

# Mobility as a Service

The next transport disruption.



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# Introduction:

## Mobility as a service- the next transport disruption

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Ride-sharing services like Uber are now a familiar proposition, especially for the young.

They are transforming the way we think about mobility - particularly car use.

Ride-sharing services also alter how we relate to the cities we live in and travel to, making new areas accessible while enhancing the opportunities these spaces offer for living, work, and leisure.

The concept of "mobility as a service" is, as yet, less familiar, but no less transformative.

While today's transport disruptors are mainly a few huge brand names such as Uber, Lyft, and Didi, there is the prospect of disruption coming to embrace the whole mobility ecosystem, uniting different transport modes and providers under a single platform.

Mobility as a service (MaaS) brings together many transport businesses and the services they provide through apps that can do such things as providing a city-to-city journey with a single "one click" payment - even between countries. MaaS could potentially cover a taxi or ride-share to the airport at one end of a trip, the air fare itself, a train to the hotel at the other end, and perhaps even the hotel booking.

For consumers, MaaS will facilitate optimal mobility choices based on travel time, cost and other personal preferences such as preferred departure time or a desire to make green choices (i.e. use active transport).

For transport providers, it will make their products and services more visible and accessible, opening larger markets and, if they seize the opportunity, increase revenue.

Less often thought about, but as important, is the opportunity for Governments to work with private transport providers to create or foster MaaS platforms that increase the use, productivity, and efficiency of public and private transport and associated infrastructure by coordinating and integrating multiple transport modes.

L.E.K. Consulting in partnership with Tourism & Transport Forum Australia (TTF) and the International Association of Public Transport Australia & New Zealand (UITP) are delighted to present this special report on MaaS to highlight the rapidly emerging opportunities it offers businesses and governments in their capacity as providers and facilitators of mobility.

# What is mobility as a service?

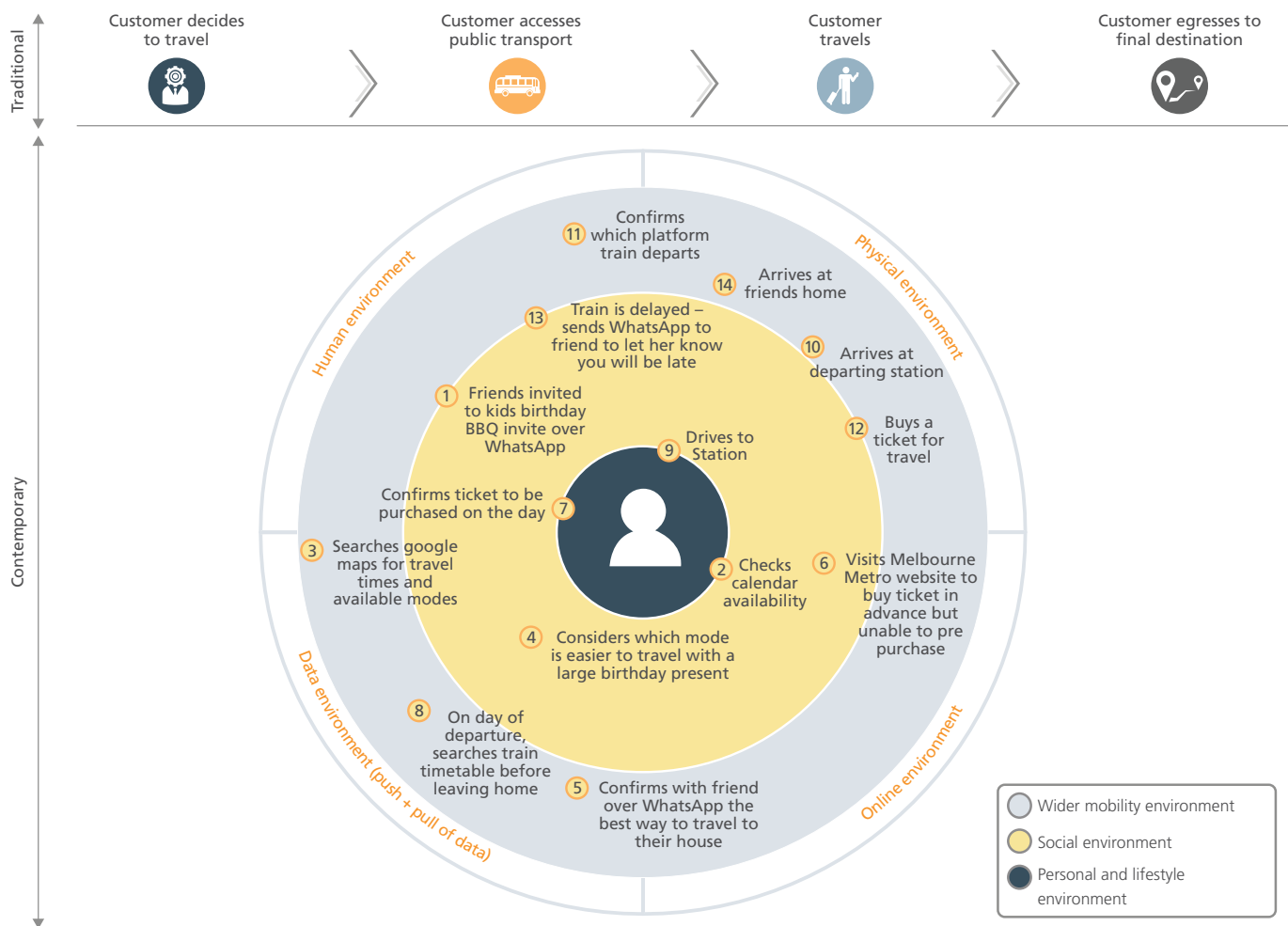
The way we use transport and the way it is provided are undergoing an evolution.

