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Dear Ms. David

Guidelines for trials of automated vehicles in Australia

Thank you for the opportunity to respond to the review of *Guidelines for trials of automated vehicles in Australia*, a review we see as timely. RAC welcomes the continued progress by the NTC in this space which follows the release of the guidelines in 2017 to support national consistency for automated vehicle trials in Australia.

RAC is a voice for more than 1.1 million members across more than 60 per cent of Western Australian households and speaks out on the road safety, transport, land use and air quality challenges facing Western Australia (WA). Since our foundation more than 115 years ago, RAC has existed to be a driving force for a Better WA by championing change that will deliver transport options that are safe, more sustainable and that better connect Western Australians and their communities now and in the future.

Automated vehicle (AV) technology is rapidly advancing and many vehicles now have technology that requires less driver intervention. AVs and driver-assist features have the potential to reduce the number of road fatalities and serious injuries. Trials such as RAC's Intellibus® help foster a better understanding of AV technology, enabling Western Australia to take an informed and leading role in developing initiatives to facilitate, regulate and fund these systems.

RAC aims to understand how AVs operate and consider their likely impacts on WA.

The Trial's three objectives are:

- Increase understanding about the potential impacts and opportunities from the advent of AV technology;
- Give Australians the chance to see AV technology, and eventually use and experience it; and
- Further help WA prepare a roadmap for changes to support and safely transition to AV technology.

Background

Since 2015, RAC has been working to test and evaluate a driverless, electric shuttle bus and on 31 August 2016, RAC, with the support of the WA State Government and City of South Perth (CoSP) launched Australia's first automated vehicle trial on public roads. In one of the first trials globally, the RAC Intellibus® takes passengers along its 3.5-kilometre route in South Perth, interacting with traffic, parked cars, cyclists and pedestrians. The trial has had 15,034 passengers participate with the Intellibus travelling 24,318 kilometres in automated mode.

Monitoring community perceptions, and understanding the social impacts of AVs, are key components of the South Perth Trial. Passengers are asked to complete a pre and post-ride survey, to provide insights into the rider's experience and attitudes towards driverless vehicle technology.

Key results from the South Perth Trial post-ride survey are as follows:

- 83% of riders had heard of driverless vehicles before participating in the Trial;
- 96% of riders rated their participation positive to extremely positive;
- 92% of riders felt positive to extremely positive about driverless vehicles after experiencing the Intellibus;
- 98% of respondents think that a vehicle like the Intellibus could be used as a future service in WA; and
- 85% felt that it was very to extremely appropriate that RAC acts on behalf of its members and the community to help ensure that WA will be ready for the introduction of driverless vehicles.

The most commonly identified benefit of making vehicles driverless was enhancing the freedom and independence for the young, aging and those with mobility difficulties, which supports RAC's Mobility Agenda of safe, easy and sustainable mobility. Other highly rated benefits were the lower vehicle emissions; better fuel efficiency; and the opportunity to reduce the severity and frequency of crashes.

The five most commonly identified concerns were not being able to manually override the vehicle and take control if the system fails; cyber security threats of the system/the vehicle being hacked and overridden remotely; who will be responsible in the case of a crash; how driverless vehicles will interact with non-driverless vehicles; and the cost of purchasing and/or fixing a driverless vehicle.

Image 1 RAC Intellibus in South Perth

Building on the South Perth Trial, RAC delivered a regional AV experience in Busselton in May 2019**.** Expanding the trial to a regional location provided members of the public residing outside of the metropolitan area with the opportunity to experience and learn about the benefits of AV technology while it is still in the early stages of development. Furthermore, different locations and traffic conditions present new and unknown technological challenges, and it is important to understand and evaluate these to assist in safely transitioning AVs onto WA roads.

Following extensive collaboration and planning with the City of Busselton, and governing bodies such as Department of Transport (DoT), Main Roads WA (MRWA) and the Public Transport Authority (PTA), in addition to the recruitment of local personnel / chaperone, provision of a Traffic Management Plan (TMP), Road Safety Audit (RSA), a number of insurances and approval for a Special Permit to operate on public roads enabled the RAC Intellibus® to become the first driverless vehicle to operate on public roads in regional WA.

