

THE FUTURE OF **MOBILITY AS A SERVICE** (MaaS)

Which model of MaaS will win through?

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INTRODUCTION

THE FUTURE OF MOBILITY AS A SERVICE : WHICH MODEL OF MaaS WILL WIN THROUGH?

By refocusing the service on users and offering them an end-to-end journey, Mobility as a Service (MaaS) is profoundly changing the way urban transportation systems are viewed. This is a driving force in the transformation of mobility to find alternatives to car ownership, as well as a lever for regional development that is becoming increasingly important in Europe.

The concept of MaaS is simple enough: an app with a map that connects you to a bunch of transport options to get you from point A to point B with an end-to-end seamless journey. The first real MaaS platform was launched by Whim Global in 2016. Since then, numerous MaaS initiatives and companies have emerged around the world, especially in Europe. Yet, despite four years of effort since that first launch, success has been elusive. The key barrier remains how to find a sustainable technical, operating and business model that makes it possible to overcome the challenges raised by the aggregation of different mobility services, while providing a seamless user experience.

MaaS attracts multiple interests and players: transportation operators, IT and telco companies, energy providers, banks and insurance companies. Even the likes of Google. MaaS is also a response by local authorities to the need to provide attractive (for residents and businesses), inclusive and livable communities by replacing car ownership and offering alternative forms of mobility. The future of MaaS and the operational model remain uncertain: will one or just a few major players dominate and create a monopolistic or oligarchic market? Will several players maintain a fragmented landscape?

Software companies are already moving fast. As an example, in May 2020 Intel bought Moovit for \$1 billion. This was quickly followed by Moovit partnering with Cubic to combine its multimodal trip planning with Cubic's mobile payment and ticketing system. With its previous purchase of Mobileye in 2017, Intel looks to be preparing to deliver a full MaaS solution integrating autonomous vehicle services where needed.

Local authorities need to move fast to increase their MaaS maturity and take the lead in its development. The outcome will be MaaS solutions that fully benefit both regional development and all citizens. Accelerating this maturity will depend on the ability to mutualize funding, to find alternative sources of financing, and to create innovative and strategic partnerships.

This paper analyzes the different stakeholders and dynamics shaping the as-is MaaS landscape in Europe, and explores what the future of MaaS might look like, including how it could be developed to fully answer stakeholders' needs and the challenges they have to face.

A COLLABORATION BETWEEN CAPGEMINI INVENT AND AUTONOMY

Capgemini Invent and Autonomy have combined their expertise to assess MaaS and formulate a vision for it in Europe, offering a perspective on its development. Capgemini Invent brings to this point of view experience in supporting the design and implementation of MaaS systems. Thanks to its large network of partners, Autonomy provides a detailed analysis of the players, challenges and dynamics in the mobility market.

During the first semester of 2020, several MaaS companies were interviewed to understand the opportunities, the dynamics of development and difficulties faced. This included Moovit, KYYti, MaaS Alliance, Instant System, and Motiontag. Some key players in the mobility ecosystem, such as Ile de France Mobilité and RATP, were also interviewed to strengthen the illustrative Paris region use case.

WHERE IS MAAS TODAY IN EUROPE?

WHY MaaS IS A GREAT OPPORTUNITY FOR EUROPEAN CITIES

MaaS makes it possible to meet the transportation challenges of travelers and regions, while creating significant business opportunities for players in the sector. With its transportation network, digital infrastructure and legislation, Europe provides a framework that is highly favorable to MaaS development.

For the past few years, MaaS has been considered the best solution to answer travelers' need for a seamless and efficient journey experience. Cities also see MaaS as an opportunity to increase their livability and attractiveness.

The idea has captured the imagination of European cities wanting to reduce congestion, pollution and carbon emissions in order to enhance the attractiveness and livability of their city. They view MaaS platforms and apps as powerful enablers for encouraging commuters to walk, cycle and take public public transports rather than use a car. Of particular relevance in 2020, a MaaS solution would also enable cities to manage social distancing and trace infections during pandemics like COVID-19. This sanitary context has increased the need and the willingness to both share mobility data, and to use of micro-mobility solution, like bikes and scooters, for more safety.

The concept of MaaS further appeals to startups and big tech companies that understand the business opportunities of creating digital platforms with a large user base. Revenues associated with electric vehicles, autonomous vehicles and MaaS are expected to increase tenfold by 2030.

Europe is the perfect playground for developing MaaS platforms: developed countries with wealthy citizens, cities with strong local political power, developed public transport and a growing environmental mindset amongst urbanites who are looking for alternatives to car ownership.

European cities are laying the groundwork for rapid MaaS adoption, both in terms of policy and physical infrastructure.

European legislation is opening a highway to MaaS solutions. In the framework for a 'multi-modal travel information service', in 2017, the EU commission adopted a new Directive providing for the creation of a National Access Point by December 1, 2019 in each EU country. The goal was to share both static and dynamic travel data to any citizen through data bases, web portal, data repositories...etc.

As well as being driven by policy makers, there is momentum from commuters faced with expensive and inconvenient car ownership in urban areas where transport operators and startups are expanding the range of alternatives (scooters, car sharing...). For example, in Paris, car ownership has dropped from 60% of households in 2001 to 35% today⁽¹⁾.

⁽¹⁾ Insee (Institut National de la Statistique et des Etudes Economiques), French households car equipment 2001 – 2017, Paris

THE MaaS ECOSYSTEM IN EUROPE HAS BEEN FLOURISHING

A strong political will combined with changing consumer behavior has encouraged multiple companies and startups to enter the MaaS market. They propose software and services that can connect all the mobility offers to consumers through their smartphones.

