

## *Netherlands launches MaaS pilot projects:*

### *Eindhoven adopts a green strategy*

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Bijdrage aan het Colloquium Vervoersplanologisch Speurwerk 21 en 22 november 2019, Leuven

#### **Samenvatting**

Mobility as a Service (MaaS) staat voor het kunnen plannen, reizen, boeken en betalen van een breed aanbod van mobiliteit, via één app. Het ministerie van Infrastructuur en Waterstaat heeft de weg vrijgemaakt voor de introductie van MaaS in Nederland. Een belangrijk onderdeel hiervan is de samenwerking met marktpartijen om te komen tot standaarden voor data uitwisseling. Ook is een raamovereenkomst gesloten met 24 consortia die zich hebben gekwalificeerd als MaaS-dienstverlener. Er wordt op grote schaal ervaring opgedaan met MaaS binnen zeven nationale pilots, die zullen starten in verschillende regio's. Deze pilots hebben allemaal een net andere focus. Eén van deze regio's is Eindhoven, waar de focus zal liggen op het verduurzamen van de mobiliteit. De Gemeente werkt samen met ASML, één van de grootste werkgevers uit de regio's. Samen zijn zij de 'launching customers' voor de MaaS-dienst. Binnen de pilot, wordt het bestaande aanbod van mobiliteitsdiensten uitgebreid en relevante data zal beschikbaar worden gemaakt. Hierdoor kan de MaaS-dienst soepel worden uitgerold en waarbij eindelijk op grote schaal geleerd kan worden van de ervaringen van duizenden MaaS-gebruikers.

#### **Keywords**

MaaS, Sustainability, Pilot project

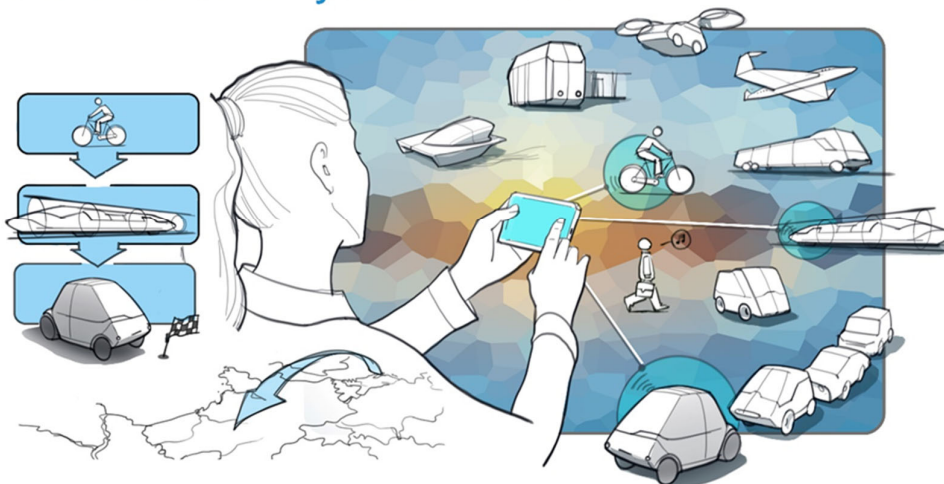
## 1. Introduction

Mobility as a Service, abbreviated as MaaS, is a transportation concept with great potential – something traffic and transport experts have agreed on for several years. Yet, despite the high expectations, the concept has not truly gotten off the ground anywhere in the world or even been tested on a large scale. The Netherlands hopes to change that. The Dutch Ministry of Infrastructure and Water Management has assumed a 'director's role' in this and is helping all of the interested government agencies, transport operators and MaaS service providers reach good agreements and, equally important, share their learning experience: seven large-scale regional MaaS pilot projects are being organised around the country. This paper discusses these national Dutch efforts, with extra attention devoted to the pilot project in Eindhoven, heart of the Southeast Brabant high-tech region, a key objective of which is greening – promoting sustainable, CO2-free mobility.

