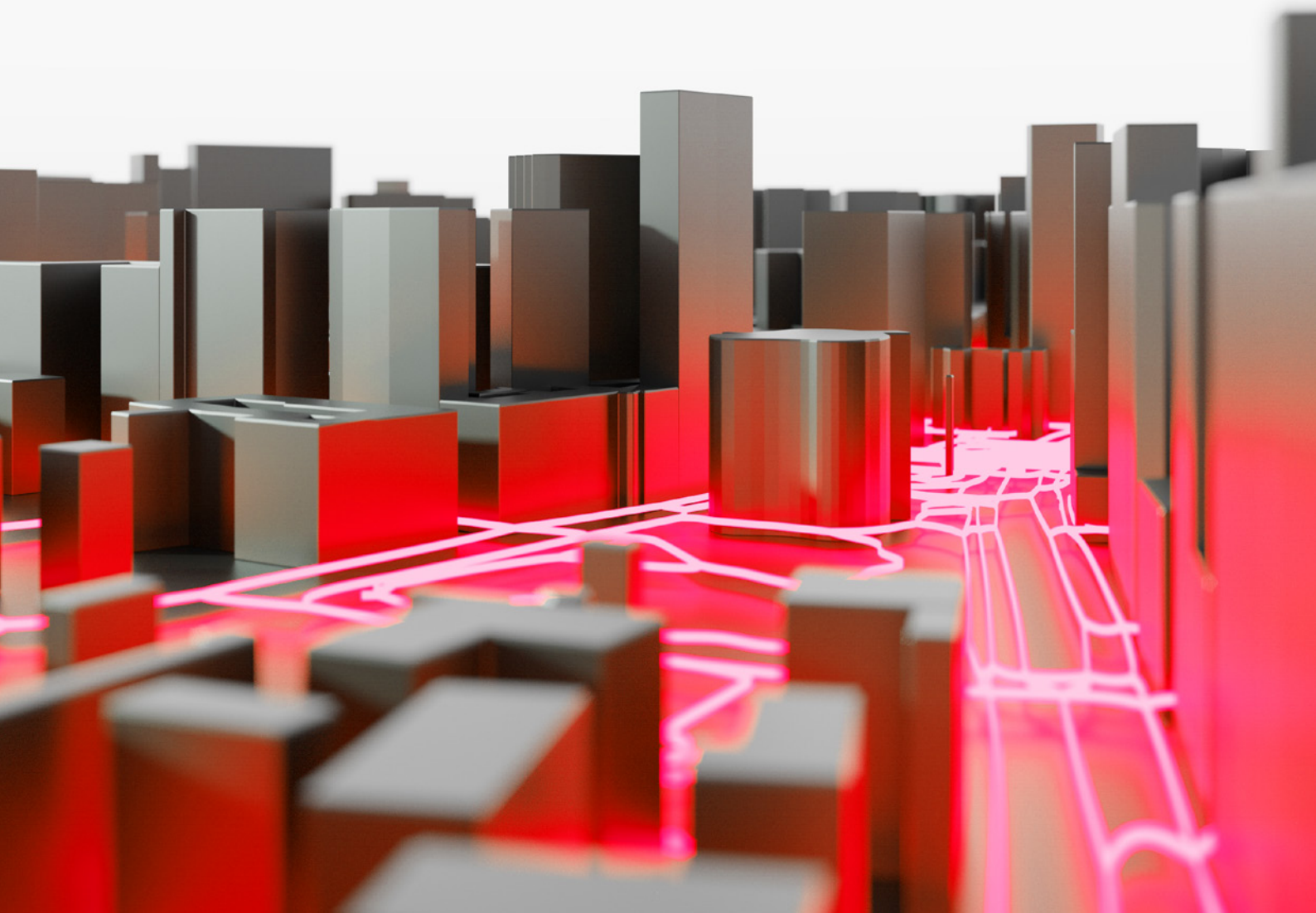




# ARE WE THERE YET?

NEW MOBILITY READINESS SCORECARD  
**MARCH 2019**





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### **L.E.K. Consulting**

Level 26, 88 Phillip Street  
Sydney NSW 2000 Australia  
T: +61 2 9323 0700  
W: [www.lek.com](http://www.lek.com)

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### **Tourism & Transport Forum**

Level 6, 7 Macquarie Place  
Sydney NSW 2000 Australia  
T: +61 2 9240 2000  
W: [www.ttf.org.au](http://www.ttf.org.au)

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# INTRODUCTION



New technologies and business models will transform transport in the coming decades. The changes will be as profound as the shift from the horse and cart to motor vehicles at the beginning of the last century. We are already in the early stages of this transition with rideshare, dockless bikes, e-bikes and scooters, and transport related apps achieving widespread adoption.

These changes will accelerate in coming years with significant electrification of the vehicle fleet looking increasingly likely starting in the next decade, and a shift to autonomous and connected vehicles commencing later in the same period.

Adoption of these technologies offers the potential for a vastly better consumer experience, better use of transport infrastructure, increased passenger (and non-passenger) safety and reduced environmental impacts. This in turn will impact both city liveability and competitiveness. For these reasons TTF believes it is important to monitor and track the progress of different Australian state governments in their new mobility policy agenda.

This report, the first of its kind, seeks to benchmark each of the major states in terms of their policies and progress for embracing new mobility. TTF has been delighted to partner with L.E.K. Consulting, a leader in new mobility strategy, in the preparation of this report.



**Margy Osmond**  
Chief Executive Officer  
*TTF*



**Simon Barrett**  
Partner  
*L.E.K. Consulting*



**Natasha Santha**  
Principal  
*L.E.K. Consulting*



# OVERVIEW OF FINDINGS

The Australian transport sector is undergoing significant change. New transport technologies have the potential to radically alter the way that people move around cities and regions, and they are becoming increasingly present in Australian life. The seamless integration of these future transport technologies and services requires considerable action on the part of state governments - not only to facilitate the trial and testing of technology deployment but also to establish appropriate regulatory frameworks to aid in their adoption.

Australia has the opportunity to be one of the countries at the forefront of transport technology innovation, with many major future technology companies looking to Australia to invest in the design and testing of new products.

This report takes a detailed look at future transport progress across the states of Australia, posing two key questions: 1) To what extent is Australia ready for future transport? and 2) Which states are leading the way?

L.E.K. Consulting compared the progress of the five Australian states and the Australian Capital Territory (ACT) across eight key new mobility technology and service trends to identify those that are relatively ahead or behind. Tasmania and the Northern Territory are also briefly addressed in this report, however, materially, they have shown less progress than the other states. L.E.K. then undertook a comparison against Singapore, an international best practice case study, to help understand where Australia sits in the global context.

