

Maas
GLOBAL

History of Maas

How one man's idea
started a revolution in
the mobility industry

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The Birth and Adolescence of Mobility-as-a-Service

Mobility-as-a-Service is set to do the same for personal mobility that Airbnb did for accommodation and Spotify to music: to turn something that used to require ownership into a service that you pay for on the go. But the scale of the revolution is much bigger. Uber and Lyft invented a new digital interface for ride-sharing and built a challenger to traditional taxis; MaaS wants to do the same for all mobility. The goal is to offer everyone the possibility to move whenever and wherever they want, door-to-door, without having to own a car, and therefore change how the world moves and eventually how physical communities are built.

The drivers of this revolution are three unstoppable megatrends: mobile phones, sharing economy, and urbanization. Some of the first in the world to see the big picture were Finns who not only invented the term ‘MaaS’, but wrote the first strategies for its implementation, restructured their ministry and agencies to support it, rewrote their legislation to enforce it, and launched the world’s first commercial MaaS operator.

MaaS Global’s Sampo Hietanen has had an undeniably central role in developing the concept and turning it into reality, but in fact the whole country was turned into an incubator for the future of world’s transportation. The birth of MaaS was very much a group effort. History, serendipity and opportunity brought together a critical mass of future-makers who loved what they were doing. This is the story of MaaS in the making.

Finland provided the perfectly fitted laboratory for what would become the Mobility-as-a-Service revolution. It has a strong engineering tradition, but no passenger car industry of its own. It won big by being among the first to develop and deregulate the emerging mobile communications industry. It has one combined ministry looking after both transport and communications, and it is small enough that when the idea of MaaS started to gain momentum, the torchbearers from startups, ministries, universities and other organizations could all fit into a bar and have a beer together. As they actually did weekly when the idea of MaaS was intensely incubated.

But before the beer sessions — not to talk about a revolution — a whole lot had to happen. To understand MaaS, we must look at the role and the story of telecommunications in Finland. The Finnish telecom success of the 1990s was a product of well-timed deregulation, public funding, agile companies, academic research, and first-class engineering education.

Telecom Revolution Provides a Benchmark

In Finland, the telecommunications equipment market has always been open for anyone to enter, but the government had a monopoly in long-distance and international phone calls. Local networks on the other hand were often operated by regional telephone companies that had strong ties to local businesses, especially in retail. In the beginning of the 80s, the state started to prepare for deregulation of the operator sector. The first step was to transfer the regulatory authority from the state postal and telephone service to an independent government body. Next, telecommunication was spinned off the state service and placed into a limited liability company that was later listed in the Helsinki Stock Exchange.

In the 80s and 90s, the state invested heavily in industrial R&D and industry-wide collaboration in R&D as well as supported research institutes, universities and public agencies. Information and communication technologies were often given a priority within state funding programs.

The push for innovation and deregulation advanced in sync with standardization of the emerging mobile communication networks. In the early 1980s, the Nordic countries agreed on a common standard for mobile networks called NMT (Nordiska Mobiltelefongruppen) and quickly formed the world's largest mobile communication market measured in the number of subscribers. Mobira, a Finnish company, supplied the first NMT portable phones in the world. While the Nordic countries had a home advantage, the NMT standard itself was open to companies from outside of the Nordics, and the space soon became hyper competitive and more market-driven. When the telecommunication authorities of the European Community initiated the GSM standard based on positive experiences from NMT in 1991, Finnish Radiolinja immediately launched a commercial GSM network as the first operator in the world.

The fruits of these efforts were nothing short of a miracle. In 1991 when GSM was emerging, the Finnish economy drove off a cliff and plunged into recession that cut 13% of its GDP and drove unemployment figures close to 20%. Companies and individuals faulted on their loans and the country was in deep despair. First slowly, then briskly, Finland started to move towards the light with the telecommunications sector, led by Nokia, spearheading the recovery. In 1998, Nokia was already the world leader in mobile phones and between 1996 and 2001 its turnover increased fivefold from €6.5bn to €31bn. In 2001, the Finnish telecom sector comprised of hundreds of firms, and Finnish economy had become one of the fastest growing and most competitive economies in the world.

Putting the House in Order

Could this stunning success be repeated in the world of transportation? The question was not far-fetched in Finland since both telecommunications and transportation were overseen by the same ministry, and this could give a great start for the process of transforming transportation. Both are also networks consisting of connections and nodes, driven by technology as well as a fundamental infrastructure. “We started asking ourselves, could transportation infrastructure that had traditionally been a cost become an export industry,” remembers Piia Karjalainen, who worked for the ministry as a senior advisor in the beginning of 2010s and later became the secretary general of the international MaaS Alliance.

But even before these questions were publicly voiced, Finland had been putting its house in order for the coming storm. 1st of January 2010 it had merged previously separate agencies for railroads, seafaring, roads, air and vehicles into new two-mode agnostic organizations called The Finnish Transport Infrastructure Agency and Finnish Transport Safety Agency. This Finland did as first in the world. A few years later, the ministry of transport and communications was organized in a similar manner, again as the first in the world. As important as the changing structures was the shake-up of management. A new generation of 40-something leaders that were more familiar with digital opportunities than their predecessors took over many of the functions.

“We saw that the requirements for future systems were conflicted: we’d have to cut emissions, increase safety, offer the citizens better and more affordable services and meet the needs of the business community, all at the same time,” remembers Krista Huhtala-Jenks, who worked at the ministry between 2011 and 2018 as an officer for digitalization and as a ministerial advisor and later joined MaaS Global. “Yet we wanted to find a way to fit these together, not just regulate, but to create better life for people and new opportunities for businesses. We started to look at transportation infrastructure as a platform on which services could be built.”

