



## Master Thesis

# “Impacts of Public Transport Disruptions of Micro Mobility Usage Patterns: An Empirical Analysis using Realtime Data”

Anecdotal evidence has postulated, and research has partly shown that novel forms of urban mobility such as ride hailing or shared mobility exert complimenting and substituting effects on public transport, be it busses or trains. Specifically micro-mobility, the most individual form of shared mobility, is said to provide first- and last-mile services for public transport (i.e., ingress and egress to and from stations). When cancellations or delays in the schedule of the public transport network occur, though, these effects might be amplified or attenuated. The thesis looks at real-world data of both shared mobility trips in a German city and real-time changes to the planned schedule of the cities public transport operator. The disruption data is provided as GTFS-RT, the commonly accepted standard data format for public transport. Matching shared mobility usage data to public transport data in spatio-temporal dimension is a key task of the thesis. The problem would need to be solved by applying econometric modelling (simplest case linear regression) to the previously combined data set. The research concludes by laying out the found impacts of disturbances on the substitution and complementation effects and contributes to the literature by juxtaposing these against known effects during undisrupted public transport.

### Relevant introductory literature includes (but is not limited to):

- Oeschger, G., Carroll, P., and Caulfield, B. 2020. “Micromobility and Public Transport Integration: The Current State of Knowledge,” *Transportation Research Part D: Transport and Environment* (89), p. 102628. <https://doi.org/10.1016/j.trd.2020.102628>
- Saberi, M., Ghamami, M., Gu, Y., Shojaei, M. H. (., and Fishman, E. 2018. “Understanding the Impacts of a Public Transit Disruption on Bicycle Sharing Mobility Patterns: A Case of Tube Strike in London,” *Journal of Transport Geography* (66), pp. 154–166. <https://doi.org/10.1016/j.jtrangeo.2017.11.018>

### Key tasks and objectives of the thesis

- Get to know the literature on synergies and competition of public transport and shared mobility
- Spatio-Temporal matching of shared mobility trips and public transport disruptions
- Empirical Analysis of matched data over a period of time, quantifying effect sizes
- Evaluation and critical discussion of found effects in comparison to the literature

#### Topics



- Urban Mobility
- Public Transport & Micro Mobility
- User Behavior

#### Methods



- Big Data Wrangling
- Econometric Modelling
- Data Analytics

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