

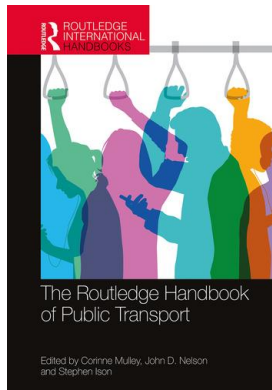
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### Mobility as a service and public transport

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# 3

## MOBILITY AS A SERVICE AND PUBLIC TRANSPORT

*Göran Smith*

### **Introduction**

Mobility as a Service (MaaS) is a digital concept that centres on integrating traditional public transport with other types of mobility services such as carsharing and ridesourcing. In recent years, MaaS has become a much-discussed topic within the transport industry. Proponents contend that MaaS can make it easier for users to combine multiple mobility services into customised offerings that match their individual mobility needs. Accordingly, they argue that MaaS can decrease the perceived need of owning private cars (for some) and thereby reduce the lock-in effect of car ownership and support a modal shift away from private cars to active mobility, public transport, and other mobility services that build on shared vehicles and/or rides. Such a modal shift could potentially address some of transport systems' pressing sustainability problems, like congestion, car parking, and carbon dioxide emissions. In the wake of the COVID-19 pandemic, MaaS has, moreover, been brought forward as a concept that can improve transport system resilience. MaaS is thought to strengthen the ties between mobility service providers and help users shift between different modes of transport, thus making it easier for both groups to quickly adapt to changed circumstances.

However, the empirical evidence backing up these propositions is sparse. The understanding of when and under what conditions MaaS can attract what customer segments is still limited, as is the knowledge on how MaaS adoption influences travel behaviour. Despite the intuitive nature of MaaS and the widespread interest in the concept, the systematically evaluated demonstrations of comprehensive MaaS services can thus far be counted on the fingers of one hand. The realisation of MaaS has proven to be a demanding endeavour. MaaS does not fit well with existing legal frameworks, for instance, regarding customer relations in multimodal travel chains. Furthermore, MaaS challenges mobility services providers' current models for interorganisational collaboration and business. Hence, MaaS developments have been accompanied by scepticism and mistrust. In particular, public transport authorities have been criticised for not permitting external actors to resell their products. Since public transport is considered the backbone of MaaS, this virtually blocks those other than the public transport authorities themselves from developing viable MaaS offerings.

Nonetheless, these hurdles seem to have been mitigated, at least temporarily, in some places. Several MaaS services that integrate public transport with other mobility service offerings have

been launched recently, such as Jelbi in Berlin (jelbi.de), Travis in Stockholm (gettravisapp.se), and Zipster in Singapore (mobility-x.com). A number of ongoing MaaS trials are, moreover, being closely monitored by researchers, for example, Tripi in Sydney, Amaze in Amsterdam, and EC2B in Gothenburg. Hopefully, these projects (and others) can start to accumulate an empirical body of knowledge regarding whether, and, if so, how, MaaS disrupts public transport, public transport authorities, and transport systems in general.

Notwithstanding the shortage of data on the effects of MaaS, this chapter takes stock of extant MaaS experiences to discuss how public transport authorities can shape the development, diffusion, and use of MaaS. Using Smith (2020) as a starting point, this chapter first provides a definition of MaaS, followed by a brief review of expectations on how MaaS will influence public transport. A framework that describes pathways to governing MaaS developments is introduced next and is subsequently used to analyse and discuss how public transport authorities in Finland, Sweden, and Norway have approached MaaS. Finally, the chapter concludes with a few statements on lessons learnt thus far.

