Submission No 9

INQUIRY INTO HEAVY VEHICLE SAFETY AND USE OF TECHNOLOGY TO IMPROVE ROAD SAFETY

Organisation: Amy Gillett Foundation

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Position: Chief Executive Officer

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Attention: Mr Greg Aplin
Chair of Staysafe – Joint Standing Committee on Road Safety
Parliament of New South Wales
Macquarie Street, Sydney
NSW 2000

Lodged online via:
www.parliament.nsw.gov.au/staysafe

Dear Mr Aplin,

Amy Gillett Foundation Submission to Inquiry into heavy vehicle safety and the use of technology to improve road safety

The Amy Gillett Foundation (AGF) welcomes the opportunity to provide a response to the Inquiry into heavy vehicle safety and use of technology to improve road safety. Technology presents significant opportunities to increase safety on our roads and reduce trauma. We ask the Committee throughout the Inquiry and in preparing their recommendations to the New South Wales Government to keep in mind one question:

How will the use of technology in heavy vehicles impact the safety of vulnerable road users?

The Amy Gillett Foundation has a direct interest in contributing to the conversation about safe vehicles, including heavy vehicles, particularly regarding the interaction with cyclists. Technology has a big part to play in reducing the high casualty rates associated with heavy vehicles. There is already technology that addresses driver fatigue through monitoring, autonomous emergency braking and technology that is capable of detecting cyclists and pedestrians. This needs to be integrated into the heavy vehicle fleet as a matter of urgency.

To date, technological advancements with regard to communication have largely focused on motor vehicle to motor vehicle (V2V) or connecting motor vehicles to infrastructure (V2I). However, both approaches overlook the people moving on our roads who are not inside a motor vehicle, namely pedestrians and cyclists. It is easy enough to include people in an inclusive approach to safety. By making small, incremental extensions of existing, and future, V2V technology, vulnerable road users can be included immediately as V2X (vehicle to anything, e.g. using smartphones carried by most pedestrians and cyclists).

The purpose of this submission is to share recent research findings into heavy vehicle safety generated by a review conducted by the AGF in collaboration with Monash University through

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our partnership with Toll Logistics and to draw the Committee's attention to the need for safer trucks in relation to vulnerable road users.

Please do not hesitate to contact me directly if you have any questions or require any additional information.

Yours sincerely,

Phoebe Dunn
Chief Executive Officer
Amy Gillett Foundation

Amy Gillett Foundation

The Amy Gillett Foundation (AGF) is a national organisation with a mission to reduce the incidence of serious injury and death of bicycle riders in Australia. We draw on evidence and international best practice, and collaborate with governments, business and the community to create a safer environment for cyclists, while maintaining an efficient road network for all road users.

Terms of Reference – AGF response

This inquiry provides an opportunity to address a significant gap in the current approach to motor vehicle technological advances, that vulnerable road users are being overlooked as manufacturers focus on the motor vehicle to motor vehicle (V2V) and motor vehicle to infrastructure (V2I) technology. There is little evidence that the potential for harm to vulnerable road users including cyclists, pedestrians and motorcyclists is being prioritised.

In this submission we have focused on one of the Terms of Reference:

b) The development of connected and automated vehicle technologies specific for the heavy vehicle industry and opportunities for further development in this space.

Definitions

We have used a broad definition of heavy vehicles in this study. We have included all types of trucks including:

- Prime mover (including all trailers)
- Rigid truck (all weight)
- Prime mover only, single trailer, B double, B triple
- Light commercial vehicle (rigid) <=4.5 tonnes
- Heavy vehicle (rigid) > 4.5 tonnes

We have also included waste management trucks, street sweepers, buses and coaches.

In addition, the terminology related to the road network, automation and connective have several initialisms that are often used interchangeably, but have specific meanings. We have used the following in this submission:

- V2V connectivity between motor vehicle and motor vehicle
- V2P connectivity between motor vehicle and a person (i.e. non-motorised road user, e.g. pedestrian and cyclist)
- V2I connectivity between motor vehicle and infrastructure
- V2X connectivity between motor vehicle and any other entity on the road network (i.e. person, other motor vehicle, infrastructure)

- P2I connectivity between person (e.g. pedestrian and cyclist) and infrastructure

To address Term of Reference b), the following submission is presented in three sections: inclusive safety, technology and insights from AGF partnership with Toll Logistics. Finally, concluding remarks have been included for the Committee's consideration.

