

IMPROVING SPEED LIMIT COMPLIANCE

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Summary

The benefits of reduced road travel speeds in terms of reduced crash risk are well researched. Yet speeding on WA roads continues to occur, just as it does around the world, even by normally law-abiding people. Compliance with speed limits in WA is poor and there appears to wide-scale community agreement that it is acceptable to exceed the speed limit.

This paper recommends that the practice of designing urban roads with a design speed 10 km/h greater than the posted speed limit should be stopped and any necessary state legislation introduced to protect road authorities from the possible resulting exposure to increased liability. It also proposes research into three linked proposals for improving driver compliance with speed limits.

The linked proposals have been developed to provide increased motivation for drivers to keep within the speed limit, to provide drivers with improved information on the prevailing speed limit and to provide drivers with accurate information about their current travel speed.

Specifically, the proposals are:

1. The development of incentives to assist drivers to want to comply with speed limits;
2. The installation of speed limit repeater signs at a closer spacing than used currently;
3. The provision of roadside speedometer testing stations.

Further research needs to be carried out to determine whether the proposals are worth implementing and what their costs would be. Support and action by WA Police, Main Roads WA, the Department for Planning and Infrastructure and the RAC would be required to enable the proposals to be introduced in a co-ordinated manner.

1 Introduction

So far this year, at the time of writing this paper in July 2007, 121 people have been killed on WA's roads. If we carry on killing ourselves at the same rate for the rest of the year, the result will be 232 people dying on our roads during 2007. That will be a 15% increase on last year's fatalities. The number of fatalities last year was a 24% increase on those in 2005.

These shocking statistics should be sufficient in themselves to warrant a new approach to saving lives on the roads.

The safety benefits of reduced travel speeds are well researched. For example, reducing average speeds on the roads by only 5% will save around 20% of current fatalities (Joint Organisation for Economic Development and Co-operation/European Conference of Ministers of Transport research report, *Speed Management*, 2006).

The *Speed Management* report identifies “The significant adverse safety impacts of higher vehicle speeds have been confirmed by extensive research. The relationship between serious injury accidents, fatal accidents and speed has been modelled by many researchers.” Nilsson (Traffic safety dimensions and the power model to describe the effect of speed on safety, Lund Institute of Technology thesis, 2004) identified the Power Model relationship between changes in vehicle speed and crashes.