### What is Mobility as a Service?

MaaS is an ambiguous term with multiple meanings. Since it was first introduced in Finland in 2014, the rapidly growing scientific literature on MaaS has provided a range of overlapping typologies (Kamargianni et al., 2016; Lyons et al., 2020; Sochor et al., 2018). Still, the most-cited definitions stem from grey material such as master thesis projects, industry magazines, and research reports:

- “A system in which a comprehensive range of mobility services are provided to customers by mobility operators” (Heikkilä, 2014, p. 8).
- “A mobility distribution model in which a customer’s major transportation needs are met over one interface and are offered by a service provider” (Hietanen, 2014, p. 2).
- “A user-centric, intelligent mobility management and distribution system, in which an integrator brings together offerings of multiple mobility service providers, and provides end-users access to them through a digital interface, allowing them to seamlessly plan and pay for mobility” (Kamargianni et al., 2018, p. 3).

As illustrated in Smith and Hensher (2020), a shortcoming of these definitions is that they more often than not employ subjective and value-laden terms (e.g. major, comprehensive, user-centric, and seamless), which makes it arbitrary to apply them to objectively determine what is MaaS and what is not. To overcome this issue, this chapter suggests that MaaS can be understood simply as “a type of service that through a digital channel enables users to plan, book, and pay for multiple types of mobility services” (Smith, 2020, p. 3). Hence, at its core, MaaS introduces a digital one-stop shop (e.g. a smartphone app) that integrates scheduled and real-time information on several types of mobility services (e.g. public transport and taxi), as well as a unified method for gaining access to these. Additionally, MaaS might include possibilities for users to pay through periodical subscriptions and could synchronise the MaaS offering with transport policies (cf. level three and four in Sochor et al., 2018). Nevertheless, the fulfilment of these functionalities will not be a binary determinant for whether MaaS will be attractive to potential users. Rather, the attractiveness of MaaS can be described as a function of the perceived utility of the integrated mobility services (including interoperability and in comparison with alternative modes) and the service quality experienced by the users (Hensher et al., 2020; Karlsson et al., 2016; Smith et al., 2019a). As explained by Lyons et al. (2020), the ultimate MaaS service

would go beyond multimodal information and payment functionalities to provide a level of service that is on a par with the private car in terms of the cognitive efforts required from users.

### **Expectations on how Mobility as a Service will influence public transport**

It has been widely acknowledged that transport systems are undergoing a technology-powered transformation that, *inter alia*, blurs the lines between public and private modes of mobility. The advent of new shared modes, such as ridesourcing and sharing systems for cars, bicycles, and scooters, has started to transform the mobility landscapes in many metropolitan cities, while autonomous technologies are anticipated to change the rules of the game even more dramatically in the not-so-distant future (Smith & Theseira, 2020).

Veeneman (2019) notes that these new modes can have either synergetic or competitive relations with traditional public transport. For example, a survey of ridesourcing adoption in seven cities in the United States found that ridesourcing had attracted people away from public transport (Clewlow & Mishra, 2017), while a spatial analysis of docked bicycle sharing systems in two Chinese cities concluded that bicycle sharing can improve links between public transport stations and thus improve the catchment area and efficiency of urban public transport networks (Yang et al., 2018). In order to pave the way for synergetic relations rather than competitive, Veeneman (2019) argues that governments have a key role in driving integration between modes. Although the importance of traditional policy fields such as infrastructure and land-use planning and transport regulation remains, MaaS provides a new promising tool for providing such integration.

However, in a review of the expectation on MaaS among actors involved in MaaS developments in Sweden, Finland, and Australia, it was found that rationales regarding MaaS diverged (cf. Smith, 2020). Although a majority believed that MaaS will improve the integration between mobility services and thus help mobility services attract people away from private cars, others were either sceptical that MaaS will catch on or anticipated that MaaS will lead to undesirable outcomes such as induced travel demand, a modal shift away from public transport, increased transport exclusion (see also Chapter 26), or a higher complexity in planning and managing transport networks. In relation to public transport, it was contested whether MaaS will: bring new customer segments to public transport or primarily attract current public transport users, increase the cost-effectiveness of public transport by replacing ineffective routes or decrease its cost recovery by competing with the most efficient public transport routes, improve public transport authorities' understanding of their users by collecting a fuller picture of travel habits or deplete this understanding by cutting public transport authorities' access to user data, and enhance the brand value of public transport by associating it with modern mobility services or degenerate it by reducing public transport authorities to invisible suppliers (Smith, Sochor, & Karlsson, 2018).

