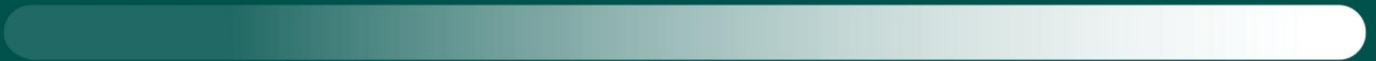


Regulatory options to assure
automated vehicle safety in
Australia discussion paper
Transurban's response



ABOUT TRANSURBAN

Transurban manages and develops urban toll road networks in Australia and the United States of America (USA).

Our vision is “to strengthen communities through transport”. We aim to be the partner of choice for governments, communities and investors in providing effective and innovative urban road infrastructure.

We have been in business since 1996 and are a top 20 company listed on the Australian Securities Exchange.

Transurban supports the move to automated vehicles as there will be improved safety and efficiency outcomes as well as reduced congestion that will benefit the broader Australian community.

We are committed to helping progress the development of connected and automated vehicle (CAV) technology. To this end, we are partnering in trials of CAVs on our roads in the USA and in Australia.

As part of this, Transurban has initiated a two-year program investigating the interaction of CAV technology with motorway infrastructure in Victoria. This program involves partnering with the Victorian Government and VicRoads, with the support of RACV and the automotive industry, to facilitate real-world testing along the Monash-CityLink-Tullamarine corridor in Melbourne. The aim of these trials is to understand how our road infrastructure and other vehicles can interact with CAV technology under a variety of different conditions. This intelligence will help inform the management of our road networks over the coming decades.

Commencing in mid-2017, the first phase of the program will collect insights into how a selection of vehicles with partial automation features use urban road networks and interact with the motorway environment including tunnels, road works, congestion, variable road signs and line markings.

In parallel, the program will also investigate community expectations of the impacts from these technologies through a series of research tools.

These two streams of work will help develop an understanding of how to prepare road infrastructure, operations, regulations and the community for the

integration of new vehicle technologies into our transport system.

We believe that these initiatives provide vehicle companies, governments and others with the ideal, real-world conditions to test complex technology, infrastructure, systems and other factors.

FEEDBACK RELATING TO THE DISCUSSION PAPER

The automotive industry is confident that we are five to ten years away from driverless vehicles being on the market, with mass adoption likely by 2040. With these types of vehicles now in the real-world testing phase, it is important for Australian governments and industry to consider the regulatory frameworks that need to be in place to support their safe adoption.

At Transurban, road safety is our first priority. We believe that any regulatory options, frameworks and recommendations related to automated vehicle safety in Australia should take into account the highly uncertain future vehicle technology, adoption rates and social acceptance scenarios that can be envisaged. Additionally, any regulatory recommendations should be designed to be flexible and agile to ensure they can adapt to a rapidly changing automated vehicle future.

While Australia has the freedom to define an Australian-appropriate regulatory and compliance regime, if this regime differs significantly from international norms, or sets conditions that are significantly different from accepted international practice, it may introduce barriers to entry into the Australian market that may delay deployment of automated vehicle benefits in Australia. Our responses are framed with these considerations in mind.

Transurban commends the National Transport Commission (NTC) on its recent *Regulatory Options to Assure Automated Vehicle Safety in Australia discussion paper*, which proposes four different regulatory options to assure automated vehicle safety in Australia.

At the recent NTC workshop in June, Transurban was represented by two employees from the road safety and CAV trial program teams. In addition, the discussion paper has been examined by other key teams within our business.

The options proposed by the NTC include "continue current approach", "self-certification", "pre-market approval" and "accreditation". Each model presents a variety of complex and pertinent considerations in preparing Australia's regulatory environment for the introduction of automated vehicles on public and toll roads.

While Transurban is an interested party, our role is to ensure that we are abreast of the evolving CAV technology developments and that our assets / road networks are able to respond to ensure a safe environment for CAV implementation.

Transurban supports the development of a national regulatory framework for CAVs that provide a standardised approach across state and territory jurisdictions. We believe that this framework should be inherently flexible and evolve over time to reflect technology and legislative changes. We note that this approach appears central in the NTC's thinking and thus **we broadly support the rigorous appraisal of options outlined in the discussion paper.**

Thank you for the opportunity to respond to the discussion paper. This document provides our responses to each of the questions posed in the paper (refer to the Summary section overleaf).

If the NTC would like to discuss Transurban's response, please contact Senior Manager – Strategic Initiatives Jeremy Nassau via email jnassau@transurban.com or phone (03) 8656 8046.

Summary

We have provided some specific points of feedback to the NTC’s discussion paper in the table below.

