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Increases in speed limits: Unjust and unjustifiable

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Summary

This article explores the tension between international attempts to increase road safety and the speed limit increases in the Land Transport Rule: Setting of Speed Limits 2024. The Rule will raise speed limits around schools excluding pick-up and drop-off times, based on an economic rationale: weighing time saved from faster travel against increased injuries and deaths, both expressed in monetary terms.

The Rule disregards broader public health impacts of increased speed limits, such as discouraging active communities by stifling walking and cycling. It is also unfair, as faster speeds disproportionately benefit drivers, while vulnerable road users like children bear the brunt of increased risk.

When it comes to speed limits, we need a more balanced approach to protect public health and community safety, an approach that aligns with design speeds to which our vehicles are configured that takes a longer-term view of societal, environmental and economic wellbeing.

In keeping with the laws of physics and the limitations of human reaction times, higher speeds always generate higher rates of severe injury and death.[1]

A current issue of debate is driving speeds in our communities. Collisions with vulnerable road users have much higher fatality risks than crashes between motor vehicles. Reductions in speed limits have been shown to be effective in reducing such trauma. For example, a study conducted in Toronto, Canada of the effect of 40 km/h and 30 km/h speed limits on pedestrian-vehicle collisions, estimated a decrease in such collisions of 28%.[2]

When a child darts into the path of a vehicle that has little time to brake, the child is six times more likely to be killed if the vehicle is travelling at 50km/h compared to 30km/h.[3] At an impact speed of 50km/h, the speed limit of many of our urban roads, around 30% of all pedestrians hit by a vehicle will die. Many more will suffer injuries that will affect them for the rest of their lives. By reducing the speed to around 40km/h only around 12% of pedestrians struck will die. At 30km/h, only 5% will die.

The *Land Transport Rule: Setting of Speed Limits 2024* proposes that the setting of speed limits should be subject to an overt trade-off of mobility advantages (faster speeds) against road injuries and deaths, using an economic rationale. Using this rationale, the expected increase in injuries and deaths that always accompanies increases in vehicle speeds is given a monetary value. On the other side of the ledger, the benefits of increased speeds, mainly the value of people's time saved, is also monetised. If the benefits outweigh the costs, the increased speed limit is considered to have an economic justification. It is worth noting that European research has found benefits were higher than costs for speed limits reduced to 30km/h, which implies that doing the reverse of the Europeans, by increasing speed limits in urban areas, there would be a net cost to society.[4]

Wider public health costs missing

A more difficult issue to quantify is the price that increased speeds imposes on community

mobility, such as walking and cycling: faster vehicle speeds discourage pedestrians and cyclists from using the road, as people—quite correctly—see the road as being less safe for them to use. Our walking and cycling rates, particularly for children, have fallen over time.[5] This decline is a concern as physical activity is important for our health, particularly when we are faced with an obesity epidemic. As detailed in an earlier Briefing, speed is also a factor contributing to air and noise pollution.[6]

Cui bono—who benefits?

The World Health Organization advises against using an economic rationale as a basis for setting speed limits.[7] In their publication "Global Plan – Decade of Action for Road Safety 2021-2030" the WHO provide guidance for jurisdictions aiming for lowered road trauma rates, including**: "…safety should not be compromised for the sake of other factors such as cost or the desire for faster transport times."**[8]

One of the arguments is that different people receive the benefits of faster speeds compared to the people who suffer the consequences. A good example of this is a Land Transport rule change: the 30km/h speed limits around school zones to apply only during the period immediately before and after school, reverting to 50km/h at other times. Schools tend to be focal points of communities, particularly families with children. Children play on the school grounds after school and during weekends. To provide an economic justification for increased speed limits, officials would estimate the increase in deaths and serious injuries to children with faster vehicle speeds, and convert this trauma into dollar values. On the other side of the ledger, they would estimate the economic value of 14 seconds (time saved passing a 300 metre school zone at 50km/h rather than 30km/h).

Even if the trade-off seemed acceptable in monetary terms, the problem is that children and their whānau bear the negative consequences of the speed increases but other people benefit from an extra 14 seconds. This distribution of costs and benefits makes the trade-off an unfair basis for setting speed limits.

Conclusion

Society and the economy suffer when there are deaths and serious injuries on our roads. The setting of speed limits needs to be considered as part of a system, where mobility, road design, vehicle design, the environment, the economy, community and public health all interact (see Appendix). The most expensive aspect of the system is harm to human health and safety, so this aspect must be paramount. The roads in our communities need to be designed so that slower speeds make sense and slower speeds are considered ethical rather than seen as an imposed constraint by road-controlling authorities.

