



ADVANCING
PUBLIC
TRANSPORT



▶ REPORT

MOBILITY AS A SERVICE

APRIL | 2019

International Association of Public Transport (UITP)
Rue Sainte-Marie, 6 | B-1080 Brussels | Belgium

Tel: +32 2 673 61 00
info@uitp.org
www.uitp.org

© UITP – International Association of Public Transport, 2019

All rights reserved / No part of this publication may be reproduced or transmitted in any form or by any means without the written permission of the International Association of Public Transport

TABLE OF CONTENT

— 2 —

What is MaaS?

— 4 —

MaaS Eco-system

— 5 —

Objectives

— 7 —

Traveller needs

— 9 —

Business partners:

What do transport operators expect from MaaS?

— 11 —

The MaaS Provider or the Integrator

— 17 —

Multiple MaaS models with
different actors as integrators

— 20 —

Institutional landscape and a regulatory framework to
promote MaaS and sustainable mobility

— 22 —

Outlook

— 24 —

Acknowledgements

INTRODUCTION

This report intends to provide the reader with an overview on the topic of Mobility as a Service by explaining what it is, how it works and who are the different stakeholders involved and their roles and expectations. It aims to show the complexity of setting up such an integrated mobility platform and key points that need to be addressed. This report has been prepared by the MaaS Working Group which is part of the UITP Combined Mobility Committee. For presentations and examples of MaaS initiatives, visit the UITP Combined Mobility Toolbox.

For feedback and questions please get in touch with Caroline Cerfontaine (caroline.cerfontaine@uitp.org)

WHAT IS MOBILITY AS A SERVICE?

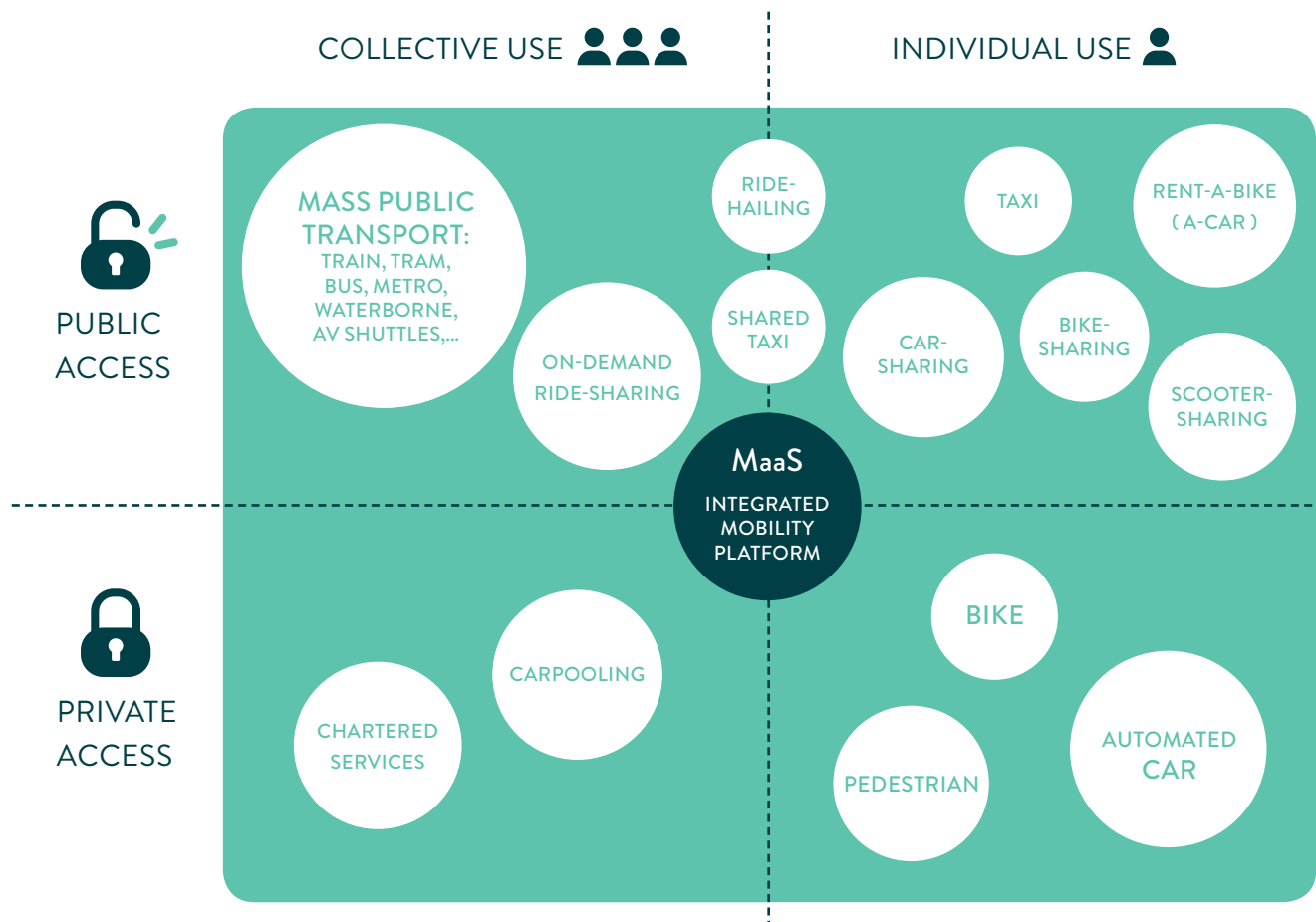
The urban mobility landscape is evolving fast and new solutions are being offered to citizens all over the world. The number of mobility services is growing rapidly, yet for the user it can be challenging being confronted by all these options when choosing the best way to travel.

This is where the Mobility as a Service (MaaS) concept steps in: MaaS is about taking away the hassle of finding the most suitable mobility option. At UITP we define it as follows:

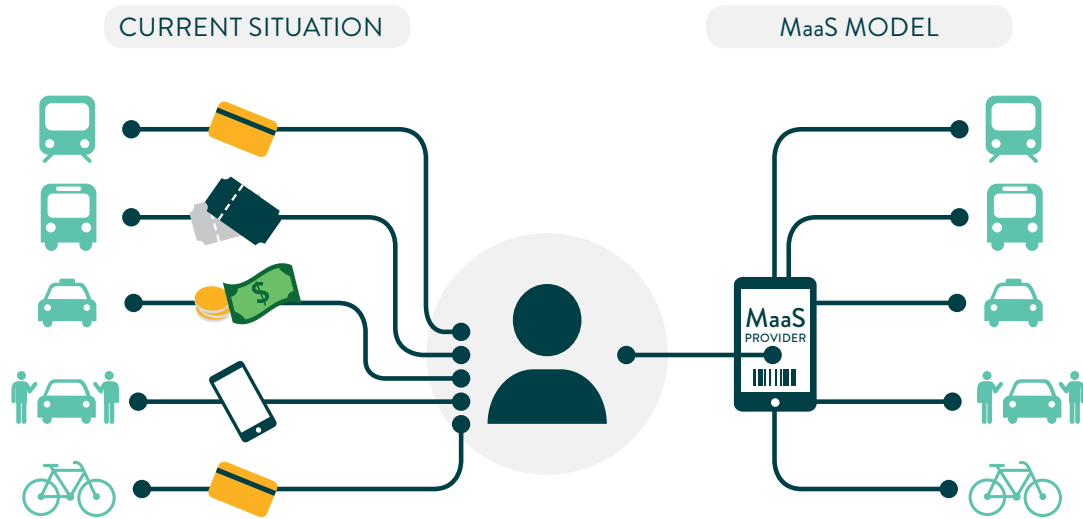


Mobility as a Service (MaaS) is the integration of, and access to, different transport services (such as public transport, ride-sharing, car-sharing, bike-sharing, scooter-sharing, taxi, car rental, ride-hailing and so on) in one single digital mobility offer, **with active mobility** and an **efficient public transport** system as its basis. This tailor-made service suggests the most suitable solutions based on the user's travel needs. MaaS is available anytime and offers integrated planning, booking and payment, as well as en route information to provide easy mobility and enable life without having to own a car.

