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Infrastructure Victoria
Submitted electronically

Submission to Infrastructure Victoria's Draft 30-year Infrastructure Strategy

INTRODUCING ROADS AUSTRALIA

Roads Australia (RA) is the peak body for roads within an integrated transport system, representing an industry that contributes $207 billion annually to the economy and supports 1.3 million jobs. RA has over 150 members and brings industry, government, and communities together to lead the evolution of Australia's roads, integrated transport and mobility.

SUBMISSION

RA welcomes the opportunity to make a submission to Infrastructure Victoria (IV) providing feedback on the *Draft 30-year Infrastructure Strategy* (the Draft Strategy). Our submission addresses the following areas, which were also highlighted by the various recommendations made in the Draft Strategy:

- Zero Emission and Automated Vehicles
- Mobility as a Service (including Public Transport and Active Transport)
- Freight Movement
- Recycled Materials in Transport Infrastructure
- Priority Infrastructure Sectors
- Procurement
- Transport Network Pricing
- Road Safety
- Roadworker Safety

Policy Insights developed by RA relevant to, and referenced in this submission, are attached.

ZERO EMISSION AND AUTOMATED VEHICLES

RA believes that Australia's productivity and road safety outcomes can be strongly improved by the introduction of autonomous vehicles, initially in the heavy vehicle freight sector, then through driverless capability in the light vehicle fleet. However, we remain concerned that the lack of a nationally coordinated, consistent and integrated regulatory framework for autonomous vehicles, will potentially delay these benefits for many years.

Improved coordination of Australia's autonomous vehicle trials, enabling law and regulatory processes is essential. Governments should be collaboratively engaging on the development of strategies to help remove consumer and societal barriers to the introduction of autonomous driving technologies.

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RA believes the Federal Office of Future Transport Technologies can play a pivotal role in avoiding a potentially fragmented approach to the introduction of automated vehicles. It is incongruous that our national highway system could see markedly different network control and management systems in place, given that vehicles routinely traverse state and territory borders. Alternatively, we could be faced with the suboptimal scenario of accepting staggered jurisdictional implementation, or significant delays until all states and territories have adequate systems in place.

The Department of Infrastructure, Transport, Cities and Regional Development and Communications fact sheet on Automated Vehicles acknowledges that there are differing views about when developments in automotive technology will enable more sophisticated automated vehicles to be ready for use on our roads. There is further uncertainty about when these vehicles will be commercially available in Australia, and when they may represent a significant component of our vehicle fleet. However, while noting this uncertainty, the November 2020 Infrastructure and Transport Ministers Meeting (ITMM) agreed that the National Transport Commission (NTC) and others will report back to Ministers in November 2021 with an evaluation framework for trials and the scope for reviewing Australia's overall readiness for the commercial deployment of automated vehicles.

The capacity of the Office of Future Transport Technologies should be leveraged to help support this objective and ensure that emerging regulatory frameworks for automated vehicles are designed and implemented in a nationally consistent manner.

RA also supports the recommendations in the Draft Strategy relating to the uptake of electric vehicles and hydrogen fuel technology, noting that RA members have consistently identified uptake of low emissions vehicles as a critical component of reducing overall emissions from the transport sector.

Preconditions and potential pathways for enhancing uptake are set out in Policy Insights pieces RA has recently produced. The first Policy Insights included an exploration of factors driving take-up of EVs in Europe, noting fuel standards, public investment and support for deploying charging infrastructure have engendered a consumer-led transition towards EVs. The potential for electric buses to help reduce public transport emissions was also a focus, noting that there is opportunity to expand the range of economic benefits by manufacturing such vehicles domestically.

Reduced emissions from public transport was also the focus of a Policy Insights piece that examined hydrogen fuel cell technology. As well as the obvious emissions reduction benefits that flow from the use of cleaner fuels, hydrogen also offers considerable advantages through its long-term storage potential and Australia's capacity to develop new export markets though its uptake.

MOBILITY AS A SERVICE (MAAS) INCLUDING PUBLIC TRANSPORT AND ACTIVE TRANSPORT

The onset of the COVID-19 pandemic and associated changes to demand for transport services in 2020 led RA to revisit Mobility as a Service (MaaS) [1], and examine how mobility in Australia might evolve as shared modes are less attractive and working from home becomes more commonplace in a post-COVID economy.

We considered the transition to a "new normal" on public transport, with progressive easing of restrictions and a range of precautions and monitoring in place (such as social distancing, which limits capacity). This included an exploration of how transport network demand can be better managed through the promotion of flexible work practices, and incentivising off-peak travel through flexible timetabling and fare structures. Ideas for achieving this are set out in an RA Policy Insights piece.

An associated theme has been the increased profile of active transport (walking and cycling), with these modes now seen as more attractive by Australians as a result of COVID-19. RA believes there is opportunity to harness and maintain this mode-shift over the long-term, as well as better integrate active transport with public transport as part of a truly integrated and multi-modal network. However, as set out in an additional RA Policy Insights piece, this means complementary active transport solutions must proactively be considered when developing and funding transport infrastructure.

Separately, RA commenced a social licence-based research project in the final months of 2020 that aims to identify how to make buses a preferred mode of transport within a multi-modal transport system. This research focuses on the customers' underlying concerns regarding the bus industry, with a view to developing an understanding as to how to attain an increased level of acceptance, legitimacy, and ultimately, trust in this under-utilised mode of transport. This research will be shared with RA members when available.

RA believes that the COVID pandemic presents an opportunity for MaaS offerings to be rolled out in Victoria that can encourage mode-shift and towards active and mass transit solutions. Technology has a critical role to play in this space, and trials of new technologies should be facilitated to ensure a focus on customer experience and delivering the best outcomes for road users – no matter what their chosen mode of travel.

FREIGHT MOVEMENT

Freight movement is an essential component of an integrated transport system and RA is supportive of infrastructure projects that will enhance the efficiency and capacity of Australia's freight network as Australia's population grows.

This is why RA strongly supports the Inland Rail project from Melbourne to Brisbane via Inland NSW, which has been identified as a priority project on Infrastructure Australia's *Infrastructure Priority List* 2020[2] and has recently made a submission[3] to the NSW Parliament's inquiry into the project.

One of the key benefits of Inland Rail is the potential for local communities to benefit from the establishment of intermodal terminals at strategic locations along the alignment. In light of this, RA supports and encourages IV's recommendation to buy the land and develop business cases for new intermodal freight terminals and precincts at Truganina and Beveridge to deliver a terminal in time for the completion of the Inland Rail project. This will help to ensure Victoria's freight network is well placed to meet projected growth and will allow local Victorian communities to more fully share in the benefits of Inland Rail.

RECYCLED MATERIALS IN TRANSPORT INFRASTRUCTURE

RA strongly supports the 2019 announcement by the Prime Minister[4] on the steps toward a cleaner environment through a $20 million commitment for innovative projects to grow our domestic recycling industry and welcomes the re-emphasis of recycling as a priority area in the Government's manufacturing strategy in his first public speech in 2021[5].

Many successful trials of recycled materials in road construction have been conducted in Australia over recent years. One such example is the Paving The Way[6] initiative of the Southern Sydney Regional Organisation of Councils, which aims to use nearly 100 million glass containers that might otherwise end up as landfill as road base. RA is keen to see the full realisation of the benefits of these trials, which have generated significant experience within industry and state road and transport agencies to be drawn on. A statement by the Australian Council of Recycling[7] (ACOR) highlights the potential opportunities, based on independent research, to use recycled material in road construction.

RA and the Australian Road Research Board (ARRB) held a Roundtable in 2019 on the use of recycled materials. The key message from Roundtable participants was the need to review all current standards and specifications, to facilitate the widespread use of recycled materials in roads in Australia.

There was strong support for a coordinated and collaborative approach from industry, key stakeholders and governments take this opportunity forward. The Roundtable recognised that supporting additional research, testing, and data will be required give governments confidence to optimise the use of recycled content materials in road projects.

However, the opportunity to harness recycled materials and build greater sustainability in infrastructure should not be limited to road construction. According to ClimateWorks Australia, Australian Sustainable Built Environment Council and Infrastructure Sustainability Council of Australia's *Reshaping Infrastructure for a Net Zero Emissions Future*[8] report around 70% of Australia's greenhouse gas emissions are either directly attributable to, or influenced by, infrastructure, whilst 10% of Australia's carbon footprint was attributable to 'engineering construction'[9].

The ClimateWorks Australia et al report acknowledges that while infrastructure assets themselves have no control over vehicle emissions, or how the energy for vehicles is produced, there is potential for the infrastructure to support the uptake of low and zero emissions transport (such as investment in public transport and active transport).

To encourage greater sustainability in transport infrastructure, RA will shortly commence a project exploring best practice in the development and operation of environmentally sustainable transport infrastructure. We expect this will provide governments and industry with examples of sustainability excellence in transport projects from Australia and internationally.

That said, RA believes the Commonwealth Government can take a lead role in this process. ITMM should facilitate discussion with all governments on the need for a national approach to the development and operation of environmentally sustainable transport infrastructure including the use of recycled materials in road construction.

PRIORITY INFRASTRUCTURE SECTORS

The increasing size and complexity of the pipeline of investment in road and related transport infrastructure will require new approaches if projects are to be effectively delivered.

Infrastructure Australia's (IA) *Australian Infrastructure Audit 2019*[10] points out that by global standards, Australian infrastructure industry capacity and capability is relatively strong, and the efficiency of the sector is high. The Audit also points out that each decision to build or upgrade infrastructure can impact on taxpayer and user bills for generations. Conversely every dollar of public infrastructure investment can generate GDP increases that can add up to $4 of value over the life of the asset. It is therefore essential we get these decisions right to improve the quality, affordability and access to our infrastructure.

The Infrastructure Audit shows there is considerable room for improvement in how we plan, fund and deliver infrastructure in Australia. It concludes that, while both the public and private sectors generally perform well, infrastructure projects are increasing in size and complexity, and will require new approaches if they are to be effectively delivered. The Audit emphasises that the way the public sector makes decisions, handles procurement, selects contract models and handles risk will have significant impacts on the functionality and efficiency of our infrastructure. Alongside these challenges, new demands for sustainability, resilience and security will provide opportunities to achieve better outcomes - however, this makes the planning and management of industry capacity more complex.

The importance to our industry of a strong and consistent pipeline cannot be underestimated, with the record level of current and planned investment in critical transport infrastructure providing a catalyst for strong growth in the Australia engineering and construction sector.

Australia is now making record investments in infrastructure to promote post-COVID-19 economic recovery. This means RA members are able to contemplate engaging a new graduate or apprentice entering the workforce, with the certainty that projects will be available to give them the variety of experience they require to develop into our next generation of nation builders.

RA PROCUREMENT REFORM REPORT

Implementing the recommendations from RA's Procurement Reform Report will improve planning and design of projects, more appropriately allocate and manage risk, give a more fulfilling role to medium and smaller contractors, improve skills and capacity building and ultimately deliver enhanced benefits for the whole community.

RA convened a major workshop[11] in Melbourne on 5 March 2020. Participants agreed that there were significant opportunities for improvement in major project procurement processes that must be addressed if governments are to get best value for money, and industry is to get the best use of its capital and people.

Subsequently, in September 2020, RA released the Procurement Reform Report[12], which identified solutions to the significant procurement issues being encountered by government and industry.

The Report contains 21 recommendations to address the major procurement challenges being experienced across Australia, and clearly sets out key areas where governments and industry need to work together and take action.

It brings together perspectives from a wide spectrum of national and regional industry participants including engineering and design consulting firms, project managers, legal and commercial advisors, government agencies, and construction and related services companies.

The main issues identified are:

1. The **process for risk definition and allocation,** particularly on large projects.

2. The **size and complexity of projects** has increased significantly and as a result, small to medium contractors are unable to effectively participate.

3. Governments do not lay out a **long-term pipeline of work** so that companies can invest and gear up.

4. The **time available during procurement** is often not long enough to allow for sufficient risk assessment.

5. The **time available during the design phase** for most big projects is often not adequate for design firms to innovate or explore better engineering solutions.

6. Current **procurement models which apply 'hard edged' risk transfer** can often result in significant and complex legal disputes which ultimately create a lose-lose scenario.

7. **Governments do not engage with industry early enough** in the design stage.