Sparked by the rise of ride-sharing services and the advent of electric and, eventually, autonomous vehicles, the transport ecosystem is becoming a complex web that brings transport services and infrastructure together with mobile technology and big data (Figure 1). Accordingly, planning and decision-making processes related to public and private transport provision need to be more agile and take into account a wide range of considerations.

It is no longer credible for mobility planning to be characterised as a single, linear process of decision-making, but rather, a complex interrelated web of planning between the human, physical, online, and data environments. Australians are also more mobile than ever. Over the last century, urban trip rates in Australia have grown by more than 65 per cent, so that each person now makes an average of 4.7 single trips each day.<sup>1</sup>

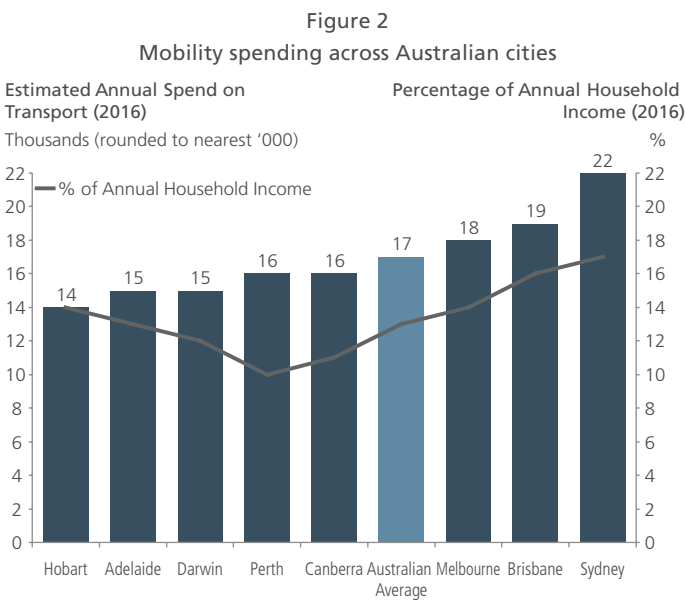
Meanwhile, urban sprawl, combined with traffic congestion, has led to longer travel times: on average, Australians spent almost 15 per cent more time commuting to and from work in 2011 than

Figure 1  
The web of mobility decision-making



<sup>1</sup> Bureau of Infrastructure, Transport, and Regional Economics, "Long Term Trends in Urban Public Transport" (September 2014), [https://bitre.gov.au/publications/2014/is\\_060.aspx](https://bitre.gov.au/publications/2014/is_060.aspx).

they did in 2002.<sup>2</sup> And Australians are spending not just more time on transport, but more money: it is the second-largest household expenditure after housing, averaging between 10 and 17 per cent of annual household income across the country in 2016<sup>3</sup> (Figure 2).

