

VACANCY: Modelling Freight Trip Chains in Strategic Traffic Models

INTRODUCTION

Freight mobility is a crucial component of transportation systems given that movement of goods and commodities fuel economic activities and daily life. It encompasses the logistics processes involved in transporting raw materials, intermediate goods, and finished products across various modes of transport, including road, rail, air, and sea. Efficient freight mobility is vital for supply chain management, ensuring that goods are delivered timely and cost-effectively from producers to consumers. It impacts everything from the availability of products in stores to the operational efficiency of industries. With the growing complexity and scale of global trade, optimizing freight mobility is essential to meet the demands of businesses and consumers, reduce transportation costs, and minimize environmental impacts. Despite its large societal and economic impacts its often overlooked in strategic transport modelling with many assumptions giving a less then desired result.

PROBLEM DESCRIPTION

The current transport models of Goudappel use simple parameters from a linear regression model for trip generation and trip distribution of freight in the Netherlands. While this does allow for localised parameterisation, it is limited in its application because it is trip-based and in most cases only links generation to the workforce and does not include any additional information as the data is either classified or harder to apply in a strategic context. Freight models heavily depend on aggregated (non-competitive) data from national sources like CBS locational data, LISA workforce data and the Basismodel voor Goederenvervoer (BasGoed)

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With increasing e-commerce and increasingly changing distribution chains a better methodology for freight in strategic traffic models must be constructed to more accurately describe freight traffic in current and future scenarios. This is because Feight modelling is an important part of multi-modal traffic assignments where trucks and cars share infrastructure. A higher quality freight model will help improve the overall model quality and as such help facilitate decision information for policymakers in regards to policies that aim to control freight movements (for example by restricting freight movements towards urban centres)

RESULT / OBJECTIVE

The goal of this assignment is to develop a new freight modelling framework for regional models that is able to accurately describe freight and logistics mobility in the Netherlands or improve the existing framework by adding features that will aide in providing information for decisionmakers.

This means a new freight model should be capable of generating complex tripchains whilst being able to accurately show the effects of policy, infrastructure and economic variables. Examples of improving the existing module would relate to



adding more variables (like was proposed by Gommans (2024) in *Quantifying freight trip and freight generation from spatial developments in the Netherlands*) adding trip-chaining modules to the current model (by determining ways to improve freight chains) or refactoring the implementation to use more information for a higher accuracy. Alternatively a new activity based model can be proposed or a new approach to freight modelling can be introduced. An example of this is shown in *Freight activity-travel pattern generation (FAPG) as an enhancement of freight (trip) generation modelling: Methodology and case study*

INFORMATION

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REFERENCES

Gommans W.G.J. (2024) *Quantifying freight trip and freight generation from spatial developments in the Netherlands*. [Msc thesis] Delft: University of Technology <u>http://resolver.tudelft.nl/uuid:0b5c9c68-83c2-4f65-9501-82ce9f4a9e71</u>

Agnivesh Pani, Prasanta K. Sahu, Lóránt Tavasszy, Sabya Mishra (2023) Freight activity-travel pattern generation (FAPG) as an enhancement of freight (trip) generation modelling: Methodology and case study https://pure.tudelft.nl/ws/portalfiles/portal/161155744/1 s2.0 S0967070X23002585 main.pdf