Mobility as a Service (MaaS) for Local Authorities

CONTACT
Connected Transport Local Authority Coordination Team

Innovate UK

Jacobs

ITS Knowledge Transfer Network

ICAV International Connected Autonomous Vehicles

IET The Institution of Engineering and Technology
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This report is based on the Mobility as a Service training workshop for Local Authorities held by the Connected Transport Local Authority Coordination Team (CONTACT Group) in March 2019.

The ideas presented are based on the opinions and experiences of officers from various English and Welsh Local Authorities.

The report was consequently written and formatted by the Transport Data Initiative.
Introduction

Mobility as a Service (MaaS) offers an end to end customer experience across different modes of transport and provides seamless integration within the customer’s journey. MaaS journeys are often enabled by mobile applications, yet may not always cover the whole transport landscape of an area, for example Black Cabs in London are not covered by any form of MaaS solution.

MaaS solutions attempt to create transitions seamlessly, providing customers a better experience and allowing local authorities or businesses to develop a better understanding of a person’s transportation needs.

Mobility as a Service requires a number of areas to function. The Governance & Contractual side to MaaS needs to allow the MaaS system to operate at its fullest without being hindered or prohibited. Technology is vital for MaaS; without the relevant technology in place, MaaS can simply not function. Economics and Business Models are highly important for providers to make full use of MaaS, and therefore be able to provide it to their customers. Finally, MaaS is a fairly unknown concept to many, it is key to understand any Safety, Behavioural and/or Social Factors relating to MaaS to make sure that it is not detrimental to the community it is being introduced into.
MaaS Governance & Contractual Aspects

For many, the definition of MaaS is unclear.

- Is it a concept rather than a physical process?
- Is it data driven to provide efficient services?
- Is it a multi-modal way of providing automated transport services?
- Is there even a correct answer to this question?

Whilst an exact definition of MaaS remains unclear, or is debated upon, the success of a MaaS model can be measured. Success can be about bringing together new business models and ways in which to organise and operate the various transport options. There can be advantages for transport operators such as including access to improved user and demand information, plus new opportunities to serve unmet demand.

MaaS has the potential to be at the centre of dramatic changes in UK society going forward, closely aligning to the “as a Service” consumer solution and the share economy.

The UK is already experiencing growth of alternative smartphone enabled transportation, taking Uber as a successful example.

MaaS providers can be ranked relative to their integration and availability in the market. Reaching the higher levels makes for a more successful MaaS outcome.
What issues are there which are halting the development of the next Uber? What can be put in place to help move up the rankings?

In order to have the scale desired from the scheme, it needs to be prevalent in the current society. Politicians, both locally and nationally, are vital to the smooth running and the implementation of up and coming MaaS schemes. Their opinions need to be heard, noted and integrated into the process. Politicians can use a large deal of their influence to persuade citizens to use the scheme in the area of implementation. Once regular citizens start using it, the likelihood is that many new customers will be attracted to the scheme.

Level 4 integration has not yet been achieved. In order to complete this move, governance will play a key role. Given that MaaS is a new and rising concept, much legislations and/or local regulation may be inhibiting it. Legislation MUST keep up with the evolving technologies; hence it is vitally important that politicians get involved with MaaS both in their areas and on a national or sub-national level.

Going forward, will MaaS be more relevant for the Public or Private Sector?

- The future of transport is more public sectors driven, with technology driving how people want to travel. Local Authorities must be aware of this with the services they are implementing
- The end users are driving the whole MaaS concept, whether public or private sector
- Uber in America is starting to implement local public transport services into their product, is this something we could see in the future for the UK?
- Could Autonomous Vehicles become an extension of a person’s journey? Whilst train operators run an extensive service, door to door transportation is unusual. AVs can bridge this gap in the journey, and be provided either by local authorities or private operators.
Issues faced for MaaS implementation relating to governance and contractual matters

- **Co-Operation** – Many entities are involved in the creation of a MaaS solution, and are often a mixture of both private and public sector organisations. These organisations need to adapt to each other’s beliefs and desires.

