

# Unlocking the next level of MaaS

Advanced technical functionalities are already available to support a One-Stop-Shop for Mobility as a Service, offering a viable multi-modal alternative to private car use, but greater collaboration and regulatory reform are needed to harness the opportunities.

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In recent years, Mobility as a Service has begun to redefine the way in which players in the mobility market interact. True MaaS is much more than just an app; it is a multi-faceted ecosystem of different stakeholders, collaborating to offer flexible and efficient day-to-day travel, ensuring a sustainable future for both urban and rural transport.

The concept is infinitely adaptable and scalable, based on the needs of providers and operators. But the main focus of MaaS must be on the travellers, and giving them seamless mobility, independent of the mode(s) of transport, with minimal effort and maximum comfort. The primary objective is to provide an alternative to car ownership that is as convenient but more sustainable, while delivering a higher passenger capacity than private vehicles.

Modal shift from private cars to public transport and shared mobility services brings many benefits for cities and their residents, notably reduced road congestion and lower greenhouse gas emissions.

## Moving beyond the status quo

MaaS is a comparative newcomer in the long history of travel and transport. The concept was first mentioned at the European Congress on Intelligent Transport Systems in 2014, when it was defined as 'a mobility distribution model in which a customer's major transportation needs are met over one interface'. In less than a decade, MaaS has evolved from a theoretical concept



to a broad spectrum of applications. These operate on different levels, from providing basic information about routes and available transport options to more advanced models incorporating booking and payment services.

Even though they offer many different functionalities, most MaaS applications are not yet able to deliver the same level of convenience as owning and using a private car. If we are to create a holistic experience for both users and providers, we have to unlock the next level of MaaS. But what exactly does that mean? And how can it be achieved?

In an ideal (MaaS) world, travellers would no longer be dependent on fixed schedules and timetables, or have to choose between public and private transport options. Instead, they would be able to plan, book, pay and make

*Bringing together planning, payment and real-time information for multiple modes will help public transport to match the convenience and flexibility of the private car.*

any journey from origin to ultimate destination based on their individual requirements and expectations. Combining public transport with shared mobility services has to become more convenient, time-efficient and comfortable if it is to match the flexibility of a private car.

Most current applications either offer information-only services or selected deep integrations. But more and more transport operators that already have their own MaaS system or want to enter the market are asking for non-fragmented concepts allowing users to plan and book multi-modal trips within a one-stop-shop.

Existing MaaS solutions have different levels of maturity, but it is important to note that none of these levels should be considered 'better' than another; the individual deployment needs to be



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based on the target group as well as the operator's objectives. However, the higher the level of integration, the lower the cognitive effort required from the user, leading to a more convenient customer experience overall.

## Unlocking the next level

To deliver an even smoother user experience, multi-modal trip planning has to be combined with multi-modal booking and payment functionality in a single app and within one account. A one-stop-shop must connect all modes, not only for trip planning purposes, but also to allow users to manage, book and pay for their entire trip in a single transaction. This needs to be the basis for future business models, such as subscriptions, season tickets or travel budget accounts, which are suitable for either the B2B or B2C sectors.

To provide a seamless experience in the booking and payment process, this next level of MaaS requires full integration between planning and booking. Otherwise it would simply remain a multimodal aggregator, forcing the user to consciously interact with a third-party provider to finalise their payment(s). MaaS needs to evolve in terms of both the depth and range of integration provided.

Deep integrations allow users to manage the planning and booking of a specific service via an Application Programming Interface. But at present they come with high technical and organisational overheads, due to the lack of established standards. The deeper the integration, the higher the effort required.

Since MaaS, by definition, is a concept covering a broad spectrum of different services, we need to establish a way to facilitate this effort and reduce both the technical and organisational overheads.

Partnerships between service and technology providers are a way to strengthen co-operation and exchange experience, reinforcing collaboration and speeding up the integration process.

The standardisation of interfaces would further reduce the integration

effort required for each application, and simplify the combination of mobility services into comprehensive MaaS solutions. Service providers, developers and technology suppliers need to work together to foster a mutually beneficial ecosystem.

## Shopping cart functionality

Full integration is an important contributor to delivering an appealing user experience. But to make the booking process even more seamless and reduce the level of user interaction required, individual mobility products need to be connected more closely. And perhaps the simplest tool for this is the humble shopping cart.

Long known in e-commerce, shopping cart functionality is rarely used in the mobility space today. It would enable users to collectively manage their bookings and ticket purchases for an entire trip in one go, avoiding the need to process them sequentially, one-by-one. This would facilitate ticket purchase and the booking of connected mobility services from multiple third parties, and allow the MaaS operator to bring onboard any number of service providers. It would increase convenience and usability for the user, who would no longer have to deal with multiple interfaces, but could seamlessly choose,

manage and track all modes and their respective tickets in a single app with one account.

