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# Shifting from ownership to access and the future for MaaS – learning from shared mobility users

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## Abstract

Transport levels continue to increase worldwide representing complex challenges to climate change prevention and the liveability of cities. Private car use in particular represents a critical problem due to its negative impacts on global climate, local air quality and congestion. In recent years, interest has arisen in the concept of Mobility-as-a-Service (MaaS) as one possible path towards sustainable mobility futures. MaaS builds on the idea of a shift from private car *ownership* to a seamlessly integrated system providing *access* to multimodal mobility options including public transport and shared mobility services like car and bike sharing. Currently, only few examples of MaaS exist (e.g. Whim in Finland) and knowledge of user experiences is limited.

The aim of this paper is to contribute to a better understanding of how shared mobilities fit with the everyday life and social practices of citizens. Methodologically, the paper will draw on insights from qualitative interviews with families using shared mobility schemes in Copenhagen. The interviews will be informed by a practice theoretical approach focusing on how mobility practices are shaped through elements of materials, competences, and meaning (Shove and Pantzar, 2005) in order to study the ability of MaaS to fit people's social practices. To inform the discussion of our empirical results, we include a literature review of existing studies of user experiences with MaaS and a review and analysis of user practice representations in existing MaaS trials; i.e. how the use of MaaS is envisaged.

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## Background and purpose

The continued growth in car-based transport results in increasing levels of climate change impact. In Denmark, car-based passenger transport accounts for about 20% of the CO<sub>2</sub> emissions related to energy consumption in 2018 (Danish Energy Agency, 2020). While other consumption areas have demonstrated reductions in recent years, the emissions from transport continue to increase. Thus, there is an urgent need

for promoting reductions. This call for action is strengthened by other negative implications for the environment, public health and liveability of cities from a system dominated by automobility and private car ownership.

In recent years, the concept of Mobility-as-a-Service (MaaS) has emerged in discussions of future sustainable mobility. While no consensus on the definition of MaaS yet exists (Jittrapirom et al. 2017), Hensher et al. (2020) identify a number of commonalities across different applications of the concept; namely that MaaS is a user-centred, multi-modal and integrated transport service. In addition, many authors also include normative dimensions like goals of sustainability and reduced private car ownership in the definition of MaaS. For instance, Sochor et al. (2016), who have contributed with an oft-cited MaaS typology, defines the highest level of MaaS (level 4) as “integration of societal goals” with the “added value” of “reduced private car ownership and use, a more accessible, livable city, etc.” (p. 11)<sup>1</sup>. In short, MaaS denotes an ideal of a shift from car ownership to a system based on a seamless integration of existing and new mobility modes, which the users can access via one single platform (a smartphone app). The mobility modes typically include both “traditional” public transport services and private services (e.g. taxi) combined with shared mobility services such as car, ride and bike sharing. The latter modes of transport have attracted much attention in recent years as they are part of a more general transition towards an economy based on sharing or collaborative consumption (Schor & Fitzmaurice, 2015). These services involve a shift from ownership to access which may affect the way mobility forms part of the everyday life of citizens. However, research has so far provided limited knowledge on user experiences with MaaS solutions (Utriainen & Pöllänen, 2018).

In this paper, we will study families’ experiences with *shared mobility schemes* in Copenhagen. Our aim is to contribute to a better understanding of how shared mobilities fit with daily practices (including how these activities are planned) of citizens living in a major city. This is done on basis of qualitative interviews with families using car sharing schemes. It is our hope that the findings can inform the design of shared and integrated mobility solutions of future, sustainable MaaS services.

To facilitate the discussion of the design implications of our empirical findings, the paper will include a literature review and analysis of user practice representations in existing MaaS trials; i.e. how the users’ way of using MaaS is envisaged. These representations are compared to the findings from the qualitative interviews with shared mobility users. Also, the paper will include a literature review of existing studies of user experiences with MaaS, which will also inform the discussion of our empirical results.

## Methods

The empirical work of the paper consists of both drive-along and traditional qualitative semi-structured interviews with families living in urban areas of Copenhagen who currently use shared cars<sup>2</sup> (see table 1). The empirical work is centred around families with children, as they provide a unique opportunity for studying changes in mobility practices, because considerations of car access is often connected to the event of having children (Freudental-Pedersen, 2009; Godskesen, 2002). The car sharing service investigated for this paper is a non-profit organization offering station-based (round-trip) car sharing – a type of service most likely to be included in MaaS solutions.

Drive-along interviews, along the lines of go-along interviews, allow for examining informants’ experiences, interpretations and practices within their local environment (Carpiano, 2009). This way it can capture the

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<sup>1</sup> The other levels are integration of information (1), integration of booking and payment (2) and integration of the service offer (3).

