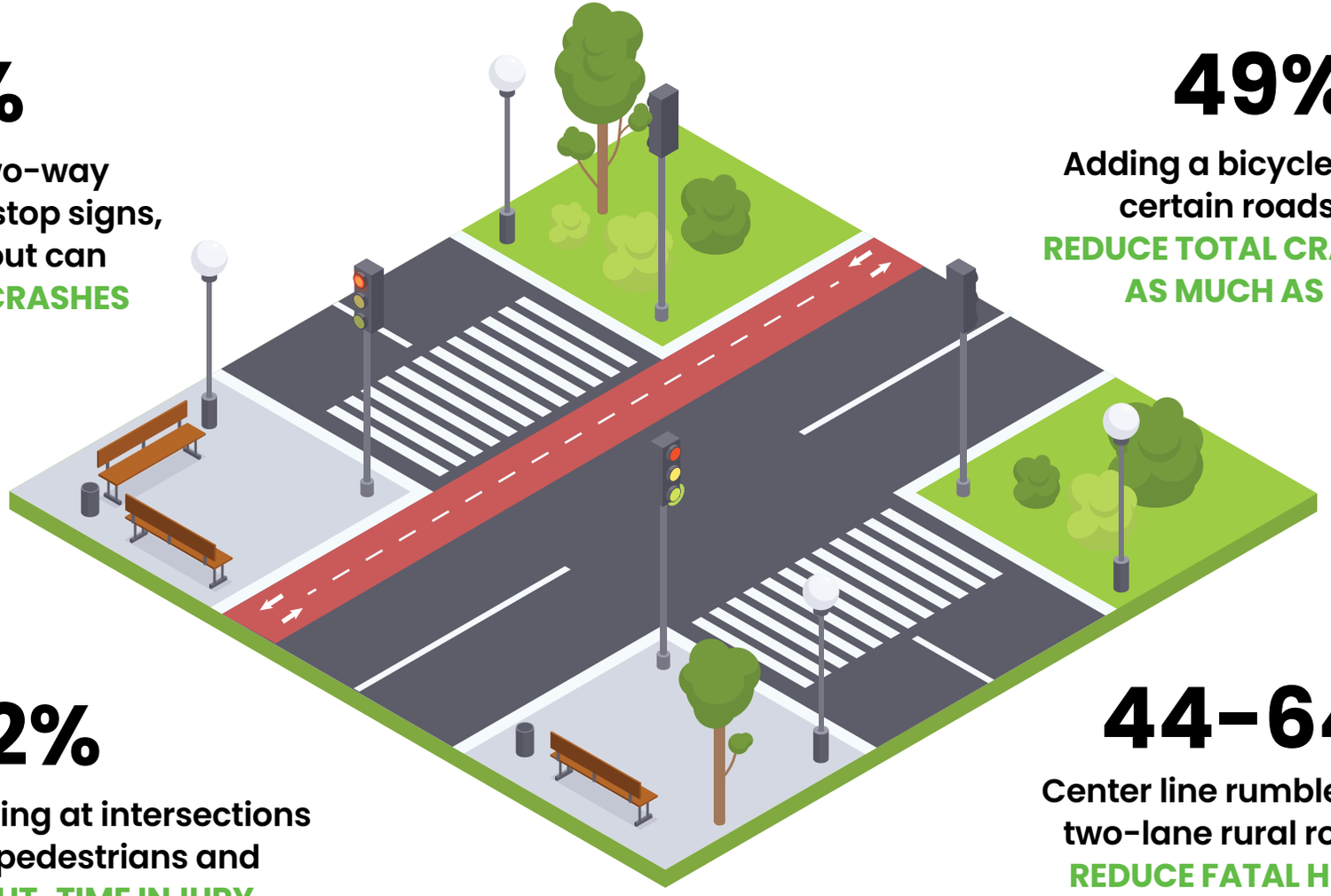
PLAN PRODUCTION & DOCUMENTATION

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

Why Moving to Complete Street Design Matters

82%

Changing a two-way intersection with stop signs, to a roundabout can **REDUCE FATAL CRASHES BY 82%**



49%

Adding a bicycle lane on certain roads can **REDUCE TOTAL CRASHES BY AS MUCH AS 49%**

42%

Increasing lighting at intersections can protect pedestrians and **REDUCE NIGHT-TIME INJURY CRASHES BY UP TO 42%**

44-64%

Center line rumble strips on two-lane rural roads can **REDUCE FATAL HEAD-ON CRASHES BY 44-64%**

See What Leading Design Firms Have Accomplished

JMC2 CIVIL ENGINEERING DOWNTOWN PEDESTRIAN IMPROVEMENT PROJECT

- A complete rebuild of all driveways, sidewalks, drainage systems, water lines, and street lighting, brought the street up to current ADA standards.
- Bentley's highly accurate 3D design software helped JMC2 to decrease design time by 20% and save USD 50,000, a cost-saving that was passed back to the client.

