

Pave the Way for Safer Streets

An Engineering Guide for Secure Environment Design





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Introduction

According to the World Health Organization, 3,400 individuals lose their lives daily on global roads, and tens of millions of people each year suffer from road-related injuries or disabilities. Among those who use the roads, children, pedestrians, cyclists, and the elderly are notably vulnerable.

Many of these deaths occur on urban roads and are preventable crashes caused by behavior induced by street design.

In this e-book, you will discover how to reshape road engineering by leveraging comprehensive planning and design capabilities to design safer streets, making urban environments secure and saving lives.





What are safe streets?

“Safe streets” refer to roadways and urban environments designed and maintained to prioritize the safety and well-being of all users, including pedestrians, cyclists, and motorists.

This term signifies creating a built environment that minimizes the risk of accidents, injuries, and fatalities by implementing various safety measures and infrastructure.

These streets feature well-marked crosswalks, clear signage, proper lighting, traffic calming measures, and dedicated spaces for cyclists and pedestrians.

Why is moving to safe streets crucial?

The impacts of safe streets are significant:

- 1. Safety Boost:** Reducing accidents lays the foundation for safe travels.
- 2. Public Health:** Embracing active transportation fosters well-being and reduces pollution.
- 3. Quality of life:** Welcoming spaces foster community and enhance the lives of residents.
- 4. Economic Growth:** Flourishing businesses elevate local economies and property values.
- 5. Sustainability:** Promoting sustainable transport reduces car dependency and contributes to an eco-friendly urban environment.





How are safe streets successfully designed?

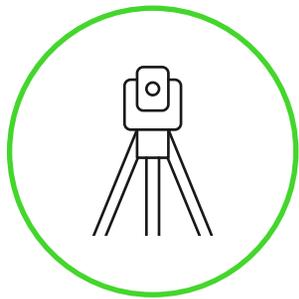
Designing safe streets involves considering multiple elements that improve the safety and well-being of everyone. The top five elements include:

- 1. Pedestrian Safety:** Well-lit paths and crossings.
- 2. Cycling Infrastructure:** Dedicated lanes away from traffic.
- 3. Traffic Calming:** Speed bumps, roundabouts, and narrower lanes.
- 4. Visibility and Signage:** Clear markers for all.
- 5. Community Spaces:** Green spaces and social spots.

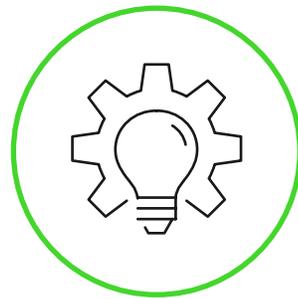
Design safer streets

In addition to considering the above elements, understanding existing conditions is crucial for designing streets that guarantee everyone's security and well-being.

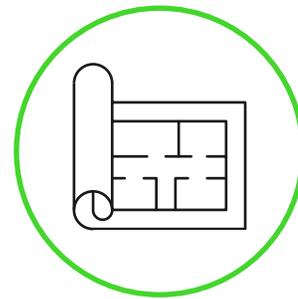
Here is the typical workflow for designing safer streets:



