Microscopic traffic simulation with VISSIM

Simulation of multimodal traffic flows made easy
Whether you need to take fundamental decisions on the layout of your traffic infrastructure (traffic circle or classic inter-section?), evaluate public transport priority schemes or monitor the effects of specific signal switching patterns – VISSIM® enables you to simulate precisely the impact on all traffic flows. The system is the globally leading software for microscopic traffic simulation, covering all traffic modes, from motorized private transport, goods transport and public transport on rail or road right up to pedestrian and bicycle travel. Its wide range of analysis options makes VISSIM a powerful tool for planning and optimizing traffic systems – in both urban and interurban areas.

VISSIM is fully integrated in the Sitraffic® system landscape
VISSIM can model all traffic control and management systems of the Sitraffic family on all levels, from the traffic control platform with Sitraffic Scala, Sitraffic Concert and Sitraffic Guide down to individual traffic controllers. This opens up a very wide scope of applications for intersection, route and network simulation.

VISSIM results make presentations convincing
Traffic infrastructure decisions are often taken by committees whose members are no died-in-the-wool traffic engineering experts. VISSIM makes it possible to present the simulation and evaluation results for different scenarios and planning cases in different easy to understand and thus convincing forms such as detailed reports, various versions and impressive 3D animated graphics – enabling also “non-professionals in traffic engineering” to make informed decisions.
VISSIM is the ideal tool for building a clear and conclusive knowledge basis for decisions for all kinds of traffic engineering questions. The system has been designed for analyzing and modeling transport networks of any size and traffic systems of all types, from individual intersections right up to entire conurbations. The link-connector structure of the VISSIM network topology allows for highest versatility and – in combination with detailed movement models – extremely precise traffic flow modeling, including pedestrians and their complex interaction with the surrounding traffic flows.

VISSIM models motorized and non-motorized traffic flows
An unlimited number of vehicle types are available in VISSIM for traffic flow modeling, including cars, trucks, vehicles equipped with satnavs, buses, tramway and light-rail vehicles and even airplanes. In addition to motorized means of transport, the system can also cover pedestrians, cyclists and wheelchair users.

VISSIM uses both a psychophysical vehicle movement model and a rule-based model
For simulating the movements of the vehicles involved, VISSIM uses an evidence-based psychophysical vehicle sequence model with a resolution of up to 1/10 seconds. The rule-based lane-change model has been optimized for simulating urban as well as interurban traffic. Driver behavior patterns can be defined using user-configurable driver-vehicle classes.

VISSIM offers different ways of visualizing route choices
VISSIM proposes different options for visualizing route choices so that the user can select and apply the most suitable method for the available data sets and the objective of the analysis.

VISSIM simulations can include all types of public transport
For many years now, VISSIM has proven its worth in modeling public transport. For studies on public transit, the user can specify public transport routes, various public transport vehicle types, schedules, stops, stop types and dwell times. Different network analysis options are available. Also for studying various aspects of signal control and multimodal transfer points, VISSIM is the planning tool of choice.
Functions and application areas for microscopic traffic simulation with VISSIM

All modeling options ...

- Complex signalized and unsignalized intersections
- Traffic circles
- U-turns, mixed-flow lanes, separate (2-lane) turn lanes
- Bicycle paths and lanes shared by different modes (bicycles and motorized vehicles)
- Public transport stops and terminals
- Pedestrian-vehicle interaction
- Multi-lane freeways with user-defined curviness and roadway grades
- Freeway junctions, interchanges and merging and weaving areas

... for a wide range of traffic engineering issues

- Design, tests and evaluation of traffic-actuated signal control systems
- Design and dimensioning of intersections
- Modeling of complex public transport intersections
- Analysis of public transport acceleration measures
- Evaluation and optimization of intelligent transport systems
- Visualization of planning alternatives for supporting the political decision making process
- Creation of development plans, for instance for supermarkets, malls or entire city districts
- Set-up and coordination of roadwork sites
- Traffic calming measures
- Environmental impact studies, including emission calculations
- Performance analyses of rail transport systems
- Planning of parking facilities and modeling of parking-related traffic
VISSIM can simulate the following processes and systems:

- Fixed-time control systems
- Traffic-actuated control systems such as Sitraffic PDM(e) or S-L(e)
- Adaptive network control systems such as Sitraffic Motion MX and Scoot
- Numerous other control processes of other providers
- Green waves
- Public transport priority schemes
- Rail transport control
- Priority schemes for emergency vehicles
- Ramp metering
- Dynamic speed control signs
- Dynamic lane opening signs
Sitraffic Office and VISSIM

The integrated traffic engineering workstation

Sitraffic Office is a fully integrated, modular software system providing all traffic professionals with the required tools using a shared data base. The integration of VISSIM creates a complete traffic engineering workstation with an especially comprehensive range of functions.

**Sitraffic Office and VISSIM: ideally complement each other**

All steps can be carried out at a single workstation, from planning an intersection (including tests and simulation of the intersection design and data supply) right up to planning traffic actuation algorithms for entire networks. VISSIM and Sitraffic Office are fully integrated, so that all required data and configuration parameters are transferred directly from Sitraffic Office to VISSIM and the user can start the test or the simulation directly within Sitraffic Office. Types of data that can be passed on: intersection topology, layout plan, individual links or an entire network including all relevant objects as well as traffic volume profiles on the basis of existing directional volume flows. For different intersection states or versions, identical simulation parameters are used. And it goes without saying that all relevant data are stored also in the central data base of Sitraffic Office.

**VISSIM can simulate traffic control and traffic management systems of various types and manufacturers**

VISSIM can deal with all intersection types including the applicable right-of-way rules and the relevant signal control scheme. The focus is on signalized intersections, but VISSIM can also be used to simulate unsignalized intersections equipped with a variety of traffic signs (e.g. right-of-way and stop signs, traffic circle signs).

**Analyses and evaluations as needed**

All simulation results can be displayed for analysis: counts at a specific point, route travel times, pollutant emissions, performance of the entire network and many more. The data can be filtered so that only the relevant elements are displayed. Periods and intervals for evaluation can be freely defined, from raw data right up to the entire period simulated. Besides data output in the form of text files or data base entries, the Analyzer Report function allows the direct automated export of the results to Excel for further editing and analysis.

As easy as it gets: Just select the required intersection version, define the volume profile and enter the traffic-actuation parameters – and there’s your simulation.
The information in this document contains general descriptions of the technical options available, which do not always have to be present in individual cases. The required features should therefore be specified in each individual case at the time of closing the contract.