WHAT DOES INTELLIGENT MOBILITY ADD TO SUSTAINABLILTY?

Is MaaS a Game Changer or Not? What about Post-Covid-19?

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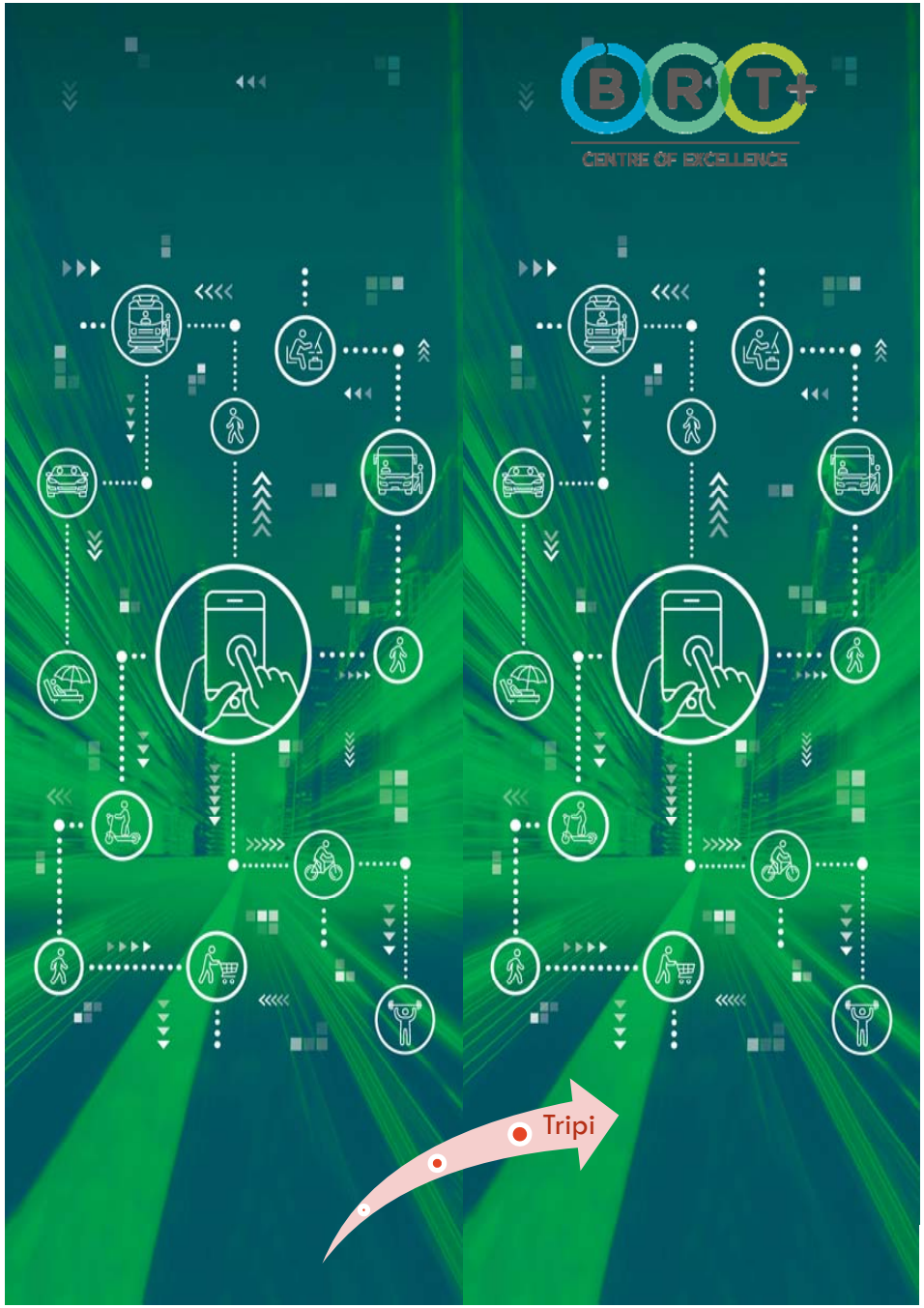
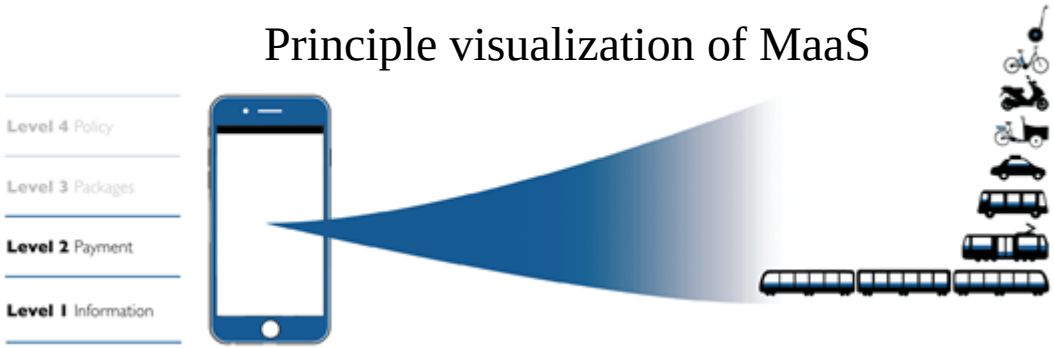
iMove Webinar, 1 May 11am Sydney Time

I acknowledge the significant contributions of **Dr Chinh Ho** (ITLS), Goran Smith (ITLS and Chalmers University Sweden), Daniel Reck (ITLS and ETH Switzerland), John Nelson (ITLS), Yale Wong (ITLS), **Andre Pinto** (ITLS), **Sam Lorimer** (IAG), **Ivy Lu** (IAG), Dave Worldon (IAG), and the Skedgo team (Tim Doze, **Dr Brian Huang** and Claus von Hessberg)

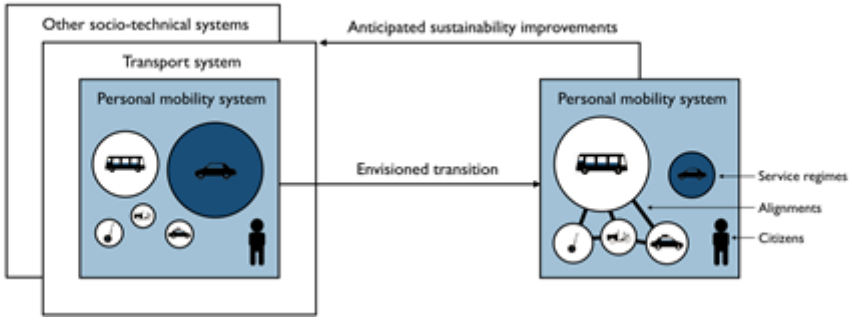


MaaS - A type of service that, through a joint digital channel, enables users to plan, book and pay for multiple types of mobility service. Simply put '*A one-stop travel management platform digitally unifying trip creation, purchase and delivery*'

Principle visualization of MaaS



Creating boundary-less modal choices complying with societal goals



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Hensher, D.A., Mulley, C., Ho, C., Nelson, J., Smith, G. and Wong, Y. (2020) *Understanding Mobility as a Service (MaaS) - Past, Present and Future.* Elsevier, available in June,~200 pages.

