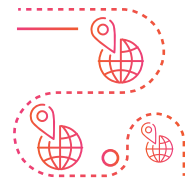




## Mobility as a Service (MaaS): Driving Sustainable Transportation

WHITE PAPER

### Abstract



Mobility-as-a-Service (MaaS) has a significant role to play in building smart cities of the future by improving the overall efficiency of the transport system and reducing reliance on private vehicles. This is crucial to manage congestion, reduce pollution and mitigate CO<sub>2</sub> emissions while tapping into society's growing needs for personalization, immediacy and convenience. The global mobility as a service market size is projected to reach \$70.4 billion by 2030, from an estimated \$4.7 billion in 2020, at a CAGR of 31.1%<sup>1</sup>. This is clearly an exciting opportunity to accelerate MaaS adoption as it provides consumers with integrated, flexible, efficient and user-oriented mobility services – a shift from personal ownership of individual motorized transportation modes and non-integrated means of transportation to integrated multimodal mobility solutions consumed as services. This paves the way for creating a seamless combined mobility ecosystem centered on individual needs, enabling improved quality and convenience in travelling while enhancing transportation networks and reducing traffic congestion and environmental impact. This will help to meet safety requirements as we try to overcome the disruptions caused by the global pandemic. More importantly, it will reduce mobility cost, improve revenue growth and enhance environment sustainability.

This paper showcases how key stakeholders in the MaaS ecosystem can collaborate and combine services to increase accessibility to a newer, greener and sustainable transportation model that enhances public satisfaction and drives revenue growth.

[1] <https://www.marketsandmarkets.com/Market-Reports/mobility-as-a-service-market-78519888.html>, Published on Aug 2020, Accessed on 21, Jan 2021

# Switching Gears to MaaS: The Need for an Integrated Digital Platform

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As the urban population grows exponentially, substantial investments are underway for enhancing mass transport systems such as metro and rapid bus transit. However, adding new infrastructure is not only costly but also time intensive. In addition, under the traditional model, it is also difficult to realize the projected ridership and revenues due to lack of insights into fare collection, information dissemination and on-board ticketing as different transport operators use their own systems to measure data on these elements. MaaS, on the other hand, aggregates all operators on a single platform for enhancing their reach of customer base. Here, the data is managed through a centralized location based on contracts amongst participating operators which eventually helps in bringing down their operating costs. In addition, integrating multimodal transport services is a challenge given the lack of connectivity between different modes of transit, inability to manage unexpected delays, high transfer time and inadequate personal safety. How can transport service providers elevate traveler experience while boosting revenues?

Technology enabled door-to-door, multimodal travel that encompasses pre-trip, in-trip and post-trip services is key to improving commuter journey and experience. An integrated digital platform that acts as a gateway enables personalized access to multiple transport modes and services, owned and operated by different mobility service providers. Such a platform can support single payment options across various modes of transport as well as first and last mile capabilities, creating a seamless travel experience based on individual commuter preferences and needs (see Fig. 1). For example, an intercity rail service provider in Netherlands is planning to integrate their core rail services with bicycle renting and parking services for enhancing last mile traveler connectivity and providing seamless door-to-door service in a reliable and environment friendly manner. Similarly, transport for West Midlands and Whim in UK provides transport packages tailored to individual needs across different modes of public transport including buses, trams, taxis and hire cars. Offered either as part of a monthly fee or on a pay-as-you-go model, these packages enhance end user experience by integrating access to multiple public transport options through a single platform, similar to the convenience levels of privately owned vehicles.