When the history of digitalization is narrated, the focus bounces between technological development, power of networks and exceptional individuals, depending on who is telling the story. In the case of MaaS all three are important, but what stands out is platform thinking, both public and private. The democratic and open idea of a platform appeals to Finns, who enjoy technology but dislike individuals standing above others. And then there is one more that is often forgotten: government initiative and investment. It brought us the internet, GPS, and touch screens – and in a tiny corner of the globe it brought us MaaS.

Once the organization was in place, a strategy was needed. In 2009, Harri Pursiainen, chief of staff at the Ministry of Transport and

Communications was assigned by the Finnish government to outline a strategy for intelligent transport as a one-man task force. The architect of the recent organizational changes at the transport agencies and the ministry, Pursiainen saw digitalization as a chance to shake a market he felt was stuck in the past.

“I was a digital believer. It was the new way. To get the politicians’ attention we had to talk about the state of the infrastructure, but the real drivers were the digital opportunities. As in telecommunications, we’d bring relief to the inconveniences caused by place and time in people’s lives,” recalls Pursiainen about his state of mind at the time.

Yet we wanted to find a way to fit [everything] together, not just regulate, but to create better life for people and new opportunities for businesses. We started to look at transportation infrastructure as a platform on which services could be built.

During the strategy work he approached 170 “friends of intelligent transport”, as he called them, and asked for thoughts. After a seminar and several iterative rounds, the paper came out late in 2009, just before the organizational changes of the Finnish transport agencies. In what would become the world’s first National Intelligent Transport Strategy, he named the changes that would rock the world of transport and painted a vision for 2020.

As drivers for change he outlined climate change, globalization, lack of public funding, and technology. New technologies meant that the focus of transportation policies and initiatives could be moved from building and maintaining infrastructure to operating the transportation network. There would be a real time snapshot of all existing transportation modes, and that would power a variety of services using mobile devices and new location technologies. The resulting transport system would suggest alternative routes and modalities based on customer preferences and sustainability. The strategy also describes the roles of government (regulation, core systems, real-time data) and private sector (building and providing services) and goes as far as predicting international roaming and seeing intelligent transport as a major new export sector for Finland.

When revisited, a decade later, the strategy stuns with its far-sightedness. But as is the case with so many strategies, it has a built-in time fallacy. To gain traction a strategy must create a sense of urgency. Therefore, they often overestimate what can be achieved in the short run (in transport 10 years is short), as was the case with some strategic goals presented in the paper.

Transport Revolution and Other White Papers

The other document from the same era to catch plenty of attention is a white paper called Transportation Revolution. It was published in 2011 by government-owned think tank Sitra together with several ministries and other governmental organizations. Altogether 23 experts contributed to the paper, 2/3 of them from the public sector and the rest from public-private partnerships or private corporations.

Although the paper was essentially a governmental report made for the government, like the ITS strategy two years prior, it put the individual customer at the center of its universe and stated that in the post-industrial society infrastructure mobility and logistics should be approached as services and as sources for well-being, not as investments and vehicle-kilometers. Although the main philosophy and ideas are the same in the two papers, the latter is often described as a game changer because of its broad base. It managed to anchor the ideas widely in the society.

The role of privately-owned automobiles that has later become central to much of the MaaS debate was relatively slightly touched upon in these two papers. National Intelligent Transport Strategy mostly stresses efficient use of current infrastructure, the Transportation Revolution paper points to the fact that a private car has been central to post-war traffic planning and implicitly suggests that its inevitable and unstoppable growth may not be everlasting.

On March 23rd 2011, the European Commission presented a white paper titled Roadmap to a Single European Transport Area – Towards a competitive and resource-efficient transport system to the European Parliament. This encompassing outlook was also the transport section of the European Strategy for Growth and Jobs (Europe 2020 Strategy) and therefore an important initiative. In the white paper, digitalization is presented as a tool to combat two evils at the same time: the oil dependency and the carbon emissions of transport. In 2011 when the white paper came out, staying on current oil consumption trend would have meant that in 2050 the CO2 emissions from transport would be one third higher than their 1990 level, while the target was a cut of 60% compared to 1990 levels.

Intelligent transport and multimodal travel were not yet described as the major disruptive alternatives they grew into in the coming years, but they were clearly stated and present throughout the paper. Among the ten goals, the paper lists 60% reduction of emissions as well as

to “establish the frameworks for a European multimodal transport information, management and payment system” by 2020. In the list of initiatives the European Union should pursue, the paper outlines a vision very much like that of MaaS: “Define the measures necessary for further integrating different passenger transport modes to provide seamless multimodal door-to-door travel.”

The Transportation Revolution paper points to the fact that a private car has been central to post-war traffic planning and implicitly suggests that its inevitable and unstoppable growth may not be everlasting.

In April 2012, a Finnish governmental working group led by the Minister of Transport, Merja Kyllönen and consisting of seven other ministers and their staffs presented an Outline for Future Finnish Transport Policies to the parliament. A lot of this massive work is dedicated to the obvious – infrastructure, public transport, logistics, safety, emissions and equality questions – but the seeds of the new world were planted in it too. In the conclusions section it states: “In a sustainable, user-centric service society, infrastructure, travel and logistics are approached as services and sources of growth, competitiveness and well-being,” and goes on to define a new role for the authorities: “The new role of the transport administration as a facilitator and producer of innovations will require goal-oriented development of an operating culture that releases hidden potential.”



The Idea of Packaging Mobility

When governments spot a need for a change, it is usually due to an unwanted development on the macro level: poverty or unemployment is increasing and life expectancy or competitiveness is decreasing. When businesspeople spot an opening for a change, it is often a micro observation: a customer need that is not being served. In other words, an opportunity.