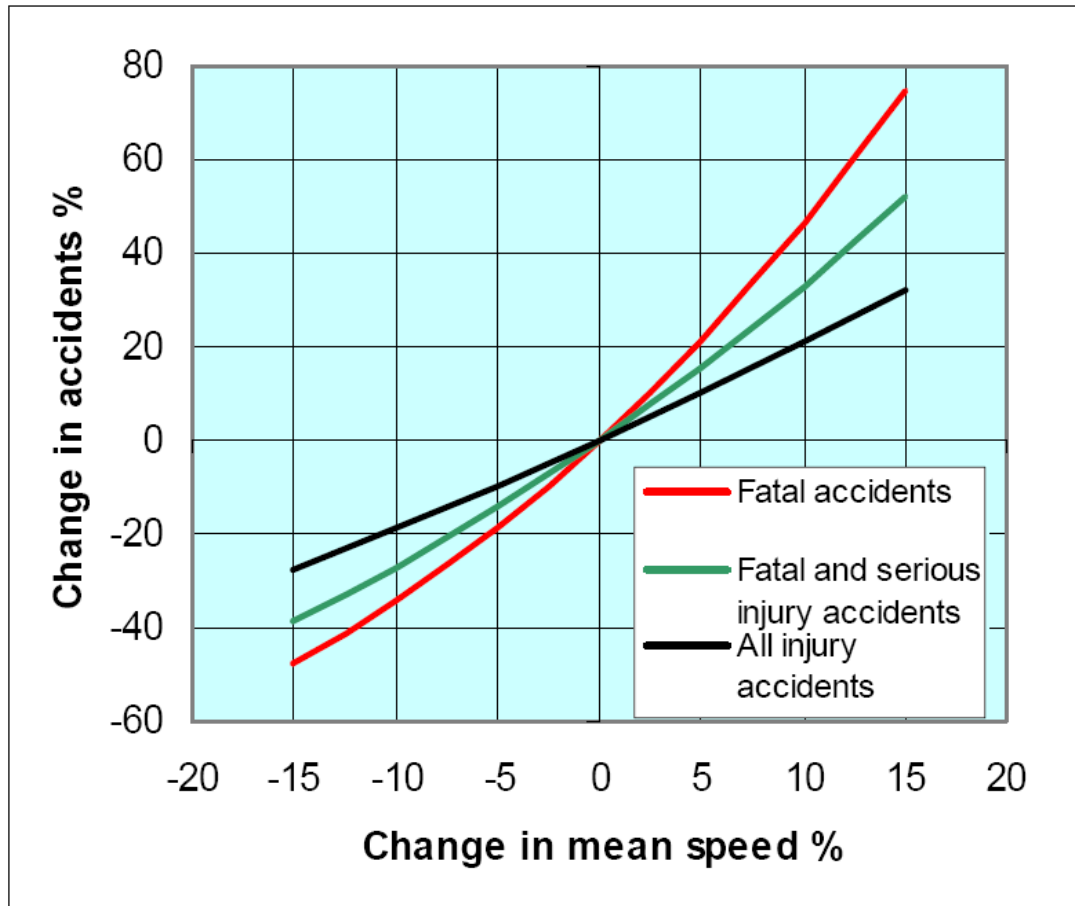


Figure 1

The Power Model: relationship between change in mean speed and accidents

Source Nilsson (2004)

The *Speed Management* report says, “Speeding – which encompasses excessive speed (ie driving above the speed limits) or inappropriate speed (driving too fast for the prevailing conditions, but within the limits) – is dangerous”.

Yet speeding continues to occur, even by otherwise normally law-abiding people.

Speed Management continues, “Excessive speed is a widespread social problem, which affects the entire road network (motorways, main highways, rural roads, urban roads). Typically, at any time, 50% of drivers are above the speed limit.”

In WA, compliance with speed limits is poor and there appears to wide-scale community agreement that it is acceptable to exceed the speed limit.

The Main Roads WA website says, “The prevalence of speeding behaviour is relatively high across Australia. In lower speed zones (60 km/h), up to 50% of all drivers exceed the speed limit by ten km/h or more. In areas with higher speed limits (100+ km/h), approximately fifteen per cent of all drivers exceed the speed limit by 10% or more. Large reductions in the incidence of speeding behaviour and speed-related crashes have been reported in Victoria, and attributed to considerable increases in both enforcement activities and in the penalties imposed on speeding drivers.”

An undated study by Main Roads WA described on its website, covering Shepperton Road, Canning Highway and Stirling Highway, identified that over 30% of drivers were exceeding the posted speed limit. Bearing in mind that those drivers observed driving within the speed limit at one location may well speed somewhere else, it is likely that the number of drivers who regularly exceed the speed limit on WA's roads is much greater than 30%.

New and improved urban roads are usually designed with design speeds of 10 km/h more than the posted speed limit for parameters such as visibility and stopping sight distance, in accordance with guidance from Austroads (Urban Road Design - Guide to the Geometric Design of Major Urban Roads, Austroads, 2002).

Drivers tend to maintain a speed that feels comfortable, based on the design of each stretch of roadway and its use. Relevant *design* features include lane width, horizontal radius, visibility and side clearance. The *use* relates to traffic volumes, heavy vehicle content, turning activity and pedestrian activity. Drivers normally want to get to their destination as quickly as possible, and so with urban roads being designed for speeds 10 km/h higher than the posted speed limits it comes as no surprise that driver speeds are more likely to be above the speed limit than below it.

I believe speeding is not acceptable on our roads, and that a new approach is needed to combat speeding in order to reverse the increasing fatalities on WA roads.

The practice of designing roads with a design speed higher than the posted speed limit should be stopped because it increases the temptation for drivers to speed. On urban roads, the design speed should be the same as the speed limit. This may require state legislation to protect road authorities from exposure to increased liability if they design roads using a design speed that is less than the known prevailing operating speed of traffic.

Drivers need to be provided with better reasons for driving within the speed limit than the thought they will be fined or banned from driving if they are caught.

They need to be encouraged to WANT to drive within the speed limit for positive reasons as well as negative ones. Those drivers that wish to drive within the posted speed limit need to be empowered so that they no longer feel obliged to increase their speed to match that of those who are driving faster, and drivers need better quality information to enable them to keep within the speed limit.

2 Measures to Improve Compliance with Speed Limits

Three of the reasons why a driver exceeds speed limit are:

- Insufficient desire to comply;

- Lack of certainty of what the speed limit is along sections of road;
- Insufficient confidence in the accuracy of their speedometer.

These reasons could be addressed by the measures indicated below. The measures could be implemented in a co-ordinated manner to improve compliance with speed limits.

2.1 Insufficient Desire to Comply

The importance of complying with speed limits tends to be portrayed negatively. Drivers may get caught, use more fuel, are more likely to crash or may have a higher severity crash. In other words, bad things happen if you speed.

