

National Transport Commission
Level 3/600 Bourke Street
MELBOURNE
VIC 3000

Public submission – Consultation RIS In-service Safety for Automated Vehicles

The Royal Automobile Club of Queensland (RACQ) thanks the National Transport Commission for the opportunity to provide this submission to the *Consultation Regulatory Impact Statement In-service Safety for Automated Vehicles*. As Queensland's peak motoring organisation, the RACQ has a vital interest and stake in the future of Queensland's transport network. On behalf of RACQ's 1.7 Million members, we advocate to ensure Queensland's transport system maximises safety, affordability, and sustainability.

This consultation RIS and the subsequent decisions have potential impacts across RACQ's business and operations including insurance, roadside assistance, repairs, vehicle inspections, fleet management, vehicle and road safety policy development, recommended repairers, and vehicle hiring partners. Based on feedback from a range of internal stakeholders, RACQ has identified the following high-level options and recommendations. Details of each recommendation are contained in the body of this paper in response to the consultation questions.

General Safety Duty

RACQ supports an overarching positive General Safety Duty to be applied to the ADSE and ADSE executive officers and sees this duty as a means of managing unforeseen safety risks while maintaining flexibility in technology evolution and innovation.

Regulating Repairers to Manage In-service Safety

RACQ has identified regulatory gaps that currently pertain to repairers and reduce the ability to ensure in-service safety is managed consistently across jurisdictions. Market failures have also been identified which are likely to limit access to the safe repair of ADS related equipment and place strain on the 'so far as reasonably practical' component of a General Safety Duty.

RACQ therefore suggests at this stage, a General Safety Duty may not be the best approach to managing repairers. This is a highly complex issue, and RACQ believes there is adequate evidence of gaps and failures that warrant an in-depth, holistic review of the repair and modification segment issues, to minimise the potential for negative safety/consumer outcomes for vehicle owners.

Road Owners' Influence over In-service Safety

A primary outcome of this reform process is to ensure Australia can access the safety benefits of automated technologies. If the safe operation of the ADS cannot be ensured due to the quality of roads in Australia, ADSEs/vehicle manufacturers may choose to disable the technology to facilitate entry of the vehicle to the Australian market. This would effectively eliminate any benefits the vehicle may have been able to provide. An even worse situation would be if infrastructure/ADS interaction caused negative safety outcomes and diminished public trust and uptake of the technology. RACQ therefore recommends that road managers, at least during lower automation levels and while the technology is still maturing, have a major influence on the in-service safety of automated vehicles.

RACQ has identified the following duties for road owners which could deliver improved safety outcomes. They are based on recommended responses developed by Austroads:

- Consider AVs in design of roadwork zones including line removal and replacement.



- Revise intervention levels/trigger points for line maintenance.
- Monitor characteristics which are proven to be vital to AV operation and amend where safety issues exist.
- Certify or develop risk assessments for AV use cases on individual roads, and communicate access limits or use of automated features where not appropriate.
- Road operators have responsibility for the validation and sharing of key information (related to roadworks and closures).

Regulating the Dynamic Driving Task

To regulate the dynamic driving task, RACQ is of a strong view that no one option as written is suitable for delivering the intended outcomes in both the short and long term and suggests there needs to be further refining of the Options in alignment with recommendations I-III below. Notwithstanding, in the long term RACQ supports Option 1 (in a written or codified form). In the short/medium term a combination of elements in Options 1, 2 and 4 are preferred. Elements recommended for both short- and long-term options include:

- i. Specific rules may be required to address ADS limitations and ensure Dynamic Driving Task adherence.
- ii. Central body/regulator should collate jurisdictional variations and check self-certification adherence (in alignment with the first-supply requirements for jurisdictional variations).
- iii. Jurisdictional variations must be considered and adhered to (or new rules created to manage risks) – though national harmonisation as far as practical is supported

An in-depth reconsideration and staged approach will also ensure Australian regulations reflect international standards and conventions and are sufficiently flexible to adapt to changing technologies, as currently no international standard for regulating the dynamic driving task exists.

Preferred Regulatory Approach

RACQ supports regulatory model Option 3, with 2b as an interim solution. The U.S Department of Transport National Highway Traffic Safety Authority could be looked to as a current 'best practice' example of a safety-focused body which achieves notable outcomes and investigates automated vehicle accidents and new safety technology. Australia could emulate this regulator model through existing bodies or those currently being established such as the National Office of Road Safety which would be less likely to suffer from historical culture constraints which many Australian state and national departments experience as a significant barrier.

Further detail regarding the RACQ's response to each of the discussion paper questions is provided in the body of this submission. RACQ thanks the NTC for the opportunity to provide this submission and contribute to shaping the future of Australia's transport network. Should you need to discuss any of the items raised in this letter, you can contact Grace Willems, Transport Planning and Infrastructure Advisor, Ph. (07) 3872 8984 or email Grace.Willems@racq.com.au.

Yours sincerely

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RACQ Submission to NTC Consultation RIS on In-service Safety for Automated Vehicles



1. To what extent has the consultation RIS fully and accurately described the problem to be addressed, including the in-service safety risks? Please provide detailed reasoning for your answer.

The RACQ accepts the RIS's overarching problem statements of:

- I. Automated vehicles may introduce new in-service safety risks that the market will not eliminate or mitigate, and
- II. Nationally inconsistent approaches to in-service safety and multiple regulators without clearly defined roles could be a regulatory barrier to market entry.

To address problem 1, options and solutions within the RIS should be evaluated for:

- their ability to mitigate the identified potential safety risk examples.
- whether they provide an improved outcome compared to the market self-regulation approach and current mechanisms.
- if they adequately manage risks in alignment with public expectations while recognising that 100% safety should be the target but not necessarily achievable in the short- to mid-term.

And to identify an appropriate solution for problem 2, options and solutions should be evaluated for:

- Their ability to reduce market entry barriers and costs for all parties – though recognising that costs should be covered by a range of stakeholders, particularly those who receive benefits, to deliver optimal safety outcomes.
- Ensuring there is national consistency in regulation, though with adequate flexibility to allow states to manage any significant state-isolated issues effectively and in a timely manner.
- Effectiveness in reducing overlapping and duplicated administrative costs and delays, while ensuring there will be adequate knowledge transfer between State bodies, stakeholders, and overarching regulatory bodies.