The core question of MaaS – how it could help a customer – had been asked and partially answered already in 2006. Sampo Hietanen, the entrepreneurial manager of the information services for the government-owned Finnish Road Enterprise, was returning home from a business trip to London. After a few glasses of champagne, in a deserted business class that he had been to his surprise upgraded to, he pulled out his laptop and started preparing for his next day's presentation at the Finnish Infrastructure Day. The topic was the future of transportation industry.

Ten thousand meters over the North Sea, he began to think about his friends in the telecoms industry who usually travelled like this, in business class with a drink in hand. They always had it better and bigger than Hietanen and his colleagues in the world of transportation infrastructure. Some aggravation crept in. In telecoms, it wasn't just the technology that had changed. The rules and the playing field were also new. What if something similar happened in the world of the kind of traffic engineers he would be talking to the next day? What would happen if the government, due to lack of funds, would start licensing out the right to build and maintain transport networks as had happened in telecommunications? Would that introduce a service layer to transportation, a group of customer centric service operators that would, instead of selling tickets to particular modes of transport, start selling aggregated packages of travel services and right to use roads? Hietanen came up with two such packages and wrote them down in his presentation: Commuter Package for a region and Salesman Package for the whole country. Selling those packages to consumers would be quite different from laying asphalt.

During the following years, Hietanen continued to work for the Finnish Road Enterprise, then headed a startup called Helpten developing travel information services, and at times returned to the idea of the service layer and packages. What would a use case look like for such packages? And what would it look like in the age of smartphones? In August 2011, he was preparing a lecture for Helsinki Executive Summer School

in transportation and thought that once again he should stress the need for a use case. Without a use case, an actual human being finding value in what was on offer, there was no business case. And while preparing his slides late at night, he started thinking it was high time he started living as he preached. He'd have to draw out the use cases for individual customers using multimodal transportation services through a smartphone.

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“I must say that it wasn't until I had sketched the packages that it hit me,” Hietanen remembers the moment. “It was this one slide. To be honest, it was that one slide that was the basis for what would become MaaS.” On the slide he had written two packages, one titled Urban worker package comprising the services of public transport, taxis, lease car and road use, the other titled Be anywhere package that included roaming for services outside one's home country. Neither package was technically feasible at the time. The point was to look at the whole thing from the point of view of a single customer, describe a product they might want, and put a price tag on it. If the idea was ever to take off, technologies, systems and legislation should be aligned to make this possible.



The Club for New Transport Policy

Two streams, public and private interest towards intelligent traffic, began to meet and even merge on two platforms, the governmental Club for New Transport Policy and a non-governmental organization ITS Finland. Both wanted to attract the smartest minds from administration, academia and business to discuss and draft the future of transport. The Club for New Transport policy was initiated and called together by Merja Kyllönen, the independent thinking Minister of Transport, and Minna Kivimäki, the General Director from the ministry with plenty of international experience. It was to be an invitational gathering of 40–50 people two to four times a year between September 2012 and March 2015.

The club brought together politicians, public servants, planners, academia, and business leaders. Also, several veterans of the telecom revolution were present to give prospective and encouragement, among them Reijo Paananen. At Nokia, he had once headed the team that developed the Nokia Communicator, a somewhat clunky but fully functional forefather of current smartphones. The kick-off event was intentionally packed with symbolism. The 30 attendants gathered at the old tram shed in central Helsinki that today serves as cultural centre, and the hosts were dressed in coveralls to stress the need for an overhaul of the transport system.

“At the parliament, the club was a laughing matter,” recalls Kyllönen. “Politicians get excited about transport infrastructure, especially if it is built in their electoral district, but they are not used to sitting and thinking about the future of the whole system. They thought the club was a bunch of suits and jacket suits detached from reality.”

The disruptive thinking present in the ministry, the agencies, and among the likes of Sampo Hietanen was not gaining much political traction. The politicians did not have to care about an individual minister’s opinions, but they’d have to pay attention to public opinion. “I was thinking a bit like a mafia boss,” describes Kyllönen. “I wanted to build tentacles that would reach everywhere.”

The event that many club members remember most vividly took place in February 2014 in Mustio at a historic ironworks-turned-conference-center outside Helsinki. In the two-day retreat chaired by Kyllönen, Hietanen held a presentation on future transport that included the slide on packages, which would open new doors for many of the attendants. The term MaaS was also agreed upon as the new common denominator. When the club published a paper it called “A Futury” presenting its thinking on the future of transport, Kivimäki wrote in the introduction that “the digital transformation of transport is summarized in the acronym MaaS, that signifies a complete overhaul of our transportation ecosystem.”

Established in 2004, ITS Finland was a cooperation society for transportation telematics that became more influential as intelligent transport gained momentum. Hietanen joined ITS Finland as its CEO in December 2012, bringing all his ideas about packages, applications and roaming to the table.

In October of 2013, an updated, second generation version of the national ITS strategy appeared. It was signed by minister Kyllönen and ministry's Harri Pursiainen and Minna Kivimäki. Since the strategy of 2009, the principles had not changed, but the environment had. Smartphones were everywhere, the EU had published its white paper, communications technology was marching on. The updated strategy also pointed to a "growing global trend in which young adults no longer feel the need to get a driving licence or to own a car," and went on to describe how "European vehicle manufacturers plan to offer solutions in which manufacturers will provide not just a vehicle, but a total mobility service package with integrated public transport services. The SaaS concept (Software-as-a-Service) known from information technology and cloud services will be developed in the transport sector as the TaaS concept (Traffic-as-a-Service)."

The core of the strategy is a vision for an intelligent transport system that seeks to be one of the best in the world. In retrospect the timeline on many points was once again very optimistic, but when looked through a MaaS glass, it contains many important ingredients: sustainability, ease of use, use of technologies familiar to the public, international compatibility, public-private cooperation. It also sees transportation as industrial policy: "Raising Finland to the status of a leading global developer and user of intelligent transport solutions is important not only for achieving the Government's transport objectives but also for its industrial policy goals."