The results for each of the five States and the ACT are presented in a scorecard which assesses

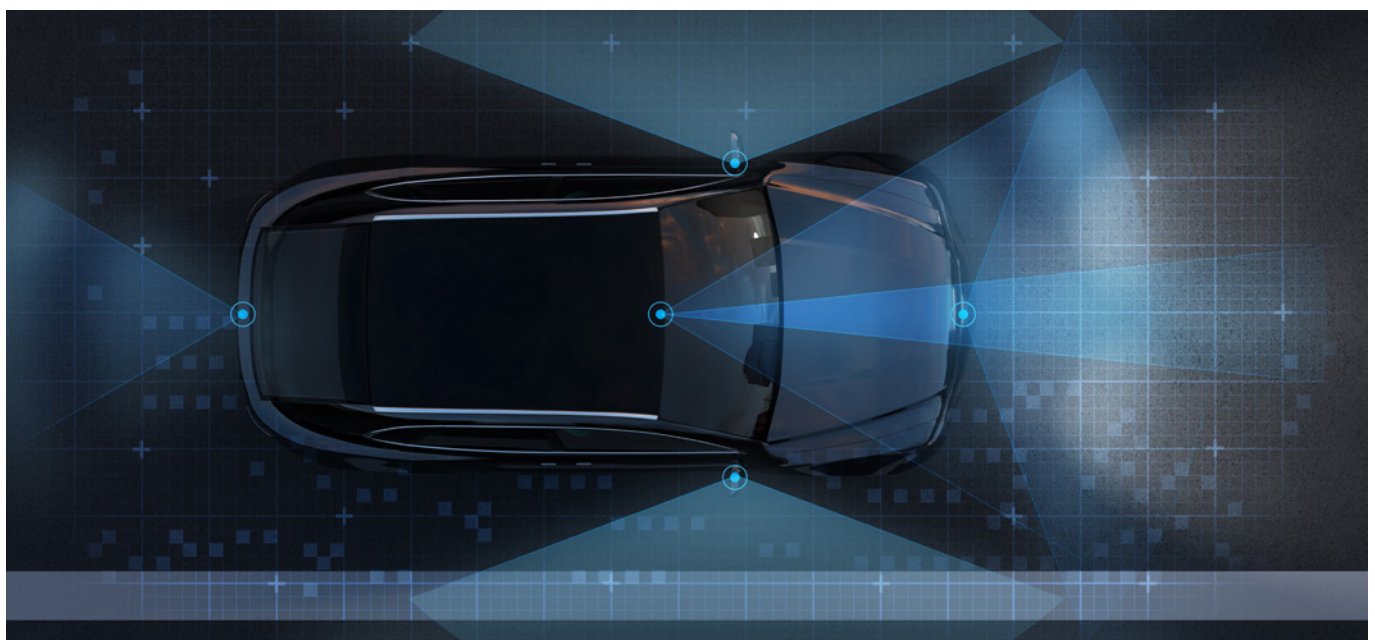
progress. Firstly, it looks at whether there is a clearly articulated future plan or strategy and then for each new mobility technology or service trend it assesses whether the state:

- has made significant investment
- has undertaken pilot programs
- has fostered an appropriate regulatory environment
- is operating the technology or service at scale

This report is intended to inform future policy decisions, by encouraging states to learn from the developments across borders, as well as assist new mobility entrants to understand the relative progress of each jurisdiction and where to focus their investment.

It is based on publicly available information as at December 2018, and does not take into account any initiatives or work that is not in the public domain or was announced after this date.

These findings should be considered in the context of each state's own challenges in relation to public transport demand growth and therefore relative priorities. For example, use of public transport in Sydney has increased by c.11.4% p.a. since 2015, driven by growth in rail and bus trips, while ferry patronage declined slightly. In Melbourne, rail and light rail patronage has been growing at c.1.3% p.a. from FY2012 to FY2017, while bus patronage has fallen by c.0.9% p.a. over the same period. In Brisbane and Perth, declining patronage associated with bus utilisation is starting to stabilise as declining patronage growth slows.



## OVERVIEW OF FINDINGS (CONTINUED)



The following pages explore in greater detail the degree of progress that has been made by each state to encourage future transport technologies and services, and where their strengths lie.

In many states significant investment has already been dedicated to modernise the way people move. As a result, each state has developed unique strengths, and areas where more work can be done. The table below ranks each state across eight new mobility areas to identify who is ahead of, on or behind the trend for each respective technology or service.

The results show that each state government has taken a different approach to tackling the challenge of adopting new mobility technologies and services. For example:

- some states, such as NSW and WA, have chosen to develop a long-term strategy that acknowledges the shortfalls of today's legislation and aims to address emerging trends as they arise
- other states, such as VIC and SA, have been more reactive to present day challenges and new market entrants, and have spent less time developing a formal forward-looking plan

The differences in approach begin to explain the varying progress of certain technologies in each state. While some states are relatively progressive across the majority of segments (for example NSW, which is mostly ahead of the trend), others appear to be specialising or strengthening their position in particular areas before turning to other trends. For example, SA has focused on autonomous trials and digital driving licenses, whereas WA has put more emphasis on electric vehicles (EVs).

Another reason for differences between states may be difficulties accommodating new mobility services within existing regulatory and operational frameworks. Many states have struggled to balance the growth of ride-share companies with the existing taxi industry. Traditional timetabled bus services are now being reconsidered as on-demand services become more readily available and affordable.

Some states have partnered with global technology giants and early-stage innovators alike. The key being to ensure that policy is advanced enough to allow for experimentation without compromising the existing transport network or safety of the population. For example:

- SA is recognised worldwide for its openness to automated vehicle technology. SA created a \$10m Future Mobility Lab fund in late 2016 to support international and local companies seeking to test automated technologies. Some beneficiaries of this fund include Navya (a French-based autonomous vehicle (AV) company), Aurigo (a subsidiary of UK driverless vehicle company RDM Group), Cohda (an Adelaide founded wireless technology leader), and the University of Adelaide
- In WA, the Royal Automobile Club (RAC) and Navya ran a trial of a driverless shuttle bus in 2017, supported by the WA government. In 2018, a joint venture of RAC, Navya and state and local governments ran a trial of electric AVs on private roads, with testing on public roads expected to be undertaken in 2019

It is also clear that some new mobility segments are relatively more advanced than others. Shared mobility, for example, is particularly mature given the rising popularity of ride-sharing and car-sharing companies like Uber and GoGet. There is also increasing momentum around electric vehicles and AV trials. In contrast, the Australian market has seen minimal development of Mobility-as-a-Service (MaaS), while the advancement of driverless rail and digital driving licences appears to be binary, with NSW leading the way on both fronts and SA leading on digital driver licence technology.

## OVERVIEW OF FINDINGS (CONTINUED)

In many new mobility segments Australia compares favourably with Singapore – Australia's leading states are close to (if not on par) with Singapore's progress to date. However, this position may not be maintained for long without further investment, as Singapore is poised to make advancements in MaaS and payment innovation in 2019.