## 2. The promise and challenges of MaaS

The principle behind the Dutch MaaS plan is simple: travellers can plan, book and pay for a multimodal, door-to-door trip using a user-friendly, all-in-one app. This naturally represents greater convenience and service for the traveller. Yet at the same time, MaaS provides advantages for the transport supply as well. For one thing, it would be a boon for new transport services such as car-share, bike-share and ride-share services. Moreover, MaaS can be used to better coordinate the various modalities (old and new transport forms), which would further improve the quality of the overall transportation system. The hope is that with a high-grade, user-friendly service of this order, we might be able to encourage travellers into changing their entrenched mobility behaviours – and perhaps leave the car behind more often and make use of more sustainable alternatives. That would reduce congestion, lower emissions and abate noise pollution. On top of that, the data that will become available through MaaS, will pave the way to more data-driven policy-making.

### MaaS : Mobility as a Service



*Figure 1: concept of MaaS: all forms of mobility available through one mobile app*

All of this makes MaaS very promising and various studies have painted a rosy future for the concept.<sup>1</sup> The reality, however, is that MaaS has only been haltingly implemented to date. One could point to partial solutions out there that might be considered 'MaaS-like', such as Uber and Lyft or commercial mobility passes like MobilityMixx or Shuttle, but a complete service such as that outlined above on large scale does not exist – either in the Netherlands or elsewhere.

The reason for this slow start is not necessarily technological: apps already exist that can match mobility supply to demand, for instance, and technological solutions are available for 'multimodal'

reservations and payment. The bigger problem is the cooperation between transport operators (in particular) and MaaS service providers. Our entire transportation system is structured around separate modalities.

This cooperation conundrum is particularly a factor in terms of sharing data. With absent complete, accurate and up-to-date information on the availability, occupancy capacity, location, planning and cost of the mobility supply, a MaaS service provider will never be able to correctly match the demand of travellers. The sharing of data is not commonplace, however, under today's transport system. Data provides a revealing glimpse of the operations of the party providing it, which is not always desirable from a competitive vantage point. In addition, sharing that data requires action (= effort, investments) on the part of the transport operators. MaaS service providers who, for instance, request data on occupancy figures from public transit companies or want access to payment systems data and the systems themselves are quickly met with reluctance or a resounding 'No'. While most stakeholders more and more realise that MaaS also affords great opportunities and that data openness is, in theory, a necessity, they are waiting for the time being to see what happens.

### 3. National programme

This status quo prompted the Dutch Ministry of Infrastructure and Water Management (the ministry) in 2017 to actively intervene in MaaS developments in a directing and facilitating capacity. The Netherlands increasingly suffers from traffic congestion and delays and would thus benefit from any solutions with a potential for reducing car use. There is no shortage of urgency: the economy is growing at an above-average rate in the Eindhoven region, for instance<sup>3</sup> – which of course means more people on the roads.

The ministry's efforts are directed, among other things, at facilitating the necessary data exchange. To that end, the ministry is working together with the municipalities of Amsterdam, Rotterdam, The Hague, Utrecht and Eindhoven on a standardisation operation to make it easier and less expensive to widely share data. The ministry is also acting as a mediator to inventory those modalities for which there is still a great shortage of data, such as bike and car shares, and examine what level of data exchange is needed, along with the accordant standards. This matter is also being taken up at the European level and in conjunction with the MaaS Alliance<sup>2</sup>. Finally, the ministry is working with market players to draft rules on commercial property and the appropriate use of travel data – the latter in the context of the EU's General Data Protection Regulation (GDPR).

The most important aspect of the national approach, though, is to learn by doing. Seven MaaS pilot projects are being conducted throughout the country – see figure 2 – to give us more insight into the dos and don'ts of MaaS. These are exploring such questions as: Which business cases work? How should we structure the payment system? What do travellers think of MaaS? Is their behaviour changing? And to what extent can MaaS be deployed to achieve the government's policy goals? To ensure that the lessons learned are as broadly applicable as possible, the pilot projects each have different aims and learning questions – and of course the nature of the resources and challenges in each region also varies. In Amsterdam, Utrecht and Rotterdam-The Hague Airport, MaaS is primarily being used to entice travellers out of their cars and convince them to use other modes of transport. In Groningen-Drenthe and Twente, the emphasis is on intelligently combining specialised passenger transport with standard public transit. The province of Limburg is focusing on cross-border transport, and the Eindhoven region is adopting a unique green approach and the municipality of Eindhoven will be one of the launcher customers .