- 1. Plan:** Plan multimodal trips
- 2. Book:** Choose between travel options and initiate the booking transaction process
- 3. Pay:** Purchase via electronic ticketing
- 4. Reconcile:** Reconcile purchases and disburse funds

*Figure 1: Capabilities of an integrated digital platform underpinning MaaS*

# Moving into the Fast Lane: Creating an Open Mobility Ecosystem of Interconnected Participants

As MaaS is a data-driven and user-centric paradigm, it requires access to open source and high quality data in a standard format, enabling all market participants to engage in the ecosystem and promote their offering. It will not exclude specific modes or operators such as a particular car-sharing fleet or a specific taxi company, but instead mediates between the different market segments. The MaaS solution framework (see Fig. 2) will offer the following functionalities:

1. Collect real-time data from various operators on diverse transportation networks.
2. Plan intermodal routes which take into account real-time travel conditions, current availability of shared services and user preferences, so as to enable people to make well-informed, rational travel decisions.
3. Enable booking, reservation and purchase of MaaS partner services, whether public transport, taxis, or parking spaces, thereby lowering the barrier to access.
4. Process electronic tickets and provide them securely to the traveler, possibly supported by the integration of convenient hands-free ticketing technologies.
5. Administer partner accounts and manage service offerings and requests between partners.
6. Support a discreet and intelligent travel companion in future which feeds travelers with context- and location-sensitive intelligence, through the use of intelligently placed beacons or geo-sensing technologies interacting with the back-office platform.

In addition, a successful MaaS model also requires each stakeholder to have an equally important part to play in the overall development of this new ecosystem. It is crucial that all stakeholders are in mutual agreement while defining policies and future business models.



Figure 2: MaaS Solution Framework

The legislation should consider use of public transit where different mobility partners can come together to provide their offerings through a single digital platform, enabling end-users to interact with MaaS service providers/operators through a user interface such as smartphone. As stakeholder roles evolve, it will be crucial to achieve the following set of individual objectives:

- Public transit agencies (PTAs) can enrich the commuting experience by delivering solutions geared towards enabling disruption management, improving accessibility for the disabled and enhancing crowd control.
- Similarly, cities and government can reduce carbon emissions and congestion for their constituents through a rich selection of transport service providers (TSPs), including MaaS, connected automated vehicles (CAVs), electric vehicles (EVs) and demand responsive transport (DRT).
- In addition, corporates can monetize MaaS by reducing the use of private vehicles and providing alternate travel options while car parking spaces can be repurposed into revenue generating facilities or retail shops and cafés to add value across the commuter journey.

At the same time, mobility providers must aim to change citizen behavior and accelerate adoption of more sustainable travel modes that reduce vehicle ownership by successfully deploying MaaS solutions that offer the same flexibility and convenience as in personal vehicle, while improving business outcomes.

## Navigating MaaS Transit: The Road Ahead

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With changing mobility demands, MaaS offers a paradigm shift from personal vehicle usage to a combined public, personal and shared mobility model that optimizes outcomes for both cities as well as their citizens. Major cities around the world such as Paris, Helsinki, Los Angeles and Singapore have already piloted some form of MaaS. Singapore, for instance, defined its 15-Minute City concept in 2019 as part of its Land Transport Master Plan 2040<sup>2</sup>, whereas a third of US citizens are already using ride hailing services.<sup>3</sup> Cities can also implement MaaS to help commuters get around safely by offering personalized access to multiple transport modes and services, owned and operated by mobility service providers incorporating social distancing. As an example, mobility aggregator apps enable users to plan journeys with a wide variety of transport modes and to prioritize routes that fit social distancing requirements.

Given the multiple stakeholders in the MaaS ecosystem, accelerating adoption requires deep collaboration. Building alliances and forums that share information and best practices around consumer, technical, legal and safety issues can help players quickly overcome roadblocks, spur innovation, and fast track success.

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[2] <https://www.intelligenttransport.com/transport-articles/116047/mobility-trends-2021/>, Published on 26 Jan 2021, Accessed on 17 Feb 2021

[3] <https://www.pewresearch.org/fact-tank/2019/01/04/more-americans-are-using-ride-hailing-apps/>, Published on 4 Jan 2019, Accessed on 17 Feb 2021

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