Transformative Innovation Learning History: Finland

The emergence and consolidation of mobility-as-a-service in Finland

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THE PARTICIPANTS

This innovation history is based on a number of written sources, a 4-hour workshop in Tekes (09.05.2017) with various stakeholders related to mobility-as-a-service (MaaS) as well as a number of preparatory and follow-up conversations. The reconstruction of the events is partly based on the empirical material gathered by Jukka-Pekka Ovaska (University of Aalto) for his MA thesis. The stakeholders met include:

- Senior government official from the Ministry of Transport and Communication (LVM)
- A MaaS expert from Tekes
- Two representatives of Liikennelabra (Traffic Lab)
- Two representatives from MaaS start-ups (MaaS Global and Tuup)
- Two senior transport researchers (VTT and Aalto University)

GENERAL BACKGROUND

The following document provides an overview of the emergence and consolidation of a novel approach to transport, called mobility-as-a-service (MaaS), and the policies underlying and influencing this development in Finland. The basic idea behind MaaS is that "travellers have easy access to the services they need, from door to door with a single payment and ticket. Different modes of transport work seamlessly together, and a plan can be changed even in the middle of the journey as information can be communicated smoothly if the mode of transport changes" (TEM, 2017: 109). MaaS aims to bring together three sources of vehicle capacity heretofore separated: private cars, mass transit and on-demand services. This means the emergence of an extra layer, a mobility operator, between the users of transport and various vehicle owners. Within the general MaaS model there might be variations, e.g. between pay-as-you-go or mobility package based (subscription) models.

By aiming to increase the usage of existing vehicle capacity and reducing individual vehicle ownership, MaaS is one of the most recent innovative attempts in Finland to renew the transport sector. Other advances include improvements in fuel (e.g. biofuels) and vehicle technology (e.g. electric vehicles, automated driving) as well as attempts to reduce demand for travelling by car (e.g. city planning, innovations in taxation). There are many contextual factors contributing to the current Finnish mobility transition in general and the evolution of MaaS in particular. These include international climate commitments, digitalization, urbanization, ageing population, and decreasing interest among young people in owning a car or obtaining a driving licence (LVM, 2013; Temmes et al., 2014). The national-level structural characteristics include a cold climate, and sparse population density (16 people per square kilometre). The small population size of Finland (5.49 million people) and its egalitarian culture make it easy for various stakeholders to reach and interact with each other.

> *"We have the luxury that we are not a country, we are a club"*
> Workshop participant, Tuup.

In relation to national policy one could also mention Finland's early introduction of a systematic information society policy (1995) or transport and communications being unified under a single ministry (LVM), creating a possibility for the still unfolding ICT revolution to interact with transport.

KEY INSIGHTS

- MaaS emerged from the interaction of top-down and bottom-up initiatives where a system-oriented approach at the ministry level met with entrepreneurial initiatives
- The overall evolution of MaaS can be described as multiple rounds of iterations between public and private sector stakeholders with each taking a temporary informal lead in the

process while adding new elements to MaaS

- The coupling of multiple policy initiatives by different policy actors has been crucial in enabling a broader approach to transport, facilitating market formation for MaaS and removing system barriers hindering its development
- The acceleration of mobility transition in Finland might require more attention to the issue of coordinating the development of different niches and the threat that niches end up reinforcing the existing regime rather than transforming it
- More attention needs to be turned to distinguishing transformative process (policy) from transformative outcome (impact)

PLEASE SEE APPENDIX 1. FOR TIMELINE

CASE STUDY

Intelligent transport: from re-orientation of vision to strategy formation (2005-2009)
Around the mid-2000s, the Ministry of Transport and Communication's (LVM) chief of staff, Mr. Harri Pursiainen, was assigned to look into the possibilities of intelligent transport. Pursiainen, considered a visionary by many stakeholders, proceeded to prepare a report that provided a stimulus for the ministry to open up and to conceive of transport in broader terms.

Reportedly it was also around that time when Sampo Hietanen – a CEO of the future enterprise MaaS Global, at that time working for Tieliikelaitos (Finnish Road Enterprise) – first conceived the idea of having mobility service providers similar to ones providing communications services.

> *"He [Sampo Hietanen] just started thinking what if we could actually bring the same kind of model we have in telecommunications to transport. And, of course, at that time it was not realistic, the market was not mature enough. So for a long time it was just a concept in his mind."*
> Workshop participant, MaaS Global.