There is little sense at present that good things happen if you do not speed.

Positive reasons for speed limit compliance are required, to result in more people wanting to comply with speed limits.

Such positive reasons could include:

- i. A reduction in car licence fees or insurance premiums or a rebate for drivers who go for a period of time without having been caught speeding.
- ii. The introduction of a lottery that rewards drivers who do not exceed speed limits. The possible rules for such a lottery are described in Appendix A.

Opinion surveys and a possible trial should be carried out to establish the value of introducing such measures, and sources of funds need to be identified.

A possible source of funding could be the fines imposed on drivers for speeding. This would help to demonstrate that speed enforcement is not a revenue-raising exercise, but is in fact a life-saving exercise.

Those drivers that do prefer to comply fully with speed limits are likely to feel intimidated by those who go faster, and tailgating can serve a purpose in making the driver in front go over the speed limit. A bumper sticker that lets other drivers know the owner intends not to exceed speed limits when they drive will help to empower the owner by proclaiming their intentions. It will also inform following drivers that the driver in front is less likely to be intimidated by tailgating. An example of a bumper sticker is also included in Appendix A.

2.2 Lack of Certainty of what the Speed Limit is along Sections of Road

If drivers are to comply with posted speed limits, there must be no doubt in their minds what the speed limit is. Unfortunately, speed limit signing in WA assumes that drivers notice speed limit signs and remember what they said. In practice it is quite likely that a large proportion of drivers do not notice speed limit signs and that some that do notice them, soon forget what the speed limit is.

In practice drivers often fail to observe the speed limit signing for a change of speed limit after an intersection because they are concentrating on the changed conditions along the new length of road. In 50 km/h areas it is normal practice to provide no

speed limit signs at all, even though many 50 km/h roads appear to be very much like 60 km/h roads.

Speed limit signs are relatively widely spaced in WA. For example, the theoretical maximum spacing between repeater signs in urban areas on 80 km/h roads according to Main Roads WA requirements is 1.5 km. In the UK, within 50 mph (80 km/h) speed zones, speed limit repeater signs are placed at a maximum spacing of 0.45 km. The distance between repeater signs at 80 km/h in WA is over three times the distance in Britain. There is therefore generally a much longer period between reminders about the speed limit on WA roads than there is in the UK.

Moreover, there are plenty of examples on WA roads where speed limit signing is at a much greater interval than required by Main Roads WA.

The following examples were noted during a brief drive around the Perth Metropolitan area:

- Along the newly installed South Street bus lanes, repeat Bus Lane signs have been installed at approximately 0.13 km to 0.30 km intervals. Yet on the same stretch of 70 km/h maximum speed road, where the maximum spacing for speed limit signing is supposed to be 1.0 km, some of the speed limit repeater signs are over 2 km apart and on one section they are nearly 4.0 m apart. The importance of keeping out of the bus lanes appears to be given much more prominence than compliance with the speed limit.
- The Northbridge Tunnel has a speed limit of 80 km/h and is over 1.6 km long. The required maximum spacing for speed limit repeater signs on an 80 km/h road is 1.5 km. There are no speed limit signs in the tunnel.
- On one section of the recently constructed Roe Highway east of Kwinana Freeway, where the required maximum spacing of speed limit signs is 3.0 km, there is a section of road 6.9 km long with no speed limit repeater signs.

It may be the case that some previously installed speed limit repeater signs have been removed by vandals or damaged as a result of crashes. However, this is no excuse for the high spacings identified because it is a known problem that sometimes individual speed limit signs are removed, and the safety of drivers should not be compromised when this occurs. The required spacing of speed limit repeater signs should take account of the possibility that signs occasionally get removed.

There are examples of States in Australia where attempts have been made to address the problem of drivers not being aware of the posted speed limit.

In Victoria additional repeater signs have been introduced 0.1 km into lower speed zones to remind motorists of the lower speed limit. In Tasmania, the first repeater sign located beyond the start of a 60 km/h speed limit zone on a collector road when entering from a higher speed limit zone is 0.3 km along the road. This indicates that non-awareness of speed limits by drivers is an acknowledged problem.

Research should be carried out in WA to establish:

- i. What proportion of drivers on WA roads is not aware of the posted speed limit along the section of road on which they are driving.

- ii. Whether the introduction of more frequent speed limit repeater to remind drivers of the speed limit on the section of road along which they are driving will improve compliance with speed limits.