8. **State and territory education systems and the Federal immigration model are not coping** with the increased demand for skilled labour and industry does not do enough to encourage women and people from diverse backgrounds into the industry.

Given the scale of infrastructure investment currently being undertaken and the COVID-19-related economic challenges confronting all governments, RA believes now is the ideal time to implement the recommendations contained in this Report.

RA is continuing to engage with Ministers and key departmental leaders across all jurisdictions to discuss the contents of the Report, and how its recommendations can assist Ministers to secure collaborative-based approaches to procurement and risk allocation.

RA believes the publication of priority infrastructure plans should lead to greater clarity for industry including sequencing and timelines for government investment in road projects.

TRANSPORT NETWORK PRICING

It is imperative that we move to a more equitable and efficient road pricing and investment model. All road users should contribute according to how, where and when they travel and the impact they have on the road network.

The RA *Future Transport: Smart Cities*[13] 2019 international study visit report concluded that the days of traditional fuel taxes and excises are numbered. The North American government organisations visited by the RA delegation expressed concerns about shrinking fuel tax revenue and the implications for funding and maintaining infrastructure. The system of funding roads through fuel taxes in North America is similar to that in Australia – so we face the same dilemma, with little evidence that there is a solution being developed that will be equitable for all road users.

RA recommended in the report that Australian governments should urgently consider a transition away from the fuel-based road user charging system currently in play. As IV indicated in its March 2020 publication *Good Move – Fixing Transport Congestion*[14], in 2020 the Commonwealth Government levied a fuel excise at 41.8 cents for every litre of fuel, charged as part of the price of petrol. Despite increases in the rate being charged to motorists (indexation was applied prior to 2001 and again from 2014), the Parliamentary Budget Office (PBO) reports that there has been a steady decline, as a percentage of GDP, from 1.6% in 2001/02 to around 1.0% in 2016/17[15]. The PBO found that increased fuel efficiency of passenger vehicles has been a significant contributor to the decline.

The PBO suggests that continued improvements in the fuel efficiency of the passenger motor vehicle fleet in Australia is likely to contribute to a further slowing of total fuel consumption, which in turn will further constrain fuel excise revenue. The report also highlighted that the uptake of electric vehicles (EVs) could further accelerate this. Consequently, RA believes that fuel excise revenue will be increasingly inadequate to fund the required investments in, and maintenance of, Australian road networks. We are concerned that electric vehicles will make no contribution to fuel excise, and therefore to road investment, under the present system.

Currently, EVs are only a small proportion of the market, however it is a growing market with EV sales in Australia increasing by 200% according to the Electric Vehicle Council[16]. Under the Australian Energy Market Operator[17] neutral scenario for electricity consumption, EVs are projected to represent around 19% of the light vehicle fleet in Australia by 2036–37 (AEMO 2018).

The SA, NSW and VIC Governments have recently announced plans to implement road user charging for EVs in 2021[18]. RA supports a road user charge for EVs, as part of a nationally consistent move to road user charging, while recognising that there needs to be measures in place to ensure uptake of more environmentally sustainable vehicles is encouraged. RA supports continued efforts by governments across Australia to engender a more environmentally sustainable transport network by encouraging greater uptake of EVs.

It is clear the momentum for road charging reform is building – and this momentum should be harnessed to drive development of a nationally-consistent approach to road funding that strengthens links between road related revenue and road related investment.

To maintain the confidence of industry and road users, it is essential that road pricing and investment reform models are transparent and equitable for all road users.

RA suggests that the proposed approach to implement staged pricing through congestion charges, dynamic pricing and changes to public transport pricing risk being mischaracterised as an imposition 'additional' taxes and charges, potentially undermining community support and ultimately delaying overall reform. As with RA's support for the introduction of a road user charging mechanism for EV's, it is important that these changes are made as part of a nationally consistent move towards road user charging reform. We note that the Draft Strategy highlights that these interim steps are intended to demonstrate how the benefits can be achieved on a smaller scale, and it is important that messaging is consistent with this.

As pointed out in the 2020 Productivity Commission Report into National Transport Regulatory Reform[19] the model of road funding and management should seek to strengthen links between road related revenue and road related expenditure. This would help to determine road users' preferences and willingness to pay for road infrastructure services and require the adoption of well-designed institutional and governance arrangements.

RA understands that the reform process will be challenging, with potentially up to a decade of concerted collaborative effort required. However, the potential benefits to the Australian economy, and all Australians, from successful delivery of what many see as the missing link in major micro-economic reform are enormous.

ROAD SAFETY

Regional and rural road safety was a significant area of policy focus for RA during 2020. Despite regional Australia accounting for just 17% of the national population, two in every three fatalities occurs on a regional or rural road.

RA welcomes Federal funding announcements in June and July 2020 relating to road safety infrastructure, as part of the $1.5 billion nationwide infrastructure package, including $500 million for targeted road safety works. RA has been supporting increased federal funding for low-cost road safety treatments for some time, so it is encouraging to see these types of treatments being supported, including shoulder widening or sealing and audio-tactile line markings.

RA has continued to engage with road safety experts and road managers on this important issue, and has produced a Policy Insights piece exploring regional road infrastructure. This piece includes research presented by Transport for NSW (TfNSW) which demonstrates the effectiveness of several road safety treatments, including:

- Full containment (roadside and median barriers): 90-95% reduction in head-on FSIs; 90-95 reduction in run-off-road FSIs; and 50-75% reduction in FSIs across all crash types;
- Median barrier only: 90-95% reduction in head-on FSIs;
- Roadside barriers: 90-95% reduction in run-off-road FSIs;
- Wide centreline: 50% reduction in head-on crashes; and 20-25% reduction in run-off-road crashes; and
- Audio-tactile line marking: 20-25% reduction in run-off-road crashes; and 25% reduction in head-on crashes.

RA notes the Draft Strategy recommends delivering funding certainty for regional road maintenance and upgrades. We encourage IV to support continued and accelerated investment in the proven, relatively low-cost road safety initiatives set out above as an effective means of achieving this outcome.

At a national level, RA supports the Australian Automobile Association (AAA) Reviving Road Safety[20] policy priorities document, which calls for urgent Federal Government action to combat Australia's rising road toll. RA supports the four broad priorities in the policy and encourages IV to consider the three priorities below and how these can be supported through the Draft Strategy at a state level:

1. Continue to support the development of a National Road Safety Data Hub within the Office of Road Safety, delivering a coordinated approach to the collection and analysis of road infrastructure safety data to inform future policy and investments.
2. Link infrastructure funding to road safety outcomes, and use incentive payments to ensure road funding proposals are tied to safety standards.
3. Encourage the uptake of safer vehicles and work towards targets to lower the average age of Australia's vehicle fleet.

ROADWORKER SAFETY

A further critical issue for consideration is roadworker safety. RA's July 2019 Roadworker Safety Workshop[21] brought together more than 60 industry leaders to consider how best to manage the risks posed to road workers (considered as vulnerable road users), while providing a safe road environment for all road users.

Key themes from the workshop included: raising the credibility and respect for road workers; improving public social awareness and driver compliance behaviour at work sites; a collaborative role for government and industry to improve awareness/education; concern that the low tolerance of occupational health and safety risks generally does not flow through to our standards for road workers; the need for regulatory change to improve pre-qualification standards; and opportunities to improve uptake of technology and innovation to remove road workers from danger.

The RA *Future Transport: Smart Cities 2019*[22] report highlighted that like Australia, USA road safety statistics are trending negatively after years of consistent decreases in fatalities and serious injuries. The American Road and Transportation Builders Association (ARTBA) indicated that roadwork zones in the USA account for 15,000 road worker injuries and 135 road worker deaths. ARTBA's aim was to head towards zero deaths through their Safety Certification for Transportation Project Professionals Program[23]. This on-line safety centre has a focus on training candidates to attain the skills to identify temporary traffic control occupational, health and safety hazards, and to develop a safety planning culture and climate, with thorough incident investigation.

While Australia appears more advanced in its application of the safe system approach to road safety and traffic management around roadwork sites, the RA report recommended that Australian authorities should take a close interest in the ARTBA Program. Following these activities, RA established a Road Worker Safety Working Group (RWSWG) with the objective of raising safety standards among traffic management and road workers. The RWSWG is an initiative that arose from the recognition by the RA Board that our organisation should take a leading role in ensuring the safety of our road worker community.

The RWSWG is currently focussed on several strategic issues, including (but not limited to) reforms to the procurement process and pre-qualification requirements. However, RA recognises that without access to reliable data on fatalities and injuries specific to this group of road users, it is difficult to accurately measure the impact of policy initiatives designed to resolve the issue. As such, RA has encouraged the Office of Road Safety's National Road Safety Data Hub to include data on road worker safety, which is currently not specifically measured. As part of this process, we suggest that the Office of Road Safety consults with Safe Work Australia, as well as other relevant industry and government stakeholders.

RA recently produced a Policy Insights piece containing contributions from Australian and international experts emphasising the importance of sharing safety data and examples of road safety best practice. The importance of introducing high quality, consistent and structured training around road worker safety issues for industry participants is of particular note. One specific observation made is the noticeable difference between Australia, where road safety workers are casually employed, compared to the UK, where traffic management was considered a safety-critical and respectable career. That said, Austroads' work in unifying standards to improve the safety and efficiency of temporary traffic management on road sites and to develop cross-jurisdictional consistency in qualifications for road workers in Australia should be recognised.

Austroads[24] has acknowledged that working on roads and roadsides poses significant risks to workers and motorists, through changed roadway conditions, disrupted traffic flow, limited working space and movement of construction and public vehicles in close proximity to workers and worksites. A four-part Austroads project is underway to facilitate the introduction of a harmonised approach to temporary traffic control at road worksites across Australia. As part of this process, RA has made a submission on a proposed temporary traffic management training framework and prequalification scheme[25].

RA believes that this project will need to be supported by broad public awareness-building and industry-wide training and compliance monitoring and therefore suggests that the issues of roadworker safety including data and national harmonisation be further considered by IV to improve the safety of those who work on Victorian roads.

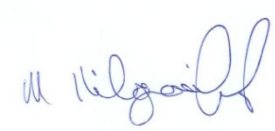
CONCLUDING COMMENTS

RA commends IV on the Draft Strategy and the included recommendations and welcome the considerable alignment between the issues and approaches raised in that Draft Strategy and the policy priorities that RA is pursuing.

We trust that the feedback provided is useful, and welcome further discussion on any of the topics raised.

For more information about this submission please contact me at michael@roads.org.au or 03 9821 5255.

Yours sincerely



Michael Kilgariff
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[3] RA submission to the Inquiry into the Inland Rail project ad regional NSW 2021 https://www.parliament.nsw.gov.au/ladocs/submissions/70541/Submission%2020%20-%20Roads%20Australia.pdf

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[5] Prime Minister – Address National Press Club 1 February 2021 https://www.pm.gov.au/media/address-national-press-club-barton-act

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[10] Australian Infrastructure Audit 2019 https://www.infrastructureaustralia.gov.au/sites/default/files/2019-08/industry_efficiency_capacity_and_capability_-_2019_australian_infrastructure_audit.pdf

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[16] Electric Vehicle Council – State of EVs 2020 report https://electricvehiclecouncil.com.au/wp-content/uploads/2020/08/EVC-State-of-EVs-2020-report.pdf

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[23] ARTBA Safety Certification for Transportation Project Professionals Program https://www.artba.org/2016/10/12/life-saver-industry-launches-safety-certification-for-transportation-project-professionals-program-through-artba-foundation/

[24] Austroads: Guide to Temporary Traffic Management https://austroads.com.au/network-operations/network-management/temporary-traffic-management

[25] RA Submission on the Draft Austroads Temporary Traffic Management Training Framework and Prequalification Scheme August 2020 https://roads.org.au/LinkClick.aspx?fileticket=Q3MvtY9lYXE%3d&portalid=3

ATTACHMENTS

1. RA International Policy Insights: Moving from ICE powered vehicles to EVs Webinar September 2020

2. RA International Policy Insights: The future role of hydrogen fuel cell technology in our public transport system Webinar December 2020

3. RA Policy Insights: Re-engaging Public Transport Customers Webinar August 2020

4. RA International Policy Insights: Active transport in a multi-modal transport system Webinar September 2020

5. RA Policy Insights: Regional Road Infrastructure Webinar July 2020

6. RA Policy International Insights: Road Worker Safety Webinar November 2020

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POLICY WEBINAR *proudly sponsored by* ARUP

ABOUT ROADS AUSTRALIA

Roads Australia (RA) is the peak body for roads within an integrated transport system, representing an industry that contributes $207 billion annually to the economy and supports 1.3 million jobs.