Capture existing conditions



Create conceptual designs during the planning stage

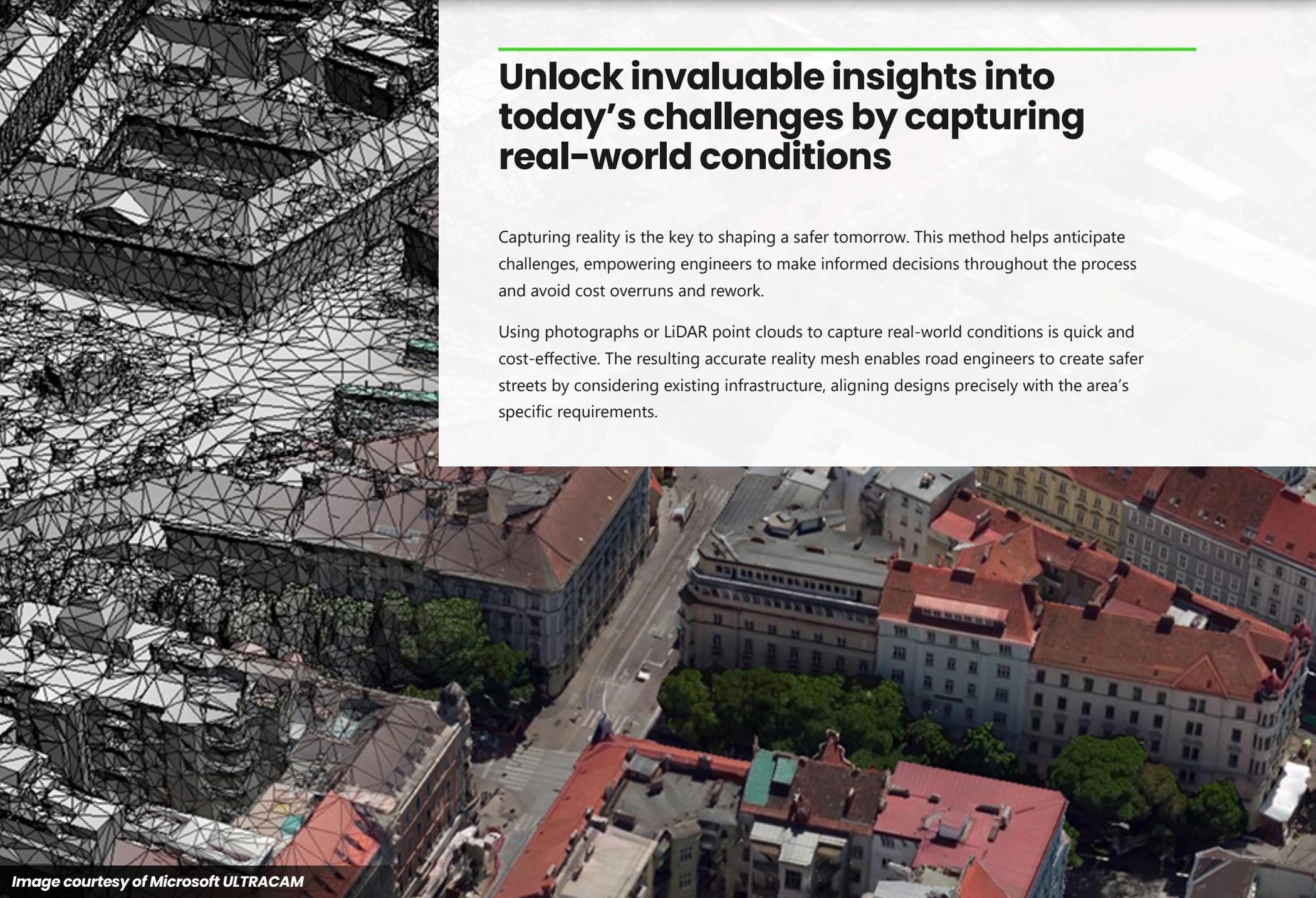


Design a detailed road project



Bring designs to life





Unlock invaluable insights into today's challenges by capturing real-world conditions

Capturing reality is the key to shaping a safer tomorrow. This method helps anticipate challenges, empowering engineers to make informed decisions throughout the process and avoid cost overruns and rework.

Using photographs or LiDAR point clouds to capture real-world conditions is quick and cost-effective. The resulting accurate reality mesh enables road engineers to create safer streets by considering existing infrastructure, aligning designs precisely with the area's specific requirements.

Quickly simulate road designs by leveraging real-world conditions for optimal outcomes

Creating conceptual road designs based on real-world conditions will facilitate the exploration of diverse design options early on, streamlining the process and achieving better efficiency.

