# Attachment 7

## The theoretical basis of speed limit reduction crash savings

(Excerpt from Corben and Johnston (MUARC) 2006 *Final Report: Development of Future Directions for Tasmanian Road Safety Strategy 2007-2011: Stages 1 & 2* page 103) Note: **emphasis** added

4.4 EXPECTED CRASH REDUCTIONS RESULTING FROM DECREASES IN VEHICLE SPEEDS IN TASMANIA

It is not practicable to present comprehensive estimates of cost-effectiveness for the speed reduction initiatives proposed here, as these estimates would depend heavily on the particular Tasmanian circumstances into which the speed measures were to be introduced. However, the research evidence is clear that where speed reductions are achieved, reductions in crash and injury risk follow.

The work of Nilsson (1982) can be used to estimate the potential safety benefits of reductions in speed limits, and hence travel speeds, on selected Tasmanian roads. **Nilsson (1982) published the results of research that related increases or decreases in mean travel speed to corresponding increases or decreases in the risk of fatal, serious injury or other injury crashes.** Nilsson found that changes in the risk of fatal crashes were related to changes in mean travel speed by a 4th-power relationship; serious injury crashes by a 3rd-power relationship and casualty crashes by a 2nd-power relationship. For example, reducing mean travel speed by 10% (i.e., to 0.9 of the original value) results in an estimated reduction in fatal crash risk of 34% (i.e., (1 - (1 - 0.1)4) x 100 = (1 – 0.66) x 100 = 34%). Nilsson's research, published in 1982, was recently reviewed by Elvik (2005), who concluded some two decades later, that Nilsson's research findings remain valid.

**Nilsson's findings apply to all types of crash and may not be fully transferable across low and high speed ranges.** However, his research provides an indication of the potential savings in fatal and serious injuries as a consequence of reductions in mean speeds. For the proposals made in this report, namely, reducing speed limits from 100 km/h to 80 km/h on selected roads and from 110 to 100 km/h on other roads, it has been assumed, somewhat conservatively, that the former option will produce a 10% reduction in mean speed and the latter option a 5% reduction in mean speed (rather than a 20 and 10 km/h drop in mean speed, respectively). Under these assumptions, Nilsson (1982) predicts:

- a 34% drop in fatalities and a 27% drop in serious injuries from reducing speed limits from 100 km/h to 80 km/h on selected roads, and

- a 28% drop in fatalities and a 14% drop in serious injuries from reducing speed limits from 110 to 100 km/h on other roads.

Trauma reductions of this order are possible for relatively low cost: changes to speed limit signing; supporting enforcement publicity and education as required and relatively low impacts on driver rider mobility, though no estimates could be made within the scope of this project.