Mobility as a service = Public transport
+ Shared mobility services
+ New mobility technologies
+ Institutional overlay

- Premise: Shift from asset ownership to access *on demand*
- By definition: Service must be on par, in many circumstances, with or exceed private vehicle ownership

- Sampo Hietanen, MaaS Global: 'the profitable part [of MaaS] is having access to a car on the weekend, otherwise MaaS is just a utility service' (17 April 2020)

- Technology/product vs. vision for our cities

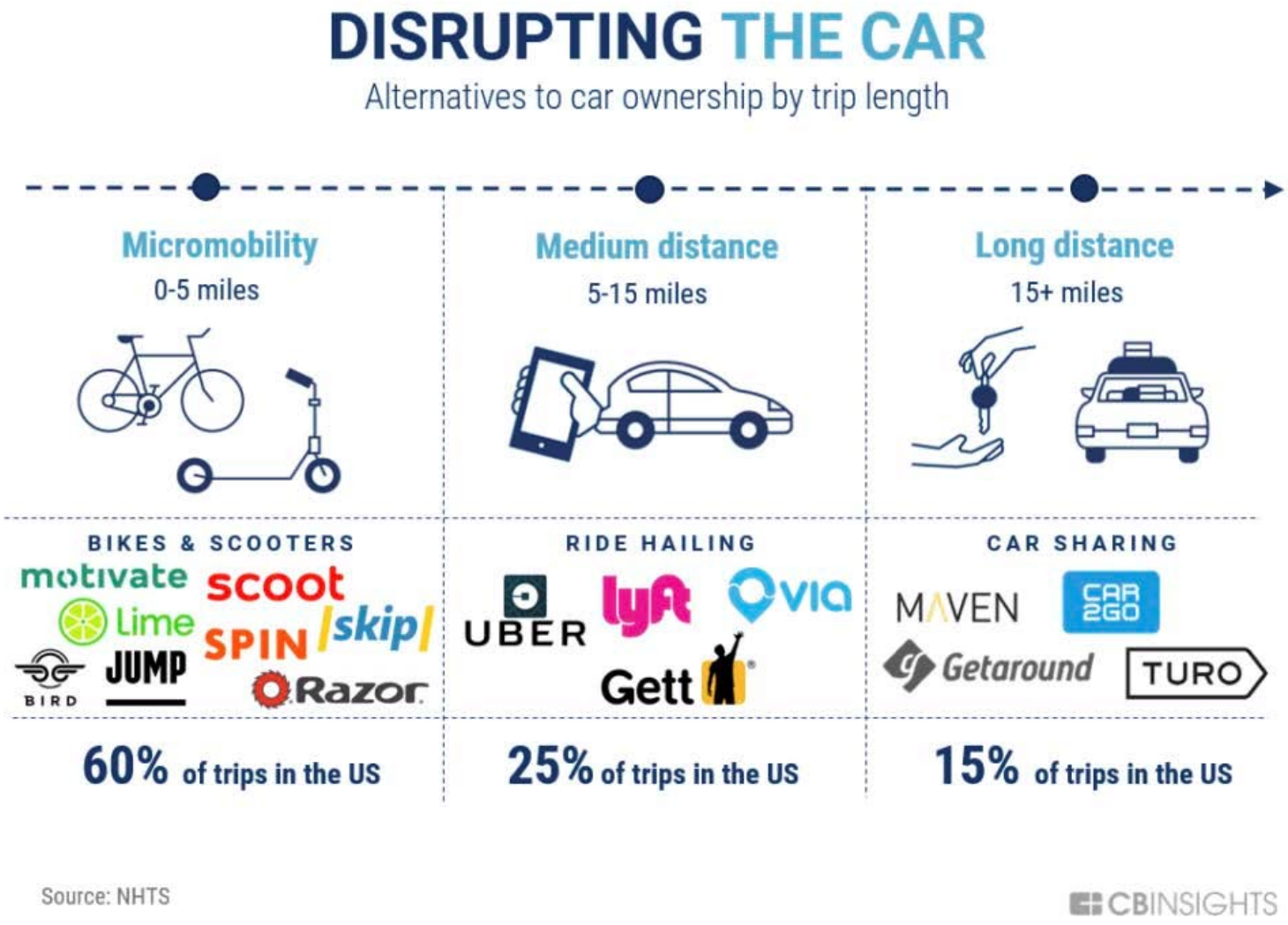
- Key dimensions of a High Level MaaS Offering (Hensher 2017):

  - **"Bundles":** Mobility packages representing bundles of mobility
  - **"Budgets":** End user preferences and service provision possibilities
  - **"Brokers":** New entrepreneurial model providing aggregating function

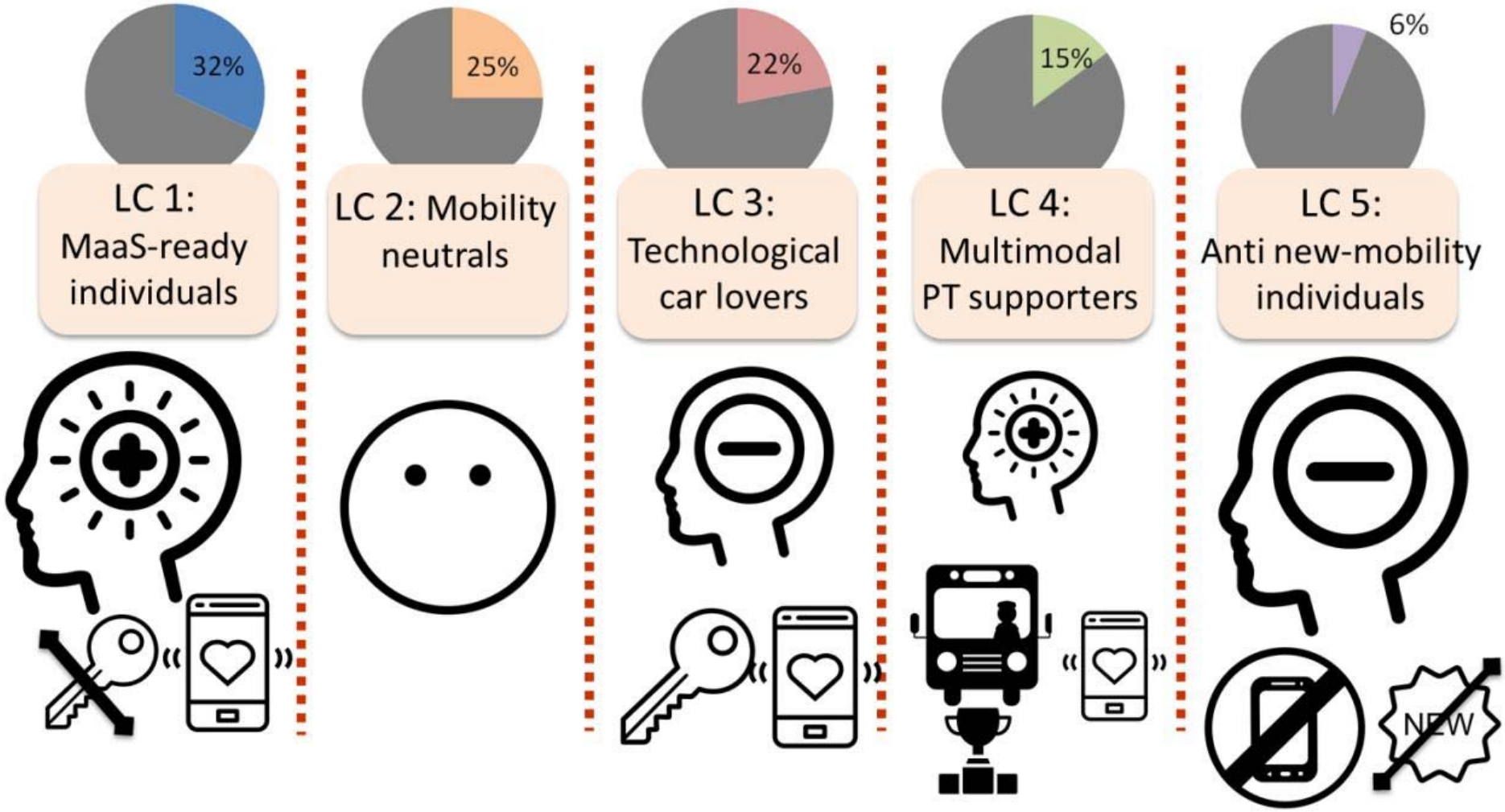
HENSHER, D. A. (2017) Future bus transport contracts under a mobility as a service (MaaS) regime in the digital age: Are they likely to change? *Transportation Research Part A: Policy and Practice*, 98, 86-96.
https://doi.org/10.1016/j.tra.2017.02.006

