ATSE

National Transport Commission's Discussion Paper on Safety Assurance Systems for Automated Vehicles

SUBMISSION TO THE NATIONAL TRANSPORT COMMISSION

Regulatory options to assure automated vehicle safety in Australia

The Australian Academy of Technology and Engineering (ATSE)[1] welcomes the opportunity to provide input to the National Transport Commission (NTC) discussion paper *Regulatory options to assure automated vehicle safety in Australia.*

ATSE is in strong support of the introduction of regulatory frameworks for autonomous vehicles to facilitate the development and introduction of automated vehicle technologies on Australia's roads. The uptake of autonomous vehicles in Australia will result in a wide range of economic, safety and infrastructure benefits, and it is important that Australian governments fully encourage and embrace the development of the technology. In June 2016, ATSE prepared a submission[2] to the NTC issues paper on *Regulatory options for automated vehicles.* Many of the questions raised in the current NTC discussion paper were addressed in the Academy's response to the issues paper.

Autonomous vehicle regulation

ATSE favours regulatory options that promote innovation and rapid time to market of new technologies, while still ensuring safety. As such, continuing the current regulatory approach is not the best option because it does not account for the new opportunities created by autonomous vehicles to save lives and reduce pressure on infrastructure. Governments must provide a regulatory environment that ensures the safe introduction of a fully autonomous road system in the minimum time possible.

While driverless vehicles will have considerably fewer accidents than human drivers would, there will still be accidents, especially during the early phases of system introduction. Therefore, regulation needs to be in place to ensure the safe and effective introduction of driverless vehicles in Australia. ATSE recommends that new methodologies for certifying vehicle safety must:

1. **Define minimum technology requirements for situational awareness**
   a. Cameras: Number, direction, resolution, spectral range

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[1] ATSE advocates for a future in which technological sciences, engineering and innovation contribute significantly to Australia's social, economic and environmental wellbeing. The Academy is empowered in its mission by some 800 Fellows drawn from industry, academia, research institutes and government, who represent the brightest and the best in technological sciences and engineering in Australia. The Academy provides robust, independent and trusted evidence-based advice on technological issues of national importance. ATSE fosters national and international collaboration and encourages technology transfer for economic, social and environmental benefit. www.atse.org.au

2 http://www.atse.org.au/Documents/submissions/regulatory-options-for-automated-vehicles.pdf

      b. Radars: Number, direction, timing
      c. Audio: Number, sensitivity, purpose (what are they detecting)
      d. Lidar: Number, direction, coverage

2. **Define requirements for V2X communications**
   a. Standards
   b. Minimum capability
3. **Define requirements for mapping and localisation**
   a. Differential GPS coverage
   b. Mapping standards
   c. Map information supplier
4. **Define a test harness that vehicles must pass**
   a. This must specify
      i. Geographic circumstances (urban, suburban, rural, etc)
      ii. Type of road (paved, gravel, etc)
      iii. Weather conditions
      iv. Availability (or lack thereof) of infrastructure (e.g. differential GPS, Infrastructure to vehicle communications)
      v. Parameters to be measured
      vi. Logging requirements for the test
5. **Define retest frequency**
6. **Define cyber security measures**
7. **Define failsafe measures**
   a. This must identify the actions taken by the vehicle when the autonomous systems fail e.g. coming to a safe stop.
8. **Define ownership and availability of data collected by vehicles**
   a. Vehicle manufacturers are likely to want to own the data they collect. However, some or all of that data must be made available to the road authorities to ensure the safe and optimal operation of the whole system
9. **Define minimum requirements for data logging and telemetry**
   a. Data collection is required for forensic analysis of accidents so the system can be reprogrammed to avoid future errors. Full telematics collection (via 'black box' and networks) is required to ensure forensic data is available.
   b. Define minimum real-time telematics transmission requirements (which will be a subset of the data in point 9(a) above.
   c. Any additional data logging required for algorithms to explain actions (in other words, the logging of specific data which may not be required for normal operation, but will be required for forensic examination in the event of failure.
10. **Define crash investigation methodologies**

To incorporate these requirements into a regulatory framework for autonomous vehicles, ATSE proposes regulation that is a hybrid of the 'self-certification' and 'pre-market approval' options defined in the discussion paper. ATSE supports the core attributes of the 'pre-market approval' option, but believes manufacturers, as in the 'self-certification' option, rather than government, should carry out the testing of new vehicles. This would be an effective option provided:

      a. Certification is mandatory.
      b. It meets the list of criteria provided above.

c. Government must specify test procedures for manufacturers. It is not acceptable for manufacturers to choose their own testing regime.
d. Government continues to monitor safety events.

Infrastructure and policy for autonomous vehicle uptake

The Academy recognises that the introduction of automated vehicles on Australian roads presents an array of challenging and complex regulatory and policy issues for state and federal governments.

It is vital that Australia's policies and infrastructure anticipate the exponential rate of technological advancement and uptake. Accordingly, ATSE recommends that Australian governments pursue a fully autonomous road system at the earliest feasible date. Governments must introduce flexible and adaptable legislative frameworks that can keep pace with the technology and ensure that Australia becomes a key competitive player in the global market of automated vehicles.

ATSE would be pleased to recommend members of the Academy's Infrastructure Forum to provide the NTC with further assistance. For further information, please contact Emily Finch, ATSE Research and Policy Officer, at emily.finch@atse.org.au or 03 9864 0920.