

# Abstract

This thesis springs from the observation that a sustainability transition in urban passenger mobility is taking place in parallel with the processes of climate change and digitalisation. However, surprisingly little is known about the cause-and-effect relations between these processes.

I explore these relations by analysing urban mobility innovations facilitated by digitalisation using frameworks and insights from innovation studies, political science, and transportation economics. Based on these perspectives I seek to answer the question: *how can digitalisation and transport innovations contribute to more efficient and sustainable passenger transport in urban areas?*

I focus on urban mobility for four main reasons. 1) It is where most people live. 2) It is often the first location where new technologies are introduced. 3) It is where the widest variety of mobility options are available. 4) It is where the direct negative impacts of private car-based mobility are the strongest.

Further, I use a selection of transport sector innovations as my cases: ridesourcing, e-scooters, mobility-as-a-service (maas), smart charging, and autonomous vehicles. These are selected as they represent technologies at different developmental stages and with different organisational forms. However, in their present form, they are all dependent on the advances in ICT technology that have occurred over the last decade and a half.

The thesis consists of an introduction and four individual papers. Each paper focuses on the relation between the technologies and the socio-technical regime(s) they face. The first paper focuses on the regulatory impacts of introducing ridesourcing and autonomous vehicle services, which represent a novel way of offering a traditional service. The second focuses on the transition impact of e-scooters. The third paper focuses on how innovations that are facilitated by digitalisation, such as e-scooters and mobility-as-a-service, are different from the technologies the extant socio-technical regimes have evolved with. The fourth paper focuses on how a technology, smart charging, is perceived differently when introduced by incumbents as opposed

to new actors. The introduction includes and overall discussion of the findings from each paper, and how these relate to the research question.

The main contribution of the thesis is an increased understanding of the interplay between digitalisation, efficiency, and sustainability in the urban mobility context. I find that although all the digitalisation-facilitated urban transport innovations that I have studied have a positive effect on efficiency at the transport mode level, their overall contribution towards a sustainability transition is unclear. Digitalisation may well contribute positively towards sustainability in urban mobility, but that is contingent on a number of factors mainly relating to policy and governance, but also to some extent, properties of the technology and local context.