Keeping People Moving

Mobility Simulation

Bentley®

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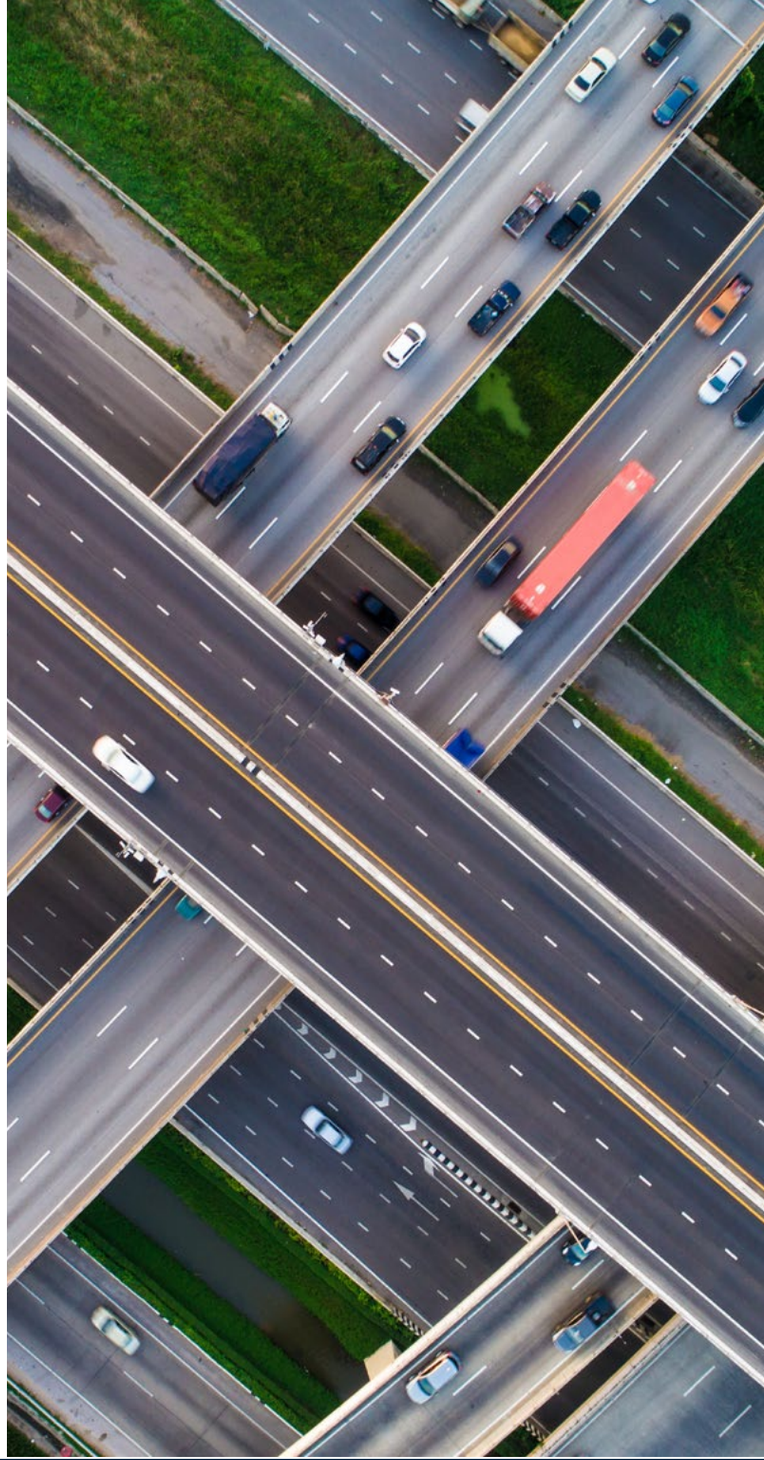
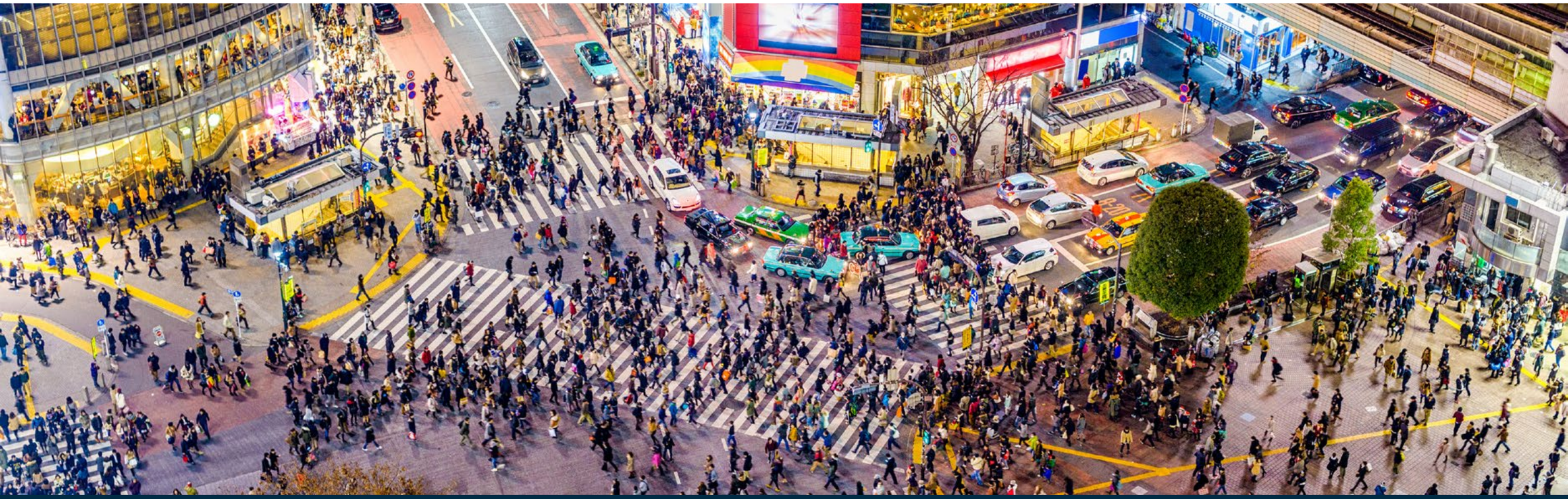