- **Approach to Data** – Data is a key part of a MaaS solution, yet also one of the most complicated. This applies in the modern era across many technologies not just MaaS. Questions include, what data can be shared in line with numerous Data Protection Regulations? What standards are there for data? Do we all have the correct technology and interfaces to manipulate the data as we want to.

- **Governance** – As previously mentioned, governance, including legislations and regulations, are vital to both forming barriers and breaking these barriers down.

- **Security** – Security underpins a lot of MaaS, relating to data, technology and the overall security of the end users.

Local Authority cooperation with MaaS providers

- Is there any form of subsidy available?

- Negotiation and education is important, both sides need to be informed throughout and UNDERSTAND what is going on. This may mean that hiring skilled staff, or focusing on training is an important aspect going forward

- Many people are protective of their business models, but sharing can bring the best out of all organisations and lead to the overall success of the nation.

- Can DfT get involved around MaaS to work with existing players to get the ideas of collaboration out there? DfT at the current have a role that is more of guidance and having the environment in place to enable the industry to engage with each other.

Working together will allow us the opportunity to prove the benefits for the whole country, rather than for individual organisations.
MaaS Technology

MaaS will create both benefits and unintended consequences through its implementation. Understanding these is important to knowing which technologies can and cannot be implemented at particular times.

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Consequences</th>
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<tr>
<td>Improved Journey Experience</td>
<td>Increased Taxi Journeys</td>
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<td>Modal Shift</td>
<td>Congestion with Car Hire</td>
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<tr>
<td>Knowing Travellers Better</td>
<td>Limited uptake of Public Transport</td>
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“MaaS is not a technology. It is a concept for delivering transport services”.

(Khalid Nur, Principal Technologist, Connected Places Catapult)

The technology underpinning MaaS provides the services which MaaS aims to deliver, but is not MaaS in itself. It is the technology which enables, or inhibits the success of MaaS. For example: MaaS can be delivered through an app, however MaaS is not the app.
Whilst MaaS is not a technology, and is in fact a concept, it does require the underlying technology and data to function. The movement of data for the MaaS provider from the customers and transport operators can be found below. This is only enabled by the use of technology;

![Diagram showing MaaS Customer(s), MaaS Provider – Design of Service, Transport Operator(s), Asset(s) and Service(s)]
Core MaaS

Provides the platform, planning and ticketing options for the MaaS system; this offers a personal account for the user which can be accessed via app, web or even call centre to access the areas of the particular MaaS service.

Advanced MaaS

This relates to access of real time and predictive information, which is very important for both the end users and the transport operators, both to use and of course adapt the services which are provided. Incentives can help both users be attracted to using MaaS services, and also providers who would be interested in offering their services through the MaaS platform.

Integrated MaaS

Integrated MaaS is key to the customer experience, otherwise customers can only use MaaS for parts of their journeys and interoperability is limited. This could sway customers away from using MaaS if they have to undertake journeys in an “old fashion” (non MaaS) way.
The three components listed above indicate development areas for MaaS but what can MaaS provide the end users and operators in terms of journey planning, ticketing and modes of transport? How can these then be applied within the MaaS technological environment?

**MaaS Technological Applications**

In the main, we have the technology available for MaaS. Indeed of all the things required for MaaS this is probably the only thing that is prepared for the advancements in the industry. Regarding MaaS technology, it is useful for the following aspects:

- Journey Planning
- Ticketing
- Connectivity and Data
- New/Advanced modes of transport
Journey Planning

Technology plays a key role in the journey planning aspect of MaaS. Traffic management systems and 3rd party information allows for the availability of real-time data for customers and systems to plan the best journeys both in terms of time and cost. Therefore many journey planning questions can be answered by MaaS technology. For example.

- Will the bus be busy?
- Where is the train, can I wait in the waiting room, or is it worth standing on the platform?
- I’m not at the station yet, is the station itself busy?
- What platform/stop is my train/bus coming to?
- Once I’m at the station, how do I find the correct platform?

Ticketing

Gone are the days of only being able to buy tickets from the kiosk on the date and time you wanted to travel. Not only can tickets be bought days or even months in advance, the availability of ticketing is through the roof. Whether purchasing online or at a station, train tickets for example can be picked up or used across thousands of stations nationwide. These ideas are fundamental to the ticketing side of MaaS and are important to be considered when building a fully mobile MaaS system.

