Mobility as a Service: innovation, customer-focus and efficiency

As the pace of change in mobility increases, the ability of central public transport authorities to keep up with trends reduces. Disruptions (e.g. ride share) have taken control away from transport planners and with the most profitable parts of networks being cherry-picked by operators the efficiency of public transport networks is challenged. This in turn reduces the ability to plan for long-term infrastructure needs. Operators and authorities, in a desire to create innovation, are building technology platforms and although there is more choice for end-users, with a plethora of single-mode or single-region apps, transport users have less real choice in their day to day mobility.

What then is the way to ensure that public transport networks are efficient, contribute a central plan for long-term infrastructure and provide real choice to end-users?

Mobility as a Service (*MaaS)* is the answer, but it needs a dynamic market, incentivized to innovate, and the support of authorities to provide the necessary guiding principles for MaaS to work. When this happens, public transport will become much more customer-focused and efficient and privately-owned modes can contribute to longer-term infrastructure planning.

MaaS: a new paradigm of mobility

Instead of the current system of owning a car, bicycle public transport (PT) subscriptions, future systems will have MaaS-providers engaging the market by offering this service to travellers. Individuals can choose their destination and mode per trip that they make; one day can be by share-bike, another by train and sometimes by ride share. This can be planned, booked and paid through their chosen independent MaaS provider. Furthermore, with access to the trip data and journey information, the public transport authority can take a more of a central planning role – focusing policies and investment on where people are actually travelling, rather than relying only on their own networks.

MaaS offers significant advantages over traditional models. As MaaS develops, new opportunities for use will arise:

· The traveller will receive more sophisticated options to get from A to B and will be aided in the decision-making process. Advanced trip planning tools will be very customisable and will use advanced analytics to predict user preference. The traveller can then travel precisely as they require (faster, easier, cheaper and/or with a better service depending on their choice).

· With up-to-date information and dynamic pricing, the traveller is incentivised to avoid congestion and traffic. This means that the scarce capacity of roads, rails and vehicles can be better utilised.

· Sharing will become the norm, leaving fewer unused cars and bicycles along the roadside or at stations. This provides additional space, for example, for additional playgrounds or green space, which will make cities more liveable.

· There will be more payment options in public transport but also with other providers of mobility. Credit card (EMV), bank card, and account payment will become the norm, as will very specific tools for particular users, including social credit systems. The idea of needing to top-up a separate account or accounts is likely to disappear.

· Destination marketing and usage bundles are likely to appear. These will be developed with combinations of public transport and hotel, theatre performances or flights. There are apps and sites that will calculate the most attractive combination of subscriptions based on your travel history, as is standard place in the hospitality and telecoms industries.

· Authorities will be able to use much richer data sources to understand demand patterns. This will contribute to the long-term planning of precincts and cities and lead to more efficient allocation of capital, making investments where the market doesn't or can't, and leaving efficient markets alone.

A New Model of infrastructure planning: network knowledge through MaaS

A journey from A to B requires a road or rail and systems: a bicycle, a car, taxi, bus or train. If the demand for travel changes, the supply can only be adjusted slowly. Infrastructure expansion takes 15 to 20 years. For new public transport systems, a period of 2 to 5 years is required. The consequence of increasing demand is therefore congestion (as is happening with ride share); overcrowded trains and parking scarcity. Increasingly, however, there are opportunities to make better use of existing capacity. Real-time information (e.g. road congestion) tied to incentive ticketing (e.g. rail dynamic pricing) will allow the traveller to make the most appropriate choice at any time. This will be done on the basis of time, money and comfort and increasingly with a vehicle that is not the traveller's own. There is therefore room for a 'aggregator' between the traveller and the means of transport that supports available choices. This aggregator function should remain independent of any mode – this is not about incentivising one's own mode, it is about coordination across the chain. These aggregators will represent the customer. They will create a new dynamic in the mobility market with better service for the customer and better utilisation of systems and infrastructure. They are the MaaS providers.
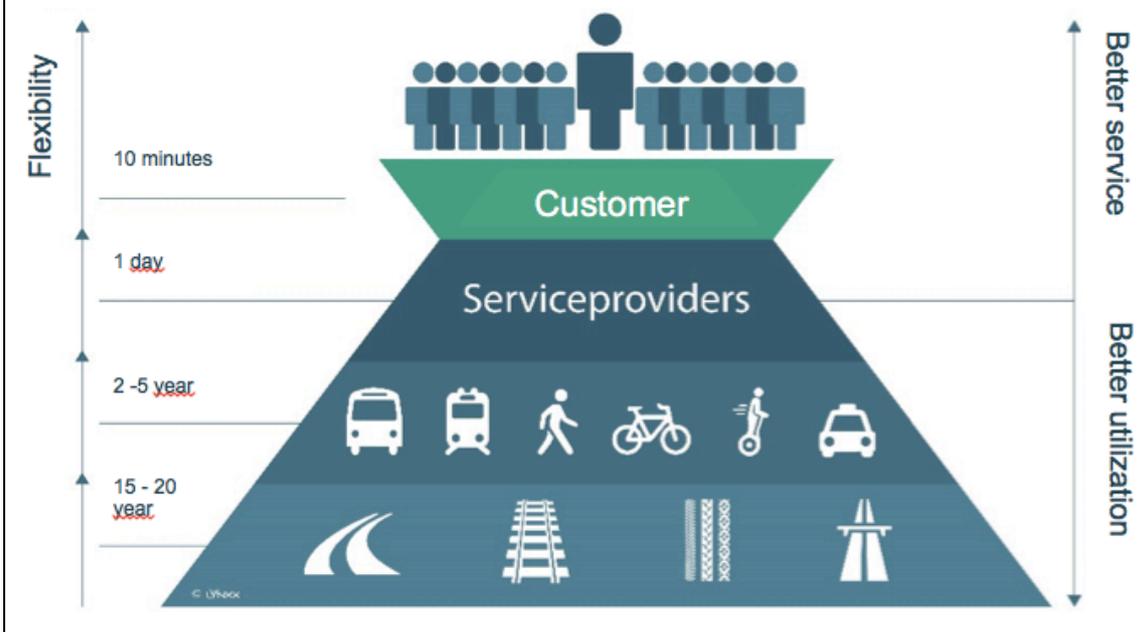
Market Dynamics

