Shared (Smart) Mobility, MaaS and Public Transport – A new Future!

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MaaS – Mobility as a Service
mobility as a service ≠ mobility service

It is also NOT Mobility on Demand (MOD)

MOD – trip planning and booking, real time info, fare payment in a single user interface

In general MaaS primarily focusses on passenger mobility aggregation and subscription services

mobility as a service ≠ mobility technology

OPPORTUNITIES + REALITIES
WHAT IS MAAS? Mobility as a Service is a combination of public and private transport services within a given regional environment that provides holistic, optimal and people centred travel options, to enable end-to-end journeys paid for by the user as a single charge, and which aims to achieve key public equity objectives. (Cubic definition)
TODAY

Population of a city or region

Population of a city or region using private cars

Population using Private TNC

Target Market of MaaS Operators

Population of a city or region using public transport

TNC=Transport Network Companies
MAAS TOMORROW?

Population of a city or region using public transportation

Population of a city or region

Private cars

Population using Private TNC
PAYG and MaaS

PAYG

Pay-as-you-Go, i.e. the status quo: if you take a taxi, you pay the taxi price, if you take a bus, you pay the bus fare

MaaS Subscription model

– Monthly transport plans, modelled after phone plans. For a fixed monthly price, you get a fixed number of taxi kilometers, bus and train tickets, etc.
– Introduces market disruption
– But allows a MaaS operator to hire taxi’s for the day and then get better utilisation
– The hope is that families will give up their car
Conceiving Mobility as a Service (MaaS)

- Total transport integration across public, private and intermediate modes
- User, provider and societal benefits
- Live trials around the world—Finland, Vienna, Hanover, ....
- Bundles: mobility packages
- Budgets: end user preferences and service provision possibilities
- Brokers: new contracting models and business interest

Mobility as a Service enables new market approach

Urban commuter package for 95 €/month:
- Free public transport in home city area
- Up to 100 km free taxi
- Up to 500 km rental car
- Domestic public transport 1500 km

15 minutes package for 135 €/month:
- 15 minutes from call to pick up by shared taxi
- EU wide roaming for shared taxi at 0.5 €/km
- Free public transport in home city
- Domestic public transport 1500 km

Business world package for 800 €/month:
- 5 minutes pickup in all EU
- Free taxi in home city
- Lease car and road use
- Taxi roaming worldwide

Family package for 1200 €/month:
- Lease car and road use
- Shared taxi for all family with 15 minutes pickup
- Home city public transport for all
- Domestic public transport 2500 km
We need to take a step back - Pre-Conditions for MaaS
Some Pre-Conditions for MaaS (Aligned with MoD)

- What has now made the difference?
- Smart Transition (ST) is already occurring
- Digital Technology delivering better information in real time
- Enabled by
  - Digital platforms
  - Journey planners
  - Integrated ticketing
  - The internet of things
- Not essential for MaaS but value adding in a non-marginal way:
  - Driverless road-based vehicles (car and bus)
  - Sharing culture
- Crucial to separate out these pre-conditions which in many ways are likely to be far more important to managing the transport network than the appeal of MaaS (time will tell!)
Book Uber in TripGo

Buy bus ticket in TripGo

➔ All public & private transport modes
➔ Multi and mixed modal trip planner
➔ Agenda, calendar
➔ Personalise
➔ Real-time
➔ Booking & tickets
➔ POIs & events

Download on AppStore
Download on PlayStore
Launch Web App
The Car and MaaS

– New service mobility models are expected (or ‘would like’) to make the need to use a car owned by a traveller significantly reduced,
  – even if the substitute is a point-to-point serviced car operated by the smart multimodal transport MaaS provider.
– Under MaaS, to be efficient and effective point-to-point, however, the car has to be a shared car (not privately owned in the main).
– If remains private, it may risk increased congestion:
  – Depends on whether autonomous or not
    • If autonomous and not made available to the pool, 2 one-way trips may become 4 one-way trips (to avoid destination parking)
    • If autonomous or non-autonomous, and made available to the pool, depends on use of car in between owner needs.
– However; Phase 1 may be a subset of trip activity with some private car trips remaining outside MaaS
  – Transition is a big challenge.
Potential Uptake and WTP for MaaS
Demand Side Preferences
Introduction

– The question of how MaaS technology might alter urban transport systems and, in turn travel behaviour, is being highly debated with much speculation but limited insight to date (due to the relative lack of behavioural data and models)

– At ITLS we undertook a first study in 2016-17 to shed some light on a number of key unknowns around MaaS potential uptake and Willingness To Pay (WTP) for components of a Subscription Bundle (package). Since repeated by ITLS in the UK (funded by Catapult Transport Systems)

– These are important for bundling and pricing mobility plans that attract high level of uptake (i.e., commercially-viable)
MaaS Preference Research Design

– We summarised various MaaS models (Whim, Ubigo, Smile, EMMA, Hannovermobil, etc.) and the broader literature into stated preference (SP) study.