In 2006 a non-profit organization ITS Finland was established. By bringing together stakeholders from private and public sectors as well as the academia, its task was promote "the development and deployment of transport and logistic telematic services and improve the awareness of Finnish ITS expertise". Its aims are to make EU a forerunner in transport digitalization and to "[m]ake markets for Mobility as a Service (MaaS) easy and environmental access to all citizens" (ITS Finland web page).

In the meantime, internal discussions in LVM had led to the formulation of Intelligent Transport Strategy, published in 2009. It was "the world's first national ITS strategy covering all modes of transport" (LVM, 2013: 5), containing not only a vision but also a programme of action. The strategy was based on a number of principles: contribution to sustainable development, equal treatment of citizens, businesses and regions, stress on usability and cost, respect for the privacy of citizens, developing solutions on the basis of their familiarity to users, nationwide and international compatibility of services, and cooperation between public and private stakeholders as well as users. In practice, not all principles were followed to an equal extent.

> *"Sustainability was in the first strategy but much more as a principle. There was not so much a strategy for that.*
> Senior government official, LVM.

Nevertheless, the strategy received substantial international attention and the European Commission's eSafety Forum's Policy award (2010). In 2009, the Climate Policy Programme 2009-2020 of the Ministry of Transport and Communications was also published, including aims to switch from conventional planning towards a more integrated transport system design (LVM, 2009). Simultaneously to strategy development, LVM's administrative sector was reorganised. In 2010, previously separated agencies for aviation, rail, road and marine transport responsible to LVM were merged into a new transport infrastructure agency called the Finnish Transport Agency and the Finnish Transport Safety Agency (Trafi). "This enabled more coordinated planning of different transport modes with potential benefits to low carbon transition" (Kivimaa and Temmes, 2016: p. 141), and set also a background for the implementation of renewed transport policy.

The emergence of MaaS (2010-2013)

In 2010 LVM, in cooperation with other ministries and the Finnish think tank Sitra participated in a joint development programme called Liikennerevoluutio (Transport Revolution). The aim of the programme was to develop new visions for planning and policy-making for urban areas and transport. Along with the organizational changes taking place in the ministry, it signified LVM's shift away from narrow infrastructure-related focus towards an increasingly problem- and user-centred approach.

> *"[Harri] Pursiainen found, because he came from the communication side, that constructing roads is not our [LVM's] task. We have to solve the problems of transport; constructing roads is one tool and intelligent transport technology is another one. We called it at the time the transport revolution.*
>
> Senior Government Official, LVM.

It was also around that time that Sampo Hietanen came to the realization that the market might have become more receptive to the idea of servitizing mobility: hence he started consultations with various experts and policy-makers.

An important forerunner of flexible transport is the Kutsuplus technical pilot started in 2012. While the idea and development of the software application originated in Aalto University, the consortium agreement to pilot the technology also included the Finnish Transport Agency and Helsinki Regional Transport Authority HSL. Using 15 minibuses in the Helsinki metropolitan region, the experiment was based on the idea that instead of walking to a station or a bus/tram stop a customer would use an online app to order a vehicle to a specific point with the routes merging the travel requests of several passengers being optimized accordingly. "By the end of 2014, Kutsuplus still operated in a geographically-limited scale in the Helsinki metropolitan region, having about 18,000 registered users and 9,000 trips per month" (Kivimaa et al., 2017: p. 8). The plan to scale the pilot up was subsequently not realised.

In 2012, a long-term transport policy plan, the Transport Policy Report 2012-2022 to the parliament
(Council of State, 2012) came out. It marked a clear change to the previous transport policy report published by the previous government in 2008, through its aims to reduce passenger kilometres, direct traffic towards more sustainable transport modes, renew the vehicle fleet and develop sustainable fuel options.

2012 was also a significant year for another reason: it was then that Merja Kyllönen, a minister of

Transport and Communication at the time, established a New Transport Policy Club. This was an informal association, a "hand-made coalition" of politicians and civil servants (mainly from LVM), big cities, industry stakeholders (including both incumbents and start-ups from transport and telecommunications), ITS Finland and Tekes (the Finnish Funding Agency for Innovation). The purpose of the club was to exchange thoughts about the future of transport policy.

A New Transport Policy Club meeting at Mustio Manor in February 2013 proved especially important as it was here that Sampo Hietanen, who had now taken up a position as a CEO of ITS Finland, gave a talk on subscription-based mobility services. The reception of the talk was highly favourable and it was through the following discussion that the MaaS concept emerged. Although the concept was not very clearly defined at the beginning it seemed specific enough to provide a common vision guiding the subsequent interactions between different stakeholders.