RA brings industry, government and communities together to lead the evolution of Australia's roads, integrated transport and mobility.

The nation's only roads champion, RA's 150+ members includes all of Australia's road agencies, major contractors and consultants, motoring clubs, service providers and other relevant industry groups.

RA's current policy focus extends across five activity streams: Safety; Capacity; Transport Reform; Customer Experience; and Sustainability with Diversity and Inclusion an underlying commitment across each stream.

Register for upcoming policy events to contribute to the debate.

BACKGROUND

In lieu of the deferred 2020 Study Visit to UK and Europe announced earlier in the year, RA has introduced an International Insights webinar series.

Our second webinar focused on the transition from Internal Combustion Engines (ICE) to Electric Vehicles (EVs), including an update on the progression to EV's in Europe, and the challenges being faced.

EVENT SUMMARY

Over 100 attendees joined RA's webinar on 16 September 2020 to hear from:

- **Sharon Masterson,** Manager, Corporate Partnership Board, International Transport Forum (ITF) at the Organisation for Economic Co-operation and Development (OECD)
- **Pierpaolo Cazzola,** Advisor - Energy, Technology and Environmental Sustainability, ITF at the OECD
- **Sandra McKay,** Executive Leader, Sustainability, National Transport Commission (NTC)
- **Mark Rowland,** Transport & Highways Advisory Leader – Australia, Arup

Individual speaker presentations are available on the RA website.

The webinar was moderated by **Clare Gardner-Barnes**, Transport Reform Policy Stream Chair, Roads Australia and Head of Strategy, Planning and Innovation, Infrastructure NSW and sponsored by Arup.

POLICY INSIGHTS

The webinar brought together leading experts from across Europe and Australia.

Sharon Masterson from the International Transport Forum (ITF), kicked off the session by providing an overview of the work of the ITF. The Corporate Partnership Board (CPB), which Ms Masterson manages, is ITF's official platform for engagement with the private sector.

She explained that with businesses at the cutting edge of a rapidly changing world of transport and mobility, the CPB allows private sector stakeholders to contribute their valuable business insights to policy discussions, and provide an effective mechanism for collaboration on issues of common interest.

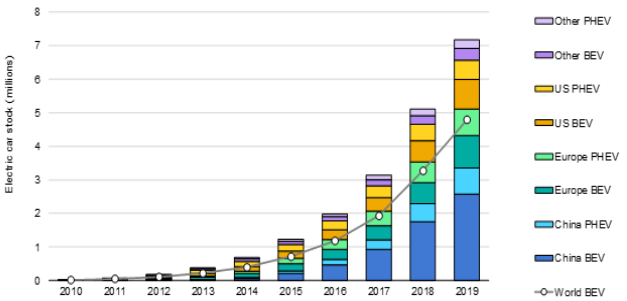
She also outlined how the work is organised into a number of different work-streams, one of which was the Decarbonising Transport Initiative. This Initiative focuses on promoting carbon-neutral mobility to help stop climate change, and provides decision-makers with the tools to select CO_2 mitigation measures that best deliver on their climate commitments.

For more information on the ITF (of which Australia is a member country), including their extensive body of leading research covering areas such as road, rail, infrastructure, energy and new mobility, visit their website.

Pierpaolo Cazzola, Advisor in the Energy, Technology and Environmental Sustainability area of the International Transport Forum (ITF), provided the keynote presentation, focusing on the policy drivers and market development of vehicle electrification in Europe.

He explained the importance of electrification in helping to promote the transition to clean mobility, and highlighted the current mix of vehicle technologies, including plug-in hybrid electric vehicles (PHEVs), battery electric vehicles (BEVs) and fuel cell electric vehicles (FCEV). He further highlighted the crucial importance of increasing the use of renewable or low-carbon energy for such electricity generation.

F1. Electric Cars on the Road

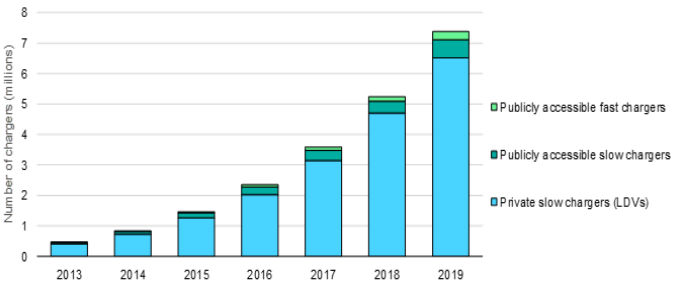


Source: IEA Global EV Outlook 2020

In terms of EV take-up, Mr Cazzola described how this was accelerating at a rapid pace, noting that in 2019, the global electric car fleet had reached 7.2 million, up 2 million from 2018, with China having the world's largest EV market, and Norway the highest electric car market share, as shown in Figure 1.

As to the key drivers for such increases, he explained a number of policies were being utilised, including economic instruments that help bridge the cost gap to ICE-powered vehicles as well as support for the deployment of essential charging infrastructure, which had almost doubled since 2017 (Figure 2). It was also noted that with advances in battery technology, there will be significant reductions in battery costs, and corresponding increases in battery performance.

F2. Global Installation of Electric Charging Points, 2013-2019



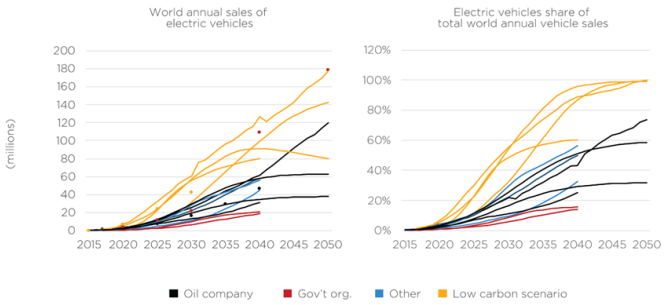
Source: IEA Global EV Outlook 2020

Mr Cazzola also highlighted that other major policy drivers included governments planning to legislate bans on the production of ICEs, with countries such as Germany and the UK planning such bans by 2030 and 2035 respectively.

These bans, together with initiatives such as the European Green Deal and other policy frameworks such as CO_2 emission standards, differentiated tax regimes favouring EVs (including significant taxation of fossil fuels), and the Clean Vehicles Directive, to name a few, would help to significantly drive take-up of EVs.

Taking these multitude of factors into consideration, Mr Cazzola indicated the outlook for the increased deployment of electric vehicles and charging infrastructure was very positive. According to research done by Columbia University, this included approximately 130 million EVs or more on the road by 2030, with the coexistence of both BEVs and PHEVs (refer to Figure 3 over page).

F3. EV Sales Volume and Market Share



Source: Columbia University, 2019

Sandra McKay, Executive Leader of Sustainability at the National Transport Commission (NTC), provided an overview of the Australian experience and new car buying trends over a decade. Ms McKay explained that the NTC was accountable to all Australian Governments, and aimed at achieving greater integration and national consistency in areas including vehicle automation, electrification and rail reform.

Ms McKay emphasised that Australian consumers were driving change, and welcomed the fact that the Commonwealth Government was about to release its National Electric Vehicle Strategy and a Technology Roadmap.

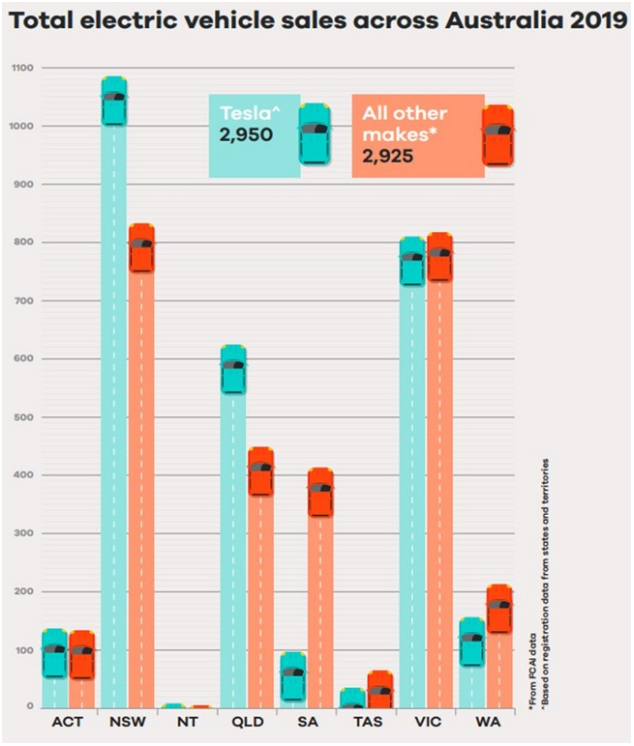
She also highlighted that Victoria, South Australia, Western Australia and the Northern Territory all have EV strategies coming out this year, while Queensland, the ACT and NSW were already advancing theirs.

Nevertheless, it was noted that Australia had significant work to do to change the trajectory of emissions if we are to meet our commitments to the Paris Agreement by the target date of 2030.

In regards to Australia embracing EVs, Ms McKay explained that although we were coming off a low base, we were starting to build pace. In fact Australia had substantially increased sales of EVs in 2019, with 40% of all EVs on the road in Australia sold last year (5,875), largely driven by a tripling of private sales (refer Figure 4).

Although still a minor user of EVs, the Federal Government fleet had increased from 1 to 16, State Government fleets from 34 to 123 and Local Government from 36 to 215.

F4. Total EV Sales Across Australia 2019



Source: FCAI, Registration Data 2019

However, looking at total national vehicle sales in 2019, whilst the purchase of EVs had increased by 149% since the previous year, the overall number of EVs on the roads (14,500; 0.08%) was still small in comparison to the nation's almost 18 million cars and light trucks.

Nevertheless, consumer sentiment indicated that there were encouraging signs that would help drive up-take of EVs. For example, according to a survey carried out by NRMA, RACV and RAA on behalf of the Electric Vehicle Council, 56% of surveyed consumers would now consider purchasing an electric vehicle as their next car.

There were also positive developments with the rollout of ultra-fast charging network along Australia's highways. This included 42 charging sites to connect a number of Australia's capital cities, as well as 21 ultra-rapid charging stations, to connect Australia's most trafficked inter-city routes along major highways.

Ms McKay also highlighted a number of other positive state-government based initiatives, including current and future commitments to the electrification of government fleets and further roll-out of charging infrastructure.

She concluded that, taken together with the soon-to-be-released National Electric Vehicle Strategy, Australia was moving in the right direction.

Mark Rowland, the Transport & Highways Advisory Leader from Arup, presented on de-carbonising Australia's on-road public transport system and opportunities for accelerating the transition of the bus fleets. Mr Rowland noted that although 17% of the world's buses are electric, 99% of them are operating in China, with very few operating in Australia.

Taking Sydney as an example, with a fleet of approximately 5,000 buses, and an average electric bus cost of $750,000, it would take a significant investment of around $3.75 billion to electrify the fleet. In terms of performance however, those electric buses that were currently being trialled were reportedly capable of doing up to 500 kilometres in a day, which included topping up with 30-35% through regenerative braking.

Mr Rowland also spoke about the franchise model ('Fleet as a Service' models) and noted that this was a significant policy lever for governments. Specifically, it would create an opportunity to accelerate the electrification of the bus fleet as those contractual arrangements started to come up for renewal over the short- to mid-term.

He also highlighted the importance of having clear definitions around what constituted zero and low emissions vehicles, noting a broader scope beyond just tail-pipe emissions needed to be consistently applied. Specifically, the carbon footprint associated with electricity generation, and for hydrogen fuel cell vehicles (FCEV), the manner in which that hydrogen had been produced (i.e. 'green' vs. 'brown' hydrogen), needed to be factored in.

Another key challenge was the length of the franchise cycles and associated contractual rules. In Australia, this meant that buses of up 25 years old were being used (this contrasts to 10 to 12 years in London) and then would continue their service in the second-hand market.

