UITP Policy Brief

Ready for MaaS? Accelerating easier mobility for citizens and better data for cities

Introduction

The urban mobility landscape is evolving fast and new solutions are being offered to citizens all over the world: From e-scooters, to bike-car and ride-sharing to the rise of (e-) cycling and ride-hailing - the options to move around are growing rapidly, especially in larger cities. Is this the mobility revolution everyone talks about? Or are these niche services hyped by the media and huge capital investments? And how should public authorities and local public transport companies act in response?

It becomes more and more clear that we are at the beginning of a new mobility era based on these fundamental trends:

- **Clean vehicles**: Combustion engines will be phased out and in the future all vehicles will (have to) be clean.
- **Shared vehicles**: The shared use of vehicles will increase both in the form of car-sharing (consecutive sharing of vehicles) and ride-sharing (simultaneous sharing of vehicles)
- **Automated vehicles**: In the future vehicles will be driverless and connected, which will offer many opportunities for completely new mobility services as explained in the UITP policy brief AV’s: A potential game changer for urban mobility.
- **Digitalisation of mobility**: Optimisation of existing services and creation of new ones based on smart data and IT solutions that change the way people move and consume goods.

Are we ready for these changes? Instead of being a spectator of what is happening we should act now and steer developments into the right direction. Because, if applied in a smart way these trends offer an absolute momentum for better and more sustainable mobility with public transport as backbone! They will help us to regain urban space and rebuild streetscapes to create attractive cities for people. The way to harvest the benefits goes via the integration of all the different mobility options to offer an alternative to car ownership: Mobility as a Service (MaaS).

This official Policy Brief of UITP aims to provide guidance on what Mobility as a Service is and how it can become a tool to provide better and more affordable mobility for all.

1. What is Mobility as a Service?

New players are offering a multitude of new services to move around cities. But for the traveller confronted with the increasing number of options, finding the best way to move around can be challenging. This is where the Mobility as a service (MaaS) – concept steps in: MaaS is about
offering a complete mobility solution and 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 conventional 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.

**Diversity of MaaS platforms**

The coexistence of MaaS platforms of different geographic footprints will be a reality since 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. Moreover, MaaS has the potential to appeal to a very broad audience, from young persons to persons with reduced mobility, international business travellers, families or elderly persons etc. Therefore there will probably be different MaaS offers addressing different customer segments.

**2. Why is MaaS interesting?**

MaaS is an important and unavoidable step in building a better mobility system, because:

- 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.

- The mobility services are coming together as a chain of different options. In the end the traveller’s choice will depend more on the price and performance (quality, Source: Kamargianni & Matyas, 2016
comfort, flexibility, ..) than on the mode. But help to make the right choice is expected!

- MaaS, if organised in a smart way, is a key to change travel behaviour towards more sustainable mobility options, reduce private car use and provide better and more affordable mobility.

MaaS has the potential to increase the modal share of all mobility services at the expense of single-car usage. Therefore, MaaS will benefit not only travellers but all mobility providers and it can help reach public policy goals. It is in the traveller’s interest to set up an integrated mobility-ecosystem including all mobility services, private and public, based on an optimized system to enjoy total freedom of mobility. It is in the community’s and cities’ interest that the integrated offer is built with high capacity public transport and active modes at its heart. MaaS is both attractive to the traveller and a tool to shape sustainable mobility. The MaaS solution should therefore help to optimise the mobility system which requires adequate rules, controls and governance where appropriate. Consequently there need to be incentives to increase efficiency and occupancy rates and to complement mass public transport. There should be disincentives for the cannibalisation of public transport, walking or cycling, as well as for single occupancy or even empty trips.

It is important and urgent to act now to ensure MaaS is the desired tool to build a more sustainable future as global platforms are building up now.

3. Creating a user-centric service

If MaaS is not responding to the travellers needs it will not be able to attract enough users to make a difference and activate the expected modal shift towards sustainable modes. Therefore it is crucial to put the traveller at the heart of the MaaS solution.