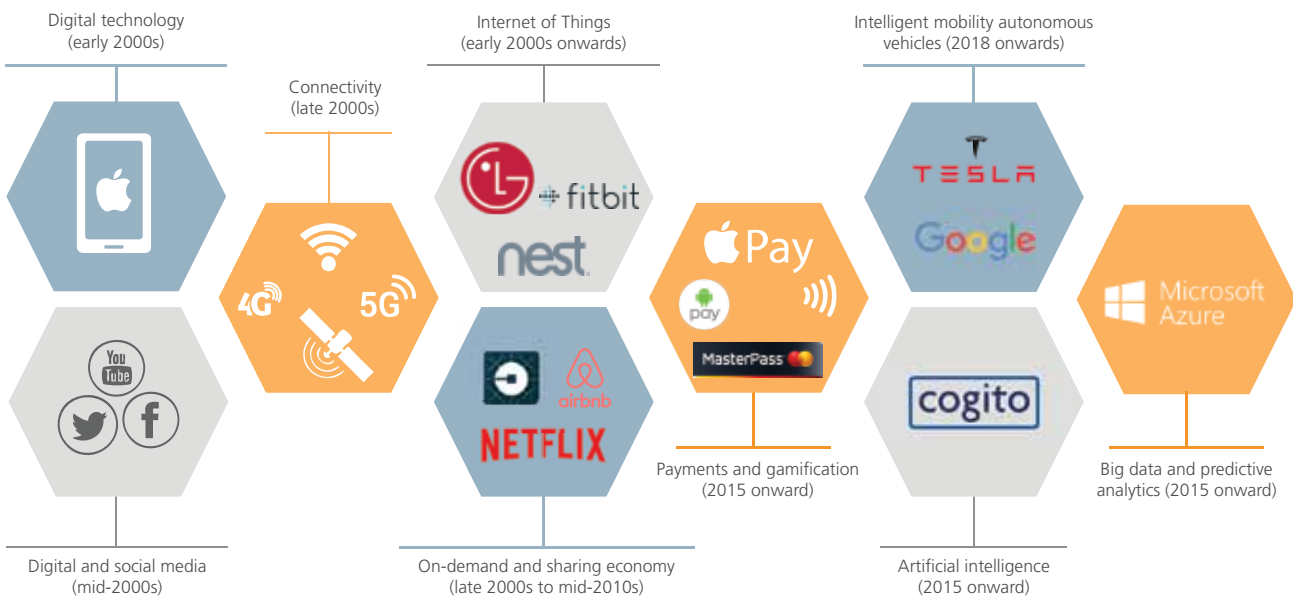


Note: Transport costs include motoring and public transport expenses. Estimated annual spend is rounded to the nearest thousand.

As traffic congestion worsens, the use of private cars for a door-to-door journey is becoming less satisfactory when one looks at cost, travel time, and other factors. But mobility as a service (MaaS) could be part of the solution to reversing this trend.

As a transport delivery model, MaaS builds on contemporary social and technological trends to deliver seamless, personalised transport options and experiences. It will eventually be able to predict demand, suggesting the right service at the right time to consumers while allowing providers to better plan the supply of services. The market is ripe for this change: ride-sharing services have already made significantly disrupted the travel market and has changed what consumers expect from transport while opening new opportunities and markets for transport operators. All this has been enabled by the explosion in smartphone use, the rise of connected everyday devices and the real-time Internet of Things (IoT), the emergence of the sharing economy, and the abundance of data. These tools and trends are available to businesses and public sector alike to shape the way in which customers consume mobility services (Figure 3).

**Figure 3**  
**Shaping the digital era**



<sup>2</sup> "Fact Check: Do Nine in 10 Australians Spend More than 90 Minutes a Day Commuting?" ABC News (9 July 2015), <http://www.abc.net.au/news/factcheck/2015-07-09/commuting-times-travel-shorten/6592510>.

<sup>3</sup> Australian Automobile Association, "Transport Affordability Index" (August 2016), <http://www.aaa.asn.au/storage/aaa-transport-affordability-index.pdf>.