Tech giants and scale-ups are capitalizing on their huge data bases and a massive volume of users to rapidly develop more consistent and customized mobility services:

- Google and Citymapper are progressively extending their core feature (map app and trip planning) to become real MaaS providers – however, currently the user is still unable to book and pay via the app, but it is just a matter of time.
- Worldwide ride-hailing operators like Lyft, Grab and Uber are becoming multi-mobility operators by offering a marketplace on their apps: Uber announced its partnership with Cityscoot at Autonomy Paris last year and offers free-floating bikes and scooters.
- Some software giants, such as SAP, are starting to position themselves as mobility enablers based on their software and cloud services.
- As these tech giants have few (if any) cash issues, M&A operations become more frequent: Intel acquired Moovit, a MaaS solutions company known for its popular urban mobility app, to accelerate Mobileye's MaaS offering.

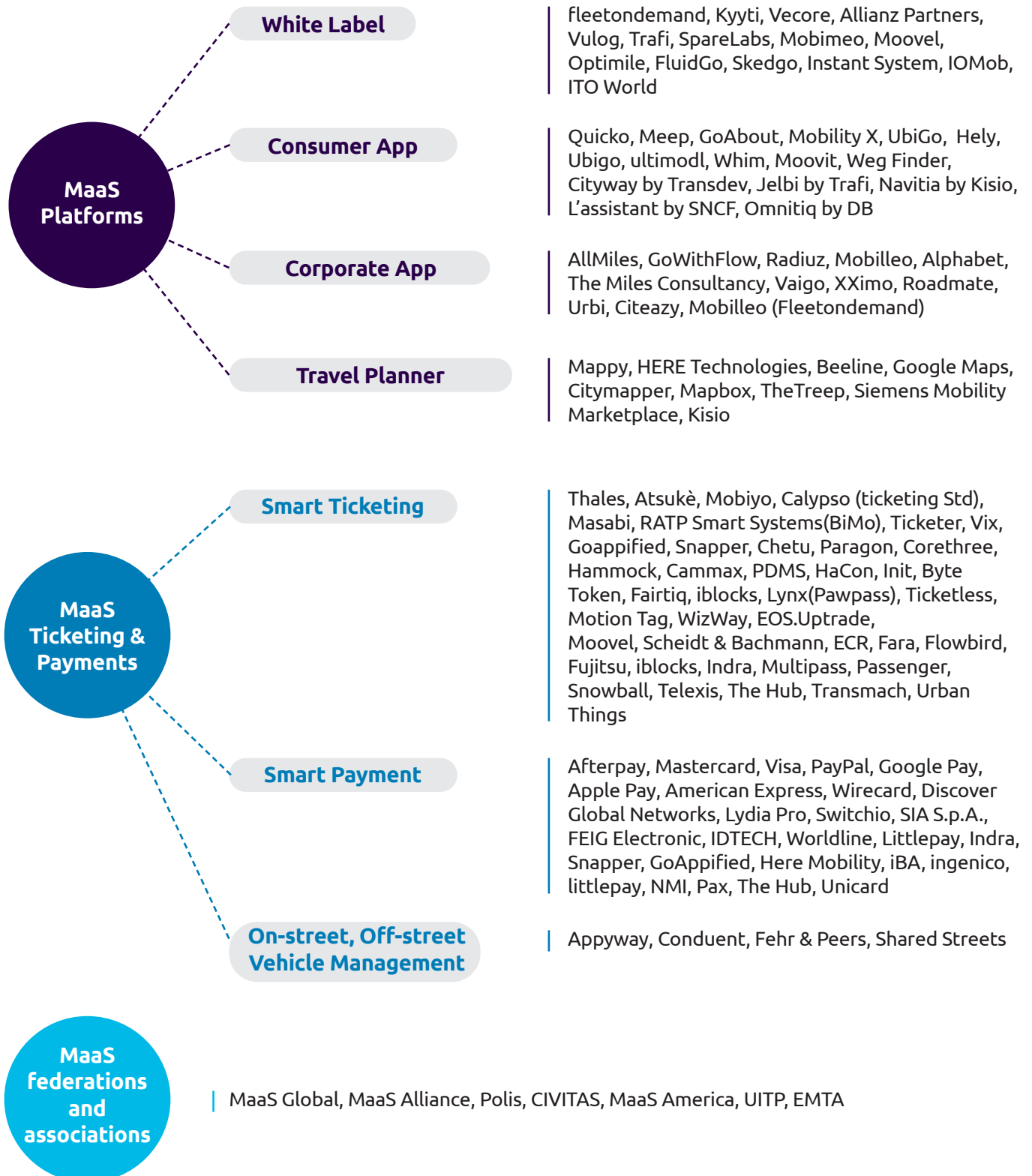
Early mobility start-ups are also learning from their first solution deployments and adapting their MaaS offers to fit a more local context:

- MaaS solution startups like Trafi, Instant System and Kyyti are proposing white label and customizable solution offers to public transit operators and public authorities looking for more affordable and easily deployable solution.
- Independent startups like Whim Global, Migo and Zipster (in Singapore) are pushing to aggregate public and private mobility providers on their consumer-facing apps to rapidly reach a critical mass.

