

Demand Nudging in Shared Mobility and Public Transport using Credits/Tokens



Problem description

Shared mobility and public transport integration has emerged as a promising strategy to alleviate the challenges posed by private car usage, such as traffic congestion and harmful emissions. Encouraging passengers to opt for shared mobility and public transport over private vehicles requires effective behavioral nudging. Applying gamification techniques to the promotion of shared mobility and public transport can increase engagement and make the experience more enjoyable for passengers. This thesis aims to explore the use of gamification in demand nudging and to compare two possible mechanisms, namely credits and tokens, to achieve this goal.

In this thesis, different credit/token mechanisms (Provoost et al., 2023) will be compared and evaluated using simulation models. These models encompass an optimization framework for the supply side, incorporating public transport and shared mobility services, along with choice models to capture passenger behaviors on the demand side. The simulation will be supported by the research group. By simulating various scenarios, this research aims to provide a comprehensive understanding of the strengths and weaknesses of each mechanism, ultimately facilitating the identification of the most effective approach to promote sustainable transportation choices.

Assignment

The project will involve the following steps:

- Identify and compare various token and credit mechanisms in the context of demand nudging for shared mobility and public transport.
- Integrate the token and credit mechanism into the simulation model.
- Investigate which mechanism offers more significant advantages and fewer drawbacks in achieving sustainable transportation goals.

Candidate

- Should have: coding skills in Python or similar and knowledge on simulation.
- Good to have: behavioural modelling, operations research.

Research group

Smart Public Transport Lab and the Sustainable Urban Multi-modal Mobility

Contact: Oded Cats o.cats@tudelft.nl, Shadi Sharif Azadeh S.SharifAzadeh@tudelft.nl, or Yimeng Zhang Yimeng.zhang@tudelft.nl

Reference: Provoost, J., Cats, O., & Hoogendoorn, S. (2023). Design and classification of tradable mobility credit schemes. *Transport Policy*, 136, 59-69.