# MaaS benefits customers and transport providers

MaaS puts the customer experience first, increasing convenience, effectiveness, and satisfaction by enabling sharing and personalisation through real-time connectivity. It can be as deceptively simple as a single mobile app that coordinates access to and use of public, private, and active transport modes. Service information, journey planning, and payment for such diverse services as bicycle hire, ride-sharing, car-sharing, road tolling and public transport can all be brought together at a single point, with just one user account, where consumers can pay for a whole journey with one tap on the screen of their device.

This is a network-wide approach to mobility that presents users with the best choice for a particular time given their cost and other preferences, and better enables transport suppliers to meet travellers' needs. It requires a real-time exchange of information between the consumer and providers of transport services, allowing for better matching of customer needs, preferences, and willingness to pay, with the services that can be provided.

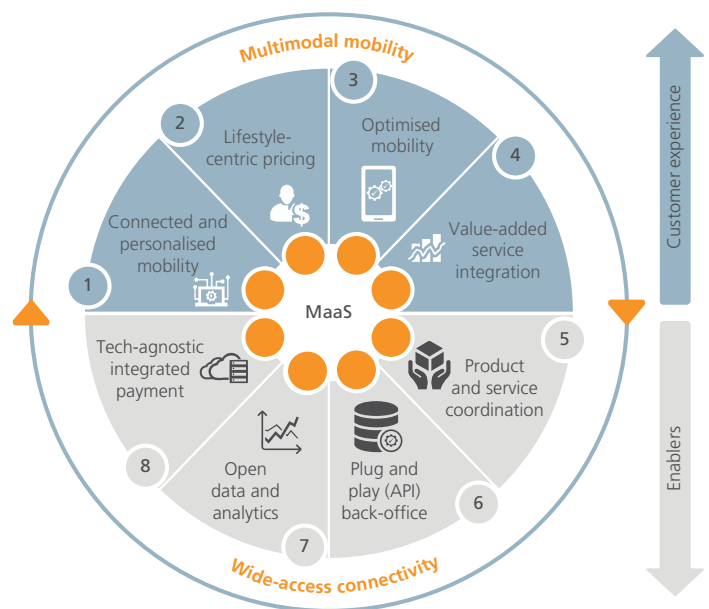
Another benefit of MaaS is that it supports mobility for those who currently find it difficult to access transport, including the poor, the elderly, people with disabilities, and residents of communities that are underserved by public transport. All these groups can benefit historically from the availability of on-demand travel services that reduce the need to rely on making trips by private vehicle.

MaaS also has a wide range of additional advantages:

- Improving the quality and convenience of travel (i.e. on-demand, personalised, seamless and predictive journeys)
- Redistributing travellers to their most efficient mode of transport, in terms of cost and other factors
- Reducing overall transport times by informing network improvements
- Enabling better monitoring, management and planning of mobility services
- Potentially lowering traffic congestion and the environmental impact of transport

