Denne artikel er udgivet i det elektroniske tidsskrift
Artikler fra Trafikdage på Aalborg Universitet
(Proceedings from the Annual Transport Conference at Aalborg University)
ISSN 1603-9696
https://journals.aau.dk/index.php/td

trafikdage
NY VIDEN & NETVÆRK

OTM 8.0 Demand Model: Comprehensive Re-estimation and Methodological Advances for Greater Copenhagen

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Abstrakt

This article presents the comprehensive re-estimation of the OTM 8.0 travel demand model for Greater Copenhagen, representing the most substantial update to the OTM demand modelling since version 7.1. All mode–destination and tour frequency models were re-estimated for seven travel purposes, encompassing both home-based and non-home-based travel. Drawing on detailed national travel survey (TU) data from 2016–2019 and 2022–2025, updated level-of-service (LoS) data for 2023, and revised zonal socioeconomic indicators, OTM 8.0 provides a strengthened empirical foundation for forecasting and policy appraisal, with improved behavioural realism across modes and purposes. Values of travel time (VTT) have also been recalibrated to 2023 levels and differentiated across car drivers, car passengers, and public transport users. The resulting models closely reproduce observed mode shares and trip-length distributions across most purposes, while yielding behaviourally consistent elasticity estimates.

A key contribution of OTM 8.0 is the explicit disaggregation of the former “car driver” alternative into Single-Occupancy Vehicle (SOV) and High-Occupancy Vehicle (HOV) categories. This refinement enables a more realistic representation of cost sensitivity, travel time valuation, and substitution patterns between modes. Furthermore, the cost-sharing methodology has been revised, replacing the previous party-size approach with purpose-specific average HOV occupancies, resulting in more robust elasticity estimates, which are particularly relevant for evaluating congestion pricing, fuel taxation, and parking policies.

The representation of public transport has also been significantly improved. OTM 8.0 incorporates fully weighted generalized travel times, ensuring consistency between route choice and demand modelling. These generalized times combine access, waiting, transfer, and in-vehicle components into a unified metric of “bus-equivalent minutes,” while explicitly accounting for bike-and-ride and bike-on-board options. New distance-correction terms further enhance the model’s ability to replicate observed trip-length distributions, especially for public transport.

Finally, the modelling workflow has been strengthened through improved data preprocessing, including advanced income imputation using Random Forest methods and the explicit identification of tour structures, primary purposes, and time-of-day choices. Together, these enhancements ensure that OTM 8.0 is grounded in a richer, more coherent, and internally consistent dataset, providing a robust platform for evaluating future mobility policies, sustainability strategies, and multimodal transport investments.