Disrupting the car? Big challenge given we have failed in past to get switch to public modes – niche or mainstream future?

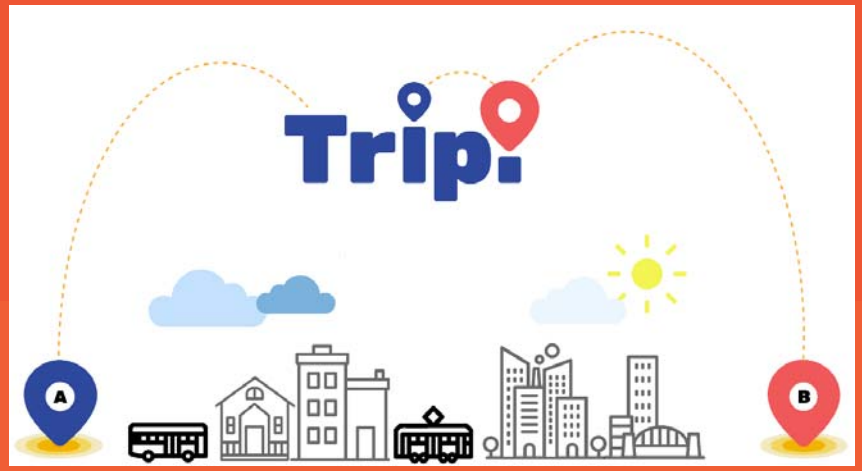
Can MaaS Help? Covid-19 may go against the MaaS multimodal aspiration?



Potential MaaS Supporters (~47% (LC1+LC4) - Holland, Sydney, Newcastle UK…) LC = latent class



The Sydney MaaS trial



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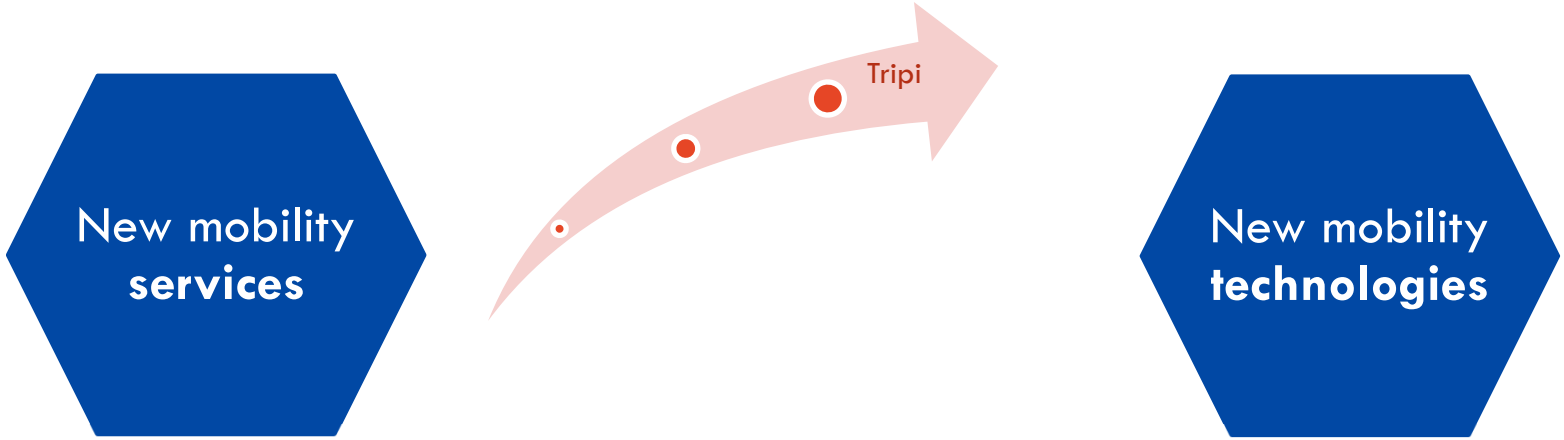
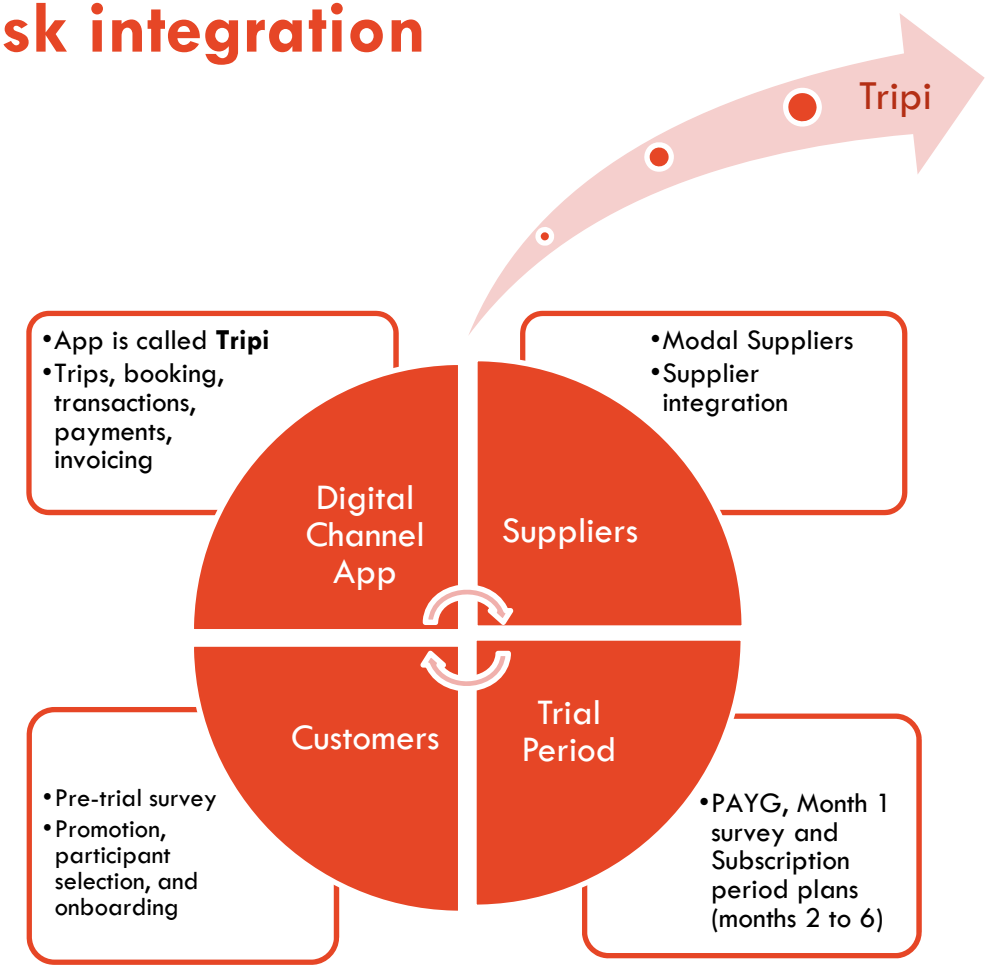