Image 2 RAC Intellibus visited Busselton in May 2019

The Intellibus® visited Busselton for eight weeks, giving 1,596 locals and visitors the opportunity to take a ride and learn about driverless vehicle technology across 1,235 automated kilometres.

Like the South Perth Trial, monitoring community perceptions, and understanding the social impacts of AVs, was a key outcome of the Busselton Experience. Passengers were asked to complete a pre and post-ride survey to enable understanding about the rider's experience and attitudes towards driverless vehicle technology.

Key results from the Busselton Experience post-ride survey are as follows:

- 83% of riders had heard of driverless vehicles before participating in the Busselton demonstration;
- 97% of riders rated their participation positive to extremely positive;
- 87% of riders felt positive to extremely positive about driverless vehicles after experiencing the Intellibus;
- 96% of respondents think that a vehicle like the Intellibus could be used as a future service in WA; and
- 84% felt that it was very to extremely appropriate that RAC acts on behalf of its members and the community to help ensure that WA will be ready for the introduction of driverless vehicles.

In support of RAC's Social Impact Agenda of safe, sustainable and connected communities, the most commonly identified benefit of making vehicles driverless was the opportunity to reduce the severity and frequency of crashes; other highly rated benefits of AVs were identified as reduced congestion, lower vehicle emissions and enhanced freedom and independence for the young, aging and those with mobility difficulties.

Following the continued success of the South Perth trial and feedback from community groups regarding participation, the concept of establishing an educative experience and delivering an Intellibus® School Program was developed. An opportunity was identified to expand RAC's Automated Vehicle Program to educate upper primary school children in years 5 and 6 on AV technology, road safety and aspects of STEAM subjects (Science, Technology, Engineering, Art and Mathematics), as well as addressing HASS topics (Humanities and Social Sciences).

Image 3 The RAC Imagine Program was launched in September 2019

On Tuesday, 3 September 2019, with support from the City of South Perth, the RAC Imagine Program™ was launched. In a day of interactive activities students take a 3.5km journey on the driverless RAC Intellibus® to experience and learn about the technology first hand, step back in time with a tour of South Perth's historic Old Mill to understand how the technology used at the time was world leading, board the RAC Rescue Experience through virtual reality, get hands on with the impact AV technology can have on road safety through the teaching of Global Navigation Satellite Systems, odometry, sensors, lidars, coding and robotics with Edison robots and based on the day's learnings, construct their own futuristic sculptures from recycled materials where students have the opportunity to talk about the technology used for a cleaner, safer and more accessible future of transport.

Due to significant demand, the program was quickly extended from one to two operating days per week. 1,302 students across 40 school bookings have now attended the program which continues to receive plenty of booking requests with approximately 70 schools now waitlisted.

A post excursion survey is sent to all participating schools to gather feedback on presenter, student engagement and relevance of content. Results have been overwhelmingly positive with all areas averaging an excellent score.

Through the post program surveys, schools have provided the following feedback:

- 95% of schools rated overall experience extremely positive.

- 77% of schools said that it was extremely important and 18% very important for RAC to be involved and give back to the community with the free RAC Imagine Program™, which is proudly supported by City of South Perth.

At the easing of Covis-19 restrictions, the RAC Intellibus and the Imagine Program will soon travel to Geraldton to provide participants with an opportunity to experience and learn about driverless vehicle technology. The inaugural regional Imagine Program will be co-delivered with the Museum of Geraldton which will also provide students with insight into the history of navigation and mapping in the Mid-West region. The regional demonstration is pending the provision of the required special permit from the Department of Transport.

Image 4 Proposed route of regional demonstration.

We trust that RAC's submission (enclosed below) and ongoing collaboration will be of assistance to the National Transport Commission in reviewing the Guidelines for trials of automated vehicles in Australia.

Should you require further information, please do not hesitate to contact Julian Gomez, Operations Lead (AV Trials) on 0439 985 038 or julian.gomez@rac.com.au.