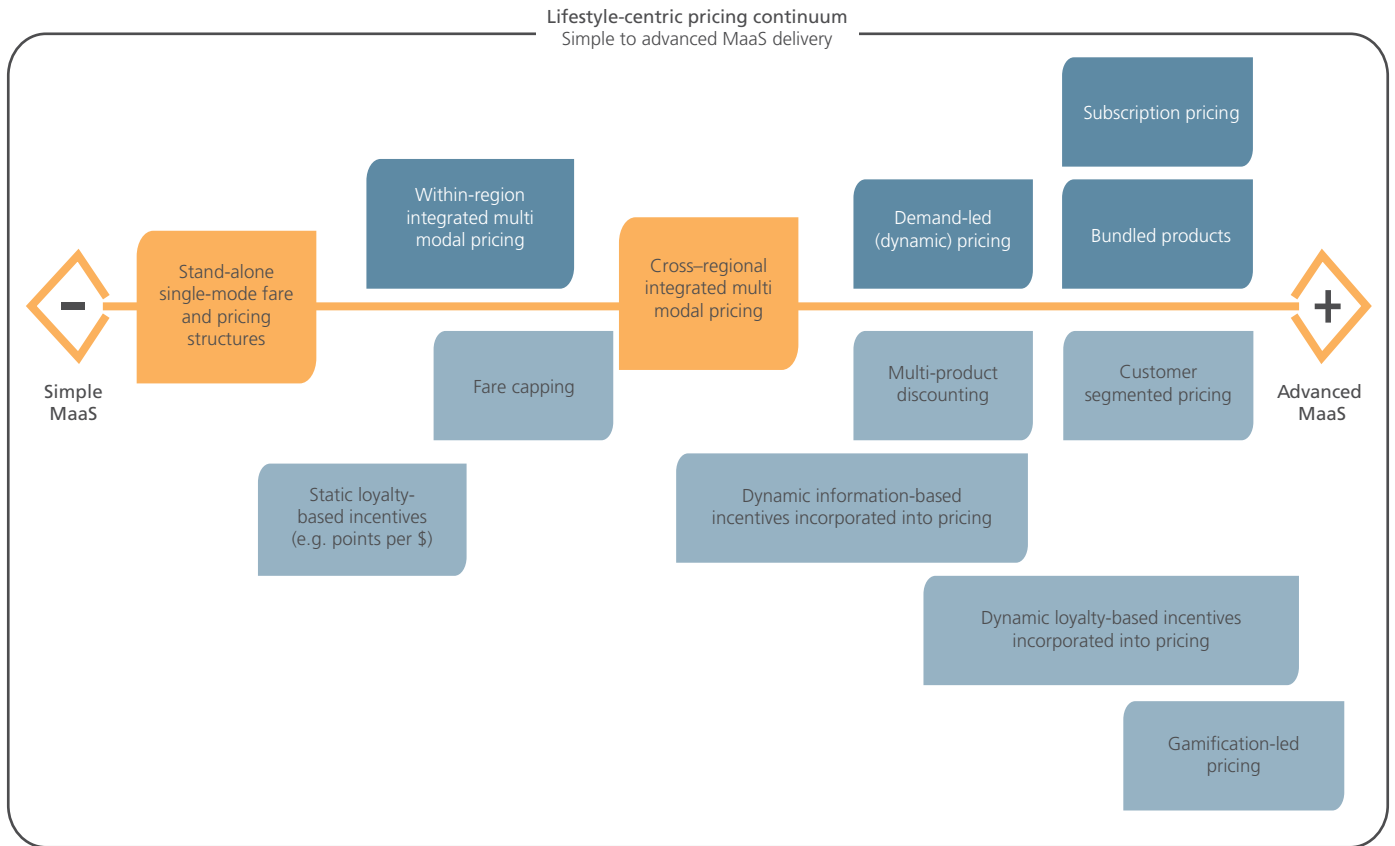
- Lessening the cost of mobility by widening the range of suppliers and increasing accessibility
- Enabling revenue growth for transport service providers, either by opening new revenue sources or enlarging the market
- Increasing regional responsiveness to the evolution and emergence of new transport services

Figure 4  
MaaS key attributes



The MaaS delivery model has eight key attributes (Figure 4). Half are related to the customer experience and the other half to enabling technologies and processes. All are supported by widespread and reliable access to the internet. These cover varying degrees of functionality, take for example pricing under MaaS. It could begin with a stand-alone single mode pricing structure to a solution more integrated with customer lifestyle choices such as subscription pricing (i.e. pay a monthly fee for unlimited use of services) (Figure 5).

Figure 5  
The evolution of pricing



In an environment where MaaS is possible, traditional ways of thinking about delivering transport infrastructure for journeys that mainly use a single transport mode (e.g. car, bus, train), often between the outskirts of a city and its centre, can no longer be

considered best practice. Planning needs to evolve to embrace the possibility of delivering an integrated solution that addresses what the modern consumer needs and expects from transport.

# When is MaaS coming?

Although the concept of MaaS has been talked about in various forms over many years, progress towards its realisation has varied greatly between cities and across transport modes (Figure 6). Only now have technological, social, and cultural factors converged to make it timely for transport authorities to consider what they may need and want to do to enable the further development of MaaS.

Because there is fragmentation in the connected mobility market, technology companies in the space (e.g. TripGo and Citymapper) have innovated to align their business models with MaaS principles without being able to deliver on the full vision for a single app that can facilitate multimodal journeys from beginning to end.