Urban mobility services



Urban trips



source: Kamargianni & Malys, 2016

From a city authority's point of view, MaaS provides citizens with easier access to more mobility options and it optimally reduces the volume of car traffic, if there is also a coordinated approach towards all mobility services from a street design and urban space-allocation perspective. Furthermore, it will give a larger number of citizens the opportunity to fulfil their mobility needs without having to own a car. The notion behind MaaS is that citizens will not give up private automobiles as their preferred mode of transportation unless and until we give them a service that provides the benefits of convenience, reliability, and low costs, whilst weaving together mobility service operators into one seamless service¹. Part of the challenge is that setting up such an innovative integrated mobility platform means moving outside the exclusive control of traditional company boundaries. **MaaS requires a business ecosystem where multiple organisations act in collaboration**, mixing the traditional boundaries of business sectors and companies, and involving users in the co-creation².

DIVERSITY OF MAAS PLATFORMS

The coexistence of MaaS platforms of different geographic footprints is likely to become a reality. Although many MaaS initiatives are currently being built at a local level, the 'market reality' is evolving with the emergence of national and even global MaaS platforms (or multi-local but on a global level). MinRejseplan in Denmark and the Mobility Inside initiative in Germany are examples of national MaaS Platforms. Google Maps or Free2Move are global examples of integrated services. These global/multi-local players will mostly address non-frequent customers, but they should not be underestimated because they still represent a huge market segment.

Moreover, as MaaS appeals to a broad audience, from working people to persons with reduced mobility or elderly and young persons, there will probably be different MaaS offers addressing these different customer segments.

MINREJSEPLAN: DOOR-TO-DOOR ROUTING ALL OVER DENMARK

As Denmark's national trip planner, Rejseplanen's goal is to secure seamless transportation all over the country, both in metropolitan and rural areas. In summer 2018, the new multimodal MaaS app MinRejseplan was launched with the help of software specialist HaCon, a Siemens company. In addition to their regular public transport services, MinRejseplan integrates shared mobility services, demand-responsive transport, road traffic information, as well as bike, ferry and pedestrian routing. Instead of filters sorting search results according to modes of transport, the intelligent algorithm enables users to filter according to times, prices or the fastest connections. All integrated transport means can also be booked via the app.



¹ Dr. Maria Kamargianni, Lecturer in Transport and Energy, Head of MaaS Lab Energy Institute, University College London
² Heikkilä et al., 2012; Lettles et al. 2006; TSC, 2015

THE MAAS BUSINESS ECOSYSTEM³



THE MAAS PROVIDER



The MaaS provider or the integrator forms the framework enabling transport companies to thrive and citizens to enjoy easy mobility. This role could be taken by different actors such as the public transport authority, any transport operator, a trailblazer MaaS company or companies from the banking, telecommunications or other sectors.

THE CORE BUSINESS



The core business is formed by multiple transport operators, who trade their capacity to MaaS operators and provide access to their data and application programming interface (API's). There are also other data providers, who offer data and analytics capabilities, and the customer can be individuals and companies. As providers of the core data needed to build MaaS, the trans-

port operators should have special rights, as addressed in the section dedicated to the role of the integrator and data exchange.



THE EXTENDED ENTERPRISE

The extended enterprise is populated by technology-specific actors, offering support to the MaaS provider and backend providers who provide on-demand cloud computing services. Internet connectivity is also critical to any MaaS provider.



THE BUSINESS ECOSYSTEM

The business ecosystem is the space in which regulators and policy-makers set the market rules and investors support businesses. Research on the impact of MaaS is undertaken by universities and other firms support the market.

³ This section is inspired by UCL's work : The Business Ecosystem of Mobility-as-a-Service

OBJECTIVES : WHY IS MAAS INTERESTING

We know from studies (for example, about the impact of car-sharing) that car ownership shapes mobility habits⁴. A car parked in front of one's door will influence mobility habits and choices in its favour because it is easily accessible and the cost of owning a car is not transparent. Indeed, fixed costs are already paid and year-long excellent marketing techniques ensure people are also emotionally linked to their cars.

Car ownership is the greatest obstacle for a flexible, context-oriented choice between modes. This means the conversion of car owners is the key to change mobility behaviour.

MAAS CHANGES MOBILITY HABITS: RESULTS FROM THE UBIGO PILOT IN GOTHENBURG

The 2014 Ubigo pilot in Gothenburg involved 70 paying households under real conditions for 6 months. The arrangement was that each household paid their transport costs upfront, while earning a bonus for making sustainable choices. Researchers at Chalmers University have published many papers based on the very thorough evaluation. The results clearly show that there has been a shift to more sustainable transport modes, as private car use has reduced by 50% :

MODE	“BEFORE” TRAVEL DIARY FROM UBIGO PARTICIPANTS, N=40	“DURING” TRAVEL DIARY FROM UBIGO PARTICIPANTS, N=36
Walk/run	25%	-5%
Bicycle	10%	+35%
Private Car	25%	-50%
Carsharing	2%	+200%
Tram	15%	+5%
Bus (local)	15%	+35%
Bus (express)	3%	+100%
Train	2%	+20%

⁴ Evaluation Car-Sharing, Bundesamt für Energie BFE, 3003 Bern, Switzerland, September 2006

KEY PURPOSE AND TARGET GROUPS OF MAAS

From a city authority perspective, the main objective is to change citizens' travel behaviour towards more sustainable modes, offer better service and affordable mobility to reduce car ownership through a mobility solution, while offering the same flexibility and convenience as a car for all citizens.

From the user perspective, they are looking for reliable and accessible urban mobility from door to door, enjoying total freedom of mobility without having to pay for, maintain and park a car. Once people realise the improved service through MaaS they will reconsider car ownership and be more inclined to change their mobility habits towards more sustainable modes.

From a transport operator perspective, MaaS is therefore also about offering its travellers a better service with a wider range of options that will attract more customers. It is clear that any business actor in the MaaS ecosystem will pursue the goal to grow his business.

The two main target groups for MaaS are:

➤ CAR OWNERS



Private households and companies. The biggest impact of MaaS would be achieving a shift from car ownership to shared sustainable mobility. Travellers could save a lot of money, the MaaS provider would acquire a profitable client group and the transport operators would win additional clients and profit.

➤ MULTI-MODAL TRAVELLERS



Current users of public transport and shared mobility services, who are looking for simplicity and improving their mobility experience through better services. For the transport operators, MaaS is a tool to improve customer loyalty and provide better value for money.

However, more research is needed on other target groups and motives for car ownership and car affinity in order to understand how to market MaaS solutions. It will need many diverse MaaS pilots to know what is attractive to car owners and businesses as a substitute to cars.

The key promises towards the users are to regain time, a guarantee of getting from A to B and more convenience at the best price.



