



Analysis and mitigation of bunching effects on metro services

General description

The strategic and tactical planning of public transport networks require advanced tools to model, analyse, quantify, optimize and evaluate current and alternative service designs. Challenges include the interactions between its infrastructure layer, service layer and passenger flows, as well as the importance of behavioural and dynamic phenomena. Projects in the domain of network analysis, service dynamics and service optimization can be performed at the rail group of Royal HaskoningDHV, an international engineering consultancy firm.

Assignments

Bunching is a complex phenomenon and has a profound impact on the operations of public transport systems. Multiple operators show interest in simulation models which can predict the impact of measures to mitigate the impact of bunching effects on their network properly and additionally can provide insights or generate automatic countermeasures based on the simulation. Based on a microsimulation model of metro infrastructure, the position of each vehicle can be predicted. The simulation models are not yet able to make fully dynamic decisions based on changing patterns, such as a sudden influx of passengers (increased boarding times) during to large-scale events. These bunching mechanics need to be researched, quantified and modelled in order to generate dynamic simulation results.

The objective of this project is to develop methods to support decision makers during all phases of public transport planning. In all cases, system dynamics and passenger flows will be considered for real-world case studies.

Candidate background

T&P or TIL Students who preferably have affinity with modelling such as simulation and optimization techniques. Basic knowledge of public transport operations is required and especially a willingness to learn in this field.

Research group

Transport & Planning Department

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External support

This project will be performed at Royal HaskoningDHV

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