

# VACANCY INTERNSHIP PROJECT

*We are looking for students interested in carrying out their master thesis project at DAT.Mobility*

## Development of a generic framework for estimation and implementation of discrete choice models using multiple data sources

### Problem description

When estimating and implementing discrete choice models to be used in strategic transport model systems, ideally at least three different data sources are used: stated preference (SP) data for estimation and revealed preference (RP) data amended with data from the transport model system for calibration and implementation within the context of the transport model system. In the Netherlands, discrete choice models are rarely found in strategic transport model systems. The two main reasons for this are the limited transferability of existing discrete choice models from one context to the other (see e.g. Karasmaa, 2007) and the large effort required to carry out a survey, estimate and calibrate discrete choice models and implement these models within transport planning model systems from scratch. At the same time, more (but often also more different) (big) data sources are becoming available. Currently, the most important examples of new data sources available to DAT.Mobility are the Mobiliteitspanel Nederland (MPN, Hoogendoorn-Lanser et al., 2015; Olde Kalter and Geurs, 2016). Sense.DAT ("Sense.DAT - DAT.Mobility," n.d.) and BikePrint (Bussche, 2015). For his data to be (cost effectively) used in discrete choice models within strategic transport models, a generic framework for estimation and implementation using different datasources should be developed.

### Assignment

The assignment roughly consists of the following three stages:

1. Design of the framework. In this stage, literature research on joint model estimation methods, but also on methods for classification and preparation of the different types of data and transferability of existing discrete choice models should lead to a conceptual model and functional requirements of the framework.
2. Development of a prototype of the framework. The framework should make use and integrate existing tools as much as possible (e.g. nGene for survey design, OmniTRANS / ruby for preparation of the dataset, Biogeme for model estimation and OmniTRANS / OtChoice for model application. If possible, incorporation of existing models as another datasource would be considered very welcome. In this stage, it is very thinkable that at the start of this stage, the scope of the prototype should be narrowed down to comply with the time constraints for this assignment.
3. Demonstration of the (proof of concept) of the framework using a case study on one of the different choice processes in strategic transport model systems (i.e. mode, mode, destination, departure time or route choice).

### Research group

DAT.Mobility and Goudappel Coffeng, Deventer.

Daily supervisor: Luuk Brederode, consultant DAT.Mobility, PhD candidate Delft University.

Secondary supervisor: Bastiaan Possel, consultant Goudappel Coffeng / Marie Jose Olde-Kalter, consultant Goudappel Coffeng / PhD candidate University of Twente.

### Information

When interested in this internship assignment development of a generic framework for estimation/implementation of discrete choice models using multiple data sources, please contact Luuk Brederode [bdl@dat.nl](mailto:bdl@dat.nl) / +31627369830.

### References

- Bussche, D., 2015. Bikeprint – in depth analysis of cyclist behaviour and cycle network performance using extensive gps-track data. Presented at the European Transport Conference.
- Hoogendoorn-Lanser, S., Schaap, N.T.W., OldeKalter, M.-J., 2015. The Netherlands Mobility Panel: An Innovative Design Approach for Web-based Longitudinal Travel Data Collection. *Transp. Res. Procedia, Transport Survey Methods: Embracing Behavioural and Technological Changes Selected contributions from the 10th International Conference on Transport Survey Methods 16-21 November 2014, Leura, Australia 11*, 311–329. doi:10.1016/j.trpro.2015.12.027
- Karasmaa, N., 2007. Evaluation of transfer methods for spatial travel demand models. *Transp. Res. Part Policy Pract.* 41, 411–427. doi:10.1016/j.tra.2006.09.009

Olde Kalter, M.J.T., Geurs, K.T., 2016. Exploring the impact of household interactions on car use for home-based tours. A multilevel analysis of mode choice using data from the first two waves of the Netherlands Mobility Panel. *Eur. J. Transp. Infrastruct. Res.* 16, 698–712.

Sense.DAT - DAT.Mobility [WWW Document], n.d. URL <http://www.dat.nl/en/products/sensedat/> (accessed 11.21.16).