## Data analysis

Underpinning this next level of MaaS will be data — a vitally important element. Within MaaS ecosystems, huge amounts of data are generated, processed and stored. This covers all of the transport modes (schedules, real-time vehicle location, availability, etc), and infrastructure (congestion, parking spaces, charging spots), as well as individual and aggregated information about passenger journeys. Analysing all of this data is the basis for optimising and enhancing operations as well as ensuring the overall quality of service.

So it is essential for MaaS operators and service providers to be able to access and use this data appropriately. That will ensure that user behaviour can be evaluated and understood correctly, in order to enable the development of even more advanced functionalities, such as predicting future demand, identifying necessary process improvements and providing real-time travel assistance.

Data from multiple sources can also be combined with external data (holiday periods, special events, traffic control systems, etc) to generate further valuable insights. This could include delay analysis, assessment of first and last mile connectivity, and reviewing the quality of interchanges and connections.

## Intelligent travel companion

Thanks to smarter use of data, what starts out as an advanced MaaS application will more and more become an 'intelligent travel companion'. Individual users will be alerted automatically about possible disruptions to their journey and receive extensive

*Shared mobility options such as bicycles and electric scooters provide attractive first and last mile access to rail, metro and tram services in major cities.*



support in the event of a rerouting. They will be able to benefit from tailor-made suggestions that match their personal mobility behaviour.

Using Artificial Intelligence, the application will be able to 'learn' each users' habits, preferences and daily routines, allowing it to serve as a proactive assistant for any trip with minimal intervention. In the long run, this travel companion may also be able to connect and interact with non-mobility products.

## Practical examples

These advanced functionalities are not just theoretical, but are starting to become reality. Through its various subsidiaries such as Hacon, eos.uptrade, Bytemark and Padam, Siemens Mobility Software has been working on a range of use cases which demonstrate different approaches to implementing these functionalities.

A good example of the step-by-step approach is the path that was chosen by Rhein-Main-Verkehrsverbund, covering the greater Frankfurt region in Germany. This began with the implementation of a trip planner, which was then enhanced with deep linking functionalities to offer app users multi-modal travel options. Deep integrations followed, topped with the introduction of a full shopping cart functionality to complete a one-stop-shop.

Going 'all in' from the start and building a top-notch solution is also possible. This approach has been adopted by Spanish national rail operator RENFE for the development of its countrywide MaaS platform. This will include a trip planner, deep integration of all mobility service providers and a shopping cart functionality as well as offering incentives for frequent users and car-free travellers.

In the corporate sector, Deutsche Telekom is developing a MaaS app for its own employees as a first step. Longer-term options include extending its geographical reach and potentially opening up the system to the wider public. According to Carsten Schröder, Head of Future Mobility at Telekom Mobility Solutions, 'corporates will influence employee commutes to meet environmental, social and governance targets. MaaS is a profound way to offer shared mobility for all, and the next logical step on our way to secure the future of mobility.'

A prominent example of an open platform approach can be found in the Rivier project in the Netherlands. Here, Siemens Mobility Software is building a nationwide MaaS platform for a consortium of local authorities and



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transport providers, on which multiple apps can be built that offer different levels of integration and service volumes to meet individual providers' requirements.

All of these implementation examples show that MaaS is a constantly growing and expanding concept. It is influencing the lives of more and more people every day, and getting closer towards the ultimate goal of providing a level of convenience that is as good as or better than that of private transport.

## The functionality is ready

From a technical perspective, the functionalities needed to unlock the next level of MaaS are now available in the market and ready to be deployed on a large scale. But it will take effort from all of the stakeholders jointly to create MaaS solutions that are not simply mobility aggregators but valuable assistants accompanying the traveller.

Public authorities will have to provide and actively push the regulations and frameworks that enable data exchange, fare alignment and standardisation, as well as providing incentives for the travelling public to make more use of public transport and mobility services. That was borne out by the experience of Bolt, a global provider of ride-hailing, shared cars and scooters, which confirmed through its own observations that 'if shared scooter numbers were capped by local regulation, the shift in mobility habits was consistently weaker.'

Mobility service and MaaS providers need to continue enhancing and extending their partnerships, and collaborate closely to grow and shape the market. MaaS is not about

*Public authorities, operators and developers need to co-operate in delivering the next generation of MaaS applications, bringing together proven functionalities.*

competition and forming a cartel or monopoly; it is all about forming a strong alliance that can jointly provide more sustainable, efficient and comfortable travel for the future.

We need to reach the stage where users no longer need to think about tariffs and connectivity or use a variety of apps, but can plan, book, pay and ride in one go. Only then will multi-modal travel untie the close bond that many riders have with their private cars, leading to a more sustainable future overall.

The next mobility revolution is already in full swing. Rapid urbanisation, societal sustainability goals and the continuously growing demand for mobility services in cities mean experts are predicting a near-tenfold increase in the size of the market in less than a decade. MaaS is ready to take on the private car. The key is to take the first steps now, and start to unlock the next level — for MaaS, for the transport market and for society overall. 🌱

[www.mobility.siemens.com/global/en/portfolio/intermodal/mobility-marketplace](http://www.mobility.siemens.com/global/en/portfolio/intermodal/mobility-marketplace)

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