Identifying risks and understanding financial impact early helps you to make informed decisions throughout the project.

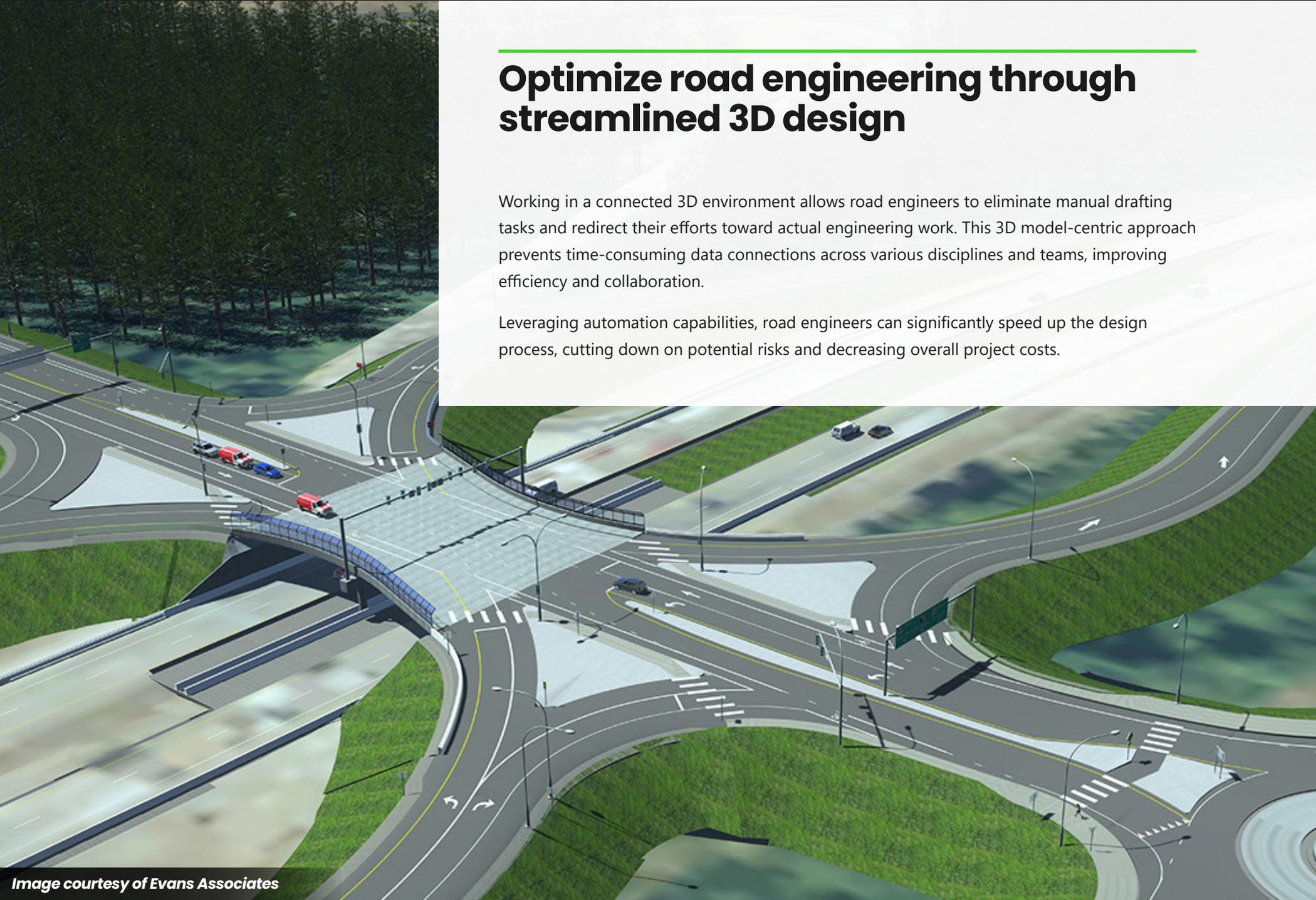
Additionally, designing the road in 3D and sharing the model includes the local community from the start, ensuring their needs and preferences are part of the design and fostering a sense of community involvement and support for the project.



