Transport and Road Safety (TARS) Research Centre

Submission to the National Transport Commission

regarding

Developing technology-neutral road rules for driver distraction:

Consultation regulation impact statement

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16 Aug 2019

General

The purpose of this document is to respond to the invitation from the National Transport Commission (NTC) to comment on their Consultation Regulation Impact Statement (RIS) on Developing technology-neutral road rules for driver distraction. Our comments cover the proposed regulatory approaches and the methods used in developing the RIS. Our response first summarises our position in general, then covers each of the questions posed in the RIS.

The nature of driver distraction and implications for road rules on driver distraction:

Driving distractions can be defined as any factors that take the driver's attention away from the driving task sufficient to compromise safe driving performance. Experienced drivers can maintain accurate and safe driving performance with relatively low levels of attention as the skilled behaviour they have developed does not require moment-by-moment conscious attention. Safe driving does, however, require continuous visual attention to monitor the progress of the vehicle within the road system and to be prepared to respond as the conditions demand. This means that drivers can, and do, safely direct attention to other cognitive tasks while driving, typically so long as visual attention is maintained and manual control is not compromised. There is also evidence that drivers adjust driving behaviour by adopting longer headways and slower speed when engaging in secondary tasks to reduce safety risk. The implications for developing targets for reducing distraction while driving are that all secondary tasks should not be defined as distractions under the road rules as they do not all compromise safe driving equally. Factors that take visual attention away from the driving task or that interfere with manual control of the vehicle should be the targets of action to reduce driver distraction. This should be the focus of any modification to Australian Road rules on driver distraction.

For this reason, we agree with the idea that addressing behaviour that results from distracting activities regardless of device or technology is a good approach, and that it needs to be more targeted. It must address those devices, technologies and secondary tasks that take visual attention and manual control away from the driving task. It is not about technology per se. Technology and/or secondary tasks that can be used without removing eyes and visual attention from the road are not of prime concern here. This includes manual controls that provide spatial and touch feedback on status and do not require visual attention (such as knobs and dials). Accordingly, we suggest that the title of this RIS should reflect its focus and be 'Developing road rules to reduce driver distraction due to visual distraction and manual interference with driving.

NTC Proposed Options for addressing the driver distraction problem

We agree that the best approach to driver distraction is probably one that combines prescriptive and performance-based elements. The Hybrid Option appropriately improves the existing prescriptive regime of rules by refining and clarifying the relevant sources of driver distraction that should not be allowed while driving as well as providing a better definition of performance outcomes relevant to driver distraction regardless of the source of the distraction. In our view, however, the proposed Prescriptive element is missing a major source of visual and manual distraction: Visual Display Units (VDU) in vehicles. By doing so, the Option is not consistent with the objective of reducing the specific distraction behaviour of eyes-off-road. The Road Rules must

include all VDU and video-based functions of in-vehicle devices at least while the vehicle is moving. This includes so-called safety-enhanced functions like Navigation as in visual mode these usually involve long visual glances to negotiate complex screens and multiple levels. However, it does not include functions designed specifically to improve the visual information or manual control of the vehicle for driving (e.g., reversing camera screens).

Further solutions needed

The solutions discussed under the proposed Hybrid Option are too narrow and have missed some potentially effective solutions. The Prescriptive rules focus on banning the driver from engaging in certain behaviours which require eyes off road and hands off the steering wheel. This approach should be supplemented by action to reduce technology in vehicles that to operate requires drivers to take their eyes off the road. This requires that vehicle manufacturers and suppliers of after-market devises should be encouraged to redesign driver-machine interfaces. For example, when the vehicle is moving, the device should only operate in auditory mode, screens should be blank, and controls should be able to be operated without visual feedback. The technology already exists to limit the action of mobile phones while the vehicle is moving. The Consultation RIS should consider this solution as it is the most likely approach to prevent visual distraction from these devices and will be more effective than requiring behavioural change, especially in a period when VDU's and visual distractors have become standard features of vehicles. Strengthening of Australian Vehicle design rules is the most obvious and direct approach, but in the interim, the ANCAP should be used to establish vehicle design rules that reduce driver distraction and provide guidance to vehicle purchasers which in turn encourage the design of safer driver interfaces.

Also missing from the discussion of performance or outcomes-based solutions is the need to educate drivers on what is safe driving or 'proper control'. This is especially important with the rapid incorporation of potentially distracting technology in vehicles. Drivers need to understand how to use these devices safely especially without having to take eyes-off-road. For education to be effective, it will be essential for the prescriptive rules to be consistent. For example, the rules should not allow behaviours in use of technology in vehicles, such as VDU screens and complex visual controls, that are obviously distracting, as this seriously undermines the message to drivers about driver distraction (some visual distractors are a problem but not others?). In the same vein, it is also essential that education on application of prescriptive rules and especially the performance-based rules extends to Enforcement Officers. The performance-based element, although better defined, will still allow significant interpretation by Enforcement Officers about what is 'proper control'. It is essential that Enforcement Officers understand why these new behaviours are being targeted and what is the intention of the enhanced rule for reducing driver distraction.