> *"It seems that an inspiring concept must strike an optimal balance; a too narrow definition might prove to be too exclusive whereas a too broad one might remain too ambiguous. In the end both would turn out to be uninspiring ultimately failing to fulfil the function of mobilizing the stakeholders and providing direction for concerted action."*
>
> Researcher reflection

For example, ITS Finland brought together a number of private sector collaborators that, in a few years' time, would come to constitute MaaS Global.

Meanwhile LVM published the second intelligent transport strategy in 2013. While continuing to rely on the original foundational principles, it now emphasized more strongly "the exploitation of the potential of open data, promotion of ecological mobility, exploitation of synergies of electric and intelligent transport and development of necessary testing and piloting facilities" (LVM, 2013: 5). Interestingly, the document makes two references to "Traffic as a service" (ibid.: 11, 39) but not yet to MaaS, possibly demonstrating the uncertainty around the emergent concept.

Also in 2013, a working group, led by Nokia's former CEO Jorma Ollila, published a report proposing kilometre-based taxation to influence change in the number of kilometres travelled by private vehicles. Although anticipating potential privacy issues arising from the need to introduce some kind of movement-tracking, the report received fairly negative media attention and, hence, was not taken up by the government. Nevertheless the committee's work provided a foundation for future developments shaping the evolution of MaaS.

MaaS: from idea to practice (2014-2017)

In 2014, LVM started a portfolio of transport experiments. It ended up being rather short-lived but, nevertheless, contributed in part to kick-starting MaaS and demonstrated change in the policy culture of LVM. One of the pilot projects, initiated together with Trafi (Finnish Transport Safety Agency), was called Liikennelabra (Traffic Lab). Initially much of the work of Liikennelabra was oriented towards probing the feasibility of kilometre-based taxation. However, after the latter failed to take off, the lab gradually re-oriented its activities towards the future of mobility more generally, providing a meeting arena for various stakeholders, facilitating communication and providing support for emergent mobility-related business ecosystems. By 2016 Liikennelabra had received a more permanent status with its operation transferred from LVM to Trafi and its activities extending to air and water transport.

At the beginning of 2014, Tekes had arranged a meeting with about 20 "champions" (business people, technology experts, academic researchers) to discuss the future of door-to-door transport. One of the key results of this meeting was the recognition that MaaS might turn out to be the next market disruption. From this perspective the issues of open data and the creation of interfaces linking various transport providers became to be seen as preconditions for MaaS: if mobility service providers were to emerge as an intermediary between vehicle owners and users, these operators would require information about the available vehicles (e.g. real-time locations of vehicles, timetables, fleet capacity, payment engines). At that point Tekes assigned an expert to each of the five working groups in Liikennelabra, which enabled Tekes to build up its own organization-internal MaaS team, while contributing to Liikennelabra's debates on mobility services, road pricing and open data.

Two building blocks now seemed to be in place: the strong support for sustainable and intelligent transport on the ministry level and a more specific vision of MaaS uniting various stakeholders from private and public sectors. For further vision-consolidation an important role was played by Sonja Heikkilä's Master's thesis defended in Aalto University's School of Engineering in 2014. By outlining how MaaS might be deployed, the thesis provided increasing coherence to the concept and communicated it effectively. It also received considerable attention in the Finnish media. Internationally, MaaS was heavily promoted at the Intelligent Transport Systems Conference (2014), contributing to international media coverage and EU level discussions where Finland increasingly became to be seen as a frontrunner.

However, at this point, LVM and Tekes shared a concern: although the vision was there, business participation was still largely missing. Perceiving the need to take quick action, Tekes's emerging MaaS team cooperated with LVM to initiate an activation campaign targeting the business sector and encouraging them to develop new technologies and services for MaaS. From Tekes's perspective this was an unorthodox approach: instead of starting a formal programme requiring at least half a year in preparation with considerable uncertainties about the outcome (whether the programme would be approved or not), the formal procedure was now largely bypassed to be able to act more flexibly.

> *"I had my boss's support and his philosophy was that you just deal with customers while I cover your back internally. His motto at the time was "don't ask, just do"."*
>
> MaaS Expert, Tekes

Also, there was no previous programme collaboration with LVM setting an administrative precedent. However, the initiators of the campaign quickly found out that arranging thematic workshops and increasing the awareness still achieved little on their own to get the transport providers seriously engaged.