Mobility as a Service (MaaS)

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

Trial key task integration



Plus Post-Trial Evaluation – 12 months (to April 2021) of data analysis, insights, Reporting, talks (nationally and internationally) and assessment of commercial possibilities

Introducing MaaS https://youtu.be/fsik7mjuhiw

Congratulations, you're a great candidate for Mobility-as-a-Service!

In order to personalise our live trial, we'd love you to watch this short video (if you haven't already) and let us know how appealing the following features are.

16

How appealing is this feature?

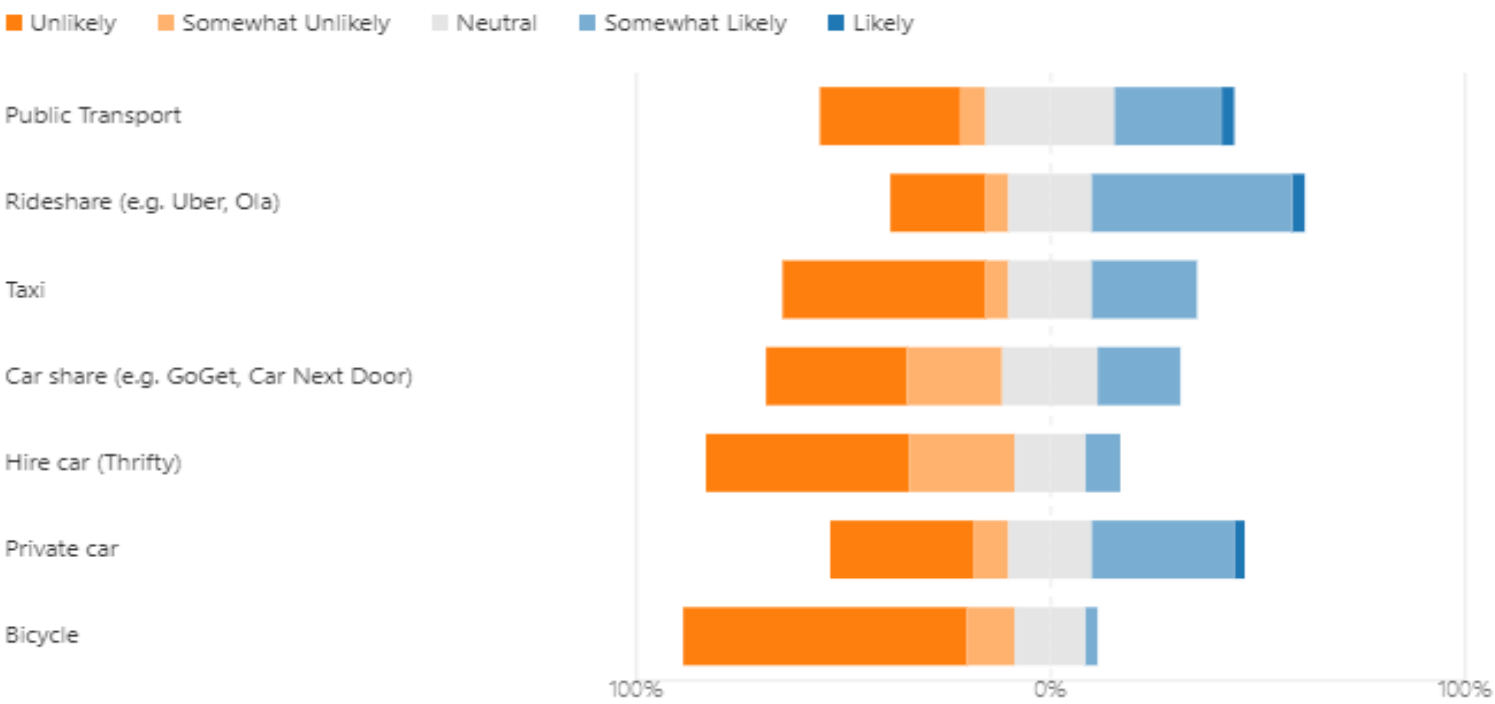
An app that helps you plan your journey according to what matters to you. Multiple modes, cheapest journey, quickest time, lowest carbon emissions, fitness - it's your choice!

	1	2	3	4	5	
Not appealing	○	○	○	○	○	Very appealing

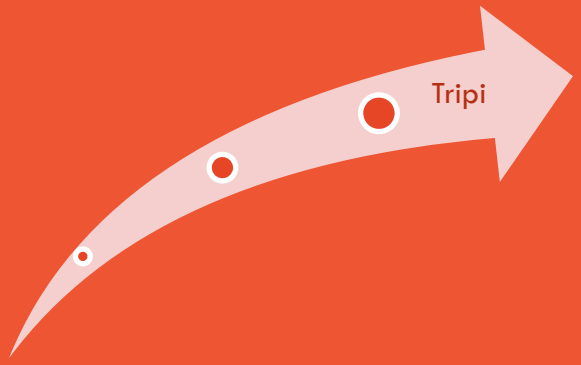
Pre-trial expectations of Impact of Maas on Modal Activity
(Dark blue relatively negligible; light blue encouraging)

25. Do you expect our MaaS offering to change the way you use the following modes of transport?

More Details



Bundle Design and Take Up



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Snapshot Overview of Incremental Bundle Introduction – The first 4 bundle months (Dec 2019 (Fifty50), Jan (Saver25), Feb (GreenPass), March (SuperSaver25) following November PAYG only.