Transport operators have also entered the MaaS race on the understanding that if they want to secure their core business (selling train tickets, cars, etc.) they have to keep this link with the end users and propose mobility as an end-to-end experience:

- Transdev has launched MaaS system Moovizy in Saint-Etienne, covering the payment process and several innovative multimodal apps in other French cities (Rennes, Mulhouse, Rouen). Transdev has also recently positioned its subsidiary Cityway as a MaaS operator;
- RATP has developed one of the first French MaaS services in Annemasse and recently, in partnership with the Ile-de-France Mobilités transport operator in Paris, its own app (MaaS) and acquired Mappy;
- Siemens mobility and HaCon have built MaaS platforms that cover journey planning, booking, and ticketing;
- Traditional automotive companies are also investing in MaaS solutions: BMW-Daimler has launched Moovel / Reach Now and Free Now;

MAP OF PLAYERS MaaS



MAP OF CITIES

Thus, the number of MaaS projects in European cities has multiplied in recent years. As of today, we have identified more than 40 cities with existing MaaS platforms or pilots. These projects are led either by the local authorities or by a private MaaS platform.



| Pays | Ville | Opérateur Maas | Année |
|-------------|---------------------------|---|---------------------------|
| Austria | Vienna | Whim Upstream / WienerLienen | 2019 2017 |
| | Graz | Upstream / WienerLienen | |
| Belgium | Antwerp | Whim | 2018 |
| Denmark | Copenhagen | HaCon / Rejseplan | 2018 |
| Finland | Helsinki | Whim | 2017 |
| France | Angers | RATP | 2019 |
| | Annemasse | RATP | 2019 |
| | Mulhouse | Cityway | 2018 |
| | Paris | RATP / Instant System | 2019 |
| | Saint-Etienne | Transdev | 2019 |
| | Région Nouvelle Aquitaine | Instant System | |
| Germany | Aschaffenburg | Moovel | 2017 |
| | Berlin | Mobimeo / BVG Trafi / BVG | 2018 2019 |
| | Karlsruhe | Moovel | 2017 |
| | Hamburg | Moovel Upstream Mobimeo / Deutsche Bahn | 2016-2019 2017 2019 |
| | Hanover | Mobimeo / Deutsche Bahn | 2019 |
| | Stuttgart | Moovel Mobimeo | 2015 2019 |
| Italy | Cagliari | Moovit + Reach Now | 2019 |
| | Catania | Moovit + Reach Now | 2019 |
| | Milan | Moovit + Reach Now | 2019 |
| | Napoli | Moovit + Reach Now | 2019 |
| | Palermo | Moovit + Reach Now | 2019 |
| | Rome | Moovit + Reach Now | 2019 |
| | Turin | Moovit + Reach Now | 2019 |
| Luxemburg | Luxemburg | HaCon / Ministry of Transports | 2019 |
| Portugal | Lisbon | Moovit / Wondo Ferrovia | 2019 |
| | Porto | Moovit / Wondo Ferrovia | 2019 |
| Spain | Barcelona | Moovit / Wondo Ferrovia | 2019 |
| | Bilbao | Moovit / Wondo Ferrovia | 2019 |
| | Madrid | Moovit / Wondo Ferrovia | 2019 |
| | Sevilla | Moovit / Wondo Ferrovia | 2019 |
| | Valencia | Moovit / Wondo Ferrovia | 2019 |
| Sweden | Gothenburg | | 2014 |
| | Stockholm | Ubigo | 2019 |
| Switzerland | Basel | Axon Vibe / Swiss CFF | |
| | Bern | Axon Vibe / Swiss CFF | |
| | Geneva | ZenGo | 2019 |
| | Lausanne | ZenGo | 2019 |
| | Zurich | Axon Vibe / Swiss CFF | |
| UK | Birmingham / West Midland | Whim | 2018 |
| | London | Citymapper | 2019 |

The Paris example: a successful experiment jointly led by the public transport operator and the Paris region

Capgemini has worked with the Paris Region Transport Authority (Ile-de-France Mobilités, IDFM) and the Paris transport operator (RATP) to create a MaaS platform at the regional level. This project, named MaaX, has been experimented with 2,000 beta testers in 2019 and 2020. Within a single mobile application, the platform gathers the mobility services offered by the region for a unique customer journey: public transport options, carpooling (Klaxit), ride hailing (Kapten, Marcel), carsharing (Communauto), self-service and free-floating bikes (Velib, Donkey Republic, Orib KY), free-floating scooters (Voi, Dott), e-scooters (Cityscoot) and parking (Zenpark).

With MaaX, commuters can :

- Search for mobility options
- Search for itineraries (single mode or intermodal)
- Book and link their personal account with carsharing solutions





Vania Ribeiro, CDO at Paris urban transport operator RATP, offers a perspective on MaaS

« This experiment proved there is a real demand for MaaS in Paris region »

In what context has RATP positioned its MaaS solution and for what purpose?

For RATP, MaaS represents a real change in its business: we are moving from transport to mobility, from product to service.

RATP is supporting local authorities in this paradigm shift. The arrival of new private players in the mobility sector is shaking up the regional mobility offer: MaaS platforms are, for example, changing the regulatory role of public players and Public Transport Authorities. We also support cities and local authorities in developing a sustainable multi-modal offer that helps to reduce the environmental footprint of citizens and self-driving vehicles, and facilitates access to shared mobility. Lastly, the new French law on Mobility (LOM) legislates on MaaS by extending the jurisdiction of the Public Transport

Authority, which now has a role to play in MaaS. It also requires the opening of static and real-time data to citizens and companies, and from next year mobility operators will have to open up their ticket sales services: **indirect distribution through new actors is being introduced in the mobility sector.**

What lessons have you learnt from MaaS?