		NSW	SA	ACT	QLD	VIC	WA	Singapore
Public future transport technology strategy?		Yes	No	Yes	Partly	No	Partly	Yes
New mobility segments	Car-share	4	4	4	4	4	2	4
	Ride-share	4	4	4	4	4	4	4
	Bike-share	4	4	4	4	4	3	4
	AV Trials	3	3	3	2	3	3	4
	Electric vehicles	4	4	4	4	3	4	3
	Mobility-as-a-Service	1	0	1	0	0	0	2
	On-demand mobility	4	0	2	1	2	0	3
	Driverless rail	3	0	n/a	0	0	0	4
	Digital driver licence	3	4	0	1	0	0	1
	Payment innovation	4	3	3	3	1	0	4
Score of each States' progress		34	26	25	23	21	16	33
Commentary		NSW has developed a broad future transport strategy and has laid the groundwork for many future technologies. It is ahead of the trend on many new mobility segments	SA has been at the forefront of automated vehicles and digital driver licence technology. The government has shown an openness to transport innovation, although some trends have been prioritised over others	ACT has developed an integrated future transport strategy with a view to future technology and has been an early adopter in areas of ride sharing, AVs and EVs	QLD has recently invested heavily in shared mobility and future transport technologies, particularly EVs	VIC has been the test ground for shared mobility companies and has a long history in smart road technologies. There is still potential for significant investment in a range of other future transport trends	WA has developed a robust future transport strategy that considers future transport technologies and has partnered successfully with Navya to bring AV technology to WA	Singapore is a global leader in future transport solutions, and is ahead of the curve on many future mobility trends



# METHODOLOGY

Eight new mobility trends and services are addressed in this report. For the purposes of this report, these segments have been defined as follows:



## SHARED MOBILITY

Shared mobility includes ride-hail (Uber), ride-share (UberPool), car-share (GoGet) and bike-share services. Under these schemes, the user does not own the vehicle and is charged for its use.



## AUTONOMOUS VEHICLES

Vehicles that are operated by a computer rather than a human. The term includes fully autonomous and connected vehicles.



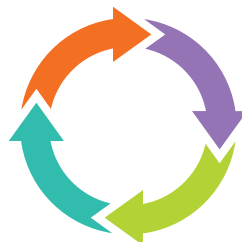
## ELECTRIC VEHICLES

Vehicles that are purely powered by electricity rather than fossil fuels. The term includes charging infrastructure.



## MOBILITY-AS-A-SERVICE

A connected multi-modal transport application. The user uses one app to book, travel and pay for multiple modes of transport.



## ON-DEMAND

Public transport that allows users to book travel from a specific location, such as their home, to another location. The term does not include taxis or commercial ride-share services.



## DRIVERLESS RAIL

Trains that are operated by a computer rather than a human. The term includes public rail but does not include private freight.



## DIGITAL DRIVER LICENCE

A non-physical licence that is accessed via an app. The term includes secure technology required to store sensitive documentation on devices.



## PAYMENT INNOVATION

Innovative methods of paying for transport, including contactless and account-based options (using credit cards to 'tap and pay').

A scorecard of each State's progress was developed based on the following four criteria:

Criteria		Key Questions	Score
C1	Is there an appropriate regulatory environment?	<ul style="list-style-type: none"> <li>• If a new company were to enter the market, could they do so immediately / with relative ease?</li> <li>• Is there already a legal operation underway?</li> <li>• Have all major regulatory barriers to entry been removed?</li> </ul>	If any has answer 'yes' – then score 1
C2	Has a pilot program been undertaken?	<ul style="list-style-type: none"> <li>• Is there government or privately sponsored trial program underway / planned for the near future?</li> <li>• Is it operating?</li> </ul>	If any has answer is 'yes' – then score 1
C3	Has there been significant state investment? (\$ or hours)	<ul style="list-style-type: none"> <li>• If there is a pilot, was there significant state investment required?</li> <li>• Was there extensive analysis / advice that informed the future plan?</li> <li>• Has a fund / investment pool been set up for future work?</li> </ul>	If any has answer 'yes' – then score 1
C4	Is it operating at scale?	<ul style="list-style-type: none"> <li>• Is there commercial company operating at a medium-large scale?</li> <li>• Is there a non-commercial company operating at scale (ie. larger than a pilot)?</li> <li>• Is the mobility entrenched in the local transport network (e.g. Brisbane's Citycycle)?</li> </ul>	If any has answer 'yes' – then score 1



# NEW SOUTH WALES

New Mobility Segments		Scoring criteria				Score	Commentary
		C1	C2	C3	C4		
Public future transport technology strategy?		Yes: Future Transport Strategy 2056 and the Future Transport Technology Roadmap (2016)					
Shared mobility	Car-share	1	1	1	1	4	• Operators began trials in 2007. Now commonplace throughout Sydney.
	Ride-share	1	1	1	1	4	• Since 2016, ride-sharing services have been legally allowed to operate in NSW. Stage 2 of the Point to Point Transport Act came into effect on 1 Nov 2017. In Feb 2018 a \$1 levy per trip was applied.
	Bike-share	1	1	1	1	4	• Bike-share operators are permitted to operate under a set of guidelines. A group of councils is working to propose more thorough regulation.
Autonomous vehicle trials		1	1	1	0	3	• Driverless cars are being trialled on major Sydney motorways. Driverless shuttle trial is in progress at Sydney Olympic Park. Four other shuttle trials are planned in regional areas. • Legislation was passed to allow companies to apply for trials to run AVs on NSW roads (Transport Legislation Amendment – Automated Vehicle Trials and Innovation 2017).
Electric vehicles		1	1	1	1	4	• NSW has implemented tax discounts on low emissions cars. Three year trial of a government EV fleet began in April 2017.
MaaS		0	1	0	0	1	• TfNSW's Digital Accelerator is running a MaaS innovation challenge to find innovative ideas within industry and has selected five winners to progress to the pilot stage. • MaaS was considered as part of the NSW Future Transport Strategy released in 2017 and an EOI was published in July to find a partner to build a MaaS portal.
On-demand public transport		1	1	1	1	4	• Permanent on-demand bus services in the Inner West launched in July 2018. Several on-demand trials are underway elsewhere in NSW.
Driverless rail		1	1	1	0	3	• Driverless metro trains have successfully been tested on Sydney's Metro Northwest line and will be rolled out in 2019, with plans to expand to other areas by 2024.
Digital driver licence		1	1	1	0	3	• Successful trial in Dubbo, now expanded to Eastern Sydney. Full roll-out is planned for 2019.
Payment innovation		1	1	1	1	4	• Contactless payment pilot began for ferry and light rail services in 2017. In Nov 2018 Sydney became the first Australian city to adopt contactless payments for public transport. Sydney Trains/ NSW TrainLink networks now accept paywave-enabled debit or credit cards and Apple Pay.
Total						34	Ranked 1st of Australian states for new mobility progress

**C1** Criteria 1: Has there been significant investment (\$ or hours)?

**C2** Criteria 2: Has a pilot program been undertaken?

**C3** Criteria 3: Is there an appropriate regulatory environment?

**C4** Criteria 4: Is it operating at scale?



## NEW SOUTH WALES (CONTINUED)

NSW has been experiencing strong growth in public transport over the last 2-3 years particularly on its rail system. Significant new investment in roads and public transport will come on line from 2019 improving transport coverage and service frequency.