Inclusive safety

In the main, the AGF welcomes technology as a means of improving vulnerable road user safety around heavy vehicles. Increased visibility with on-board monitoring cameras, other recording devices and automatic braking are all positive changes in the heavy vehicle fleet.

However, to date, the focus of connected and automated vehicle technologies, for all motor vehicles, has been the connectedness with other motor vehicles (V2V) and infrastructure (V2I) (Figure 1). This motor vehicle-centric approach was highlighted in a recent Austroads report: *Safety benefits of cooperative ITS and automated driving in Australia and New Zealand*.[i] Of 22 technologies reviewed in the study, only **one** related to the safety of cyclists, and the authors predicted the safety benefits of the cyclist-related technology to be Low. Many of the technologies being developed for the safety of people when we are inside the car were predicted to have a high safety impact.

Figure 1. Current priority for connected and automated motor vehicle technologies

Small nudge will bring big safety gains for all road users

For incremental investment, technology can be extended to enter the market connect to all road users, connecting motor vehicles to other motor vehicles (V2V) and connecting motor vehicles to people (V2P, i.e. cyclists and pedestrians). Mobile phone use is almost ubiquitous in Australia and extending the V2V technology to include smartphone applications would connect the majority of Australians (Figure 2).

From our discussions with the automotive industry, they do have plans to include V2P and V2X technology, but it's on their long-term agenda and will not be realised in the short term. We encourage the Committee to recommend to the Government that V2P technology be included in all connected and automated technology, including heavy vehicles.

Smartphone based technology gives people the opportunity to opt-in. For example, most cyclists ride with their mobile phone in their pocket or bag, extended technology would mean the motor vehicle technology would detect the cyclist and assist drivers to avoid conflict.

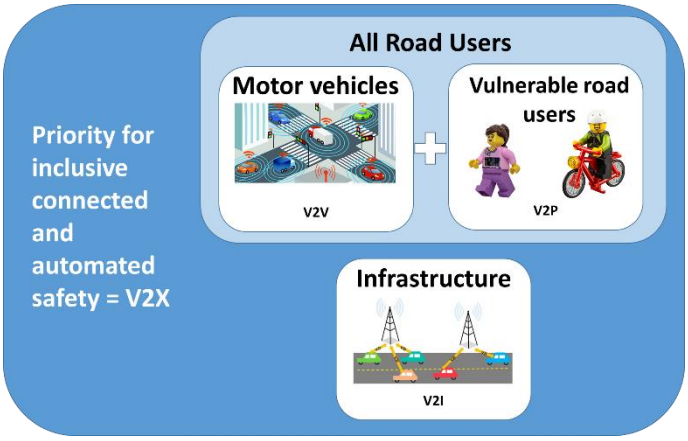

Figure 2. Priority for inclusive safety

Technology

In relation to specific technology, we request that the Committee consider vulnerable road users in relation to any connected or automated vehicle technology, for both heavy vehicles and the entire motor vehicle fleet. This is particularly important to avoid unintended consequences that are foreseeable if the impact is considered from the perspective of the vulnerable road users.

Under the Safe System approach that underpins road safety in Australia, governments have a shared responsibility with other stakeholders, including motor vehicle manufacturers, to ensure that safety gains benefit all road users. This is clearly stated in the Safe System principles:

> ***Principle 2: the health and well being of our society should not be traded off against other societal benefits…we should not be prepared to accept additional death or serious injury on our roads as trade-off for increased productivity***[ii]

Example of unintended consequences

From the perspective of driver and occupant safety, Lane Keep Assist technology provides breakthrough technology to help prevent motor vehicle crashes, in particular, run-off-road crashes. However, Lane Keep Assist technology is one example where the intended outcome of the technology (keep motor vehicles central to the lane) has unintended consequences.

Figure 3 below is an example from Mazda of their Lane Keep Assist System, it clearly shows that the steering assist begins when the driver veers away from the central lane position.

