Whether unsignalized or signalized, isolated or coordinated, you can use TransModeler to simulate intersections with greater detail and accuracy than any other microsimulation software. TransModeler allows you to achieve ground-truth geometric representation for the most faithful portrayal of storage, capacity, and operations.

**Intersections**

That geometric fidelity extends to roundabouts, too, allowing you to simulate the range of roundabout designs from the traditional to the novel, from single-lane to multi-lane. TransModeler employs rigorously calibrated car following, lane changing, and gap acceptance behavioral models that are field-tested and validated against empirical data sources such as those referenced in the *Highway Capacity Manual* (HCM).

TransModeler reports **level of service** (LOS) for intersections of all kinds and is HCM2010-compatible, basing LOS on simulation-based **control delay**. You can also use TransModeler to optimize isolated signal timings and cycle lengths and offsets for coordinated systems.
You can use TransModeler to simulate tough, oversaturated urban street conditions, where legacy traffic simulation tools routinely succumb to gridlock. Moreover, without having to use the built-in application programming interface (API) or purchasing add-ons or modules, you can simulate more urban street features than any other simulator, such as:

- **Two-way left turn lanes** (TWLTLs) and **reversible lanes**
- Access management control from curb cuts to RCUTs (Restricted Crossing U-Turn intersections)
- **Street diets** and **smart streets**
- Public transportation strategies like **bus lanes** and **transit signal priority** (TSP)

Per the HCM, TransModeler reports urban street level of service (LOS) based on the ratio of average travel speed to free flow speed.

On urban streets with coordinated traffic signals, you can also leverage the one-of-a-kind **microsimulation-based traffic signal optimization** in TransModeler to compute robust, operations-sensitive cycle lengths and offsets.
TransModeler makes it simpler and more cost-effective to leverage microsimulation to support traditional traffic modeling studies, such as Interchange Justification Reports (IJR) and Traffic Impact Analysis (TIA) studies. TransModeler has an integrated traffic impact analysis toolbox for calculating:

- trip generation
- internal capture
- pass-by trips
- trip distribution

**Traffic Impacts**

Use TransModeler and its scenario management tools to explore the impacts of alternative capacity improvements to mitigate traffic impacts in base and forecast years.

TransModeler makes it easy to analyze future years with tools to estimate forecast-year demand based on annual growth rates and to import demand from multiple travel demand modeling platforms.

You can leverage the level of service (LOS) reports in TransModeler to analyze traffic impacts. TransModeler reports measures of effectiveness consistent with HCM2010 definitions for intersections, urban streets, freeways, multi-lane highways, and two-lane highways.
TransModeler packs a variety of powerful features for modeling two-lane highways. The same road editing tools that make it possible to simulate unique intersection geometries, novel roundabout designs, and alternative interchange designs allow you to accurately model horizontal and vertical curvature (i.e., grade) so that you can capture the critical impacts of geometric delay, particularly on heavy vehicles.

TransModeler simulates the limiting speeds of heavy vehicles on upgrades and down-grades as a function of detailed vehicle attributes, including mass and power. Moreover, you can simulate passing zones and passing lanes on two-lane highways. TransModeler simulates passing maneuvers in the opposing lane where passing lanes are not present.

TransModeler also reports level of service (LOS) of two-lane highways based on performance measures, such as average travel speed (ATS) and percent time spent following (PPTSF) per the HCM2010.
Whether for traditional capacity and alternatives analyses or for evaluation of active traffic management (ATM) strategies, TransModeler is the most capable solution because it simulates driver behaviors and vehicle interactions in merging and weaving sections in ways that other microsimulators cannot.

In projects around the US, TransModeler has been confirmed to simulate levels of service similar to those estimated with HCM methods, report capacities observed in the field on congested freeways, and replicate the fundamental diagram through stable and unstable conditions. On top of a solid behavioral foundation, you can simulate a host of ATM and intelligent transportation system (ITS) designs right out of the box, including:

- reversible lanes
- managed lanes
- hard shoulder running
- ramp metering
- variable speed limit signs
- electronic toll collection

You can also report simulation-based levels of service for basic, merging, diverging, and weaving freeway segments.
Choose Mesoscopic Simulation for Scalability
TransModeler can also simulate wide area networks at varying levels of fidelity and with different simulation methods. TransModeler includes a mesoscopic simulation mode in addition to its microscopic simulator. In the mesoscopic simulator, vehicles are collected into traffic cells that travel with an average speed and density and streams that form by movement at intersections and diverge areas on freeways. Aggregate speed-density relationships and capacities that vary by road class are used to model traffic flow.

Speed-density functions offer a robust, computationally efficient substitute to the more accurate car-following and lane-changing algorithms that are characteristic of microsimulation, allowing you to scale your simulation to wider and wider areas.

Choose Hybrid Simulation for Increased Accuracy
TransModeler provides a hybrid simulation capability in which high fidelity microsimulation can be readily intermixed with mesoscopic simulation on any network segments. Portions of the network of greatest sensitivity and interest can be simulated with microsimulation, and other portions can be simulated by the mesoscopic model in a consistent, unified network. This hybrid capability makes it possible to simulate very large networks with modest computing power and without sacrificing accuracy and level of detail where it is most needed.
About TransModeler

TransModeler is a powerful and versatile traffic simulation package applicable to a wide array of traffic planning and modeling tasks. TransModeler can simulate all kinds of road networks, from freeways to downtown areas, and can analyze wide area multimodal networks in great detail and with high fidelity.

Based upon the latest research, TransModeler employs advanced methodological techniques and software technology to bring traffic simulation into a new era. It simulates public transit, as well as car and truck traffic, and handles a wide variety of ITS features such as electronic toll collection, route guidance, and traffic detectors. You can use TransModeler with TransCAD to provide an integrated capability to perform operational analysis of transportation projects and plans. Learn more about TransModeler at www.caliper.com/TransModeler.

Are you simulating smaller projects for traffic impact and other studies? TransModeler SE is a complete traffic analysis software solution for up to 20 intersections or 100 links for only $995. TransModeler SE is a powerful microsimulation, traffic impact analysis, and traffic signal optimization tool that is HCM2010-compatible. Learn more about TransModeler SE at www.caliper.com/transmodeler-se.

Caliper Corporation
1172 Beacon Street, Suite 300
Newton MA 02461 USA
617-527-4700
sales@caliper.com
www.caliper.com