What this Briefing adds

- The *Land Transport Rule: Setting of Speed Limits 2024* puts forward an economic rationale for increasing speed limits, an approach that is explicitly criticised by the WHO and is inherently unjust.
- Increased speeds will inevitably lead to more injuries and deaths on Aotearoa's roads.
- There will be flow on deterioration in active transport rates and public health, with consequent increases in healthcare costs, a consideration that is missing in the proposed trade-off between speed and safety.

Implications for policy and practice

- When setting speed limits, consideration needs to be given to design speeds. Research indicates that only when the impact speed is around 30km/h is there considerably reduced risk of fatal and serious injury.
- Effective policy-making cannot happen in narrow sector silos and must take a long-term view that fosters public good. Setting road speed limits is no exception.

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Appendix: Vision Zero vehicle safety advances and why they depend on safe speed limits

To systematically address risks on our roads there needs to be a long term plan to reduce road injury in Aotearoa New Zealand (NZ), which used to be expressed in a road safety strategy based on Vision Zero[9], an approach to road safety that has been adopted by a large number of countries worldwide—including NZ until recently—and has saved many lives. The breath alcohol limit for drivers was gradually reduced as evidence was produced of its harms even at low levels[10] and public acceptance of drinking and driving fell.

There is compelling evidence that higher speed limits always cause higher rates of road injury.[11] To reduce harm to unprotected road users (mainly pedestrians and cyclists), there needs to be effective separation for these road users from traffic (via well-designed pedestrian infrastructure and cycle lanes) or vehicle speeds need to be reduced so that inevitable collisions do not cause death or seriously injuries.

Where separation is impractical, road design needs to foster lower speeds rather than relying on speed limits per se, so that lower speeds make sense. But this shift requires planning over time (which is why Vision Zero was labelled a “vision”). When a coordinated plan is put into place to support these measures, evidence shows that this also encourages walking and cycling, with impressive benefits for health and economic benefits that far outweigh the costs of implementing the plan.[12, 13]

Using a Vision Zero approach, vehicle safety has improved substantially over past years[14], largely guided by New Car Assessment Programme (NCAP) protocols[15], which rate the safety of vehicles, including their safety when colliding with pedestrians, and the safety of occupants when struck from the side. Modern vehicles are engineered to score well in NCAP tests where pedestrian dummies are struck by the vehicle being tested and measurements are made of likely injury consequences. These tests are not performed at 50km/h because pedestrian impacts at this speed are extremely severe, so severe that vehicles cannot be engineered to moderate such impacts. Instead, these tests are done at 24mph (39km/h).[16] Most countries manage pedestrian risk on roads passing through communities by adopting speed limits of 30 or 40km/h in conjunction with gradual improvements in vehicle safety via NCAP pedestrian protection.

An important consideration for NZ is the mix of vehicle types in our fleet. Along with Australia and the USA, NZ has an increasing proportion of SUVs and utes, which pose a particular risk to pedestrians because of their design.[17] Their frontal structures impose a higher fatality risk to pedestrians at any given speed, a risk that can only be moderated by lower speeds.[15]

For side impacts, as for pedestrian impact assessments, crash tests are done at set speeds and the vehicle safety is optimised at these speeds. For example, under Euro NCAP's testing programme, a deformable barrier is mounted on a trolley and is driven at 60 km/h into the side of the stationary test vehicle at right angles. Similar constraints on operational and test speeds apply to the Advanced Driver Assistance Systems (ADAS) such as Autonomous Emergency Braking. The safety systems fail at higher speeds. The responsibility of each country is to set its speed limits according to the design speeds to which the safety systems of vehicles are configured. For most countries, setting speed limits is guided by an understanding of the safe system they are fostering. In Land Transport Rule Proposal 5, its table of speed limit classifications propose speed limits that

exceed the design speeds of vehicle safety systems, undermining the considerable gains in vehicle safety design over recent years.[14]