Solutions selected for either problem should also be evaluated for suitability under a range of progressive scenarios including various automation levels and mixed fleets, to minimise community and industry disruption and adverse external impacts.

2. Have we correctly identified the parties with an influence on the in-service safety of automated vehicles and accurately described their role? If you identify additional parties, please explain what their role is.

RACQ agrees the majority of parties who have an influence on in-service safety have been captured. However, further consideration may need to be given to the abilities and support provided for various levels of repairers. The RIS does not have a separate category for roadside assistance vehicles, or call-out repairers (e.g. windshield replacement) and they may therefore be captured under the broader 'repairers' category which would be subjected to an overarching positive duty of care.

RACQ does not dispute that roadside and call-out repairers have an obligation to ensure so far as is reasonably practicable, that the health and safety of other persons is not put at risk from work carried out. However, roadside repairers are unlikely to have the same capability to diagnose and repair issues with automated vehicles or automated driving systems as full and ADSE-certified repair centres. This is already placing strain on the 'so far as reasonably practical' component of the duty of care.

An example which is currently causing issues is windshield repairs. Low and mid-level automated features currently available, including autonomous emergency braking, lane-departure warning, collision avoidance, and adaptive cruise control, often have critical sensors and hardware mounted in the front windshields. Replacing a windshield must include precise sensor replacement in the glass and recalibration. RACQ has encountered situations where low/mid-level automated vehicles sold in Northern Queensland by dealers that did not have access to any suitable recalibration equipment had to be towed over 1600km either way at a high expense to the insurer, to be recalibrated following



windshield replacements and. This challenges the notion of 'reasonably practical' as the dealer (accredited by the vehicle's manufacturer/ADSE) was not able to offer what some would consider a relatively common and basic service and did not ensure there was local maintenance available.

In these circumstances, repairers and insurers will likely be required to develop a policy to respond to their responsibility under a General Safety Duty, and different providers will have a different approach to 'as far as reasonably practical'. Small or budget insurers could refuse to cover automated vehicles or certain components, and repairers unwilling to absorb excessive costs may take a minimal approach such as informing the driver of the need for calibration and disabling the ADS until it has been reinstated by a certified repairer at the owner's cost which may be significant.

However, this minimal approach may lead to issues such as drivers who have become reliant on safety systems creating negative safety outcomes when required to drive without them. It is also likely consumers may be unsatisfied with more minimal approaches and in the long-term dealers may have to ensure local maintenance capabilities are provided, and repairers may have to upskill their employees and adapt their processes to meet the customer and technology requirements – which would likely require the provision of information under the 'right to repair' regulations. Alternatively, word of mouth regarding repair difficulties may lead to lags in uptake of the technology by consumers. RACQ recommends the NTC consider these risks and identify appropriate solutions. This may require a separate evaluation category for repairers vs callout/roadside repairers who may not be able to guarantee optimal safety outcomes.

3. Have we accurately assessed each party's influence on the in-service safety of automated vehicles? If not, please provide details

The RACQ accepts the majority of parties have been correctly assessed in terms of influence. However, notes that additional consideration should be given to the following parties.

Vehicle Inspectors/Certifiers

RACQ acknowledges the important role vehicle inspectors/certifiers have in managing safety during the vehicle transfer and sale process and agree legislation which covers them is likely adequate or can be adjusted to suitably manage. RACQ manages and engages with vehicle inspectors and noted that an issue which needs to be considered is whether or not the safe operation of the ADS should be considered in the certifying process, and if the inspectors/certifiers have the skills to evaluate this. RACQ subject matter experts are of the opinion that the safe functioning of the ADS should be added to the safety evaluation process, but the certification industry may not have the relevant training, expertise, or potentially equipment to undertake this evaluation currently.

Road managers

Local trials and research/crash reports internationally have identified that with currently available automated features and ADS technology capabilities and sophistication, the road infrastructure and environment is critical in ensuring the ADS can operate safely.¹ Even with a fall-back ready user, there have been international examples where an ADS failure (potentially due to infrastructure faults) has resulted in inadequate warning (as little as 5 seconds) for the driver to take back control of a vehicle to avoid a crash.

¹ Australian Road Research Board (arrb) (2019). EastLink Connected and Automated Vehicles Trial. Accessed: <https://www.arrb.com.au/case-studies/eastlink-connected-and-automated-vehicles-trial> <12 August 2019>.



The NTC's paper acknowledges road owners have functions which can influence the in-service safety of automated vehicles, such as managing access to the road network/limiting access to certain parts of the road network. It is also recognised in the NTC paper, 'road management legislation creates obligations for state, territory and local government road managers and shapes a road manager's duty of care towards road users, such as a statutory duty to inspect, maintain and repair a road to a particular standard'.

A primary intended outcome of this reform process is to ensure Australia can access the safety benefits of automated technologies. If the safe operation of the ADS cannot be ensured due to the quality of roads in Australia, this may result in the vehicle technologies being disabled by the OEM/ADSE for entry to Australian markets, which limits the achievement of this outcome. RACQ therefore proposes that road managers, at least during lower automation levels and while the technology is still maturing, have a major influence on the in-service safety of automated vehicles.

RACQ recognises it is difficult to hold government agencies accountable compared to other parties using regular legislative frameworks and penalties, as any monetary penalties or onerous duties would ultimately impact taxpayers. In May 2017, Austroads undertook an assessment of key road operator actions to support automated vehicles², which examined automated vehicle safety and operational issues related to physical infrastructure, digital infrastructure, and road operations. Some of the recommended responses which road owners can deliver to provide improved safety outcomes may be worthy of consideration as prescriptive or performance-based duties under existing or new legislation. RACQ has identified the following duties which could deliver improved safety outcomes. They are based on recommended responses developed by Austroads¹:

- Consider AVs in design of roadwork zones including line removal and replacement.
- Revise intervention levels/trigger points for line maintenance.
- Monitor characteristics which are proven to be vital to AV operation and amend where safety issues exist.
- Certify or develop risk assessments for AV use cases on individual roads and communicate access limits or use of automated features where not appropriate.
- Road operators have responsibility for the validation and sharing of key information (related to roadworks and closures).

4. Have we accurately described the regulation that already applies to relevant parties that would help ensure the in-service safety of automated vehicles?