What is **Mobility Simulation?**

Every day, millions of people move around regions, cities, and spaces. Mobility simulation helps understand these movements by combining real-world data with models to reveal the journeys that people will typically take.

Mobility is shaped by assets; from cars and buses, to roads, trains, bridges, tunnels, trains and more. But it is the overall transport networks and services, economic and population growth, transport policies, programs and new technologies that determine how infrastructure will be used by communities, customers, and citizens.

Mobility simulation is concerned with the **planning stage** of infrastructure development and helps ensure you make the right decisions before entering the implementation phase. Multiple scenarios can be tested to help determine what the effect on transportation will be today, and what it will look like in the future, to support both short, medium and long-term planning decisions.



Why **is it important?**

Have you ever wondered what would happen if a new bridge was built in a city, or part of an intersection was changed? Mobility simulation **helps answer these "what if" questions** by measuring the impact of a given scenario so users can evaluate and forecast pedestrian and transport performance, reliability, accessibility and cost. Mobility simulation **supports real-world decisions** so answers to critical questions can be provided before any physical changes are made.

Mobility simulation helps:

- Make smart investment decisions
- Identify the safest, most convenient, sustainable or economical solution
- Reduce the risk of projects failing or having an adverse effect
- Prioritize projects that have the highest impact
- Optimize the spaces used by people
- Support business case decisions
- Communicate the value of changes
- Reduce the costs in planning and construction stages

What **questions can it answer?**

You may be surprised how many questions mobility simulation can help answer. It can answer any number of questions to help guide the planning process and ensure you make the right decisions for your project.