References

1. World Health Organization. (2023). *Pedestrian safety: a road safety manual for decision-makers and practitioners*. World Health Organization. https://www.who.int/publications/i/item/9789240072497
2. Fridman, L., Ling, R., Rothman, L., Cloutier, M. S., Macarthur, C., Hagel, B., & Howard, A. (2020). Effect of reducing the posted speed limit to 30 km per hour on pedestrian motor vehicle collisions in Toronto, Canada-a quasi experimental, pre-post study. *BMC Public Health*, *20*, 1-8. https://doi.org/10.1186/s12889-019-8139-5
3. Hussain, Q., Feng, H., Grzebieta, R., Brijs, T., & Olivier, J. (2019). The relationship between impact speed and the probability of pedestrian fatality during a vehicle-pedestrian crash: A systematic review and meta-analysis. *Accident Analysis & Prevention*, *129*, 241-249. https://doi.org/10.1016/j.aap.2019.05.033
4. Daniels, S., Martensen, H., Schoeters, A., Van den Berghe, W., Papadimitriou, E., Ziakopoulos, A., Kaiser, S., Aigner-Breuss, E., Soteropoulos, A., & Wijnen, W. (2019). A systematic cost-benefit analysis of 29 road safety measures. *Accident Analysis & Prevention*, *133*, 105292. https://doi.org/10.1016/j.aap.2019.105292
5. Keall, M., Hopkins, D., Coppell, K., Sandretto, S., Bengoechea, E. G., Spence, J., Wilson, G., & Mandic, S. (2020). Implications of attending the closest school on adolescents' physical activity and car travel in Dunedin, New Zealand. *Journal of Transport & Health*, *18*, 100900. https://doi.org/https://doi.org/10.1016/j.jth.2020.100900
6. Kingham, S., & Curl, A. (2024). Increasing speed limits defies the science - more deaths and pollution expected. *Public Health Expert Briefing*. https://www.phcc.org.nz/briefing/increasing-speed-limits-defies-science-more-deaths-and-pollution-expected
7. World Health Organization. (2008). *Speed management: a road safety manual for decision-makers and practitioners*. World Health Organization.
8. World Health Organization. (2021). *Global Plan for the Decade of Action for Road Safety 2021-2030*. https://www.who.int/publications/m/item/global-plan-for-the-decade-of-action-for-road-safety-2021-2030
9. Haworth, N. L., & Tingvall, C. (2000). Vision Zero down under. *Journal of Traffic Medicine*, *28*(2S), 18.
10. Keall, M. D., Frith, W. J., & Patterson, T. L. (2004). The influence of alcohol, age and number of passengers on the night-time risk of driver fatal injury in New Zealand. *Accident Analysis and Prevention*, *36*(1), 49-61. https://doi.org/10.1016/s0001-4575(02)00114-8
11. Doecke, S. D., Kloeden, C. N., Dutschke, J. K., & Baldock, M. R. (2018). Safe speed limits for a safe system: The relationship between speed limit and fatal crash rate for different crash types. *Traffic Injury Prevention*, *19*(4), 404-408. https://doi.org/10.1080/15389588.2017.1422601
12. Keall, M., Chapman, R., Howden-Chapman, P., Witten, K., Abrahamse, W., & Woodward, A. (2015). Increasing active travel: results of a quasi-experimental study of an intervention to encourage walking and cycling. *Journal of Epidemiology and Community Health.* https://doi.org/10.1136/jech-2015-205466
13. Chapman, R., Keall, M., Howden-Chapman, P., Grams, M., Witten, K., Randal, E., & Woodward, A. (2018). A Cost Benefit Analysis of an Active Travel Intervention with

Health and Carbon Emission Reduction Benefits. *Int J Environ Res & Pub Health*, *15*(5), 962. https://doi.org/10.3390/ijerph15050962
14. Keall, M. D., Watson, L. M., Rampollard, C., & Newstead, S. V. (2022). Association between Australasian New Car Assessment Program pedestrian ratings and injury severity in real-life crashes in different speed limit areas. *Journal of Road Safety–Volume*, *33*(4). https://doi.org/10.33492/JRS-D-22-00005
15. Euro NCAP. (2017). Euro NCAP 2025 roadmap: in pursuit of vision zero. *Leuven, Belgium*, 1-19. https://cdn.euroncap.com/media/30700/euroncap-roadmap-2025-v4.pdf
16. ANCAP. (2018). *Technical Protocols & Policies*. https://www.ancap.com.au/technical-protocols-and-policies
17. Monash University Accident Research Centre (MUARC). (2019). *Pedestrian Crash Risk and Injury Outcomes and their Relationship with Vehicle Design*. https://www.monash.edu/__data/assets/pdf_file/0016/1045222/Pedestrian-crash-risk-and-injury-outcomes-relationship-with-vehicle-design.pdf

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