NTC Review Questions

Question 1: What other factors should be considered in the problem statement?

The RIS rightly defines driver distraction as 'a diversion of attention away from activities critical for safe driving…'. This definition also defines the factors that should be considered in developing

road rules that will tackle this problem. Overall, the factors that should be considered must involve attention related to driving, that is factors relating to disruptions to visual (eyes on the road) and manual (hand on steering wheel) control as these are the primary requirements for driving.

In general, if drivers maintain visual attention to the driving task and manual control of the vehicle, driving will continue to be safe. In addition, experienced drivers only require comparatively low levels of attention to monitor the visual environment and to make manual adjustments to longitudinal and lateral movement of the vehicle and to speed because their driving behaviour has become very automated with extensive practice and their hazard scanning very strategic. Experienced drivers have spare attentional capacity to do other cognitive activities while driving. It is possible to do another task while driving provided that visual monitoring (eyes on-road) and manual control continues and that the secondary task allows the driver to break-off at any moment to direct more attention to the driving task if this is needed such as if conditions change. This means that technology or secondary tasks that do not require long off-road glances and can be dropped at any time so drivers can direct more attention to the driving task are not a main concern.

Some sections of the RIS suggest that all secondary tasks are of concern as distractors. This is unfortunate as it overstates the problem. For example, the claim is made that 97.5% of drivers experience significant reduction in driving performance when executing a secondary task based on a study by Watson and Strayer (2010). Unfortunately, the results do not support this conclusion. This study involved performance in a driving simulator while doing a complex cognitive task which, while it did not involve vision or require manual control, required significant attentional demand. The results showed longer brake times, but also longer following distances in the dual task compared to simply driving, indicating that drivers adapted their driving behaviour to be more cautious in order to compensate for the need to divide their attention between two tasks. It is also notable that their performance on the secondary task was significantly poorer when driving compared to the secondary task alone. This is to be expected as attention was divided between the two tasks but also since participants were instructed to favour the driving task. Other studies have also demonstrated behavioural compensation when undertaking another activity while driving.

Put together, these findings indicate that we should not generalise driving distraction to all secondary tasks. Drivers can maintain attention to the driving task when doing another activity or will adjust their driving to reduce safety risk so long as the secondary task does not require visual attention or interfere with manual control of the vehicle. We think the problem statement needs to be refined to make this point very clear. Currently it is too broad in focus.

Question 2: Has the consultation RIS provided enough evidence to support the case for government intervention? What else should be considered and why?

The RIS makes the strong case for government intervention on the issue of driver distraction and the need to improve the way distraction is defined and the scope of the road rules (which currently prohibit some distracting activities but not others which would be expected to have comparable effects on safe driving behaviour). The RIS argues sensibly that negative effects of distraction occur primarily when competing activities undertaken by the driver during driving compromise his

or her ability to see the road environment and to physically operate the vehicle. This position reflects dominant research findings on driver distraction, which show that road safety is reduced when drivers pay insufficient visual attention to the road and/or are not able to manually act upon the vehicle's controls in a timely way. Importantly, the RIS recognises that any activities that reduce visual attention to the road or impair manual operation of the controls can have adverse effects, regardless of whether they involve a particular type of technology. Road rules that target unsafe visual and manual distraction, rather than individual types of technology such as mobile phones, have the potential to encompass more distraction, to automatically include new technologies, and to increase the consistency of the road rules across activities.

Question 3: Are there issues relevant to developing technology-neutral road rules for driver distraction not covered by the process for addressing the problem?

The main issue is visual and manual distraction, and these are the secondary tasks that need to be eliminated while driving. It will be important to reduce or eliminate technology as well as other conventional secondary activities that create visual and/or manual distraction. It is important not to confuse the issue by targeting other types of tasks that drivers might do while driving as they are not distracting from the driving task.

The RIS process for addressing driver distraction has not addressed the option of preventing visual distraction through better design of driver-machine interfaces. As discussed in the introduction, it is essential to consider limiting the increasing potential for distraction occurring in new vehicles. Attempting to reduce driver distraction only through requiring drivers to limit their behaviour in the face of these changes will never be very effective. Removing the sources of visual distraction will be by far the best approach to eliminating driver distraction.

The RIS also only makes perfunctory reference to the need for education of drivers on how to be safe and achieve 'proper control' of vehicles especially in the face of new technologies in vehicles.

A review of existing research evidence should be an integral part of the decision-making process in any review of policy. In this case the review was directed to focus heavily on the issue of cognitive load in distraction rather than directing of attention which is the fundamental issue and should be the heart of this initiative.

