Mobility-as-a-Service and changes in travel preferences and travel behaviour: a literature review

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Background & policy context:

Scientific literature pertaining to Mobility as a Service (MaaS) is growing fast. According to G. Smith et al. (2018), 'the term has rapidly gone from nowhere to nearly everywhere in the personal transport sector' since 2014. In June 2017, Utriainen and Pöllänen (2017) searched 'Mobility as a Service' in a large scientific database (Scopus) and found 37 peer-reviewed journals and conference papers mentioning the term in either their titles, abstracts or keywords. By June 2018 this number had more than doubled to 76 citations. Nonetheless, much of this available literature focuses on defining what MaaS is and on its organisational challenges (ecosystem, technologies, integration of modes), rather than using in-depth analysis to quantify how MaaS may impact travel preferences and behaviour, as already emphasised by Matyas and Kamargianni (2017).

Although multiple pilots and schemes have been initiated around the world in recent years, empirical knowledge of MaaS’s expected impacts on people’s travel preferences and travel behaviour remains limited, as highlighted by Ho et al. (2017). Consequently, the frequent claims about the positive contributions MaaS will make towards achieving sustainability goals rely on a scattering of limited yet insightful research findings.

Objectives:

Against this background, this study strived to respond to the 'lack of clarity' about MaaS’s impacts on travel behaviour and preferences, as stated by Wong (2017). The purpose of this research was therefore to provide a better understanding of the ways in which MaaS may impact people’s travel preferences and travel behaviour. The research question that this study sought to answer was as follows: 'What can current literature teach us about the expected impacts of Mobility-as-a-Service (MaaS) on people’s travel preferences and travel behaviour?'

Reviewing the potential impacts of MaaS on travel preferences and behaviour is relevant from the research, business and policy perspectives, as it can inform various parties about the state of the research pertaining to MaaS and travel behaviour. In this sense, the review has assisted in discerning what people would value in such a new service and what might pose challenges, thereby providing a more nuanced yet realistic picture of what MaaS can achieve for travellers and society in the near future. This study can be useful to transport operators and authorities seeking to apply an attractively designed MaaS scheme. Furthermore, researchers may be interested in the research gaps found in this review.

Methodology:

We use a two-step approach to reach our objective:

1. First, we provided an explorative literature review on research topics not directly focused on MaaS, but which are particularly relevant for MaaS.
2. Second, we conducted a systematic literature review of studies focused on MaaS and travel behaviour.

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**Key Results:**

The reviewed studies show that MaaS has the potential to reach certain travellers, to support decreases in private car use and to instigate different travel patterns among these travellers. However, the impact magnitude, the timeline and direction of these changes remain relatively uncertain. Nevertheless, it is unlikely that a drastic shift from the private car ownership paradigm to the MaaS paradigm will occur within a few years. Other results are:

- The adoption of MaaS is likely to require a combination of multiple aspects. A service with enough added value, providing an economically feasible alternative without requiring travellers to compromise (too much) on their autonomy, flexibility and reliability demands is crucial. In addition, a particularly crucial point is a smart design of the MaaS user interface, rendering it accessible for everyone.
- In order to have the potential to challenge current travel behaviour patterns, features of behavioural change support systems and a high degree of mobility integration are likely to be needed. Further, mobility packages could be used to influence travel behaviour patterns, by altering the way people perceive travel alternatives rather than physically altering alternatives. This could stimulate the use of more sustainable modes, and notably shared mobility modes. The latter have proven to be effective for decreasing car use and, to a lesser extent, car ownership.
- Generally, young to middle-aged people residing in urban areas are likely to be the first group to switch to MaaS from a more traditional mobility paradigm. Current literature only provides very limited quantified indications about who these travellers are, and no quantification about the extent to which such shifts in travel behaviour could occur. The extent to which MaaS will be adopted and instigate changes in travel behaviour among the wider population remains uncertain. Skills, values, age and place of residence, and other socioeconomic, sociodemographic and cultural characteristics are likely to play roles in the adoption of MaaS and potential subsequent changes in travel behaviour.
- This study named a few impacts that MaaS could have, such as (perceived) access to transport and social inclusion, environmental sustainability (e.g. air pollution and noise pollution) and the transport system generally (e.g. capacity optimisation and passenger demand). However, at such a preliminary stage in this new type of paradigm, only rough qualitative indications about the types of impacts exist, and the extent and direction of such impacts remain uncertain. Perhaps one of the most illustrative examples of this uncertainty is MaaS’s impact on sustainability via car use: while MaaS’s access-based paradigm may compel decreases in private car use, it may also provide access to motorised vehicles to people who previously did not have such access.

**Documents:**

- [MaaS and changes in travel preferences and travel behaviour](#)

**STRIA Roadmaps:** Smart mobility and services

**Transport policies:**
- Societal/Economic issues, Environmental/Emissions aspects, Digitalisation, Decarbonisation

**Geo-spatial type:** Urban