The MaaS experiment was co-constructed, co-financed and co-branded with Ile-de-France Mobilités (IDFM) and carried out in partnership with Capgemini. This application brings together the offers of 10 mobility operators in Paris, its inner suburbs and outer suburbs. The choice of these partners was mainly motivated by their level of maturity with regards integrating a MaaS system.



Today, we are pleasantly surprised and proud to have received a satisfaction score of 7/10 from beta testers. Our analysis of the feedbacks shows the benefits of our MaaX platform for the different profiles of Ile-de-France residents:

- For young multi-modal travelers, MaaX allows them to optimize their multi-modal choices and thus to choose the right mode of transport according to price and proximity;
- For daily public transit users, MaaX allows them to better control their public transit costs and time, and helps them change their transportation habits by introducing them to new modes of transportation that are adapted to their needs;
- For skeptical public transport users, MaaX allows them to compare trips between the car and other modes, and encourages them to use alternative modes of transport to the car, such as bicycles and scooters.

The main lesson we have learned from this experiment is the importance of building and managing an integrated ecosystem: it is no longer possible to offer a mobility service on its own. So, we worked very closely with the employees of the ten private mobility operators, at all levels, and with our client IDFM on a daily basis.

MaaX has thus enabled the RATP and IDFM to prove that users really expect a MaaS experience in Paris region. Thanks to this experiment, we will be able to accelerate the industrialization of MaaX development.

MaaS FACES SEVERAL CHALLENGES TO ESCALATION

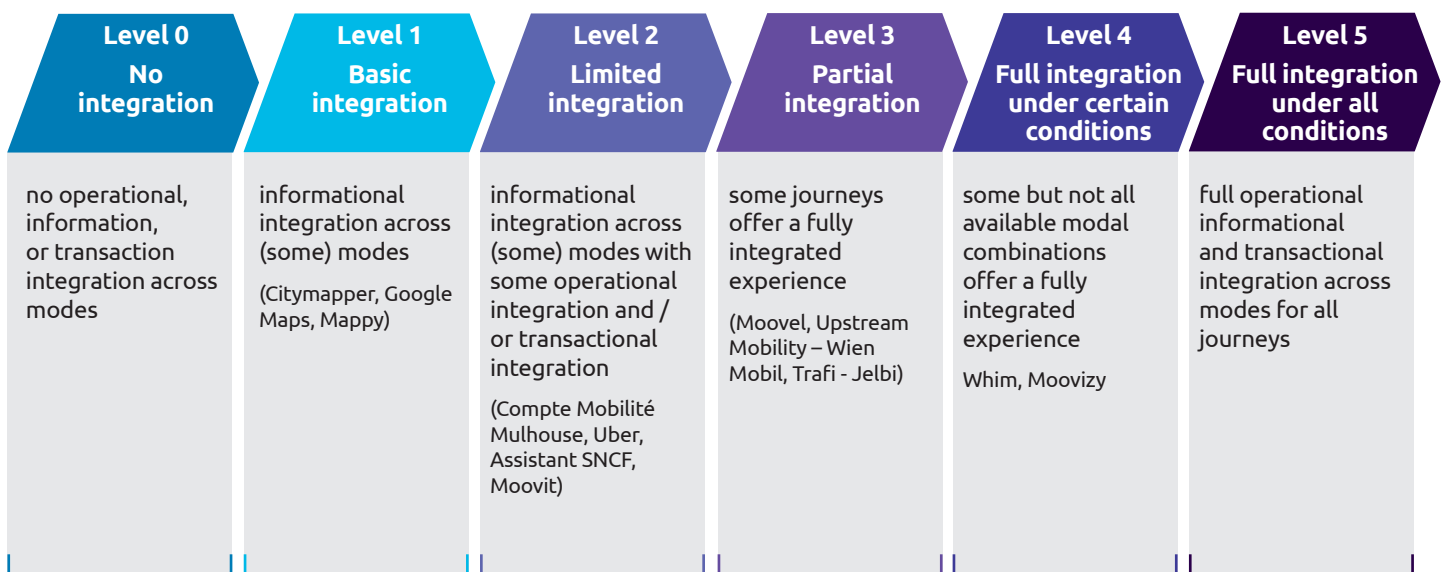
Despite the enthusiasm of cities and companies in the sector, it is clear that the various solutions launched have not yet achieved the full MaaS ambition. They are particularly facing difficulties in:

- Aggregating several mobility services
- Standardizing of data and interfaces
- Offering a real time service
- Finding a viable business model

WHERE DOES MaaS STAND TODAY IN EUROPE

Describing the current status of MaaS initiatives launched in Europe, we noted the limited level of integration of the means of transport, and the lack of opened digital systems and infrastructures.

Among the MaaS initiatives and platforms launched in Europe, one of the first observations is the heterogeneity of service levels offered by these platforms. MaaS is multi-layered, and the different levels of service and integration have been presented in a taxonomy, proposed in a paper by academics Lyons, Hammond and Mackay⁽²⁾. Inspired by the classification of vehicle autonomy levels and a study conducted by Janar Socho⁽³⁾, this taxonomy presents **five levels** of integration that increasingly support the user in their travels:



It is clear that the majority of existing models today are limited to level 2 or 3.