Considering the lifespan of the bus, this means that an ICE-powered bus purchased today could still be operating in 2050, which it was noted was misaligned with current climate change goals, particularly accounting for the 2030 Paris Agreement emission targets to which Australia had committed.

Therefore, the next round of franchise contracts would create a rare, yet vital, opportunity to accelerate the electrification of Australia's bus fleets, and help contribute towards lowering greenhouse gas emissions.

This would however require new and innovative thinking on vehicle electrification, together with a harmonised strategy, including but not limited to, investment in charging infrastructure, possible local manufacturing of buses using 3-D printing technology, and low carbon power generation.

RECENT DEVELOPMENTS

In further developments, the Commonwealth Government has just announced business incentives to invest in new electric car fleets to aid the push towards net-zero emissions beyond 2050.

The Electric Vehicle Council has also just commissioned Ernst & Young (EY) to analyse the costs and benefits of electric vehicles to the government and society.

EVENT OUTPUTS & NEXT STEPS

A snapshot of the event was promoted through Roads Australia's LinkedIn channel.

A second webinar, on active transport and the role it plays in a multi-modal transport system was held on 15 September. The synopsis of that event can be downloaded on the RA website.

Future topics to be discussed in the International Insights series include Road Worker Safety and Hydrogen, both of which are planned for November and December 2020.

In addition, Roads Australia plans to host further webinars on this and related topics.

roads australia

POLICY WEBINAR proudly sponsored by Advisian Worley Group

Katy Taylor
The Go-Ahead Group plc

James Hetherington
Department of Industry, Science, Energy and Resources

International Insights:
The future role of hydrogen fuel cell technology in our public transport system

Dr Fiona Simon
Australian Hydrogen Council

Phil O'Neil
Advisian

Becky Wood
Aurecon and Roads Australia

TUESDAY 8 DECEMBER 2020

ABOUT ROADS AUSTRALIA

Roads Australia (RA) is the peak body for roads within an integrated transport system, representing an industry that contributes $207 billion annually to the economy and supports 1.3 million jobs.

RA brings industry, government and communities together to lead the evolution of Australia's roads, integrated transport and mobility.

The nation's only roads champion, RA's 150+ members include all of Australia's road agencies, major contractors and consultants, motoring clubs, service providers and other relevant industry groups.

RA's current policy focus extends across five activity streams: Safety; Capacity; Transport Reform; Journey Reliability; and Sustainability with Diversity and Inclusion an underlying commitment across each stream.

Visit our website for upcoming policy events.

BACKGROUND

Presented as part of RA's ongoing policy focus on the impact of new technology on the transport sector, the event followed on from an International Insights webinar in September 2020, where RA facilitated a discussion on the transition from Internal Combustion Engines (ICE) to Electric Vehicles (EVs).

The impact of these technologies were also covered in RA's two most recent study visits in 2018 (Cities for the Future) and 2019 (Future Transport: Smart Cities).

This latest session explored the role hydrogen is expected to play in the electrification of buses and whether hydrogen fuel cell buses will be embraced in Australia. The session also considered the importance of looking beyond just tailpipe emissions, and using renewables to generate green hydrogen to achieve low / zero emissions. Panellists were also asked to provide their view as to whether Australia is likely to use hydrogen in other forms of public transport.

EVENT SUMMARY

Over 90 attendees joined RA's webinar on 08 December 2020 to hear from the following speakers:

- **James Hetherington**, Manager of Hydrogen Strategy, International Climate and Technology Division, Department of Industry, Science, Energy and Resources
- **Dr Fiona Simon**, Chief Executive Officer, Australian Hydrogen Council
- **Katy Taylor**, Chief Strategy and Customer Officer, The Go-Ahead Group plc (UK)
- **Phil O'Neil**, Senior Associate – New Energy, Advisian

Several of the speakers' presentations are available on the RA website.

The webinar was moderated by **Becky Wood**, former Transport Reform Policy Stream Deputy Chair, RA, and former Managing Director - Transportation ANZ, Aurecon, and was proudly sponsored by Advisian.

POLICY INSIGHTS

The webinar brought together leading experts from across Europe and Australia.

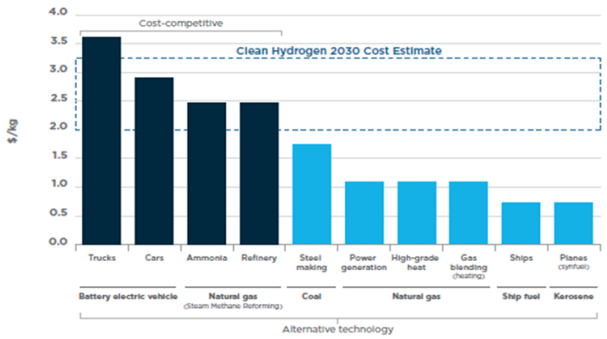
James Hetherington, Manager of Hydrogen Strategy, International Climate and Technology Division, Department of Industry, Science, Energy and Resources, kicked off the session by highlighting Australia's National Hydrogen Strategy, released in 22 November 2019. Mr **Hetherington** set the scene by explaining why there has been significant interest in clean hydrogen in recent times. He noted that with energy linked to over 70% of global emissions, a clean fuel option, alongside clean electricity production to help decarbonise, is required.

Clean hydrogen (i.e., hydrogen produced with little or no CO_2 emissions such as renewable energy) and its derivatives could be this fuel, particularly given its only by-product is water (i.e., no carbon emissions), it has a high energy content on a weight basis, and is highly versatile. From a transport perspective, hydrogen can be used in fuel cell technology to power buses, trains and other road-going vehicles. It can also be used to store energy when there is excess capacity from the power grid, which could prove a particularly effective way to harness unused power from renewable energy such as solar and wind. He also highlighted that there were significant export opportunities for Australia.

Mr Hetherington explained that transport offers a promising early use case for hydrogen. With costs falling, hydrogen fuel cell technology can complement battery electric vehicles, particularly for heavy load and long-distance applications. It also offers shorter refuelling times when compared to recharging a battery electric vehicle. However, there are challenges and barriers to be overcome to make hydrogen in transport a reality. Refuelling infrastructure needs to be deployed, hydrogen fuel cell vehicles need to become widely available and cost competitive, and low-cost hydrogen supply will need to be in place. In this regard, refuelling stations and hydrogen supply will need to develop in step with each other to ensure the businesses involved can be commercially viable (refer to Figure 1). Furthermore, rollout will need to be structured in a way that overcomes any anxiety about vehicle range.

He explained the importance of electrification in helping to promote the transition to clean mobility, and highlighted the current mix of vehicle technologies, including plug-in hybrid electric vehicles (PHEVs), battery electric vehicles (BEVs) and fuel cell electric vehicles (FCEV). He further highlighted the crucial importance of increasing the use of renewable or low-carbon energy for such electricity generation.

F1. Breakeven cost of hydrogen against alternative technology for major applications in 2020



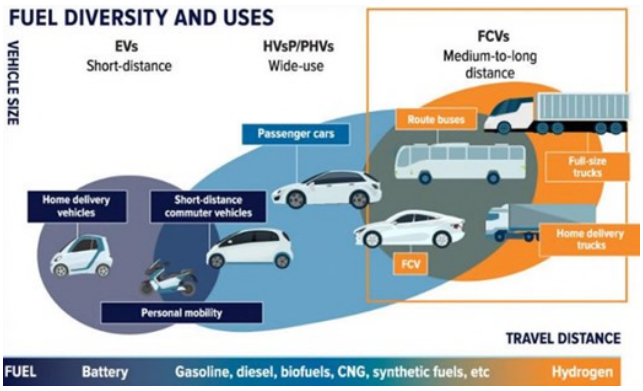
Source: McKinsey & Company 2019

Mr Hetherington explained that through the National Hydrogen Strategy, governments have agreed to encourage consortia models which will bring together vehicle manufacturers, hydrogen producers and fuel suppliers to build up supply and demand at the same time, and to lower project risk. The initial focus will be on transport tasks that do not rely on a network of refuelling stations and which offer compelling advantages. Early opportunities include 'back to base' transport applications, such as fleet vehicles, metropolitan public transport, and freight transport (refer figure 2).

In the longer term, the Strategy seeks to encourage deployment of refuelling stations along major transport corridors as well as promoting open access to government supported infrastructure to enhance vehicle range.

Mr Hetherington also explained that in the future, hydrogen production and use will create new sectoral linkages, which if intelligently managed, could create additional value and accelerate the commercial case for hydrogen in transport.

F2. Expected Opportunities for Hydrogen in Road Transport



Source: Green Cars Report

In the future, hydrogen production and use will more closely link operation of the electricity grid, the gas distribution network and the infrastructure supplying fuel for vehicles and will create new linkages between the transport, energy, industrial and agricultural sectors.

These properties mean that that the opportunities from hydrogen need to be thought about more broadly than through a focus on transport uses alone. Done well, intelligent sector coupling could improve the viability of projects and provide broader benefits such as greater fuel security through domestic fuel supply, improved electricity grid reliability and security, health benefits from cleaner air, more efficient and lower cost energy supply, as well as major export revenue and job opportunities.

Mr Hetherington concluded by highlighting the significant support from Australian governments to help accelerate hydrogen industry's growth. This includes a $1.9 billion investment package for future technologies to lower emissions, including hydrogen, as well as over $500 million of funding that has already been specifically committed to hydrogen industry development. From a transport perspective, some of the noteworthy initiatives being supported include a $74.5 million investment in refuelling infrastructure and schemes to promote the expansion of future fuels, including hydrogen.

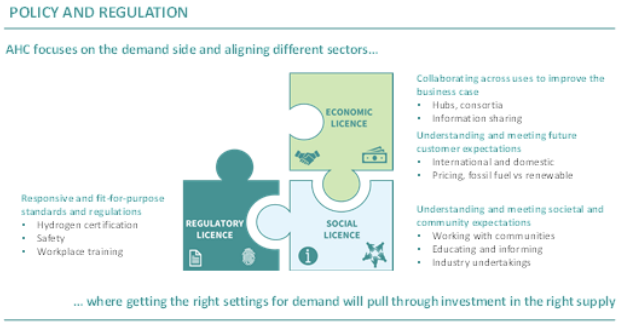
Dr Fiona Simon, Chief Executive Officer, Australian Hydrogen Council (AHC), provided an overview of the AHC. She explained that the AHC is the peak body for the emerging hydrogen industry, with the objective to grow the industry to have clean hydrogen as a key part of Australia's energy mix.

Dr Simon highlighted several key characteristics of hydrogen that make it desirable, particularly in the context of the transport sector. First, hydrogen is storable over time and transportable, and unlike batteries, does not lose its energy potency. Second, hydrogen is made, not found, which means it is not a limited resource. Furthermore, hydrogen can be made in different ways, with the clean and green versions presenting the longer-term opportunity. Third, hydrogen is versatile, and can be converted for different uses across energy, transport and industrial processes. She stated that in the opinion of the AHC, it's not a matter of *if* Australia could be a global hydrogen powerhouse, but *how*, and *by when*.

Dr Simon reinforced the importance of the AHC working with Government and other key stakeholders to ensure a coordinated approach to delivering against the National Hydrogen Strategy, including development of policy and regulation. She highlighted that there is already great interest in hydrogen in Australia, with recent estimates that there are over 50 industry projects and 30 research projects currently in progress or announced.

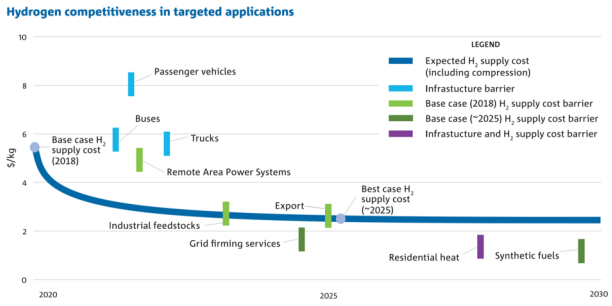
Dr Simon explained that from the AHC's perspective, the nation's immediate policy focus was on two key objectives. The first related to developing the export market, and it was noted that the National Hydrogen Strategy set an objective for Australia to be a top three exporter by 2030. The second related to the cost of hydrogen, and helping to reduce this price to a point where we can achieve the Low Emissions Technology Statement stretch target of below $2 per kilo. She highlighted that to achieve such objectives, a robust set of standards and regulation needed to be further developed, and presented the AHC's model showing that with the pursuit of economic, regulatory and social licence, supply and demand could be properly aligned (refer Figure 3).