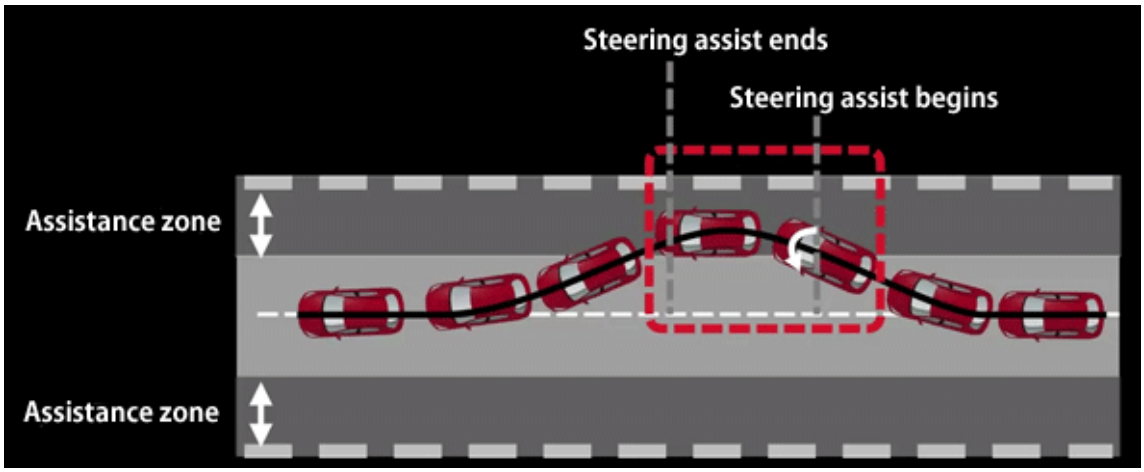

Figure 3. Illustration of Lane Keep Assist technology (Lane Departure Avoidance)[iii]

Current technology relies on cameras detecting the lane edge lines and positioning the vehicle central to those two outer lane markings (Figure 4).

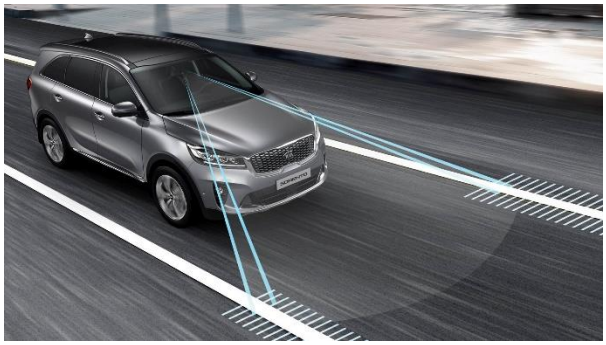

Figure 4. Illustration of camera detection used in Lane Keep Assist technology[iv]

However, if we consider this technology from the perspective of a cyclist, this 'safety' technology is less clear. Figure 4 shows the same image, this time with cyclists in the image. If the driver moves out of their lane to provide a cyclist with more lateral distance when passing (which is a mandated requirement in most Australian states and territories), some versions of Lane Keep Assist technology will activate and 'assist' the driver back into the centre of the lane.

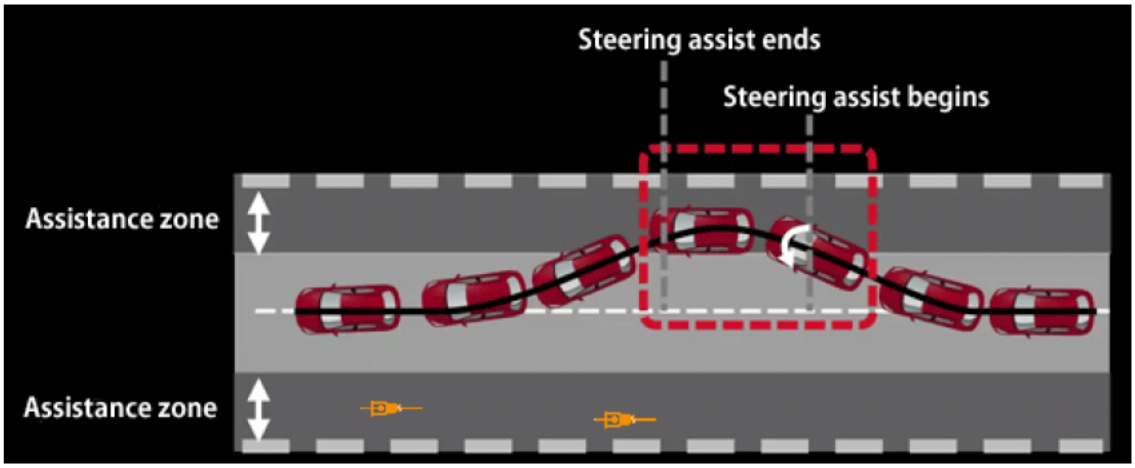

Figure 3. Illustration of Lane Keep Assist technology with other roads users (cyclists)

The nudge

As mentioned above, an incremental extension to the technology by the manufacturing industry can remove the risk the current Lane Keep Assist technology creates for cyclists. A camera aimed to the left of the vehicle that detected the presence of a cyclist to the left and used in conjunction with the Lane Keep Assist would ensure that the motor vehicle maintains a safe passing distance.