– SP design based on the 3Bs future coined by Hensher (2017)
  • Bundles: granting customers a defined volume of access, with a specified LOS
  • Budgets: matching customer needs/WTP more closely with service supply
  • Brokers: choosing the business models around which MaaS will be delivered

– Bundles and budgets form the core focus of this study with Sydney used as an empirical setting

– Designed using Ngene© (our own developed software for choice experiments – Bliemer, Hensher, Rose and Collins)
Prospects for switching out of conventional transport services to mobility as a service subscription plans – A stated choice study

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Classification codes:

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Keywords

Mobility as a Service (MaaS), choice experiment, service bundles, willingness to pay, nonlinear choice model

Abstract

Mobility as a Service (MaaS), which develops plans that brings all modes of travel into a single mobility package, has received great attention from interested parties, including transport authorities, transport providers (public transport, car-sharing, bike-sharing, taxi, car rental), software developers, brokers, engineers, academics and environmental groups. Different business models have emerged in which it is planned for interested parties work together to provide integrated mobility services to MaaS subscribers, who in turn pay a subscription fee for the use of mobility services packaged into the MaaS plan. With such a smorgasbord of potential offerings, it is necessary to understand how large the market of MaaS would be if travellers are offered this one-stop access to a range of mobility services, and how much potential users might value each item included in a MaaS plan. To this end, this paper reviews the literature on the various MaaS models and synthesises their features into a choice experiment in which different mobility services are packaged into plans for respondents to select as a way of revealing their take-up and preferences for MaaS. An online survey is conducted in Sydney, Australia and non-linear experience conditioned mixed logit models are estimated to obtain willingness to pay for each item packaged in the MaaS plan. This also allows an investigation as to the extent to which MaaS could change the way Sydney residents travel in the future, including the impact on car ownership, modal shift and induced travel activity.
The Safety Net: CIY Plan

<table>
<thead>
<tr>
<th>Your Current Travel Record</th>
<th>Create Your Own Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>$345 /fortnight</td>
<td>$278 /fortnight</td>
</tr>
<tr>
<td>8 trips</td>
<td>4 days unlimited use</td>
</tr>
<tr>
<td>4 days</td>
<td></td>
</tr>
<tr>
<td>10 hours, 292 km over 10 days</td>
<td></td>
</tr>
<tr>
<td>0 trips</td>
<td>2 days</td>
</tr>
<tr>
<td>Full fare</td>
<td>8 hours</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>minutes advance booking</td>
</tr>
<tr>
<td></td>
<td>One-way</td>
</tr>
<tr>
<td></td>
<td>Round-trip</td>
</tr>
<tr>
<td></td>
<td>10% discount</td>
</tr>
<tr>
<td></td>
<td>20% discount</td>
</tr>
<tr>
<td>0 trips</td>
<td>10% discount</td>
</tr>
<tr>
<td>Full fare</td>
<td>20% discount</td>
</tr>
<tr>
<td>N/A</td>
<td>Unused credits rolled over</td>
</tr>
<tr>
<td></td>
<td>Unused credits lost</td>
</tr>
</tbody>
</table>

If the Plan you created above were available today, would you buy it? ☑ Yes ☐ No

Back

Next
Comment

— MaaS plans were not particularly attractive to existing PT users, suggesting the need for lowering PT fares or cross-subsidy

— Current travel patterns are most important to MaaS uptake
  • Importance for packaging and pricing (i.e., bundles and budgets)
  • Implication for modelling: preference models need to be updated over time with on-going research capturing changing experience

— Future research:
  • MaaS plans designed for family, group, organisation
  • Include MaaS impacts on travel behaviour in strategic travel models for long-term planning
WTP for Mobility Entitlements – obtained from a Mixed Logit Model

<table>
<thead>
<tr>
<th>MaaS component</th>
<th>WTP ($/fortnight)</th>
</tr>
</thead>
<tbody>
<tr>
<td>An hour access to car-share</td>
<td>$6.39</td>
</tr>
<tr>
<td>A full day access to car-share (10 hours)</td>
<td>$63.85</td>
</tr>
<tr>
<td>One-way car-share</td>
<td>$7.27</td>
</tr>
<tr>
<td>Round trip car-share</td>
<td>$0.00</td>
</tr>
<tr>
<td>Every 15 minutes increase in advance booking time</td>
<td>−$1.06</td>
</tr>
<tr>
<td>A day of unlimited PT use</td>
<td>$5.92</td>
</tr>
<tr>
<td>10% discount to every taxi bill</td>
<td>$3.68</td>
</tr>
<tr>
<td>10% discount to every ride-sharing bill</td>
<td>$7.18</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Entitlement per fortnight</th>
<th>Plan 1</th>
<th>Plan 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car days</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Car hours</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>Car-sharing scheme</td>
<td>one way</td>
<td>round trip</td>
</tr>
<tr>
<td>Advance notice</td>
<td>60 mins</td>
<td>30 mins</td>
</tr>
<tr>
<td>Taxi discount</td>
<td>10%</td>
<td>20%</td>
</tr>
<tr>
<td>Ridesharing discount</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>PT days</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Average WTP</td>
<td>$185</td>
<td>$231</td>
</tr>
</tbody>
</table>
Need for urgent Governance Reform
How a System Might be Governed?