The commercial development of MaaS encompasses both single-mode and multimodal journeys, value-added services, innovative products and pricing models, as well as real-time, on-demand service planning. The major deficiencies of current

MaaS offerings are the lack of integrated payments and door-to-door planning for multimodal journeys. The participation of Government authorities in the MaaS ecosystem will be a key to overcoming these limitations.

To date, Australian public transport authorities have had no active participation in commercial MaaS offerings, though open-data policies have let public transport service data be pulled into commercial mobility journey-planning platforms.

While some may suspect that MaaS is a fad, big businesses are making a significant investment in mobility and the take-up of related apps, and it is hard to argue that this will not have lasting effects. Mobility disruptors have already presented business models with ground-breaking product offers and cost structures that have influenced consumer decision-making and expectations. This will have indelible effects on the delivery of travel services.

Figure 6  
MaaS progress in key cities

Scheme and location	Description	Degree of MaaS Customer Experience Integration				
		Ticketing	Payment	Pricing	Value-added mobility services	Non-PT modes included
<b>Smile:</b> Vienna, Austria	Door-to-door integrated transport planner; book ticket and pay.	Integrated	Integrated	Not offered	Not offered	Integrated
<b>Hannovermobil 2.0:</b> Hannover, Germany	€10 subscription to a digital, one-stop mobility shop, with integrated mobile phone billing and discounted pricing.	Integrated	Integrated	Integrated	Not offered	Integrated
<b>UbiGo:</b> Gothenburg, Sweden	Monthly subscription starting at €150 per month, delivered via an app and enabling access to a range of transport modes, and with a single monthly invoice.	Integrated	Integrated	Integrated	Not offered	Not offered
<b>Whim:</b> Helsinki, Finland	Subscription to public transport service model tailored to customer segments.	Integrated	Integrated	Integrated	Not offered	Integrated
<b>Föli:</b> City of Turku, Finland	An app that allows customers to plan in real time, ticket and pay. Customers can be invoiced and pay using debit/credit cards or through mobile phone operator billing.	Integrated	Integrated	Integrated	Integrated	Integrated
<b>EMMA Contracts:</b> Montpellier, France	Single-key access to 30 or 365-day subscriptions to integrated transport packages.	Integrated	Integrated	Integrated	Not offered	Not offered

Source: L.E.K. Analysis; Department for Transport, 2015, Feasibility Study for "Mobility as a Service" concept in London



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On the one hand, personalised on-demand travel services such as ride and car-sharing schemes could cannibalise public transport market share and reduce its recovery of operating costs through fares, while also cutting local public parking revenues. This might seem an unhappy prospect for Governments. But on the other hand, the disruption could present an opportunity to find new markets for various transport modes, cost efficiency (e.g. by ride-sharing providing first and last-mile services), reduce reliance on private vehicle ownership, decrease road congestion and increase public transport use. It may also enable Governments to consider network-wide pricing. How Governments respond to disruption, and whether they can embrace and facilitate the emergence of MaaS, could help to determine which of these scenarios plays out.

So far, most transport authorities have approached the evolution of transport in a piecemeal way, creating apps that facilitate

public transport use (e.g. journey-planning apps) or developing new but relatively isolated payment systems to support public transport only. The lack of integration between public transport services and privately offered transport can be an obstacle in moving towards MaaS. Creating an open and standardised platform to bring transport suppliers together in one marketplace allows customers to access “mobility” in a unified way — rather than a collection of discrete journeys.

International MaaS success stories such as those of Helsinki and Turku in Finland (Figure 6) demonstrate that a frictionless experience, strong branding and customer trust are crucial aspects of MaaS delivery.

# Opportunities for transport authorities

In areas such as MaaS, which involve technological innovation, change is rapid and ongoing, and there is a high degree of uncertainty about what shape the future will take and how organisations should prepare. However, the emergence of MaaS is almost certain to require significant coordination among mobility suppliers, as well as wide-ranging changes to a complex set of transport-related policies. At present, transport authorities should be considering the following strategic questions (Figure 7):

- What is our stance on MaaS?
  - Who should orchestrate it?
  - What are the potential delivery models?
  - Is a state-based, national, or city-only model appropriate?
  - What is the strategic and economic business case for MaaS?
- How should network-wide transport policy evolve to accommodate an integrated mobility ecosystem?
  - What policy incentives, constraints and disincentives currently exist?
  - How can policy remain responsive and enabling?
- How can commercial and public organisations work together effectively to modernise mobility?