As discussed in the next section, it is, moreover, widely debated if the new operational tasks that MaaS entails should fall under public control or not. Depending on pathway, MaaS can either enlarge or reduce the current scope of public transport authorities. Regardless of this choice though, MaaS builds on new forms of relationships between many different actors, such as public and private mobility service providers, technology providers, and users. Consequently, MaaS is bound to change public transport authorities' interorganisational relations. This will also likely put new requirements on their internal processes. For example, how are internal development projects prioritised vis-à-vis external ones, and how are strategies and action plans communicated? Furthermore, it will most probably demand new types of competences, such as

managing networks of interdependent but more or less autonomous actors. Despite the limited data to date on the impacts of MaaS, and the diverging expectations, it thus seems reasonable to assume that MaaS will cause/require adjustments to the current structures and practices of public transport authorities in one way or another.

### Pathways to governing Mobility as a Service developments

The process of realising MaaS can be conceptualised as a case of disruptive and collaborative innovation (Smith, 2020). In other words, the realisation of MaaS can be understood as an innovation process that disrupts current structures and practices within the transport industry and which requires synchronised activities from many actors. Innovation processes are here understood to include multiple iterative stages that together describe how ideas are transformed into products, services, or processes that are perceived as new within a defined area and which are adopted, adapted, and used (cf. Rogers, 1995). Following this view, the MaaS innovation process can be divided into three interrelated core phases: *development of MaaS* during which operational MaaS services are materialised; *diffusion of MaaS* during which users get exposed to MaaS, form attitudes about MaaS, and decide to start using MaaS or not; and *use of MaaS* during which the use of MaaS is stabilised and becomes a mainstream part of transport systems (Smith, 2020).

Since the realisation of MaaS requires activities from a diverse set of actors, the innovation process puts high demands on interorganisational and intersectorial co-ordination. For example, the MaaS development phase would benefit greatly from harmonisation of customer categories and technical data interfaces (Smith et al., 2020), while the MaaS diffusion and use phases require that the transport infrastructure and land-use planning at local, as well as regional and national, levels encourage the diffusion and use of mobility services (Smith & Hensher, 2020; Smith et al., 2019a). Hence, the realisation of MaaS poses a great governance challenge (see also Chapter 2). Due to its unique capabilities (e.g. reforming regulation) and objectives (e.g. capturing public value), it can be argued that the public sector is best positioned to face this challenge. Beyond the need for synchronising and stimulating activities across sectors and policy fields, public sector governance of MaaS has, moreover, been advocated for based on the risks associated with MaaS, such as technological determinism, de-politicisation, and regulatory capture (Docherty et al., 2018; Pangbourne et al., 2018, 2020) (see also Chapter 1). In other words, public sector governance of MaaS seems to be needed to both facilitate MaaS developments and to steer the long-term trajectory towards contributing to policy objectives (Smith, 2020).

Broadly speaking, governance, and theories of governance, are concerned with “the capacity to steer the economy and society, and involves identifying some effective means of deciding upon collective goals and then finding the means of reaching those goals” (Peters, 2014, p. 302) (see also Chapter 2). Since economies and societies are populated by a range of actors that have their own agencies and participate in various influential processes, governance is inherently a hybrid activity involving public-, private-, and civil-sector actors to different degrees and in different ways (ibid.). Nonetheless, the term governance is also used to describe a specific public administration theory (sometimes referred to as new public governance) which emphasises intersectorial collaboration between interdependent but autonomous actors as a key method for policymaking, negotiation, and implementation (Osborne, 2006; Rhodes, 1997). Here, the public sector manages sociotechnical developments by influencing public-private arenas through a mix of *hands-on* and *hands-off* interventions (Sørensen & Torfing, 2011, 2016). Hands-on intervention entails that the public sector participates in and oversees decision-making and is assumed to generate public sector accountability and control (Vento, 2019). Hands-off

intervention implies that the public sector focuses on co-ordinating and incentivising external activities and is thought to give freedom for the private sector to innovative (ibid).