The key expectations from the traveller are trustworthiness, simplicity, low-threshold accessibility, impartiality, flexibility, fair pricing and personalization:

In order to trust a service MaaS should guarantee correct real time information, a high level of quality, have a strong reputation/brand and offer or point to reliable transport services. It should also be simple, meaning an easy, user-friendly, convenient service offering a single sign-on access with integrated information all along the trip and helping the traveller in the decision-making process by reducing the cognitive load. Impartiality is another requirement as MaaS must be non-discriminatory and provide access to all available mobility options keeping in mind efficiency and sustainability over commercial profitability. Flexibility is important, as the service must be able to adapt to changing traveller’s needs and it should take into account personal preferences.

4. Building a strong partnership – MaaS is all about collaboration

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, who runs the platform, and join the integrated mobility offer, the business partners expect impartiality, fairness, an innovative strong brand with a positive image, and an integrator that is stable and trustworthy enough to stay for a long time. Indeed, all business partners should be
treated as equals and the approach of the MaaS provider towards transport operators should be non-discriminatory. The access conditions to join the MaaS platform should be fair. On top of the considerations to create the necessary trust to build the partnership a Maas solution requires, the usability of the solution must be excellent in order to be highly attractive to the traveller. Of course all transport operators expect to gain new customers through the MaaS platform.

5. The role of the MaaS Provider and the Integrator

To build a MaaS solution there are different layers. The integrator is responsible for the integration of data from multiple transport operators and infrastructure data and the MaaS provider builds the solution on top of the integrated layer. The integrator could be different from the MaaS provider, but sometimes these roles are taken by the same entity.

The one question that is on everyone’s lips is who will be the integrator and MaaS provider. But the key question is actually who is able to get a maximum of users that will create maximum benefits for sustainable and affordable mobility? Indeed, the role of the integrator is to make MaaS fly: he needs to attract a large number of customers and create value for the business partners (mainly the transport operators). Only by having happy customers and happy business partners will a MaaS provider be able to scale and create maximum benefits for sustainable mobility. Therefore there need to be incentives and nudges to increase the use of sustainable modes.

Depending on the local context, taking into account many factors such as the strength of established mobility services, the readiness of the travellers, the institutional organization and legal framework for the transport services and many more, the roles of the MaaS provider and integrator could be taken by different actors such as the public transport authority, the public transport operator, any mobility service operator, a tech firm, a MaaS company or any other actor from the banking or the telecommunications sectors.
Data & customer relationship: Building trust for a strong partnership

There are different data sets that the integrator and MaaS provider need from the infrastructure operators and the transport operators, his business partners, to build a MaaS solution:

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

- **Infrastructure data**
  For example, availability of EV charging points, parking spaces, road conditions and congestion levels

Not all of the required data is yet available in the required format and questions of financing for the adaptation arise.

**Data analytics & usage data**

Data analytics based on the usage data, including demand data, from the MaaS operation can provide organising authorities and transport operators valuable insight on how to adjust their network or service to enhance the overall service quality of all transport services and better respond to traveller’s needs.

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

- It allows the MaaS provider to improve the service by providing more personalized services and optimize 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 optimize their costs.
It enables cities and authorities to have a better understanding of the needs and to improve their infrastructure and urban planning. It could also be used to manage the demand and supply of transport services better by spreading demand over different routes, modes and times.

Customer and usage data should be shared by the MaaS provider with the transport operators and authorities in respect of data protection laws. It empowers the whole ecosystem and contributes to build better cities, which in return is beneficial to MaaS. This must be built on the reciprocity principle in the opening of data.

Building trust: Data sharing concepts & algorithms

Most of the transport operators are concerned about opening their data, as they see different risks:

- The first perceived risk is related to losing the customer relationship. Indeed community building and customer care are essential to the success of any service and yield management.
- The second risk is that if the MaaS offer gets really 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 might newly enter the market on the basis of this data.
- The fourth perceived risk is linked to the algorithms. How can transport operators get the guarantee that the integrator will not prioritize one or the other transport solution according to his own interests?

Transport operators also need to have full trust that the MaaS provider will give a quality service to their clients. The real question is less about opening data than on how to share the access to the customer. In order to build the trust needed amongst all partners, and ensure that only data essential for improving services is shared and operator’s commercially sensitive data is protected 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,
- by a clear reselling contract such as a share-alike licence set by the transport operators
- by regulation and governance
- by a shared approach involving all actors, for example by defining a Code of Conduct
On regulations and standards

The quality and consistency of data shared and the data format are essential for MaaS. It must be easy for all transport operators, large and small, to plug in the MaaS solution. 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 will not necessarily address the above-mentioned risks and there needs to be a collaborative way as setting up a MaaS solution is all about collaboration.