Your sincerely,

Anne Still

GENERAL MANAGER, PUBLIC POLICY & MOBILITY

Advocacy and Members

Review of 'Guidelines for trials of automated vehicles in Australia'
RAC's Response to the National Transport Commission's Discussion Paper
July 2020

Chapter 3: Content and level of detail in current guidelines				
	Relevant Question	**Item**	**Current Guidelines**	**Response**
1	Should the guidelines be updated to improve the management of trials and, if so, why? Consider in particular: ▪ the standard of evidence required in a traffic management plan ▪ the definition of 'trial location' ▪ the stakeholders trialling organisations should engage with ▪ requirements to state the purpose of a trial	3.2 Management of Trials	Section 3 Management of Trials	Yes, the guidelines should be updated to improve the management of trials noting there is a particular opportunity to inform industry on *how* various requirements can and should be met. In advance of the release of the NTC Guidelines in May 2017, RAC developed a systematic approach in planning Trials and applying for required special permits for the operation of its AV shuttles. Depending on the type of vehicle and technology capabilities, the process may differ slightly. Firstly, a comprehensive desktop site assessment is undertaken to determine suitable trial locations. Pending suitability of the desktop assessment, an on-site assessment is conducted to confirm findings against route selection criteria and to evaluate road network features. Manufacturer requirements are also met which includes filming the route and completing mapping requirements using a mobile mapping system (MMS). If the trial location and route is deemed appropriate for safe operation a proposal is shared with key stakeholders, which generally includes the Department of Transport. Once acknowledged, the Local Government Authority is also provided with a detailed proposal which highlights trial objectives / purpose, routes within the trial location, a description of the vehicle's technology (aligned to an Operation Design Domain (ODD)),

				insights into testing and previous trial outcomes, planned communications with key stakeholders e.g. enforcement agencies, an independent Road Safety Audit (RSA) and Traffic Management Plan (TMP) tailored to the parameters of the trial. We consider that only one RSA and one TMP are required for the Trial's operation and for now, both the RSA and TMP are funded and commissioned by RAC on the basis that this removes the need for Government to do so. Having in-house expertise to critically review these documents is helpful. The guidelines should be updated to include a checklist of items that will be required according to the type of trial and vehicle being used. Ultimately, the NTC may look to provide examples or templates for key provisions such as RSA's and TMP's to better guide Advanced Driving System Entities (ADSE) on the requirements for these documents. It is noted that guidelines may differ at different stages of proposed trials, for example if a trial was to be tested and demonstrated on a private track or closed environment on public roads, requirements to allow testing including safety management processes, procedures and approvals may need to be relaxed to enable such trials.
2	Should the guidelines be updated to improve the safety management of trials and, if so, why? Consider in particular: ▪ the standard of evidence required ▪ human driver or operator inattention ▪ road user behaviour that does not comply with road rules	3.3 Safety Management Plan	Section 5 Safety Management Plan	Broadly, the guidelines can remain as they are, however, where the trial is on public roads, an independent Road Safety Audit and accompanying Corrective Action Report should be provided by the ADSE to inform the Safety Management Plan including risks to other road users. Ongoing training should be required for human drivers/operators as part of operating on public roads. Operators should have full attention on the road and be able to take immediate control of the vehicle. It has been noted that for some trials operating nationally operators have not worn a seatbelt, have stood up

	▪ interaction with enforcement and emergency services ▪ pre-trial testing ▪ any additional key safety criteria. Consider the safety criteria for the first supply of automated vehicles for commercial deployment			whilst the shuttle was operating and converse with trial participants during motion. RAC has ensured that one operator has full attention on the road/vehicle, while another operator engages with riders. Although the end goal is to reduce operators to one (or remove operators all together), passengers should be notified that operators are required to maintain full attention on the road whilst the vehicle is moving. ADSE's should also carry out police and drivers licence checks for operators and appropriate breaks should also be provided during shifts. The RAC trial in South Perth has been operating for more than 3 years along the approved route where the shuttle has been interacting with traffic and other road users. The shuttle operates at a top speed of 18km/h with different limits applying along parts of the route as a risk mitigation measure, including slowing in areas where there are densely parked vehicles and high pedestrian activity areas. Now that the trial has operated for an extensive period, it is possible to explore opportunities to reduce traffic management measures. As time goes on, there might be a need to consider different requirements based on the level of risk with AV's travelling a slower speed in less heavily trafficked environments having a 'lighter' safety case compared to automated heavy vehicle trials or trials on freeways, regional and busier road networks, for example. RAC engaged with Officers in Charge from WA Police for its two regional demonstrations. Information is provided to ensure that all involved agencies understand operating parameters and risk mitigations including emergency procedures. RAC supports the requirement for pre-trial testing to take place at a closed facility within Australia. A focus should be placed on the boundaries of sensor perception and vehicle response. An exception to this would be if a road transport/local government agency

