

ADVERTORIAL

Changing the way you travel with Mobility-as-a-Service

Mobility-as-a-Service is a subscription-based service that offers a seamless combination of transport modes to meet commuters' end-to-end travel needs based on their preferences or other criteria

The future is becoming increasingly digitally-driven, as companies like Amazon, Uber and Airbnb disrupt the industries they are in, by redesigning services to deliver new efficiencies into marketplaces and ultimately redefining industries and business models.

The Republic supports a population of more than five million with a land area of just 716 square km and like any developed country, one of the most pressing problems is transportation. Technology will play a crucial role in changing the transport landscape and offering an opportunity to redesign the way we commute and how transport services are provided.

In 2014, the Land Transport Authority (LTA) and Intelligent Transportation Society of Singapore (ITSS), of which NCS is a member, jointly developed the Smart Mobility 2030 Plan which outlines the way forward for a car-lite and more connected and interactive land transport community.

Applications or services that can take advantage of ubiquitous smart devices such as mobile phones and tablets, On-Board Units (OBUs) in vehicles and Internet of Things (IoT) sensors deployed in buildings or along the streets will become important communication channels amongst travellers, transport operators and roadside infrastructure.

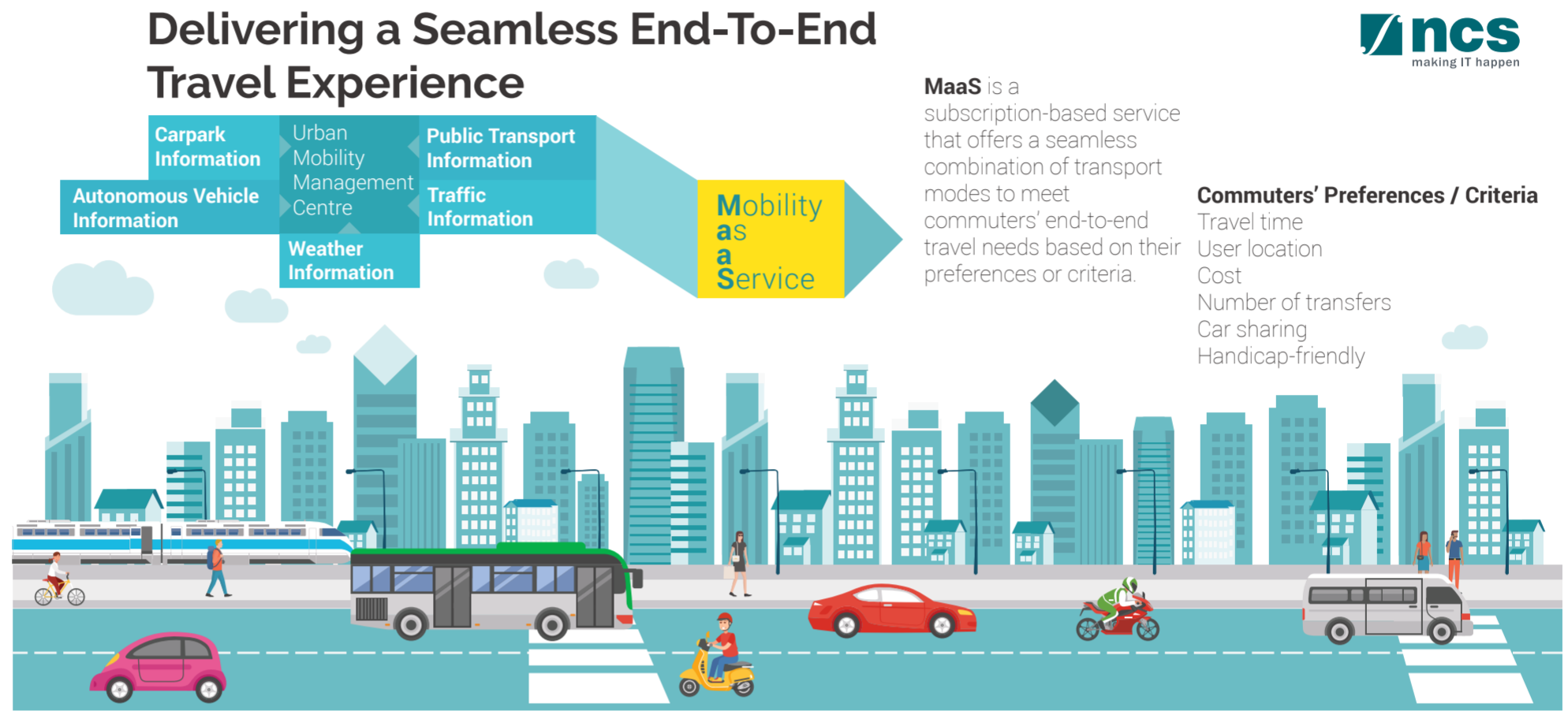
Currently, there are many journey planning and navigation applications available to commuters and road users, and many other location-based applications to assist users with their transportation needs. However, these are typically quite disparate and lack a holistic view of the entire journey.