Examples of some questions mobility simulation can answer include:

- How many new passengers can be served with a new transit service?
- How many people will be “priced off” if tolls are implemented?
- How much traffic will a new development generate?
- How will transit-oriented development affect mode choice?
- What road planning can I undertake to mitigate construction traffic impacts?
- What are the effects of a new airport in the land value?
- How are commodities moved by truck in a region?
- How much pedestrian “induced demand” will be generated if we host the Olympics?

Have a question you need answering? Explore our comprehensive range of mobility simulation products.

Meet **EMME**®

EMME is a complete transportation forecasting system for planning the urban, regional and national movement of people. EMME is used to create digital transport models for travel demand forecasting, traffic planning, transit service planning, and many other applications to support effective transport strategies. By modeling the people, places, processes, and options involved in travel, transport planners can evaluate transport system performance on any number of virtual scenarios prior to implementation. EMME powers some of the world's most demanding transport models with trusted algorithms and rigorous procedures.

Benefits

- Highly regarded traffic, public transit and multimodal network modelling procedures are trusted by leading transport agencies
- Quickly evaluate any number of virtual scenarios or interventions to test the impact before implementation
- Assemble virtually any travel demand model structure including activity-based (ABM), tour-based, hybrid and trip-based models
- Easily configure model procedures with a visual control flow system that anyone on the team can use, or leverage comprehensive Python APIs for developers for model-as-code
- Houses all your mobility data, including multimodal networks, travel demand, surveys, demographics and travel simulations including network results, households, persons, trips and tours
- Create 3D animations across time or between planning scenarios to understand regional mobility patterns at-scale or playback time-based models

Meet **CUBE**

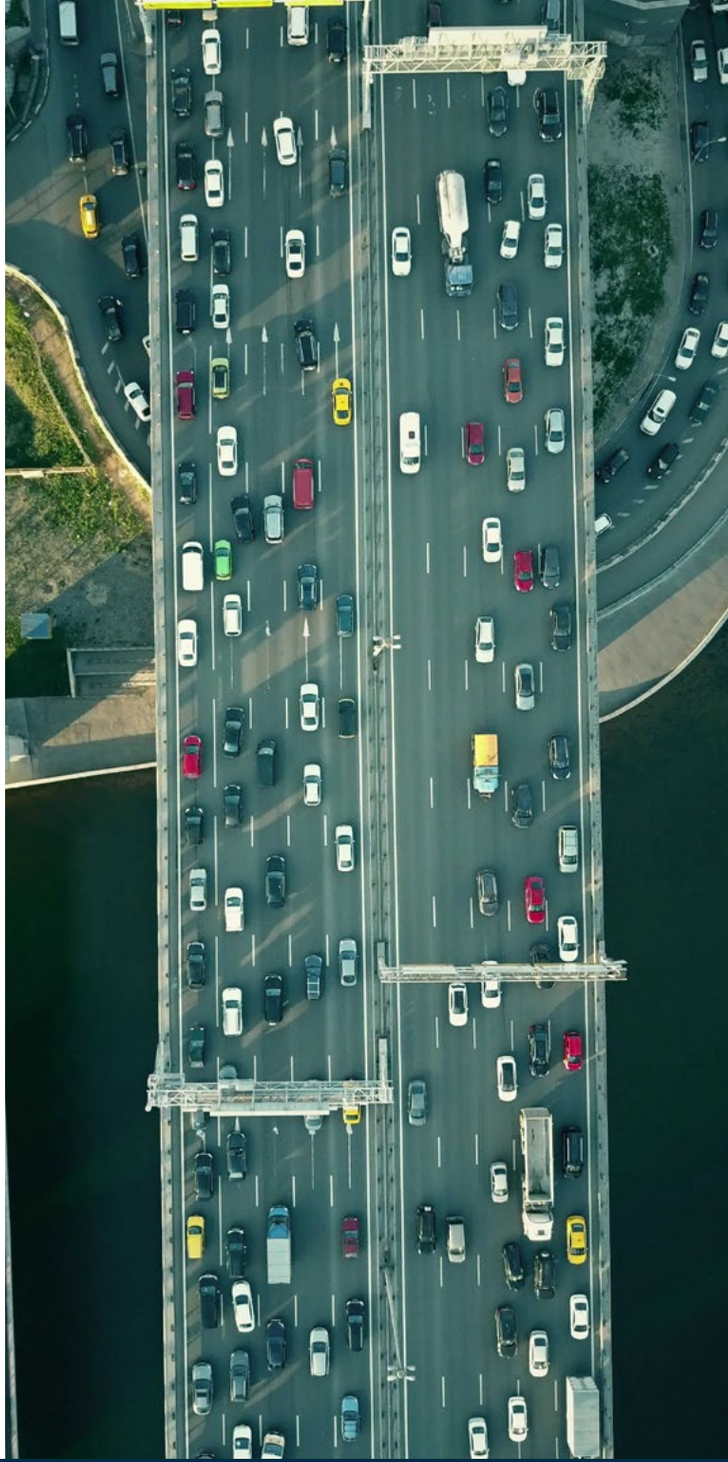
CUBE is a multimodal transport and land use planning system used to analyze the effects of new projects and policies on a city's transportation network, land-use, and its population. It is used to develop and apply predictive multimodal transportation models to simulate how changes in infrastructure, operations, technology and demographics will impact movement and accessibility of a given area. Including macroscopic movement of people and vehicles, freight modeling, land use modeling, CUBE allows you to know the impact before implementation.