NSW has a thorough, publicly-available strategic approach to future transport technologies. It has a relatively advanced transport portfolio across the board, and is generally ahead of the other states on most dimensions.

Currently, NSW has the most comprehensive documented approach to future transport technologies compared to the other Australian States. The NSW government's Future Transport Strategy highlights the need for a new approach to transportation that will adapt to population growth and the changing needs of travellers to 2056. This strategy is influencing decision-making and funding to ensure that emerging trends are prioritised.

The Future Transport Roadmap is an associated strategy document that specifically focuses on the

role of future technologies in NSW's transport future and how TfNSW should support these changes. It outlines a number of potential future scenarios, and prioritises technologies for investment over the long term. For example, it examines AVs and rail, future bus technologies, MaaS, drones and aerial mobility. It looks beyond near-term policies by outlining a number of future 'no regrets' initiatives and 'game changers' for transport policy.

To support their stated Future Transport goals, TfNSW operates a Digital Accelerator, designed to facilitate collaboration between the public and private sectors to develop initiatives aligned with the Future Transport Roadmap. Its first initiative, currently in progress, is investigating potential MaaS solutions.

NSW has shown particular strength in on-demand public transport. It is running a number of trials throughout the state, and made one of these services permanent in mid-2018. It has already incorporated on-demand services into one of its metropolitan bus contracts (Region 6).



**Source:** City of Sydney; NSW State Government; Transport for NSW; NRMA; Uber; Electric Vehicle Council; Sydney Metro; Service NSW; Press reports

# SOUTH AUSTRALIA

New Mobility Segments		Scoring criteria				Score	Commentary
		C1	C2	C3	C4		
Public future transport technology strategy?		No: However, the Future Mobility Lab Fund of \$10m was created in 2016 to support new transport technology and innovation.					
Shared mobility	Car-share	1	1	1	1	4	• GoGet operates in Adelaide and is supported by local councils.
	Ride-share	1	1	1	1	4	• After significant debate between 2014-17, Uber was allowed to legally operate in Adelaide. While current regulations are strict, amendments are ongoing.
	Bike-share	1	1	1	1	4	• Adelaide Free Bikes have been available since 2005.
Autonomous vehicle trials		1	1	1	0	3	• In June 2016, the Motor Vehicles (Trials of Automotive Technologies) Amendment was passed, allowing on-road trials, tests and development of automated technology on SA roads. There have since been a large number of autonomous car and shuttle trials.
Electric vehicles		1	1	1	1	4	• SA provides financial support to provide charging infrastructure and government and public transport electric vehicle trials are also underway.
MaaS		0	0	0	0	0	• The Future Mobility Lab Fund mission includes creating a connected transport network but no work has been made public specifically on MaaS.
On-demand public transport		0	0	0	0	0	• On-demand does not feature in any future transport documents, although Keolis Downer launched ‘Dial-a-ride’ in Adelaide in 2003 (a minibus door-to-door service) and Southlink offers a similar pre-book service.
Driverless rail		0	0	0	0	0	• In mid 2016 the former Transport Minister suggested an autonomous rail project to Flinders University but this has not been confirmed by government.
Digital driver licence		1	1	1	1	4	• Digital driving licences were rolled out in October 2017 and are available via a government app, following successful trials on other types of licences (e.g. fishing).
Payment innovation		1	1	1	0	3	• Smartphone payment trials were conducted in late 2017 but there have been no further announcements.
Total						26	Ranked 2nd of Australian states for new mobility progress

**C1** Criteria 1: Has there been significant investment (\$ or hours)?

**C2** Criteria 2: Has a pilot program been undertaken?

**C3** Criteria 3: Is there an appropriate regulatory environment?

**C4** Criteria 4: Is it operating at scale?



## SOUTH AUSTRALIA (CONTINUED)

Adelaide remains a relatively car dependant city, with public transport provision largely centred on bus services. The rail and light rail systems are relatively small, but have benefited from recent investment.

South Australia has taken the lead on AV innovation and trials and is also strong in a number of other new technologies. While there is no central strategic plan for the future of transport, this does not seem to have impacted its engagement in the future mobility space.

The Department of Planning, Transport and Infrastructure (DPTI) operates a \$10m Future Mobility Lab Fund to provide funding to projects and research on future mobility technologies, supporting Adelaide's growth into a Smart City. So far, the fund has focused mostly on autonomous technologies. Approved projects have included AV crash safety testing, ITS trials over the 4G mobile network, and a number of autonomous shuttle trials in Adelaide.

The SA Government's 30 Year Plan for Greater Adelaide includes a number of specific transport

goals, including encouraging car-sharing and providing charging points for EVs. However, it does not have a unified future transport plan. Similarly, DPTI has issued an Integrated Transport Plan, but it is not focused on future transport technologies.

Despite this, South Australia is at the forefront of AV innovation in Australia. South Australia was the first state to pass appropriate legislation permitting AV trials, and as a result there have been a large number of AV trials conducted in the state. Additionally, South Australia was also the first state to roll out digital driving licences - NSW is conducting trials, but they are fully deployed in South Australia.

South Australia has focused less on on-demand public transport and driverless rail, where there has been limited public policy direction from government. Overall however, South Australia has a high level of readiness and engagement with future transport technologies.



**Source:** NRMA; Electric Vehicle Council; SA Government; Adelaide City Council; Australian Institute of Traffic Planning and Management; Press reports