Building on Kronsell and Mukhtar-Landgren (2018), Smith (2020) suggests that public sector actors that want to facilitate the realisation of MaaS can take four roles in the development, diffusion, and use of MaaS: *MaaS Promoter*, *MaaS Partner*, *MaaS Enabler*, and *Laissez-Faire* (a public sector actor can take several governance roles at once and change roles across MaaS innovation phases); see Table 3.1.

The MaaS Promoter role entails that the public sector actor intervenes hands on in the realisation of MaaS. In other words, a MaaS Promoter manages MaaS developments by being directly involved in executing day-to-day decision-making and innovation (cf. the network participation and network management tools in Sørensen and Torfing [2009]). This could, for instance, imply mobilising resources to lead and co-ordinate the development of MaaS services and components during the MaaS development phase; funding MaaS marketing and/or acting as first customer of MaaS during the MaaS diffusion phase; and taking on the two new operative tasks during the MaaS use phase – *MaaS integration*, which encompasses collecting and curating data and tickets from mobility service providers, and *MaaS operation*, which comprises bundling MaaS services and delivering these to users (Smith et al., 2018).

The MaaS Partner role entails that the public sector actor intervenes in the realisation of MaaS through a mix of hands-on and hands-off intervention in order to build collaboration networks and to support, participate in, and influence private sector-led innovation activities. This could, for instance, imply setting up and participating in knowledge sharing forums and MaaS experiments during the MaaS development phase, sharing user insights with those operating MaaS and legitimising their MaaS services during the MaaS diffusion phase, and taking on the MaaS integration task (but not the MaaS operation task) during the MaaS use phase.

The MaaS Enabler role entails that the public sector actor intervenes hands off. The main goal is to create conducive conditions for MaaS developments carried out by private sector actors (cf. the network design and network framing tools in Sørensen and Torfing [2009]; see also Chapter 32). This could, for instance, imply pursuing institutional reforms and funding experimentation during the MaaS development phase, promoting the spread of mobility

Table 3.1 Pathways for governing MaaS developments, adapted from Smith (2020)

Role	MaaS development	MaaS diffusion	MaaS use
<b>MaaS Promoter</b>	Takes the lead in transforming MaaS visions and ideas into operational services	Acts as the lead customer for MaaS services and/or advertises MaaS services	Integrates mobility service data and tickets, and operates MaaS services
<b>MaaS Partner</b>	Participates in knowledge-sharing forums and in MaaS experiments	Legitimises MaaS services, supports marketing, and shares user insights and data	Mediates data and products from mobility service providers to MaaS services
<b>MaaS Enabler</b>	Opens for and funds MaaS experimentation and research	Promotes the diffusion of mobility services and/or digital interfaces	Feeds data and tickets for its own mobility services into MaaS services
<b>Laissez-Faire</b>	Monitors MaaS development processes while continuing business as usual		

services during the MaaS diffusion phase, and feeding data and tickets for the mobility services it manages to third-party resellers during the MaaS use phase.

Finally, the *Laissez-Faire* role entails that the public sector actor withholds from intervening in the realisation of MaaS, and instead concentrates on monitoring the progress. Although this approach might appear passive, it could be a deliberate choice, that is, to ‘step away’ to give external actors leeway for innovation.