Benefits

- Easily visualize, test and compare multiple scenarios to support investment decisions
- Uncover hidden consequences to save time and money during review cycles before entering the design process
- Reduce rework, opportunity for errors in data transfers, and streamline processes with powerful spatial technology
- Use simple flow charts to group processes and quickly complete tasks
- Access libraries of functions to save time when developing models
- One central interface for land use and transport to support seamless communication and data sharing

"CUBE - As the name suggests, it provides a multidimensional approach in developing and editing the models, making it easier to work on for modelers across the world."

— Surender Ganta, Transport Planner, Urban Mass Transit Company



Meet **CUBE Access**

An intuitive planning software that empowers its users to perform their own accessibility analysis whether it be for national, regional or local areas. CUBE Access functions as an ArcGIS add-on, allowing for easy implementation into an organisation's workflow. With all the data included in one package, you can hit the ground running with everything you need at your fingertips.

CUBE Access allows users to easily map Access Scores for your community and quantify the number of destinations that are accessible by any mode of travel within a specified travel time limit.

Benefits

- Quickly understand your community's accessibility to employment opportunities, daily errands, public services, and much more
- Test and compare proposed changes to your city's transportation and land use
- Conduct your first analysis in less than an hour with all your roadway and public transport networks, census data, and points of interest delivered with the software
- Calculate accessibility via walking, biking, using public transportation or automobiles
- Test multimodal parameters such as walking speed and cycle lanes
- Compare and visualize transportation impacts across demographic groups and different neighborhoods
- Document economic growth drivers in a region as well as potential opportunities for transit-oriented development

