



Refocusing MaaS approach: A brief

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ABSTRACT

Lately, there are raising concerns regarding MaaS capabilities, mainly related to its impact on modal shift. In this brief, we aim to highlight the importance of refocusing the discussion around MaaS potential by arguing that it should be considered a powerful tool for public authorities to steer and optimize urban transport networks rather than a means to reduce car ownership. We believe this discussion is relevant given the rising number of MaaS skeptics and people losing faith in the concept. This approach is based on the possible accessibility gains, and the equity impacts it could bring for instance, in the global south and the gender gap in transport.

1. The brief

In recent years several studies which aimed at reducing private car usage as the primary goal (Christensen et al., 2022; Hensher et al., 2021; Hensher and Hietanen, 2022) have raised concerns regarding the ability of mobility as a service (MaaS) to reduce car ownership. These studies suggest that investing in MaaS platforms is pointless if they do not offer the right incentives for users to give up their cars or make MaaS attractive so they could use it as a complementary service. The first paper about Mobility as a Feature (MaaF) (Hensher and Hietanen, 2022) explains how insurance companies could be the brokers for MaaF so car owners would join, an interesting and probably successful measure to make MaaS a reality but what about non-car users? We could include them by offering mobility packages through other services such as bicycle insurance, life insurance for pedestrians, etc., so it can reach the whole population.

In an interview with Mobility Payments last year, Professor David Hensher stated that “MaaS is in danger of becoming a hyped socio-technical phenomenon lacking full-scale implementations” and that “MaaS will only have a future if it changes the travel behavior of a sufficient number of people.” We agree with these statements, and believe that while reducing car usage is highly relevant and acknowledging that it was the argument that created the MaaS concept, efforts should highlight the importance of other potential outcomes (Butler et al., 2021).

Some studies found in the literature argue that MaaS could eventually change travel behavior by improving the commute of non-car users, which will refrain from joining the car culture (Strömberg et al., 2018)

and possibly influence other people (including car users) to join MaaS. Such an argument finds its conceptual basis in the Social Influence dimension included in the extension of the Technology Acceptance Model (Venkatesh and Davis, 2000). MaaS could also capture additional trips from car users and increase opportunities and welfare by, for instance, allowing them to take a shared bike to the gym.

We concur with the studies above that MaaS cannot compete directly with the private car because it will hardly match attributes such as privacy, comfort, and a “sense of freedom” (Jittrapirom et al., 2020). Moreover, MaaS cannot control or address the main factors behind car ownership: the built environment and urban policies (and politics) (Ding and Cao, 2019; Wang et al., 2018). MaaS (by itself) is not the solution to having fewer cars on the streets but rather a complementary measure along with other effective interventions (Kuss and Nicholas, 2022). Competing with the car (although not only) would require strong incentives beyond the financial approach (Hensher, 2022).

If we consider MaaS’s primary objective as increasing the level of accessibility to all segments of the population, then maybe the main goal should not always be to reduce car ownership (Hensher et al., 2022; Mulley et al., 2023). Instead, MaaS could be a valuable tool for public authorities to enhance the reliability and level of service of current public transportation systems and, in some cases, even regain control of the network where there is a high share of informal modes. With this approach, we can create an integrated network of transportation that caters to the diverse needs of all individuals, regardless of their vehicle ownership. Also, Ho (2022) states that “combining services across multiple modes in the most effective way possible can affect mode choice but also trip generation,” which means MaaS can help users meet

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the latent demand through sustainable modes.

Using a multilevel perspective approach (Geels, 2012), an analytical framework for socio-technical transitions that suggests that innovation occurs across three levels of analysis (Landscape, Regime, and Niche), we can identify that the main barriers to MaaS adoption are the current *stabilizers* of the landscape (such as the built environment and car culture) and the *lock-up* mechanisms of the regime (policies favoring the car, disagreements among operators, aspirational status & lifestyle, users preference, etc.). Being MaaS a Niche innovation, it can't (and should not) be responsible for reducing car ownership without addressing these practices.