RACQ accepts the NTC's assessment of current regulations as they apply to relevant parties for managing in-service safety.

² Austroads (2017). Research Report AP-R543-17. *Assessment of Key Road Operator Actions to Support Automated Vehicles*. Accessed: <https://austroads.com.au/publications/road-design/ap-r543-17> <12 August 2019>.



5. *Do you think there are any new risks posed by second-hand ADS components, after-market modifications or the transfer of ownership of automated vehicles, which may not be adequately addressed by existing regulation designed for conventional vehicles?*

Second-hand Components

Second-hand ADS components could pose a risk as there is currently little or no regulation of the reuse of such components. However, it isn't clear if the risk would be any greater than that currently being experienced by owners of conventional vehicles.

Some jurisdictions place controls (bans) on the reuse of certain components sourced from wrecked vehicles, though usually this is only when they are being used to repair a designated repairable write off. There is no oversight or restriction (apart from consumer laws) on second-hand parts used in the repair of other vehicles and parts recyclers usually limit warranties to replacement with another used part if the first one is found to be faulty – i.e. there is no suggestion at the time of sale that the part will work as it should. Given that a basic requirement of an ADS is to revert to a minimal risk condition in the event of a system failure, the risk may be no greater than it is now. However, there is a possibility that components may be mixed and matched from incompatible vehicles by persons with insufficient knowledge, resulting in unknown consequences.

Some state agencies including Queensland's Department of Transport and Main Roads (TMR) are currently reviewing the requirement of a "repair" check prior to a vehicle being reregistered if purchased as a repairable write off. Currently TMR only confirm the vehicle identifiers such as the Vehicle Identification Number (VIN). Roads and Maritime Services (NSW) have a more thorough process in place to have the vehicle reregistered, whereby a vehicle must have:

- An identity and safety check at an Authorised Unregistered Vehicle Inspection Station
- Insurer vehicle damage declaration
- Photographic and evidence and invoices provided; and
- Work completed or checked by a licenced repair facility.

RACQ highlights this as there may be an opportunity to increase consistency and safety of repairs, second-hand parts use, and re-registration requirements in relation to ADS equipment and automated vehicles.

After-market Modifications

Modifications could pose significant safety issues as the ADS may not be able to identify the change. There is a current issue that illustrates the point. The behaviour of Electronic Stability Controls (ESC) can be adversely affected by changes to certain aspects of the vehicle, such as wheel size and ride height. Such changes can be easily made, and are common for 4WD vehicles, and the ESC is incapable of identifying the change. The ESC will continue to operate as it has been programmed, however the vehicle's operation is affected and may be inappropriate for the circumstances. The current method of dealing with this issue is limit the changes that can be made, and to require recertification of the system operation through empirical testing if certain original design parameters are exceeded.

A lack of consistent or any regulation of the repair industry in some jurisdictions makes managing this challenge difficult. Professional repairers are less likely to cause problems compared to backyarder repairers and/or and DIY-repairers. DIY repairs/modifications by those without the skills or knowledge are particularly risky as they simply don't know what they don't know. However, potentially the more dangerous modifier would be the one that reprograms the ADS functionality. Such reprogramming is already common in the performance industry and an ADS may not be immune.

If repairer and modifier information and guidelines were developed, these could be helpful to develop criteria for defect detection and enforcement by police as a proactive approach to managing safety outcomes.



Transfer of Ownership

RACQ also recognises potential in-service safety risks could result from sale of the vehicle to secondary owners or driving by a non-owner without adequate training about the vehicles' capabilities and limitations. It is recognised that the driver education and training component may be predominantly outside the scope of this RIS and is a mandatory self-certification criterion upon ADS market supply, though RACQ recommends at a minimum this self-certification should also include in-service education and training measures which cannot easily be bypassed (such as clicking agree without proper reading of instructions). If an untrained driver of a conditionally automated vehicle were to operate the vehicle, it would be preferable that the vehicle would not engage more complex features such as autopilot until the driver was verified as having completed and understood the training and understood their obligations as the fall-back ready user. This would be a safer outcome than operating features without adequate understanding of the vehicle/feature's limitations.

Transfer of registration (between owners) inspections are cursory at best. Some jurisdictions don't require them at all. It's unlikely that any inspectors (in their current form) would be capable of identifying something as complex as an ADS fault. For Queensland, such system checks currently only require a check of the warning lights (malfunction, indicators, lights) and a short road test. If neither show up a problem the vehicle passes, though this doesn't mean the vehicle doesn't have a fault. Interrogation of the system to identify faults is possible however a significant amount of training and equipment (if available) would be required. Given that experience to date has shown that such systems are unique to the vehicle brand, and that it's difficult to source equipment that will operate on all, or even a wide range of vehicles, this would seem to be a difficult problem to overcome. The Right to Repair campaign outlines the issue and the difficulty and cost of sourcing the appropriate equipment for such work.

Grey Imports

Grey imports are vehicle models that make their way to Australia outside of the normal full volume import process. These vehicles also pose a risk for a number of reasons. First, they may be designed to operate under different conditions and with different rules and may not operate in an environment for which they were not originally intended. Alternatively, they may not be fully functional or display undesirable behaviours. It also isn't clear who would take responsibility for these vehicles as there would be no ADSE for them in Australia. There have been numerous issues with safety recalls on grey imports as local dealers/distributors usually refuse to carry out the recall as they didn't bring the vehicle to market. While the person or entity that bought the vehicle to the Australian market could be held responsible, based on current arrangements, it's unlikely that the importer would have sufficient resources to cover a major issue if one were to arise, even if they could be held legally responsible. It's common for recalls of grey imports to go uncorrected as the original importer is no longer in business.

6. *Do you think the parties with an influence on in-service safety are sufficiently covered by Australia's current legal frameworks?*

RACQ notes there are new parties who are not sufficiently covered by Australia's current legal frameworks to manage in-service safety. It is also recognised that even with current vehicles, some existing parties may not be sufficiently covered to manage the in-service safety of vehicles, let alone as automation is introduced. The introduction of automated vehicles offers an opportunity to identify current and new issues specific to automated vehicles and identify appropriate management mechanisms.