MOBILITY AS A SERVICE A TOOL FOR MORE SUSTAINABLE JOURNEYS IN MANCHESTER

In 2018, Transport for Greater Manchester (TfGM) and Atkins/SNC-Lavalin tested the hypothesis that MaaS could shift commuters out of their cars, either onto public transport or towards active travel options such as walking and cycling to work. This work took a very customer-centric and human-centred approach from the outset.

39 participants from across the city, and all working in Salford, took part in the live trial. Immersive research captured rich data from the participants, including in-depth interviews and ride-alongs with passengers, which provided insights into the key day-to-day issues affecting commuters. Sev-

en modes of travel were offered in the personalised journey plans: buses, trams, carshare, taxi, bike share, on-demand shared mini-bus and walking.

Extensive analysis showed that MaaS could be a significant tool in achieving TfGM's objectives, as 26% of participants were more willing to use public transport, and 21% were more willing to cycle and walk. This indicates that MaaS has the potential to create

more sustainable travel behaviours (active travel modes and ride-sharing), which can help address the challenges local authorities face in urban areas. Six months following the trial, 82% of participants interviewed wanted MaaS back. One third of car owners wanted to give up their vehicle

following the research, and the majority of participants were willing to pay an increase in their monthly travel expenses for MaaS.

MaaS has the potential to create more sustainable travel behaviours.

TRAVELLER NEEDS

The notion of 'traveller' or 'commuter' should replace the notion of 'customer' when planning for MaaS. This is because it puts the planner in the user-perspective, confronted by a variety of mobility options offered by different transport providers.

KEY EXPECTATIONS OF A TRAVELLER FOR AN INTEGRATED MOBILITY SERVICE



TRUSTWORTHINESS



SIMPLICITY &
LOW-THRESHOLD ACCESSIBILITY



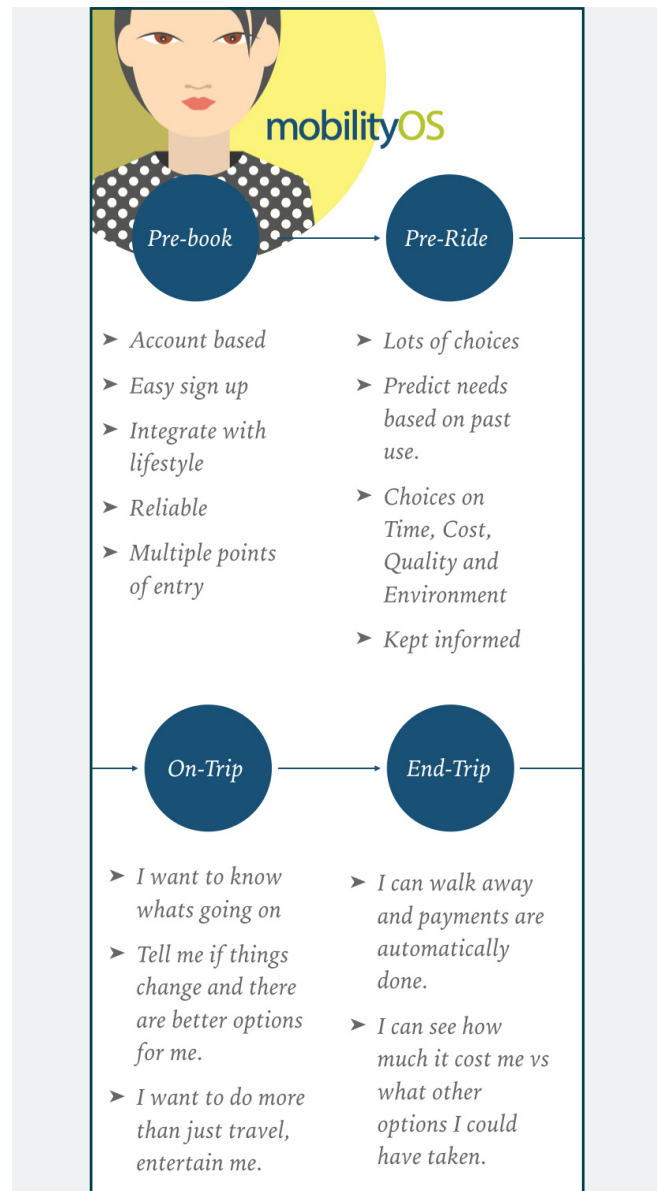
IMPARTIALITY



FLEXIBILITY &
PERSONALISATION

In order to trust a service it should guarantee a high level of quality, offer correct real time information, have a strong reputation/brand and offer reliable transport services. It should also be simple, with an easy, user-friendly and convenient service. This includes offering a single sign-on access with integrated information before, during and after the trip and helping the traveller in the decision-making process by reducing the cognitive load. Impartiality is another requirement as MaaS should be non-discriminatory and present all available mobility options in a transparent way. Flexibility is important, as the service must be able to adapt to changing traveller's needs and it should be personalised in order to take into account personal preferences.

The New Zealand Transport Agency has identified the following traveller needs showing the work needed to reduce the cognitive load as much as possible in accordance with personal preferences:



©NZTA_Mobility OS_hi

THE RIGHT MIX: MIX OF PUBLIC AND PRIVATE SERVICES



To set up a MaaS solution, a good public transport system as well as adequate walking and cycling conditions and combined mobility services need to be available. This introduces the question of which key services, whether public or private, a MaaS solution should offer in order of propose a convincing alternative to car ownership.

There is general agreement that public transport is the backbone product of any MaaS offer. Indeed, high quality public transport is the only alternative able to fulfil the majority of trips by using a minimum of space and without public transport, other sustainable and innovative mobility services cannot offer an affordable alternative to car ownership. Thus, when there's a well-developed public transport network, public transport providers have a very strong position in setting up their own MaaS solutions and being a 'must-have' in other MaaS solutions from other providers.

Car-based services such as car-sharing, ride-sharing, TNC's (transportation network companies or ride sourcing), taxis and car rental are considered core products to attract car owners and offer a complete mobility solution. Several studies have shown that roundtrip car-sharing has excellent results in helping citizens to live car-free. For example, in Bremen (Germany) 80% of car-sharing clients do not own a car⁵. Especially for young people, bike-sharing and other forms of two-wheeler-sharing like e-scooters, are very popular as well as peer-to-peer services.

More research and experiments are necessary to better understand which transport options are needed to replace car ownership.

Other services such a Wi-Fi in public transport, delivery services, physical integration and information about active modes, scooters, parking or park and ride all add to the convenience of the service.

THE RETAIL MODEL: MARKETING THE SOLUTION

When it comes to whether the MaaS offer should be a package tailored to special needs, like a telecom contract, or a pay-as-you-go offer like in a supermarket, it seems there could be a need for both options.



A **package** can offer special conditions, discounts and new pricing models which can enhance attractiveness for the customer and propose new business models for the provider. But monthly

fees or long-term subscriptions for these packages are also barriers to the customer – especially those who are not experienced in the use of new mobility services. Flat-Rate-Style packages seem to be very difficult, both for the provider and the customer, as they will require a high basic fee.



Thus, for the moment, a **pay-as-you-go offer** or small (low priced) bundles seem to be better received from a customer-perspective. It is also important to reduce the entrance barrier for customers, and could be used to learn and

move to valid packages at a later stage. Again, more research and feedback experience in this area is needed.

In Helsinki, the company MaaS Global launched its service under the brand Whim in 2017, and offers both pay-as-you-go solutions and packages. The large majority of clients so far adopted the Whim To Go and Whim Urban offers.