There is room in this new market for many MaaS-providers, just like there has been place for AirBnB, Booking.com and bedandbreakfast.nl. Market parties will seek their own target group and develop the services and propositions to suit. The technology and ideas already exist and are improving fast, and most importantly, in a dynamic market, customers will be won by functionality, quality of service and user experience (not by being required to use a specific app or service).

The Challenges with Innovation

A variety of innovations are being implemented, including in the Netherlands by app developers, mobile card providers, governments and transport operators themselves. More and more travel schemes are appearing that simplify the use of public transport for the business market. New multimodal travel planners have been developed for different governments; and provinces are experimenting with payments via smartphone.

At the same time, it doesn't work very well at a holistic level. The initiative generally lies with the public transport companies, which, at the request of the concession provider, show that innovation is being carried out, but miss the market dynamics of service competition. Public transport operators hold a contract for the duration of a concession so have little incentive to produce long-term solutions for travellers (and very often the innovation occurs at the award of the concession rather than throughout).

Furthermore, there end up being a lot of individual apps for customers by mode or sub-region. Someone who wants to take a complex journey from end-to-end may need a combination of 2 or 3 apps and different ticketing types. This is neither efficient, nor customer friendly, nor does it do much to grow the use of public transport.

Within the business of the development of travel information apps, app builders are dependent on the data feeds very often provided by the transport operators which can be subject to commercial incentive or trip prioritisation. This lack of independence will end up reducing the trust in the available data.

All of these challenges are representative of the problem in this space: the slow speed of innovation.

Speeding up innovation
With a few interventions in the market, innovation in the sector could be greatly increased. It is often said that more cooperation between transport companies is necessary. However, it will be faster if the voice of the traveller is strengthened and, as a result, other parties can respond appropriately.

We propose below four governing principles for a dynamic Mobility as a Service market, which are simple to enable, but will have far-reaching positive consequences.

1. **Allow 3rd Party Sales of PT Products.** The sale of all public transport products should be released for resale by any authorised 3rd party. This could involve other operators, but also travel organisations or providers of mobility services. The best mass-scale example of this is in the United Kingdom rail industry. Here, organisations can obtain a license to sell any rail ticket at a standard commission rate. This right of resale leads to parties selling each other's products and bundling of new and innovative products and the opening of new channels.

2. **Open up the necessary data.** The development of additional services (such as travel planners or assistance in choosing pricing models (e.g bellen.com) can be promoted by offering open data. This requires that the information on the current timetable (GFTS and GTFS-RT) improves and that full tariff information is also released. Data on the availability of taxis, rental bikes and parking places would be a sensible addition (and public transport authorities could insist on this data as a licence condition of operating in a city). A good example is with the transport authority San Francisco (SFMTA). SFMTA actively promotes the opening up of all possible traffic and transport data with the aim of shifting the car to other forms of transport. One of the results is a holistic travel planner with metro, bus, taxi and rental bikes. A second important pillar in opening the data is that the traveller (or a service provider on behalf of the traveller) can easily and instantaneously get digital access to their own historical travel data across all mobility modes.

3. **Non-discriminatory.** All parties that are publicly funded directly or through the public space must offer their services to all independent service providers so that they can offer a journey (within 1 application). Think of share bikes that are parked in public space that need a unique app for use. These should be available to be offered via third party MaaS apps to ensure the end-to-end connectivity of all transport modes contributing to a city's mobility.

4. **Central Planning Guidance not App Building**: MaaS providers and operators must be provided with appropriate guiding principles by the public transport authority, especially with regards to pricing. The authority will have to indicate what they consider important by setting prices, releasing licenses on parking, taxis and refining rules for use. Through these guiding principles, a service provider can incentivise customers to make more appropriate choices for mobility across an entire city. In this way MaaS providers can work hand in hand with the authority, focusing on customer innovation and service excellence. Authorities can focus on ensuring the market rules offer the greatest opportunity for MaaS providers.