⁽²⁾ The important of user perspective in the evolution of MaaS, Lyons, Hammond and Mackay, 2019

⁽³⁾ A topological approach to Mobility as a Service: A proposed tool for understanding requirements and effects, and for aiding the integration of societal goals. Proc. ICoMaaS – 1st International Conference on Mobility as a Service, Sochor, J., Arby, H., Karlsson, M., Sarasini, S., 2017.

Cerema, a French research center specializing in mobility and the environment, analyzed the models implemented in Vienna, Helsinki and Hannover⁽⁴⁾. This analysis identified several key success factors or pre-requisites for MaaS to achieve high levels of integration, beyond the regulatory framework and financing:

- The availability of a diversified and high-performance mobility system, particularly in the public transportation system, with centralized information and ticketing systems to facilitate the implementation of a MaaS;
- Open data and the existence of data exchange infrastructures: the implementation of APIs facilitates the interfaces between the different stakeholders of MaaS for route calculation, reservation, etc.;
- Open ticketing systems, based on a model that does not require prior validation to allow MaaS actors to easily provide tickets;
- A good mobile network or WiFi coverage;
- Physical connections between modes of transportation to support intermodality.

Today's MaaS are 'niche markets', still in their early stages of development. Cerema concluded from its study that current MaaS address only a limited market today. This observation can be explained on the one hand by the limited level of service, with technical constraints that prevent the implementation of an almost complete level of integration, and thus fail to allow a seamless end-to-end path, entirely managed by the same application. On the other hand, a system such as Whim, which has achieved almost complete integration of different modes of transportation, offers a fare structure that may slow down some passengers (e.g. the cheapest isn't always the fastest) and exclude the least wealthy populations, which today make up a large proportion of public transportation customers.

⁽⁴⁾ Cerema, Le MaaS en Europe : enseignements des expériences d'Helsinki, Vienne et Hanovre, décembre 2019

AGGREGATING MOBILITY SERVICE OFFERS

MaaS platforms face the challenge of achieving a critical mass of transportation services and negotiating with operators who fear that their service will be disintermediated.

Intermodality is key for MaaS platforms to be able to offer the most efficient door-to-door trip. Their value lies in their ability to meet users' needs by bringing together several transportation offers on the same application covering an entire territory.

For the platforms resulting from local public initiatives, the public transportation network is a real asset and a strength compared with private MaaS operators, especially in Europe where public transportation has good regional coverage.

The next step is to successfully convince other mobility stakeholders to collaborate and create partnerships to offer a variety of transportation options: car sharing, carpooling, bicycles, electric bicycles, scooters, scooters, parking, etc. MaaS platforms represent a risk of disintermediation between transportation operators and their customers. Talking on behalf of the public players, a director of Transport for London explains: "We will always keep the customer relationship with our users because we want them to remember that it's their taxes". And on behalf of the private sector, Migo specifies on its website that Uber and Lyft do not want the platform to allow access to the prices and availability of their drivers.

However, these platforms are also a lever for these operators to gain visibility, make their service offer more accessible, and reach new users to increase their customer base. This argument is often more convincing for mobility startups.

In a survey conducted by Capgemini and Autonomy in 2019 among European mobility startups, 90% of respondents saw MaaS as an opportunity.

STANDARDIZING DATA AND INTERFACES:

By positioning themselves as intermediaries and aggregators of mobility services, MaaS platforms face the challenges of standardizing interfaces and data between different mobility operators. In order to offer the various transport services, they must interface via APIs with each operator, and these operators will potentially have different repositories and data structures from one another.

Secure, open data is a prerequisite but is not sufficient. Data formats are highly diverse and require significant development work when interfacing to be able to exploit data from different sources: this is the challenge of interoperability.

In an ideal world, we would define a common language composed of data standards and APIs on an international scale. Today, concrete initiatives are already being launched at regional scale. The best example is in Los Angeles, where the Department of Transportation has deployed the Mobility Data Specification (MDS) to manage the city's micro-mobility services. Reflections have also been launched in Europe via DG Move in order to propose a European standard and avoid having an American or Chinese standard imposed on us in the long term.

OFFERING A REAL TIME SERVICE

To provide a seamless end-to-end customer experience, the MaaS platform first has to suggest the trips that make up the journey. Then it must allocate which operator receives what portion of the fare before issuing a 'ticket' to the user that can be used across the different modes. This needs to happen in real time, which adds to the complexity.

Organizing the journey and choosing the best commuting path. Users will generally choose on price and time, but some will also take carbon footprint, safety, and other aspects into consideration. They might select specific criteria to find the best combination, and the platform may harvest their data over time to create unique user profiles, as with most streaming services. In addition, the availability or real-time schedules of the different means of transportation that may be used for the trip must be included. These real-time data raise the issue of the data format, but also that of their availability and reliability. Reliability can be particularly critical during transportation network disruptions.

Setting the right price at the right time. With an upfront fee and a low per kilometer additional fee (or none), the cheapest journey is often the one with the least modes but not necessarily the fastest. A flexible price from the mobility operators for MaaS would offer dynamic pricing that encourages multi-modal travel. One of the ways to achieve this is through a real-time auction. The app creates a journey and offers a price to the different operators that their customer is willing to pay. Pricing needs to be dynamic throughout the day to balance supply and demand.

FINDING A VIABLE BUSINESS MODEL

MaaS providers are struggling to find a viable model, especially given the underestimation of the cost of car ownership, the position of MaaS platforms as an intermediary between commuters and transport operators, and in a context where urban transport is notoriously unprofitable.