Whim to go	Whim Urban	Whim Unlimited
<p>HSL single tickets, taxis and citybikes always on your phone</p>	<p>Unlimited HSL single tickets Regional tickets +50€/month Regional 3 tickets +100/month 10 € taxis (within 5 km radius) Rental cars from 49 € / day Unlimited use of citybikes (30min. at a time)</p>	<p>Unlimited HSL single tickets Regional tickets +50€/month Regional 3 tickets +100/month Unlimited taxi rides (within 5 km radius) Unlimited use of rental cars Unlimited use of citybikes</p>
Pay as you go	From 49€/month	From 499€/month

whim

©MaaS Global

⁵ Final report: Analysis of the impacts of car-sharing in Bremen, Germany, team red, 2018.

Broker and service provider model

A natural step to a more mature MaaS-scheme would be a change from reselling existing services towards repackaging and repricing.

Indeed, in a broker model the MaaS provider resells existing mobility services. The client remains the client of the transport operator of the bought mobility service. In a service provider model, the MaaS provider buys the mobility services from the different transport operators and resells them at his own conditions, meaning by repackaging and repricing the services. In this model, the MaaS provider would take over the client relations including responsibility. From a legal point of view, issues could arise around the pricing of, for example, public transport services, whose fares are often fixed by law and certain conditions and discounts need to be respected.

BUSINESS PARTNERS: WHAT DO TRANSPORT OPERATORS EXPECT FROM MAAS?

MaaS is about building a strong partnership with different transport operators who are the business partners and the public authorities in charge of strategic mobility planning. In order to trust a MaaS provider and join their integrated mobility platform, the business partners expect neutrality, independence, fairness, an innovative strong brand with a positive image, and an integrator⁶ that is stable enough to stay for a long time. Indeed, all business partners should be treated as equals and the approach of the MaaS provider should be non-discriminatory. The access conditions to join the MaaS platform should be fair and the information on the different transport services is presented neutrally. In addition to the trust necessary to build the partnership, the solution must be very user-friendly in order to be highly attractive to the traveller. Different business partners offering different transport services with different business models means different expectations.

As MaaS relies on the strength of the partnership built by these partners, it is essential to understand and respond to each other's need.

Depending on the local context and the existing mobility system, expectations may vary. Here is an overview of general expectations public transport operators, car-sharing providers and bike-sharing providers would have towards a MaaS operator in order to be integrated in its MaaS solution:

PUBLIC TRANSPORT OPERATORS (PTO)



➤ Customer relationship:

- Gaining new clients through the MaaS operator
- Maintaining the customer relationship

➤ Business Model:

- Fair share of revenue

➤ Data:

- Shared accounts, data sharing
- Reciprocity and data deals
- Operational/usage data open for everyone
- Transparency on the whole trip demand

➤ Responsibilities:

- Liability for the whole journey
- Customer focus and service

➤ Co-Branding, visibility for the PT brand

⁶ To know more about the MaaS provider and Integrator, refer to Chapter 6.

CAR-SHARING PROVIDERS (CS)



➤ Benefits expected:

- Gaining new customers - gaining new turnover and profit via the MaaS offer.
- CS expects the MaaS provider to understand CS is a low margin business and they do not wish to give away their bargaining power. Getting a commission from the MaaS provider or a contribution of their profit is desired.

➤ Data:

- Some data is needed to run the operation, for community-building and to provide customer-service during the trip. CS needs users' private data and the usage data to plan CS-offers in a demand-oriented way.
- Protection of vehicle availability data against competing operators inside and outside the MaaS platform to protect business secrets (planning of availability, fleet size, expansion etc.)

➤ Other demands:

- Guarantee of a flexible contract – CS wishes to keep control over prices, rules and regulations, expansion, fleet management etc. This also means there is a possibility to change the offer when needed and there is no obligation to keep to the outline of the initial CS-offer.
- The MaaS provider should promise not to compete with CS operators in the future and will not give collected and generated data to competing mobility operators outside the platform without permission

BIKE-SHARING PROVIDERS (BS)



➤ Benefits expected back to BS:

- Data for operational procedures: user identifier, personal data, payment data depending on who will take liability for billing and dunning.
- Access to a bigger market – gaining more clients.
- Market rate price for their service (since margins are already small).

➤ Where BS would like to have influence:

- Mode choice /mode hierarchy.
- How BS is presented/marketed.

➤ Other demands:

- User clearing done by the MaaS user.
- Inclusion of bike lanes/safe bicycle routes in the route planner.
- MaaS providers should show the benefits of public health and sustainability of cycling by displaying the positive effects of calories burnt and CO2 saved to offer better personalised choices.
- Customer processes are ideally managed through the operator's customer service.
- Respecting the tariff autonomy of the operator unless the service is a publically procured system where the tariff system is contractually fixed.
- The MaaS provider should ensure to only accept those BS operators who can ensure certain industry-standard quality levels.
- MaaS aggregators need to respect the system-inherent impossibility for 100% availability of bikes at all stations at all time.

As outlined, we can see that transport operators would like to gain more customers through entering a MaaS solution, maintain the customer relationship, meaning they would like to have access to the customer data and the usage data in order to plan their offer in a demand-oriented way.

THE MAAS PROVIDER OR THE INTEGRATOR

THE ROLE OF THE INTEGRATOR

The one question that is on everyone's lips is who will be the MaaS integrator. But the key question is rather who is able to attract the maximum customers to produce the maximum benefits for sustainable and affordable mobility?



Therefore, the role of the integrator is to make it fly. The integrator needs to set up an integrated mobility platform that attracts a large number of customers and that creates value for the business partners (especially the transport operators) and satisfies their expectations.

Only by having happy customers and happy business partners will a MaaS integrator be able to scale and create maximum benefits for sustainable mobility.

Depending on the local context, taking into account many factors such as the strength of established mobility services, the openness of the travellers, the institutional organisation and legal framework for the transport services and many more, this role could be taken by different actors such as the public transport authority, any transport operator, a tech firm, a MaaS company or any other actor from the banking or the telecommunications sectors.

DATA AND CUSTOMER RELATIONSHIP: BUILDING TRUST FOR A STRONG PARTNERSHIP

A MaaS provider needs different data sets from the transport operators to build a MaaS solution. At the same time, as business partners, the transport operators have expectations and needs that they want to see fulfilled in order to trust the MaaS provider and provide them with the required data.



What data does the MaaS provider need to create an integrated mobility platform?

➤ **Transport data:**

Data on the availability of the mobility service, real-time data via secured API's

➤ **Access/ticketing data:**

Data to resell the access to the mobility service, mobile ticketing, online booking through secured API's.

➤ **Traveller data:**

Private data on the traveller is needed to clear them for the use of the mobility services (e.g. driving license for Car-Sharing)

Not all transport operators have this data available yet in the required format. Questions thus arise regarding the financing of the adaptation in data and APIs.

Most of the transport operators are concerned about losing the customer relationship if they open their data, especially the ticketing/access API's. Indeed they need to have full trust that the MaaS provider will give a qualitative service to their clients. The fear to lose control and contact with the customer is a barrier to build MaaS. Thus the real question is less about opening data than on how to share the customer.



DE LIJN OPEN TICKETING APPROACH

The public transport operator De Lijn from Flanders (Belgium) chose to actively support MaaS, because of its potential positive impact on societal policy goals.