We Should Call it MaaS

From the start, General Director Minna Kivimäki saw the new world of transportation in the international context. She had been the Finnish Transport Counsellor in the Finnish Permanent Representation to the EU in Brussels in the beginning of 2000, and during Finland's EU council presidency in 2006 she was the chair of the EU Council's Transport Working Party. From where Kivimäki was sitting, it was clear that MaaS would not scale nor become an export industry if Finns stayed in their sandbox. On the other hand, if Finns managed to move quickly, they'd have – at least for a while – the first-mover advantage.

In the summer of 2013 with Kivimäki as the executive lead, Finland started planning for the European ITS Congress to be held in Helsinki in 2014. Every year ERTICO – ITS Europe, founded in 1991 by industry leaders and the European Commission – organizes a European ITS Congress in a major European City and every third year the European Congress is skipped when the ITS World Congress is held in Europe. In practice, most of the congress is organized locally, but because of ERTICO's ties with the European Commission it reaches the highest levels of European decision making. This meant that in the case of the 10th ITS European Congress in Helsinki, the congress would include a European Ministerial Round Table.

It was a chance for Finland to present its strategies in European context and hopefully make its mark in European policies. One small but hardly insignificant detail was what organizers would call this new thing they had referred to as TaaS (Traffic-as-a-Service) in the strategy. TaaS had many strong proponents (to some it meant Transportation-as-a-Service) and initially Kivimäki was in favor of it too. But some people – including Kivimäki's right-hand aid Krista Huhtala-Jenks – were pushing for MaaS (Mobility-as-a-Service). Undoubtedly the word mobility could be interpreted as more modern, user-centric and mode agnostic than traffic or transportation. It felt fresh and broad. Finally it was Minna Kivimäki who made the decision: it would be called MaaS. And not only in Finland but in the world.

In March 2014, Eurotransport Magazine published an ITS & Traffic Management Supplement preparing its audience for the upcoming ITS Europe Congress in Finland. Hietanen wrote a piece to the supplement titled 'Mobility as a Service' - the new transport model? The single quotation marks were there because this was for many the first time they ever saw the term printed anywhere. In retrospect, the idea, the role, and the business model of a MaaS operator were already laid out in relative detail: "Mobility-as-a-Service (MaaS) is a mobility distribution model in which a customer's major transportation needs are met over one interface and are offered by a service provider," writes Hietanen.

He goes on to describe consumer-centric packages with suggested pricing, the expected efficiency gains for the public sector, the need for ecosystem thinking in transportation, and the business potential. The endgame, a service so good that the need for car-ownership is abolished is laid out: “In the future, through the use of automated vehicles, MaaS will substantially enhance productivity by offering the level of convenience of a private vehicle but without the physical ownership.”

Undoubtedly the word mobility could be interpreted as more modern, user-centric and mode agnostic than traffic or transportation.

The push for the term and the concept of MaaS proved to be a well-planned and well-planted success at the ITS Europe congress. In the opening ceremony of the congress in June 2014, the new Minister of Transport, Henna Virkkunen gave a presentation and showed the audience an animated film made for the occasion. The film was called *Could mobility be viewed as a service?* The next day the Ministerial Round Table issued a joint statement, prepared by the hosting country, saying: “Following the example of the telecom sector, the transport sector should embrace the concept of *Mobility-as-a-Service*.” The statement concluded: “Our goal is seamless connectivity and seamless mobility for users across all modes and all borders.”

In practice, it would take years before the term MaaS was accepted and even later for people to embrace it. Both in the business circles and in the ministry the definition and nature of MaaS were discussed again and again. Was it a definable “thing” or was it an umbrella term? In most discussions the latter won. In any case, during the next five years MaaS ripened from an obscure abbreviation to an investor pitch punchline.



The MaaS Explosion

A distinguished ministerial round table at ITS Europe Congress was an important instrument in gathering European political consensus behind MaaS, but what caught the eye of the press and the imagination of the public came from a somewhat unexpected direction — in the form of a master’s thesis of a 24-year old engineering student, Sonja Heikkilä.

In the spring of 2013, she had been looking for a subject for her upcoming thesis. At an Aalto University annual event for the students and alumni of transport engineering, she had started talking with Sampo Hietanen who she had never met before. Hietanen had told Heikkilä about his work and ambitions within intelligent transport and Heikkilä showed immediate interest. “I had been studying transportation technologies at university level for almost six years and this was the first time I heard someone talking about a digital service that was customer centric,” recalls Heikkilä of their conversation.

Keen to support anybody interested in MaaS, Hietanen introduced her to another traffic visionary Ville Lehmuskoski, who at the time was Director of Helsinki City Traffic Planning. Lehmuskoski had followed the intelligent transport debate and had attended meetings of The Transport Policy Club and was interested in what MaaS would mean in a city like Helsinki. He commissioned Heikkilä to do her thesis for the city on this subject. The supervisor of Heikkilä’s thesis was professor Eric Bruun (who initially was very much opposed to the subject he did not find feasible, but later joined a MaaS company, Kyyti, as an advisor) and the instructors were Lehmuskoski and Hietanen. Together with Lehmuskoski and Hietanen, Heikkilä agreed that her work should be as easy to approach as possible: there would be illustrations and stories in addition to the more theoretical content.