Note (i) Saver25 replaced by SuperSaver25 in March (ii) seasonal variation considerations relevant

'MaaS without subscription plans is questionable'

Take up of Different Plans as of beginning of March 2020

Note: SuperSaver25 is March Bundle Offer (as revised Saver25) (~36.5% take up of Bundles in March)

	Month First Introduced						
	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	Share to date
Paygo	66	97	95	79	75		63.56%
Fifty50		11	13	13	14		**11.86%**
GreenPass				12	19		**16.10%**
Saver25			10	14	0		0.00%
Super Saver 25					11		**9.32%**
Total	66	108	118	118	119	0	100.00%

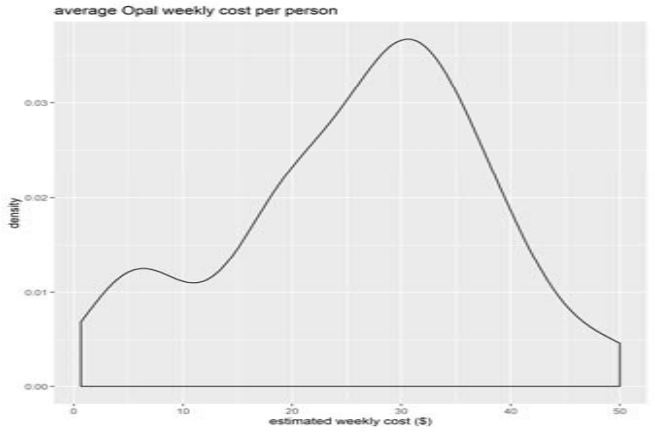
From Pastbundle	To Fifty50	To GreenPass	To PAYG	To SuperSaver25	Total
Fifty50	8	1	3	1	13
GreenPass		12			12
PAYG	4	3	68	4	79
Saver25	2	2	4	6	14
Total	14	18	75	11	118

4 people from PAYG joined SuperSaver25, while another 4 participants who were on Saver25 in February now switch to PAYG in March.

Nobody on Green Pass was tempted by moving to another bundle, so it saw the most growth and is also the one promoting the most sustainable travel, and the only one with a hard cap ($125 for "all you can eat" public transport).

Synthesis of First 3 months of trial: PAYG (Nov) and December (Fifty50) and January (Saver25) introduce Bundle Offers: Dec 10%, Jan 19.5%

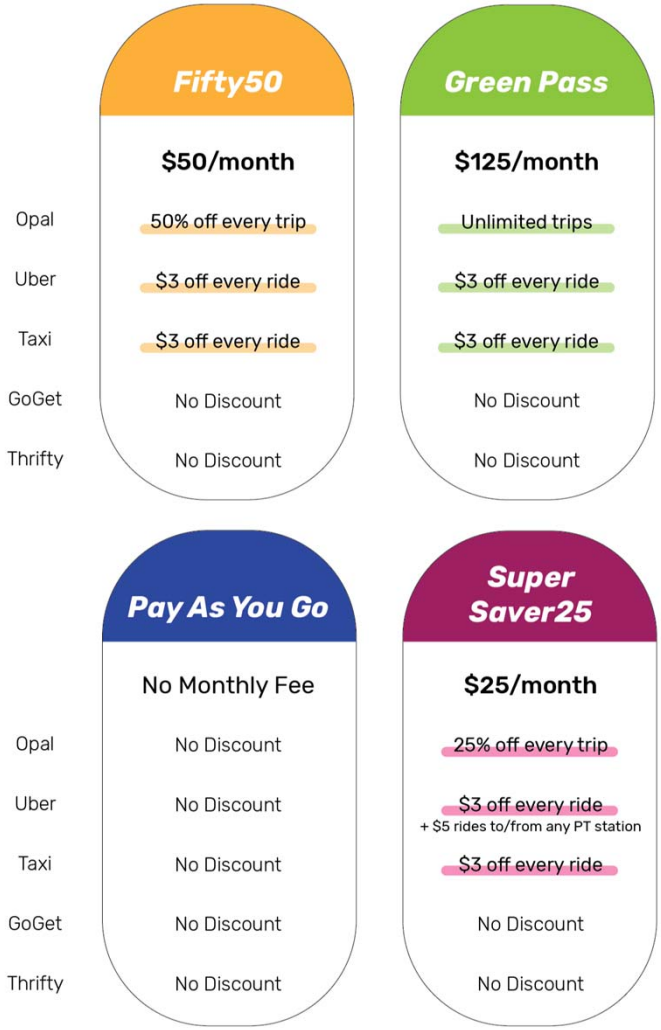
- Early evidence (as of January 20, 2020) suggests we have two good bundles in place to cater for different segments of the participants so far.
  - The **Saver25 bundle (February #2)** has proven more attractive to participants
    - with a lower level of PT use (~4 – 5 trips per week) and one or two weekly Uber/Taxi trips.
  - The **Fifty50 bundle (January #1)** has appealed to participants
    - with a higher level of PT use (~8 – 10 trips/week in Nov 2019).
- Despite this high level of PT usage, many users do not reach the weekly Opal cap of $50 per week yet.



Bundle #3 (February GreenPass): 79 PAYG, 13 (~12.4%) Fifty50, 14 (~13.3%) Saver25, 12 (~11.4%) GreenPass. Bundles Feb total ~37.1% (cf. Dec~10%, Jan ~20%)

- **The Feb bundle designed to encourage PT use:**
  - Unlimited use of public transport (free PT)
  - 15% discount for every Taxi & Uber trip
  - Subscription fee: $125 per month
    - Calculated a net $ benefit given previous month travel activity

Bundle Uptake: Dec~10%, Jan ~20%, Feb 37.1%, March 36.5%
Specific Bundle Uptake March: PAYG (63.6%),Fifty50 (11.9%), SuperSaver25 (9.3%), GreenPass (16.1%).



Revise January **'Saver 25'** as March **'SuperSaver25'** by

1. Removing discount on car share - mainly existing GoGet users
2. Changing the 15% on Taxi & Uber to a flat $3 reduction
3. (note: tried a financial offer on GoGet to all bundle +PAYG and no take up)
4. **Add a first/last mile incentive (to use PT) on the SuperSaver25 plan**

Revise **GreenPass** by:

1. changing the 15% on Taxi & Uber to be a flat $3 reduction

Leave **Fifty50** Bundle as it is currently

1. **Green Pass growing in popularity (strong PT focus) – lines up with sustainability goal.**
2. **SuperSaver25 less popular than Saver25- could be seasonal effect and/or car bias?**
3. **We are reducing PAYG numbers, so bundles are progressively growing in appeal.**

Emission Buster Challenge

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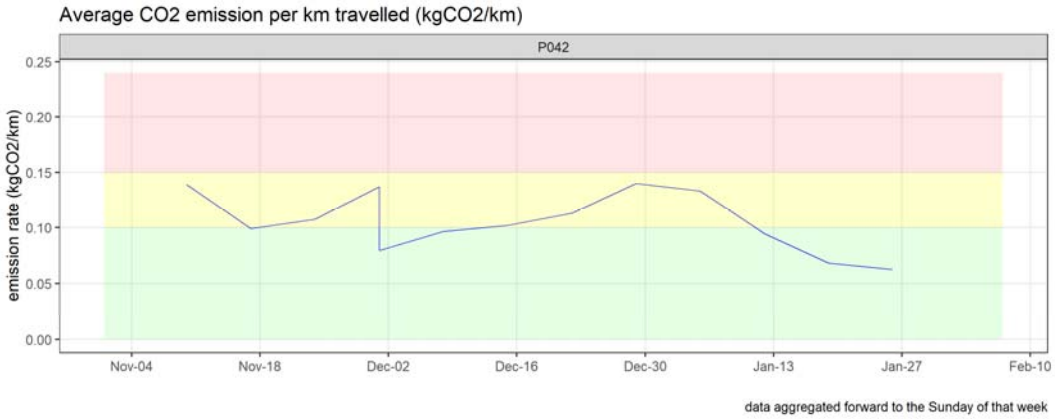
Focus on Car Use: New to March 2020 for All Participants Group (PAYG and each Bundle): Emission Buster Challenge as an additional offer for all PAYG and bundles

The adage 'To make PT more attractive you must make the car less attractive' can be restated as 'to make PT more attractive you must reward reductions in car use.