Although the pilot projects are starting at the regional level, they will quickly be scaled up to the national level as they progress. Each one has a maximum duration of three years including upscaling. They are partly being funded by both the ministry and the regional governments, which are collectively allocating €20 million to the effort. A special learning platform is being designed to measure the impact of these pilot projects, in which all of the data generated will be anonymised and input to be used for monitoring purposes. This should make it clear whether travellers are

actually changing their behaviour. Another objective of the pilot projects, in addition to gathering information, is to establish confidence in the partnership among the respective parties – regional governments and the MaaS service providers. This is the crux of further developing a 'MaaS ecosystem' capable of running without the financial support of government .

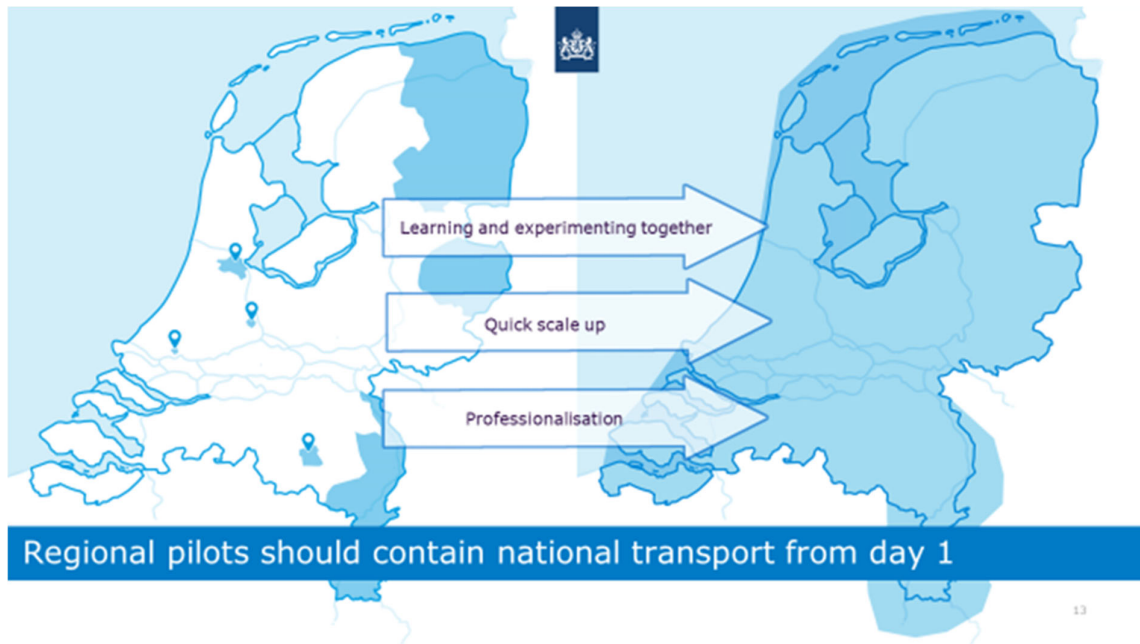


Figure 2: The seven regions hosting MaaS pilot projects

#### 4. Process

The ministry started the Maas pilot project process in November 2017 with a MaaS Market Consultation. The idea was to query companies about the obstacles they were experiencing in terms of adopting MaaS and gauge enthusiasm for national scalable regional pilot projects. Some 85 highly diverse companies responded to the formulated consultation questions, yielding valuable insight into the dynamics of MaaS use and the barriers that they experience.

This was followed by what was known as the MaaS Pre-competitive Dialogue, a series of meetings with 61 market players in the months of July and August 2018. One of the major objectives at this point was to expedite the formation of consortia for conducting the regional pilot projects. These sessions made it abundantly clear that in order for MaaS to be commercially successful, we would have to greatly upscale the endeavour: the market parties were of the opinion that it would only be financially viable if a MaaS service provider processed on the order of tens of thousands of travellers a day.