MaaS can be considered as an alternative to car ownership. As car ownership costs between 350 and 700 Euros per month, car users are a good source of revenue for private MaaS providers. They already dedicated a significant budget to transport, unlike public transport users: comparatively speaking, in the Paris region the price of a monthly public transport pass is €75,20.



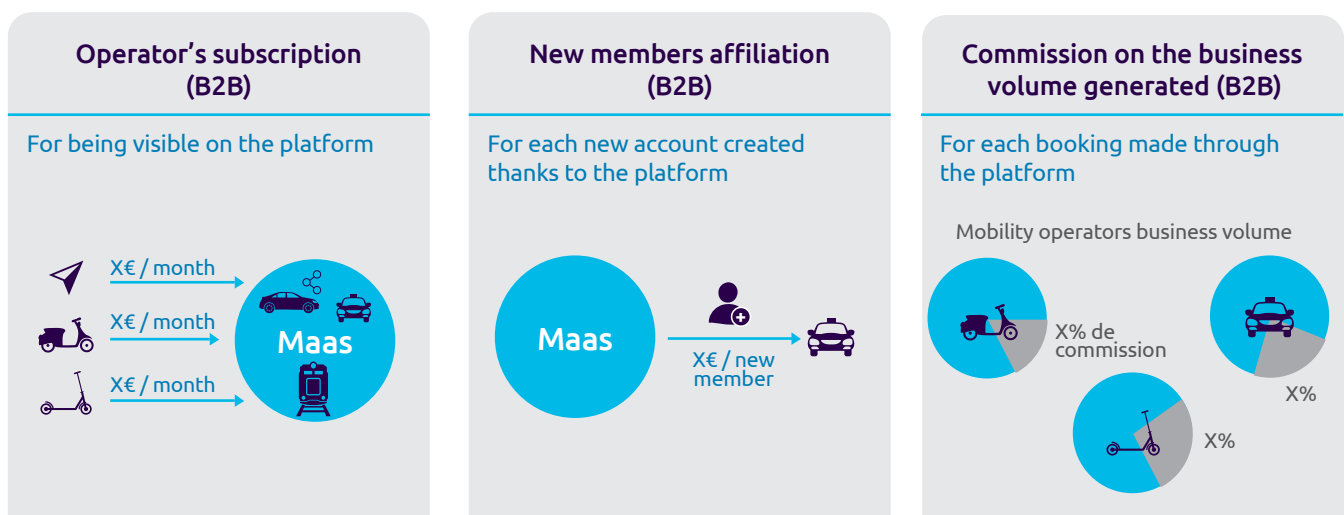
A recent study from Capgemini Research Institute on smart cities showed that, among different smart city projects in urban areas, citizens are most willing to pay for smart transportation projects, especially smart card or app-based access to public transport (68% of respondents are willing to use this kind of app, and 46% are willing to pay for it)⁽⁵⁾.

Different business models exist: the package system and the pay as you go system.

Whim Global offers a subscription service scheme and has difficulties in converting customers to the premium subscription of \$500 per month. This package is equivalent to the price of car ownership, but car owners underestimate the true costs of car ownership by as much as 50%⁽⁷⁾.

The “pay as you go” system presents two flawed economic models. Either the MaaS platform negotiates margin sharing with operators to offer an attractive price to users... to the expense of the operators’ economic balance, which is sometimes already fragile. Or the MaaS platform applies its margin directly on the general public ticket prices. However their tickets are then less attractive for users compared to direct purchase from operators.

Alternative models can be based on the business value that a MaaS platform brings to mobility operators, as a business provider. The MaaS platform could then be remunerated through a subscription offered to operators, or through a commission on new customers, or even through a commission on the volume of business generated.



⁽⁵⁾ <https://www.capgemini.com/research/street-smart/>

⁽⁶⁾ Cars4Publicity, 2012, <https://www.lecho.be/monargent/auto/roulez-moins-cher-grace-au-sponsoring/9196389.html>

In London, Citymapper launched a MaaS platform that includes Transport for London (TfL) tickets to bus and underground. TfL was not willing to discount its tickets and preferred to retain the relationship with its customers, so Citymapper has to buy them at retail and sell them at a discounted price.





Olivier Vacheret, Chief of the Information and Digital Services at the Paris Region Transport Authority (Ile-de-France Mobilités - IDFM)

What opportunities does MaaS represent for local authorities?

According to IDFM, MaaS represent three main issues:

- 1 - **Improving passenger service** in a seamless, fully multi-modal experience
- 2 - **Improving the knowledge** and thus the ability of a public transport authority to make decisions on mobility policy. Indeed, being the contracting authority for a MaaS, or being part of a consortium at the head of a MaaS, gives the public transport authority the capacity, through the data collected and services delivered, to better manage mobility policies.
- 3 - **The innovation dimension:** the ecosystem is constantly looking for balance (financial, business model, new models of mobility or immobility within the framework of COVID-19). These innovations will fuel the development of services, as well as the acquisition of knowledge and use of data and services to extract the best information from them, which will enable services to be redirected.

This triptych is entirely inter-twinned with a MaaS strategy for a transit authority.

What are the main challenges MaaS faces?

The first obstacles lie on the technical or technological side: MaaS involves a high degree of complexity in integrating different mobility services and mobilizing a number of technologies. Questions relating to information storage are a good example of this. Users' demand for data in real time will massively increase flow and storage requirements. Our need for continuous improvement will also require historical data creating needs for competencies in big data. We would like to integrate learning algorithms and artificial intelligence, and we are going to move towards complex interconnected systems. In this context, the main challenge for a transit authority such as IDFM is to adopt a digital way of delivery, combined with the ability to imagine and produce innovative services.