Hence, commuters and road users still need to make concerted effort to plan their journey end-to-end and navigate the complexity of the transport system. The key would be to aggregate and integrate information from various transport systems and services including traffic data shared by the authorities or operators, and weather information, into a unified mobility management platform that then enables Mobility-as-a-Service (MaaS) to evolve towards a fully integrated transport service.

MaaS as a disruptive force in providing transport services

MaaS is a subscription-based service that will enable a commuter to meet his or her daily transport needs by effective matching of transport supply with demand. This supply is the amalgamation of all modes of transport into seamless trip chains, with bookings and payments managed collectively for all segments of a trip.

With MaaS, aggregated transport information



MaaS is a subscription-based service that offers a seamless combination of transport modes to meet commuters' end-to-end travel needs based on their preferences or criteria.

- Commuters' Preferences / Criteria**
- Travel time
 - User location
 - Cost
 - Number of transfers
 - Car sharing
 - Handicap-friendly



will be used to propose the most efficient end-to-end journey for commuters, based on their preferences and criteria. It provides transport as a flexible, personalised, on-demand service that integrates all forms of mobility and presents them to users in an integrated manner to enable them to get to their destination as easily as possible, meeting quality of service expectations.

In a typical scenario, a commuter would first need to subscribe to MaaS through a transport service provider. The traveller will have to select from a choice of transport packages based on his or her budget and travel preferences, with a monthly subscription fee. The registration process will require the traveller to provide details such as the preferred transport modes, any special mobility requirements, payment modes and other preferences or criteria.

What makes MaaS attractive is the assurance of convenient and seamless transfers to different transport modes during the journey. This may require some physical changes to existing transport nodes such as provision of sheltered walkways, sheltered waiting areas, appropriate signage to guide travellers to the transfer points, and routing to ensure the shortest walking dis-

tance at the transfer nodes, and autonomous vehicles facilities.

MaaS by itself is not an entirely new concept. MaaS initiatives are being tested in many cities and countries around the world, such as Vienna in Austria, Hannover and other places in Germany, and in Helsinki in Finland. In all the cases, the objective is door-to-door transportation and a car-lite society.

According to analysts, one of major advantages of the MaaS model is that it does not focus on adding new vehicles on the road or in operating a transportation node, like buses or trains. The premise of the model is that it aggregates the current transportation services and increases productivity of these sectors by optimising usage through smarter ways of matching demand with capacity in time and in place. In this way, MaaS gives the end-user an efficient door-to-door transportation option.

MaaS is a disruptive force that presents a paradigm change in how transport is managed, provided and consumed. It is enabled by the ubiquity of multiple technologies such as wireless broadband, smart devices as interfaces, location-based services and connected vehicles. The role of data and information will be central as

transport data, data infrastructure and physical transport infrastructure will all serve to underpin MaaS.

Big data analytics can provide real-time information to commuters to indicate whether trains or buses are on time and if there is road congestion that may impact their journey by increasing journey time or its variability. Integrating data such as live weather information can help provide new services both to customers and to transport providers to help predict and manage network disruption more effectively. This will help the transport sector to provide more integrated and customer-focused services.

The implementation of MaaS will necessitate a multi-modal journey planner, physical changes to existing transfer nodes and an urban mobility management centre. It will require detailed engagement with the transport operators to understand their concerns, and to secure their acceptance and participation.

Equally importantly, commuters need to be informed about the benefits of MaaS so that they become stakeholders in its successful implementation. It would be necessary to understand the concerns of the consumers and gauge their willingness to pay for such a service.

“MaaS transforms the way we can help transport service providers make use of data to effectively match commuters' travel demand with supply.

MaaS presents the best combination of transport modes, based on commuters' budget and preferences, to get them from their point of origin to their destination without the hassle of journey planning.”

