

VACANCY: Comparing and improving assignment algorithms for cyclists

INTRODUCTION

Cycling has been an important part of Dutch mobility for many decades and the importance of cycling is increasing because of its positive effects on sustainability and use of public space. Because of the long cycling tradition, the Netherlands has extensive cycling infrastructure, but due to developments such as the increase of bicycle use and changing composition of cycling traffic (e.g. e-bikes), pressure is increasing on the infrastructure. Therefore, policymakers need information on the expected effect of these developments on the cycling infrastructure in order to make decisions on enhancements or extensions. Traffic models are an important tool to assess the effect of measures in the transport network, but this requires that cycling behaviour is described and predicted sufficiently well in models.

PROBLEM DESCRIPTION

The current transport models of Goudappel use different (combinations of) algorithms to assign cyclists to the network depending on the model. For example some models use an all-or-nothing assignment based on estimated travel time, while other models assign part of the demand based on cost, part based on distance and a part based on a combination of distance and cost. Next to that, Voorhorst (2018), Van Steenis (2020) and Gebhard (2020) tried to improve the assignment by using logit choice models for deciding the route choice. Which algorithm is most suitable is difficult to determine. The route choice of cyclists varies strongly between different people and next to that, most data do only show the number of passing cyclists, not the route taken. Decisions on which assignment algorithm is used in a given model have therefore been made based on limited data and knowledge on which algorithm reflects actual behaviour most accurately.

RESULT / OBJECTIVE

The goal of this assignment is to obtain more quantitative insights into which traffic assignment algorithm(s) can be used best for modelling cycling route choice in Dutch strategic transport models. In order to do so, a secondary goal would be to research and compare existing algorithms and/or to develop or improve an algorithm specifically for cycling. The exact objective will be decided together with the student depending on among other things, the duration of the internship and the requirements of the study programme.

ASSIGNMENT

The assignment can be fulfilled in different ways, depending on the chosen scope of the assignment, but the following steps will probably be part of the execution:

1. Research existing traffic assignment methods (both general algorithms and methods specifically for cycling)
2. (if time allows or necessary) develop or adapt an algorithm tailored to cycling route choice
3. Apply a number of methods in one or more test case(s)
4. Compare the quality of the results on a number of indicators
5. (if time allows or necessary) research whether delays on intersections and capacity of roads in busy areas change the outcomes of 4
6. (if time allows or necessary) research the effects of new developments, such as increased e-bike usage on the route choice

Depending on the required level of the assignment, the student can be provided with suitable indicators or can develop or choose relevant indicators themselves.

INFORMATION

When interested in this assignment, please contact Jesse Voorhorst (jvoorhorst@goudappel.nl) or Bastiaan Possel (bpossel@goudappel.nl). More information on Goudappel can be found via www.goudappel.nl

REFERENCES

Gebhard, S. E. (2020). *Modelling cyclist route choice in the Netherlands: a revealed preference study using GPS data to improve bicycle route assignment modelling*

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