Question	Response	Feedback
1. Should government have a role in assessing the safety of automated vehicles or can industry and the existing regulatory framework manage this? What do you think the role of government should be in the safety assurance of automated vehicles?	Yes	<p>Transurban believes that government should play a role in an outcomes-based rather than prescriptive, regulatory regime relating to the safety of automated vehicles in Australia.</p> <p>We further believe that this role should encourage innovation and actively remove unnecessary constraints that may limit Australia’s ability to rapidly adapt to, and benefit from any unforeseen technology disruption.</p>
2. Should governments be aiming for a safety outcome that is as safe as, or significantly safer than, conventional vehicles and drivers? If so, what metrics or approach should be used?		<p>Given that current safety standards and regulations contain requirements designed to ensure both vehicle and driver safety compliance, any future safety outcome will need to consider that control will shift from the driver.</p> <p>The community may have a lower tolerance for failure of an automated system than is currently the case for driver error. An appropriate safety outcome will be determined in part by what society deems acceptable as technology matures and various use cases evolve.</p> <p>Transurban believes that ongoing community attitudinal research is key to understanding automated vehicle safety tolerance levels and this will assist us in preparing the community for automated vehicles.</p> <p>Assessing community understanding of and attitudes towards the use and prevalence of automated vehicles will form a key part of the Transurban CAV trials currently underway.</p> <p>Automated vehicles will primarily deliver safety benefits. These vehicles will reduce accidents by reducing the impact of human error. Also, where accidents do occur, they will manage the forces in the system and protect occupants so that crashes are survivable, reducing fatalities and serious injuries.</p> <p>Serious injury and fatality rates are the primary road safety performance indicators, along with contributing factors such as speed and impaired driving. These should continue.</p> <p>However there is an opportunity to extend current measures by establishing metrics using the diagnostics of automated vehicles that demonstrate:</p> <ul style="list-style-type: none"> • crash types, numbers and trends associated with specific technologies • crash impact speeds associated with specific technologies, e.g. adaptive cruise control and autonomous emergency braking

		<ul style="list-style-type: none"> • reductions in specific crash types as a result of targeted technologies e.g. AEB for rear end crashes • level of injury and injury type to occupants and other road users in crashes involving automated vehicles and linked to specific technologies e.g., is there a 'herd' effect protecting those not in vehicles with autonomous features.
3. Should the onus be placed on the automated driving system entity to demonstrate the methods they have adopted to identify and mitigate safety risks?	No – suggest a hybrid approach	<p>In keeping with Transurban's view that any regulatory regime should not stifle beneficial innovation, we suggest a hybrid approach in which initially the automated driving system entity demonstrates that appropriate safety methods and risk mitigations have been adopted.</p> <p>However to ensure a balance of agility and compliance, any required outcomes and entities to which these outcomes need to be demonstrated should be clearly defined and articulated to automated system entities.</p> <p>As the market and technology matures we see this progressing to an accreditation, self-certification preapproval approach aligned to maturing international norms.</p>
4. Are the proposed assessment criteria sufficient to decide on the best safety assurance option? If not, what other assessment criteria should be used for the design of the safety assurance system?	Yes	<p>Transurban agrees with the proposed criteria</p> <p>In addition Transurban suggests including an additional criterion relating to Market Influence Pragmatism. Australia will have limited influence on a global industry, and thus should avoid adopting a model that is too different from other models in major world markets, to the extent that this would discourage automated vehicle providers from entering the Australian market. While this is partly addressed in the criterion around domestic/international consistency, a lens of pragmatism should be applied across all the criteria mentioned.</p>
5. Should governments adopt a transitional approach to the development of a safety assurance system? If so, how would this work?	N/A	No comment
6. Is continuing the current approach to regulating vehicle safety the best option for the safety assurance of automated vehicle functions? If so, why?	No - suggest a hybrid approach	<p>Aligned to Transurban's response to Question 3, we believe that the regulatory approach should be an evolution towards the most applicable internationally accepted regime. This will likely be a hybrid of the approaches tested in questions 6, 7, 8 and 9.</p> <p>Transurban's view is consistent with the desire to support the development of an effective, pragmatic, flexible and agile safety regime.</p> <p>Thus we believe that initially the automated vehicle entity should demonstrate compliance to a clearly articulated set of safety outcomes. This will be the precursor of an evolution towards a premarket approval, accreditation, certification approach in which certified automated vehicle entities (certification issued by approved certifying entities) are required to provide</p>

assurance (prior to market entry), on a self-certification basis, that any required safety outcomes have been met.

Definition of a safety compliance enforcement regime will need to take cognisance of the environment within which the automated vehicle is used. For example, in a fully connected urban environment, vehicle self-reporting and automated monitoring may be deployed. This approach will not be applicable in regional areas.

7. Is self-certification the best approach to regulating automated vehicle safety? If so, should this approach be voluntary or mandatory? Should self-certification be supported by a primary safety duty to ensure automated vehicle safety?

Refer to Q.6

See answer to question 6

8. Is pre-market approval the best approach to regulating automated vehicle safety? If so, what regulatory option would be the most effective to support pre-market approval?

Refer to Q.6

See answer to question 6

9. Is accreditation the best approach to regulating automated vehicle safety? If so, why?

Refer to Q.6

See answer to question 6

10. Based on the option for safety assurance of automated vehicle functions, what institutional arrangements should support this option? Why?

Comment

Transurban believes that the proposed approach should consider a National institution with support for devolution of compliance to states using an approach such as model law development. The development of these national and state based entities should be undertaken in keeping with Transurban’s view that the regulatory regime will evolve over time and thus not be seen as the final entities.