There may need to be additional and harmonised prescriptive requirements placed on repairers to manage in-service safety of both regular and automated vehicle repairers. Under the *Mutual Recognition (Equivalence of Motor Vehicle Repairer Occupations) Declaration 2015* – and as depicted in the following extract – most jurisdictions do not have a licensing process for motor mechanics,



automotive electricians, transmission specialists, fixed/mobile workshops, or other more specialised repairer types.³ A review of this scheme at a national level and potentially incorporation of a specialised trade license for ADS/automated vehicle repairs may be one solution – however as noted previously, a market failure is likely to exist in regional locations until the fleet has a high percentage of automated vehicles and the ADSE's may be required to provide adequate maintenance support to address this failure until the market can meet demand.

Mutual recognition matrix – Motor Vehicle Repairers

Note: Autogas Installers are covered in a separate Ministerial Declaration

	A	B	C	D	E	F	G	H	I
	First State	Second State							
		NSW ¹	VIC	QLD	WA ²	SA	TAS	ACT	NT
NSW									
1	Tradesperson Certificate – Automotive Electrician		Not licensed in this jurisdiction	Not licensed in this jurisdiction	Repairer's Certificate – Electrical work and Electrical accessory fitting work	Not licensed in this jurisdiction	Not licensed in this jurisdiction	Not licensed in this jurisdiction	Not licensed in this jurisdiction
2	Tradesperson Certificate – Motor Mechanic		Not licensed in this jurisdiction	Not licensed in this jurisdiction	Repairer's Certificate – Light vehicle work AND Repairer's Certificate – Heavy vehicle work	Not licensed in this jurisdiction	Not licensed in this jurisdiction	Not licensed in this jurisdiction	Not licensed in this jurisdiction

Balancing access to repairers and safety is a complex issue which should be given in-depth consideration. ADSEs are highly liable for the loss and damage caused by any safety defects of automated vehicles. Furthermore, the design and components of the automated vehicles can vary from one to another.

One option could be for manufacturers to provide the necessary training and assessment and therefore authorise certain repairers to complete repairs, especially those related to any of the ADS critical components, which may require very specialised expertise to repair and adjust. This would allow any issues which arise to be more easily identified and resolved between manufacturers and repairers.

However, this needs to be evaluated and discussed with the industry to ensure certifications and limitations placed on repairs do not impact negatively on the consumer. One way to combat this could be to outline which repairs could be completed by a regular repairer, and which would require certification as they may impact on the safe operation of the ADS.

³ Australian Government (2015). *Mutual Recognition (Equivalence of Motor Vehicle Repairer Occupations) Declaration 2015*. F2015L01801. Available: <https://www.legislation.gov.au/Details/F2015L01801>



7. Do you think that a general safety duty to ensure the safe operation of the ADS 'so far as reasonably practicable' is appropriate to address the safety risks?

RACQ generally supports an overarching positive General Safety Duty applied to the ADSE and ADSE executive officers as an appropriate mechanism for managing unforeseen safety risks while maintaining flexibility in technology evolution and innovation.

However, as noted in our response to previous questions, repairers can be classified under multiple tiers and capabilities, and there may not be adequate clarity or support provided to ensure a standard that meets community expectations 'as far as reasonably practical'. RACQ therefore suggests at this stage, a General Safety Duty may not be the best approach to managing repairers. This is a highly complex issue, and RACQ believes there is adequate evidence of market failures already emerging that warrant an in-depth look at the repair and modification segment issues holistically, including:

- Repairer classification/tiers
- Training and qualifications of repairers and vehicle certifiers/inspectors
- Review of ADS inclusion in safety certificates
- Supply of qualified repairers to support automated functions/systems
- Right to Repair information
- Safety critical information provision such as:
 - running ADS diagnostics/disablement
 - modifier/repair impacts to ADS functionality by part or vehicle feature
 - defect detection and qualification, and
 - appropriate minimum standards for managing safety

Some of these outcomes may be suitable for more performance or prescriptive based requirements placed on both repairers and the ADSE.

RACQ accepts the WHS enforcer does not have adequate knowledge to enforce the existing duty of care related to ADS performance, and State-based enforcement would create inconsistencies.

An additional area which may require broader review includes vehicle/ADS end of life/ADSE support options and implications, including data/code access, regulator powers, liability and compensation impacts, and broader economic implications. RACQ notes there have been recurring instances of manufactures (potential ADSEs) going into bankruptcy (e.g. Suzuki and Isuzu), requiring acquisition (e.g. Ford Motors - Jaguar Land Rover Brand), and repeated withdrawal from the Australian market (e.g. Renault). It is unclear what support for existing ADSs in the market would be provided under each of these scenarios, recognising that the first-supply obligations related to minimum financial requirements and a corporate presence in Australia, may result in ADSE breaches.

8. If a general safety duty were introduced, which parties should it apply to?

As above, RACQ only supports application of a General Safety Duty to the ADSE and ADSE executive officers at this stage, until further investigation has been completed in relation to repairers.

9. If a general safety duty were introduced, should it apply on public and private land (such as residential driveways)?

RACQ agrees that some automated features have been designed to operate on private land (such as parking garage pilot) and therefore the general safety duty should extend to private land.



10. Should people injured by breaches of the general safety duty have a cause of action, or should the ability to enforce a general safety duty be limited to a regulator?

Recognising that a regulator may be overseen by a political-related body, RACQ strongly supports the ability for persons to have an alternative course of action to pursue a breach of the general safety duty against ADSEs and ADSE Executive Officers.

In the event the regulator does have government oversight or even if it is separated but reports to a Minister or similar power prone to lobbying/persuasion, ensuring there is an alternative cause of action aligns with the constitutional principle of separation of legislative, executive, and judiciary powers. Lack of alternatives leaves regulatory enforcement decisions vulnerable to political blockading or interference.

11. Do you think there should be specific driving rules for ADSs like the Australian Road Rules, or would it be sufficient to simply require them to 'drive safely'?

RACQ does not accept that the directive to 'drive safely' is sufficient to manage automated vehicle behaviour while the technology is still maturing, and the fleet is highly mixed. "Drive safely" could lead AVs to display an overly cautious driving style which has potential safety implications.

A California study examined accident reports involving automated vehicles. It found a majority of incidents were read-end collisions, where a human driver impacted the rear-end of the automated vehicles⁴. An article related to these findings noted experts suggest the rear-ending issue "may stem from computers driving more cautiously than the humans with which it shares the road"⁵.