- Ticketing infrastructure is vast, being able to purchase tickets online or at local stations that are NOT limited to local stations and/or routes
- INTEROPERABILITY is VITAL for MaaS to succeed, if you are limited to a certain provider, mode of transport, or geographical location then what is the point in going through the MaaS software, one may as well buy one’s ticket as normal on the bus or train etc.

Connectivity

Being connected is key for MaaS, a system that is hard to access fully when offline, given the amount of data, and real time data at that, passing through at any one point in time. MaaS provides even more fuel for the fire for improvements to the UK’s mobile networks and fixed connectivity.

- Mobile phone coverage availability is highly relevant, boosting to 3G and 4G in some areas, and also fuelling the need for 5G developments in the near future
- Will MaaS be able to improve the business case for 99%-100% coverage across the UK?
Data

Without Data, MaaS is essentially the app on a person’s phone rarely ever used, as it serves little purpose without data backing it up. In recent years, data protection can strike fear into people, with concerns about sharing their data and using others data, but fundamentally, if providers can work out a data model which is successful and accessible then MaaS has the potential to succeed. Some questions to be answered include

- Which data can be shared or opened?
- What format does data need to be in to make it accessible to as many as possible?
- What is the cost of using data?

New Transport Modes

MaaS can allow for the development of new transport modes which have not been made popular yet in the UK. Whilst there are some in the pipeline already, who knows what MaaS will be able to enable once it has been fully implemented? But.

- Is the environment ready for new types of transport technology? Will the infrastructure be able to cope with new advancements and enhancements?
- Certain transport that could be developed include;
  - E-Scooters
  - Ride Sharing
  - Connected and Autonomous Vehicles
MaaS Economics & Business Models

This section is aided by the Case Study of Whim (MaaS Global) in Helsinki and Birmingham

For MaaS, the realisation of a sustainable business model is key. MaaS provides an additional transport service layer that needs to be monitored, and notably, paid for:

- The user: can pay for the convenience of using MaaS, but how much are they charged and how much are they prepared to pay?
- The transport operator: has very tight profit margins in order to make MaaS a business it is not a charity
- The Local Authority: has very limited budgets to help aid with the development of MaaS
- Could there be room for subsidies and an improved procurement process?

A successful MaaS service brings new business models and ways of organising and operating the various transport options which are available to the customer. There needs to be advantages for the transport operators whilst also maintaining or developing improved user experience and demand information to aid the new opportunities for the unmet demand. MaaS looks for alternatives to the private car, which can be as convenient, more sustainable, reduce congestion and can even be cheaper.
The Whim Business Model in Helsinki and Birmingham

Whim’s Launch in Helsinki

Whim’s full commercial launch occurred in December of 2017, based in Helsinki, Finland, offering three packages for users to take their pick.

- **Whim to Go (Pay as you go) - 0€ per month**
  - Allows the user a no commitment option
  - Whim is a brand that they may never have heard of and providing a no commitment way in encourages them into the brand
- **Whim Urban - 49€ per month**
  - For those regular travellers who could use the flexibility of a taxi or car occasionally
  - Allows access to all public transport, with taxis and car shares at better rates than without Whim
- **Whim Unlimited – 499€ per month**
  - This is the “modern alternative to owning a car”.
  - Pricing is based upon the cost of owning a car
  - Through Whim Unlimited you get unlimited access to public transport, taxi or car hire, according and adaptive to your daily needs

After the launch of the new Whim packages in Helsinki in December 2017, more than 20,000 Whim downloads were seen in the first three weeks, To date this now sits at around 80,000. Most of the Whim downloads saw users register as pay as you go subscribers.

As for the “packages”, the Urban Package (49€/month) has been the most popular package with approximately 8000 subscribers, whilst the Unlimited Package (499€) was less popular, it did however have subscriptions that were made at the time of launch.

Bringing Whim to the UK: Birmingham

Whim launched a beta test in Birmingham, working with partners such as Transport for West Midlands, in order to penetrate the market. Unlike Helsinki where there was a requirement for business to work with Whim, they switched to a partnership model with no contracts or subsidies.