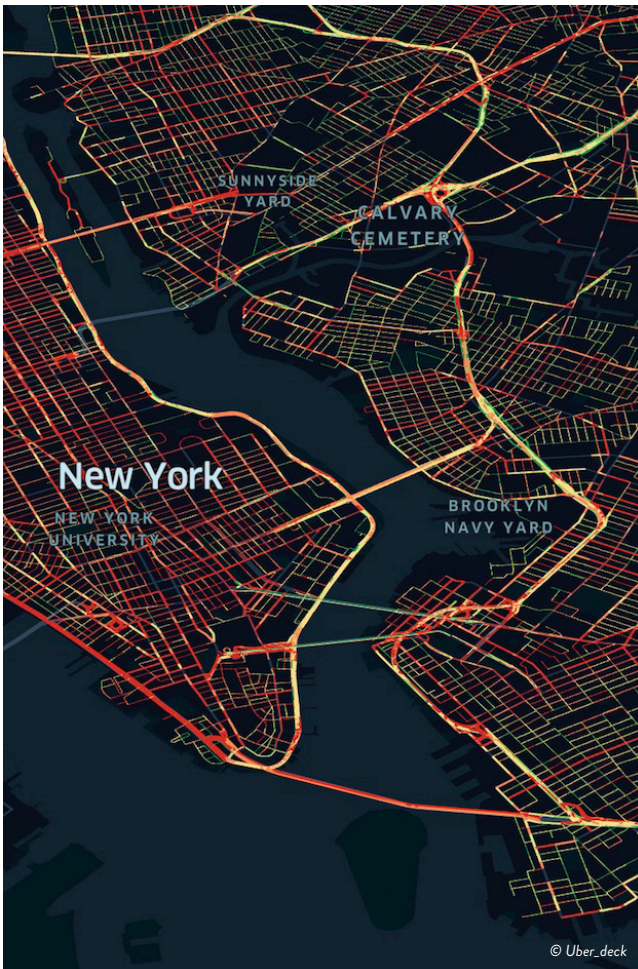
De Lijn launched mobile ticketing for third party resellers in September 2016 through open accession agreements. Digital tickets come with a price advantage for ad-hoc travellers: Digital single mobile ticket for 1,80 euro compared to a magnetic paper ticket for 3,00 euro and an sms-ticket for 2,00 euro + 0,15 euro (operator costs).

A strong brand and a large customer base are key assets

Two years later this approach contributed to a vibrant MaaS ecosystem in Flanders with 7 active third party resellers, most of them MaaS operators. However third party sales account for only 3% of all mobile tickets sold. For every third party digital ticket sold, De Lijn sold 32 sms tickets, even though they cost 0,35 euro more.

Price is not enough to nudge people. A strong brand and a large customer base are key assets that De Lijn will continue to leverage in its transition from a unimodal operator towards a combined mobility service provider.

Data analytics and usage data



Data analytics based on the usage data, including demand data, from the MaaS operation can provide organising authorities and transport operators with valuable insight on how to adjust their network or service in order to best match the demand. This can be done by, for example relocating stops, redefine certain routes or schedules or offer additional services. This means data analytics of the usage data has many benefits to enhance the overall service quality of all transport services and better respond to traveller's needs.

The data value lies in the service above the generated data:

- It allows the MaaS operator to improve the service by providing more personalised services and optimise the business with a global view on usage and needs.
- It gives the transport operators better knowledge of their customers and helps them to improve their offer and optimise their costs.
- It enables cities to have a better view on their territories and to improve their infrastructure and urban planning.

Building trust: Data sharing concepts and the use of algorithms



Transport operators might feel reluctant to open their data to MaaS integrators, as they see different risks.

- The first perceived risk is related to losing the customer relationship. Community building and customer care are essential to the success of the service and yield management.
- The second risk is that if the MaaS offer is successful, the MaaS provider would become the gatekeeper to all demand and usage data.
- The third risk all transport operators face is disclosing the business model. By sharing the availability data their business model becomes visible to present competitors and to other businesses who may be newly entering the market on the basis of this data.
- The fourth perceived risk is linked to the use of the algorithm. How can transport operators ensure that the integrator will not prioritise one or the other transport solution according to his own interests?

In order to build the trust needed amongst all partners, these risks need to be addressed. This can either be done by:

- The MaaS integrator proposing fair business rules meaning terms and conditions for the reselling of the transport services,
- A clear reselling contract such as a share-alike licence set by the transport operators
- Regulation

The integrator needs to find a way of enabling the transport providers to maintain their customer relation. Regarding demand and usage data, there are two visions: one where this information is shared back to the operators and one where it would be sold to those that pay the highest price. To build the needed trust, customer and usage data should rather be shared by the MaaS provider with the transport operators as it empowers the whole ecosystem and contributes to build better cities, which in return is beneficial to the MaaS service. This would also build on the reciprocity principle in the opening of data.

New forms of shared customer ownership and licences on data need to emerge to strengthen the partnership and hence reinforce the MaaS solution.

On regulations and standards



The quality and consistency of data shared and the data format are essential for MaaS. A standard to share data should be set up, to which every actor could adapt voluntarily. Forcing transport operators to open their booking and/or ticketing via regulation is difficult as it will not necessarily address the above-mentioned risks. Therefore, it will not help to build the solid partnership that is needed to create a successful MaaS.

There needs to be a collaborative approach as setting up a MaaS solution is all about cooperation.

New forms of regulation, such as the possibility that public authorities establish a ‘public data cache’ for mobility data and regulate input and output, should be taken into consideration. Therefore public authorities need to have the necessary capabilities and resources to understand and manage the risks and stakes from an IT and data analysis perspective. It is also essential that data is shared back to authorities in order to enhance overall mobility coordination and planning.



THE FINNISH ACT ON TRANSPORT SERVICES

In 2018, The Act on Transport Services in Finland brought together legislation on transport markets. The aim of the legislative reform is to provide the users with better transport services and to increase freedom of choice in the transport market. Part of this act ensures that regardless of the mode of transport, a provider of passenger mobility services shall ensure that essential, up-to-date data on its services is freely available from an information system (open interface). The data should be provided in a standard, easy to edit, and computer readable format. At minimum, this essential data shall include information on routes, stops, timetables, prices, availability, accessibility as well as access to the sales interface of their ticket and payment systems - at least for single tickets.

BUSINESS RULES

The aggregation of sometimes similar services and providers within a MaaS-platform leads to a vulnerable situation concerning competition. Imagine there are two competing car-sharing offers in a city. For the customer, both services are only one click away, thus a financially-powerful service operator could easily undercut the prices of its competitor for a certain time in order to take over the whole business.

Another example would be that a transport operator tries to undermine the MaaS-platform by giving extra bonuses if a customer signs up directly with him instead through the platform.

This exemplifies how a MaaS Platform needs to have certain business rules to avoid this kind of unfair handling.

MOBILITY BRANDS – HOW TO MARKET THE TOTAL OFFER?

In order to join a MaaS solution, the transport operators and the users have expectations towards the brand under which the MaaS will be promoted. This poses different questions from a B2C and B2B perspective, such as what attracts them to one brand or the other. For the MaaS provider these are important questions since they need to be the most attractive provider, and the competition in the market is fierce. Public transport companies, independent MaaS providers and car manufacturers are not the only ones positioning themselves on the mobility service market, but other sectors such as the global IT-Industry and the banking and the telecommunications sectors are competing as well.