- **For the participating group as a whole** (to avoid individual gaming), offer
  - A group (cohort) reward if aggregate CO2 emissions are reduced over a month:
    - A reward of $1 per participant for each 1% reduction of emissions of the group.
    - Indicate to each participant their CO2/km in colour coded bands to see their relative contribution (cannot do at a total level since biased by trip lengths etc.) – example below for P042.
    - The group aspect (here as employees) is very relevant for future prospects - think of it as a large group e.g., employees, tourist group, club etc.and even a small group such as a household;
      - Hints at how groups of any definition can be rewarded.
    - The entire cohort travelled ~150,000 km and produced ~ 14 ton of CO2 since the trial started.



With CO_2 per KM over the entire cohort, any individual trying to game it is minimised.

Example of Gaming Potential - Switching Uber travel to Didi or Ola not measured by *Tripi* (so kms not recorded), but the overall CO_2 produced would be the same.

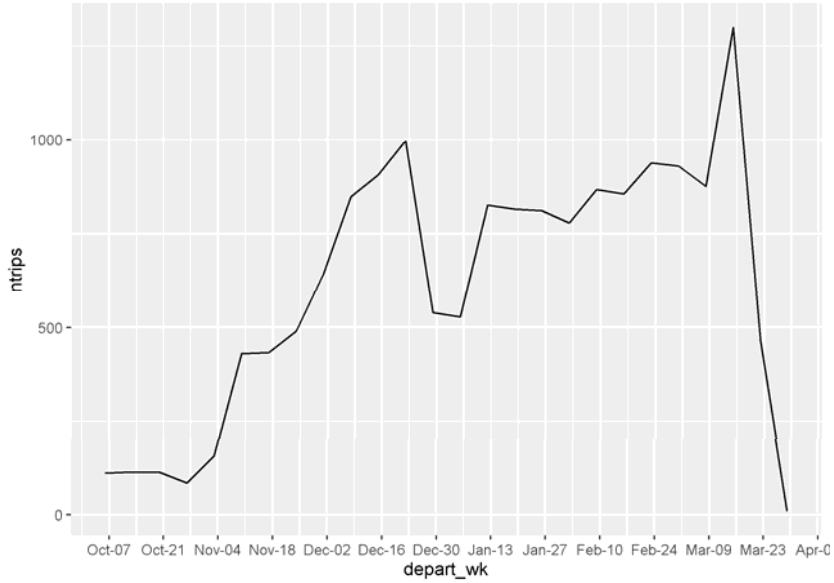
Initial Results of the Emission Busting Challenge
(As of 10 March 2020 – 2 days before Covid-19 shut down)

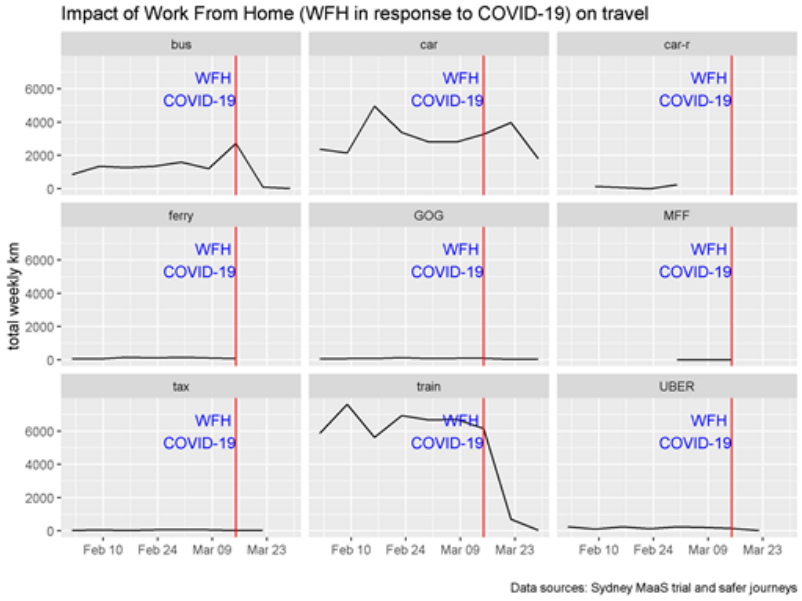
- Data include private car travel and GoGet but excluding Thrifty car-rental.
- Data are accurate to Sunday 08/03/2020.
- As of 7/8 March 2020, The entire cohort has increased CO2 emissions (kg) by 1%.
- **So no financial reward at all.**

- Despite this, for Safer Journey subset:
  - The evidence across the trial participants involved with the Safer Journeys program, is that **the car kilometres in February for bundle subscribers are generally much lower than those individuals who continued with PAYG**.
  - This is a very important result suggesting that **MaaS bundles do attract interest by active car users, and that these appear to be participants who rely relatively less on the car for their mobility needs.**

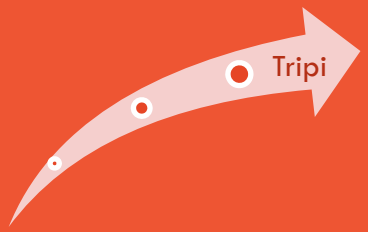
- The Covid-19 impact on the trial
  - From March 12 all IAG staff are not allowed to travel (International and Domestic) and are allowed to stay at home and work.
  - Clearly, this has huge impacts on any results after March 12, 2020.

Initial Impact of Covid-19 Post 12 March 2020





Lessons Learnt to date from Bundle Design



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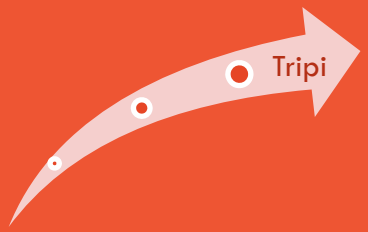
Lessons Learnt in Bundle Design

- Sydney is a nice example of a well-planned cascade with
  - a pre-trial survey,
  - an initial pay-as-you-go period, and
  - subsequent, monthly sequential bundle design and introduction.
  - Besides facilitating continuous learning, this has a positive effect on trial participants (with appropriate feedback)
    - keeping them interested in the trial.
- The monthly "feedback and choose" is very innovative and allows for a customisation of personal preferences which should be a key feature of MaaS - no other trial or actual offering has this as far as we can tell!.

More General Lessons Learnt to Date in the Sydney MaaS Trial: Qualitative interviews Mid-Trial (February 2020)



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More General Lessons Learnt to Date I

- There is clear interest in MaaS (37% of participants up to end of February subscribed to a bundle)
- The designed bundles have attracted interest
  - Although we have only limited evidence of scalable appeal of bundles due the few bundles offered
    - **but just as many bundles as existing real offers** – indeed we exceed or equal the number in Whim/Ubigo/Mobil-Flat
  - Have we got the best set of bundles? We have no idea.
  - What other bundles might we consider? That is unclear (see Reck et al. 2020)

Reck, D.J., Hensher, D.A. and Ho, C. MaaS Bundle Designs, submitted to *Transportation Research Part A*, February 2020, under revision.