Meet **DYNAMEQ**®

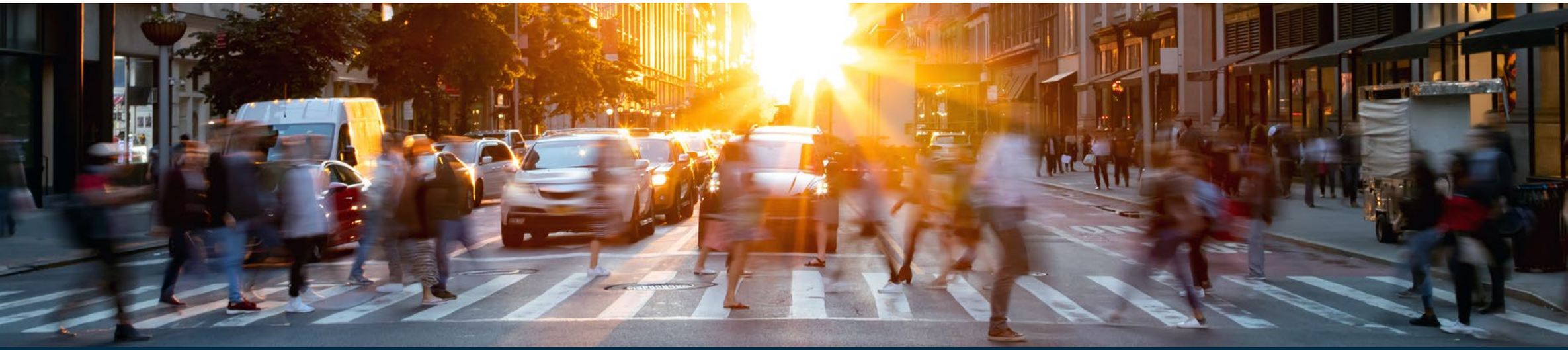
DYNAMEQ provides an advanced vehicle-based traffic simulation and simulation-based dynamic traffic assignment (DTA) that allows even large, congested applications to be modelled reliably with a single traffic model at a consistent level of detail throughout the entire network. DYNAMEQ traffic simulation is applicable to a wide range of operational and travel forecasting applications, is scalable across wide-area urban networks and provides comprehensive vehicle-level detail throughout the model.

Benefits

- Simulate and evaluate traffic studies with a single traffic model of your entire city
- Simulate individual vehicles with car-following, lane-changing and gap-acceptance models for realistic traffic behaviour and representation of congestion
- Industry-leading Dynamic User Equilibrium (DUE) model convergence facilitates efficient base year calibration and forecasting on highly congested scenarios
- Simulation-based O-D matrix adjustment can save months of calibration time and effort when used with available count data
- Streamlined network development tools, data importers and signal generation tools speed-up project application

The DTA Model is an effective tool to evaluate traffic diversion impact due to network supply capacity changes and the model results are credible and highly recognized by the City Council and transportation professionals."

– Peter Xin, City of Edmonton



Meet **LEGION**®

A software tool for modeling, simulating and analyzing the movement of pedestrians within a defined environment. Its output supports improvement of infrastructure assets ranging from metropolitan and mainline railway stations, Olympic common domains, stadiums and arenas, airports and ports, bus and coach stations, and more.

"Highly visual, LEGION makes it easy to validate and adjust, if necessary, the design and relevance of the redevelopment project."

— Gonzalo Tavares, Mobility and Pedestrian Flow Analyst, SYSTRA

Benefits

- Discover unexpected insights based on LEGION's extensive empirical scientific research
- Test designs and operational assumptions to assess and optimize scheme performance, communicate with stakeholders and support investment decisions
- Identify bottlenecks and test multiple scenarios to improve pedestrian journey times and levels of service
- Test evacuation strategies to mitigate risk associated with emergencies
- Identify under-used areas of space and implement solutions to improve pedestrian flow
- Enter input data quickly and easily using a logical and structured data template
- Easily build and assess pedestrian models, supported by artificially intelligent entities, automatic navigation, and spatial objects
- Define, re-use, and share objects across projects and teams to increase productivity

Mobility Simulation

Thousands of professionals around the world rely on Bentley's mobility simulation software to understand the urban, metropolitan, regional, and national movement of people. Bentley's mobility simulation software measures the impact of transportation policy, demographics, and urban geography on travel demand and transportation infrastructure. Using Bentley's mobility simulation software our users can evaluate and forecast transportation system performance, reliability and accessibility.

From regions and cities to buildings and stations, from roads and public transit to new mobility, from travel demand to traffic and pedestrian simulation, Bentley mobility simulation applications help to inform real-world decisions across planning, engineering, construction, and operations.

Model, forecast, and analyze movement through regions, cities, and places

Want to learn more? **Chat with an expert ›**

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