The RACQ supports more specific rules to manage vehicle behaviour and risks/issues specific to the ADS.

12. What approach to regulating the dynamic driving task for ADSs most efficiently achieves safe outcomes? Please provide reasons.

Summary

To regulate the dynamic driving task, RACQ is of a strong view that no one option as written is suitable for delivering the intended outcomes in both the short and long term, and the options presented all have advantages and disadvantages for various reasons. RACQ suggests there needs to be further refining of the Options in alignment with recommendations I-III below. Notwithstanding, in the long term RACQ supports Option 1 (in a written or codified form). In the short term a combination of elements in Options 1, 2 and 4 are preferred. An overview of this combined solution is provided in the final section of the Q12 response.

Elements recommended for both short- and long-term options include:

- I. Specific rules may be required to address ADS limitations and ensure Dynamic Driving Task adherence.
- II. Central body/regulator should collate jurisdictional variations and check self-certification adherence (in alignment with the first-supply requirements for jurisdictional variations).
- III. Jurisdictional variations must be considered and adhered to (or new rules created to manage risks) – though national harmonisation as far as practical is supported.

⁴ Favarò FM, Nader N, Eurich SO, Tripp M, Varadaraju N (2017) Examining accident reports involving autonomous vehicles in California. PLoS ONE 12(9): e0184952. <https://doi.org/10.1371/journal.pone.0184952>.

⁵ Martyn, A. (2017). Autonomous car companies report getting rear-ended in most crashes, blame driver error. Consumer Affairs. <<https://www.consumeraffairs.com/news/autonomous-car-companies-report-getting-rear-ended-in-most-crashes-blame-driver-error-102017.html>>



Justification for these recommended elements are outlined in the following three sections.

An in-depth reconsideration and staged approach will also ensure Australian regulations reflect international standards and conventions and are sufficiently flexible to adapt to changing technologies, as currently no international standard for regulating the dynamic driving task exists.

Recommended Element 1: Specific rules may be required to address ADS limitations and ensure DDT adherence

RACQ notes that at this time there is not a consistent national approach to which Australia can align and this is a highly complex issue as current road rules, even those which apply to the dynamic driving task, may not all be suitable for an ADS due to either jurisdictional variations which need to be adhered to, or judgements or exceptions which are difficult or impossible for an ADS to make.

For example, the Queensland road rule relating to obstruction of a vehicle states:

- 132 (3) “A driver on a road with 2 continuous dividing lines must drive to the left of the dividing lines” unless...
 - 139 (b) “it is necessary and reasonable, in all the circumstances...”⁶

A vehicle must be able to have exceptions to its programming to stay within the lines built-in, but an ADS is also unable to make a judgement about necessity, reasonableness, and safety.

Another practical example relates to Queensland road rules for passing a cyclist:

- 144A (1) “The driver of a motor vehicle passing the rider of a bicycle that is travelling in the same direction as the driver must pass the bicycle at a sufficient distance from the bicycle.”
 - Where a sufficient distance is lateral distance of at least 1m if the applicable speed limit is not more than 60km/h, or at least 1.5m if the applicable speed is more than 60km/h.⁶
- Several exceptions for passing a bicycle rider exist, such as:
 - 139A (2) “A driver on a road with a dividing line may drive to the right of the dividing line to pass the rider of a bicycle that is travelling in the same direction as the driver if—
 - (a) the driver has a clear view of any approaching traffic; and
 - (b) the driving is necessary to comply with section 144A(1) for the passing of the rider; and
 - (c) the driver can do so safely.”⁶
- It is unclear if an ADS can adhere to these rules and exceptions, or make judgements regarding safety.
- Unfortunately, in a mixed fleet situation, the inability to complete legal manoeuvres such as this may result in unsafe behaviours by surrounding human drivers if travelling behind the AV (e.g. overtaking the automated vehicle and cyclist with excessive speed/over continuous lines)

Other examples of Queensland road rules where judgements are required in the current legislated language include:

- 125 (1) “A driver must not unreasonably obstruct the path of another driver or a pedestrian.”⁶
- 126 “A driver must drive a sufficient distance behind a vehicle travelling in front of the driver...”⁶

Based on these examples where the current DDT rules cannot be adhered to by an ADS as written, and the previous example where unexpected driving behaviours by the ADS may be a contributing factor to crashes, to adhere to dynamic driving task rules and maintain safe outcomes, specific rules may need to be rewritten for an ADS. It is acknowledged in the example given of South Australian School Zones, the ADS is unable to adhere to the rule in its current form, and a blanket speed restriction

⁶ Queensland Government (2019). Transport Operations (Road Use Management—Road Rules) Regulation 2009. Accessed August 2019.



may need to be applied. An alternative to this would be to restrict operation of automated driving systems in certain high-risk zones/scenarios where compliance is challenging (such as school zones or when driving near vulnerable road users), and prescribe the fall-back ready user/human driver to complete the dynamic driving task.

To provide safe outcomes in situations outside the normal driving conditions for a vehicle, additional and specific rules may also be required. For example, currently automated vehicles would be unlikely to cross a solid lane marking to swerve around an obstacle on a road or highway as this is an illegal maneuverer and would be unsafe in many situations. However, as outlined in the previous legislation exceptions, this move is legal under certain conditions and this type of maneuverer could provide a safer outcome than sharply applying the brakes. Specific rules regarding behaviour around vulnerable road users may also be valuable. In some instances, a safe engagement could be achieved through human cues, but a vehicle may need to undertake specific actions to provide clear direction and ensure a safe interaction.

Recommended Element II: Central body/regulator should collate jurisdictional variations and check self-certification adherence (in alignment with the first-supply requirements for jurisdictional variations)

Options 2 and 3 as they exist are not supported, as they will likely be a significant market barrier to entry. A similar outcome was observed in the United States, which has over 13x the population of Australia, when the 2018/19 Audi A8 was introduced (which contained level 3 automated features). ‘Fragmented legislation’ led to the OEM choosing to disable the autopilot feature. This type of market barrier/burden could also lead to regulatory monitoring costs being passed onto the vehicle purchaser.

If either of these options were implemented, a central body should coordinate jurisdictional road rule variations and provide them to ADSEs, rather than making ADSEs monitor variations and legislative changes across jurisdictions. While still impacting taxpayers, it would likely be a more economically efficient and transparent approach, and government expenses may be recoverable through collection of penalties and reduced crash/injury costs in the long term.

