Subject:	Supplementary Questions from StaySafe Inquiry into Driverless Vehicles and Road Safety in NSW
Prepared for:	NSW StaySafe Committee
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Question 1

The NSW Government submission notes that the safety benefits of driverless vehicle technology have yet to be fully proven since most of the testing has been done in limited conditions which are not representative of the more demanding conditions experienced by commercial vehicles.

- What should the priorities for on-road tests in NSW be?

  As we transition towards higher levels of automation, the key areas that need to be better understood are (i) supportive regulatory responses and business models and (ii) human factors and technological challenges. On-road tests will build upon the world-wide foundation of academic, industry and national research and development efforts in this area which includes laboratory, test track and closed road tests.

  For NSW, the priorities for specific on-road tests will fall into 2 areas: (i) specific identified knowledge gaps not already addressed elsewhere and (ii) to trial or pilot or deploy as a prototype in NSW in order to resolve any remaining issues, calibrate and validate the final operational model before full deployment/approval.

  The specific use cases for such on-road tests will need to cover a range of vehicles with differing levels of automation from a Level 2 (e.g., a Tesla with Autopilot) to a Level 5 (i.e., a vehicle without a steering wheel). Vehicles of interest would include pods/shuttles, light vehicles, public transport vehicles and freight vehicles (urban and heavy vehicles). Operating conditions could include precincts, urban, regional and remote roads.

  Other use cases involve automated valet parking as well as shared driverless vehicles.

  Trials involving Level 3 vehicles, which require the driver to take back control of the vehicle if the automation fails, or reaches the limits of its competence, are a priority. Little is known about the conditions under which these systems will issue takeover requests, and in drivers' ability to take back control of the vehicle if and when requested. The recent Tesla crash, in the United States, highlights potential technical and human factors issues that will need to be resolved in on-road tests before Level 3 vehicles can be safely deployed on public roads.

  Generally, priorities for on-road trials in NSW should emerge out of a body of work and stakeholder engagement to identify the gaps and actions required.

- Who should have input into the design of the on-road testing program in NSW to ensure that it is robust and realistic?

  On road testing requires consideration of a wide range of requirements relating to issuing of permits, registration, safety, insurance, consultation with the transport authorities, the public and the media, training, fitness for duty and behaviour of test drivers, licencing of test drivers, vehicle requirements, data recording and protection, cyber security, the human-machine interface, failure warnings, software and accident reporting.

  Accordingly, input into on-road test design will need to be drawn from many key stakeholders including state and local governments, industry, research and academic institutes, local and international experts and community groups.

Stakeholders in on road testing should include the NSW Government (exemptions, safety case), insurance companies (to underwrite the testing, evaluate the risk), technology suppliers (to provide the vehicles and technology), international experts and research organisations to evaluate the testing.

International examples show that most trials are conducted in places with strong support from Government. Key to establishing a test program in NSW is support from the NSW Government. This support includes a supportive legislative framework, in kind contributions and direct funding. Other governments, including some Australian State Government, are making significant budgets available to support on-road testing of autonomous and connected vehicles.

- Does NSW have particular locations, resources or other amenities which would make it particularly attractive to evaluate the road safety advantages of driverless vehicle technology?

  Yes, NSW has: (i) automotive test labs, (ii) private and commercial test tracks, (iii) on-road test facilities in Wollongong, (iv) well instrumented motorways and toll roads, (v) traffic management expertise , including SCATS (vi) road safety expertise at the Transport for NSW Centre for Road Safety (vii) world class researchers in automation such as the Australian Centre for Field Robotics at the University of Sydney (technical), the Centre for Innovative Transport Integration at the University of NSW (technical), and the Australian Road Research Board (ARRB Group) (technical and human factors), and (viii) strong support from the insurance industry, parking industry and telecommunications industry.

  The network around Wollongong is well known and the C-ITS trial is being conducted on that network. The network is a good mix of urban roads and rural roads. Connectivity to the infrastructure, also important for testing autonomous vehicles in already available.

  Other suitable, and unique, locations could be the Sydney Motorway network, the Hume Highway in between Sydney and Canberra and the Newcastle/Hunter area.

  NSW could offer some unique user cases, due the unique road network available in NSW. Technology providers will also seek publicity. The world renowned landmarks in NSW will make NSW attractive.

  A supportive legislative framework, in kind contributions and direct funding made available by the NSW Government will be crucial. Currently, the technology companies driving the change are either not based in NSW and may be looking to re-locate or set up subsidiary Research and Development centres to areas of the globe with a supportive Government. Additionally, support needs to be provided to small start-up technology providers who currently reside in NSW and may require government assistance to grow their business and potentially export to the rest of the world from a NSW base.

Question 2

Guidelines for a trial which has commenced in Singapore require roads to have prominent signboards to give information to the public about the testing and to facilitate easy recognition by road users. All test vehicles will also sport a special decal and markings. Japan has issued number plates to allow testing of vehicles on public roads.

- Should NSW consider similar measures to allay concerns about dangerous interactions between driverless vehicles and other road users during the testing phase?

  Yes. There are a number of approaches to inform the public and other road users that have been trialled in Singapore and elsewhere (e.g. the US). The most appropriate approach for NSW will need to be derived through a process that will involve a number of stages including consultation and trialling.

  During the testing phase it will be important for other road users and law enforcement agencies to be able to identify vehicles included in the trial.

  Road users in conventional vehicles will adapt to interacting with autonomous vehicles, if these vehicles are recognisable.

  ADVI recently organised for an Australian delegation to visit the European Truck Platooning Challenge. 6 manufacturers drove trucks in platoons through different countries in Europe. All trucks involved in the challenge had flashing lights installed on all corners. No other signage or traffic control was utilised. It was proven that minimal, but clear, signage is enough to inform other road users.

Question 3

According to your submission, ADVI's mission is to raise public awareness, set up knowledge sharing demonstrations and conduct in-field trials.

- In a trial in Greenwich in England later this year, Londoners will have the chance to drive a driverless vehicle and take part in workshops discussing the future of automated vehicles in the UK. Will NSW citizens be given similar opportunities as part of ADVI's public education campaign?

  Following the first Australian on road trials of automated vehicles coordinated by ADVI in South Australia last November, there has been a flurry of activity amongst the driverless community in Australia.

  Later this year, the West Australian city of Perth will host a driverless electric shuttle bus trial, led by ADVI Partner the RAC. This trial will help members of the community, Government and industry consider the potential impact and opportunities of automated vehicle technology and also help in the development of a roadmap of changes that will need to occur for automated vehicles to safely transition onto Australian roads.

  ADVI partner Transport for New South Wales (TfNSW), has recently announced the launch of its Smart Innovation Centre, a world-class hub for collaboration, research, demonstration and piloting of emerging transport and road technologies, including connected and automated vehicles and intelligent transport systems. ADVI hopes that this centre will assist in bringing the required infrastructure and technology together to enable an ADVI trial to interact with the NSW public.

  Outside of the major cities, there is also strong momentum growing for autonomous vehicle innovation, with many local and state governments looking to facilitate and host research, trials and demonstrations.

  Through ADVI member's interactions with overseas partners and organisations, we strongly believe there is a leading role for Australia to take in enabling the development and deployment of autonomous transport innovations as well as provide knowledge to community in Australia and also the rest of the world.

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