# AUSTRALIAN CAPITAL TERRITORY

New Mobility Segments		Scoring criteria				Score	Commentary
		C1	C2	C3	C4		
Public future transport technology strategy?		Yes: In late 2018, Transport for Canberra released an integrated transport strategy plan called Moving Canberra 2019-2045. The strategy focuses on building an integrated network with a view to emerging technology and future directions.					
Shared mobility	Car-share	1	1	1	1	4	<ul style="list-style-type: none"><li>Following a two year trial commencing in 2016, GoGet and Popcar operate in Canberra with support from the ACT Government.</li></ul>
	Ride-share	1	1	1	1	4	<ul style="list-style-type: none"><li>First Australian jurisdiction to regulate and promote ride-sharing. Ride-sharing options include Uber, GoCatch and ONTAP.</li></ul>
	Bike-share	1	1	1	1	4	<ul style="list-style-type: none"><li>Airbike is now operating across Canberra following a successful six-month trial commencing in mid-2018.</li><li>There are also a number of smaller docked systems in Canberra.</li></ul>
Autonomous vehicle trials		1	1	1	0	3	<ul style="list-style-type: none"><li>The ACT Government will invest over \$1.35m over 2018 and 2019 into trials supporting AV technology. More than 30 Canberra drivers are currently participating in CANdrive, a world leading trial to improve AV safety.</li></ul>
Electric vehicles		1	1	1	1	4	<ul style="list-style-type: none"><li>ACT has a strong record of encouraging EV adoption by funding EV charging stations throughout Canberra.</li><li>Current ACT Government policy aims for 100% of government fleet vehicles to be electric by 2020-21.</li></ul>
MaaS		1	0	0	0	1	<ul style="list-style-type: none"><li>Moving Canberra 2019-2045 proposes to bring MaaS to the ACT. The ACT Government has made material investments into building a platform to support MaaS in the future, such as procuring account-based ticketing/booking systems with MaaS functionality (being evaluated) and the recent launch of the transport journey planner, which has the potential for future MaaS capability.</li></ul>
On-demand public transport		0	1	1	0	2	<ul style="list-style-type: none"><li>Transport for Canberra has been operating (last-mile) journey ‘nightrider’ services with Uber since 2015 along with flexible bus services across five zones for eligible customers.</li><li>Government is currently investigating a quasi demand responsive transport (DRT) solution to offset recent changes to reduced fleet on the new network. The DRT will initially be small scale and limited to buses.</li></ul>
Driverless rail		n/a	n/a	n/a	n/a	n/a	<ul style="list-style-type: none"><li>Moving Canberra mentions considering autonomous public transport such as buses and light rail going forward. The strategy outlines an intention to undertake trials of AVs including the testing of buses on the public transport network.</li></ul>
Digital driver licence		0	0	0	0	0	<ul style="list-style-type: none"><li>No public documentation available.</li></ul>
Payment innovation		1	1	1	0	3	<ul style="list-style-type: none"><li>A new ticketing system is currently being procured to replace the existing card based ticketing system. The system will enable open loop credit and debit transit payments.</li></ul>
Total						25	Ranked 3rd of Australian states for new mobility progress

**C1** **Criteria 1:** Has there been significant investment (\$ or hours)?

**C2** **Criteria 2:** Has a pilot program been undertaken?

**C3** **Criteria 3:** Is there an appropriate regulatory environment?

**C4** **Criteria 4:** Is it operating at scale?



## AUSTRALIAN CAPITAL TERRITORY (CONTINUED)

Canberra's public transport system is currently undergoing material changes as it introduces a light rail network to a previously bus-only public transport network.

In late 2018, Transport for Canberra released an integrated transport strategy called Moving Canberra 2019-2045, which looks to create a more efficient, sustainable and smart transport network by considering the impact of a growing population, changing economies, technological and market advancements and future transport trends. Whilst the report discusses progress to date in terms of ride-sharing, AVs and EVs and makes mention of looking to bring MaaS, driverless rail and other advancements to Canberra, no specific plans are outlined.

Canberra is considered a leader in the shared mobility space, being the first jurisdiction in Australia to regulate and promote ride-sharing services such as Uber in 2015. Since 2015, Transport for Canberra has been engaged in last mile integration solutions with Uber, through the night rider program. Canberra also continues to support car-sharing and bike-sharing.

Canberra is one of the states leading adoption of AVs. The ACT Government has partnered with industry to

support a world-first research program called CANdrive. CANdrive looks to better understand human behaviour in an AV. In addition to the trial, appropriate legislation, regulation, safety assurance and infrastructure are currently being developed to enable a smooth AV roll-out. ACT Government policy is at the forefront of EV expansion in Australia, aiming for 100% of government fleet vehicles to be electric by 2020-21. There is also a noted initiative to fund charging stations throughout the ACT.

An open payment account-based ticketing system is currently being procured to facilitate open loop credit/debit card transit payments. This will deliver the ticketing system through smartphones, transforming ticketing into a 'bring your own device' system.

The ACT also recently announced that they will be investigating a quasi demand responsive transport (DRT) system to offset reduced fleet resources. The system will initially serve a small proportion of passengers e.g. disabled and elderly, with a view to expand over time.



Source: Transport for Canberra and City Services; ACT Government; Press reports



# QUEENSLAND

New Mobility Segments		Scoring criteria				Score	Commentary
		C1	C2	C3	C4		
Public future transport technology strategy?		Partly: A brief digital strategy for 2016-20 is publicly available.					
Shared mobility	Car-share	1	1	1	1	4	• Multiple car-sharing companies have recently launched in Brisbane.
	Ride-share	1	1	1	1	4	• Ride-sharing has been legal since 2016 and the Queensland Personalised Transport Horizon Five Year Plan (2016-21) steps out implementation stages for legislation. Licencing fees are required for Uber drivers.
	Bike-share	1	1	1	1	4	• CityCycle has been operating in Brisbane since 2010 and the Gold Coast introduced a similar scheme in 2018.
Autonomous vehicle trials		1	1	0	0	2	• The TMR CAVI project aims to trial AVs in Ipswich in 2019 and is negotiating a partnership with QUT and Bosch to test driverless cars on public roads.
Electric vehicles		1	1	1	1	4	• In Oct 2017, the Queensland Government released its Electric Vehicle Strategy which details future steps to encourage EV uptake. An electric charging network was completed in early 2018 with free supercharging stations installed between Gold Coast-Cairns and Brisbane-Toowoomba. There are c.21k EVs, including hybrids, registered in Queensland as of October 2018.
MaaS		0	0	0	0	0	• No public information available, although Queensland DTMR has mobilised a team to define their strategy.
On-demand public transport		0	1	0	0	1	• On-demand transport trials are underway in three areas of Logan, in partnership with Yellow Cabs. Results will influence further plans for expansion.
Driverless rail		0	0	0	0	0	• No plan in the public. Still has train guards many years after phased out in Melbourne.
Digital driver licence		0	0	1	0	1	• A procurement process to engage a vendor to develop a digital wallet started in October 2018. A pilot for a digital wallet may be announced in the second half of 2019.
Payment innovation		1	1	1	0	3	• Contactless payments for public transport were announced mid-2018 as part of DTMR's Next Generation Ticketing (NGT) program, and will be rolled out over the next four years in a \$371m infrastructure refresh.
Total						23	Ranked 4th of Australian states for new mobility progress

**C1** **Criteria 1:** Has there been significant investment (\$ or hours)?

**C2** **Criteria 2:** Has a pilot program been undertaken?

**C3** **Criteria 3:** Is there an appropriate regulatory environment?

**C4** **Criteria 4:** Is it operating at scale?

## QUEENSLAND (CONTINUED)

Queensland's population growth slowed somewhat during the past decade from record levels. As a consequence, public transport demand has been flat for some time, but has recently begun to grow once again. The state is investing significantly in major roads and the Cross River Rail project, as well as the Brisbane Metro to improve central area bus services.

Queensland has shown strong progress with electric vehicles, particularly creating its "Electric Superhighway" completed in early 2018. Queensland has also progressed in specific future transport areas, including on-demand transport trials and contactless payment for public transport. However, it lacks a formal unifying plan, and other future technology areas are trailing behind.

The Department of Transport and Main Roads (DTMR) has released a 2016-2020 digital strategic plan for transport but currently only one page of this document is publicly available. The key themes include supporting a contemporary workforce, embracing innovation, creating liveable regions and active cities, and building prosperity. However, it does not disclose any concrete policy directions or any discussion of particular transport technologies.