6. Multiple MaaS models with different actors as integrators

Building the solution

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. **Local context matters.** When contemplating which model would work best for one’s city it might 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.

- Mode shift towards public transport, walking & cycling
- Number of users /Market penetration
- Social inclusion
- Innovation
- Customer orientation / usability
- Alignment with public policy goals
- Integration of local mobility providers
- Non-discriminatory approach
- Sharing data back with public authorities

1. Commercial actor
   - Integrators organise themselves
   - Competition
   - Free, unregulated market

In the MaaS Model 1, commercial integrators act in the context of a marketplace with bilateral agreements between the MaaS provider and the transport operators. There would be competition and there are no specific regulations. This model could be perceived as providing a more customer oriented and innovative solution, but doubts persist on whether it would be socially inclusive. Data would probably not be shared with public authorities making the enhancement of existing public transport services and planning thanks to data analytics impossible. The risk of a
bias in the presentation of the transport options not in favour of sustainable mobility, by acting on the algorithms, is perceived as high. A variation of this Model could be that all transport providers, private or public are forced by law 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.

2. Creator of an open back-end platform

- Technical back-end platform serves as «public infrastructure»
- Competition on front-end side
- Other mobility service providers have to open up their API’s

In the Maas Model 2, an open back-end platform would be set up by a public entity with rules determined by the public authority. The platform would serve as public infrastructure on which different MaaS providers could build a MaaS solution. All mobility services have to open up their API’s to be integrated in the platform. This model would be leaving room for competition to get the most customers and it is perceived as offering the possibility to provide a customer-oriented, innovative and impartial approach. It would also integrate local mobility providers. The financing of the open back-end platform needs to be addressed.

3. Integrator around mass public transport

- MaaS run by Public Transport with selected mobility services
- Rules set by PT
- Other mobility service providers have to open up their API’s (?)

In MaaS Model 3, mass public transport would be the integrator. Indeed since public transport has the largest customer data base and is the backbone of sustainable urban mobility, it makes sense
to take the lead in integrating other mobility services. This would help public transport to stay relevant towards existing customers and be more attractive to new ones by becoming a real mobility provider. The basic building blocks of MaaS such as registration, trip planning, booking and billing have to be developed for the core product anyway. Public transport is more likely to be trusted by customers and other transport operators with regards to data protection, impartiality and stability. This model is 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. But this model could also be perceived as possibly providing a **less customer oriented and less innovative** service if conventional public transport does not adopt a forward-looking approach.

**Using decentralized ledger technology for MaaS**

A fourth emerging model is Distributed Mobility using blockchain. In that model all stakeholders work on a shared platform via decentralized ledger technology. This prevents the need for a single entity in the middle, whilst still creating a coordinated mobility ecosystem. It can for example allow for transport authority incentives on certain mode choices and determine rules for the mobility economy. Research on this possibility is ongoing.

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

**MaaS and cities’ policy goals**

From a city or regional perspective MaaS gathers valuable data about user movement and network operations that can be used to improve service efficiency and network planning. **MaaS should be a tool to steer travel behaviours into more sustainable modes.** Mass public transport is the backbone of sustainable mobility together with walking and cycling and therefore public authorities need to ensure it is at the heart of any MaaS solution. Nudging and heuristics, meaning approaches to encourage the traveller to use more sustainable modes, are often underestimated in terms of the influence they can have on people’s behaviour and perception of 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 returned to people. By instead showing
sustainable modes first, it can increase the salience of these options. Gamification and nudging are elements of motivational techniques to be used with rewards as an incentive for recognised sustainable travel behaviour, for example via bonus schemes.

The data derived from MaaS would help to make more efficient use of existing infrastructure and help enhance sustainable mobility and public transport planning. But public authorities need to have access to this data.

Since MaaS is a mix of public and private players there is also a risk purely commercial players take advantage, for example with algorithms that would favour certain services. The regulatory framework needs to ensure that high capacity public transport and active modes are the backbone of MaaS.

### Setting the right regulatory framework to promote MaaS

Many wrong incentives like free parking or subsidized company cars are currently hindering sustainable mobility behaviour and preventing MaaS from being really attractive to car drivers. Thus, one of the biggest booster of MaaS would be to stop these wrong incentives. 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.