More General Lessons Learnt to Date II

- The mid-trial qualitative one-on-one interviews (with 30% of participants) have suggested a number of factors influencing trial choices:
  - **value for money** of subscription plans
  - **issue of location** (available alternatives despite offering them in a bundle)
  - **unusual travel patterns** (less habitual and more variety seeking)
  - **lack of awareness of** the details of the subscription bundles (way information is provided – clarity etc.)
  - **need for commitment** arose as a real constraint on participants' desire to subscribe
  - **"novelty" or "curiosity" factor** for the subscription plans; people who sought something "new and different"

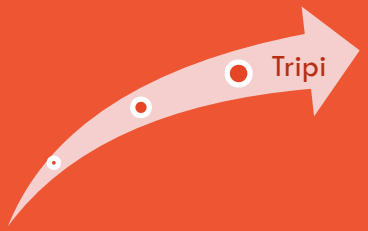
More General Lessons Learnt to Date III

- Other Interesting Findings:
  - Big point - the on-boarding process exceeded expectations; and the one-on-one time and dedication.
  - Participants have stated that they are "super proud" of the trial and how it constitutes "innovation" as the "future of transport".
  - 'One of the biggest gripes (as mentioned) remain in better communicating the cost savings under different subscription plans as compared with PAYG on an *ex ante* basis.'
    - This matter was sorted from late February onwards.

More General Lessons Learnt to Date IV

- The exclusion of relevant modes (e.g., Ola*, Didi**) from the offerings through Tripi and bundles. If a relatively popular mode is excluded it can have a negative impact on subscribing to Tripi and to a bundle.
  - * Ola is cheaper than Uber even with Uber discount.
  - ** DiDi had just entered Sydney in March.
- **So can a single MaaS (App) offer really cover all relevant modes and variations, especially with bundles?**
- Service levels often are more important than cost savings…
  - and likely to increase under post Covid-19.
- Incentives that impact on reductions in car use appear to be essential in achieving key sustainable outcomes….

Post Covid-19 and MaaS – what Does the Future Hold?



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What does Post Covid-19 look like for MaaS?

Flattening of the curve is now replaced with the challenge to find ways to maintain flattening of the peak now that Covid-19 has done the hard work for us. 'The camel has died' and now we want to preserve 'the horse'.

MaaS will increasingly align with views of Sampo Hietanen, MaaS Global:

- **'The profitable part [of MaaS] is having access to a car on weekend otherwise MaaS is just a utility service' which may generalise into 7 days a week?**
- **Potentially not a good look for PT which is assumed to be the centrepiece of MaaS.**
- Supports (electric) cars
- **Shared modes will suffer unless 'shared' is a known grouping (but driver exposure risk unless protective cabin like London Cabs)**
- E-scooters for short trips may prove increasingly popular (only mode that increased use in Finland during Covid-19 to date) but heavily dependent on quality of protected infrastructure
- **MultiModal redefined to be MultiServices (goods delivered to people, discount offers outside of mobility,…..) –for financial survival OR Govt tendering?**
- The power of adaptation by businesses is strong and it must apply to MaaS.
- **WFH and MaaS – big Q – subscription that are lesser days per week but with home delivery!**

What does Post Covid-19 look like for MaaS?

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Short term more generally

- **Public transport risk and prolonged distancing and crowd avoidance to feel safe.**
  - **Limit standing**
  - Masks and temperature check on entry to PT
  - Automatic entry/exit etc. to avoid touching
- **Growing popularity of the car with bio-security becoming the new attribute in mode choice**
  - **The bio-security mobility physical space challenge**
  - Encourage car pooling for known persons
- **Traffic congestion will worsen under current pricing, and especially with low cost electric cars unless increased WFH**
  - Government to ensure parking stations and kerbside parking pricing does not become gauging
- New local community spirit (ANZAC days - get to know your neighbours) – MaaS for the neighbourhood
- **Social distancing at the office – may 'force' employers to stagger attendance given available space.**

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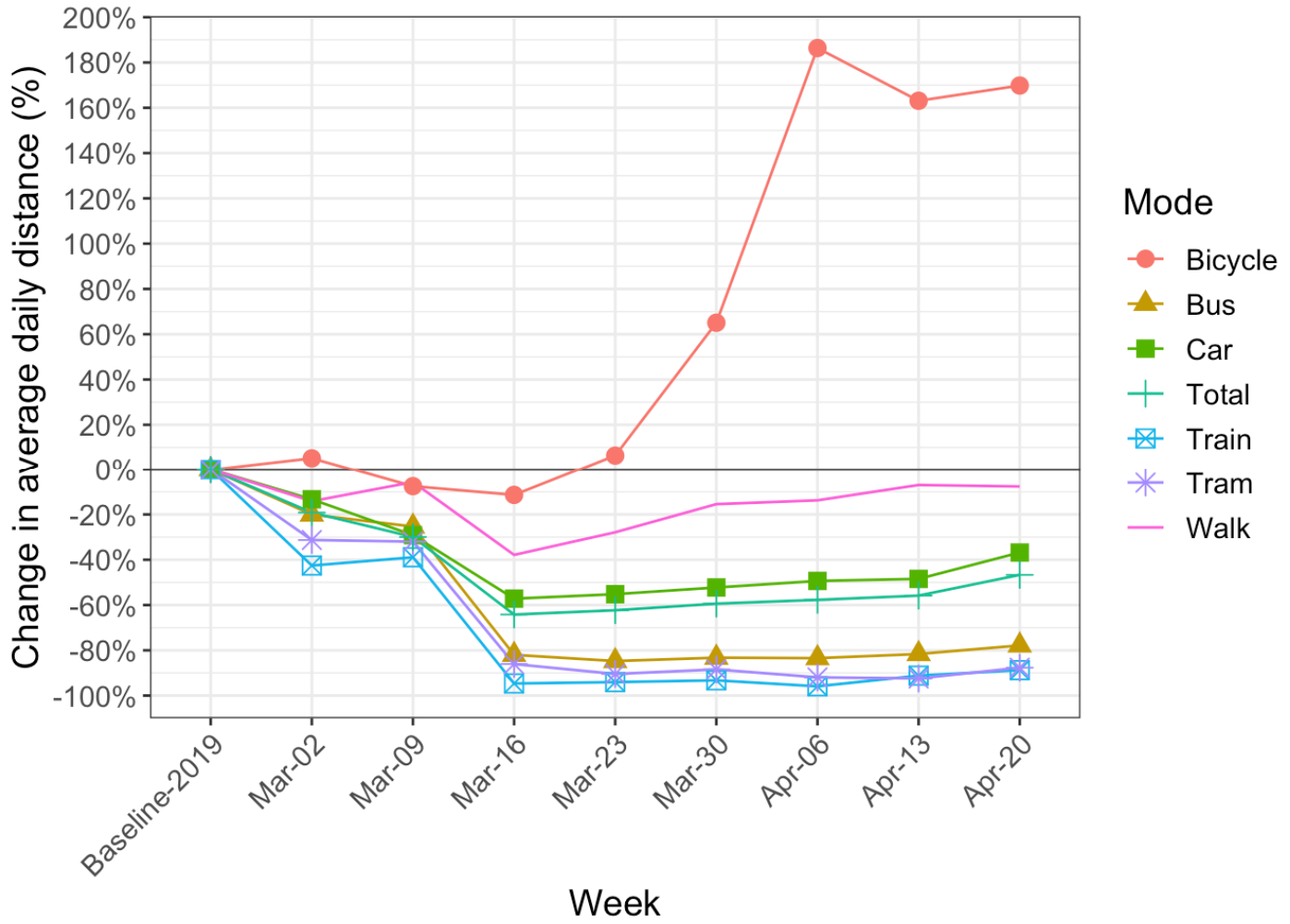
Longer term more generally