<sup>2</sup> Originally, the plan was to also include empirical data on the use of shared e-bikes, however, due to COVID-19 and the challenges of recruitment that emerged, this empirical work was postponed until autumn 2020 and will be included in a future version of this paper.

meaning of spatial practices and allow for observation of people’s engagement with the environment (Kusenbach, 2003). For this paper, the drive-along interviews contributed with a unique opportunity to observe and talk about the actual performance of driving a shared car and to gain knowledge into those aspects of competences, materials and meanings that shape the practice. The drive-along interviews were documented through field notes and audio recorded to allow for re-examination of specific statements. The semi-structured interviews took point of departure in an interview guide focusing on unravelling the families’ everyday routines including how these were affected by the shift to shared mobility. All semi-structured interviews (lasting about 1.5 hours) were audio recorded followed by verbatim transcription and analysis.

Family (parents and age)	Number and age of children	Type of interview(s)	Have formerly owned a private car
Family A: Tina (XX)* and Peter (XX)*	One child: (3) + one on its way Peter: Three grown-up children	Drive-along Semi-structured	Yes
Family B: Søren (42)* and Lise (45)	Three children (9, 13, 15)	Semi-structured	Yes
Family C: Lars (49)* and Louise (49)	Three children (12, 16, 20)	Semi-structured	No
Family D: Thomas (38)* and Sanne** (34)	Two children (8, 11)	Drive-along Semi-structured	(Yes – when Thomas was young)

\* did participate in interview(s), \*\* did only participate in drive-along interview

Table 1. Overview of interviews

## Conclusion

Our analysis of MaaS user practice representations shows that current MaaS schemes and literature are grounded on an understanding of everyday mobility as being essentially based on rational, informed and choice-making decisions. Consequently, emphasis is put on how MaaS will take over the cognitive efforts associated with planning and carrying out door-to-door integrated and multi- and intermodal journeys and provide convenient, comfortable and efficient mobility to its users. This conceptualization of the traveller and mobility practices contradicts the findings from our interviews with families using car sharing. First, the interviews show that the routine character of mobility practices and related everyday practices may stand in opposition to the idea of “ultimate flexibility”. Everyday travel is embodied and routinized practices that are not changing on a regular day-to-day basis for two reasons: The individual practices are constituted by connected elements of materials, competences and meanings that together form a close-knit entity with much inertia. In addition, mobility practices are connected with other everyday practices through bundles and complexes, which adds further inertia to the individual practices.

On the other hand, as our literature review shows, the MaaS development is often shaped by the aim of providing a solution that can compete with the private car in terms of convenience, efficiency and comfortability. While appreciating that MaaS could play a key role in the sustainable transition of mobility, we find that creating a seamless MaaS system with the same qualities as owning a private car might be impossible. As the interviews show, private cars offer a level of convenience and flexibility, without the need for constant planning and being dependent on the limitations of shared resources (like cars), that it will be difficult for MaaS to provide.

This said, our findings also indicate three ways forward to promote MaaS as an alternative to private car use. *First*, in designing MaaS solutions, the relations between mobility and other everyday practices should be acknowledged. Thus, future MaaS should take into account how mobility is entangled with family life and how this involves, for instance, the need to bring along luggage, shopping large items or taking care of children. As part of this, solutions should ideally be able to accommodate to the temporal contingencies of everyday life; like when complaining children delay the planned departure to the second home or being

caught up in good company with friends (delaying the departure from visits). It is exactly this sort of flexibility and convenience the private car offers, and which the MaaS solution is difficult to be on a par with. Additionally, it is important to study further to what extent the dependency on ICT solutions in MaaS can act as a barrier to some people (the digital divide). *Second*, despite the (basic) limitations of MaaS, shifting from ownership to access comes with several positive things, which might provide convenience *in other ways*. Most evident from the interviews is how the families express a sense of freedom from maintenance of a private car. Also, the modal flexibility of MaaS should ideally make it possible to adapt choice of mode to the specific needs and situations; like in the examples from the interviews with choosing the right shared car to the specific situation. This sort of benefits from MaaS should be highlighted more in order to challenge the private car as the ideal mode of transport for especially families. *Third*, but not least, the interviews and literature review suggest that shared mobilities and MaaS will continue to be in intense competition with the private car *as long as* urban planning, transport infrastructures and policymaking keep favouring automobility. As Hensher et al. (2020) point out, the evidence so far suggests that MaaS will not be a “game changer”, unless the car is made less attractive through initiatives such as road-pricing and physical limitations through land-use planning in private car traffic and parking. Here, inspiration might be found in the EC2B trial in Gothenburg, Sweden, which supplements a MaaS solution with physical and social interventions to support the uptake of non-private-car-based mobility practices (e.g. no residential car parking and establishing local user communities).

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