### Institutional coordination & 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 and responsibilities for the diverse transport modes are often the source of missing coordination. Today, most mobility resources are planned and operated vertically (in silos). Therefore, even if mobility services are integrated at the travellers’ level (i.e.: payment), it doesn’t mean that the offer itself will be appropriate to meet the needs. The adaptation of the current institutions to bring together all urban mobility services in mobility agencies or multimodal transport authorities would lead to a coordinated organization of mobility services. Quality management of the different services could also be facilitated. The same applies to urban space allocation and street design. MaaS might be a digital gateway to different mobility services but these services need to be integrated from a physical point of view to become really attractive. The creation of multimodal interchanges, mobility hubs, offering visibility to all mobility options is essential to promote combined mobility.

### Conclusion

Different approaches exist and still have to be tested, but one thing is clear: With an ever increasing number of mobility options Mobility as a Service will become the business model of the future. If deployed in the right framework centered on high capacity public transport and active mobility it can be a brilliant tool to change citizens travel behaviour towards more sustainable modes and optimise our urban mobility systems. Authorities need to take action now as global platforms are building up solutions that do not necessarily have a non-discriminatory approach or favour more sustainable travel behaviour. **Let’s make sure MaaS is the desired tool that cities can use to build a more sustainable future!**

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1 I-MOVE, Report, Sustainable MaaS Business Models,
Recommendations for public authorities and policy decision making bodies

In order to ensure Mobility as a Service helps to reach public policy goals, it is urgent to take action now. UITP recommends the following:

Create the right regulatory framework to promote MaaS

- Stop wrong incentives that support car use and thus hinder sustainable mobility behaviour and MaaS (free parking, company cars, …)
- Increase measures to limit single car use (access restrictions, road pricing, parking restrictions, street reclaiming…)
- Invest in digital solutions that promote integration and openness.

Build up institutional and policy integration

- Overcome institutional fragmentation with mobility agencies or multimodal transport authorities in charge of all urban mobility services e.g. by widening the competences of existing public transport authorities, and ensure they have the necessary capabilities and resources to handle algorithms and data analytics.
- Encourage multimodal urban planning for the development of mobility hubs and multimodal infrastructure
- Include MaaS as a catalyst to reach policy KPI’s related to climate, environment, spatial use, social inclusion and livability of cities and in urban mobility plans.

Setting up successful MaaS solutions

- Build the eco-system: Set-up participative processes that include public and private actors, research institutes and costumers to encourage all actors to draft a code of conduct with regards to subjects such as business model, openness, standardisation, interfacing, data reciprocity and customer sharing
- Ensure public transport and active mobility options are at the centre of any MaaS solution as mass public transport is the backbone of the urban mobility ecosystem and a key success factor of all MaaS models.
- Data reciprocity & protection: Data is key. Impose data protection and data reciprocity to the MaaS providers to enable the optimization of the urban mobility system. Aggregated, anonymized usage data (including demand data such as origin-destination requests) is to be shared in a reciprocal way with PTA’s, PTO’s and other mobility providers.
- Develop policies on the use of algorithms in order to prevent undesirable effects such as a shift from collective modes to individualised modes or a shift from sustainable to individual motorised modes in the value propositions of MaaS solutions or route planners.
- Make use of the data from any MaaS operation to optimize the urban mobility offer
- Adopt and harmonise quality standards for all mobility providers so that everyone can plug in easily.
• **Fair and free pricing:** If public authorities allow MaaS providers to repackage and reprice existing services instead of just reselling them, then the impact on public transport income and contracts is to be carefully modelled and if necessary compensated, to preserve the public service dimension and not undermine the authorities’ capability to set the right fare. Accessible, fair and inclusive pricing for customers of special interest groups needs to be ensured, if free definition of fares is allowed.

• **Foster innovation by funding:** Stimulate innovation by making funds available as it can be an important catalyst to inspire co-creation, create customer awareness or tackle technological obstacles.

• **Facilitate partnerships:** Offer contractual frameworks that address data reciprocity, conditions to access public transport ticketing, commissions, transactional compensations etc. in order to encourage open cooperation and partnership management.

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Discover examples of MaaS in the UITP report on MaaS and in the Combined Mobility Toolbox on MyLibrary