If the regulator completed the monitoring task, they could also undertake preliminary compliance checks of the ADSE’s response during the self-certification process against the NTC’s recommended first-supply principles including:

- Safety Criteria 4: Comply with relevant road traffic laws – including any variations in each state and territory; and amendments to the relevant road traffic laws when they come into force; and
- Safety Criteria 9: Verifying the Australian road environment – the applicant must demonstrate how it has considered the Australian road environment in designing, developing and verifying the ADS, which could include outlining the process for verifying the response of the ADS to the Australian road environment such as interaction with road signs in various states and territories.

If issues are picked up through proactive compliance checking on first supply, it would likely mitigate reactive enforcement impacts such as penalties and recalls.

If this task was undertaken by the central body, RACQ could support a revised Option 2 (substantial compliance) for a very limited time frame while vehicle fleets are still small and ODDs are limited, while better long-term options are developed and implemented before fleet numbers increase.



Recommended Element III: Jurisdictional variations must be considered and adhered to (or new rules created to manage risks) – though national harmonisation as far as practical is supported

There is also a need to consider how to manage safety in a mixed-fleet, multimodal, and ADS and human controlled context. If the ADSs behave in a way which differs from or conflicts with the expectations of the human driver (such as not adhering to jurisdictional variations in road rules as may occur under Option 2), there are likely a range of negative policy and safety outcomes including:

- As noted previously, ADS behaviour being more cautious than human drivers has led to collisions.
- Surrounding human drivers and vulnerable road users may not be able to as easily predict or anticipate the different driving style of the vehicles which may create negative safety outcomes, such as a pedestrian expecting a driverless vehicle to stop if the pedestrian jaywalked in front of the vehicle, or a merging driver expecting the AV to move to the outside lane (as a human driver may) if there is not sufficient room to merge on the inner lane when travelling at higher speeds.
- Human drivers and learner drivers may also copy incorrect or illegal behaviour if they see the ADS behave differently, such as if a vehicle is not required to adhere to jurisdictional variations such as speed school zone limits.
- Overall public trust in the vehicles and uptake could be eroded/delayed if they do not assimilate into the local driving environment and behave as expected within a jurisdiction.

A specific example of where jurisdictional variations may create notable negative safety outcomes if applied in a blanket fashion or not adhered to is the emergency vehicle passing rule in New South Wales. If applied to ADSs across all jurisdictions, AVs would slow down to 40km/hr when passing stopped emergency vehicles. This could create significant safety issues if implemented in states like Queensland, where this rule is not in force, as an ADS may slow to 40km/hr on a 110km/hr motorway while none of the surrounding traffic would display the same behaviour. However conversely, if the vehicle was exempt from this rule, surrounding human drivers in NSW may rapidly slow down to this speed and an ADS would be forced to brake rapidly - though would not necessarily be legally required to do so, and if there was no traffic ahead, the ADS would likely continue at higher speeds passed vulnerable road users on the roadside.

Supported Option – Combination of 1, 2 and 4 with further consideration required

An interim approach could be to combine elements of options 2 and 4, then transition to versions of option 1 or international harmonisation – a diagram of the elements and overall staged approach is provided below.

In the very short-term, if the central regulator acted as the jurisdictional rule monitoring and compliance conduit, rather than relying on ADSEs to monitor all jurisdictions, option 2 could be suitable while vehicle penetration levels are low, and automated features are only used in very limited ODDs (these could be further limited by state and territory road agencies).

Model law regarding fall-back ready user requirements could be developed to support the substantial compliance/exemptions (option 2) and implemented across states/territories to maximise harmonisation. The national regulator could also play a role in developing driver training information/standards and campaigns related to fall-back ready user requirements.

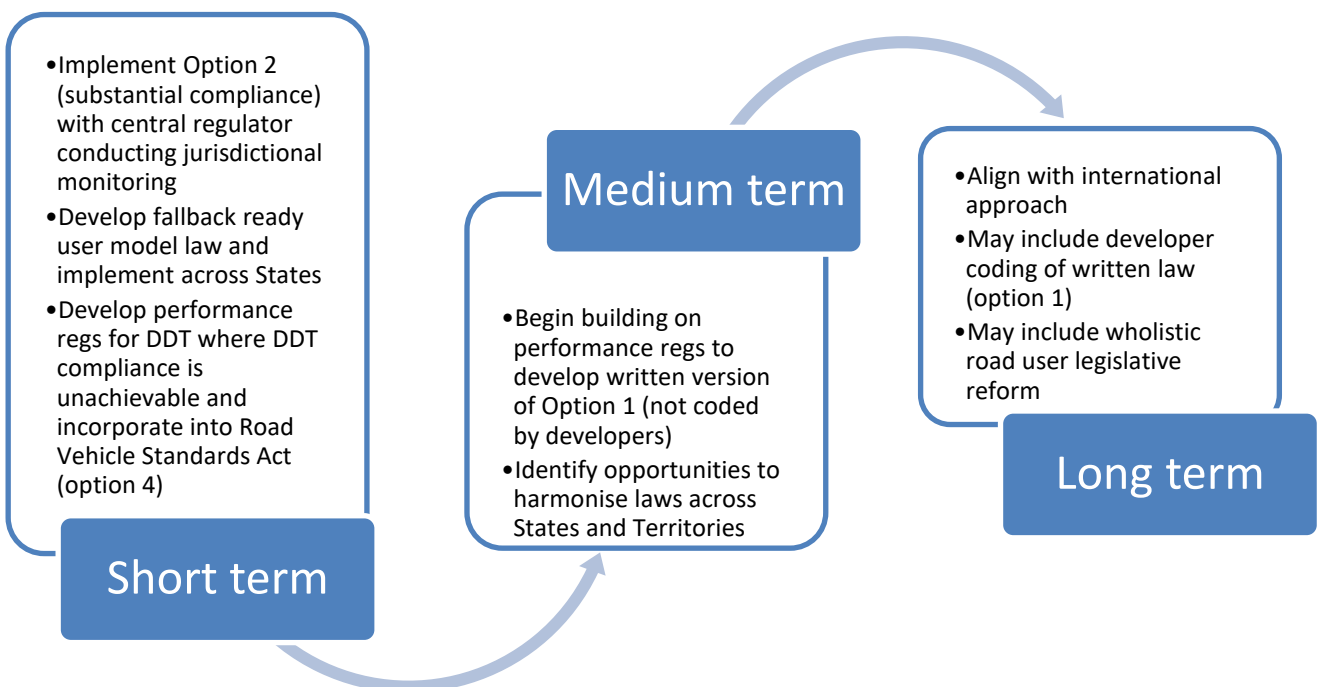
Substantial compliance/exemptions (option 2) and fallback ready user model law legislative changes at the State level could then be combined with Option 4 - where some high-level performance conditions are incorporated into the *Road Vehicle Standards Act 2019* at the Federal level for any road rules which still apply to the ADS and DDT but are not written in a way the vehicle can comply with (examples provided earlier in question 12 response) – this would align with recommended element I where specific rules may be required to address ADS limitations and ensure DDT adherence. For example, the current road rule in Queensland where “A driver must drive a sufficient distance behind