F3. AHC Hydrogen Policy and Regulation



Dr Simon identified possible early adopters (Figure 4). Consistent with James Hetherington's earlier comments, the AHC's position was that there would be an industry-wide need to replace diesel vehicles. This would likely include: (1) **buses**, a 'back-to-base' segment, which were typically operated by public agencies and therefore amenable to policy-driven procurement; (2) **light commercial vehicles**, with this category considered to include vehicle fleets operated by public agencies (also 'back-to-base' fleets), with public agencies also amenable to policy-driven procurement; and (3) **heavy road trucking**. She concluded that as the world moves to decarbonise, Australia has the chance to boost its resilience to economic and environmental shocks through using clean and green hydrogen in the energy mix.

F4. Hydrogen Demand



Source: CSIRO 2018

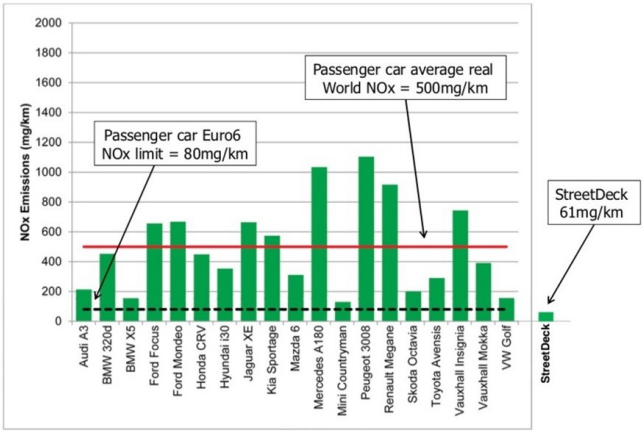
Katy Taylor, Chief Strategy and Customer Officer, The Go-Ahead Group plc (UK) (Go-Ahead), joined to provide an overview of Go-Ahead, with a focus on their bus services, one of the transport modes identified by Dr Simon as an early adopter of hydrogen technology.

Ms Taylor explained that Go-Ahead operates buses and trains, primarily across the UK. In terms of volume, this includes a third of all journeys in the UK, and a quarter of all buses in London. She highlighted that the organisation also operates buses in Singapore and in Ireland, and trains in Germany and Norway.

Considering the UK market, **Ms Taylor** explained that UK buses are already some of the cleanest vehicles on the road, even taking into account that most are still diesel powered (Figure 5).

However, many are converting these buses to battery-electric operation, with hydrogen fuel-cell trials underway. Furthermore, when considering the number of passengers moved on a bus, they offer a very clean alternative to the equivalent number of cars. It was noted that in the context of hitting the UK's net zero emissions target for 2050, shared and low or zero emissions vehicles will be priorities for the Government.

F5. Diesel Vehicle Emissions



Source: Go-Ahead Group plc (UK)

Ms Taylor set out Go-Ahead's experience with battery-electric and hydrogen fuel-cell buses. Go-Ahead now operates two all-electric bus depots, both in London. They also have 22 hydrogen buses currently in production for use around Gatwick airport, with delivery expected in late 2021. Additionally, a further 32 hydrogen buses are in production for use in the south-east of England, which are expected to be in operation by 2022. Once operational, Go-Ahead will be become the largest operator of hydrogen buses in Europe.

To help build the case for hydrogen buses, **Ms Taylor** contrasted the differences between battery-electric and hydrogen fuel-cell buses. For electric buses, significant changes were needed to depot layout, with charging taking place over 8 hours. This longer charge time meant that a larger fleet size was required.

Furthermore, current battery-electric technology offered limited range. Additionally, battery-electric buses were relatively more expensive to operate, particularly given the high battery cost (approx. £100K), which typically needed to be replaced up to three times during the lifecycle of the bus (12-15 years).

In contrast, hydrogen fuel-cell buses could be fuelled in a similar way to diesel buses, with refuelling taking between 5-8 minutes. The other major advantage was that depot layouts required minimal modifications, and no charging infrastructure was required, thereby saving £Millions. Significantly, there were no range issues, making it extremely flexible for route planning and operations.

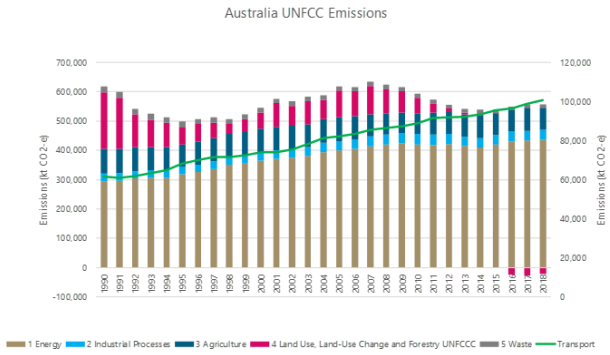
She conceded that whilst the upfront capital costs of hydrogen fuel-cell buses (£400K) were much higher than their battery-electric (£300K) and diesel (£200K) counterparts, the lifetime costs were much lower, making a compelling business case. **Ms Taylor** acknowledged that although hydrogen was currently a more expensive fuel option, it was more efficient, and in the longer term, the price of hydrogen was expected to drop significantly as scale was increased (noting again the Low Emissions Technology Statement stretch target of below $2 per kilo).

Ms Taylor went on to explain, however, that there was a role for government to provide innovation funding to help kick-start manufacturing. It was noted that this would help to bring prices of hydrogen fuel-cell buses down further, thus reducing that initial capital outlay and speeding up investment. She also highlighted that there were already robust systems in place (including to address safety) for storing and transporting hydrogen. Furthermore, and based on trials, the customer experience was further enhanced by the fact that hydrogen fuel-cell buses were even quieter than their battery-electric counterpart.

To provide context as to the emissions buses generate in the UK, **Ms Taylor** concluded by pointing out that only 4% of roadside emissions came from buses. As such, the journey to creating an entire zero emissions bus fleet was only one piece of the puzzle of tackling climate change and improving air quality.

Phil O'Neil, Senior Associate – New Energy, from Advisian, further expanded on the important role hydrogen could play in the transport sector, particularly in the context of helping to reduce emissions as tracked as part of United Nations Framework Convention on Climate Change. **Mr O'Neil** explained that emissions from transport had steadily been climbing since 1990, with a 64% increase to 2018, making up over 20% of all emissions (Figure 6). As such, the sector required urgent attention to reverse this trend and bring about meaningful reductions.

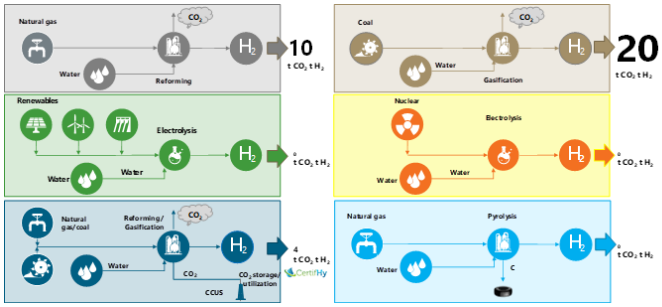
F6. Hydrogen Cost: Central vs. Local Production



Source: Australian Greenhouse Emissions Information System, Department of Industry, Science, Energy and Resources (Advisian Analysis)

Mr O'Neil explained that if hydrogen is to play a significant role, the way it is produced is key. It was noted that while 'tail pipe' emissions from hydrogen fuel cell vehicles were zero, this could be negated if fossil fuels were used to generate hydrogen. To help illustrate this scenario, **Mr O'Neil** explained six methods used to produce hydrogen (see Figure 7). He noted that methods such as those using natural gas (reforming, denoted as 'grey' hydrogen) and coal (gasification, denoted as 'brown' hydrogen) generated significant amounts of CO_2, with coal the most polluting, generating at least 20 tonnes of CO_2 per tonne of hydrogen. In contrast, hydrogen generated using renewables (electrolysis, denoted as 'green' hydrogen), produced no CO2, and hydrogen utilising carbon capture (denoted as 'blue hydrogen'), offer low emissions and are the preferred option for reducing transport emissions.

F7. The Hydrogen Rainbow

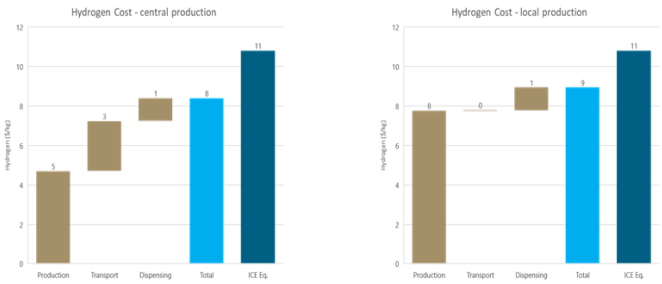


Source: Advisian

For hydrogen to be a viable alternative to other fuel sources within the transport sector, particularly for heavy transport vehicles, then consistent with earlier comments from other speakers, cost would play a crucial role. To illustrate this point, **Mr O'Neil** went on to explain the current costs of hydrogen production, contrasting central versus local production (see Figure 8). With central production, costs were currently at approximately $5 per kg, and it was estimated that it would cost a further $3 to transport to a refuelling station. Adding on a small amount for dispensing brought the cost in at approximately $8 per kg to deliver.

He noted that future transportation costs could be reduced to as little as $1 per kg if hydrogen could be moved via a network of pipelines, helping to bring delivery cost to around $6 per kilo. In contrast, local production resulted in a higher production cost of $8 per kg (driven by capital costs, electricity costs, and capacity factors), but only a relatively small difference in total cost at $9 per kg. It was noted that in both cases, it was reasonably cost-competitive when compared to a diesel option at $11 per kg.

F7. Hydrogen Cost: Central vs. Local Production



Source: Advisian

Mr O'Neil concluded by noting that prices were in fact dynamic, and other non-hydrogen options were also becoming cheaper and more effective, including battery-electric, so the jury was still out on the long-term cost competitiveness of hydrogen. He also pointed out that there were other factors impacting costs, such as fleet size and effectiveness, utilisation of infrastructure and supply chain challenges, which made the long-term outcome of hydrogen's role still somewhat uncertain.

It was noted however, that to the extent hydrogen production costs could be reduced to the target of $2 per kg as mentioned earlier, then the business case would become more compelling.

RECENT DEVELOPMENTS

In further developments, a recent article in The Age indicated that hydrogen industry hubs were being set up across the country by National Energy Resources Australia to capitalise on an emerging business opportunity.

Additionally, a recent article in the Australian Financial Review indicated that hydrogen-powered buses would be shipped to Australia in April and made in Australia from 2022 as manufacturers responded to state governments' calls for zero emissions vehicles.

EVENT OUTPUTS & NEXT STEPS

A snapshot of the event was promoted through Roads Australia's LinkedIn channel, with the presentations available on the RA website.

RA will continue its commitment to progressing policy discussions on the role of hydrogen, with further webinars and roundtable discussions being considered for later in 2021

Further details will be made available on the RA website.

roads australia

POLICY WEBINAR
SPONSORED BY WSP

ABOUT ROADS AUSTRALIA

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RA's current policy focus extends across five activity streams: Safety; Capacity; Transport Reform; Journey Reliability; and Sustainability with Diversity and Inclusion an underlying commitment across each stream.

Register for upcoming policy events to contribute to the debate.

BACKGROUND

The COVID-19 pandemic has seen rapid changes to Australia's road network and public transport usage. 'Stay home' directives across Australia saw road congestion and public transport patronage plummet.

As we move out of this pandemic, and travel into a 'new normal' where regular activities resume, it is likely that customer behaviour on public transport will be significantly changed from pre-pandemic patterns. There is a need to ensure public transport remains a critical link in the transport ecosystem and it will be important to engage customers to return safely and confidently to public transport.

EVENT SUMMARY

Over 160 attendees joined RA's webinar on 6 August 2020 to hear a keynote presentation from **Alana Newbrook**, General Manager—Advisory, WSP, highlighting key outtakes from the recently released white paper "COVID-19 & Public Transport: From Response to Recovery".

