

# Call for Master Thesis at the Institute for Transport Studies

## Working Title

Exploring the economic and environmental impacts of different public transport operation strategies with agent-based simulation

## Starting Situation / Framework Conditions

Transport demand modelling is an approach to evaluate and to seek both understanding and better solutions on how we can operate the existing system better. Whilst the performance of public transport system in Vienna is very good, it is not without challenges. With the continuing changes of socio-demographics, and subsequently the needs of travel, and the raising digitalisation and automation, it is immensely important to periodically revisit the way we plan and operate the system as we are operating it as today, and seek whether the deployment of different types of public transport (e.g. urbanloop, DRT, automated bus) would lead to different outcomes.

The trip- and zone-based transport modeling framework (as usually implemented in planning models e.g. Visum, Transmodeller etc.) have been very useful in estimating the characteristics of inter-zonal trips. That is said, those planning model have some limitations in analyzing intra- zonal travel, a weakness that is crucial to be addressed e.g. in planning the first and last mile of public transport journeys. In this thesis, this methodological gap will be addressed with the use of agent-based simulation software, MATSim.

## Aim of the Master Thesis

- To evaluate the impacts of different public transport operation strategies (e.g. on-demand and/or automated) at selected parts of Vienna to the rest of public transport performance in the city;
- to analyze benefits and risks of the solutions, even beyond transport planning;
- to develop recommendations and strategies how city the administration and public transport operators can progress on this matter.

## Methods

- In executing this work, an agent-based simulation will be used. The students will have an opportunity to learn and familiarize themselves with this tool. A basic understanding of and interest at transport demand modelling is expected. A mentor in learning the software will be provided. Some familiarity with Java is expected as a starting point to learn the simulation tool.

## Cooperations

- Depending on the individual choice of the research questions and the quality of the work, a presentation may be possible to an audience of experts and practitioners in the mobility sector, including DAVeMoS' partners e.g. Stadt Wien and Wiener Linien.

## Contact at the Institute for Transport Studies

- *Yusak Susilo (yusak.susilo@boku.ac.at)*
- *Oliver Roeder (oliver.roeder@boku.ac.at)*
- *Martin Hinteregger (martin.hinteregger@boku.ac.at)*

**Notice** Language: English