Sonja Heikkilä’s thesis Mobility as a Service – A Proposal for Action for the Public Administration, Case Helsinki was published on 19th of May, after which she stayed at the city planning office as a deputy planner. A month later on June 17th — the day of the ministerial joint statement — Helsingin Sanomat, the leading daily paper in Finland, ran a two-page article on the future of transport and on Heikkilä. Sami Sahala, another veteran of intelligent traffic and Heikkilä’s colleague at the City of Helsinki at the same time, remembers pointing the article to her on Wednesday morning at the ITS congress and saying: “You’ll never guess what just happened.”

Little did either one of them know of what was to come. Helsinki Times, an English-language news website, picked up the Helsingin Sanomat story on Helsinki, MaaS and Heikkilä and ran it on 4th of July. Six days later The Guardian ran a similar story titled “**Helsinki’s ambitious plan to make car ownership pointless in 10 years**”. Heikkilä, on vacation at the time, received a phone call from a friend who said there was something about MaaS and Helsinki in The Guardian.

Once Heikkilä googled it, she realized the story was about her thesis. Requests for interviews and subsequent articles followed in rapid succession. Among the outlets that picked up the story were Bloomberg, Time Magazine and Business Insider. By early October 2014 some 300 articles had been published in the international press about Heikkilä and MaaS. Some news organizations even sent film crews to Helsinki to document the future of transportation, and were disappointed to find nothing concrete, only papers and talking heads.

While the core ideas presented in Heikkilä’s thesis had been around for several years, her main contribution was to see them in the context of a single city and envision a possible future through user stories. This helped to make the abstract concepts comprehensible. Her suggestion for a timeline and next steps also created a sense of urgency in the readers’ minds. Some of the newspaper articles also gave the impression that Heikkilä had the authority to make her vision a reality in Helsinki and abolish private car ownership in the city by 2025.

“The year 2025 was just an audacious scenario I threw into my thesis,” recalls Heikkilä, “an idea of a single engineering student that was spun totally out of proportion.”

Because there was a year attached, the radical idea at the center of MaaS of abolishing the need for car ownership with intelligent mobility services came through like never before and caused strong reactions. It is also easy to see the press capitalizing on the opposing caricatures of digitally savvy, urban, green, bike-riding and often female

demographic, and the aging, polluting, car-loving predominantly male population. Heikkilä was a face for our time that some loved, some had a hard time accepting.

Heikkilä fared the overwhelming attention well for a 24-year-old in from the cold. She gave the interviews, travelled the world speaking in seminars, spoke to the representatives of the European Parliament, debated with aging engineers often of the opposite sex and helped to gain massive publicity to the concept of MaaS. But bureaucracies are seldom the right platforms for self-confident thinkers that get the limelight. Helsinki City saw little sense in paying the salary of an outsider fresh out of school travelling the world telling everybody she was going to change the whole transport system of the Finnish capital by 2025.

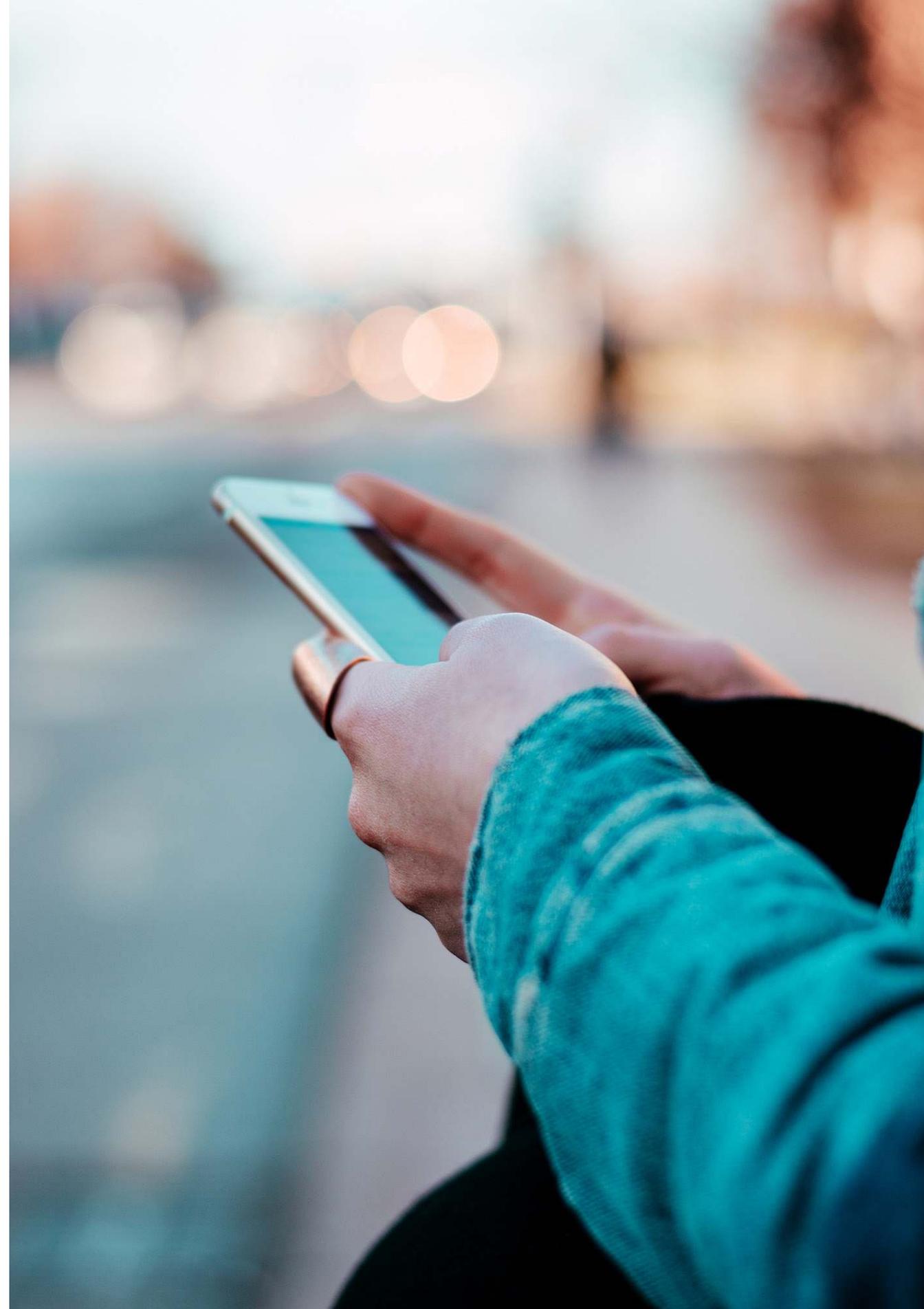
“I had been studying transportation technologies at university level for almost six years and this was the first time I heard someone talking about a digital service that was customer centric”