The appetite to deliver MaaS is growing quickly in both the public and private sectors. It is important for transport agencies to reflect on their ambitions for MaaS, consider their role in its delivery, evaluate alternative solutions and delivery models, and consider the organisational capabilities they will need to deliver a MaaS platform.

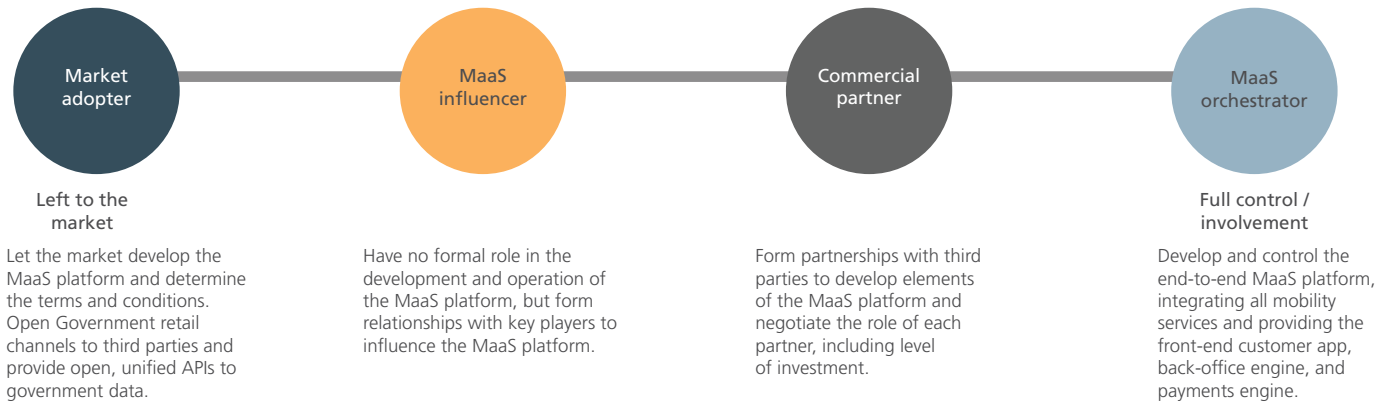
At this time, transport agencies can evaluate their own customer and digital proposition against the principles of MaaS, identifying gaps in their technology roadmap and aligning their activities with relevant strategic objectives. These roadmaps, and the value proposition made to customers, should incorporate elements beyond time and price in an effort to accommodate customers' preferences, such as their willingness to walk or cycle, or to trade time for money, their need to be productive while travelling, and their desire to optimise journeys for their particular needs.

Government can adopt a range of models to help transport providers deliver on their mobility ambitions: it can be an adopter, influencer, partner, or orchestrator (Figure 8). The roles it selects will depend on the strength of transport operators' brand, their strategic approach to customer acquisition and retention, the funding sources they have available, their appetite for quality control, and their existing organisational capabilities.

Figure 7  
Key policy questions for Government



Figure 8  
MaaS delivery continuum



Different MaaS delivery models will require different organisational capabilities. Transport agencies will need to consider what governance structures and team skills they will need to create to participate in MaaS ecosystems. For example, Governments or other organisations taking on a MaaS orchestrator role will find it places demands on their technical and digital development capabilities, as well as requiring strengths in partnering and contract negotiation in securing the involvement of third-party mobility suppliers.

Answering the strategic questions involved in developing MaaS will also require detailed evaluation, business case development and risk assessment. New approaches to business case evaluation will need to be thought through as evolving technology and new commercial models replace capital-intensive investments and traditional (business case) evaluation techniques. Innovative methods for drawing on customer insight, such as conjoint analysis involving augmented or virtual reality (e.g. to test the information delivery options) may also be needed to provide evidence for MaaS business cases in particular local settings.

# Responsive policy can encourage innovation

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Governments need to adopt a complex policy-reform program to respond to changing trends in mobility consumption. Historically, transport policy-setting has often been fragmented, focusing on individual transport modes rather than holistically on transport as a sphere of activity. In some areas, this has created perverse financial and economic outcomes as the interaction between and within all surface transport modes has not been addressed. In Australia for example, public transport users typically only contribute about 20–30 cents of every dollar required to deliver the service and pricing signals are sub-optimal from an economic perspective.

