Traffic Microsimulation Modelling

Microsimulation models replicate the movements of individual vehicles travelling through a network in real time. Cundall utilises microsimulation modelling to evaluate the impacts of proposed interventions before implementation.

Traffic flow simulation
Microsimulation modelling facilitates simulating traffic to the finest detail, whether in cities or motorways, and to develop efficient traffic management strategies to test and mitigate traffic issues.

Using PTV Vissim, a detailed multi-modal microscopic modelling software, Cundall helps create a balanced mobility ecosystem by improving the traffic situation and consequently reduce congestion and emissions. We use microsimulation modelling for:

- Simulating complex vehicle interactions realistically and detailed junction geometries.
- Parking simulation.
- Modelling demand, supply, and behaviour in detail.
- Fine tuning of traffic signals/representation of intelligent transportation systems.
- Simulating autonomous vehicles and new forms of mobility.
- Assessing the impact of road designs, traffic signal optimisation, or traffic flow management measures before implementation.
- Modelling the interaction of all modes, including public transport simulation, simulation of cyclists and pedestrians.
- Providing realistic 3D visualisation outputs.

Highways engineering
Microsimulation realistically simulates and balances highway capacity and traffic demand and as such is used for modelling the impact of developments across a large network, where background traffic may diver or choose new routes as a result of congestion.

We can model any geometry and type of junction, from simple priority junctions to signal-controlled nodes and roundabouts with public transport priority and pedestrian interaction or ‘magic roundabouts’, or complex motorway interchanges.

Airside simulation
A critical and costly task for airport management is the efficient servicing of airplanes by service vehicles.

Airside efficiency can be improved by simulating and testing different strategies, the apron design, servicing routes and restricted routes due to length or height of vehicles. Through
Public Transport simulation

We can model public transport vehicles, including bus, tram, train/metro/tube, and analyse specific operational improvements. In particular, microsimulation is used as a planning tool for multimodal transfer stops.

Through the representation of infrastructure, from roads to interchanges and transport hubs, we can test multiple scenarios to identify issues and opportunities to find improvements that deliver the optimum results for all modes.

We can specify public transport lines, different public transport vehicle types, timetables, stops, stop types and dwell times and model public transport priority signalisation. The simulation can be used to show how efficient a planned timetable will operate, how many bus bays a bus station needs and whether the scheduled connecting times are feasible for passengers.

Traffic and pedestrians

Alongside simulating traffic, Cundall can integrate this service with the simulation of pedestrians to provide a complete assessment indoor and outdoor spaces.

Smart Roads for Smart Cities

Cutting-edge integrated traffic management systems provide quicker reactive measures to reduce the impact of congestion and accidents, increase and maintain transportation capacity through the more efficient use of existing infrastructure.

Through microsimulation, we can replicate a wide range of advanced traffic management systems to increase traffic flow, simulate autonomous vehicles and new forms of mobility, improve road safety and secure road travel. Through microsimulation, we can model all operational interventions and assess their effect on overall traffic flow.

3D visualisation

The video-format output of our microsimulation service allows demonstrating the benefits of a design with data visualisation. This is particularly helpful for communications with a non-technical audience, for example at public exhibitions, committee meetings and public inquiries, as the results can be visually demonstrated in real or shortened time through a realistic and comprehensive representation of the simulation in 3D, rather than just displaying results through use of graphs and tables.