Responses were presented by:

- **Adam Berry**, COVID-19 Taskforce Lead, Transport for NSW; and
- **William Tieppo**, Deputy Secretary – Network Integration, Department of Transport Victoria.

Speaker presentations are available on the RA website.

This is the second in a series of webinars focusing on the impacts of COVID-19 on mobility. RA has released Policy Insights for the first event, MaaS: opportunities and threats posed by COVID-19 as well as a Road Work podcast to continue the discussion.

The webinar was moderated by Aneetha de Silva, Journey Reliability Policy Stream Chair, RA and Managing Director, Government - Australia & New Zealand, Aurecon and sponsored by WSP.

KEY INSIGHTS

Ms Newbrook presented on WSP's white paper, released on 28 April 2020. The paper builds on discussions around the impacts of COVID-19 on transport demand, focusing on capacity considerations, and what adjustments to services and travel patterns will be needed as restrictions are lifted and Australian states and territories transition to a 'new normal'.

The white paper has been developed for an Australian context, and builds on WSP's earlier work in North America, outlining a framework for assessing the capacity of public transport under different recovery scenarios. Additional papers with a focus on transit operations in Canada, road pricing and tolling (USA) and sustainability and climate change (UK), among others, are available on WSP's website.

The focus of the paper was the state of transition, as Australia moves out of lockdown into the 'new normal'. During this time it is anticipated that there will be progressive easing of restrictions and a range of precautions and monitoring in place with the potential for further lockdowns if needed. This is expected to occur in different times in different locations.

The paper proposed three distancing scenarios, which have now been taken up by a number of transport agencies across Australia. The scenarios include:

- Scenario 1: strict distancing—with seating capacity reduced to allow at least 1.5 metres between customers and no standing.
- Scenario 2: moderate distancing—with seating capacity reduced to ensure no person it sitting directly next to, behind or diagonally across from another person, and standing capacity of at least 1 metre between customers.
- Scenario 3: relaxed distancing—with seating capacity allowing gaps between each customer row and at least 1 metre between customers facing one another. Standing capacity of at least 1 metre between customers.

The scenarios may require public transport to operate at between 9% and 48% of total capacity, with specific issues for different modes with the largest impact on bus, tram and light rail capacity and further knock-on effects for the loading and unloading of public transport vehicles.

Ms Newbrook explained the key considerations during the transition scenario, including:

- Safety: ensuring the safety of frontline staff and passengers is essential, noting that there are safety issues both real and perceived, and additional consideration needed for vulnerable users.
- Consistency: proposals for social distancing are consistent with official advice of 1.5 metres distancing in workplaces—clear logic to approach in the paper to support confidence and perceptions of safety.
- Information: clear and consistent communication is required, with detail on public transport crowding levels provided in advance, and the ability to influence behaviour rather than focus on enforcement.
- New behaviour patterns: monitoring people's willingness to change their behaviour and determining what is the potential for mode shift.

Ms Newbrook highlighted that customer attitudes to public transport have changed and could have a big impact on future patronage. Employers will also play a significant role in influencing the way customers use public transport. As such, the public and private sectors will need to work collaboratively to develop demand management strategies. This could include core working times, shift patterns, end of trip arrangements, locations of workplaces and incentives for different modes, all of which have the potential to reduce demand for public transport (at least during traditional peak times) and increase demand for active transport. It was noted that was already being reflected in recent state and local government investment in permanent and pop-up cycle paths.

Ms Newbrook concluded that the significant changes seen in recent months offer an opportunity to re-assess and re-think what people value. Congestion and emissions have reduced, people have more time to spend with their families and are engaging more with their local places and communities.

Adam Berry, COVID-19 Taskforce Lead at Transport for NSW (TfNSW), responded noting that they saw a drop in public transport trips from 2.5 million trips to low 400,000 per day across Greater Sydney.

Mr Berry explained that TfNSW had developed a 'COVID safe transport plan' for customer return to the network, centred on customer confidence and focusing on:

- Cleaning: on-board cleaning, stations at transit interchanges and end of shift cleaning for vehicles involving over 1,350 new cleaning staff.
- Data: for decision making by customers, ensuring real-time information through open data sources for customer loading, including information by carriage where possible. A restriction of 25% capacity was initially adopted, increasing to 50% capacity.

The focus in NSW has been about education of capacity, rather than enforcement, and today 98.8% of their services stay under COVID safe desired capacity.

Mr Berry highlighted that TfNSW had developed a travel demand management plan in just a matter of weeks in response to the COVID crisis. This resulted in a significantly enhanced service plan comprising 3,500 extra services mostly in off-peak times, with changes to off-peak pricing. Importantly, TfNSW promoted these changes and targeted engagement of major sectors such as universities, industry associations and local government to re-shape their workforce travel plans.

William Tieppo, Deputy Secretary – Network Integration, Department of Transport Victoria (DoT) reflected on the current 'state of disaster' in Victoria. He highlighted the challenges this had imposed in terms of additional travel restrictions and the new curfew, which have had further impact on public transport patronage.

Mr Tieppo explained that despite a drop to patronage at the start of the pandemic, Victoria had committed to running the full timetable of services, which had allowed people to maintain social distance.

During the second lockdown, it was highlighted that Victoria was running more services to help spread peak patronage, provide more choice in terms of available services and ensure customer confidence by helping to facilitate social distancing.

Mr Tieppo explained that an 8pm to 5am curfew in Melbourne had seen Night Network services suspended and services after 8pm reduced. This had resulted in a further 35% drop in patronage from Stage 3 levels, with 4,200 people still touching on to public transport services each night during curfew. Currently public transport is running at 10% of passenger numbers for the same time last year, and road traffic is at 58% of baseline levels. Commuter cycling has seen an 11% increase and foot traffic is up 20%.

Mr Tieppo further explained that DoT were currently working on predictive modelling to ensure they were fully prepared for changes to travel behaviour, which it was noted may continue in the longer-term, such as working from home.

As part of their COVID response, their innovation hub was also investigating (with input from the private sector) ways to reduce congestion as well as providing enhanced information for customers the help better manage their travel choices.

Mr Tieppo concluded by highlighting the key learnings from the Victorian response, which were the importance of having good data, good modelling and good communication.

EVENT OUTPUTS & NEXT STEPS

A snapshot of the event was promoted through RA's LinkedIn channel.

Looking ahead, RA plans to host further policy webinars on this and related topics.

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POLICY WEBINAR
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ABOUT ROADS AUSTRALIA

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RA brings industry, government and communities together to lead the evolution of Australia's roads, integrated transport and mobility.

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Register for upcoming policy events to contribute to the debate.

BACKGROUND

In lieu of the deferred 2020 Study Visit to the UK and Europe announced earlier in the year, RA has introduced an International Insights webinar series. Our first webinar focussed on active transport and the role it plays in a multi-modal transport system, including the opportunities for active transport to play a greater role in the transport mix as we move towards a 'new normal' post-COVID-19 world.

EVENT SUMMARY

Over 100 attendees joined RA's webinar on 15 September 2020 to hear from:

- **Nicoline van Cann**, Senior Policy Officer, Trade and Economic Affairs, Consulate General of the Netherlands, Sydney;
- **Professor Serge Hoogendoorn,** Professor, Delft University of Technology (TU Delft), Professor of Smart Urban Mobility, Monash Institute of Transport Studies;
- **Dr Sascha Hoogendoorn-Lanser**, Director Automated Mobility Valorisation Centre, Delft University of Technology (TU Delft);
- **Matt Faber,** Associate Director - Transport, Australian Infrastructure Plan, Infrastructure Australia (IA)**; and**
- **Will Fooks,** National Transport Planning Lead, GTA Consultants.

Speaker presentations are available on the RA website.

The webinar was moderated by **Aneetha De Silva**, Board Member and Customer Experience Policy Stream Chair, Roads Australia and Managing Director, Government - Australia & New Zealand, Aurecon and sponsored by GTA Consultants.

POLICY INSIGHTS

The webinar brought together experts from the Netherlands and Australia.

Nicoline van Cann, Senior Policy Officer, Trade and Economic Affairs, Consulate General of the Netherlands, Sydney presented a background to cycling in the Netherlands and highlighted some of the possibilities that exist in Australia for cycling to become a part of daily life, as it is in the Netherlands.

Ms Van Cann explained that contrary to popular belief, cycling in the Netherlands wasn't embedded in urban policy in the 1960's and 1970's, viewing the car as the primary mode of the future, with bicycle use decreasing by 6% each year. Fatalities in the Netherlands peaked in 1971, including the deaths of over 400 children. This gave rise to protests by action groups who did not want city centres to adjust to cars, but rather for cars to adjust to the cities.

In the 1980's Dutch towns and cities began to introduce measures to make their streets more cycle friendly. The Hague and Tilburg were the first cities to experiment with official cycle routes through the use of dedicated paths. The city of Delft created a network of cycle paths. One by one other Dutch cities followed, which saw Amsterdam become what it is now – the cycling capital of the world.

According to Ms Van Cann, today around 38% of all trips in Amsterdam are by bicycle, compared to 2% in London, with over 35,000 kilometres of dedicated bicycle path across the Netherlands. Over the years, many Australian councils and cycling organisations have reached out to the Consulate to facilitate connections and learn from the experience in the Netherlands.

Ms Van Cann highlighted the opportunity for development focused on the areas around public transport nodes. This would encourage walking or cycling to the station, and has the potential to increase the catchment area of the train station around 15 times compared to walking alone. She noted that in the Netherlands, around 40% of train passengers arrive at their departure station by bicycle.

Given the current momentum for cycling as a result of the COVID-19 pandemic, she reinforced that now is the time to start planning to convert temporary pop-up lanes to permanent infrastructure and plan, design and execute strategies to make Australian cities cycling friendly.

Professor Serge Hoogendoorn, Professor, Delft University of Technology and Professor of Smart Urban Mobility, Monash Institute of Transport Studies and **Dr Sascha Hoogendoorn-Lanser,** Director Automated Mobility TU Delft Valorisation Centre provided the keynote presentation, focusing on the long term impact of COVID-19 on (active and non-active) mobility.

Professor Hoogendoorn began by explaining that as in Australia, COVID-19 has resulted in significant changes in transport demand across the Netherlands, including an increase in active travel through walking and cycling trips. This is shown in Table 1 below.

T1. Transport changes in the Netherlands as a result of COVID-19

Transport mode	Change as a result of COVID-19
Public transport	-42% (even after the re-opening of schools and universities)
Car use	Similar, but spread throughout the day resulting in less congestion
Car ownership	Increase in urban car ownership
Walking	Slightly less walking trips, +14% increase in distance walking trips
E-bikes & mopeds	+348% increase moped sales, e-bike sales also increased
Bicycle	Increase in the number of bike trips and 54% increase in distances travelled

Professor Hoogendoorn theorised that some of the trends leading to the changes in travel behaviour are current to the pandemic, and others will be lasting. He noted positive changes such as working from home have increased from 32% to 67% with an indication that around 50% of people will keep working from home at least two days per week after the pandemic.

Of those who caught public transport pre-COVID-19, around 12% have indicated they will walk and 20% will cycle rather than return to public transport post-pandemic.
This indicates there will likely be less long-range travel, with more active travel, in the Netherlands, resulting in greener and healthier outcomes.

However, there have also been a number of negative changes including increased car use, with 11% of public transport users switching to car and increased ownership of private mobility, which is likely to be lasting. Professor Hoogendoorn suggested that the relative increase in car traffic reduces or cancels the positive impacts of other trends.

As well as changes to demand, he explained the impact on the supply side, particularly in relation to the 1.5 metre social distancing requirement. This impacts not only public transport, but also active transport with a reduction to 40% of capacity for walking through narrow corridors and a reduction to 20% of capacity at transfer nodes, such as train stations.

Professor Hoogendoorn presented data analysis footage from work being conducted by TU Delft with the national railway company. This study allows the trajectory of pedestrian paths before and during the pandemic to be analysed to determine how people have changed their travel behaviour as they adapted to the situation.

To further study behaviour change by mode, TU Delft is equipping the campus with cameras to monitor behaviour and capacity. This includes, for example, at bus stops and at cycling routes, to see how behaviour has changed because of the crisis.