Therefore, in 2015, Tekes initiated a more standard approach, a two-stage funding call for MaaS-related projects. In the first phase, the prospective participants needed to describe their business model, the test site and potential collaborators. Those passing the first stage were given support for experimentation. More than 20 applications were submitted. The threshold for funding was rather low with funding being provided for both start-ups and incumbents (such as taxi union or the state-owned railway company VR). Internally in Tekes this approach created some tensions, because the people responsible for the call had to justify why they had decided to support incumbents for developing technically rather simple solutions (e.g. creating interfaces for opening up their data). This justification was largely done with reference to open data as a precondition for MaaS. In immediate terms the programme proved to be a success leading to a number of pilots, for example

in Seinäjoki (2015), Ylläs ski resort and Hämeenlinna (both in 2016). Two MaaS operators, MaaS Global and Tuup, were also established in 2015.

> *"We weren't very elective at the beginning and I'm glad we weren't. It was very interesting to see how different models emerged."*
>
> MaaS expert, Tekes

Tuup was the first to begin a real-life pilot project in Turku (April 2016), while MaaS Global started offering a test package of public transport, taxi and rental car rides in Helsinki (October 2016). Further developments in the MaaS domain included the Helsinki Regional Transport operator HSL opening up its interfaces to other companies (November 2016) and Tuup starting to offer an on-demand service called Kyyti (2017).

> *"Neither MaaS nor Global nor Tuup would be here without Tekes."*
>
> Workshop participant, Tuup.

The developments of MaaS should also be understood in the context of wider shifts in the Finnish policy landscape. In 2016, the European Commission set a 39% greenhouse gas emission target reduction for Finland. At national debates, it was suggested that the largest gains could be made in the transport sector and, hence, by 2030 this sector is expected to reduce emissions by 50% (compared to 2005). For example, Government Programme from 2015 states that the share of renewable fuels in transport will be increased to 40% by 2030. This has boosted the Finnish biofuels production and, to a lesser extent, the take-up of electric vehicles.

> *"It was interesting that compared to biofuels and electric vehicles the policy support provided to Maas seems to be less about protective shieling and more about development funding. At the same time the MaaS stakeholders currently seem to be rather satisfied with this situation."*
>
> Researcher reflection

At the same time, when in 2016 the Transport Agency commissioned a pre-assessment of the environmental impacts of mobility, it concluded that currently MaaS's potential for achieving Finland's climate targets remains unclear.

> *"We have done something very small calculations but everything depends very much on how many people will adopt MaaS. That's actually the biggest parameter. We can see that MaaS offers several opportunities to affect people's transport usage and behaviour. Also, if we look at younger generations in Europe many people now do not get a driving licence or postpone getting it. Based on our pilots we can identify more parameters, for instance, ride shares and car shares will probably adapt newer vehicles more quickly than normal consumers do. At this point scenario work is strongly based on early signals and hypotheses."*
>
> Workshop participant, MaaS Global

Thus, the Finnish Energy and Climate Strategy for 2030 (published in December 2016) did not contain specific targets for more intelligent transport. In contrast, targets for biofuels and electric vehicles were very specific (30% and 250,000 vehicles respectively). Possible explanations include a greater maturity of biofuels and electric vehicles compared to MaaS, and, in relation to biofuels, the existence of clear EU targets. However, it is notable that the same strategy frames MaaS as a way to reduce solo car journeys and to halt the increase in transport in urban areas.

In support of MaaS and the digitalization of transport, LVM has been leading a change in the overarching regulatory framework targeting both public and private transport providers. Titled Liikennekaari (Transport Code), the framework was proposed as a Government Bill to the Parliament in September 2016. Liikennekaari "will implement the government program leading projects to build a digital growth environment as well as to streamline the regulations. The aim is to create conditions for the introduction of new technology, digitalisation and new business models in the transport sector." It is expected to achieve many things, such as opening up specific transport routes to more than one provider (including taxes and buses), increasing competition, making new transport services possible, and stimulating the transport providers to make their data (e.g. timetables, prices, availability, location-based data) openly available. This is expected to lead to a better coordination of goods and passenger transport, reducing the expenditure on public transport by state and local governments, while increasing the quality of services and facilitating the provision of platform-based mobility services. The Bill was approved in May 2017 by the Parliament, and Act 320/2017 is intended to come into force on 1 July 2018.