a vehicle travelling in front of the driver” could replace the judgement-required phrase ‘sufficient distance’ with a metric such as ‘a minimum 3 second gap’. However, RACQ notes the *Road Vehicles Standards Act 2019* has not yet come into effect and therefore there is limited industry and government experience, and teething issue may not be resolved. This also somewhat aligns with the approach being taken in Singapore.

This short-term combined approach could then provide some time for a non-digital version of option 1 ‘national automated driving code’ to be developed where new road rules which aim to harmonise nationally as far as practical covering dynamic driving task obligations and behaviours for the ADS and fall-back ready users could be drafted together in prescriptive and/or performance guidelines (similarly to Singapore). RACQ notes the UK’s existing *Highway Code* sets out a comprehensive framework of rules for pedestrians, powered wheelchairs/mobility scooter users, animals, cyclists, motorcyclists, drivers, vehicles, and infrastructure. There would be considerable benefit in developing wholistic guidance for all road users, vehicles and infrastructure related to AVs, noting however that a significant amount of legislative and operational change would need to be delivered at the state/territory level. This also seems to differ from Option 1 proposed which seems to focus on the ADS behaviour in isolation.

As a long-term approach, if feasible, this non-digital code could be coded/developed into a digital National automated vehicle driving code (option 1). RACQ supports this option as a suitable way to manage ADS behaviour consistently at the national level when fleet levels increase, while allowing for local safety related variations in behaviour. However, this is not likely to be achievable in the short or potentially medium term due to lengthy consultations and skill shortages, and may have significant barriers or risks such as an inability to access vehicle coding or coding conflicts with the vehicle’s underlying code if developed by the national in-service regulator. If a code such as the Digital Highway Code proposed by the United Kingdom were to be developed in future by those with strong experience in automated vehicle coding, Australia could then adopt and adapt the code to our national needs.





*13. What functions and powers does the regulator need to effectively manage in-service safety? Would these differ depending on whether the regulator is enforcing a general safety duty, or only prescriptive duties?
& 14. Have we accurately described the scope of the regulatory task? Please provide data and evidence where possible to support your answer.*

The RACQ believes that both compliance and enforcement powers could be similar for a general safety duty and prescriptive duties – though the resourcing and focus would be shifted. However – this may not translate into needing significantly more resourcing for a general safety duty, as a stronger focus on proactive risk management could reduce the number of resources needed to conduct enforcement if a risk is identified and mitigated before leading to an enforceable breach.

We agree functions should include:

- Monitoring and enforcement
- Data collection and sharing
- Conducting and defending proceedings
- Education and Information sharing or research
- Creation of standards; and
- Customer service

As above, an additional duty relating to jurisdictional law monitoring and compliance checks could be a valuable function in the short to medium term. RACQ also supports the regulator being scalable in size to reflect fleet penetration levels.

It is also agreed that the below powers should be at the disposal of the regulator, regardless of whether a general safety duty exists – as they have cross-over with effective reactive investigation and enforcement following a breach of prescriptive duties:

- Proactive and investigative powers such as inspection, audit, right of entry, obtaining data/information
- Enforcement powers including:
 - ‘Light’ penalties such as improvement notices, formal warnings, infringement notices, fines and enforceable undertakings
 - Serious penalties such as variation/withdrawal or permissions to operate, ADS recall, criminal prosecutions.

RACQ notes an existing body which currently operates similarly and has been effective in investigating automated vehicle incidents and enforcing industry-wide vehicle safety standards is the U.S Federal Department of Transport’s National Highway Traffic Safety Authority (NHTSA). An overview of their functions, roles and powers are outlined in the table below. The NTC may wish to consider if NHTSA is a model which Australia could replicate, and adopt similar functions, activities, powers (existing and requested), and funding elements.



NHSTA's Mission: *Save lives, prevent injuries and reduce economic costs due to road traffic crashes, through education, research, safety standards and enforcement activity.*

<i>Functions</i>	<ul style="list-style-type: none"> ▪ Accident investigation and national statistic tracking ▪ Defect investigation and manufacturing legislative compliance ▪ Safety technology research and development
<i>Activities/ Outcomes</i>	<ul style="list-style-type: none"> ▪ Makes investigation reports available to the public which promotes transparency and provides evidence for private litigation (e.g. Tesla Autopilot California Crash investigation and report) ▪ Generates safety and educational campaigns and public awareness messaging ▪ Receives customer complaints ▪ Conducts crash testing and defect investigations on independently purchased vehicles (ensures companies do not influence or manipulate findings) ▪ Ensures manufacturer compliance through use of appropriate powers (example outcome: Takata airbag recall) ▪ Sets fuel economy standards ▪ Conducts internal research on new safety technology
<i>Powers</i>	<ul style="list-style-type: none"> ▪ Mandatory vehicle recalls ▪ Mandatory safety standard creation ▪ Issuing of significant fines (up to \$35 Million for related series of violations) ▪ Issuing of subpoenas and taking depositions
<i>Funding</i>	<ul style="list-style-type: none"> ▪ Two-thirds of NHTSA's funding is allocated to highway traffic safety grants (infrastructure related) ▪ One third is divided between vehicle safety (including compliance and enforcement) and Safety R&D ▪ Congressionally funded ▪ Critically – in 2015 the <i>Fixing America's Surface Transportation (FAST) Act (Pub. L. No. 114-94)</i> was enacted into law, providing long-term funding certainty for highway and motor vehicle safety
<i>Additional Powers Being Sought</i>	<p>NHTSA in past years have sought additional powers including:</p> <ul style="list-style-type: none"> ▪ Increase of maximum fine from \$35 Million to \$300 Million ▪ Power to halt sales of defective vehicles ▪ Extension of repair/compliance powers to rental and used car dealers