### Examples from the Nordic countries

MaaS has in recent years surfaced on many Nordic public transport authorities’ agendas. MaaS developments in the Nordic countries have, moreover, been frequently used as guiding examples in the global MaaS debate. In particular, the reform of transport legislation and the operation of Whim in Finland, and the UbiGo pilot in Sweden, have been scrutinised by both practitioners and researchers (e.g. Audouin & Finger, 2018; Hartikainen et al., 2019; Hensher et al., 2020; Hirschhorn et al., 2019; Kanger & Kivimaa, 2019; Mukhtar-Landgren & Smith, 2019; Sochor et al., 2016; Strömberg et al., 2018). Departing from the roles outlined in the previous section, the MaaS governance approaches of the public transport authorities in the metropolitan regions of Helsinki (Finland), Gothenburg (Sweden), and Oslo (Norway) are discussed next (for more detailed accounts of Nordic MaaS developments, see Hedegaard Sørensen et al. [2020] and Isaksson et al. [2019]).

**Helsinki:** The capital city of Finland has in recent years gained a global reputation as a breeding and testing ground for mobility innovations. It has been argued that Helsinki is an ideal context for future mobility solutions, since its transport situation is manageable, Finland has a rich history in digital innovation and supports experimentation, the municipality has high targets for carbon dioxide emissions reduction in transport, and its residents are quick to adopt innovations (Davies, 2018). Likewise, Helsinki has time and again been hailed as a MaaS frontrunner in the transport industry press and in news media (e.g. Greenfield, 2014; Köllinger, 2018; Putkonen & Tikkanen, 2019). This status mainly comes down to two things. First, Helsinki is host to the first continuous operation of MaaS. The much-talked-about MaaS service Whim has been available to Helsinki residents since late 2016 and currently has around 10,000 users per month (cf. Hartikainen et al., 2019). Second, the regulation of personal mobility in Finland has been thoroughly reformed in recent years. A new general transport law has been introduced, which mostly entered into force during 2018. Its main objective is to streamline transport regulation and to open for and stimulate competition in order to pave the way for better mobility services (LVM, 2017). Amongst other things, mobility service providers are now required to ensure that essential, up-to-date data on its services is freely available via an open interface in a standard, easy-to-use, and computer-readable format. They must also give third parties access to the sales interfaces of their ticket and payment systems, via which it ought to be possible to reserve and/or purchase verifiable tickets on behalf of users. Third parties should be able to provide MaaS efficiently without restrictions (Finlex, 2017). In other words, both public and private mobility service providers in Finland are required to enable external MaaS innovation.

The public transport authority in the greater Helsinki region (*Helsingin seudun liikenne*, HSL) has arguably not been in the driving seat of either the transport legislation reform or the Whim operation (Mukhtar-Landgren & Smith, 2019) but has been affected by the former and has paved the way for the latter. In order to enable MaaS Global (the company operating Whim) and others to resell digital public transport tickets, HSL has developed an application programming interface (API) and a development portal ([sales-api.hsl.fi](https://sales-api.hsl.fi)) through which third-party

actors can integrate and resell single tickets, daily and monthly passes, and zone extension. HSL has also developed general contract terms and signed a copy with MaaS Global, thus enabling the operation of Whim. Despite becoming the first public transport authority to fulfil the new transport legislation's requirements on data and sales interface openness via these activities, a few of the other actively involved actors in Finland have alleged that HSL has impeded MaaS developments. Some have described HSL as slow moving and difficult to work with (Audouin & Finger, 2018), while the API has received criticism for having (purportedly) low flexibility and strict process requirements.

All in all, HSL has thus far appeared to be sceptical of the market-driven model of MaaS in Finland. So also of the new general transport law, which forces mobility service providers to open data and ticket interfaces but does not oblige third-party resellers to share travel data back to mobility service providers. Still, HSL has been pushed to act as a MaaS Enabler of the development and operation of Whim (Audouin & Finger, 2019; Mukhtar-Landgren & Smith, 2019). As of spring 2020, two external actors are reselling public transport tickets through HSL's API (MaaS Global and *Korsisaari*). Simultaneously, HSL is analysing different MaaS scenarios in order to identify the appropriate role for HSL in the future development, diffusion, and use of MaaS. The recognised alternatives range from keeping the status quo (as a MaaS Enabler) to taking a more hands-on role.

