

**RARU Comments on the Paper
“The Magical Property of 60 km/h as a Speed Limit?” by John Lambert**

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Introduction

John Lambert has written several papers criticising the results of a metropolitan speed case control study conducted by the University of Adelaide Road Accident Research Unit (Kloeden et al 1997). This paper considers the criticisms in the latest paper titled “The Magical Property of 60 km/h as a Speed Limit?”.

Magical Properties

Lambert states that the RARU report “Does not support that there are any magical properties of the number 60 as in 60 km/h”.

This is a curious statement in that we do not imply any such “magical property”. We do use 60 km/h as a reference point for our risk curves as we were interested in the effect of free speeds relative to the speed limit in the study area. However, the shape of the curve would remain the same regardless of the reference point used.

Perhaps Lambert is referring here to the use of absolute speeds rather than differences from mean speeds. This point is dealt with below.

Free Travelling Speed Crashes

Lambert states that the RARU report “Fails to highlight that outcomes only apply to free travelling speed crashes (about 28% of serious crashes)”.

To quote the first line of the executive summary of the Report “The main aim of this project was to quantify the relationship between *free travelling speed* and the risk of involvement in a casualty crash, for sober drivers of cars in 60 km/h speed limit zones in the Adelaide metropolitan area” [emphasis added]. It is difficult to see how this could be highlighted more.

In the original report, no attempt was made to estimate the per cent of casualty crashes involving at least one free travelling speed vehicle since that was not of interest at the time and the information collected on abandoned cases was not sufficient to give an accurate percentage.

Lambert arrives at the 28% figure through the following reasoning “Of the 952 crashes, 325 did not involve ambulance transport and hence are not serious crashes. This left 627 serious crashes. And of these for 99 there was insufficient information to reconstruct the crash, leaving 528 crashes. Hence the 148 valid crashes represent 28% of serious crashes”.

The reasoning we would propose is as follows. Of the 952 crashes, 325 did not involve ambulance transport, 18 were not in 60 km/h speed zones and 8 were not vehicle crashes. Clearly, these are not casualty crashes in 60 km/h speed zones. Therefore the base number of crashes is 601. We know that 148 of these crashes involved a free travelling speed vehicle and that 148 of these crashes did not involve any free travelling speed vehicles. The remainder of the crashes were excluded for reasons not related to free travelling speeds apart from the insufficient information crashes. These crashes tended to be more likely to be free speed crashes that could not be reconstructed. So assuming that free speeds among the unknown crashes follow a similar distribution to those among the 296 known crashes, the total per cent of free speed crashes in the study is somewhere above 50%.

Comparing BAC and Speed Risks

Lambert states that the RARU report “Fails to recognise that a high BAC applies to the whole trip whereas free travel speed applies to only part”.

We acknowledge this criticism insofar as a high BAC will increase casualty crash risk for more of a trip than a high free speed will. In this sense the risk of a crash on a given trip is greater for a high BAC compared to an instantaneously identical risk for a high free travelling speed. So the high BAC should be treated as a more serious infraction.

However, we do take issue with the statement that an increased risk due to a high BAC applies to the whole trip. Clearly, a drunk driver stopped at traffic lights has no increased risk of crashing and they are more likely to be involved in an injury crash at times when they are travelling faster.

Black Spots and Black Links

Lambert states that the RARU report “Fails to adjust for the impact of black spots and black links on the findings”.

The study methodology used means that black spots and blank links are irrelevant and any attempt to adjust for them will invalidate the sought after results. The study needs the speeds of crash involved and non crash involved vehicles to be biased precisely by the distribution of actual crashes.

Speed Enforcement Locations

Lambert states that the RARU report “Fails to recognise that speed enforcement does not take place at the crash sites included in the study”.

We can see no reason why we should have recognised this in the Report even if it was true. Since most of the crashes occurred on arterial roads and most speed enforcement is conducted on arterial roads it seems that the implied assertion is false.