The future of the brands is an ongoing debate. For the moment, one can observe that there seems to be a tendency to market the integration of mobility services under a new brand. Although very strong and well-established companies, with large customer databases, are sometimes behind them, such as Daimler or Deutsche Bahn. But experiments and research on this important issue have just started and we currently lack the information to further discuss this. So far, the MaaS services that are in operation have not yet managed to attract large numbers of new customers who formerly owned a car.



DOUBLE BRAND VISIBILITY IN KARLSRUHE

Daimler decided to launch its MaaS solution under the brand Moovel and at the same time they offer their platform as a white label in cooperation with partners such as in Karlsruhe, where KVV, the public transport operator, and Moovel launched KVV.mobilapp-powered by moovel in May 2017.

GAMIFICATION AND NUDGING TOWARDS MORE SUSTAINABLE TRANSPORT MODES

Nudging and heuristics are often underutilised in terms of the influence they can have on people's behaviour and perception of having different options available to them. For example, the default settings on many route planners often favours the car, which results in this being the first and most prominent result displayed to people. Instead, by showing sustainable modes first, or by defaulting to a more sustainable mode of travel, it can increase the salience of these options.⁷

Gamification and nudging are elements of motivational techniques to be used with rewards as an incentive for recognised good travel behaviour. Further means of stimulating sustainable travel behaviour include bonus schemes, where travellers are rewarded for using shared or eco-friendly modes. Rewards must be considered carefully – different segments may respond to different types of rewards such as free or discounted travel or partner discounts.



MAAS MADRID: REWARDING SUSTAINABLE BEHAVIOUR

EMT, the public transport operator owned by Madrid City Council, is launching a MaaS platform and a public-private alliance involving policy makers. This approach is key to ensure transparency in the route planner, to grant data protection for users and data analysis for transport system improvements. It will guarantee multi-modal options in combination with public transport and tackle challenges linked to congestion, air quality, accessibility, safety and equity. An example of this is the gamification system already developed in the first phase. Users collect more points for walking, cycling and using public transport than for others mobility options.

FINANCIAL ASPECTS



When it comes to how a MaaS provider could gain money directly from running an integrated mobility platform, the following MaaS business models could be combined:

➤ Agency model

Based on pre-paid bulk purchases with a volume discount. Profit margin is gained through reselling (at normal published rates or at higher-than-published rates)

➤ Merchant model

Based on commissions that transport operators pay for the reselling of their services

➤ Transactional model

The transport operators pay fees per click, per tap, per settlement, per invoice

➤ Contribution of the end customer

For example, subscription to a mobility bundle

➤ Contribution of B2B customer

For example, service fee for aggregated billing



When looking at the financial balance of MaaS, it is important to keep in mind that from a city point of view, the shift to more sustainable mobility and reduced car use are the key benefit of MaaS. MaaS is indeed regarded as a tool for politicians to steer mobility in their cities towards more sustainable modes.

The value lies in the shift to sustainable modes and in that sense, financial means invested into a MaaS solution could be balanced by capturing the value corresponding to the cost of congestion, air pollution, parking costs etc.

Whilst the creation of social and environmental value is desirable from a sustainability perspective, the question of how to capture these types of value is difficult. Even in cases where public sector organisations create mechanisms to internalise externalities, such as subsidies for public transport, one can argue that a market exists.⁸

MULTIPLE MAAS MODELS WITH DIFFERENT ACTORS AS INTEGRATORS

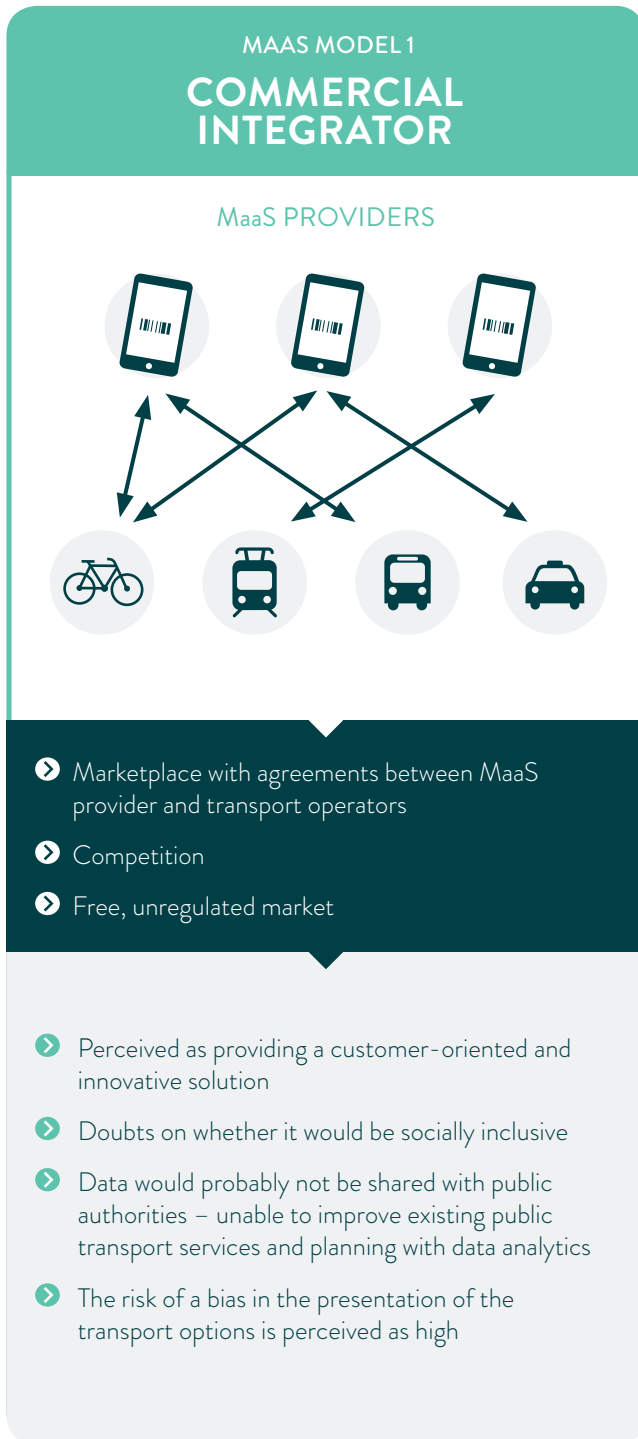
BUILDING THE SOLUTION

Local context matters. There are many different ways to build a MaaS and pilots are taking place around the world. They all have advantages and disadvantages depending on the perspective of each involved player. When contemplating which model would work best for one's city it would be helpful to look at the three basic MaaS models described here below with different actors as integrators and see how they could perform against the following set objectives:

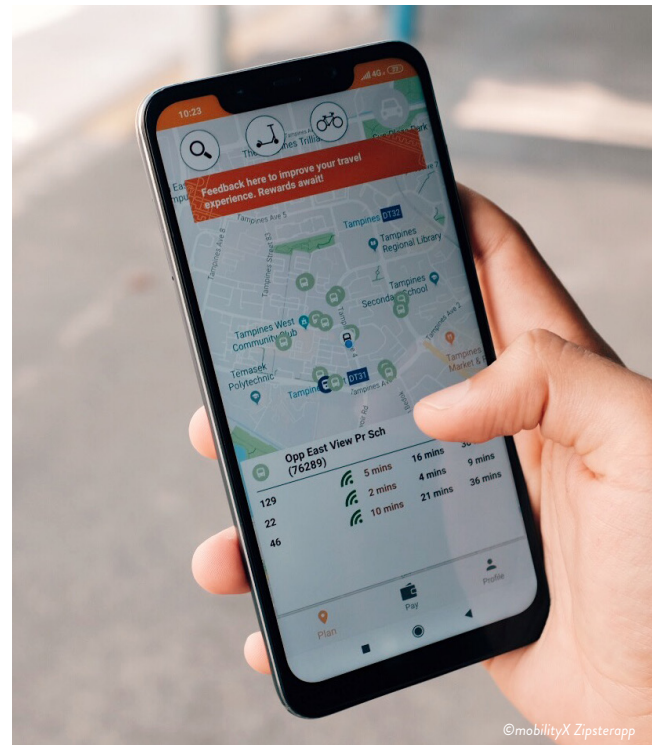
- Increase public transport, walking and cycling use
- Number of users /Market penetration
- Threat of a private monopoly in the long term
- Social inclusion
- Innovation
- Customer orientation / usability
- Alignment with public policy goals
- Integration of local mobility providers
- Neutrality/Impartiality
- Sharing data back with public authorities

⁸ Steven Sarasini, "D1.1 - Guidelines for successful multi-stakeholder partnerships". IMOVE project deliverable.

In the following section, the comparison of different raw models should help to give an understanding of key differences:



A variation of this Model could be that all transport providers (private or public) are legally forced to open up their data and API's so that their services can be resold by third parties. This model favours a more rapid development of market solutions. But without reselling licenses and the sharing back of data to transport operators and authorities, the same risks arise.



©mobilityX Zipsterapp

ZIPSTER : ASIA'S FIRST INTEGRATED MAAS APP & PAYMENT WALLET IN SINGAPORE

mobilityX Pte Ltd, an SMRT and Toyota Tsusho backed start-up, launched Zipster which provides a single point of access to multi-modal transport options. This included public transportation (MRT and buses), private-hire vehicle services, shared mobility devices, car-sharing services and many more.

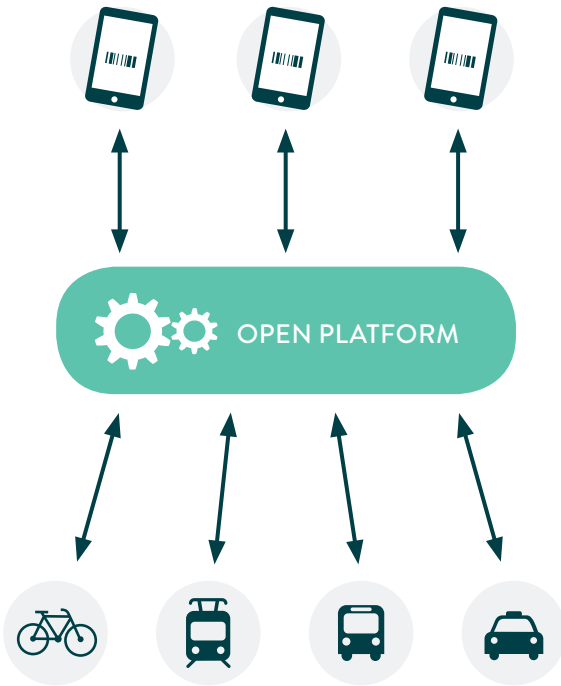
Aiding the seamless door-to-door transport experience to commuters, Zipster grants the user access to an integrated MaaS payment wallet across multiple modes of transport. As part of the wallet, mobilityX will also launch a Zipster card trial.

mobilityX has partnered with AXA Insurance Singapore to protect Zipster users across their multi-modal journey. This protection covers personal accident, accident medical reimbursement and personal liability.

With the introduction of MaaS to Singapore, mobilityX is aligned with Singapore's Land Transport Master Plan 2040 and the land use Master Plan 2019. mobilityX will strengthen the integration of the entire transportation network and meet the growing travel needs of commuters.

MAAS MODEL 2 OPEN BACK-END PLATFORM

MaaS PROVIDERS



- Set up by a public entity with rules determined by the public authority
- Serves as public infrastructure on which different actors could build a MaaS solution
- All mobility services have to open up their API's
- Competition on the front side

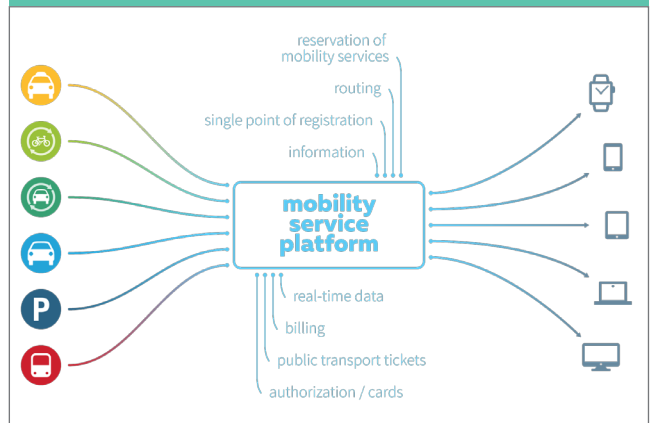
- Perceived as offering a customer-oriented, innovative and impartial service
- Local mobility providers are more likely to be integrated
- Financing the open back-end platform needs to be addressed



UPSTREAM NEXT LEVEL MOBILITY, THE MOBILITY PLATFORM BEHIND WIENMOBIL BY WIENER LINIEN

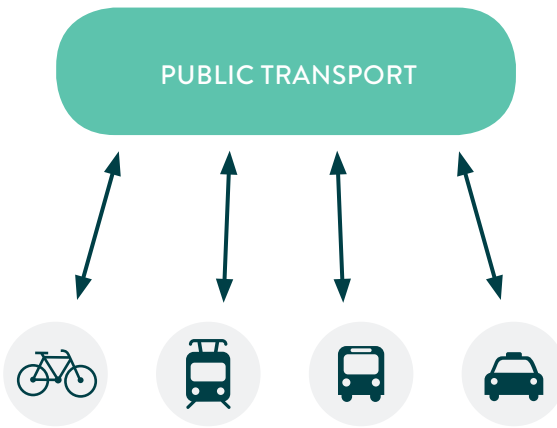
Upstream, a subsidiary of Wiener Linien and Wiener Stadtwerke, sets up the digital infrastructure for traffic management in line with public policy goals and provides a central access to all mobility services in Vienna. This platform is the back-end platform onto which different MaaS solutions can be built.

In June 2017, the mobility app WienMobil was launched. It offers simple and convenient access not only to bus, tram and metro but to all publicly available mobility services such as e-loading stations, parking garages, taxis, bike sharing, car sharing, car rentals and many more. The result is a one-stop mobility shop that, in addition to accessing real-time information, enables the user to not only to buy tickets, but also to book, reserve and pay for other combined transport.



MAAS MODEL 3

TRANSPORT AS THE INTEGRATOR



- MaaS run by public transport with selected mobility services
- Rules set by public transport
- Other mobility services providers may have to open up their API's

- Public transport already has the largest customer data base, and is the backbone of sustainable urban mobility, so it makes sense to take the lead in integrating other mobility services
- Public transport remains relevant towards existing customers and appear more attractive to new ones by becoming a real mobility provider
- Perceived as being able to achieve the highest increase in sustainable mobility, be socially inclusive and best aligned on public policy goals as data would be shared with public authorities
- Perceived as possibly providing a less customer-oriented and innovative service

FIRST MAAS WORLWIDE BY PUBLIC TRANSPORT OPERATOR ÜSTRA IN 2016

In February 2016, Üstra launched the Mobility Shop that offers, multimodal registration, routing, booking and invoicing for public transport, car-sharing bicycle, taxi and the German rail in Hannover, Germany. Üstra holds the 'umbrella' contract with the clients, offers special discounts for other mobility services and flexible registration for all services. At the end of the month Üstra does the multimodal billing, provides customers with a joint invoice and redistributes revenues. It is a major step towards becoming a true multimodal provider that offers 'mobility as a service' to its customers now and in the future.



