

## **Rural Regional Roads – Reducing Motorcycle Trauma Through Speed Limits and Infrastructure**

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### **Abstract**

Analysis of 80km/h speed limit reductions and/or infrastructure treatment on high speed Victorian rural roads revealed that motorcycles had the largest observed speed reductions. Given that motorcycles are over-represented in crash statistics this result indicates that the speed limit reductions should be an effective, low cost treatment on popular motorcycle routes.

Analysis of recent crash data reveals that speed limit reduction on its own, without concomitant infrastructure, did not significantly reduce serious and fatal injuries to motorcyclists. However, these results are not statistically significant on the basis of a chi-square test and may be an artefact of the relatively short period of analysis.

### **Background.**

On high speed rural roads with a crash history, Victoria traditionally uses infrastructure treatments and leaves the default 100 km/h speed limit. This approach is successful for high volume roads where the investment can be justified. The cost of treating low volume, high crash rate roads with expensive infrastructure treatments is difficult to justify.

### **Method.**

VicRoads Eastern Region identified 14 road sections with higher than average crash rates. The major crash type was single vehicle run-off-road and motorcyclists were the most involved (80%). Inappropriate speeds and speeding were the major contributing factors.

In 2012 VicRoads reduced the speed limit from the default 100 km/h to 80 km/h in these 14 sections (covering approximately 225 kilometres of arterial road network). Beer, Moon & Riess (2014) detailed the process. Some sections also installed road safety treatments.

The research issues in analysing crash statistics for these road sections are: firstly, were the reduced speed limits successful in encouraging motorists actually to reduce their speed; and secondly, were the reduced speed limits successful in reducing crash rates.

The first issue was studied by Monash University Accident Research Centre (2015). We tested the second issue by examining the crash statistics per annum for five years prior to the installed treatments and comparing them to the crash statistics per annum for two and a half years after the installed treatments.

### **Results.**

Monash University Accident Research Centre (2015) confirmed significant reductions in the point mean speed of motorcycles after reduction of the speed limit at selected locations on five of the seven roads as shown in Table 1.

**Table 1: Mean speed before and after speed limit reduction: Motorcycles**

| Road                 | Mean speed before | Mean speed after | Statistically significant change (95% CI) |
|----------------------|-------------------|------------------|---|
| Omeo Highway         | 82.7              | 72.2             | -10.5                                     |
| Licola Rd            | 108.3             | 100.3            | -8.1                                      |
| Lang Lang-Poowong Rd | 88.8              | 78.4             | -10.4                                     |
| Walhalla Rd          | 59.5              | 59.5             | Not statistically significant             |
| Bonang Rd            | 78.1              | 62.8             | -15.3                                     |
| Willowgrove Rd       | 74.0              | 51.7             | -22.3                                     |
| Great Alpine Rd      | 91.4              | 86.4             | Not statistically significant             |

Comparing motorcycle crash data after installation with crash data prior to installation:

***Sections with 80 km/h speed limits (with infrastructure installed)***

Serious and Fatal injury crashes reduced by 52%.

Minor injury crashes reduced by 18%.

***Sections with 80 km/h speed limits (without infrastructure installed)***

Serious and Fatal injury crashes increased by 3%.

Minor injury crashes increased by 106%.

***Sections without 80 km/h speed limits (with infrastructure installed)***

Serious and Fatal injury crashes reduced by 68%.

Minor injury crashes reduced by 39%.

## Discussion

Though not shown above, analysis of recorded travel speeds for cars, trucks and motorcycles, showed that the largest speed reductions were generally observed for motorcycles. We are thus confident that speed limit reductions do actually lead to reduced motorcycle speeds.

However, speed limit reduction on its own, without concomitant infrastructure did not significantly reduce motorcyclists' serious and fatal injuries and appears to have increased minor injury crashes. Is this really the case? We cannot tell because these results are not statistically significant on the basis of a chi-square test. However it is difficult to develop a convincing mechanism in which a decrease in speed leads to an increase in minor injuries. We thus hypothesise that the lack of a significant effect is an artefact of the relatively short period of analysis and note that at least another 2.5 years of crash statistics are needed to have the same length of prior- and post-treatment data.

## Conclusions

Speed limit reductions lead to reduced motorcycle speeds. However, speed limit reduction on its own, without concomitant infrastructure does not appear to significantly reduce serious and fatal injuries and appears to have increased minor injury crashes. Because it is difficult to develop a convincing mechanism in which a decrease in speed leads to an increase in minor injuries we hypothesise that the ambiguous results are an artefact of the relatively short period of analysis.

**References**

- Beer, K., Moon, W, Riess, A., 2014. *Rural Regional Roads – Improving The System*, Proceedings of the 2014 Australasian Road Safety Research, Policing & Education Conference 12 – 14 November, Grand Hyatt Melbourne.
- Monash University Accident Research Centre, 2015. *Effect of reductions in posted speed limit: Route-based Analysis – VicRoads Eastern Region*, Report prepared for VicRoads, Clayton, Vic.