In the end of 2014 Heikkilä moved on to a place where she was more welcome, to Tekes (Finnish Funding Agency for Technology and Innovation, that later became Business Finland). The Agency had successfully funded research and development in the telecoms business and now that MaaS looked like the next big thing, it launched a program for companies developing things related to MaaS. Raine Hermans, a visionary with both academic and business background, hired Heikkilä to

run a funding program directed at MaaS pilots and to encourage cooperation between companies. Altogether 31 MaaS projects were funded during 2015 and 2016.

On a lighter note, some of the attention Sonja Heikkilä got took Helsinki's decision-makers by positive surprise. Sami Sahala remembers how they got a text message from the Helsinki Deputy Mayor for the Building Trade, Pekka Sauri. "I am attending a Smart City seminar and everybody goes on about something called the Helsinki Model. Should I know something about this?"

Some other bureaucracies were more abuzz. At times the youthful excitement around intelligent transport, especially at the ministry and the agencies reached such heights that the Minister of Transport at the time, Merja Kyllönen, remembers having to harness it a bit: "The telecom analogy got some of the civil servants carried away at times. Some thought that on our way to a digital future we could stop caring about the physical infrastructure. I had to remind them that there must be real roads on which to build intelligent pathways."



The Birth of the First Commercial Operator, MaaS Global

All through the fall of 2014, as the international attention piled up, Sampo Hietanen — now executive director at ITS Finland — felt increasing pressure to take things to the next level. The concept was out for everyone to see, and it was only a question of time until someone turned it into a business. And if it was not the Finns, it would very probably be the Swedes.

The two Nordic neighbors turn everything into fierce competition: whether it be ice hockey, pulp production or Eurovision singing contests, beating the other often felt better than the absolute level of success. To Finns this was sometimes bitter because the social Swedes were good marketers and regularly turned Finnish inventions into Swedish products. Hietanen remembered vividly a discussion he had had with a couple of industrialists less than a year ago at the Innovation Forum Stockholm. After the seminar at which he had spoken about the opportunities in intelligent transportation, the Swedes had told him in a very polite manner that once again Finns had brought a wonderful new concept for them to commercialize. “No, this one you are not taking from us,” he had snapped back at the gentlemen, fists clenching.

The next level meant starting a commercial MaaS service operator, or at least researching the feasibility of one. If they were to capitalize on all the analogues from the telecommunications revolution they were presenting in all those keynote speeches, there would have to be an operator, someone that could organize all mobility out there into a simple service a client could subscribe to. As a part of his MaaS roadshows, Hietanen had presented the idea to several industrial companies as a potential business case, but had received a lukewarm reception. The big companies — especially telecom operators — saw MaaS as a nice to have add-on to their offerings, not as a business that would be ten times bigger than theirs, as Hietanen saw it. ITS Finland would have to make the push.

Around this time, after the World Congress in the fall of 2014, the legendary MaaS beer sessions took place in downtown Helsinki at Pub Sir Eino, jokingly called the street level conference room of the Ministry of Transport and Communications. The MaaS enthusiasts found it difficult to find common meeting times in their calendars, and therefore decided to hold a happy hour every Tuesday after work for those who could make it. At 16:30, those who could showed up, had a beer or two and discussed the red hot space of MaaS. The sessions went on for a few months and provided a much needed platform to discuss

the rapidly developing scene and what should be done about it. Also at these sessions the idea of a commercial MaaS operator started gaining support.

The first MaaS operator in the world would have to act in cooperation with everybody producing transportation services and therefore it would have to be something of a joint effort. When the telecommunications market was developing, the strong industrial backing of some of the operators was a major driving force. Hietanen, together with his only employee Jonna Pöllänen and with a blessing from the ITS chairman Karri Salminen, decided to arrange a call for arms and test the level of willingness to participate. This was done as an event towards the end of the year, on 8th of December at the Finnish Science Center Heureka. The title of the event was nothing less than “A Starting Event for the World’s First Mobility as a Service Operator.” Everybody who could possibly contribute was invited, and the road ahead – with enough sense of urgency – thought out.

From the podium Sampo Hietanen announced to the 250 people present (he had been expecting 60) that the work on a business plan for the world’s first MaaS operator would start immediately and that organizations present could all contribute with their knowledge and wallets. As a result, 24 organizations pledged – among them Ericsson, Siemens, OP Banking Group, Helsinki Region Transport Authority, Finnish Taxi Association, TeliaSonera and Uber – 5000 euros each. Since ITS Finland was an NGO, it could not start building a business and the practical work of producing the plan took place during the spring of 2015 at consulting house Eera (later Korkia).