From a driver/occupant perspective, the benefits of this technology are clear. However, the risks are equally clear to vulnerable road user experts. We recommend that as part of this Inquiry, the Committee considers including a recommendation to Government that all new technologies introduced in to the heavy vehicle fleet are reviewed by vulnerable road user experts with the aim to reduce safety risks being introduced to non-occupant road users (e.g. cyclists and pedestrians).

Insights from AGF partnership with Toll Logistics

For the last six years, the partnership between the AGF and Toll has led to considerable changes for improved safety for vulnerable road users. In this section, we have provided a summary of a recent review undertaken in collaboration with Monash University.

Summary: Review of coroners' recommendations following fatal cyclist crashes involving heavy vehicles

The AGF in collaboration with Dr Marilyn Johnson (AGF/Monash University) and Associate Professor Lyndal Bugeja (Monash University) has recently completed a review of all coroners' recommendations following cyclist fatality crashes that involved a heavy vehicle. The analysis

was conducted as part of the partnership with Toll Logistics. We bring the report to the Committee's attention as it contains numerous recommendations by Australian coroners that are pertinent to this Inquiry.

From 2000 to 2016, there were 141 cyclist fatality crashes that involved a heavy vehicle in Australia. The crashes involved people of all ages who were riding their bikes, including children. The heavy vehicles were classified as either 'truck' (84%) or bus/coach (16%). One case was still under investigation (Open) and was excluded from the analysis.

Of the 140 case analysed, coroners made recommendations in 17 cases (12%). Several of these recommendations included changes to technology and we have highlighted these below:

Safe vehicles

The most frequently made vehicle-related recommendation focused on visibility and maximising the drivers' capacity to see the road user outside the cabin, including:

- Rear vision camera – trial and install to maximise driver accessibility and visibility
- Prohibit conventional shaped heavy vehicles unless fitted with appropriate warning technology

Safe roads and roadsides

Most road related recommendations related to the need for a review of guidelines and design standards and the restriction of parking to improve safety. One recommendation made was for Person-to-infrastructure technology (P2I) with the increased use of technology that enables a person on a bicycle to activate a head-start light at a bike box at a signalised intersection. Allowing the bicyclists to begin moving ahead of other vehicles allows them to gain sufficient momentum to reduce lateral movement common in bicycles at low speed. It also helps remove them from heavy vehicle blind spots.

Safe people

Almost half the recommendations related to safer behaviours. In particular, coroners highlighted the need for increased public awareness of visibility restrictions for heavy vehicles drivers and the need for parental supervision of young children around heavy vehicles.

Concluding remarks

The Amy Gillett Foundation is optimistic that advancements in connected and automated technology in heavy vehicles can lead to improved road safety outcomes for all road users. However, we also note that vulnerable road users are a secondary consideration for motor

vehicle manufacturers. We encourage the Committee to use this Inquiry to take leadership in road safety and ensure new technology for road safety means all road users including people when they are riding a bicycle. We submit the following recommendations to the Committee:

Recommendations

- All new technologies introduced into the heavy vehicle fleet are reviewed by vulnerable road user experts with the aim to reduce safety risks being introduced to non-occupant road users (e.g. cyclists and pedestrians).

We also endorse the recommendations already made by coroners' following cyclist fatality crashes:

- Installation of rear vision cameras are mandatory on all heavy vehicles with a time limit in place to allow current operators to retrofit cameras to existing heavy vehicles
- Prohibit conventional shaped heavy vehicles unless fitted with appropriate warning technology with a time limit in place to allow current operators to install the technology
- Increase inductive loop technology installed at bike boxes to provide cyclists with a head-start light to ensure they enter the intersection ahead of motor vehicle traffic, including heavy vehicles where drivers have visibility restrictions.

[i] Austroads (2017) Safety benefits of cooperative ITS and automated driving in Australia and New Zealand. https://www.onlinepublications.austroads.com.au/items/AP-R551-17

[ii] Victorian Community Road Safety Partnership Program (2010) Guide for understanding and applying 'Safe System' principles. VCRSPPDraftGuideforUnderstandingandApplyingSafeSystemPrinciplesDec2010.pdf

[iii] Source: Mazda. LAS (Lane Keep Assist System). http://www.mazda.com/en/innovation/technology/safety/active_safety/las/

[iv] Source: Kia. Lane Keeping Assist (LKA). http://www.kia.com/eu/models/sorento/