Question 4: Can you provide evidence that would support a different treatment for cyclist distraction?

Like driving, cycling requires attention be paid to the longitudinal and lateral control of the vehicle (bicycle) and to events occurring in the surrounding roadway. As vulnerable road users, cyclists are likely to experience more severe consequences if their vehicle control and hazard scanning behaviours are compromised by manual and visual distraction. We believe cyclists should be governed by the same road rules regarding distraction as motor vehicle drivers.

There is also a case to be made that pedestrians should not engage in visually distracting activities when commencing to cross and while crossing roads.

Question 5: Do the proposed examples for proper control reduce the uncertainty about compliance with the offence in road rule 297(1)? What other elements do you think could be incorporated?

This is definitely an improvement on the existing regime, but the definitions of 'proper control' still require some judgement by drivers and enforcement people and therefore there is still a degree of vagary. It is not obvious, however, how the rules could be made clearer. Further, what is proper control will vary according to circumstances. As discussed in the introduction, it will be essential to incorporate a strong education component in this new initiative for both drivers and enforcement officers.

Question 6: Are the four options clearly described? If not, please describe the areas that may be missing.

The principles distinguishing the four options are clearly described and Appendix C details the similarities and differences in allowed behaviours under the options.

Question 7: Is the status quo option an accurate representation of the current state of the Australian Road Rules in relation to driver distraction? If not, please describe further.

Yes

Question 8: Are there any high-risk distracting behaviours and interactions that have not been addressed by the proposed new offences?

Manual interaction with any in-vehicle screen that requires vision to guide the response should be barred (e.g., music, ride apps, navigation devices) because these necessitate the driver taking their eyes off road. Navigation apps, for example, often require reading and visual navigating through an extended menu of tapping which will take eyes off road for a significant time or repeatedly. Adding to the time required are reduced screen visibility in high light conditions, unreliable navigation applications that drop out or are not timely so that visual-manual steps must be repeated, and the need for people to don glasses to read text on a close screen and doff them to see the roadway. Control of navigation and other non-driving tasks that are currently screen-based in vehicles should be made auditory/verbal only and route guidance should be verbal so map reading is not required.

Question 9: Can you propose an alternative approach for discouraging long eyeglances off the roadway that is enforceable in practice?

The best approach to reducing long eye glances away from the driving task is to remove likely sources of visual distraction from the driver's view. For technology-related distractions, this should involve automatic deactivation of in-vehicle screens and mobile phones while the vehicle is moving. The technology is available to adopt this solution and we strongly recommend that this approach is implemented. This can be done through Australian vehicle design rules and through after-purchase technologies.

A second approach to discourage off-road glances due to technology is to improve the design of controls that do not require visual checking to operate. Currently, many vehicles that employ visual display units for radio, music or navigation functions also have non-visual controls available. Often these are not used as they are not readily accessible to the driver, cannot be operated reliably without visual checking and require the driver to read the user manual to find and operate them. Australian vehicle design rules need to require non-visual controls for these functions to be obvious, easy to use and standardised to ensure these are the primary controls used by drivers.

Third, a strong education component will be essential to ensure that drivers and Enforcement Officers understand what 'proper control' means and how it should be achieved in the face of potential visual distractions and interference with manual controls of the vehicle.

Question 10: Can you propose an alternative approach for discouraging high-risk voice-based interactions that is enforceable in practice?

Because voice-based interactions are typically less problematic for driving than visual and manual interactions and because there is ample evidence that drivers can be strategic in how they deploy their attention, all voice-based interactions should permit the driver to break off to ensure sufficient attention can be directed to driving if required. That is, all voice-based technologies and interfaces should be designed to be driver-paced not machine-paced.

Question 11: Would a fully outcomes-based approach effectively mitigate the safety risks from diverse sources of distraction?

A fully outcomes-based approach would not be an effective approach to mitigate the safety risk from visual and manual distraction. First, despite the suggested refinement to the definition of 'proper control', there remains a degree of subjectivity for enforcement officers which would be undesirable as the only approach to mitigating the effects of distraction. Rather we need to be able to specify activities critical for safe driving as precursors to improper control. Second, enforcement will only be possible once control is lost which is too late.

Question 12: Does the proposed combination of prescriptive and performance-based components in the hybrid option sufficiently address all the sources of distraction that can significantly reduce driver performance? If not, please elaborate.

The hybrid option with a focus on addressing visual/manual distraction is a good compromise policy position. It prevents visual/manual activities which are most likely to interfere with safe driving regardless of technology. It also provides an avenue to enforce poor driving arising from distraction caused by behaviours or events which are more difficult to regulate prescriptively (e.g., thoughts, emotional distress, pain) via their adverse effects on 'proper control' of the vehicle. Sensibly, the hybrid option does not seek to make glance direction and length an offence which would be impractical both for compliance and enforcement. However, as noted in our previous answers, the hybrid option does not deal with all visual/manual interactions with in-vehicle screens and it should deal with all screen-based tasks consistently.