				representative has been able to experience and witness the vehicle operate in person in another location not within the trialling jurisdiction With any new trial vehicle, RAC works hands-on with the vehicle manufacturer to develop an extensive test plan that will enable the team to observe and record the vehicles' behaviour in autonomous mode. When appropriate, stakeholder demonstrations are also conducted. Notwithstanding this, ad-hoc adjustments to operating parameters are required to account for local conditions in each new environment. Regarding other requirements for the safety management plan, we support having identifiers visible on the vehicle where the design does not ensure it is easily recognisable to other road users as being automated. It is not deemed practical or useful to notify State agencies of all software updates due to their complexity and frequency. However, RAC supports the requirement for an in-situ testing regime following significant software changes to ensure safe operation when the vehicle returns to service.
3	What issues have been encountered when obtaining or providing insurance?	3.4 Insurance	Section 4 Insurance	Before the launch of RAC's trial in 2016, to safeguard and protect passengers, staff and other road users, RAC sought and acquired multiple levels of insurance through private brokers as well as the public insurance agency, the Insurance Commission of WA (ICWA). The levels of insurance include: • Comprehensive insurance • Compulsory Third Party (CTP) insurance • Public Liability Insurance

				• Voluntary Workers Insurance A condition of the first Special Permit with Compulsory Third-Party Insurance, was that a Chaperone must always be on board the vehicle with the ability to take back control when required (which still occurs). However, the support of ICWA to grant CTP insurance was withdrawn one year into the Trial and alternate private insurance was sought by RAC. Current insurances include: • Primary Public and Products Liability • Workers Compensation • Personal Accident – Voluntary Workers • RAC Insurance Motor Vehicle Often insurers will request more data and as much information on the trial and operating conditions as possible with a detailed plan of trial intentions and operations. Insurers have also requested a demonstration of the vehicle within the trial parameters to gain an understanding of the risk associated with the trial.
4	Are the current insurance requirements sufficient? If not, how should they change?	3.4 Insurance	Section 4 Insurance	While the current insurance requirements are broadly sufficient, we support the provision of further guidance, but not requirements, on the level of liability that should apply for insurance policies. Insurance certificates should be provided to State agencies as part of the permit application process.

5	Should the guidelines be updated to improve the provision of relevant data and information? Consider in particular: ▪ serious and other incidents, including: – consistency of reporting requirements – disengagements – definition of a serious incident – broader data recording requirements ▪ research outcomes and end-of-trial reports.	3.5 Data and Information	Section 6 Data and Information	Trialling organisations/individuals should demonstrate a commitment to sharing data with the relevant transport agencies and local government authorities where the trial is taking place. As per the current guidelines, all serious incidents should be reported to the relevant road transport agency and existing crash reporting requirements of the state or territory adhered to. RAC have been willing to share data on disengagements through presentations to industry stakeholders at several events as well as details about broader trial outcomes. This includes an understanding of the commissioning process, disengagements and learnings from operations and passenger survey results which includes pre and post participation. Guidance on transport agency data requirements would be welcomed as not all data is considered useful, however infrastructure/operating data around disengagements d provide insight into future recommendations and changes to road and traffic environments. At level four, it is not considered practical for ADSE's to provide monthly reports on instances when a human takes back control of the vehicle as this is part and parcel of trial operation and is not overly comparable across trial locations. It is also important to note that while the parameters for reporting serious incidents are suitable, the format of information is likely to differ between manufacturers. A reporting template for trialling organisations may be useful.
6	Is there any additional information the guidelines should include for trialling organisations?	3.6 Additional information for trialling organisations in the guidelines		A resource pack with information on successful trials that have occurred within Australia along with contact details that can be referenced by Road Transport Authorities would be helpful.

				Specific guidance on how importation of an AV should be approached would also be helpful.

