Dat.mobility

ADVANCING ANALYTICS

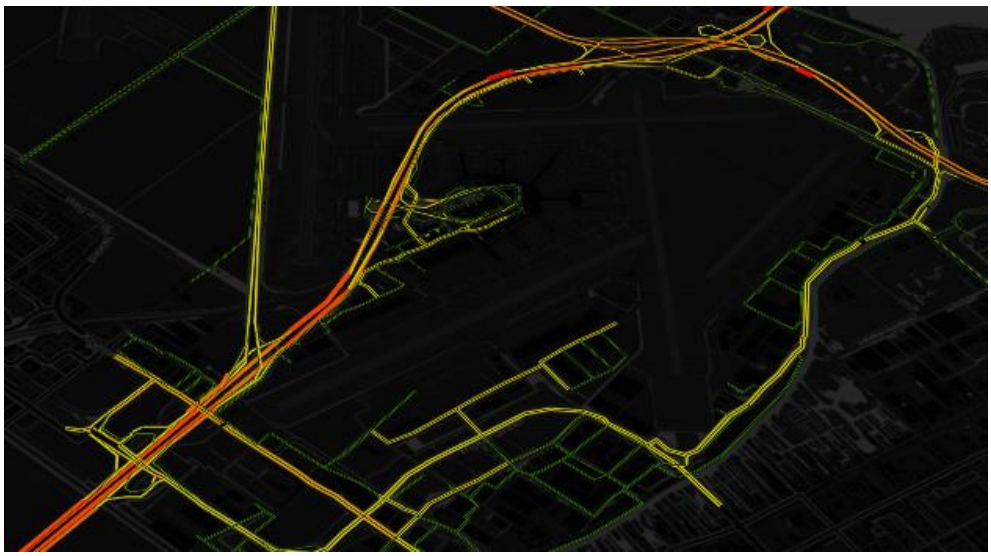
Access mode estimation for the Schiphol Airport travel demand model

Data collection & choice modelling

INTRODUCTION

Hundreds of thousands of passengers arrive and depart at Schiphol Airport every year. To understand the traffic implications on the road network around Schiphol, Goudappel was assigned to develop a transport model. Using available data, we estimated models that relate explanatory variables such as the number of arriving and departing passengers to the number of vehicles on various parts of the land-side road network of Schiphol Airport. The outcomes of the model are used to make (strategic) choices at Schiphol, such as the redevelopment of Schiphol Plaza[1].

Note: Goudappel develops and manages both the Landside and the Airside traffic model of Schiphol. This vacancy concerns the Landside model.



[1] https://www.goudappel.nl/nl/projecten/herontwerp-schiphol-plaza

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PROBLEM DESCRIPTION

Currently, the model determines the number of motorised vehicles on the road network around Schiphol; trips made by public transport and bicycle are disregarded. At the same time, developments such as the extension of the North-South metro line and policies requiring to scrap night flights are very likely to have effects on the mode choice of landside travellers from/towards Schiphol. However, which variables affect the mode choice of airport travellers, and Schiphol in particular, and to what extent is not clear yet.

RESULT / OBJECTIVE

The goal of the total research is to estimate a model for airport access mode choice.

ASSIGNMENT

This assignment is split into two separate assignments.

Assignment 1: determine relevant explanatory variables on access mode choice to Schiphol Airport

The first part requires an inventory of relevant/desired explanatory variables among stakeholders (including colleagues of Goudappel that use the model in studies such as the aforementioned Schiphol plaza project). Furthermore, a literature research into access mode choice in existing Airport models is required to estimate which of the desired variables are expected to be explanatory. A good starting point would be documentation on the AirAcc module that models the Schiphol airport access within the dutch governmental strategic transport model system (LMS/NRM) (*Documentatie van GM4 Deel D6-1 Programma AIRACCC*, 2021). After the inventory of the desired variables, they should be assessed based on the following criteria:

1. Data are available in both the model estimation and the model application context;
2. Statistically explanatory for airport travellers' mode choice.

Subsequently, a macroscopic sketch-model should be developed (e.g., elasticity model, system dynamics model), based upon insights from literature. When applied,

this sketch model may also give insights and recommendations on how a more definite access mode choice model for Schiphol should be estimated.

Most suitable disciplines
For this research we are looking for students who have affinity with primarily model estimation and to a lesser extent model application. For this research, we think students of the following disciplines are most suited:

- Econometrics
- Applied mathematics
- Data science
- Civil Engineering

However, if you are interested in this assignment but from another discipline, please do not hesitate to contact us. We can discuss then if this assignment fits your interests and skills.

Assignment 2: data collection & model estimation
The assignment consists of:

- Literature research into appropriate type(s) of choice model(s). Discrete choice (random utility) and various machine learning methods seem valid candidates.
- Construction of an estimation dataset(s), by aligning variable definitions from various data sources, such that they can be combined.
- Parameter estimation on the dataset from previous step.
- Implementation of the choice models in the application context.
- The last step is to apply the choice models using application data to demonstrate the explanatory power of the models.

Most suitable disciplines
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- Econometrics
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- Data science
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However, if you are interested in this assignment but from another discipline, please do not hesitate to contact us. We can discuss then if this assignment fits your interests and skills.

INFORMATION

When interested in this vacancy, please contact Luuk Brederode (lbrederode@dat.nl). More information on Dat.mobility and Goudappel can be found via www.dat.nl and www.goudappel.nl