**Gothenburg:** The public transport authority in Västra Götaland (*Region Västra Götaland* and *Västrafik*, VGR/VT) started working actively on the MaaS topic in 2014. Its approach to governing MaaS has arguably gone through three major phases since then. VGR/VT's interest in MaaS was awakened in association with a number of MaaS-related research and innovation projects that it participated in between 2011 and 2014. The most acclaimed outcome of these projects is the UbiGo pilot that was carried out in Gothenburg, which showcased that MaaS, at least in some cases, can attract users and influence their travel behaviour towards less car use (Sochor et al., 2015, 2016). Following the promising outcome of the UbiGo pilot, VGR/VT decided to procure a regionwide MaaS service by the end of 2014 (VGR, 2014). After a period of inactivity (characterised by internal indecisiveness and external criticism), VGR/VT commenced a dialogue with potential suppliers in spring 2016 in order to understand what procurement terms would be appropriate. The interest in bidding on the procurement was large, but it became evident during the dialogue that neither VGR/VT nor the potential bidders had sufficient knowledge and experience of MaaS to allow for a fruitful procurement process (Smith et al., 2017, 2019b). The procurement process was therefore cancelled.

VGR/VT revised its MaaS strategy accordingly and chose to invest in a nationwide initiative that aimed to establish a publicly controlled national MaaS integration function. The logic behind this initiative was that a national MaaS integration function would lower the entry barriers for both those operating MaaS and mobility service providers and thus facilitate the development of many and diverse MaaS offerings that integrate multiple different mobility services (Smith et al., 2020). However, this initiative was discontinued as well due to lack of support from key actors (a governmental inquiry has since recommended the launch of a similar initiative and to, by law, require public transport authorities to participate [Government Offices of Sweden, 2020]).

Consequently, VGR/VT had to amend its MaaS strategy once again. Its new (and current) tactic aims at enabling and stimulating private actors to integrate and resell digital public transport tickets as part of MaaS offerings. The hope is that this will stimulate private actors to establish a plurality of MaaS services, which in the short term generate knowledge of MaaS and of VGR/VT's role(s) in MaaS and in the long term contribute to a more sustainable transport system. Since late 2018, VGR/VT has therefore focused on developing an API, integration



processes, and contract terms for third-party resellers. These elements have been tested through a number of MaaS pilots, with the goal of moving from pilot contracts to regular contracts during 2020–2021 (the first regular contract was signed with the municipal parking company in Gothenburg in 2020).

In parallel to this work, VGR/VT has been an initiator of the national roadmap for MaaS developments in Sweden, which, among other things, has co-ordinated and funded MaaS development activities and formulated impact targets for MaaS (cf. KOMPIS, 2017). Hence, VGRT/VT has arguably thus far acted as a MaaS Promoter (e.g. via the national roadmap work), MaaS Partner (e.g. in the UbiGo pilot), and MaaS Enabler (e.g. by deciding to open for third-party resale) in the MaaS development phase. The first iteration of its MaaS strategy pointed towards a trajectory in which VGR/VT would act as a MaaS Promoter in the MaaS diffusion and MaaS use phases (partly via contract), while the second iteration was based on VGR/VT pulling back to a MaaS Enabler role during the MaaS use phase but still having some control over the MaaS integration task (via a jointly owned development company). The third and current strategy advocates a trajectory in which VGR/VT is involved as a MaaS Partner during the diffusion phase but only takes a MaaS Enabler role during the MaaS use phase by enabling external (more or less autonomous) actors to take on the MaaS integration and MaaS operation tasks. Put differently, VGR/VT currently plans to become increasingly less hands-on involved in MaaS as the realisation of MaaS progresses. The main reasoning behind this strategy is that it is assumed to provide the quickest path to realise, and thus learn about, MaaS under current institutional conditions. As of spring 2020, two MaaS pilots are ongoing in Västra Götaland, and three are about to commence.