Chapter 4: Application of the guidelines				
	Relevant Question	**Item**	**Current Guidelines**	**Response**
7	Should the guidelines apply to any other emerging technologies (discussed in chapter 4 or other technologies) and operating domains?	4.3 Technology Applications		The extent to which the guidelines apply to emerging technologies depends on the type of technology however if it is on public roads, the answer is generally yes. However, it could be onerous and may not be appropriate for vehicles without high or full automation capability, such as cooperative intelligent transport systems, for example.
8	Are there any additional criteria or additional matters relevant to the trials of automated heavy vehicles that should be included in the guidelines?	4.4 Heavy Vehicles		Not responded to – considered beyond current scope.
9	Are there currently any regulatory or other barriers to running larger trials? If so, how should these barriers be addressed? (Consider the guidelines, state and territory exemption and permit schemes, and Commonwealth importation processes.)	4.5 Large Trials		Not responded to – considered beyond current scope.

10	Should the guidelines continue to allow commercial passenger services in automated vehicle trials? If so, should the guidelines reference additional criteria that trialling organisations should be subject to, and what should these criteria be?	4.6 Commercial Passenger Services		Guidelines should allow for the testing and trialling of commercial passenger services in automated vehicle trials.

Chapter 5: Administrative processes and harmonisation				
Relevant Question		**Item**	**Current Guidelines**	**Response**
11	What challenges have you faced with administrative processes when applying for approving trials of automated vehicles, and how could these be addressed?	5.2 Administrative Processes for Trial Applications		Effective stakeholder engagement has been a key priority for RAC and an excellent level of support has been provided by the Department of Transport and local government. The NTC may wish to consider supplementary guidelines for State agencies to share best practice and determine processes.

12	Are there any other barriers to cross-border trials? Is there a need to change current arrangements for cross border trials?	5.3 Cross Border Trials		Not responded to – considered beyond current scope.

Chapter 6: Other automated vehicle trial issues outside the scope of the guidelines				
Relevant Question		**Item**	**Current Guidelines**	**RAC Response**
13	Should there be a more standardised government evaluation framework for automated vehicle trials? If so, what are the trial issues that should be evaluated?	6.2 Government evaluation frameworks and shared learnings		A standardised government evaluation framework could be useful, however, depending on the form and the extent of the requirements, participation to beyond a baseline level should be voluntary.
14	Should the results of evaluations be shared between states and territories? If so, how should commercially sensitive information be treated?	6.2 Government evaluation frameworks and shared learnings		RAC already shares results with government agencies when requested or at regular automated vehicle reference group meetings. RAC would be willing to share results through a standardised evaluation framework, noting the comment above, which could then be shared within and between Government Agencies. Some confidentiality requirements, where contracted with the manufacturer, would need to be upheld.
15	What works well in the automated vehicle importation process, and what are the challenges?	6.3 Importation process for automated vehicle trials		Vehicles imported to the Australian market must comply with Australian safety standards, and if they do not, a Vehicle Import Approval permit must be issued.

				It is not considered practical for automated vehicles to "fully" meet the ADR's although it is acknowledged this requirement should be in place for supply in unlimited numbers. As such, longer term, the ADR's should be updated more regularly and be more responsive to changes in new technology particularly where this applied to with automated technology or ensuring only driven vehicles with latest safety systems are allowed into Australia. RAC previously made an application to the Department of Infrastructure and Regional Development which included the following information: • In principle support from Department of Transport WA; • Technical specifications of the vehicle; • Summary of RAC's AV Trial; • Letter requesting approval from DIRD; • ASIC Certificate RAC WA; • ASIC Extract RAC WA; and • Letter to confirm RAC representative. The information provided satisfied all the application criteria at the time. Given options are available for the importation of non-standard vehicles in particularly through the Discretionary Approval process, no changes to the guidelines are required at this point of time. However, the application of Luxury Car Tax has sometimes been a barrier and should not be applied to AV's being used in trials.
16	Is there anything further that should be done to facilitate a transition from trial to commercial deployment?	6.4 Transition to commercial deployment		It is recommended that once a trial has been confirmed as safe and successful, the Local Government Authority would then allow for the transition to commercial deployment if rules and regulations allow for it.
17	Are there any matters that the NTC should consider in its review of the guidelines?	6.4 Transition to commercial deployment		RAC welcomes a comprehensive framework for commercial deployment of automated vehicles which would ensure that operations are deemed safe and viable.