15. *Have we accurately captured the benefits of the regulator being: a government body or an independent body/ a national body or state and territory level bodies / an existing body or a new body?*

RACQ accepts the benefits of the various regulator options, and highlights additional considerations and supported outcomes:

- As outlined in the NHTSA example, several factors are crucial for successful regulator operation including having effective powers to hold parties accountable, funding certainty for the long term, and transparency.
- Existing government bodies such as CASA have demonstrated their ability to achieve strong safety outcomes from within government bodies.
- However, Australian and State government agencies have a noted history of failed reform, which has been attributed by some to stagnant workplace cultures and barriers. Based on this, simply adding additional functions to departments which currently underperform and are under-resourced will likely lead to a failure to manage in-service safety.
- While a nationally consistent approach would consolidate administrative costs and reduce regulatory gaps and overlaps, States need to remain effectively informed about vehicle operational outcomes and issues, and have a degree of flexibility and responsibility, in order to



effectively manage their networks and broader transport environments and contribute to positive safety outcomes.

- The governance of the regulator has not been considered in much depth. The current arrangement where the NTC reports to TIC (or similar) could be implemented, to allow States to have an ongoing role in managing in-service safety both as road owners and conduits to local communities and enforcement agencies, and potentially as interim regulators.
- The new National Office of Road Safety could reflect the combined infrastructure, vehicle, and driver safety focus of NHTSA. The ability to monitor and act across these safety critical components could provide significant value in the long-term.

16. What are your initial views on how the regulator should be funded?

RACQ believes that National and State/territory jurisdictions should contribute to ensure an ongoing base of functions can be undertaken. Any monetary penalties received from breaches could be used to off-set State/National contribution requirements, which would incentivise the regulator to be transparent and effective in applying their powers when justified.

When it comes to national infrastructure, Federal/State investment is split on a 50/50 basis in urban areas, and 80(F)/20(S) in regional areas. A funding arrangement within this range could be considered for a national-jurisdiction split. The jurisdiction input could be apportioned between states/territories justifiably if automated vehicle models were tracked in registration systems and states contributed a fixed amount or percentage based on numbers of vehicles registered.

A critical element utilised by NHTSA to ensure adequate resourcing was the *Fixing America's Surface Transportation (FAST) Act (Pub. L. No. 114-94)* which was enacted into law and provides for long-term funding certainty for highway and motor vehicle safety. A similar legislative funding requirement should be considered to mitigate political impacts on the functions and effectiveness of the regulator.

17. Have we adequately and accurately captured the key legislative implementation models for in-service safety of automated vehicles?

RACQ supports the evaluation of the various legislative implementation models, though suggests further exploration of how a staged approach could occur and which functions/powers could remain at the State level to minimise large cost shifts and industry, government, and community disruption.

18. Do you think there are any transitional or constitutional issues that could arise when Australia establishes a national law for automated vehicles? If so, please explain what the issues are, and if they differ depending on the legislative implementation model used.

While there are still human drivers interacting in the fleet with ADSs, there will be additional administrative burden required for stakeholders such as insurers. In the event of an incident, there will need to be a determination of whether the ADS or human was responsible. If a human is the responsible party, then current processes which involve State governments will continue. However, if an ADS is responsible, insurers will have to interact with both the State enforcement agencies and Federal regulator. This kind of splitting/duplication of processes may also extend to other bodies such as fleet managers and policy/regulation makers.

Additionally, insurers and state-based actors may be well placed to identify early issues with ADS or fall-back ready user behaviour. Reporting and communication would likely need to occur at both the State and National level to ensure appropriate regulatory changes could be put in place to mitigate the risk.



Shifting responsibilities to a national regulator without any decentralisation will also be a difficult adjustment for government agencies and any related stakeholders. A planned staged transition to match fleet change, with some duties decentralised or devolved, will minimise disruptions and build capacity for future challenges.

19. Have we accurately described how each option could work, as well as the advantages and disadvantages of each option?

RACQ accepts the description of the options. Please refer to previous and following responses for additional advantages/disadvantages identified and preferred options.

20. Which option most effectively addresses the problem statement? Please consider your answer in conjunction with the PwC cost-benefit analysis

& 21. Is there another option, or combination of options, which could more effectively address the problem statement? In particular, please consider whether there is a preferable combination of the elements of each option (governance arrangements, duties, legislative implementation)

RACQ primarily supports Option 3 for the ability to apply nationally consistent enforcement across all states on ADSEs and ADSE executive officers. Options which use model or applied law are not generally supported as a final outcome as there is the risk of inconsistent uptake across jurisdictions. This option is also suitable as it allows current duties relating to regulation and enforcement of the fall-back ready user to be continued to be carried out by the State in alignment with existing resourcing.

However, a model law for fall-back ready user duties would be valuable in ensuring a reasonable level of consistency for drivers travelling across different states. RACQ does not anticipate significant variations in requirements placed on fall-back ready users – though if any are required, these could be managed similarly to Learner driver laws where requirements are a licensing condition rather than a road rule, so the issuing state/territory's road rules apply when driving interstate – though this may require licensing of conditionally automated vehicle drivers.

Recognising that creating a nationally agreed law and setting up a national regulator is a time and cost-consuming operation, in the interim, RACQ supports Option 2b. While this has risks related to inconsistent application of the General Safety Duty, this will be mitigated in future when transitioning to Option 3. In this model, there may also be some functions/duties which could be escalated to a budding national regulator, such as accident investigation and conducting and defending proceedings. Additionally, Option 2b provides the States an opportunity to establish communication channels between enforcement agencies, road owners, and the national first supply regulator, and build vital expertise to provide evidence-based contributions to creating a nationally agreed law. Even when a national regulator exists, states will likely/should still have a role in enforcement related to the fall-back ready user, ensuring infrastructure is adequate for ADS operation (as road owners), ongoing governance/decision making, and assisting with local accident investigations.