The MaaS Framework Agreement was tendered in September 2018. The primary purpose of that agreement was to provide the seven regions with a vetted pool of qualified MaaS service providers. The preconditions for submitting a tender were a commitment to learning and working together and to sharing data. By including that final aspect, the ministry took a big leap forward in terms of transparency and making the necessary data available for MaaS (and also for learning purposes). A total of 41 consortia signed up to the Framework Agreement and 24 were ultimately accepted following evaluation. These consortia demonstrated that they had experience with MaaS functionalities, possessed sufficient knowledge about the Dutch public transit and specialised passenger transport systems and had a clear vision with regard to marketing, privacy and security. On top of that they had to have a convincing business case to show they have a commercial product, also after the pilot phase.

Through these steps, the ministry created the conditions for efficient and productive pilot projects. The various pilot regions currently launching their pilot projects onto the market in a graduated manner in short succession. The consortia included in the Framework Agreement can sign up to participate. The MaaS service providers for four of the pilot projects have now been selected (September 2019). The first MaaS apps within the pilot projects are expected to go live early 2020. So that is when the first data becomes available for learning purposes.

## 5. Brainport Eindhoven pilot project: MaaS with a green strategy

One of the pilot projects starting in 2019 is the one in the Eindhoven region in Southeast Brabant (also called Brainport). As mentioned above, the Eindhoven project has a unique focus: green mobility, with a particular emphasis on urban traffic. In 2016 the city set a goal of reducing CO2 emissions 95% from their 1990 levels by 2050. Given that mobility accounts for approximately 29% of all CO2 emissions, the 'greening' of traffic and transport plays a vital role in achieving regional climate goals. Because of the opportunities MaaS presents for altering – and thus also greening – people's mobility behaviour, the city was eager to not only participate but also financially sponsor the ministry's MaaS pilot projects.

Eindhoven sought the cooperation of the company ASML (one of the region's largest employers) and the living lab partnership Brainport Smart Mobility (a driving force in the region behind smart mobility ventures, with a strong network of local companies) in defining and executing the pilot project. Moving forward, the parties will work together on the following steps:

- A. Providing a solid foundation of MaaS users
- B. Securing a suitable breadth and volume of transport options
- C. Ensuring that the data needed for MaaS is available
- D. Choosing a MaaS service provider (consortium from the Framework Agreement) and launching MaaS
- E. Scaling the MaaS service up to the regional and national levels as smoothly as possible

### A: Solid foundation of MaaS users

One of the vital roles being assumed by the municipality of Eindhoven and ASML is that they are the launching customers, each with their own interests. The municipality of Eindhoven has 2,000 employees who traverse a total of 1,500,000 km for business per year, 800,000 km of those in their personal vehicles. This pertains to business travel: kilometres driven for business purposes. The city has set itself the goal of having all such business kilometres covered in a sustainable manner by 2025. MaaS has been designated as the means of achieving that goal: as a rule, staff members will need to use the MaaS app to plan, reserve and pay for any business travel – and the app will only offer trip options that are sustainable and emissions free. This has required a change in not only policy, but also the terms of employment, which were still fairly permissive in terms of what forms of transport were reimbursed. The amendment to the terms of employment has already been approved; it has been determined that during the mobility pilot project business trips using one's personal vehicle will no longer be reimbursed. At a later, parallel stage, the city also plans to attempt to green people's commute. MaaS will not yet be made compulsory at that stage, though, but rather used as an inducement.

Commuting and enticement are also spearheads of ASML's approach. This launching customer is a powerful force, a listed high-tech company with over 22,000 full-time employees, 12,000 of whom work at its headquarters in Veldhoven (a city bordering Eindhoven)<sup>4</sup>. By offering MaaS to its staff, ASML hopes to motivate as many of them as possible to leave their cars at home. Currently approximately 69% commute to work by car and ASML wants to drastically reduce that

percentage.<sup>5</sup> In addition to aspiring to 'green' goals, ASML also aims to improve company accessibility and employee fitness.

Since ASML has decided (for the time being) to entice and not require people to take action, ASML employees will be shown a different range of options on their MaaS app, some of them maybe less green. These will include public transit, dedicated transport operator (contracts), bike sharing, car sharing and P+R facilities (parking your car in a remote lot and using another modality for the 'last mile').

