

English summary

Sustainable transport and residential mobility: Sociospatial distributions and outcomes of varying public transport accessibility

To tackle increasing congestion, reduce accidents and, especially, reduce transport-related climate gas emissions, cities around the globe seek to transition towards less car use and more use of sustainable, low-emission transport modes. To achieve this transition, measures are needed that restrict the use of private cars, in combination with measures that encourage the use of public transport (PT), cycling and walking. People who are dependent on the car to conduct daily activities will necessarily be more vulnerable to such restrictions. Therefore, it is important to consider the quality and access to sustainable transport modes when implementing car restrictions in urban areas, to secure a socially just transition to low-emission mobility. Research and theories on spatial and social justice tend to engage with the concept of Metropolitan Opportunity Structures, which describes how urban opportunities – such as education, employment and health services – are distributed among the population, and how these opportunities can be utilized by people to achieve certain outcomes. In this context, the transport systems and transport resources are central components, as they determine the ease with which individuals can access different opportunities. Policies to increase the use of environmentally friendly transport modes entails a change in the structure of metropolitan opportunities.

To contribute to the literature on opportunity structures and sustainable mobility transitions, this PhD-thesis investigates the sociospatial distribution of PT accessibility, with a specific attention on how residential mobility behaviour shapes this distribution. Individuals and households' access to urban opportunities are determined by their residential location, but choice of residential location is explained by a valuation between different dwelling and neighbourhood characteristics, within a household's opportunity space. For example, households may choose to settle in a location with low PT accessibility to fulfil other dwelling or neighbourhood preferences within their monetary budget.

The main research question of this thesis is: *what are the relationships between public transport accessibility, residential mobility, and car ownership, and how do these relationships vary with key social divisions?*

I utilize detailed individual-level registry data combined with calculations of PT and car accessibility to answer the research question. I investigate how PT accessibility is distributed among the population, how this factor is valued as a residential quality, and how it influences car ownership decisions. Throughout the thesis, I pay particular attention to how the investigated relationships vary for households with variable income, in addition to variations across the life course and with immigrant background.

The study area of the thesis is the Oslo region, the largest urban region in Norway. Municipal and regional governments in the Oslo region have ambitious goals to reduce climate gas emissions from the transport sector, and several measures to restrict car use have been implemented over the past decades. At the same time, Oslo has experienced gentrification, substantial pressure on the housing market in the inner city and increasing poverty in the suburbs, combined with medium to high levels of socioeconomic and ethnic segregation. Whether the current and future measures to restrict car use will have disproportionate effects on different social groups, and whether these measures will increase existing inequalities, remains unclear.

The research question is explored through four scientific papers. The first paper applies spatial regression models to investigate the sociospatial distribution of PT accessibility and PT competitiveness, both in individual and general terms, in the Oslo region. I find that areas with higher mean incomes are better off in terms of accessibility with PT and absence of car dependency. A related point is that in high-income neighbourhoods, employees' actual commutes are more efficient than their general employment accessibility level should indicate.

In the second paper, I investigate how PT accessibility influences dwelling selection among households who purchased a new house in the Oslo region in 2018. The findings show that families with high income achieve higher PT accessibility compared to lower-income households, especially during the time when family formation takes place. This shows that the transition to parenthood is a relevant stage in the life course in this regard.

Therefore, I zoom into recent parents in the last two papers, drawing on the life course and mobility biographies, approaches which are often used in the residential mobility and transport literature. In the third paper, I use structural equation modelling to study how recent parents value PT accessibility as a quality when deciding on a new residential location, and how this

asset is traded off against other residential qualities. The findings indicate that the need to make residential trade-offs is reduced with higher income, and, in addition, that there are substantial variations in the residential preferences of native Norwegian households and immigrants.

In the fourth paper, I study how PT accessibility influences car ownership. Here I also draw on the life course and mobility biographies approaches, and study how the influence of PT accessibility on car ownership changes after households receive their first child, as well as how this relationship varies for households with variable income. Again, I find that with lower income, households are more forced to make trade-offs. In this case, the relevant trade-off is that between a central (and PT accessible) residential location and car ownership. With higher income, households are better able to combine the two.

The thesis concludes with a discussion, suggestions for future research and implications for policy and planning. For the latter, I suggest several policy measures related both to the supply of PT services in urban areas, and in the provision of affordable and family-friendly housing.