The company that emerged from the project, MaaS Finland (later MaaS Global), was officially founded on 4th of May 2015, but began operating in the beginning of 2016 with Sampo Hietanen as CEO, French Transdev, Turkish Karsan Otomotiv Sanayii and Tickaret AS as leading industrial investors, and with Tekes contributing with a significant soft loan. The name of the actual service and application, thought

up by Jonna Pöllänen (now Heikkinen), came to be Whim. It was introduced to the public in a debate on MaaS at the Forum for Mobility and Society in Brussels on 13th of June 2016. On 17th of October that year the first commercial ride using the Whim app was made in Helsinki.

Since its inception, MaaS Global has grown internationally and has been one of the most vocal thought leaders of the MaaS ecosystem and one of the premier business model, service and user experience developers in the field. Its aim, true to the founder Sampo Hietanen’s original sketches, remains to build a service that is roamable all around the globe.

While MaaS Global may have gotten the most press of all the Finnish MaaS companies, it is not the only one. Many of the companies that received initial funding from Tekes in 2015–2016 made their mark and have continued to develop the field. Tuup (later Kyyti) was one of the first Finnish companies to focus on MaaS. Tuup grew out of the work that transportation engineer Johanna Taskinen did for the City of Helsinki on how to organize parking and car sharing in new areas being developed. Tuup quickly developed to Kyyti Group that offers a platform for anybody, whether a single company or a whole country, wanting to organize its intermodal mobility and offer MaaS solutions.

Sitewise, a major Finnish consulting and planning consultancy, launched what they called the world’s first MaaS pilot in Seinäjoki in 2015–2016 where they tested a comprehensive urban mobility package for a monthly fee. While most MaaS action focused on urban areas, one of the first ever MaaS pilots was done in Lapland in 2016–2017. Ylläs Around was a mobile application that allowed customers to move in the Ylläs region without a private car, accessing and paying for the needed mobility through their smartphones. The application allowed the customer to build multimodal travel chains from what was on offer.

The Act on Transport Services

Spring of 2015 also put the development of the Finnish transport legislation on a fast track when Anne Berner took over as the Minister of Transport and Communications. As a free market liberal, the Swiss-Finnish entrepreneur and CEO Berner came from a very different political and social background than left-leaning Kyllönen from rural Northern Finland, but in retrospect their relay team work [there were some politically short lived ministers in-between] to make Finland the most MaaS compatible country in the world was seamless. While Kyllönen had played a crucial role in kicking off the development and anchoring its ideas in the political realm, Berner did the political heavy lifting required to change the legal landscape in transportation.

The Act on Transport Services was a gargantuan undertaking that brought all legislation concerning transportation, including road, aviation, seafaring and railroads, under the same umbrella. The drivers were climate change, digitalization and deregulation. Finland had committed to reducing emissions of the transport sector by 50% from the 2005 levels by 2035. This would require drastic changes throughout the system. The new act aimed at modality and technological neutrality while forcing the actors within the field to open their data silos. The ten different registries regarding transportation would also be merged into a single registry. “A holistic approach for the transport system means that all of its ‘units’ seamlessly work together, producing services that meet the end users’ various needs”, Berner described the end game in an interview while the new legislation was about to take hold.

The relay team work to make Finland the most MaaS compatible country in the world was seamless.

The Act was drafted in three instalments, on October 1st 2017 and January 1st and July 1st 2018. Berner quit her position in the government at the end of May 2019. In addition to seeing that the new legislation was passed, she acted as its ambassador in Europe and beyond. The attention that Helsinki got in 2014 would have been forgotten had Finland not been able to deliver on the promise. The cutting edge reform got the country on the news again. Berner gave keynotes all over the world and spoke with European legislators explaining that MaaS was not just another app or a technology, but a new way of organizing everything transport-related for the benefit of the environment and the end user.

MaaS Around the World

As with most inventions, there will always be disagreements about who was the first to think or build MaaS. Here we have demonstrated how Finland practically turned the whole country into an incubator to advance MaaS and was the first in the world on numerous accounts. But of course, the world around did not stand still.

Probably the first vision of a MaaS type approach was introduced to the world in 1996 at the ENTER Conference in Innsbruck, Austria by Nico Tschanz and Hans-Dieter Zimmermann. Their idea was called an "intelligent information assistant", a platform for transportation providers and customers. It could be used, they imagined, to search, combine and book trips plus do many other travel-related things such as book hotels and buy insurance. Considering that the internet as we know it was only two years old at the time, the gentlemen had been quick to envision a future for it in transportation.

The concepts of multimodality and transportation-as-a-service were part of the intelligent transport discussion before MaaS became the buzzword, and there were services and applications that tested the waters. French Covoiturage (later BlaBlaCar) launched an online marketplace for carpooling as early as 2004 and has grown significantly since then. Citymapper, a journey planning app, was launched in London in 2011 and has since then spread to over 40 cities.

Moovit, another traffic planner (later acquired by Intel Corporation) was launched in Israel in April 2012 and has grown into an international service used by hundreds of millions users in thousands of cities. It uses official public transport and crowdsourced data to provide route-planning to individuals and transit data APIs to transit companies. As MaaS has become the popular term, Moovit has started calling itself a MaaS solutions company.

In 2016 Groupe PSA, a French auto conglomerate, launched Free2Move, a mobility aggregation platform that lets users compare car sharing services and companies to manage their fleets. And then there are American car-sharing giants Uber (2009) and Lyft (2012) that along the way had provided a lot of outside pressure to local transit and taxi companies to change. While ride-hail is not MaaS, both companies have expressed plans to move their business models towards the MaaS concept.

Didi Chuxing in China is the product of the merger of the country's two major taxi-hailing companies Didi Dache (2012) and Kuaidi Dache. In 2016, it acquired Uber China and has since then grown in modalities it offers and expanded internationally, especially in Latin America, Australia and Japan.