With Eindhoven and ASML as the first customers for large-scale implementation, the region hopes to provide sufficient volume for the pilot project to get off to a good start. This also provides a good opportunity for gaining experience with various aspects of behavioural change. What are the pitfalls of making something 'mandatory'? What are the legal ramifications and what happens when you modify employment terms and payment systems? What works and what does not in terms of 'enticing' people? What effects are attainable?

#### B: Breadth and volume of transport options

Getting drivers and passengers to transition to 'green' alternatives only makes sense, of course, if such transport modes are abundantly available. Similarly, the MaaS concept can only succeed if it has access to a sufficiently varied, intertwined network of transport supply. In the pilot region, the following forms of transport and facilities are available:

- Bike sharing. Eindhoven Central Station and the Meerhoven P+R lot have 325 metro bikes available; another 40 bikes from another provider are distributed across seven locations in the city. In addition, the bikes operated by the municipality of Eindhoven are being made available for the pilot project (see also Service vehicles).
- Car sharing. Eindhoven is currently home to over 150 car sharing vehicles including cars from MyWheels and 11 public electric car sharing hubs. That number of vehicles is increasing: the city plans to launch a trial in 2019 with shared electric vehicles that have a citywide parking permit. In that experiment the cars will be free floating, meaning they can be returned in another city. Another new element is that permits will be issued for the total number of car shares a provider has parked in the city at any one time and not linked to number plates.
- Public transit. The city is taking measures to boost its public transit and collective transport offerings by optimising bus connections and offering shuttle connections. This will further expand the network with so-called high-quality public transport– fast, frequent and reliable bus connections along major city axes.
- P+R, smart hubs. The city will be further expanding the number of park and ride (P+R) and transit transfer facilities. The first of these will be built in Meerhoven, a location close to ASML. The initial phase involves partnering with ASML to encourage its employees and suppliers to park their cars at this hub, from where they can take a bus connection to ASML and back. The region explores locations to expand with smart hubs.
- Service vehicles. The municipality of Eindhoven will see to it that city-owned vehicles, to wit eight electric pool cars and about 40 bikes and electric-scooters, are registered in the MaaS app. These will initially only be available for use by municipal workers. After that, the possibility of making the vehicles available to the public on evenings and weekends will be explored.

The transport supply outlined above forms a solid foundation for the MaaS trial in Eindhoven as it is, but the pilot project is also expected to further expand that supply. It will of course now be more interesting for any providers of new or existing mobility services to set up in Eindhoven, since they are guaranteed a sizable group of potential users, as well as good connectivity through a user-friendly app such as MaaS. Moreover, the data from the MaaS app can be used for targeted expansion of the supply as needed. At the same time, MaaS providers will be expected to actively collaborate with the providers of the mobility services to secure the highest level of quality for MaaS in the region (reasonable wait times!).

### C: Availability of data needed for MaaS

The municipality of Eindhoven has been setting a good example the past couple of years in terms of data sharing: an ever-growing number of datasets can be freely accessed and used or re-used (see [data.eindhoven.nl](http://data.eindhoven.nl)). Some of this data is valuable for the MaaS pilot project, such as the datasets on charging stations and parking spots. Equally important, though, this effort gives the city the moral authority, as it were, to request data from other parties. This has also become standard in the context of the pilot project. If, for example, a transport provider wants to offer its services in the city, then it will only be allowed to do so if it makes its data available. In any event, the city automatically makes agreements about supplying such data for every product or service it procures that generates data in any form.

### D: Launching the MaaS service

In the lead-up time to the launch, the partners have started the process of selecting a MaaS service provider for the pilot project. One of the primary goals of the market consultation the municipality of Eindhoven conducted in December 2018 was to also engage MaaS service providers in the pilot project at an early stage in the process. The written segment consisted of 32 questions about the desirable state of affairs, implementation, upscaling, improvements to accessibility, the administrative process, funding and operations.