Subscription services in Birmingham offered were very similar to those in Helsinki, pay as you go is still available, and the urban package comes in at £99 per month for taxis and public transport, with the unlimited package priced at £349 for full transport access.

Whim’s ‘Unlimited’ package in Birmingham was later pulled from the market due to problems with registered taxi operators. MaaS Global felt that they could not offer a
subscription of £349 per month for transport that did not satisfy their customers. MaaS Global openly takes all commercial risk for providing transport and when looking to sell the apps into local transport authorities, the service needs to be able to provide exactly what the customer is expecting.

Is there a market for Whim/MaaS services across the UK?

When speaking to Chris Perry from MaaS Global, it is apparent that Whim would of course want to establish a presence across other areas of the UK.

- The pay as you go aspect of Whim is something which would be great to have across the entirety of the UK – it allows a subscription with no commitment which a lot of users look for
- For now there needs to be a development in functionality to allow Whim as you go to be available in all areas
- The biggest challenge across other areas of the UK is that transport providers such as Taxi companies are very localised so not only integrating them into Whim, but involving all different companies together can be a very difficult task
- Whim is already national with the car hire operators registered to Whim; this is not contained to Birmingham alone.
- In the future, co-branding and co-licensing are key to success
- Whim need to be aware of the big brands taking ownership over MaaS solutions, for example the case of Uber in London

In order to fulfil Whim’s, and other MaaS provider’s hopes of infiltrating the UK market, it is likely that there will be a need for incentives for business to be on board with the solution. Whether this be through subsidy, legislation, or using local governments/DfT to facilitate change, it is fairly clear that changes will be required.

In more rural environments, it is more difficult to disrupt the major transport providers who are already well established within the area. In this way the urban centres can drive change patterns and develops business models to help aid the rural areas in their developments.
Safety, Behaviour & Social Factors of MaaS

MaaS solutions require not only a large deal of legislation, technology and creative business models to be successful, it is also vitally important to be aware of any safety, behavioural and societal factors which in any way could have an impact on MaaS.

MaaS can deliver both Safety Benefits, and also Safety Risks to the same set of people in contact with MaaS;

- Safety of the Users
- Safety of Others

From a safety perspective, the main focuses need to be both personal safety and road safety. Safety can be dependent on the people a user shares a vehicle with or the vehicles and transport modes themselves. Vulnerable passengers need confidence that transport is not only going to be available and on time but also safe.

There can be a great deal of anonymity when using public transport, both for drivers and passengers, one assumes safety from commercial operators, yet there is nothing stopping dangerous individuals stepping onto buses. Safeguarding plays an important role within MaaS, needing to make sure those passengers and drivers are safe in the services provided.

- Should there be safeguarding training for drivers?
- MaaS needs to be aware of a person’s needs, i.e. sending an accessible vehicle for passengers using wheelchairs or similar
Local authorities already play a key role in the safeguarding of vulnerable passengers on current modes of transport. This cannot differ for MaaS solutions, the transport service provided is the same, and so safeguarding is vital, not looked over because the transport is accessed differently, via an app for example.

Problems can arise due to the complex natures of local government structures across the UK. Some Local Authorities have been found to issue a higher number of taxi licenses than there are taxis. Once a taxi license has been issued, they are then not limited to only working within that area. What is stopping those banned from driving in certain areas, from getting a license from another authority? There needs to be close collaboration between local authorities to perhaps create a framework of those banned, and keep them off the roads not only in their area, but across the whole country.

Social Benefits

MaaS can create a number of benefits for society. Opening up transport to more people allows those who may not have used public transport in the past, for example due to the lack of provision in rural areas, the opportunity to travel and interact more with other areas of their community.

Low-Income households can look to improve their job opportunities and income directly from the services provided by MaaS. Hopefully MaaS would be able to deliver 24/7 transport for those night shifts, or even just lengthening the operating day to allow for different types of work.

Increased use of public transport would incorporate a decline in the number of cars on the road at any one time, which in turn helps to reduce traffic congestion and hopefully increase air quality, especially in urban and suburban areas where cars are used for even the shortest of journeys.