The future of MaaS

In the near future much is planned to advance MaaS. This year MaaS Global will start a pilot in Birmingham, UK, to test the service in different conditions and to try out different business models. Tuup has recently partnered up with an American company DemandTrans Inc. to develop new demand-based mobility services. Nokia has agreed to build three 5G test sites to the Helsinki-Tampere growth corridor. This opens up a potential to experiment with autonomous driving and MaaS on large scale in real-life conditions making Finland a globally unique test site. Meanwhile, Liikennekaari is expected to considerably facilitate the operation of platform-based mobility services. Moreover, a recently published (April 2017) report "Transport and Communications Architecture in 2030 and 2050", led by Esko Aho, the former Prime Minister of Finland, states its ambition as regarding Finland as the "leading ecosystem for intelligent transport" (LVM press release, 26.04.2017). There are also plans to establish a state-owned company for governing road networks (LIVE) which, through investments and customer fee charging, is expected to influence "transport performances and choices of transport modes" (TEM, 2017: 55). The creation of LIVE might stimulate reviving the idea of kilometre-based taxation. The possible combination of increase in automated driving and electric vehicles and the introduction of kilometre-based taxation, in turn,

might have a positive impact on the take-up of MaaS – but the combination may also lead to even wider transformations in the Finnish mobility system.

> *""We have been trying to define market disruption through enabling technologies and service provision. The only hindering factor [for MaaS] is the private car capacity today. I think autonomous electric vehicles will be the driver, a tipping point, in this change."*
>
> MaaS expert, Tekes

Many interviewed experts feel that MaaS is currently experiencing hype reflected in high support from various stakeholders, positive expectations towards its future but, at the moment, also relatively little experience to support the latter. In fact, it is already expected that the actual experience with MaaS as well as the increasingly strict funding from Tekes will at some point lead to at least some kind of disappointment with MaaS. However, at the same time the evolution of MaaS has already had an identifiable impact in terms of stakeholder learning. For example, a Finnish car retailer Veho has recently started to offer its cars as a package, including a flat fee for maintenance calling it "Veho as a service". Tekes, on the other hand, is currently trying to repeat the policy lessons learned while supporting MaaS in other projects. In addition, inspired by Liikennekaari, calls have been made for an equivalent "Energy Code" with respect to the power and heat producing sector.

> *"[Assessing the] success [of MaaS] is not that much related to the already emerged economic profits but more to learning, how can we speed it up even more. For example, when we learned that, oh boy, we could have done things differently, we could have followed up projects more efficiently and thoroughly."*
>
> MaaS expert, Tekes

CONCLUSION

Innovation history as a methodology is largely about the construction of a shared understanding of the policy process. The ones impacted by this process include both the stakeholders as well as the researchers themselves. In that spirit we would like to conclude this document with a set of brief observations of the policy process surrounding MaaS and its connection to the wider Finnish mobility transition. Note that these observations are not meant to present an authoritative "objective" viewpoint with an implicit aspiration to the monopoly of truth but rather as our specific viewpoint to the events as they have unfolded in Finland – we acknowledge that there is ample space for alternative framings, interpretations and assessments differing from our own. In brief, these observations reflect no more than what we think we have learned from this case:

1. Analytically there is a need to distinguish better between transformative processes and transformative outcomes for there is not necessary a connection between the two. At times the policy support provided for MaaS might be called rather traditional (e.g. the two-stage funding call), and driven by rather traditional business-oriented goals. Yet, taken together, the different measures have managed to facilitate the emergence and development of a potentially disruptive innovation as Finland, which currently seems to be an international frontrunner in the MaaS field. The case suggests how transformative innovation policy may need the coupling of multiple policy domains, where the role of established innovation policy actors is to support business creation, while broader sectoral policies may be crucial in both

initiating innovative visions and creating conditions for their advancement through policy change focused on removing system barriers.

> *"I believe that there is no sustainable product or service without economic sustainability. To me it's self-evident that the side-effect or the main effect, however you want to phrase it, is contributing to environmental or social welfare. However, if it's not economically sustainable then when the funding ends, the project ends."*
>
> Maas Expert, Tekes

2. The overall evolution of MaaS can be described as multiple rounds of iterations between public and private sector stakeholders with each adding a new element to MaaS: from initial loose ideas in 2006 to a general vision of intelligent transport in 2009 to a more specific vision of MaaS in 2013 to an activation campaign in 2014 to a funding call in 2015 to the emergence of business activities from 2015 onwards to the current approval of the Liikennekaari legislation. It is also interesting that at different times different stakeholders (LVM, Liikennelabra, Tekes, entrepreneurs) have taken an informal lead in pursuing the development of MaaS.