Eddie Lim,
Transport Practice Lead, NCS



MaaS takes the availability of transport information to the next level; where commuters can subscribe to a needs-based transport service that brings commuters on a seamless end-to-end journey from point to point at a fixed-rate subscription fee. PHOTO: ISTOCK

MaaS explained

Andrew Pickford is a leading management consultant and Director of Infrastructure and Transport Advisory Services of MVA, represented in Singapore by Systra MVA Singapore Pte Ltd, which is focused on the design and practical application of Intelligent Transport Systems to road infrastructure to help deliver optimal policy outcomes. He shares his insights on MaaS with us.

CITIES are facing a myriad of challenges. They need to enable economic development, plan for the urbanisation of population growth and at the same time provide a transportation system that meets mobility demands for all stakeholders. Sustainability will depend on it.

Congestion reduces network efficiency, it extends journey times, increases uncertainty of arrival times, and harms the economic well-being of individuals and businesses.

Singapore's Smart Nation goal aims to use technology and contemporary management practices to improve the well-being and lives of a broad range of stakeholders in Singapore. As a critical component of any liveable city, efficient high quality transportation is accepted as a given. However, just because a transportation network is comprehensive, it does not necessarily mean that it is integrated although Singapore continues to invest significantly in the network.

The advances in Information Communications Technology (ICT) has empowered citizens to easily commute throughout their city using a variety of new mobility services that depend on vehicle and ride resource sharing – including bicycle sharing, he notes.

Improved traffic sensors, location-based services, data analytics, common payment systems, and the planned introduction of the next-generation Electronic Road Pricing (ERP) system will further improve visibility of Singapore's transport network performance that can help with short- and long-term transport capacity provisioning that will underpin MaaS.

While a growing number of travellers will be using new mobility services, it is important to recognise the opportunity to optimise and manage the transport infrastructure and enable the use of a combination of different transport modes to meet their growing mobility needs. MaaS is a way forward to make the multimodal transport travel attractive, efficient and convenient to use.

“ Congestion reduces network efficiency, it extends journey times, increases uncertainty of arrival times, and harms the economic well-being of individuals and businesses. ”

Andrew Pickford, Director of Infrastructure and Transport Advisory Services of MVA, represented in Singapore by Systra MVA Singapore Pte Ltd

MaaS also aims to satisfy the “first mile” and “last mile” demand, as part of the multi-modal trip-building service provided by the Mobility Operator (MO). For some users, it will provide an alternative to the private car since the MO has an improved view of user demands before and during a trip, which means that the opportunities for shared local services become more cost-effective.

MaaS is a new paradigm for the delivery of transport services and for commuters and ad-hoc trips that involve interchanges amongst modes, it would mean that the complexities of planning or managing delays during a trip would be subcontracted to one's own personal mobility services provider, the MO.

For example, if a user is delayed during a trip, then the MO would be able to notify downstream service providers. Therefore, this could mean reduced waiting for a taxi when your train is late, since the MO would have anticipated this – and no more wasted time trying to find a bus to meet your late arriving flight at Changi since the MO would be able to advise you – without you asking – on the most convenient way to get home, whilst meeting your mode and cost preferences.

MaaS improves capacity utilisation by providing users with trip choices that meet individual preferences, coordinating the delivery of this at every stage of the trip itself. By reducing the waiting times of users between individual trip segments and giving transport operators information on purchased trips, any excess capacity may be reduced through reallocation.

Reduced traffic could permit expansion of pedestrian facilities (for example longer green times at crossings), extend bus lane provisions and also help ensure that new infrastructure is better targeted.

MaaS operating principles can be progressively phased in, with the aim of sequencing the alignment of resources that are responsible for transportation infrastructure and transport operations. MaaS not only depends on efficiently operated transportation assets (such as free flowing roads) but can also influence their provisioning. For example, improving the coordination between modes will mean that resources would need to be become more demand-responsive (users will be more informed on the availability of services particularly for first mile and last mile demands).

Also, it will be possible to reduce unused capacity since MaaS assumes that users will be offered trips built from a “pool” of current and future available capacity of all modes. If a user varies his or her start time, the MO will adapt and attempt to reallocate capacity to suit.

The standard model of MaaS introduces a new role of the MO that orchestrates the interface with users, provides account management services and builds trips that meet users' preferences. A single MO or a competitive array of MOs may be available to users.

Whichever approach to MaaS is taken, data exchange standards, data analytics, informed users, mobile location services and service level agreements, are some of the many critical enablers.

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