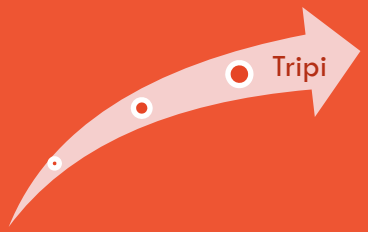
- To contain/manage traffic congestion, govt may mandate WFH for 1 or 2 days a week (allocate the days over 5 days like Singapore did with licence numbers of cars)
  - **Employers asked to support this initiative initially and if no evidence of voluntary commitment then mandate**
- **Redesign PT Accommodation space (reduced capacity)**
  - Trains return to olden days compartments
  - Retrofit single seats on in trains and ferries
  - 3 seats become 2 with spacing in buses
- Infrastructure needs must be reviewed and put on hold large scale projects and focus on small investments such as
  - Improved bicycle lanes
  - Freight distribution capacity
- Redesign of houses and workplaces to accommodate efficient and effective office space
  - Will there be employer subsidy support for a home office fit out?
- **Businesses open longer hours** with fewer persons working per hour but still possibly increased hours overall to reduce crowding
  - Might assist in flattening the peaks?
    - Late starts, early finishes?

Source: https://ivtmobis.ethz.ch/mobis/covid19/en/

The role of the modes which offer less sharing (see Switzerland evidence in the graph for bicycle, walking and the private car)



iMove CRC MaaS Trial Papers to date



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Papers prepared (to date) as drafts for the Sydney Trial and MaaS more generally

Hensher, D.A., Ho., C, Reck, D., Smith, Wong, Y., G., Lorimer, S and Lu, I. The Sydney Mobility as a Service (MaaS) Trial: design, implementation and lessons. Latest full draft 27 April 2020, 75 pages.

Hensher, D.A. and Ho, C. Is there a relationship between private car use and subscribing to mobility as a service (MaaS) plans? Latest full draft 25 April 2020.

Ho, C., Hensher, D.A. and Reck, D. A revealed preference model for choice between pay as you go and subscription bundles: the Sydney MaaS trial.

Wong, Y. and Hensher, D.A. Pay-as-you-go or a subscription MaaS model: What are the stakes? submitted to *Transportation Research Part A*, 4 April 2020.

Reck, D.J., Hensher, D.A. and Ho, C MaaS Bundle Designs, submitted to *Transportation Research Part A*, 10 February 2020, referees reports 24 April 2020.

Smith, G. and Hensher, D.A. (2020) Towards a framework for Mobility as a Service policies, (presented at the *16th International Conference on Competition and Ownership of Land Passenger Transport* (Thredbo 16), Singapore August 2019) *Transport Policy*, 89, 54-65. https://doi.org/10.1016/j.tranpol.2020.02.004

Hensher, D.A., Mulley, C., Ho, C., Nelson, J., Smith, G. and Wong, Y. (2020) *Understanding Mobility as a Service (MaaS) - Past, Present and Future.* Elsevier, available in June,~200 pages.

Hensher, D.A. and Mulley, C. (Guest editors) (2020) Introduction to Special issue on developments in mobility as a service (MaaS) and intelligent mobility, *Transportation Research Part A*, 131, 1-4. https://doi.org/10.1016/j.tra.2019.09.039

Wong, Y. and Hensher, D.A. Delivering mobility as a service (MaaS) through a broker/aggregator business model, presented at the *16th International Conference on Competition and Ownership of Land Passenger Transport* (Thredbo 16), Singapore August 2019, submitted to *Transportation*, accepted 27 April 2020.

Hensher, D., Mulley, C., Ho, C., Nelson, J., Smith, G. and Wong, Y. Understanding MaaS: Past, Present and Future, paper prepared for presentation at *the 2nd International Conference on Mobility as a Service*, Tampere, Finland, November 2019.

Understanding Mobility as a Service (MaaS)

Past, Present and Future

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Examines all facets of MaaS, assessing its role in the evolution of today's and tomorrow's transport systems

KEY FEATURES

- Includes case studies to show how MaaS is delivered around the world
- Covers foundational aspects of MaaS, clarifying what it is for those new to the concept
- Offers an in-depth analysis on a wide range of MaaS topics including governance, contracts, consumer and supplier preferences, links to societal objectives, the role of trials, assessments, and more

DESCRIPTION

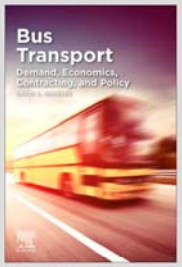
The widespread adoption of smartphones, ridesharing and carsharing have disrupted the transport sector. In cities around the world, new mobility services are both welcomed and challenged by regulators and incumbent operators. Mobility as a Service (MaaS), an ecosystem designed to deliver collaborative and connected mobility services in a society increasingly embracing a sharing culture, is at the center of this disruption.

Understanding Mobility as a Service (MaaS): Past, Present and Future examines such topics as:

- How likely MaaS will be implemented in one digital platform app
- Whether MaaS will look the same in all countries
- The role multi-modal contract brokers play
- Mobility regulations and pricing models
- MaaS trials, their impacts and consequences

Written by the leading thinkers in the field for researchers, practitioners, and policy makers, *Understanding Mobility as a Service (MaaS): Past, Present and Future* serves as a single source on all the current and evolving developments, debates, and challenges.

The authors dedicate this book as a contribution to the Volvo Research and Educational Foundations (VREF) Bus Rapid Transit (BRT+) Centre of Excellence (http://www.brt.cl/) and the iMOVE Cooperative Research Centre (CRC) (https://imoveaustralia.com/).



Bus Transport

Demand, Economics, Contracting, and Policy

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The latest public transportation insights on contracting, performance, image, crowding, and Mobility as a Service

KEY FEATURES

- Compiles, in one source, up-to-date insights on the most important public transport themes, issues, and debates
- Examines a wide range of public transport topics in the multidisciplinary fields of economics, policy, operations and planning
- Bridges the gap between scientific research and policy implementation

DESCRIPTION

Bus Transport: Demand, Economics, Contracting, and Policy examines in one source the most critical and current research themes of public transport regulators, planners, operators, researchers, and educators. It highlights the wider economic impacts of public transport and compares energy usage across all public transport modes. The book examines the evolving debate on Mobility as a Service (MaaS) and includes discussion of such themes as; public image issues, performance measurement and monitoring, contract procurement and design models, travel choice and demand, and global public transport reform. The book reflects the leading perspectives on the preservation and health of the bus sector, intending to move public transport reform forward.

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THANK YOU

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