Policy drivers relating to pricing and fares, ticketing and payment, open data formats and data sharing will need to be reviewed holistically from a network-wide perspective. Indirect policy drivers, such as taxi reform, road congestion pricing and parking policy, will also require further consideration in light of the changes that MaaS and other disruptions in the transport market. Yet, creating a set of detailed policies that apply to rapidly changing technology is impractical. Good policymaking in this area will involve not just enacting the right policies, but also creating a responsive regulatory framework within which individual policies can evolve.

Authorities could consider exploring:

- How payments and public transport ticketing can operate across mobility platforms
- How devices, providers and services can be interoperable according to customer preferences
- How pricing can be better aligned towards meeting financial, economic and social objectives both within and between modes (including revenue allocation as new mobility providers are added)

- How data collection and sharing can be ubiquitous and transparent while allowing customer control of privacy and security
- How data should move between ecosystems (or where open-data policies need adjusting)
- How customer ownership will be managed in network-wide mobility solutions, without creating market disincentives to innovate, or fragmenting the MaaS market
- How digital developments and innovations will allow for open infrastructure and technology-agnostic solutions

## Dialogue and teamwork the key

Providing end-to-end mobility for customers requires the involvement of multiple transport modes, infrastructure providers, levels of Government, businesses, technologies and innovators. Each shoulders different responsibilities. Tackling the challenge of offering better and more accessible mobility to all requires a system-wide perspective that can enable the evolution of transportation ecosystems, establishing readiness for the emergence of new mobility models and the realisation of their economic and social benefits.

Regardless of the way they choose to involve themselves in the development of MaaS, transport agencies have a role to play in engaging with mobility providers and a broader set of stakeholders, information technology vendors, and emerging business and service models. Meanwhile, authorities can focus on public and private innovation opportunities, planning medium-term (three years and up), technology roadmaps that are agile and integrate a wider range of stakeholders and business models. To promote these public and private innovation opportunities, Government could consider what partnership and industry incentives can be offered to support the ongoing development of MaaS.

# Unlocking the potential of MaaS

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MaaS represents a significant opportunity for all participants in the mobility ecosystem. Social and demographic trends, and the popularity of various integrated mobility apps, suggest that consumers want MaaS, and they will choose which offerings succeed by voting with their feet. Mobility suppliers will benefit from MaaS by using it to identify new market opportunities, hone their service offerings and optimise expenditure.



Governments will also benefit. The data platforms underpinning MaaS can be leveraged to plan the future of our cities, keep people moving efficiently, and avoid building expensive but unnecessary infrastructure by improving existing asset utilisation. Real-time network management will become a feasible strategy, helping to reduce congestion and other problems. MaaS also offers the opportunity to encourage behavioural changes (e.g. by promoting active mobility) and will provide a genuine alternative to private vehicle ownership while further improving the accessibility and use of traditional public transport modes. It will also widen the potential for Governments to participate in the delivery of new services, such as those serving the first and last mile of customer journeys.

As an emerging phenomenon, MaaS is unusual in having a scope that includes transport providers, Government, and consumers, with far-reaching opportunities to all. To maximise the benefits that MaaS could deliver within the next decade, both business and Government would do well to begin thinking, and acting, towards realising the promise of a single platform that offers consumers one-touch access to journeys that can span all the way from their front door to the skies and shores of distant lands.

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Mark Streeting is a Partner in L.E.K.'s Sydney office and is one of Asia Pacific's leading thinkers regarding surface transport, aviation and transport economics. He has 30 years of professional experience, having previously worked with the Bureau of Transport Economics, Commonwealth Department of Transport, London Underground, Travers Morgan, Booz Allen Hamilton and PricewaterhouseCoopers. Mark's fields of expertise in the transport industry include strategy and policy development, demand analysis and forecasting, financial and economic appraisal, regulatory reform and procurement, pricing strategies and development and strategic marketing and communications. Mark has advised public and private sector clients in Australia, New Zealand, North America, Europe and Asia on all forms of passenger and freight transport.

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