©Üstra

COMPTE MOBILITÉ - A MAAS SOLUTION FOR MULHOUSE

In September 2018, Mulhouse Alsace Agglomération, PTA, launched the compte mobilité with Citway a subsidiary of Transdev. After registration via the app or website clients use different services and receive a joint bill at the end of the month. They can monitor their expenses in the app.

BUILDING A TRUSTWORTHY PARTNERSHIP

Since the start in 2015, local mobility operators such as Soléa, JC Decaux, Citiz, Médiacycles, Citivia and Indigo are considered as real partners to build a win-win partnership in order to lead this innovative and ambitious project to success.



©Transdev

INSTITUTIONAL LANDSCAPE AND A REGULATORY FRAMEWORK TO PROMOTE MAAS AND SUSTAINABLE MOBILITY

MAAS AND CITIES' POLICY GOALS



From a city or regional perspective MaaS is regarded as a tool to reach public policy goals and it is hoped that it will help nudging citizen's travel behaviour towards more sustainable modes. Indeed public transport is the backbone of any Maas solution together with active modes and MaaS is expected to surpass the convenience of private vehicles. The data derived from MaaS would help to make more efficient use of existing infrastructure and help enhance sustainable mobility including public transport planning. But public authorities need to have access to this data.

Public authorities must get involved to ensure public policy goals are reached and cities will benefit from all the advantages MaaS could bring.

Since MaaS is a mix of public and private players there is a risk purely commercial players take advantage, for example with algorithms that would favour certain services. The regulatory framework needs to preserve non-profitable versus profitable services and ensure public transport and active mobility are the backbone of MaaS.

ADDRESSING THE BARRIERS TO MAAS AND TAKING MEASURES TO PROMOTE IT

Since, one of the objective of MaaS is to promote less car use, wrong incentives that hinder MaaS' ability to attract to car drivers need to be given up. These incentives include free parking or subsidised company cars.

Tools to control car traffic and car usage such as access restrictions, road user charging, parking restrictions and charging car ownership need to be considered.

The fact that people are not aware of the costs the private car entails is another barrier. MaaS packages are a good comparison point in terms of costs for the citizens, but often people have no idea how much owning a car truly costs.



INSTITUTIONAL COORDINATION AND MULTIMODAL URBAN PLANNING

The institutional fragmentation with different authorities in charge of the mobility services available in a city can be a barrier for the quality of the MaaS solutions. Indeed, different regulations for the diverse transport modes are often the source of missing coordination. The setup of mobility agencies or multimodal transport authorities in charge of all urban mobility services would facilitate a co-ordinated organisation of mobility services also in regard to urban space allocation and street design. MaaS might

be a digital gateway to different mobility services but these services also need to be integrated from a physical point of view to become really attractive. The creation of multimodal interchanges offering visibility to all mobility options is essential to promote combined mobility. Quality management of the different services would also be facilitated by multimodal transport authorities or mobility agencies, since authorities should ensure that the quality of the services offered are the same.

SWITCHH APP AND SWITCHH POINTS IN HAMBURG

DIGITAL AND PHYSICAL INFRASTRUCTURE PROVISION FOR MAAS BY THE HOCHBAHN

In Hamburg, the Hochbahn is working on the integrated mobility platform Switchh. This MaaS service will be based on a platform that will be the digital infrastructure for the Hamburger mobility market, provided by the Hochbahn.

The provision of the digital infrastructure is seen as a global task of general interest that should be developed and operated by public authorities in order to ensure:

- Required scope for action of the city
- Sustainable and equitable access to all publicly available mobility services
- Social, fair, individual and future-proof mobility
- Traffic control in a public interest perspective
- A non-discriminatory approach towards all mobility service operators

Upstream next level mobility, a subsidiary of Wiener Linien and Wiener Stadtwerke, has been selected as the suitable cooperation partner to build the digital infrastructure needed.

At the same time the Hochbahn is creating inter-modal mobility hubs, Switchh points, around the city to also ensure physical integration between the different transport modes. In 2018, 17 Switchh points with metro connection and 28 decentralised neighbourhood mobihubs were available.



OUTLOOK

MaaS is an important and unavoidable milestone in building a better mobility system, as:

- Mobility is becoming a service. The number and importance of mobility services will continue to increase in the future. New services will grow out of their niches and customer expectations will continuously evolve. The arrival of automated vehicles will be the ultimate game changer and help car- and ride-sharing as well as ride-hailing services to become mainstream. One can already observe that private cars are also progressively being offered as part of mobility packages and not only as vehicles anymore.
- The mobility services are coming together as a 'continuum' of different options. In the end the client or traveller will not make a difference between the different modes as their choice will depend on the price and performance (quality, comfort, flexibility etc), but help to make the right choice is expected!
- MaaS is a key to change travel behaviour towards more sustainable mobility options, reduce private car use and provide better mobility.

Therefore, it is important to act now to ensure MaaS is the desired tool that our cities can use to build a more sustainable future.



©Beyond DC



ACKNOWLEDGEMENTS

UITP would like to thank all experts who have participated and contributed to the report.

Listed below (in alphabetical order) are the organisations that are part of the UITP MaaS work group:

- Alstom (France)
- Barcelona Serveis Municipals – B:SM (Barcelona, Spain)
- Bundesverband CarSharing – BCS (Germany)
- Cambio/Taxistop (Belgium),
- Communauto (France/Canada)
- Compagnie des Transports Strasbourgeois – CTS (Strasbourg, France),
- De Lijn (Belgium)
- Door2Door (Berlin, Germany)
- East Japan Railways Company – JR-East (Japan)
- European Cyclists' Federation – ECF (Belgium)
- Ericsson (Sweden)
- Fluidtime (Austria)
- Giro (Canada)
- Hamburger Hochbahn (Hamburg-Germany)
- Mobility CarSharing (Switzerland)
- Netxbike (Germany)
- Royal Dutch Transport Federation – KNV (The Netherlands)
- Ruter (Oslo, Norway)
- Siemens (Germany)
- Société nationale des chemins de fer français – SNCF (France)
- Transport for Greater Manchester – TfGM (Manchester, UK)
- Transdev (France)
- Ubigo (Sweden)
- Üstra (Hannover, Germany)
- Verband Deutscher Verkehrsunternehmen – VDV (Germany)
- Wiener Linien (Vienna, Austria)

This is an official Report of UITP, the International Association of Public Transport. UITP has more than 1,600 member companies in 99 countries throughout the world and represents the interests of key players in this sector. Its membership includes transport authorities, operators, both private and public, in all modes of collective passenger transport, and the industry. UITP addresses the economic, technical, organisation and management aspects of passenger transport, as well as the development of policy for mobility and public transport worldwide.

This Report was prepared by the Combined Mobility Committee.



Rue Sainte-Marie 6, B-1080 Brussels, Belgium | Tel +32 (0)2 673 61 00 | Fax +32 (0)2 660 10 72 | info@uitp.org | www.uitp.org

APRIL | 2019