**Oslo:** The MaaS topic can in Oslo be traced back to 2015, when the public transport authority of the Oslo and Viken counties (Ruter) introduced a new strategy. Entitled M2016, this strategy's main message was that Ruter's focus would shift from public transport to mobility services (Ruter, 2015). Ruter is committed to contributing to long-term targets for the sustainability of Oslo and Viken (Hirschhorn et al., 2020). The shift in focus was thus motivated by the objective of giving residents in Oslo and Viken more mobility choices as well as by the need to make it easier for the residents to live without owning private cars. The latter was assumed as a prerequisite in order to be able to comply with the nationally formulated zero growth target for car traffic. In growing urban regions, such as Oslo, this goal implies that mobility services, along with cycling and walking, must absorb the projected growth in personal mobility demand.

In practice, Ruter is tasked with developing a dense and flexible network of integrated, high-quality mobility services that make it possible for Oslo and Viken residents to leave their cars behind without compromising freedom and flexibility in their everyday lives. The M2016 strategy assumes that Ruter will be involved in developing these mobility services to some degree. At the same time, it expects private mobility services to take over some tasks that today are handled by Ruter (Ruter, 2015). In other words, the strategy predicts that Ruter's role will change, but it is not clear exactly how yet.

To identify its role(s) in a possible MaaS future, Ruter started to investigate MaaS during 2016. In an initial scenario analysis, Ruter evaluated different value chain setups (cf. Smith, Sochor, & Karlsson, 2018). Drawing on the ongoing MaaS developments in Gothenburg, Vienna, Helsinki, Copenhagen, and Hannover, as well as on developments in the hotel and telecommunication industries, the scenario analysis concluded that a model in which the public sector takes the MaaS integration task and in which Ruter operates MaaS in competition with others was best suited to balance public control and the private sector's innovation capacity. Ruter has since chosen to carry out a number of MaaS-related pilot projects. The overall plan is to pilot MaaS and other technology-related services in the period 2019–2021 in order to

prepare for a large-scale pilot that is to be commenced around 2021. As of spring 2020, Ruter has one MaaS pilot in operation, which has drawn much inspiration from the 2013–2014 UbiGo pilot in Gothenburg. Ruter's hope is that this pilot, in combination with the others, will generate the knowledge needed to make informed strategic decisions about the way forward in relation to MaaS as well as in relation to the future mobility service landscape in Oslo and Viken in general.

In contrast to the developments in Sweden and Finland, Ruter was for some time the sole major actor in Norway that made comprehensive efforts to realise MaaS. However, a state-owned nationwide travel planner was introduced in 2018 (*En-tur*), and it has been indicated that the long-term plan is that this travel planner should enable users to find and pay for all public and private mobility services in Norway. However, how, when and to what extent this will materialise is still up in the air. Thus, it is not clear how it might influence Ruter's plans. Nonetheless, Ruter has arguably taken a front-seat position in the development phase of MaaS in Norway thus far, primarily acting as a MaaS Promoter. According to the initial MaaS scenario work, it seems that Ruter plans to keep this role in the MaaS diffusion and MaaS use phases, too (recently, Ruter released a new overarching strategy that provides further evidence for this pathway [Ruter, 2020]). The choice of being hands-on involved in all MaaS development phases is largely based on the logic that Ruter is capable of developing and delivering competitive services and uniquely positioned to promote all types of sustainable travelling in Oslo and Viken. Ruter, moreover, believes that control over the MaaS operation task is needed to be able to nudge users' travel behaviour (*ibid.*).