As well as being widely spaced, speed limit repeater signs in Australia are unnecessarily large. To the non-technical person they can appear as large as those at the start of a new speed limit. As a result, drivers may think they have just passed a change of speed limit and that they have been complying with the speed limit on the previous section of road. Speed limit repeater signs need only be large enough to be readable as the driver passes them. Repeater signs do not need to be readable from a large distance because drivers should not need to slow down significantly before they reach them.

An increased frequency of speed limit repeater signs could result in an increase in the number of roadside hazards caused by the additional signs and their posts. However, unlike signs at the start of a speed zone which need to be on their own posts for clarity and conspicuousness, speed limit repeater signs could be located on poles used for other purposes, such as street lighting poles, power poles or parking sign poles and need not constitute any addition in roadside hazards at all.

Main Roads WA should amend its signing requirements for speed limit repeater signs so that they do not have to be full sized signs (ie they should be smaller than A, B or C sized signs) and do not have to be on their own poles unless there are no suitable other poles on which to mount them.

2.3 Insufficient Confidence in the Accuracy of Speedometers

Speedometers are required by legislation to be accurate to within 10 per cent. However, there is no information available about the actual accuracy of speedometers in the vehicles on WA's roads.

The Royal Automobile Club of Victoria conducted a speedometer survey in 1994 which found that 58 out of 60 speedometers were inaccurate. Most were conservative in that the real speed was less than that displayed by the speedometer, but some displayed a speed less than the real speed.

If drivers think their speedometers are inaccurate, they will be tempted to allow for the inaccuracy and may inadvertently exceed the speed limit. If a speedometer is inaccurate and the real speed is more than that shown on the speedometer, the driver of the vehicle has no means of ensuring that they comply with the posted speed limit.

There are many reasons why a speedometer may be out of calibration. For example, a speedometer may develop a fault, or the tyre size may have been changed from when the vehicle was manufactured, or an inappropriate second-hand speedometer from a wreckers' yards may have been installed.

Some drivers consider they are not breaking the speed limit if they travel in the order of 10% faster than the posted speed limit because of the allowable tolerance in the accuracy of speedometers. As a result, 50 km/h becomes 55 km/h, 60 km/h becomes just under 70 km/h and 70 km/h becomes nearly 80 km/h in practice.

A mobile roadside system of checking and calibrating speedometers that is as common as booze buses could be introduced so that car owners can know whether or not their speedometers are accurate, and inaccurate speedometers can over time be removed from the roads.

A survey of speedometers in WA should be carried out to determine whether the wide-scale checking and calibrating of speedometers is required.

3 Conclusion

Speeding on WA's roads is a serious community problem which contributes to the increasing rate of fatalities on our roads.

The practice of designing urban roads with a design speed 10 km/h greater than the posted speed limit increases the temptation for drivers to speed. The practice should be stopped, and urban roads should be designed with a design speed equal to the speed limit. Any necessary state legislation required to protect road authorities from the possible resulting exposure to increased liability should be introduced.

The following linked measures could be introduced in a co-ordinated and well-publicised manner to improve compliance with speed limits in WA and reduce the number of fatalities that occur.

The measures are:

1. The development of incentives to assist drivers to want to comply with speed limits such as a reduction in car licence fees or insurance premiums or a rebate for drivers who go for a period of time without having been caught speeding, a lottery that rewards drivers who do not exceed speed limits and bumper stickers identifying drivers who are committed to driving within the speed limit.
2. The installation of speed limit repeater signs at a closer spacing than used currently;
3. The provision of roadside speedometer testing stations.

The measures would require the support and action of WA Police, Main Roads WA, Department for Planning and Infrastructure and the RAC to enable them to be introduced in co-ordinated manner.

Research should be undertaken to establish the value of the measures in improving compliance with speed limits in WA.

APPENDIX A – POSSIBLE SPEED LIMIT LOTTERY RULES

- a) Only licensed drivers can apply for membership.
- b) Membership is free and is available on application. Membership is valid for a six-month period.
- c) Membership is forfeited if a member is caught by the police exceeding the speed limit.
- d) Renewal of membership by any licensed drivers, including those previously caught speeding, is permitted for the subsequent six-month period.
- e) Prizes are paid monthly during each six-month period.

(If, say, 100,000 people become members, possible prizes each month could be:

- 8 new cars @ \$35,000
- 20 new bicycles @ \$1,000
- 300 Transperth SmartRider cards with \$50 prepaid trips

The cost would be approximately \$330,000 including a 5% administration fee. The chances of winning a prize with this arrangement would be 1 in 305.)

- f) Members are encouraged to display the following sticker on the rear bumpers of their vehicles:

