Preface

Mobility as a Service (MaaS) can be briefly described as a concept that aims to fulfil individual's mobility needs in a sustainable way by combining different transport services to seamless trips (Utriainen & Pöllänen 2018), offering an appealing alternative to owning and using a private car (Lyons et al. 2019). The core characteristics of MaaS include integration of multiple transport modes and actors, various payment options, use of various technologies through one user interface platform as registered user as well as personalization and customization to offer demand oriented user-centric mobility services (Jittapirom et al. 2017). The history of MaaS by name and related research is not long, but MaaS can be seen as an evolutionary continuation of integrating mobility services (Lyons et al. 2019). MaaS research is accumulating rapidly and the focus has been on describing the concept (Jittapirom et al. 2017, Sochor et al. 2018), identifying the roles of various stakeholders (Hensher 2017, Smith et al. 2018), exploring the user potential (Ho et al. 2018) and lately taking a critical view on the effects of MaaS and the needs for governing the development (Matyas & Kamargianni 2019, Pangbourne et al. 2019, Smith et al. 2019).

The visions of MaaS focus on the possibility to offer seamless and effortless, instant accessibility that is smarter, faster and greener than using a private car (Pangbourne et al. 2019). Indeed, if the aim of implementing MaaS is to change the modal split of transport to achieve sustainable mobility, as it should be, then the vision should be to offer a better freedom of mobility and with a lower cost than with a private car. The possibility to offer better freedom of mobility through MaaS is largely dependent on the cities offering high quality public transport services that are the backbone of MaaS (Matyas & Kamargianni 2019). Without the backbone of high quality public transport services, mobility services are based on ride-hailing services, even publicly subsidized ones, which decrease the use of public transport (Clewlow & Mishra 2017).

While the number of MaaS pilots is expanding, the commercial operation of a fully integrated MaaS offering seems to be difficult and operational offerings are scarce. Whim by MaaS Global remains the only offering available in several

countries, but even it only operates in one city in each country (MaaS Global 2019). Hence, the expectations of operational MaaS before 2020 by the Delphi panel of experts seem to have been optimistic and the constraints of MaaS having limited value, difficulties in integrating public transport and lack of collaboration between crucial actors seem to have prevailed (Jittapirom et al. 2018). Based on the MaaS research literature it seems that MaaS is slipping into the 'trough of disillusionment' of the Gartner's Hype Cycle (Lyons et al. 2019). In addition to the difficulties in establishing the collaboration needed to enable MaaS operations, one of the biggest challenges is the need for a cultural shift from ownership to access (Mulley 2017). This challenge may be greater than expected and MaaS is in danger of becoming a hyped socio-technical phenomenon (Giesecke et al 2016) with lacking full-scale implementations reaping the alleged benefits (Smith et al. 2018).

The challenge of a cultural shift from ownership to access seems to decide the faith of MaaS operations. Lyons et al. (2019) propose a behavioral schema on the individual choice making related to the adoption of MaaS, which can be used to analyze the trends affecting the viability of MaaS in the long-term.

1. Choice of getting a driving license. There are trends in the UK and Finland that young people do not get driving licenses as often as they used to (Chatterjee et al. 2018, Traficom 2019).
2. Choice of owning a car. Trends in the UK and USA show that car ownership is declining, due to demographics, living situation and socio-economic situation, but also due to a cars having less symbolic value than before (Chatterjee et al. 2018).
3. Modal choices. Socio economic factors, life stage delays as well as re-urbanisation made possible by land-use and transport system policies seem to have decreased the share of trips and absolute number of miles travelled by car in the UK, USA, Australia and Austria (Buehler et al. 2017, Melia et al. 2018, Delbosc et al. 2019).
4. Choice between MaaS offering and using mobility services separately. Vast majority of the trips are made within a relatively small area around peoples' homes. Hence, the number of possible mobility services is likely to be rather limited and people are familiar with the available mobility services. This leads to situations where the cognitive user effort (Lyons et al. 2019) related to choosing a MaaS offering is likely to be higher than when choosing the existing mobility services and even adopting an additional service, such as an electric scooters, to the mix of existing mobility services.

5. Choice of best MaaS plan. MaaS offerings in a certain area typically has a limited number of plans, from which the customer can choose the most suitable one. However, People have very different needs and it is impossible to tailor a plan for every customer. This may lead to lost customers but also to extra discretionary trips in order to 'make the most' of the prepaid MaaS plan (Pangbourne et al. 2019).

To sum up, it seems that the hyped expectations and optimistic timeframes of fully integrated MaaS offerings bringing benefits for the society and customers while creating revenue for the MaaS operators are changing towards facing the difficulties in the trough of disillusionment. Current mobility market is vastly dominated by private car use, which in many areas offers superior level of service in terms of effort and journey times, although with high fixed costs, compared to alternative mobility services. The superior level of service is the result of decades of determined land use and transport system planning and it is very difficult to break the pattern. Indeed, what would an ideal transport system for MaaS look like? However, emerging trends of socio-economic factors, attitudes as well as in land use and transport system policy favor modal shift from car to mobility services. Ultimately the question remains, whether MaaS offerings bring more value to the customers than owning and using private car, or using the existing and possible new mobility services separately.

ORGANIZATION OF THE BOOK

The book includes nine chapters, of which the first three focus on describing the concept of MaaS, identifying the stakeholders and exploring the potential users. Chapters 4-7 focus on the opportunities and challenges of MaaS and shared mobility services in general in rural areas. The last two chapters open new research avenues through multidisciplinary approach. A brief description of each of the chapters follows:

Chapter 1 provides a synopsis of the underlying factors that enable the existence of the MaaS concept and its role towards the improvement of the performance of transportation systems. It aims to contextualize MaaS in modern societies and explains its main functions and advantages but also the challenges facing its widespread implementation.

Chapter 2 presents Public-Private-People Partnership (PPPP) network for MaaS and considers the integration of market-based mobility services and subsidized public transport. The roles and responsibilities of MaaS stakeholders in the PPPP network are also described.

Chapter 3 aims to identify the potential user groups of MaaS through the results of an extensive public survey carried out in Finland. Young adults and people living in urban areas and in households without a car are found to be more interested in MaaS than other groups. The findings highlight that the greatest potential for MaaS can be found in urban areas.

Chapter 4 turns the focus on rural areas and considers the collaboration of authorities to provide accessibility through mobility services. The authors emphasize that strong governance is needed to develop MaaS that do not exclude rural areas.

Chapter 5 takes a practical example of integrating public transport service with carpooling to solve the challenges of MaaS in rural areas. Management and user perspectives are analyzed and the chapter also identifies barriers concerning legal aspects.

Chapter 6 reviews the applications of shared mobility services in a suburban area. As opposed to previous chapters the focus is on shared services instead of public transport based services, reflecting the difference between American and European approach to the concept of MaaS.

Chapter 7 deals with mobility in rural areas by taking the perspective of demographic and social changes as starting points. Rural areas are found to have disadvantages compared to urban areas in terms of accessibility of jobs, education and services, but various innovative solutions for improving the accessibility in rural areas are also presented.

Chapter 8 highlights the importance of civic engagement in developing sustainable mobility. Gamification is used as a tool to improve civic engagement and two cases of using gamification to promote sustainable mobility are presented.

Chapter 9 considers the concepts of Internet of Mobility (IoM) related to the technological developments in mobility and MaaS related to the service developments in mobility and introduces a new concept of Internet of Mobility as a Service (IoMaaS).

Heikki Liimatainen
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REFERENCES

Buehler, R., Pucher, J., & Altshuler, A. (2017). Vienna's path to sustainable transport. *International Journal of Sustainable Transportation*, *11*(4), 257–271. doi:10.1080 /15568318.2016.1251997

Chatterjee, K., Goodwin, P., Schwanen, T., Clark, B., Jain, J., Melia, S., . . . Stokes, G. (2018). *Young People's Travel – What's Changed and Why? Review and Analysis. Report to Department for Transport*. UWE Bristol. Available at: http://eprints.uwe. ac.uk/34640/

Clewlow, R. R., & Mishra, G. S. (2017). *Disruptive Transportation: The Adoption, Utilization, and Impacts of Ride-Hailing in the United States*. Davis, CA: Institute of Transportation, UC Davis.

Delbosc, A., McDonald, N., Stokes, G., Lucas, K., Circella, G., & Lee, Y. (2019). Millenials in cities: Comparing travel behavior trends across six case study regions. *Cities (London, England)*, *90*, 1–14. doi:10.1016/j.cities.2019.01.023

Giesecke, R., Surakka, T., & Hakonen, M. (2016). Conceptualising mobility as a service – A user centric view on key issues of mobility services. *Proceedings of the Eleventh International Conference on Ecological Vehicles and Renewable Energies (EVER)*. 10.1109/EVER.2016.7476443

Hensher, D. A. (2017). Future bus transport contracts under a mobility as a service (MaaS) regime in the digital age: Are they likely to change? *Transportation Research Part A, Policy and Practice*, *98*, 86–96. doi:10.1016/j.tra.2017.02.006

Ho, C., Hensher, D. A., Mulley, C., & Wong, Y. Z. (2018). *Prospects for switching out of conventional transport services to mobility as a service subscription plans – a stated choice study*. UTSG.

Jittrapirom, P., Caiati, V., Feneri, A. M., Ebrahimigharehbaghi, S., González, M. J. A., & Narayan, J. (2017). Mobility as a service: A critical review of definitions, assessments of schemes, and key challenges. *Urban Planning*, *2*(2), 13–25. doi:10.17645/up.v2i2.931

Jittrapirom, P., Marchau, V., van der Heijden, R., & Meurs, H. (2018). *Future Implementation of Mobility as a Service (MaaS): Results of an International Delphi Study*. Radboud University.

Lyons, G., Hammond, P., & Mackay, K. (2019). The importance of user perspective in the evolution of MaaS. *Transportation Research Part A, Policy and Practice*, *121*, 22–36. doi:10.1016/j.tra.2018.12.010

Maa, S. Global. (2019). *Find your plan*. Available at: https://whimapp.com/plans/

Matyas, M., & Kamargianni, M. (2019). The potential of mobility as a service bundles as a mobility management tool. *Transportation*, *46*(5), 1951–1968. doi:10.100711116-018-9913-4

Melia, S., Chatterjee, K., & Stokes, G. (2018). Is the urbanization of young adults reducing their driving? *Transportation Research Part A, Policy and Practice*, *118*, 444–456. doi:10.1016/j.tra.2018.09.021

Mulley, C. (2017). Mobility as a services (MaaS)–does it have critical mass? *Transport Reviews*, *37*(3), 247–251. doi:10.1080/01441647.2017.1280932

Pangbourne, K., Mladenovic, M. N., Stead, D., & Milakis, D. (2019). Questioning mobility as a service: Unanticipated implications for society and governance. *Transportation Research Part A, Policy and Practice*. doi:10.1016/j.tra.2019.09.033

Smith, G., Sochor, J., & Karlsson, I. M. (2018). Mobility as a Service: Development scenarios and implications for public transport. *Research in Transportation Economics*, *69*, 592–599. doi:10.1016/j.retrec.2018.04.001

Smith, G., Sochor, J., & Karlsson, I. M. (2019). Public–private innovation: Barriers in the case of mobility as a service in West Sweden. *Public Management Review*, *21*(1), 116–137. doi:10.1080/14719037.2018.1462399

Sochor, J., Arby, H., Karlsson, I. C. M., & Sarasini, S. (2018). A topological approach to Mobility as a Service: A proposed tool for understanding requirements and effects, and for aiding the integration of societal goals. *Research in Transportation Business & Management*, *27*, 3–14. doi:10.1016/j.rtbm.2018.12.003

Traficom. (2019). *Uusien henkilöautonkuljettajien liikenneturvallisuus*. Available at: https://www.liikennefakta.fi/turvallisuus/tieliikenne/uusien_henkiloautonkuljettajien_liikenneturvallisuus

Utriainen, R., & Pöllänen, M. (2018). Review on mobility as a service in scientific publications. *Research in Transportation Business & Management*, *27*, 15–23. doi:10.1016/j.rtbm.2018.10.005