### Concluding remarks

As illustrated in the previous section, public transport authorities across the Nordic countries have taken somewhat different positions in relation to MaaS in terms of the mix of hands-on and hands-off intervention. It should be noted that these choices are influenced by both (intra-) organisational and external institutional conditions. For instance, the strong involvement of the national government in Finland has limited the perceived action space of Finnish public transport authorities (Mukhtar-Landgren & Smith, 2019). In contrast, public transport authorities in Sweden and Norway have had more front-seat (and less challenged) positions in the MaaS developments. Among other things, this has led to MaaS more frequently being framed as a means to assist public transport growth in Sweden and Norway, while the goals for MaaS more often have been motivated by national economic arguments in Finland (Smith et al., 2018).

Recent MaaS developments across Europe demonstrate similar differences. In the United Kingdom, the public transport authority in West Midlands (Transport for West Midlands, TfWM) has supported MaaS Global in launching Whim. Although the user uptake has been slow and the service offering limited, this indicates that TfWM is taking a MaaS Enabler role. In Germany, the public transport authority in Berlin (*Berliner Verkehrsbetriebe*, BVG) has established a new business unit that focuses on MaaS. Empowered by a private technology provider, this unit has launched Jelbi – a MaaS service that allows users to find, book, and pay for BVG's public transport offerings as well as a range of privately managed mobility services in Berlin. BVG is thus arguably taking a MaaS Promoter role. In the Netherlands, the National Ministry of Infrastructure and Water Management (*Ministerie van Infrastructuur en Waterstaat*, I&W) has set aside €20 million and created a framework agreement in order to prepare for procuring seven MaaS pilots to take place across the country during the next three years. The main goals are to speed up the realisation of MaaS in the Netherlands, gain experience in preparing for and operating MaaS, and collect empirical evidence of the actual impact of MaaS. Hence, the

national strand of government is taking a front-seat role in MaaS development, which might influence the perceived action spaces and strategies of Dutch public transport authorities. In Belgium, the public transport company of the Flemish government (*Vlaamse Vervoersmaatschappij De Lijn*, De Lijn) launched an API for its data and tickets in 2016. Thus far, it has enabled seven external actors to launch MaaS-like services in Flanders. In parallel to these, De Lijn plans to offer its own MaaS service in the near future, in that case, acting both as a MaaS Enabler and as a MaaS Promoter.

The MaaS developments have been slow moving and convoluted across the contexts covered in this chapter (Finland, Sweden, and Norway), and most public transport authorities have yet to move into the MaaS diffusion and MaaS use phases. Consequently, it is far too early to determine which MaaS governance pathways produce what outcomes. Yet some initial propositions can be made based on the experience to date. For example, in Smith (2020), the case is made that the ongoing processes in Sweden, Finland, and Australia indicate that the following interventions can support MaaS developments:

- Establish an inspirational long-term vision for MaaS, which is based on transport policy objectives and links with other policy fields (e.g. land-use and transport infrastructure).
- Develop an innovation agenda for MaaS that co-ordinates mid- and short-term activities. Beyond measures directly related to the MaaS concept, this agenda should aim to strengthen mobility services and active mobility and to weaken the private car regime.
- Facilitate experimentation and joint knowledge generation by investing in experimentation activities and by establishing institutional conditions that favour learning and risk taking.

Importantly, these activities should be the subject of critical analyses as a means to revisit and refine governance approaches as MaaS evolves. Besides, the recommendations are untested and arguably quite general. Hence, further refinement and validation as well as context-specific adaption and concretisation are needed to transform them into readily applicable advices. As illustrated in this chapter, public transport authorities' MaaS governance pathways seem to diverge across jurisdictions as well as over time. Optimistically, this will create ample opportunities for comparative research studies that could contribute to this work. More generally, the ongoing and forthcoming MaaS operations should be thoroughly and transparently evaluated in order to improve the understanding of the societal effects of different types of MaaS in different types of situations, as well as of when what types of government interventions are appropriate.

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