These four adjustments will lead to major changes in mobility. They will clear the way for parties to work in their most efficient space and lead to much better customer and mobility outcomes. Operators can focus on delivering excellent services. MaaS providers can focus on delivering excellent mobility user experience. Authorities can focus on the most efficient allocation of capital and incentivising the right public transport use for the city.

Practical Steps for Authorities and MaaS

Resistance to MaaS
It is true that transport operators (concession holders) will partially lose control of the public transport offer. There is a new relationship MaaS providers and their customers (the end users of public transport). The logo on the side of the bus becomes less relevant than the service (on the bus and on the MaaS app) which leaves each party to focus on where they can be excellent. There will be new important parties in public transport, where authorities have no contractual relationship (e.g. Uber pool ride sharing). Here authorities will miss out on usage data.

It is not surprising, therefore, that there is some resistance in the current playing field against the innovations above. We would argue however that the primary focus should be the end-user. The interests of the traveller are not discussed enough because there are too many other interests, and MaaS has the unique opportunity to address that imbalance.

What can we do right now?
Embrace and manager change. Governments will have to prepare for new markets (as they are having to do with ride share disruption). Already in a number of markets MaaS service providers are inventised to open up the market by, for example, buying large amounts of private rail subscriptions and offering them to business customers (under the Dutch travel card schemes). The pressure on the release of information is also increasing strongly. It is advisable for both authorities and operators to remain at the helm in these changing circumstances. In other words: embracing innovations and limiting their disadvantages and working in conjunction with the wider disruption markets. We have seen globally that where authorities embraced ride share disruption, they had much more 'skin in the game' than those who outlawed it.

Now is the time to start thinking about the right rules for the game.
Many governments across the world are preparing pilots for MaaS. That is useful and necessary, but not enough to really bring the MaaS to real maturity. In order to go beyond non-scalable local initiatives, the market is in need of favourable conditions. Governments need to play an active role in setting the ground rules for the systems, rather than trying to build their own apps. That's why we call on governments to do something more difficult than physical pilots, rather something that is more daring and visionary: create the right conditions and experiment with legislation, concessions and contracts. The market will respond.

Some practical ideas:

· *Public transport products and rates:* choose an example concession or operation that can be experimented with in terms of the 3rd party sale of PT products. PT will create a level playing field among MaaS providers. This would, for example, work with a new PT operating concession where a PT company can act as central network price 'director'. MaaS providers can work to dynamically adjust pricing to measure passenger volumes and behaviours. All the parties need to understand the nature of how the scheme works.

· *Sharing and selling:* undertake an experiment in which bicycle sharing systems can operate in exchange for the right to for 3rd party sales of their bicycles, that is, offer their bicycles under the same conditions via an API through all other providers. Interested MaaS providers can therefore offer these bikes to their own customers and piece them together as part of an end-to-end journey.

· *Taxi and licences:* experiment with the ability to add a taxi licence to allow access taxi services through MaaS providers. Uber already has this option. The Uber API can be called in-app by other providers, the same can be provided by 3rd party ride share or taxi providers.

· *Car-sharing and parking licence:* The same idea applies for cars: insist on additional functionality to allow for share-cars to also be called by third parties.

The above experiments ask for technical developments and a clear view on MaaS, regulation and rate freedoms. It will not be simple. But if the experiments succeed, the results will be a much higher public transport usage, much higher satisfaction and much better network efficiency.

Responsibilities for other parties

MaaS service providers must be very transparent about the way the data is processed and whether and how it is sold. This may be a prerequisite for obtaining a license to resell public transport. A guarantee of independence is probably also required to avoid providers becoming incentivised resellers (presenting one party's mode above another because of financial incentive). This independence and integrity will ensure a strong MaaS user-base.

Transport Operators will have to choose a specific path. They are very unlikely to credibly take on the role of service provider because they will struggle to offer competitors' modes credibly. They may be able to establish independent MaaS arms, focusing more on planning & ticketing solutions. However, they can also focus strongly on operating efficiency, so that a role for public transport remains. Here too, the data revolution can make an important contribution. Data-driven maintenance programs and purchasing power, for example will add to network efficiency. In addition, the carriers will have to innovate around the operating costs of different network types or areas, demand-driven, dynamic operations, mass transit versus personal transport are all important. The switch to the bicycle, the taxi, or the demand-driven public transport must become accessible. There is still a lot of work to do and transport operators will become the heart of collaboration between network planners and users.

The future of mobility

A new model for the mobility market with room for new, integrating service providers offers many opportunities. Governments can accelerate and stimulate these innovations by ensuring that governing principles are put in place to guide the market (rather than stopping it). We are confident that with the right collaboration between authorities, operators and MaaS providers, the needs to the end customer will be much better taken into account. Likewise, network efficiency will start to take a new focus across all mobility, not just mass transit.