

Activity-based Demand

We usually do not travel for pleasure. Instead, we are travelling around, because we do not live, work and shop at the same place. The activities we perform during the course of a day and the locations where we perform them largely shape our mobility needs. Therefore, MATSim describes mobility demand as a chain of activities, their locations and times.

Agent-based Simulation

Each traveller is different. The effects of congestion are different depending on someone's trip purpose. People's preferred transport modes or their willingness to pay for train tickets or tolls are different. In agent-based models, persons – so-called agents – are modelled and simulated individually. This allows for heterogeneous behaviour in the simulation and to create extremely realistic scenarios.



Multimodal Simulation

By simulating persons and vehicles, MATSim models offer a very high degree of detail. Apart from simulating private cars, the models also contain a schedule-based simulation of public transportation: Agents use busses, transfer to trams or trains and finally walk the remainder of their trip. All that is simulated in detail allowing to perform very precise occupancy analyses. It allows also to capture bus bunching and on-street interactions.



Extensive Possibilities for Application

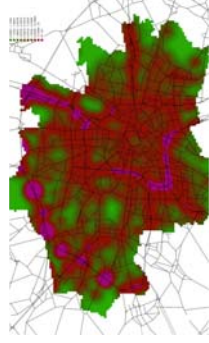
Due to the highly flexible demand modelling and agent-based simulation, MATSim models can be used for a wide range of applications. For example, there exist models to test evacuations of large regions, to plan traffic for major events, to identify much-frequented locations or to explore the diffusion of emissions.



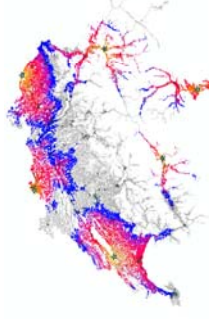
Pedestrian frequencies, Zurich



Tsunami Evacuation, Padang



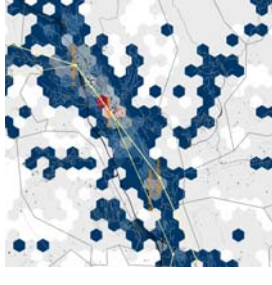
Daily NO2-emissions, Munich



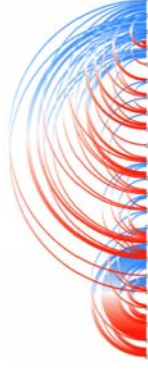
Time-dependent travel times from 6 locations, Switzerland

Manifold Implications

As every stage of the modelling is on the level of individual agents, the detailed (socio-) demographic attributes of the modelled demand are always available. Once, a model is successfully set up, it can be analysed without the need of e.g. re-generating the demand for specific user groups.



Aggregated number of trip origins, full day / all modes



Demand along a bus route from 7 to 8 a.m. with boarding and alighting

Open Source as Guarantee of Stability

For more than ten years, MATSim has been developed and applied at universities around the globe with more than 70 PhD-student years of effort in software development.

ETH zürich



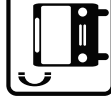
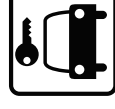
senozon

understanding mobility

Currently, MATSim is mainly developed by TU Berlin, ETH Zurich and Senozon AG. This warrants the operational stability and a continuous development of the functionality of the software. A growing global community of developers and users enriches the software.

New Transport Concepts – System-wide evaluation

Electric vehicles and car-sharing are only two of several new mobility concepts, which have recently entered the market. But under what conditions is it economically feasible to operate a car-sharing fleet? What level of service is required for car-sharing to become a viable alternative? And is it possible for companies to include electric vehicles in their corporate fleet? Is their range sufficient and is there enough time and infrastructure to recharge?



In agent-based transport simulations like MATSim, such new mobility services can be easily integrated, such that their demand as well as operational features can be analysed in depth.



MATSim
Multi-Agent Transport Simulation