On the bright side, there are encouraging *destabilizers* of the landscape and *cracks* in the regime that are reducing car ownership and are not directly linked to MaaS. For instance, the younger generation's aversion or disinterest in owning a car or even a driving license, which according to "Throughout the rich world, the young are falling out of love with cars" (The Economist, 2023), is mainly related to the growing environmental awareness and the existence of mobility platforms such as Uber or Lyft, given their ability to use and adapt quickly to technology (Jittrapirom et al., 2017). This trend will continue in the following decades, bolstered by adopting "smart growth policies" to make cities more liveable (Zhong and Lee, 2017). Also, cycling and walking already account for 40% of all European urban trips, with Bulgaria, Romania, and Spain having a higher modal share for these modes than for cars (European Commission, 2022).

Jittrapirom et al. (2020) stated that switching from cars to MaaS may be marginal. As such, rather than focusing on reducing car ownership, which might be an unattainable goal for MaaS, our attention should be on using MaaS to make public transport and shared mobility services more attractive to new generations and avoid them adopting the car culture. Ditching MaaS based on its inability to reduce car ownership is also inequitable (Pereira et al., 2017). MaaS features have the potential to provide access to transit-deprived areas and to those who cannot afford a car or drive one, such as elderly or disabled individuals. MaaS can optimize and re-organize the network according to the modes included (e.g., using ride-hailing as TOD in specific areas if financially suitable), enabling access to opportunities disregarding car ownership.

Also, the "shift from the car approach" may ignore the situation in the global south, where in most cities, public transport or informal modes dominate modal shares (Hasselwander and Bigotte, 2022). In addition, women worldwide have less access to cars, different travel patterns, and make more chain trips than men, meaning MaaS could also play an essential role in reducing the gender gap in transport and increasing accessibility for women (Loubser et al., 2021; Ng and Acker, 2018; Qiao and Yeh, 2021; Scheiner and Holz-Rau, 2017; Tiikkaja and Liimatainen, 2021). However, our aim is not to stigmatize the car as it can be instrumental in the rural context but to start considering the different segments of the population, their needs, resources, and travel patterns in the design and implementation of new mobility services.

In this sense, we also argue that public authorities should lead or enable MaaS systems to ensure that its social benefits support the required investment level and avoid the concern raised by Jittrapirom et al. (2020) that it will compete with public transport. A well-implemented, fully integrated MaaS system could prevent those who have never owned a private car from starting to own one, and this could have a direct impact on sustainable goals in the long term. However, as Hensher and Hietanen (2022) state, "We have seen almost no government commitment to subsidizing MaaS beyond what they already do for regular public transport except Japan." We believe that MaaS could empower the public transport and land use strategy, as it can be used to improve the transport network, accessibility, and sustainability in many cities worldwide, becoming the cornerstone for strategic change.

If researchers and policymakers focus not mainly on private car users but include current public transportation and sustainable modes users creating a set of KPIs that align with the societal goals (Hensher et al.,

2023), the task would be potentially easier and more realistic to achieve, positioning MaaS not as an alternative to the private car but as a digital tool that helps us achieve more comprehensive societal outcomes such as decarbonization, improved equity, and accessibility for all. This way, reducing car ownership could be a consequence rather than the objective of MaaS globalization.

This set of KPIs could become a benchmark for assessing MaaS systems performance and should include for instance: reduced private vehicle ownership, effective and active accessibility gains (D. Vale, 2020; D. S. Vale et al., 2015), reduced VKT per capita, shared modes trips increase, gender gap impact (McIlroy, 2023), increased trip awareness and improved social equity (Butler et al., 2021). This would provide a more holistic approach towards MaaS. Specific research should be conducted to correctly define context-specific KPIs as the transportation, land-use system, legal and institutional settings differ between countries (Hensher et al., 2023).

As MaaS could make MaaS financially viable for private companies, public authorities must understand that subsidizing or supporting MaaS initiatives could generate a strategic change and steer the path to achieving mobility-related societal goals. This said, MaaS (or MaaSF) stakeholders should move on beyond talking about it (Hietanen, 2023) and speed up its implementation, given that, as explained in this brief, there are strong reasons to support it rather than ditch it and start exploring other market segments.

Finally, if the ultimate goal is to reduce car ownership, maybe policymakers should stop with the carrots (and not treat MaaS as one) and start getting serious about the sticks, for instance, road pricing, which has been difficult to implement in most countries due to the political regime.

CRedit author statement

Mauricio Orozco-Fontalvo: Conceptualization, investigation, Writing – Original Draft. Filipe Moura: Conceptualization, Supervision, Writing – Review & Editing.

Data availability

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