Optimize road engineering through streamlined 3D design

Working in a connected 3D environment allows road engineers to eliminate manual drafting tasks and redirect their efforts toward actual engineering work. This 3D model-centric approach prevents time-consuming data connections across various disciplines and teams, improving efficiency and collaboration.

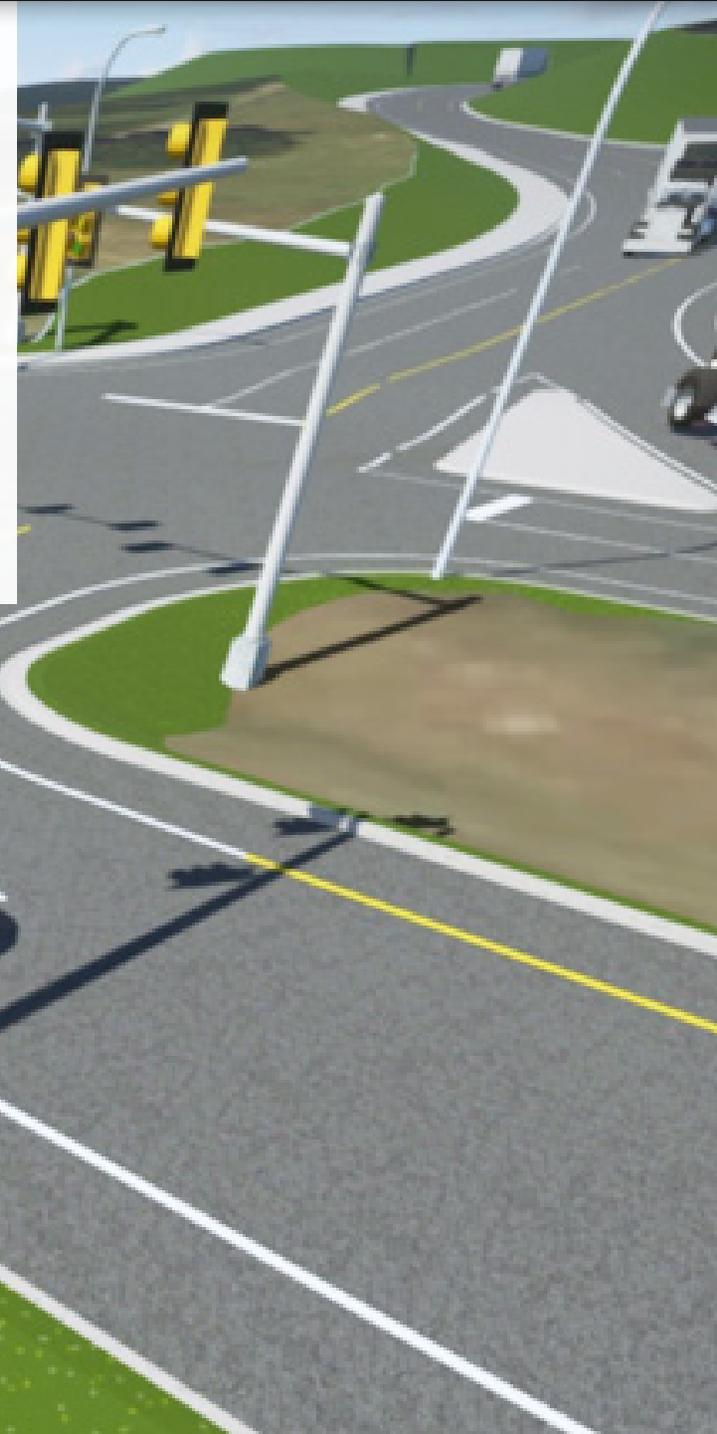
Leveraging automation capabilities, road engineers can significantly speed up the design process, cutting down on potential risks and decreasing overall project costs.