Dr Hoogendoorn-Lanser highlighted other changes that have occurred to the transport network framework to manage the impact of COVID-19, including:

- Network design – such as Milan turning car infrastructure over to bicycle infrastructure;
- Measures – Brussels providing less green time at traffic signals to cars and more to active modes;
- Regulations – facemasks being required on public transport, allowing for 100% capacity, rather than the earlier 40%, which was deemed to be insufficient; and
- Allocation principles – the introduction of a capacity allocation system through booked seats on the national railways. This started with only vital worker groups allowed to travel and expanded to all customers.

She explained that the TU Delft campus provides a unique opportunity to study mobility in a microcosm, with a number of data sources available, including through sensors installed to monitor movement throughout the campus. This includes standard traffic data and real-time locations of public transport vehicles, as well as some more innovative measures such as: the number of devices with Wi-Fi on in a building; in and out-flow from buildings using installed detectors; as well as crowding notifications from stewards. This last method works via an app that checks if there are situations where overcrowding is occurring, in particular where people see violations of 1.5 metre social distancing.

This has allowed a 3D ‘digital twin’ visualisation of the campus to be created. The ‘digital twin’ allows measures to be tested and their impacts assessed as well as providing short-term predictions (i.e. 15 minutes) of potential bottlenecks to allow action to be taken.

Dr Hoogendoorn-Lanser concluded by indicating that mobility is changing for the better but questioned whether the changes will become the ‘new normal’. Early indications suggest that working from home will become normalised. However, greater active travel needs to be accommodated, but potentially also more car-traffic in the short-term. A reduction in public transport use is likely to continue, but given the subsidy model in the Netherlands, this may lead to reductions in supply and result in a further decrease in ridership – which needs to be avoided.

Matt Faber, Associate Director - Transport, Australian Infrastructure Plan, Infrastructure Australia (IA) presented on the possible place of active transport policy in a national infrastructure plan for Australia. The Australian Infrastructure Plan is produced by IA every 5 years, taking a 15-year forward view, and builds on the 2019 Infrastructure Audit released in 2019.

IA’s 2019 Audit confirmed that active transport remains a challenge for Australian policymakers. The percentage of children walking or riding to school has halved since the mid-1970s.

When compared to the Netherlands, even our busiest bike-riding suburbs have around one-tenth of use of active transport for day-to-day trips. Mr Faber indicated that low urban densities and long distances are only part of the story, as feeling unsafe when walking or riding a bike is the biggest barrier.

Nevertheless, 55% of Australians would like to see more investment in active transport infrastructure.

Mr Faber noted that annual passenger kilometres travelled on public transport has increased 20% in the 10 years since 2005/06 and grown at a rate three times that of the passenger car.

He suggested this indicates that Australia is becoming much more like European cities in terms of public transport use, population density and critically the need to get to and from public transport stops.

Mr Faber highlighted the directions for active transport that are emerging for the 2021 Plan, noting that walking and riding are now seen as more important by Australians as a result of COVID-19.

He pointed out that the pandemic has seen a new role for active transport, specifically in local areas and in connections to local centres. As a result of this and other factors, there is a significant proportion of Australians who expect to travel by foot or bike in the future.

Further, he noted that advances in technology have seen developments in e-bikes, which now allow many of the barriers of cycling (age, distance, terrain etc.) to be overcome. E-bikes, share bikes and other forms of micro-mobility can be integrated into Mobility as Service (MaaS) packages which include traditional and demand-responsive transit packages. MaaS customers then have access to solutions for all travel needs - including gap-filling options for times like wet weather when riding is not attractive.

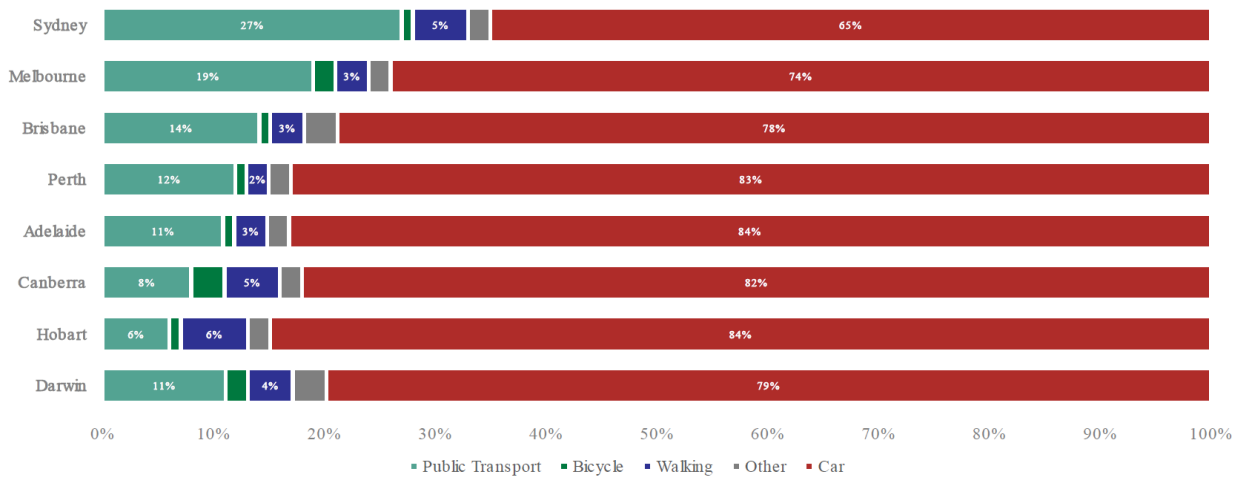
Over the longer term, combining rail, rapid bus and other line-haul public transport modes, with first and last mile walking and cycling access is critical, and is an area that IA is interested.

In closing, Mr Faber indicated that short-term investment in cycling and walking throughout catchments around train and rapid bus stations, and local activity centres, is a no-regrets investment option, as these will become in future first and last mile access routes.

Will Fooks, National Transport Planning Lead, GTA Consultants, highlighted emerging good practice in Australian major transport project planning and development, and the importance of making positive provisions for active transport.

Mr Fooks highlighted that this year has seen a fundamental shift in the way we envisage the transport landscape. The reality is that for most people in Australia, the car has been the dominant mode as shown in Figure 1 below.

F1. Mode choice by Australian capital city



Source: GTA Consultants

Having this narrow perspective on what our roads do, i.e. provide for car access, has influenced design criteria. He highlighted however that we are now seeing a transition to a multi-modal transport journey.

Mr Fooks indicated that community engagement highlights that people want active transport provisions. Active transport has become a selling point for major transport projects such as the West Gate Freeway in Melbourne, Dandenong line level crossing removals in Melbourne and the Veloway in Brisbane.

Mr Fooks also highlighted the health benefits of active transport, noting COVID-19 has resulted in the opportunity for people to walk or ride more often, especially in their local area. This has generated a hype around active transport (as evidenced through the rollout of pop up lanes and tactical urbanism) which, while not new, have been brought to the forefront of discussion as a result of the pandemic.

He suggested that the globalisation and shift in policy is a significant opportunity to learn from others and the innovation happening around the world. Specifically, there is opportunity to learn from New York, London, Paris and to shift the ecosystem around how we manage, plan and deliver projects. This would include moving from specifications around bike lane widths, to decisions on who designs the road and ensuring they have experienced the road as a rider.

Mr Fooks concluded by acknowledging that while we are some way away from the level of active transport seen in Europe, Australia is on a journey to improve this. He suggested that there needs to be incremental steps to improve the quality and connectedness of the network, with corresponding increases in road space allocation and project budgets over time.

EVENT OUTPUTS & NEXT STEPS

A snapshot of the event was promoted through Roads Australia's LinkedIn channel.

A second webinar, focusing on the transition from Internal Combustion Engines (ICE) to Electric Vehicles (EVs) was held on 16 September. The synopsis of that event can be downloaded on the RA website.

Future topics to be discussed in the International Insights series include Road Worker Safety and Hydrogen, which are planned for November and December 2020.

In addition, Roads Australia plans to host further webinars on this and related topics.

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POLICY INSIGHTS
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Register for upcoming policy events to contribute to the debate.

BACKGROUND

Despite making up only 17% of the nation's population, deaths on regional roads account for two in every three of the lives lost nationally.

While driver behaviour and vehicle design have a role to play in improving safety, relatively low-cost infrastructure treatments can be an effective and efficient way to reduce the number of crashes. These treatments can be especially helpful in reducing run-off-road and head-on crashes.

EVENT SUMMARY

Over 120 attendees joined RA's webinar on 8 July 2020 to hear from:

- **Robin Jackson**, Chief of Infrastructure Prioritisation, Infrastructure Australia,
- **Bernard Carlon**, Executive Director, Centres for Road Safety & Maritime Safety, Transport for NSW,
- **Mike Stapleton**, Deputy Director General, Queensland Department of Transport and Main Roads, and
- **Colin Dominish**, Regional Director, Southern Hemisphere, GHD Digital.

Speaker presentations are available on the RA website.

The webinar was moderated by **Jeff Doyle**, Safety Policy Stream Chair, RA and Chief Executive Officer, Altus Traffic Group and sponsored by GHD.

RECENT ANNOUNCEMENTS

There have been several federal funding announcements in June and July 2020 relating to road safety infrastructure, as part of a $1.5 billion nationwide infrastructure package including $500 million for targeted road safety works.

Details of the funding by jurisdiction is provided in table 1, below.

RA has been supporting increased Federal funding for low-cost road safety treatments for some time, so RA is encouraged to see these types of treatments being funded, including shoulder widening or sealing and audio-tactile line markings, otherwise known as rumble strips.

POLICY INSIGHTS

The webinar brought together experts from across Australia.

Robin Jackson, Chief of Infrastructure Prioritisation, Infrastructure Australia (IA) presented on the Infrastructure Priority List for 2020, which is IA's largest list yet, comprising 147 nationally significant infrastructure proposals. A mid-year update, with new projects and initiatives, will be released in coming weeks.

He reinforced that regional roads account for a disproportionate amount of road fatalities, and one of the key themes of the List is a regional focus for both regional and rural road network safety improvements, and well as mobile telecommunications coverage in regional and remote areas.

Mr Jackson indicated that the speed with which projects can be progressed from concept or problem stage to solution and delivery can help to speed up the recovery of the economy.

IA is calling for submissions to the 2021 Infrastructure Priority List and specifically encourages submissions from the following areas, which are relevant to roads:

- Addressing national waste and recycling management challenges; and
- Responding to national road maintenance issues.

Submissions close 31 August 2020. Visit IA's website for more information.

Bernard Carlon, Executive Director, Centres for Road Safety & Maritime Safety, Transport for NSW, presented road crash data for country roads in NSW.

T1. Recent road safety funding announcements

State/ Territory	Funding (Joint Federal & State/Territory)	Road Safety Upgrades Include:
ACT	$3.2 million	Upgrades to traffic signals to keep them on during power outages, the installation of road safety barriers and a variable speed limit
NSW	$398 million	Mass action rollout of audio-tactile line markings
NT	$34.6 million	Widening and sealing shoulders and improving or installing guardrails, truck stops and audio-tactile line markings
QLD	$150 million	Audio-tactile line markings
SA	$59.5 million	Safety barriers, shoulder sealing audio-tactile line markings
TAS	$17 million	Heavy vehicle rest areas, electronic school zone signs and roadside barriers
VIC	$97.2 million	Intersection upgrades on 30 high-speed, high-risk rural intersections, Pedestrian and Safer Schools (urban and regional) upgrades
WA	$100 million	Approximately 1,400 kilometres of roads treated, with shoulder sealing and audible edge lines being installed in every region of WA

He reminded us of the ongoing importance of road safety, highlighting the 9,816 fatalities and serious injuries (FSIs) that occurred on country roads in NSW between 2015 and 2019, at a cost of $13 billion.

The Towards Zero Infrastructure Program, which is included in IA's list as a High Priority Initiative, found that a $1 billion investment in road safety is estimated to avoid 628 fatalities and 4,820 serious injuries over the lifetime of the investments, returning a benefit-cost ratio (BCR) of 5.06.