Public transportation authorities also face governance issues: governance of mobility is particularly segmented in the Paris region, with one public transportation authority (IDFM), and with competencies spread across the entire range of mobility capacities (parking, traffic, road management). MaaS require a partnership approach and the ability to bring together a large number of mobility operators into a common ecosystem. This is why we publish our MaaS Guide. This guide defines the vision, positioning and potential relationships between various public / private partners towards a same goal: meet the objectives of public mobility policies.

Besides, MaaS are also a collection of services that will need to be operated at a consistent level of services for travelers. This consistency requires to set-up an operational governance to secure the right balance between the different services.

What is your opinion on the different models of MaaS that are appearing?

I have a feeling that there will be dedicated or thematic MaaS. Some will focus on specific means of transportation. Others are being created in regions that want to respond to local challenges of micro-mobility or to improve the accessibility to remote areas. Some approaches, pushed by the major digital players, are much more global in scope. All these players have potentially different positions, but with a tendency to converge towards a very global MaaS.

The set-up of competitive MaaS challenges the efficiency of each individual MaaS.

In this landscape of differentiated MaaS, Ile-de-France Mobilités sets-up a recognized public MaaS and could ease the development of thematic MaaS. We could give them access to certain resources or technological bricks they would leverage. This positioning will enable Ile-de-France Mobilité to promote best practices on sustainable mobility. We could also collect more data and thus acquire a better understanding of mobility in our region to define mobility policies.

WHAT MODEL(S) OF MaaS WILL SUCCEED IN EUROPE IN THE FUTURE?

Notwithstanding the difficulties outlined in this paper, we are convinced MaaS has a bright future ahead. The question we need to answer is «what model of MaaS will overcome these obstacles in order to become viable?». Taking into account the diversity of MaaS actors, we foresee several possible models.

SCENARIO 1 : THE WINNER TAKES IT ALL

GAFA (Google, Apple, Facebook and Amazon) are one step ahead of the data management needed for MaaS, but face growing mistrust from Europeans. The challenge is to succeed in creating a digital champion in Europe to ensure the region's digital sovereignty.

In a system such as MaaS, where the value lies in the ability to reach a critical mass of data (itineraries, mobility services, schedules, availability of transport modes in real time, prices, etc.), the 'winner takes it all' model would certainly favor players who already collect and use data on a large scale. In this race, it is the American and Asian digital giants, such as Google, Apple, Airbnb, Uber, Tencent (WeChat) or Yandex, who could become quasi-monopolistic MaaS leaders in Europe, as in the sectors where they already operate. Indeed, Google and Uber have daily users, mobility data and the investment capacity and financial means to maintain a MaaS platform by defining a business model that may be loss-making but viable for them at their scale.

However, this scenario has several limitations:

- On the one hand, cities find themselves deprived of their leverage to orchestrate mobility within their territory to meet the needs of users, while preserving the city's attractiveness and livability. But, as in the case of the development of Airbnb, MaaS regulations may appear locally or nationally retrospectively, to frame and regulate their activities in order to preserve the general interest.
- On the other hand, the European Union is seeking to further limit access and use of its citizens' private data to non-European companies. The GDPR has put in place stricter regulations, and the questioning of the Privacy Shield this summer is imposing new constraints on the development of American and Asian digital giants in Europe.

The MaaS is an opportunity for a European champion to emerge and compete with the American and Asian giants. But who would be the candidates? Access to financing is a discriminating factor for European companies and startups, which are currently struggling to reach a critical size to compete with the big global platforms.

⁽⁷⁾ <https://www.sdworx.com/en/press/2018/2018-09-20-more-than-20percent-of-europeans-commute-at-least-90-minutes-daily>

SCENARIO 2 : COMPANIES AS MaaS PROMOTERS

Europeans expect their employers to play an increasing part in the environmental transition. This could therefore be the best solution to finance the MaaS in a sustainable way.

Daily travel is mainly used for commuting to and from work, or for business trips: in 2018, European workers spent 1 hour and 24 minutes a day commuting⁽⁷⁾; for French people, business trips represented 39% of their weekly time. Companies often contribute to their employees' transportation costs as part of the regulatory framework, and this can sometimes be considered a competitive advantage, part of the 'package' to attract talent, for example with company cars. More and more European countries are asking employers to actively contribute to reducing their carbon footprint, which can result in the implementation of mobility plans with financial incentives.

Companies are therefore positioning themselves as drivers of changes in mobility behavior. Several MaaS players have understood this, such as SkipR in Belgium and Search.cab in France⁽⁸⁾. They have chosen a B2B model, directly addressing employers to offer MaaS platforms to their employees, accompanied by payment cards, in order to pay for journeys directly without advancing the costs. MaaS will eventually be able to replace company vehicles and facilitate the management of business trips if it can offer a cost lower than the total cost of mobility borne by companies today: leasing, cabs, parking lots, etc.

Nevertheless, this scenario still does not give territories control over the algorithms for proposing transport alternatives and thus over their mobility policies.

SCENARIO 3 : LOCAL AUTHORITIES AS LEADERS OF MaaS SYSTEMS

Beyond proposing the best route for a user, MaaS is a powerful public policy tool to ensure general interest in the use of urban transportation. Local authorities are best placed to implement a MaaS, provided that their investments can be mutualized for greater efficiency.