Bring road designs to life to improve communication and accelerate buy-in

Bringing projects to life plays a vital role in communication and swiftly gaining stakeholder approval. Real-time 3D visualization enables a comprehensive understanding of the project across all the stakeholders, enhancing clarity and communication.

Creating impactful designs using cinematic-quality visuals, videos, or real-time presentations of infrastructure models will secure enthusiastic buy-in for the project.





Design firms are already saving lives

Using Bentley solutions, users across the world like Foth are creating safe streets.

Foth Transforms, Connects, and Revitalizes Cedar Falls, Iowa Corridor

Cedar Falls, Iowa, United States

Located in Cedar Falls, Iowa, the University Avenue roadway, which serves over 20,000 vehicles per day, is over 60 years old and needed to be redeveloped to effectively serve the community. To improve roadway conditions and traffic flow, provide non-vehicular access, and support economic growth, Cedar Falls initiated a USD 38.9 million revitalization.

Foth modeled and analyzed several design alternatives. The modern, efficient transportation network they developed is estimated to save USD 32 million over the next 25 years. Animated renderings effectively presented the design intent, accelerating public approval. Bentley applications reduced the design phase by 50%, with construction beginning a year and a half ahead of schedule.

The corridor redesign, which includes six new roundabouts, bike lanes, and bus stop turnouts, has provided an 18% reduction in crashes and an 89% reduction in injury crashes.

Civil WorkSuite: field to finish solutions for better road design

Civil WorkSuite empowers road engineers to seamlessly create streets that are not just safe, but also enrich communities and most importantly, save lives.

However, because the work of a road engineer is not limited to making streets safer, Civil WorkSuite includes all the capabilities that you need to do your daily job, no matter if you are designing a road, a bridge, or a tunnel.

Civil WorkSuite includes nine leading purpose-built transportation solutions, including OpenRoads™ Designer, OpenBridge® Designer, OpenSite® Designer, and OpenTunnel® Designer.



Image courtesy of Sichuan Road and Bridge

Four common workflows you can improve with Civil WorkSuite

Here are the four common workflows that our users are achieving with Civil WorkSuite.

	Workflow 1 Road Design	Workflow 2 Bridge Design	Workflow 3 Site and Land Planning	Workflow 4 Tunnel Design
Acquire	iTwin® Capture Modeler	iTwin Capture Modeler	iTwin Capture Modeler OpenSite Designer	iTwin Capture Modeler
Plan	OpenRoads ConceptStation	OpenRoads ConceptStation	OpenSite Designer	OpenRoads ConceptStation
Design	OpenRoads Designer LumenRT™	OpenBridge Designer	OpenSite Designer LumenRT	OpenTunnel
Analyze	OpenRoads Designer OpenFlows™ CivilStorm®	OpenBridge Designer ProStructures® OpenFlows CivilStorm	OpenSite Designer OpenFlows CivilStorm	OpenTunnel ProStructures OpenFlows CivilStorm
Deliver	OpenRoads Designer OpenFlows CivilStorm	OpenBridge Designer ProStructures OpenFlows CivilStorm	OpenSite Designer OpenFlows CivilStorm	OpenTunnel ProStructures OpenFlows CivilStorm



Getting started

Civil WorkSuite equips engineers with the capabilities that they need to design and analyze projects better and faster while minimizing overhead fees. You will benefit from purpose-built modeling applications that reduce design time, automated plan production that accelerates documentation, and data scalability that consumes and processes large files for improved project performance.

With Civil WorkSuite, you will receive a 12-month license for trusted Bentley software with customizable training from experts. With lower upfront costs and flexible support options, businesses of all sizes can now compete with the industry's heavy hitters.

[Shop Civil WorkSuite Now >](#)