Mr Carlon presented TfNSW research showing the effectiveness of a number of road safety treatments including:

- Full containment (roadside and median barriers): 90-95% reduction in head-on FSIs; 90-95 reduction in run-off-road FSIs; and 50-75% reduction in FSIs across all crash types;
- Median barrier only: 90-95% reduction in head-on FSIs;
- Roadside barriers: 90-95% reduction in run-off-road FSIs;
- Wide centreline: 50% reduction in head-on crashes; and 20-25% reduction in run-off-road crashes; and
- Audio-tactile line marking: 20-25% reduction in run-off-road crashes; and 25% reduction in head-on crashes.

Mike Stapleton, Deputy Director General, Queensland Department of Transport and Main Roads who provided an overview of the work that has been happening in Queensland (QLD).

Wide centre line treatments (WCLT) have been used successfully in high-risk areas to reduce crashes where a vehicle crosses the centre line. This has been operationalised through application of policy requiring any project on a rural road with 4,000 vehicles per day or more to use WCLT and audio tactile line marking. In QLD, this has been found to reduce the rate of fatal and serious injury crashes by an average of 20% and the rate of head-on crashes by an average of 46%.

Other road safety treatments in QLD include:

- Township entry treatments (TET): implemented where high-speed rural roads transition to lower-speed roads;
- Sealing roads: with more than 2,000 kilometres sealed since 2001; and
- Regional roads stimulus packages.

Colin Dominish, Regional Director, Southern Hemisphere, GHD Digital, presented on digital innovations to improve road safety across Australia including:

- The role of technologies such as ITS in improving safety of roads. GHD is helping to assist road authorities in this, such as though the use of video in remote locations to understand the workings of an intersection.
- Their current work on a trial with TfNSW of a mobile phone app to measure the road roughness index.
- The use of training simulators to help drivers transition to larger heavy vehicles.
- The role of autonomous vehicles and the need to manage this well in regional areas to help save lives.

EVENT OUTPUTS & NEXT STEPS

A snapshot of the event was promoted through RA's LinkedIn channel.

Looking ahead, RA plans to host further policy webinars on this and related topics.

In August 2020, RA will host another webinar featuring experts in regional road safety, and will look to expand on the issues raised in both these events in a Road Work podcast.

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POLICY WEBINAR
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BACKGROUND

In 2019, Roads Australia formed a Road Worker Safety Working Group (RWSWG) with the objective of raising safety standards among traffic management and road workers. The RWSWG is an initiative that arose from the recognition by the RA Board that our organisation should take a leading role in ensuring the safety of our road worker community.

The key driver of this initiative is the imperative to ensure the safety of road workers at a time of unprecedented transport infrastructure spending. There is a strong pipeline of roads activity underway, with BIS Oxford Economics estimating a total spend on roads, highways, and subdivisions of $22.7 billion over the next five years.

There are approximately 1,200 fatalities each year on Australian roads. Although no single reliable source of data exists about what proportion of these fatalities are road workers, it is clear from Safe Work Australia (Work-related Traumatic Injury Fatalities 2019), that road-related fatalities from the construction industry are disproportionally high, and as such, Safe Work Australia has identified this industry group as a priority area.

The RWSWG is currently focussed on a number of strategic issues, including but not limited to, reforms to the procurement process, pre-qualification requirements and industry image. As part of furthering those areas, the RWSWG is looking to other jurisdictions for guidance on best practice, in particular the UK, which has demonstrated significant leadership in the area of road worker safety.

As part of the RWSWG activities and in support of Australia's National Road Safety Week, RA hosted an International Insights webinar, focussed on road worker safety. The webinar brought together leading experts from across the UK and Australia to share experiences and best practice and to explore the latest innovations in play to help keep those who work on our roads safe.

EVENT SUMMARY

Over 90 attendees joined RA's webinar on 18 November 2020 to hear from the following speakers:

- **James Haluch**, Managing Director - Highways and Waste Collections, Amey
- **Mark Byard**, Health, Safety and Wellbeing Director, Highways England
- **Andrew Fennell**, Chief Strategy Officer, Chevron Traffic Management
- **James Bennett**, Program Director, VBA
- **Amanda Tarbotton**, Director WHS Sydney Division, Transport for NSW

Speaker presentations are available on the RA website.

The webinar was moderated by **Jeff Doyle**, RWSWG Chair, RA, Safety Policy Stream Deputy Chair, RA and CEO, Altus Traffic Group and proudly sponsored by Ventia.

KEY INSIGHTS

Mr Doyle kicked off the session by providing an overview of the RWSWG and its key objectives, including the desire to identify learnings from our international counterparts.

He also highlighted National Road Safety Week's theme of the day, Move Over, Slow Down and its focus on emergency services, road-side assist and road workers.

James Haluch, Managing Director - Highways and Waste Collections, **Amey** and **Mark Byard**, Health, Safety and Wellbeing Director, **Highways England**, provided the keynote presentation, focusing on a collaborative approach to safety.

Mr Haluch outlined the two main guides in the UK; Safety at Streetworks and Roadworks – A Code of Practice; and Chapter 8 of the Traffic Signs Manual (2009) Best Practice Guidance. He explained that despite the UK's robust legislative and training systems, challenges still exist. Some of these include silo working on industry safety challenges with limited avenues for collaboration, as well as technological advances that are changing infrastructure and impacting the way the network is being used.

As an example, Mr Haluch introduced the 'naked highway' concept. Regardless of the considerable efforts that have been made to enhance workforce training and competency, some degree of complacency and human error still exists. The naked highway solution would see road workers removed from the road completely through accelerated investment in innovation and modernisation of the network, deploying digital solutions to replace physical assets that will ensure the safety of the road network without the need for workers to be on-site to undertake maintenance activities.

Mr Byard explained that to address these challenges, Highways England introduced a new approach of 'Home Safe and Well' to their 2019 Health, Safety and Wellbeing Strategy, with the objective that by 2040, no one should be harmed when travelling or working on the Strategic Road Network. In order to achieve this, one of the Corporate Actions in the approach was Supply Chain Engagement and Raising Industry Standards. As a result, the Supply Chain Safety Leadership Group (SCSLG) was formed. Its members comprise senior executives, industry technical experts and leaders and is aimed at raising industry standards through 11 working groups focused on specific safety workstreams.

Mr Haluch explained that one such working group is the Impact Protection Vehicle (IPV) Strike and Traffic Management Incursions Group which focuses on incident prevention and safety innovation in traffic management. The Group's vision is to improve safety performance to stop injuries and deaths on the road network. Through the sharing of data and good practice, the group was able to identify the hot spots where incidents and near-misses occur, to begin to understand areas for improvement and innovations to raise industry standards.

IPV and incursion innovations include the use of automated cone laying and roadside deployment systems, anti-incursion barriers and enhanced mobile carriageway closure techniques, some of which are being made to be fully autonomous. These learnings were incorporated into the IPV and Incursion Group Common Intent document which includes a traffic management decision making flowchart. The flowchart gives traffic management designers a consistent best practice guide, and demonstrates the key role of industry collaboration and technology in delivering on the aspirations of the Home Safe and Well approach.

Andrew Fennell, Chief Strategy Officer, **Chevron** presented on traffic management as a career path, and how technological advances are assisting to protect road workers.

It was explained that Chevron has a large focus on training, development and career progression of their employees. The Chevron Academy was established to help facilitate this - a tailored learning and development platform that offers a range of courses specific to particular areas of traffic management. Through the courses available at the Academy, employees are able to enhance their skills and progress their careers, with their elective and mandatory training being monitored, ensuring they are legally compliant.

It was emphasised that introducing high quality, consistent and structured training, has resulted in professional career pathways and opportunities for those engaged in traffic management. It has also reinforced Chevron's commitment to upskilling its workforce, as well as their competitors.

Mr Fennell then provided a short overview of the use of technology to reduce road worker exposure to safety risks. For example, the use of digital twins that map the worksite and employ sensor technology to monitor real time movement and speed on worksites. This can be used to immediately notify road workers of incursions, allowing immediate intervention. It was suggested that implementing digital assets on worksites and collecting real time data is helping to significantly improve safety in traffic management.

He concluded by highlighting that Chevron Traffic Management has maintained 9.5 million hours of work without a serious accident – a testament that well-trained, traffic management professionals can make a difference in keeping worksites safe.

Amanda Tarbotton, Director WHS Sydney Division, **Transport for NSW** (TfNSW), provided a domestic context, which was focussed on the safety challenges and opportunities being faced in Australia.

She pointed out that the COVID-19 pandemic has seen new challenges, specifically with the significant infrastructure spend towards the development of road networks in greater metropolitan areas. Whilst the positive economic and social impacts of this investment are recognised, it creates a need for road workers on the road - a critical aspect of delivering works, but an increased safety risk on the network. As part of this, Ms Tarbotton noted that whilst alternate modes of transport are promoted to support a sustainable transport solution, more interfaces are being created in the road corridor which inevitably requires the use of road workers.

Ms Tarbotton provided a snapshot of TfNSW's activities around road safety, including their commitment to delivering the Safer Roads Program through the Centre for Road Safety. COVID has presented an opportunity to fast-track the completion of a number of road safety treatments, such as widening shoulders, wide centre lines, trials of audio-tactile lines and the installation of medians and roadside safety barriers. She also spoke of emerging technology that is being trialled and used to improve road safety, including drones, autonomous vehicles, and mobile phone detection cameras. Ms Tarbotton emphasised the importance of the quality of training of traffic management workforce to ensure the best safety outcome in delivering these works.

Ms Tarbotton concluded by urging the audience to be proactive in the steps we can all take to better protect the safety of our industry's workforce and reinforced the message that road safety is everyone's business.

James Bennett, Program Director, **VBA** built on the theme of the importance of industry collaboration to drive best practice and spoke of his experiences working in the UK compared to Australia.

When comparing his experience to the UK, he noted that similar challenges exist in terms of poor driver compliance, accidents, near misses and road worker abuse. He noted that with major infrastructure builds on both sides of the world, inevitably road workers are exposed to safety risks, regardless of their training and diligence.

Mr Bennett reflected on the noticeable difference in Australia with the transient, casual nature of the workforce, whereas in the UK, Traffic Management is considered a safety-critical and respectable career. He emphasised that this difference demonstrates the need for cross-jurisdictional consistency in qualifications for road workers in Australia, however acknowledged Austroads' work to unify standards to improve the safety and efficiency of temporary traffic management on road worksites. To add to this, he spoke of the potential for tenders that advocate improved safety measures to be rejected in favour of lower cost bids, which he noted, can seriously compromise safety.

Mr Bennett suggested that road agencies and other organisations must not only consider best value, but also best safety practice, and should reject the lowest cost proposal if safety is not adequately addressed.

Mr Bennett also pointed out Australia's lack of technology on worksites. He noted that adopting those being used in the UK, as highlighted by Mr Haluch and Mr Byard, will be a big step towards enhancing the safety of both motorists and road workers by enabling road workers to perform duties away from live traffic.

Mr Bennett echoed the other speakers' sentiments of the power of industry working together, suggesting that the SCSLG was a great example of industry championing change rather than waiting for regulators. He encouraged the audience to look at international examples of collaboration and best practice and work to use them within the Australian setting.

Christian Frost, Group Executive - Safety Health Environment & Quality, Ventia, concluded the session with a Vote of Thanks to reinforce Ventia's commitment to road safety and road worker safety. Mr Frost highlighted the challenges being faced in Australia, particularly around procurement and the casualised nature of the traffic management workforce.

Mr Frost further highlighted the opportunities available to assist in reducing and eliminating road worker injuries and deaths through the use of technology, innovation and a commitment from industry to drive positive change.

EVENT OUTPUTS & NEXT STEPS

A snapshot of the event was promoted through Roads Australia's LinkedIn channel, with the presentations available on the RA website.

RA will continue its commitment to progressing the work of the RWSWG, which will include hosting further International Insights webinars on road worker safety to explore best practice and review lessons learned.

In addition, RA's flagship safety event, Spotlight on Safety will be held on 6 May 2021 in Brisbane. Attendees from government, industry and the community will convene to hear from those at the front line and showcase some of the latest innovations in road safety.

With the next National Road Safety Strategy to 2030 currently being developed, there is no better time to shine a spotlight on those key themes that will help frame this Strategy, including safe roads, safe vehicles, safe road use and safe road workers.

Further details will be available on the RA website in early 2021.