As we said earlier, MaaS is a great opportunity for local authorities that want to reduce the use of private cars and the incumbent issues in their cities (congestion, pollution...). However, MaaS can also be a very powerful tool for public policy.

MaaS platforms are able to gather a huge amount of data from mobility services, such as collecting all the itineraries of the journeys realized through the app. Hence, MaaS can become a powerful lever in the management of urban policy. Local authorities already have some data on public transport, but this is not always exploitable and often only partial regarding the different means of transport, especially in metropolitan areas. The analysis of this data provides valuable and much more detailed information on users' habits: routes, modes of transport used, use of space, etc.

⁽⁸⁾ French national study on mobility, 2020: <https://www.actu-environnement.com/media/pdf/news-35081-Enquete-mobilite-francais-forum-vie-mobiles-2020.pdf>

Furthermore, MaaS can become both a decision-making tool for local authorities and a mobility 'control tower', a tool for implementing the city's mobility policy. For example, route recommendations can be adjusted according to the needs of the city, to avoid temporary work zones, to pedestrianize some areas, to strengthen the transport offer in certain territories, etc. At a time when cities are worried about the arrival of MaaS systems managed by private entities whose interests often diverge from their own, the future of MaaS, the smart MaaS, will give local authorities greater control of their territory. Smart MaaS will enable them to develop and propose mobility offers consistent with their own interests and in an intelligent way according to the needs of the city at a given time. The aim should be to ensure optimized local transport models that reconcile supply and demand for mobility.

However, in this scenario, the risk lies in the inefficiency of local authorities' investment. European cities are independently launching different MaaS initiatives, partnering with different MaaS platform operators. These solutions will be designed specifically for them but will also multiply the investments and therefore limit their efficiency.

In contrast, a co-investment between different cities and even private players could maximize the gains and the ability to develop an integrated MaaS system and even create the basis of common standards.

SCENARIO 4 : A FUTURE MADE OF DIFFERENT TYPES OF MaaS

More likely, we anticipate that different MaaS models will coexist, whether it is the consumer application, or 'niche' formats, enterprise applications, private or public models. Thus, they will meet the multiple needs of users. However, for this future to become a reality, platform interoperability (between platforms and with mobility operators), and data standardization are key.

We are convinced that cities and territories have a major role to play in creating the conditions for the sustainable and financially efficient coexistence of several models. Indeed, this scenario is based on their ability as public transport authorities, to provide access to public transit data to the entire ecosystem. As a first step, cities and regions must equip themselves with tools for managing mobility in their territory. They must also take the lead in the development of standards for private data, as in Los Angeles, by specifying them in their public procurement contracts. Finally, they should provide private MaaS operators with a MaaS back end, to which all MaaS platform operators can connect, and offer their services based on shared and mutualized data.

The city of Antwerp has already taken this position: in their MaaS development scenario the city chose not to choose a dedicated MaaS operator. It wants to allow different solutions to coexist while guaranteeing the public interest and promoting these solutions throughout the territory, among citizens and businesses.



CONCLUSION

MaaS is considered the Holy Grail of urban mobility. It brings benefit both for passengers who enjoy an optimized trip and a seamless experience, and for local authorities who reduce car use and optimize transportation in their area. Transportation operators too can enhance their mobility offer and access a broader passenger market.

However, given the current state of play in the development of MaaS platforms in Europe, we can see that MaaS is still at an early stage of its evolution. Several challenges have yet to be met: standardizing interfaces with mobility operators, defining a viable business model, implementing a high-performance operating model, etc.

It is becoming increasingly evident that established PTAs and PTOs want to control MaaS in their cities to achieve societal objectives like reduced traffic and pollution and ensure that their public transport infrastructure provides the backbone of the service. In addition cities are increasingly wanting to reduce their carbon footprint and MaaS will become a powerful tool to achieving this. For example in Berlin, Mobimeo, warns motorists driving into the city, the expected time delay in finding a parking slot and offers them a route to an alternative park and ride solution. PTA's understandably want to keep the relationship with their users and will not give that power over to large tech companies that can monetize the data. We do not see this necessarily as a hindrance or obstacle to MaaS adoption in Europe. PTAs have the structures to award contracts to software companies and convince private mobility operators to enter their platform as they are the licensing authority and therefore are in a much more powerful position than private players

We strongly believe in scenarios in which public authorities play a role both as an orchestrator of consumer and B2B MaaS in their territories and as a facilitator for their implementation. This would see them participating in investments to create the conditions for the deployment and expansion of MaaS (open data, provision of APIs, centralized information systems, open ticketing systems, etc.). The challenge is then for them to coordinate at the national and international level to make their investments more efficient and accelerate the achievement of the highest levels of MaaS integration.

CONTACTS

AUTHORS



Mehdi Essaidi
Vice-Président Smart Mobility
Capgemini Invent



Claire Duthu
Managing Consultant Smart Mobility
Capgemini Invent



Sebastian Tschödrich
Vice President Automotive
brand & Experience
Capgemini Invent



Ross Douglas
Président fondateur
Autonomy



Guillaume Cordonnier
Deputy Head of Services
Capgemini Invent

CONTRIBUTORS



Marc Cäsar
Director Automotive Digital,
head of Smart Mobility Connect
Capgemini Invent



Franck Dansaert
Vice Président Automotive
Capgemini Invent



Solenne Cucchi
Directrice Smart Mobility
Capgemini Invent



Daniel Garschagen
Head of Applied Innovation Exchange
Munich
Capgemini Invent



Jérôme Coignard
Vice Président Digital Transformation
Capgemini Invent

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