Question 13: Do you agree with the impact categories and assessment criteria? If not, what additional impact categories or assessment criteria should be included?

The categories of efficiency, effectiveness and coherence are appropriate criteria for assessment of road rule changes. Unfortunately, the evidence provided in the RIS on each category is poor or absent so limiting the value of this assessment of impact.

Question 14: Does our analysis accurately assess the road safety benefits for each reform option? Please provide any further information or data that may help to clearly describe or quantify the road safety benefits.

Without good quality information on distraction crashes and related trauma, it is impossible to assess the accuracy of the RIS impact assessment. To date the definition of distraction used to identify relevant crashes has not been adequate to underpin good quality data and our ability to measure distracted driving in the general population is poor. Any attempts to make quantitative estimates of the road safety benefits and costs of the reform options proposed in the RIS will be restricted by the fundamental limits on available data. A purely qualitative assessment would have been more appropriate. Clearly, more research is needed about the incidence of distracted driving and the role of different distractions in crashes in natural driving so that the effect of changing the road rules for distracted driving can be properly evaluated.

Question 15: Is the assumption that technology related distraction crashes would be 24 per cent higher in the absence of existing laws plausible? If not, can you provide any evidence that supports a different estimate?

The source of the 24% estimate is unclear as it does not appear to be cited in the Arhin et al report, in the NHTSA publication on Distracted driving in Fatal Crashes, 2017 nor in the NHTSA publication on Distracted Driving 2016. In fact the latter publications show no change in crashes involving distraction over the period of study. Consequently, we think that this criterion for impact assessment needs to be revised or better justified. As far as we are aware, currently we can only make estimates of the benefit of any of the Options put forward in the RIS. These should be evaluated when new road rules are introduced using a strong research design. Clearly this research would be of benefit in Australia and internationally as no similar evidence is available.

Question 16: Has the consultation RIS captured the relevant individuals or groups that may be significantly affected by each of the options? Who else would you include and why?

All drivers and riders will be affected by visual and manual distraction. Providing exemptions to certain groups of occupational drivers is not sensible because all drivers are susceptible and occupational drivers spend more time on the road than others so they will be exposed to higher risk.

Question 17: Has the consultation RIS used an appropriate analytical method for assessing the benefits and costs of the options? What else should be considered?

In the absence of good quality evidence on which to assess benefits and costs of the three options, the method used in the consultation RIS is a reasonable approach. As it stands, therefore, it is not possible to be confident in the conclusions of the Impact assessment. As discussed above, this means that it would be essential to evaluate the effects of any change in road rules on driver distraction. Unfortunately, the Review of Scientific Literature commissioned to support this project did not target the main issues relevant to inform the proposed changes in road rules for driver distraction. For example, it focussed on cognitive load and stress rather than on attention-related effects, which are by definition the problem for driver distraction, especially visual and manual interference. It also failed to review the influence of behavioural adaptive effects when drivers undertake secondary tasks. Most importantly, the review did not critically compare and contrast the existing evidence on driver distraction, especially the differences in likely effects of various secondary tasks, nor did it compare and contrast the types of guidelines available to reduce the impact of poor human-machine interfaces which distract drivers.

Question 18: On balance, do you agree that the preferred option best addresses the identified problem? If not, which option do you support?

We agree that the preferred (hybrid) option is the best of the options for regulating distracted driving that threatens safety. The focus on components of human behaviour important for safe driving (visual information gathering and manual responding) rather than on any technology is an improvement on existing road rules covering distracted driving. Greater consistency in the application of the rules across technologies is also a strength of the preferred option and should assist drivers understand what behaviour is and is not allowed.

The impact of the preferred option will be limited by drivers' knowledge and compliance and by the ability to enforce the rules. The definition and hence enforcement of 'proper control' is likely to be the most challenging aspect.

It is important that changes to the road rules are not the sole intervention used to reduce unsafe driver distraction. Rather, better design requirements are needed that mandate auditory/verbal information/control functions for any in-vehicle devices that are not part of the driving task or, at least, manual response options that do not require vision. That is, as far as possible, tasks that are incompatible with safe driving should be engineered out of vehicles rather than trying to reduce the behaviour prompted by poorly designed driver interfaces. In addition, to be successful, education of drivers and enforcement officers will be needed about the changes, including the meaning of 'proper control'. Finally, improved data collection on distracted driving and distraction crashes will be needed to evaluate changes to the road rules.

References

Watson, J.M., Strayer, D.L. (2010). Supertaskers: Profiles in extraordinary multitasking ability. *Psychonomic Bulletin and Review*, *17(4)*, 479-485.