'Connecting Brisbane', a publicly available government document, discussed the future of public transport in Brisbane. It addresses current congestion and the required growth to support a growing city. However, the document discusses contemporary infrastructure (e.g. rail and bus), rather than any future technology or new mobility options.

Queensland's Electric Vehicle Strategy outlines sixteen programs to encourage growth in the uptake of EVs, including supporting infrastructure, driving innovation, and increasing the availability of EV models for consumers. It shows that Queensland is committed to embracing the technology and realising the associated environmental benefits.

Also, the rollout of the 'Electric Superhighway' represents a significant investment. It is the longest EV superhighway within a single state, and provides charging stations along the Gold Coast-Cairns and Brisbane-Towoomba routes, which allows tourists and locals to travel throughout Queensland with low or zero tail pipe emissions.



Source: Queensland Government; GoGet; Brisbane City Council; CityCycle; Press reports





# VICTORIA

New Mobility Segments		Scoring criteria				Score	Commentary
		C1	C2	C3	C4		
Public future transport technology strategy?		No: A “Plan Melbourne” transport strategy was developed in 2017 but does not explicitly address future transport technologies.					
Shared mobility	Car-share	1	1	1	1	4	• Multiple car-share companies operate mainly in the inner city, with councils providing spaces and support.
	Ride-share	1	1	1	1	4	• Uber and other ride-sharing companies were legalised in August 2017.
	Bike-share	1	1	1	1	4	• RACV bike-share has been operating since 2010 and other bike-sharing operators have since entered the market.
Autonomous vehicle trials		1	1	1	0	3	• Trials of driverless vehicles are allowed under the 2018 amendment of the Road Safety Act. \$9m grant was provided for researchers and industry on AVs.
Electric vehicles		0	1	1	1	3	• A Government inquiry into EVs was tabled in May 2018 identifying a lack of policy support. There are more charging stations in Victoria than any other state. The Victorian government has invested in EV manufacturing in the State in partnership with SEA Electric.
MaaS		0	0	0	0	0	• While MaaS is a topic in the City of Melbourne’s Transport Strategy refresh, minimal progress has been made.
On-demand public transport		0	1	1	0	2	• On-demand bus services have been operating in Gisborne since Nov 2017, but there are no current plans to expand this trial.
Driverless rail		0	0	0	0	0	• In late 2016 the State Transport Minister announced that there were no plans for driverless trains. Position remains unchanged.
Digital driver licence		0	0	0	0	0	• VicRoads announced it was investigating digital driving licences in 2016 but there has been no further public discussion.
Payment innovation		0	1	0	0	1	• A smartphone-based payment option for public transport (mobile myki) was trialled in May 2018.
Total						21	Ranked 5th of Australian states for new mobility progress

**C1** **Criteria 1:** Has there been significant investment (\$ or hours)?

**C2** **Criteria 2:** Has a pilot program been undertaken?

**C3** **Criteria 3:** Is there an appropriate regulatory environment?

**C4** **Criteria 4:** Is it operating at scale?





Victoria has been experiencing strong population growth, and is investing significantly in its transport systems to keep pace with this growth.

Victoria has been quick to support shared mobility, particularly in Melbourne, and has a strong framework for conducting AV trials. However, it has not been as rapid on the uptake of other new vehicle technologies.

Victoria does not have a publicly available, unified transport technology strategy. However, future transport technologies appear in some government strategy documents. For instance, the Government's Victoria Infrastructure plan outlines a number of transport initiatives, including the roll-out of advanced traffic management systems and support of Melbourne University's Intelligent Transport Systems (ITS) testing area. It also suggests a number of broad future directions for transport investment, but they are general (e.g. "Monitor developments in technology and how they can be applied to transport infrastructure") and do not constitute strategic directions.

One of Victoria's key strengths in the new mobility space is its robust framework for AV trials. The 2018 amendment of the Road Safety Act created a permit system to allow driverless vehicle trials, and was designed to encourage development of AV technology in Victoria. Victoria was second only to South Australia in introducing this legislation.

While there has so far been limited progress in the uptake of EVs, a government inquiry into EVs was tabled in May 2018. This included a thorough examination of the current EV landscape in Victoria and the steps required for government to create a more supportive environment. This led to the Victorian Government requesting advice from Infrastructure Victoria on this topic.

In one of the most extensive research programs undertaken globally, Infrastructure Victoria considered the infrastructure implications of automated and zero emission vehicle technologies across ten areas, including transport modelling, ICT infrastructure and energy. The final advice was released in October 2018 and included recommendations around 'innovative transport services' (e.g. encouraging ride-sharing and ride-hailing) and generally supports the adoption of driverless vehicles. However, these individual recommendations are within a broader infrastructure framework, rather than a comprehensive approach to transport.

Overall, while Victoria has been slower on the uptake of some technologies, there are signs that it is developing an approach to address these, and some of its policy work has been far reaching.

# WESTERN AUSTRALIA

New Mobility Segments		Scoring criteria				Score	Commentary
		C1	C2	C3	C4		
Public future transport technology strategy?		Partly: The Department of Transport developed a Perth Transport plan in 2017 called Transport@3.5million designed to guide the future of public transport; it includes a short section on future technologies.					
Shared mobility	Car-share	0	0	1	1	2	<ul style="list-style-type: none"><li>City of Freemantle is supportive of car sharing.</li><li>Car Next Door and GoGet have plans to enter Perth.</li></ul>
	Ride-share	1	1	1	1	4	<ul style="list-style-type: none"><li>Uber is legalised and a levy on Uber drivers is funding a taxi plate voluntary buy-back scheme in 2017.</li></ul>
	Bike-share	1	1	1	0	3	<ul style="list-style-type: none"><li>Urbi began a 1 year trial in 2017 with the support of a local government.</li></ul>
Autonomous vehicle trials		1	1	1	0	3	<ul style="list-style-type: none"><li>The WA Government partnered with RAC WA and Navya, a French automated vehicle company to trial on-demand electric driverless vehicles in Perth in 2018. Early stages were completed on private roads with later testing on public roads with trained drivers.</li><li>WA completed a successful driverless bus trial in 2017.</li></ul>
Electric vehicles		1	1	1	1	4	<ul style="list-style-type: none"><li>In 2015 WA introduced Australia's first electric highway, along 310km with 12 electric charging stations. Future plans include adding more rural charging points.</li></ul>
MaaS		0	0	0	0	0	<ul style="list-style-type: none"><li>No public documentation available.</li></ul>
On-demand public transport		0	0	0	0	0	<ul style="list-style-type: none"><li>There have been rumours in the press that the State Government is considering on-demand public transport as a first-mile/last-mile solution, but there is no mention in official documents.</li></ul>
Driverless rail		0	0	0	0	0	<ul style="list-style-type: none"><li>Autonomous rail is mentioned in the Transport@3.5million plan, however, there are no plans yet to roll it out.</li></ul>
Digital driver licence		0	0	0	0	0	<ul style="list-style-type: none"><li>Digital licences have been considered as part of WA Government's NextGov program, but no further developments have been made as yet.</li></ul>
Payment innovation		0	0	0	0	0	<ul style="list-style-type: none"><li>It was reported in 2017 that contactless payment options were being investigated as part of the SmartRider ticketing overhaul.</li></ul>
Total						16	Ranked 6th of Australian states for new mobility progress

**C1** **Criteria 1:** Has there been significant investment (\$ or hours)?

**C2** **Criteria 2:** Has a pilot program been undertaken?

**C3** **Criteria 3:** Is there an appropriate regulatory environment?

**C4** **Criteria 4:** Is it operating at scale?



## WESTERN AUSTRALIA (CONTINUED)



After a long period of growth, Perth's public transport system has experienced a slow down in the last few years, consistent with the broader weakness in the local economy as resources investment has declined.