At the same time, with the help of Brainport Smart Mobility and other parties, potential tie-ins – with other companies and regions who might want to jump on-board with the MaaS pilot project as a customer – are being investigated. The objective of the early consultations with service providers and user groups was to optimally calibrate the procurement strategy to the market situation: what kind of 'MaaS environment' (app, mobility supply) do we want to create, given the consortia's abilities and customers' needs?

The tendering process started March 2019. In a dialogue session each tenderer had the opportunity to present four topics: vision, implementation and scalability, business model and status of the app. First, the five top ranked parties were selected to participate in the last part of the tendering process, which started in May. The tendering process ended in October, after which the selected party was able to start with the implementation of MaaS. One of the concrete steps in this will be linking together all the data streams, so that the MaaS app is indeed able to present travellers with a suitable travel option that they can then also book and pay for. Three to six months have been scheduled for the implementation phase, which will include also starting the mobility service. This will be first offered to a designated focus group, a small group of employees from various departments. Their feedback will be used to make adjustments to the system and then expand the group of employees being served. This initial implementation should be completed by the fourth quarter of 2019, whereupon full implementation throughout the organisation can occur.

### E: Scaling up to the regional and national levels

Other employers facing urgent accessibility challenges can join the project at this stage. This is primarily the domain of the Brainport Smart Mobility partnership: they will serve as the portal for employers in the region. Six large, influential employers from the region were interviewed as part of the preparations for MaaS. These parties – representing at least 20,000 staff and students with daily commutes – view MaaS as an opportunity and are eager to be indirectly involved in the pilot project. The idea would be to bring them on-board once the pilot project is running well with the municipality of Eindhoven and ASML.

National upscaling could follow soon afterwards. The majority of transport modes being supplied – e.g. train, car shares, bike shares, ride-share services and taxi companies – are of course also nationally available. Quickly scaling the operation up to the national level would obviously make the service more attractive overall; practically no one only ever has to travel within a single region.

## 6. Lessons

Many lessons will inevitably be learned once MaaS is implemented in the fourth quarter of 2019. Yet at the same time, much has already been learned from the preparations so far – insights that will definitely be addressed in the follow-up to the pilot project and which could well be of interest to other regions and pilot projects. We list some of these below.

### Employers

- It is important for any employers considering making MaaS mandatory for their staff, such as the municipality of Eindhoven is doing, to discuss this at an early stage in the process with managers and the works council. Adapting policies, as well as terms of employment, can be time-consuming.
- Another challenge for employers involves tax aspects. Tax rules can form an obstacle to implementing MaaS. One example: in the Netherlands, reimbursements for business travel and for commuting are treated differently for tax purposes. This makes combining these two activities in the MaaS app tricky, since they must be kept strictly separate in the reimbursement administration.
- Give some serious consideration to which department will take the lead in concluding contracts for MaaS services: facilities management, HR or IT? MaaS straddles multiple domains – which can make it 'scary' to assume responsibility for it. This is why it is also important to include the contract manager from the very beginning. Be sure to appoint – again, at an early stage – ambassadors and supervisors. No one likes change, so employees will be nervous about driving an electric car or using the app for the first time. Devote time and resources to clearly explaining what MaaS is. Many workers, for instance, are extremely attached to their cars ('the only efficient vehicle for the job!') or unfamiliar with the full variety of options afforded by MaaS and have only heard of car sharing. Moreover, the importance of good communication grows to the extent MaaS is made compulsory.
- To receive a maximum of result, both business travel and commuting need to be taken in account.

### Government

- Laying the groundwork will not only take a great deal of time, but also require freeing up sufficient capacity. In Eindhoven's case, it involved internal deliberations with various departments, works councils, boards and management and users, as well as external deliberations with the ministry, partners ASML and Brainport Smart Mobility, other regional pilots and government agencies, potential customers, potential providers, transporters, etcetera.
- Create a portal for mobility and transport providers. It must be generally known that providers can join in and they must be provided with correct information (on the opportunities and preconditions) succinctly and professionally.
- Ensure that your policies concerning shared mobility and data are up-to-date. This boosts your 'authority' in making demands of other parties. Moreover, it helps you discuss such things as standardised, privacy-preserved data sharing from a position of knowledge.
- Look beyond your own city; MaaS transcends borders. Investigate partnerships with other government agencies and operations.



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