Some companies and organisations are now incorporating some form of MaaS, or reduced car use within their workforce. Employees at Jacobs are limited to claiming 100 miles per day for car use when on Business. They are encouraged to only use cars for part of their journeys, and incentivised to using public transport where possible.

MaaS can also indirectly benefit residents who may not be using the solution, but those around them are. Social care is vital to the everyday running of society; using MaaS can allow us to move towards more people being looked after in their own homes. People who cannot make trips easily themselves can be supported by a mobile workforce of health care workers who can use MaaS to travel to where they need to be, and at times of demand rather than times of frequency of transportation i.e. bus times.
Social Concerns

MaaS’ future implementation can raise concerns along with its major benefits particularly those relating to the society of an area.

MaaS is often labelled as the alternative to the personal car, eventually trying to reduce car ownership in favour for an increased use across public transport and private hire industries. As before mentioned, this can help to not only reduce congestion but in theory have effect in increasing air quality once we move to more environmentally friendly methods of transport and ride sharing.

However, whilst for many individuals, swapping their car for a bike, train, taxi or bus is a highly cost effective method of transport from A to B, for those such as families, it is arguable as to whether or not MaaS is the correct approach. A family’s need for a car to transport say 4-5 people to different locations in one trip such as school and work places, can then seem counter intuitive to swap the car for a means of transport which is likely to end up succeeding the car in terms of cost, but may not be as feasible for routes of travel. Parents are unlikely to let primary school children ride a bus by themselves, but happy to drive out of their own way to work or other schools in order to ensure the safe arrival of their child.

Data

Safety is not only limited to aspects of physical safety. Safety is also extremely important when talking in terms of data, especially when it is likely MaaS could hold personal information such as names, addresses, workplaces and payment methods.

Taking Uber as an example, are people happy to be giving off personal information on a regular basis. In theory, when a person previously travelled to and from work via their own personal car, and move towards Uber or other forms of Taxi/Bus Service through a MaaS solution they provide regular information of the pickup points, and route of travel. Whilst its unlikely that this data will be released, the fact remains that a person’s home address and work address could be available for those it is not intended for.

As with any technological solutions, questions arise regarding how long until a hacking scenario is presented. Even the world’s largest corporations with designated data security teams can be subject to hacking, remember the NHS. Users want MaaS to run through one app for efficiency, and yet if that app’s software is compromised, a multitude of personal data can be released.
Conclusion

MaaS is a truly complex up and upcoming concept. It involves many areas from Governance and Contractual issues, to relevant MaaS Technologies, Economics and Business Models to help facilitate MaaS, and finally the Safety and Societal impacts that MaaS can have.

Whilst this report focuses on the key findings from a small group of Local Authority officers, results are clear. Going forward collaboration is key to implementing MaaS, the technology is there but being able to access it is a different ball game.

Creating relevant business models to allow MaaS innovation, and being able to introduce said business models through our legislative frameworks, will help MaaS to thrive, rather than being just a technology waiting to be used. MaaS will then help Local Authorities to focus on the safety and social impact for their residents, if they have not done so already.

At this point in time, MaaS has the potential to develop into our everyday lives, and it will be something Local Authorities will be at the heart of, along with other members of the public and private sector. Soon, we will be able to understand whether the potential of MaaS is truly revealed.
Transport Data Initiative

The Transport Data Initiative is led by local authorities who believe that improving the way we collect, store, and use data will help us deliver improved transport services while reducing costs of delivery. Founded by a consortium of local authorities led by Buckinghamshire County Council in 2016, the TDI has fast established itself as a major player in UK transport, with representatives from over 40 different transport authorities, covering 85% of the UK population, having attended at least one of our forum meetings to date.

Supported by an extensive network of transport specialists from the wider public sector and industry, we enable local authorities of all sizes and budgets to benefit from innovative solutions traditionally reserved for large urban centres. With our uncompromising focus on the common transport challenges faced by all local authorities, we facilitate deep and targeted collaboration across the sector, by helping solution providers design services which meet the unique requirements of local authorities and improving awareness within local authorities of the capacities of the wider marketplace.

For more information about the Transport Data Initiative you can access our website by clicking here.

The Transport Data Initiative is proud to be sponsored by InnovateUK, details for whom can be found by clicking here.