FOTH TRANSFORMS, CONNECTS, AND REVITALIZES CEDAR FALLS, IOWA CORRIDOR

- The corridor redesign which included six new roundabouts, bike lanes, and bus stop turnouts has provided an 18% reduction in crashes and an 89% reduction in injury crashes.
- Bentley's open applications facilitated coordinated modeling to reduce conflicts and expedite design by an estimated 50%, saving over USD 500,000 in construction costs.

SAI-SYSTRA GROUP MUMBAI COASTAL ROAD PROJECT (SOUTH) PACKAGE – II

- Using 3D drive-throughs in OpenRoads Designer enabled SYSTRA to identify interferences between the seawall and the structures saving 20% in resource hours.
- Additionally, the dynamic nature of the 3D model enabled them to effortlessly define and modify the plan, saving them 50% in design time.

Getting Started

PARTNERSHIP FOR SUCCESS

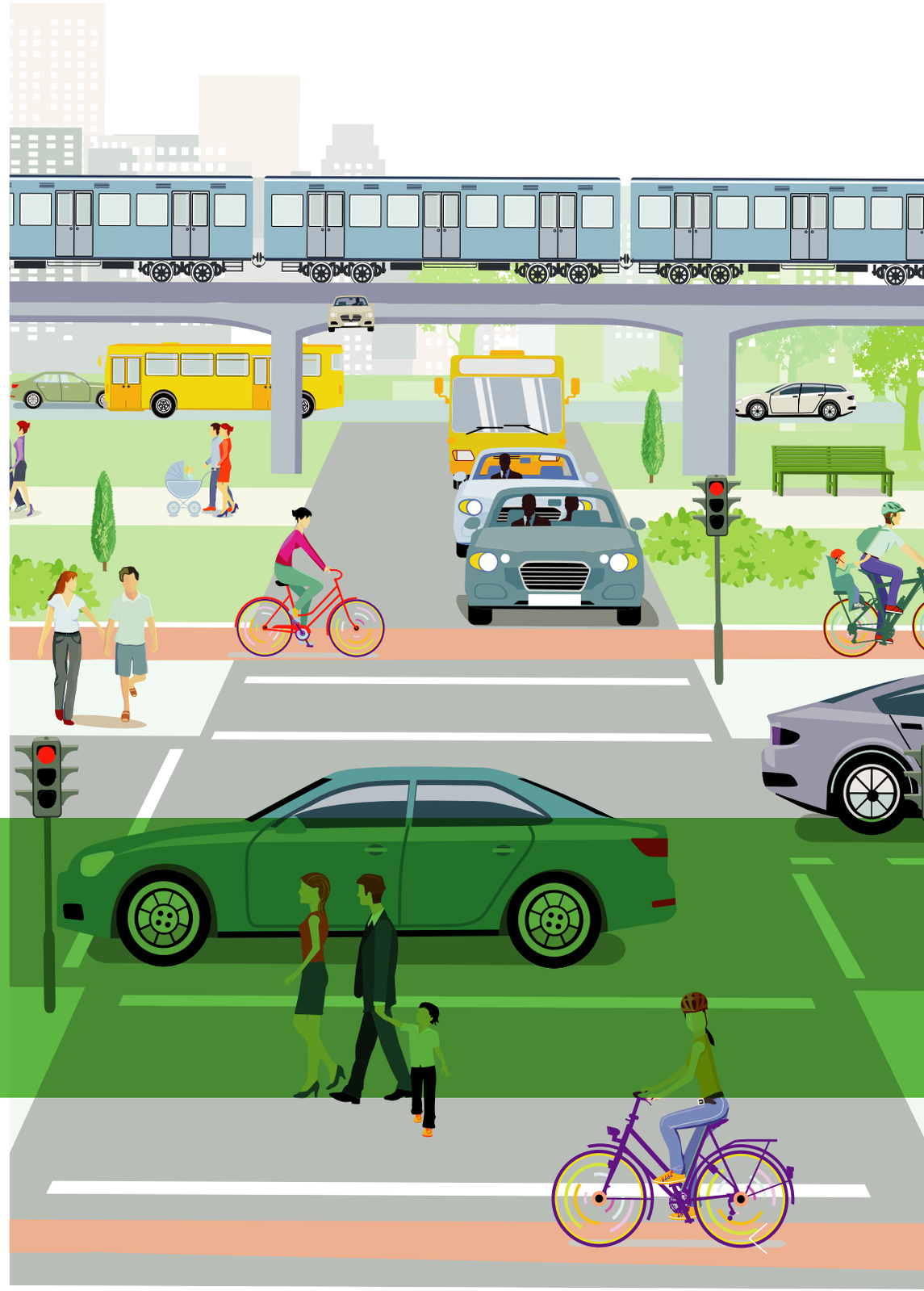
Bentley makes it easy for organizations to find the product license that offers the best options, affordable price, and the training you need to be successful – through Virtuosity, Bentley's eStore for practitioner licenses.

Whatever subscription is right for you, you'll get access to our Expert Services, and the ability to leverage one-to-one mentoring by Bentley project experts, personalized training for your team, and on-demand learning.

We call this bundle Virtuosity's Virtuoso Subscription, and it ensures your workforce can quickly learn the latest technology and workflows while minimizing downtime and project costs.

Shop OpenRoads Designer Now

Chat With A Civil Solutions Expert



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