In the MaaS context, UbiGo in Gothenburg deserves a special mention. Technically UbiGo was the world's first MaaS service, but not technologically since there was no platform serving the users. It was a research project in which most of the work was done manually behind a customer interface. Between November 2013 and April 2014, 75 households in Gothenburg were able to use existing transportation services – such as public transport, bike sharing, car sharing and taxis – through a monthly subscription service. Although the results were promising in that the families liked the service, the projected financial reward was not what UbiGo was looking for and the project was discontinued (UbiGo reappeared in Stockholm in 2018). Instead it triggered plenty of research and several research papers.

Finland practically turned the whole country into an incubator to advance MaaS and was the first in the world on numerous accounts.

In Hamburg, the local transport operator ÜSTRA Hannoversche Verkehrsbetriebe AG has been active in developing multimodal public-private offering in modern mobility. Already in 2004 it introduced a multimodal offering called HANNOVERMobil. It was an add-on to the public transport pass and included a membership to car-sharing and discounts to taxis, rental cars, delivery services and bike shops.

In 2016, Üstra launched an app it describes as a multimodal mobility shop with the intention of becoming the MaaS provider in the Hannover region. The shop is flexible and modular, meaning the customer can add desired modes and services. The shop also integrates routing, booking and billing via a joint mobility bill for all services.

When MaaS is discussed, one more city that must be mentioned is Vienna. With its WienMobil app, the local transport operator Wiener Linien is at the forefront of smart mobility. Through WienMobil, citizens have access to door-to-door transport using bus, tram and metro as trunk lines and taxis, bike and car sharing and car rentals as last mile options. The service also includes e-loading stations and parking garages. To provide technical infrastructure to the effort, Wiener Linien together with the local utility company Wiener Stadtwerke has founded a platform company, Upstream Mobility. The platform links public and private mobility services and combines them with services and analytics.

The MaaS Alliance

While the history of the MaaS concept is dotted with individual towns and apps, the big picture is based around its universal possibility for roaming. Again, the analogy comes from the telecom sector. When mobility dawned as the future in telecommunications, there were hundreds of telecom operators that made thousands of point-to-point agreements with each other. This was time-consuming, expensive and when agreement was not reached left dead spots that infuriated customers. If a mobile phone stops working when you move, it's not mobile. Several organizations were formed to deal with the challenges of roaming, especially a seamless consumer experience and setting off tariffs when mobile users visit networks outside of their home network.

In 1987, the basic parameters for the GSM were agreed and the 13 countries committed to deploying GSM signed an operator agreement in the form of "Memorandum of Understanding." By 1995, the group had over 100 members and became the GSM Association. Its task was to standardize the technical and contractual conditions between GSM operators. Individual European companies also formed strategic alliances, such as the Freemove Alliance and the Starmap Mobile Alliance in 2003 to provide seamless roaming services. Although much of the international cooperation was initiated by the biggest European countries and companies, it very much benefitted small countries like Finland with advanced technologies. The first-ever GSM call was made by Radiolinja in Finland in 1991, and next year the first international roaming agreement was signed between Telecom Finland and Vodafone UK.

The MaaS Alliance – very much a copy of the telecom alliances – was formed in Bordeaux, France, on the 10th of October 2015 with 20 European organizations signing. Getting it off the ground has later been described as a masterpiece of Jacob Bangsgaard (CEO of ERTICO), Rasmus Lindholm (ERTICO's Director of Communications and Partnerships), Sampo Hietanen and Anne Berner, the Finnish Minister of Transport and Communication at the time. The original signees include Aalborg University, AustriaTech, Ericsson, ERTICO – ITS Europe, Federation International de l'Automobile (FIA) Region I, Finnish Ministry of Transport and Communications, Helsinki Business Hub, IRU, Connekt, ITS Finland, ITS Sweden, ITS Ukraine, MOBiNET, National Mobile Payment Plc. (Hungary), Swedish Ministry of Enterprise and Innovation, Finnish Funding Agency for Innovation (Tekes), Transport for London, Vinnova, University of Tampere, and Xerox. Five out of these twenty organizations were Finnish.

While MaaS Alliance did not have the muscle comparable to telecoms partners to introduce standards and form strategic alliances, it has had an important role as a forum for cooperation and harmonization of business practices and technologies. As MaaS becomes mainstream and the European Union's role in promoting it gets stronger, the role

of MaaS Alliance with the number of members growing past 100, has been increasing. The European Commissioner for Transport between 2010 and 2014, Estonian Siim Kallas, was a known friend of Finland and MaaS. When his successor, Slovenian Violeta Bulc took over the role of the commissioner on 1st of November 2014, she came out of the gate declaring that: “The future belongs to three developments: automation, electric cars and MaaS.”

Over the years the group of 20 that got MaaS Alliance off the ground has grown to have over 100 members. Originally a very European organization, it has lately attracted strong players from other continents as well. Finland may have been spearheading the development of the concept but today The Netherlands, Sweden, Belgium, regions of Great Britain and some towns in Germany are leading the way just as much as Finland. Outside of Europe, especially Canada, Japan and Australia have been active. Also, the big ride-hailing companies, Lyft and Uber have expressed increasing interest towards becoming MaaS operators rather than staying in the car-centric ride-hailing business. Uber even joined MaaS Alliance in 2017.

The march of MaaS has continued, and even if there are political, economic and technical obstacles, it seems to be on its way to becoming a significant disruptive concept and technology. The potential benefits to everyone involved have been listed in this article several times. But there is one more reason for its rise hiding in plain sight. During the hot years of intelligent transport 2009–2015, Finland saw the Minister of Transport change five times. Even if the political climate was not always in favor of intelligent transport, all five ministers gave it and MaaS their solid support. When asked why all of them were so on board, Merja Kyllönen has an answer that is hard to counter. “It’s the word ‘intelligent’,” she says. “Nobody wants to be remembered as the one who made dumb choices.”

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