—A key issue is the set of assumptions about how a system would have to be governed were it to achieve public value?
—Leave it to the market or what?
Comment – Been there before?

— The Smart Transition and MaaS, to date, has clear echoes of other transport markets through the decades, which have tended towards conditions of oligopoly or monopoly:

— Without effective regulation, preventing anti-competitive behaviour such as a global-scale company providing mobility services from strangling new market entrants at birth through price attacks, could be well-nigh impossible.

— A further issue is how these new systems consider the allocated access to public space of different sorts (a city vision).
How might we do it?

— In a smart future, will the state need to consider supporting mobility subscriptions rather than the transport services which underpin them
  — or could a social contract form part of the right to operate, a new kind of ‘Public Service Obligation’ for Smart Mobility?
— For example, a kind of per-transaction charge could be levied in areas with very high sharing densities, which subsidises the areas which would otherwise be under served (rural/regional).
— So will it be
  — an economically deregulated market place (competition in the market),
  — a tendered contracting place (competition for the market), or
  — some hybrid form?
— We may need an independent (National or State)office of the smart mobility regulator?
Service Delivery Models

C: Mobility as a service under government contracting
WHAT MIGHT MAAS MEAN FOR FUTURE BUS CONTRACTS?

More Questions than Answers at this stage on the Learning Curve
A Big Challenge – Contracts and which Bus Services?

— A starting position is a consideration of the conditions under which point-to-point MaaS, supported by smart booking technology, can be provided as a substitute for conventional urban bus services,

— where the latter are typically offered under an areawide contract that is either competitively tendered or negotiated.

— Existing contracts in many geographical jurisdictions provide regular public transport services (timetabled), contracted school runs (also timetabled) and charter services.

— The question of interest is whether some of these services might be better delivered by point-to-point smart booking transport or whether the nature of transport service required makes the new digital inspired smart MaaS an inappropriate substitute?
IMAGINE THE FUTURE …

Small baby steps?
MaaS skeptic?
MaaS supporter?
IMAGINE THE FUTURE …

– I see the growth of MaaS Mobility Contracts (linked to Digital mobility apps)
– Conventional PT will be folded into the Mobility Contract
  – With possibility of a single mode initially (giving future proofing on contract)
– Multi-modal Contract Brokers will play an increasing role
– PT operators may become providers of all modes, ensuring matching of vehicle to user need
– Geographical contract boundaries will disappear (they create inefficiency and poor services)
– New mobility regulations will replace mode specific service contracts
– The autonomous car and the autonomous bus (of varying sizes) will act as essentially the same ‘mobility mode’ but with differing passenger capacities
– Pricing will be market driven with a community service obligation built in as appropriate for specific users (it will be a user side and not provider side subsidy)
Mobility as a Service (MaaS) Trial in Sydney (2019-2021) – An Overview

A partnership through the iMove CRC of ITLS at the University of Sydney, IAG and Skedgo
Project objectives

– To explore appropriate transport service mixes and subscription plans for early adopters of MaaS
– To generate first-hand knowledge of actual MaaS experiences
– To assess the readiness of the current public and private transport mix in Sydney to support MaaS
– To advance the understanding of user uptake and willingness-to-pay for MaaS
– To test the ability to influence travel behaviour through introducing MaaS subscriptions
– To document the experience in designing, planning and undertaking a MaaS trial
Participant id = x from x = 1, ..., 150

<table>
<thead>
<tr>
<th>Agreed bundle</th>
<th>Tool</th>
</tr>
</thead>
<tbody>
<tr>
<td>xx days/trips PT</td>
<td>Opal card</td>
</tr>
<tr>
<td>yy trips/kms Taxi</td>
<td>e-cab-charge/cc</td>
</tr>
<tr>
<td>Uber</td>
<td>Corp card</td>
</tr>
<tr>
<td>GoGet/CarND</td>
<td>GoGet/CND membership #</td>
</tr>
<tr>
<td>Rental car</td>
<td>Thrifty/Hertz membership #</td>
</tr>
</tbody>
</table>

Choosing Taxi

Mobility wallet

Data for analysis (e.g., next month bundle)

Database (IAG back)

Uses e-cab charge

Structure of Interfaces Between Trial Participant Action, SkedGo App and IAG Processing Mechanisms
## Key project milestones

<table>
<thead>
<tr>
<th>Pre-trial (7.5 months)</th>
<th>Main trial (6 months)</th>
<th>Post-trial (10 months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-trial survey</td>
<td>PAYG in M1</td>
<td>Project evaluation</td>
</tr>
<tr>
<td>Protocols to select participants</td>
<td>Initial subscription in M2</td>
<td>Lessons learnt</td>
</tr>
<tr>
<td>Establishing suppliers and getting them involved</td>
<td>Subscription packages revised or settled in M3-M6</td>
<td>Commercial considerations</td>
</tr>
<tr>
<td>Development of enhancements to TripGo application</td>
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</tbody>
</table>
THANK YOU

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