In new mobility technologies, Western Australia has demonstrated significant progress in EVs and ride sharing.

The Department of Transport released Transport@3.5million in 2017, intended to act as a guiding plan for public transport in Perth as the city grows to a projected population of 3.5 million. It includes a section on Future Trends, which addresses some technological advances, specifically: ITS, AVs and EVs. It discusses what these trends entail and possible challenges associated with transitioning to using these technologies. However, it does not include specific directions, initiatives, or goals for the adoption of these technologies.

Western Australia is ahead of the trend with EVs, having introduced Australia's first electric highway in 2015. It includes c.11 fast charging stations along the 310km highway from Perth to Augusta. This was funded by RAC, but is owned and maintained by local government councils.

Western Australia is also investing in AV trials, having completed an autonomous bus trial in 2017 and on-demand AV trials commencing in Perth in September 2018, in partnership with Navya. It has also shown progress in shared mobility, although car-share arrangements are not readily available as in other parts of Australia.

In other areas, such as on-demand public transport and digital driving licenses, Western Australia is still in the early stages of discussion and consideration of how to support and implement these future transport technologies.





# TASMANIA

Tasmania remains heavily dependent on private vehicle transport, with commuters in Hobart reporting that 83% of all journeys to work are by car, the highest across Australian cities. Metro Tasmania operates a local bus network in Hobart, Launceston and Burnie, however, access outside these areas is limited. Rail service in Tasmania remains focused on freight and no commercial passenger services in operation.

The Tasmanian Government and Infrastructure Tasmania released Hobart Transport Vision 2018-2030. This vision outlines the development of an integrated and efficient system for the movement of people around Greater Hobart. The plan prioritises creating a rapid passenger transport system as a competitive alternative to private vehicle travel.

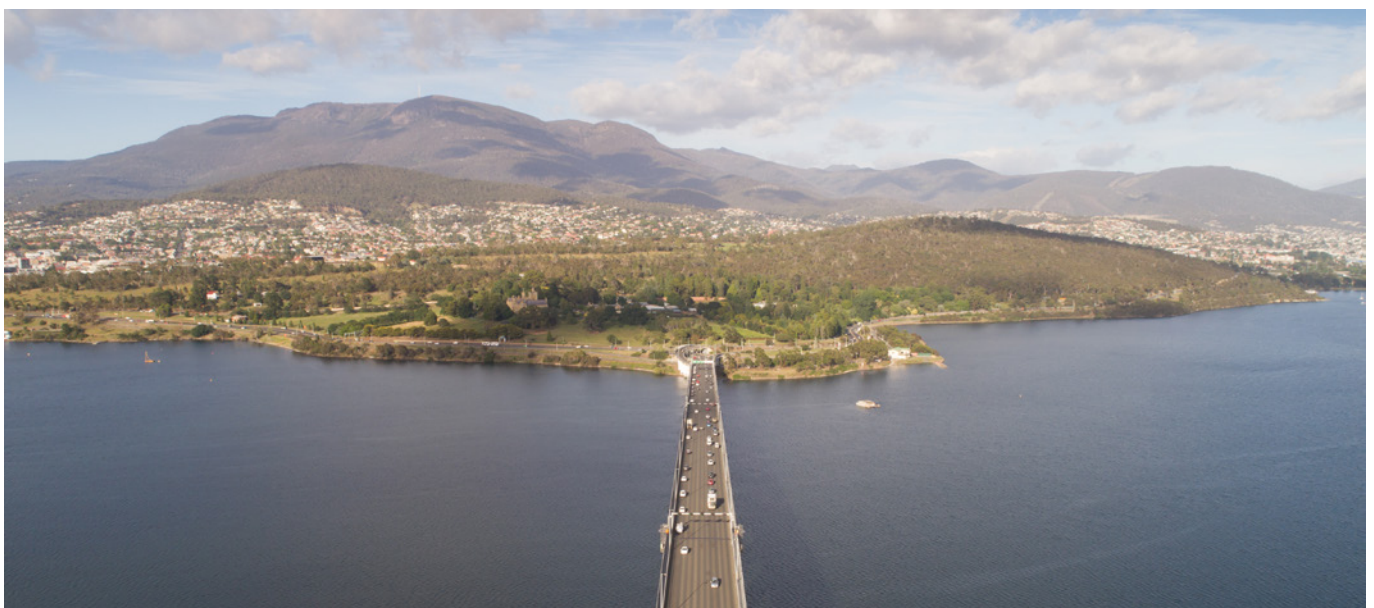
Use of new technologies is highlighted as a key strategy to manage and ensure reliability of future networks and conduct network monitoring and management in real time.

Ride-sharing services such as Uber, Shebah and Hi Oscar have been permitted to operate in Tasmania since late 2016, however car and bike-sharing offerings remain unavailable, with little public information available on potential for future availability.

Whilst the Hobart Transport Vision mentions the need to prepare infrastructure to accommodate AVs, it appears no progress has been made to advance this as of yet.

Tasmania remains relatively progressed in the area of EVs and there are now over 90 charging points across the State. Despite low uptake to date, the Tasmanian Government has established an EV working group to accelerate adoption of EVs as part of their goal to reach a zero net emissions target by 2050.

In other areas, such as MaaS, on-demand public transport, driverless rail and digital driving licenses, Tasmania is yet to release any information on how they plan to support and implement these future transport technologies.



**Source:** Infrastructure Tasmania; Department of Infrastructure, Planning and Logistics; Press reports





# NORTHERN TERRITORY

Bus services are currently available around Darwin, Palmerston and Alice Springs. However as a low density region, travel within the NT is also largely dependent on private vehicles, as the regional transport network remains comprised of roads unserved by public transport.

The NT Government and Department of Infrastructure, Planning and Logistics released the Darwin Regional Transport Plan in 2018. The Plan is an updated version of a 2016 release and focuses on integrating transport and land use planning for public transport, roads, and active transport across Darwin.

The Transport Plan considers future declines in private car use and technological innovation in this space, however the plan points out that tangible shifts in transport demand and technologies is unlikely to be seen in Darwin over the next 10-15 years.