3. Through a number of measures Finland has so far managed to support the emergence and, in the case of biofuels, the scale-up of niches in the transport sector. However, from a more theoretical, transitions-oriented perspective, one might wonder about the future interaction of these niches: currently both the need and the possibility of linking different experiments remains rather unclear. Addressing the issue of inter-linkages might be important for many reasons. To begin with, each linkage might lead to specific problems: for example, one interviewee has pointed out that the massive use of MaaS based on EV-s in cities might decrease the individual ownership of the car but this, in turn, would require building a large-scale public charging infrastructure. There is also a danger that, taken separately, each niche might end up reinforcing existing practices: for example, one might conceive of deploying electric vehicles in a manner that would not contest individualized mobility (e.g. replacing gasoline-based cars with Tesla-like cars); similarly, in principle MaaS could also be applied to gasoline-based cars. Additional problems arise from the fact that, transport-wise, the challenges of urban and rural Finland are vastly different.

> *""Biofuels are interesting because they have been really heavily enhanced. The market has been formed by policy." Senior researcher, VTT: "If you think about biofuels it is not an experiment any more, it's a commercial business. For example, Neste is producing 400,000 tons of renewable fuels in Porvoo annually and more than 2,500,000 tons renewable fuels globally."*
>
> Senior research, Aalto University

The need for a combined approach to achieve emissions reduction in the transport sector is already recognized. However, currently there seems to be little policy support to facilitate

the coordinated evolution of different niches. In order for the mobility transition to happen the sum of all mobility experiments needs to be greater than the contribution of each niche separately.

> *""There has been a lot of unproductive debate between biofuels and electric vehicles supporters. Perhaps there can also be a fight between improved technologies and improved services. But we need everything."*
>
> Senior research, VTI

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Appendix 1: see overleaf

1990s-mid-2000s:
•Information Society policy introduced in 1995
•LVM's Chief of Staff is assigned to investigate the role of intelligent transport in transportation policy

2009: LVM's strategy for Intelligent Transport and Climate Policy Programme 2009-2020 published

Early 2010s: organizational changes in LVM and its participation in the Liikenerevoluutio programme gradually lead the ministry away from infrastructure-centric to solution- and customer-centric thinking

2013
•LVM's second strategy for Intelligent Transport
•LVM's working group proposes kilometre-based taxation

2012:
·Transport Policy Report 2012-2022 is published
·Merja Kyllönen, minister of Transport and Communication, establishes the New Transport Policy Club

News of MaaS in foreign media, discussion on the EU level: Finland is seen as a frontrunner in the field

2014
•LVM initiates a portfolio of transport experiments. As part of a portfolio LVM and Trafi initiate a Traffic lab, emphasizing digital mobility and experimental culture
•The cooperation between Tekes and Traffic Lab leads to Tekes and LVM jointly starting an activation campaign for MaaS

2016: European Commission sets a 39% GHG emission reduction target for Finland by 2030

2016: Energy and Climate Strategy for 2030 emphasizes new services, influencing modes of transport and utilizing intelligent transport methods

2006
•Sampo Hietanen first conceives the idea of applying telecom business logic to the transport sector
•ITS Finland registered as an association

2012: Kutsuplus pilot in the Helsinki region

2013: the concept of MaaS emerges at the meeting by the New Transport Policy Club

2014
•Sonja Heikkilä publishes a MA thesis, providing coherence for the MaaS concept
•MaaS is heavily promoted at the Intelligent Transport System Europe conference

2015-...: Tekes initiates a two-stage funding call for MaaS-related projects

2015
•Tuup and MaaS Global established
•First pilot activities initiated (Seinäjoki)

Future
•Autonomous driving and MaaS experimentation planned in the Helsinki-Tampere growth corridor
•MaaS Global plans to start a pilot in Birmingham, UK

2017: Tuup's on-demand service started

2016
• Further MaaS pilots are initiated in Ylläs and Hämeenlinna
•Tuup and MaaS Global start pilot services in Turku and Helsinki respectively
•Helsinki Regional Transport operator HSL opens up its interfaces to other companies

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Future
•Government's new regulatory framework for transport (Liikennekaari) is anticipated to facilitate the provision of platform-based mobility services
•Plans to establish a state-owned enterprise for governing road networks (LIVE)

2017: "Transport and Communications Architecture in 2030 and 2050" report published

2016
•Government's action plan aims at creating a growth environment for digital transport services
•Transport lab extends to air and water transport

Note: this timeline is partly based on the empirical material initially gathered by Jukka-Pekka Ovaskala for his MA thesis