However, Lambert does go on to explain that he is talking about crashes occurring at intersections and speed enforcement occurring mid-block. To quote Lambert “speed enforcement is not generally undertaken at crash sites (mainly intersections) and there is no evidence that speeding on a safe section of road correlates with speeding at crash sites (mainly intersections)”.

This is incorrect on a number of levels. Firstly, there are no “safe” sections of road. Crashes can and do frequently occur on sections of road that appear to be perfectly “safe”. Secondly, speed enforcement presence has the effect of slowing drivers down for some considerable distance after the point of detection. Thirdly, speed enforcement does have a general deterrence effect on drivers speed everywhere. Fourthly, speeding in one location is in fact a very good indicator of speeding in other locations.

Not that we have anything against measuring speeds at intersections. We think speeds should be measured in as many places as possible up to the point where drivers consider detection for speeding almost certain on any given trip.

We also have to ask if Lambert would restrict random breath testing to black spots and give free reign to drunk drivers as long as they only drove on “safe” sections of road?

Speed Differences

Lambert includes as one of his hypotheses in developing his paper that “speeds above or below site-specific mean speeds are dangerous and result in crashes”.

He offers no physical or situational justification for this and proceeds to reanalyse our data based on this assumption. The results appear to show a U-shaped curve, however, fitting confidence intervals to the negative speed differentials (which he failed to do) would have shown no statistically significant results there.

In the original report, we provided detailed physical justifications for treating speed as an absolute risk factor in casualty crashes namely:

- higher speeds lead to longer reaction and braking distances
- higher speeds lead to higher impact speeds and crash energy
- higher speeds are associated with high risk of losing control of the vehicle
- higher speeds of approaching vehicles are more likely to be misjudged by turning drivers and the consequences of this are more serious

Possible justifications for increased risk of slower than average vehicles are crashes due to overtaking manoeuvres where faster vehicles overtake slower vehicles and rear end crashes where the vehicle in front is travelling unexpectedly slowly. However, we saw very few of these types of crashes among the free speed casualty crashes we investigated and remain unconvinced that speed difference effects even begin to approach absolute speed effects.

Speed Limit Setting

Lambert states in his conclusions “There is evidence that the risk of crash involvement increases for speeds significantly less than or greater than average speeds, with the increase in risk being much greater at high speeds. Hence consideration should be given to changing speed offences detected on those devices which can measure average speeds of vehicles to relate offences to differences from the average speed”.

This suggestion would seem to be unworkable in practice and is not supported by the data or common sense.

Lambert also assumes the hypotheses that “different speeds are appropriate for different sites in 60 km/h zones” and “that most drivers are good decision makers in regard to safe speeds of travel” and concludes that “The speed limit is an approximation of the safe speed for the area to which it applies” and that “the use of a 10 km/h enforcement tolerance ... be retained as a fair approach to speed enforcement”.

Crashes are rare events by their nature and hence it is extremely difficult for drivers to assess relative risk at different speeds and in particular locations. A particular driver can make very bad decisions and still be unlikely to have a crash and hence assume their decisions are good. There is also no “safe” speed for a given section of road. As speeds are lowered there will tend to be less crashes and those that occur will be of lower severity on a continuum. There is no speed at which a road becomes “safe”.

The purpose of speed limits and enforcement is to get vehicles to travel slower and hence reduce the number and severity of crashes, not to provide an indication of a mythical “safe” speed.

Likewise, a large enforcement tolerance sends the message that the speed limit is a target speed rather than an upper limit (as implied by the use of speed *limit*). To the extent that a large tolerance leads to higher speeds, it increases the number and severity of crashes which is why we recommended that it be reduced or removed.

Conclusion

We agree that the increased risk of high BACs may apply to a greater proportion of a trip than high free travelling speeds.

Most of the other points raised by Lambert are clearly without substance and rely on unsupported and incorrect assumptions.