Despite being underdeveloped in most other areas of new mobility, the Northern Territory is relatively progressed in terms of shared mobility. Uber and

other platforms have been available in Darwin since 2018 after the NT Government's framework to permit ride-booking services came into effect. Furthermore, Darwin council approved a car sharing scheme that has been running since 2015 operated by Carshare Darwin Pty Ltd.

Realising a commitment by the NT Government to explore AV technology for passenger transport, a driverless bus trial was undertaken in 2017 around Darwin's waterfront. Trial objectives focused on learning about AV technology in a pedestrian environment, raising awareness and evaluating outcomes to plan and deliver sustainable transport.

The Northern Territory appears less advanced on MaaS, EVs, on-demand public transport, driverless rail, digital licenses and payment innovation. To date there has been limited public policy direction from Government on these transport technologies, with the suggestion that there might be a time lag between adoption in the NT and other Australian states.



# SINGAPORE

New Mobility Segments		Scoring criteria				Score	Commentary
		C1	C2	C3	C4		
Public future transport technology strategy?		Yes: The Land Transport Authority developed a Smart Mobility 2030 plan in 2014 designed to guide Intelligent Transport Systems (ITS) adoption, which covers most new mobility technologies.					
Shared mobility	Car-share	1	1	1	1	4	<ul style="list-style-type: none"><li>There are a number of car-sharing services operating in Singapore, some partially owned by the Government. Such schemes are attractive as the Government has strict controls on the number of cars on the road.</li></ul>
	Ride-share	1	1	1	1	4	<ul style="list-style-type: none"><li>Ride-sharing operates at scale in Singapore, although the Land Transport Authority (LTA) is monitoring the impact of the 2018 merger of Grab and Uber, the two major players.</li></ul>
	Bike-share	1	1	1	1	4	<ul style="list-style-type: none"><li>Bike-sharing began in 2017 and there are five companies in Singapore currently. Operators require a licence from the LTA.</li></ul>
Autonomous vehicle trials		1	1	1	1	4	<ul style="list-style-type: none"><li>A number of separate trials are currently operating, some of which are open to the public. The earliest began in 2015.</li><li>The Government plans to operate fleets of AVs on a larger scale starting in 2022. Further legislation for AVs was released in the second half of 2018, supported by findings from the trials.</li></ul>
Electric vehicles		1	1	0	1	3	<ul style="list-style-type: none"><li>There are 776 registered EVs in Singapore, including BEVs and PHEVs as of October 2018. There is no public charging network. Singapore operates tight controls on car numbers, making purchasing new vehicles of any kind unattractive.</li></ul>
MaaS		0	1	1	0	2	<ul style="list-style-type: none"><li>Finnish startup Maas Global is partnering with ComfortDelGro to pilot Whim, a MaaS app, in Singapore, with commercial launch expected in Q1 2019.</li></ul>
On-demand public transport		1	1	1	0	3	<ul style="list-style-type: none"><li>In early 2018 Singapore awarded contracts to two firms to operate on-demand bus trials. These trials commenced in December 2018. There are a number of existing ‘bus-pooling’ services that are not affiliated with the Government.</li><li>Autonomous on-demand shuttles will operate in three districts from 2022.</li></ul>
Driverless rail		1	1	1	1	4	<ul style="list-style-type: none"><li>Two of Singapore’s MRT lines are driverless.</li></ul>
Digital driver licence		0	0	1	0	1	<ul style="list-style-type: none"><li>There are no public plans to digitalise driving licences. However, the National Digital Identity framework under development would create a digital ID for citizens.</li></ul>
Payment innovation		1	1	1	1	4	<ul style="list-style-type: none"><li>Payment with near field communication enabled mobile phones was rolled out in 2016. The LTA has also trialled Apple Pay, Android Pay, and Mastercard contactless payments.</li></ul>
Total						33	

**C1** Criteria 1: Has there been significant investment (\$ or hours)?

**C2** Criteria 2: Has a pilot program been undertaken?

**C3** Criteria 3: Is there an appropriate regulatory environment?

**C4** Criteria 4: Is it operating at scale?



## SINGAPORE (CONTINUED)



Singapore is a global leader in new mobility, and has a history of transport innovation. It leads the scorecard on multiple dimensions.

In 2014, Singapore's Land Transport Authority (LTA) developed a Smart Mobility 2030 plan. This was designed to guide Intelligent Transport Systems (ITS) adoption, and provides a vision for the future of a connected Singapore. It discusses technologies like connected vehicles and infrastructure, smart traffic light management, AVs, and alternative power sources. However, it did not cover other aspects of future mobility, like MaaS and on-demand services. The LTA does not have a central guiding document for these other new transport technologies, but this does not seem to have slowed Singapore's progress.

Singapore has run a number of sophisticated AV trials, some of which are open to the public. These include autonomous shuttles and buggies as well as cars. The Government also plans to operate fleets of AVs on a large scale starting in 2022. In late 2017, it issued a request for information for technology companies to offer scheduled and on-demand services in AVs.

The LTA also funded the development of a \$3.6m AV testing centre, launched in 2016, which enables research on AV technologies in simulated on-road situations. Legislation around AVs has been in place since 2017, when the law recognised that vehicles do not require a human driver; further amendments informed by trials were implemented in the second half of 2018.

While Singapore has a number of EVs on the road, adoption has been slow. The Government tightly regulates the number of cars on the road, due to the lack of road space on the island. As a result, purchasing any car (including an EV) is not incentivised. However, there are EV car sharing schemes, which represent a compromise.

It is also expected that Whim, a MaaS app, will launch in 2019, making Singapore one of the earliest adopters of MaaS in the region.

The only area in which Singapore could be considered behind the trend is digital driving licences. However, it plans to implement a digital national ID, which would serve a very similar purpose.

# CONCLUSION

New mobility technologies and services are becoming increasingly prevalent in the Australian market. They stand to deliver significant benefits to the community as a whole, creating more equitable and lower cost transport options, as well as creating a more sustainable future.

The onus is on state and local governments to seize this opportunity and create the necessary policies and frameworks to aid adoption, as well as to foster a collaborative environment that encourages innovation in the private sector.

Governments need to start thinking ahead to secure positive societal benefits by planning for change, focusing on long-term outcomes and working collaboratively with other states to learn from each other and unify their approach. Over the coming months, those states who are behind the trend on respective new mobility dimensions, may consider the following actions:



## PLAN

Establish a long term strategy (where one does not exist).



## PRIORTISE

Decide where to focus first, considering which new mobility technologies and services deliver the greatest outcome (potentially even considering alternative financing approaches).



## COLLABORATE

Work with other states, learning from those that have gone before them, without re-inventing the wheel.



## UNIFY

Work towards standardising the approach to supporting regulatory frameworks nationally, to enable more efficient interaction with the private sector (particularly international new market entrants).



TOURISM &  
TRANSPORT  
FORUM

LEVEL 6  
7 MACQUARIE PLACE  
SYDNEY NSW 2000  
T: +61 2 9240 2000  
[www.ttf.org.au](http://www.ttf.org.au)

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