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Profiling heavy vehicle speeding

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Foreword | *The Australian heavy vehicle industry is critical to the movement of people, freight, livestock and other goods. However, every year there are deaths and serious injuries on Australian roads, some of which are caused by speeding heavy vehicles.*

Speed management is an important part of Australian road safety and includes the implementation of appropriate policies, regulations and legislation, as well as speed-related enforcement and compliance responses. It also includes speed limiter and intelligent assist technologies, driver education programs, and road maintenance and other road infrastructure work.

This paper outlines findings from a study that examined the circumstances surrounding heavy vehicle speeding in New South Wales in an eight year period between 2003 and 2011. Based on the evidence, a number of suggestions are made about how heavy vehicle speed management could be further enhanced in New South Wales and in other Australian jurisdictions.

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Truck or heavy vehicle crashes feature regularly in print, online and television media. When a heavy vehicle is involved in a serious crash, particularly one involving loss of human life, this often triggers public debate about the road conditions at the location of the crash, the factors that may have contributed to the crash and how the government is addressing the issue. Recently, there have been a number of high profile stories involving speeding heavy vehicles (eg Cuneo 2012; Waters 2012) that have led to renewed public debate focused on the types of interventions necessary to effectively respond to truck drivers who regularly speed and heavy vehicle companies that tamper with heavy vehicle speed limiter equipment or encourage other practices that flout the law.

Effective responses to a problem, which derive long-term benefits, require a solid understanding of that problem. However, there is surprisingly little publicly available research about the nature of offending behaviour that is committed by heavy vehicle drivers and operators, particularly heavy vehicle speeding. This paper goes some way towards redressing this gap by describing the types of heavy vehicles that are most often detected speeding and the typical circumstances in which this occurs. It then discusses the implications of these findings for Australian policy and practice at national, and state and territory levels.

What is heavy vehicle speeding?

Speeding most commonly refers to an offence where a vehicle travels faster than the signposted speed limit designated for a given area. However, it can also be defined as driving at a speed that is inappropriate for the conditions (RTA 2003). Heavy vehicles (vehicles whose Gross Vehicle Mass is in excess of 4.5 tonnes) are also subject to speed restrictions that do not apply to other vehicles. For instance, the maximum speed limit for heavy trucks and road trains (7+ axle vehicles with either 2 or 3 trailers) in New South Wales is 100 km/h and 90km/h respectively and differential speed limits may apply to heavy vehicles in certain locations, such as on steep inclines (RTA 2003).

What is already known about heavy vehicle speeding?

Although very little research has been published on the prevalence of heavy vehicle speeding on Australian roads, available evidence suggests that it is common. One way heavy vehicle speed information is obtained is through weigh-in-motion stations. Weigh-in-motion stations collect information about traffic volume and loading, which are important in determining (among other things) appropriate road treatments, the value of freight traveling on the roadway system and the relative cost responsibility of different road users. Weigh-in-motion data from a number of Australian states (excluding Western Australia and the Northern Territory) found that 17 percent of two-axle trucks and 26 percent of six-axle articulated trucks exceeded the speed limit, although the majority of trucks (81% of 2-axle trucks and 87% of 6-axle trucks) were detected speeding at no more than 10km/h over the posted limit (George 2003). Further, qualitative research based on interviews with heavy vehicle drivers suggests that up to 55 percent of truck drivers had received at least one speeding fine while driving a heavy vehicle within the 12 months prior to interview (AMR Interactive 2006; Hensher et al. 1991).

However, an analysis of speed data from weigh-in-motion sites in New South Wales and Victoria between 1996 and 2002 indicates that only a minority of heavy vehicle drivers exceed the speed limit by 10km/h or more (NTC 2005), which is consistent with the findings for other motorists based on speed data obtained from Global Positioning System technology (Ellison & Greaves 2010). Moreover, heavy vehicle drivers have been found to be *less* likely to speed overall than other classes of driver, as measured by traffic surveys conducted at fixed speed cameras sites (Friswell, Irvine & Williamson 2003).

Although speeding is a significant risk factor for road crashes for all types of motor vehicles, it is generally considered to be a more critical factor in heavy vehicle crashes. This is because of:

- longer breaking distances—heavy vehicles require between 20 to 40 percent more stopping distance;
- shorter reaction times—reaction time is a smaller proportion of stopping distance;
- greater instability—heavy vehicles are less stable than lighter vehicles, which makes emergency manoeuvres and loss of control on curves more likely; and
- greater collision energy—due to their size and rigidity, heavy vehicles exert more collision energy and cause more damage on impact than do other vehicles (Bishop et al. 2008; Brooks 2002; NTC 2005).

Risk factors

Attempts have been made to create risk profiles of speeding drivers. Risk profiling is useful for policymakers as it provides an insight into the reasons behind problem behaviour and so assists to tailor prevention schemes to manage those who are likely to speed and particularly those who speed repeatedly. Risk profiling also assists law enforcement to develop proactive policing responses. Available research (eg AMR Interactive 2006; Hensher et al. 1991; Quinlan & Wright 2008; Watson et al. 2009) indicates that risk factors associated with heavy vehicle speeding relate to the individual characteristics of the driver (for instance, young, inexperienced drivers generally speed more often than older, experienced drivers and drivers who have a previous history of offending are also more likely to speed) and the driving conditions/environment (such as distance travelled, time of travel, weather conditions etc). Other risk factors include:

- professional driving culture—some heavy vehicle drivers regard speeding fines as a necessary cost of doing business and have negative attitudes towards speeding legislation and limits (AMR Interactive 2006);
- workplace 'safety' culture—some companies have better track records than others in relation to enforcing safe driving practices (AMR Interactive 2006);
- competition in the road transport industry—for example, operators and drivers using payment schemes that encourage speeding and competition for a place at the front of loading/unloading queues at distribution centres (Hensher & Battellino 1990; Hensher et al. 1991);
- pressure to cover operational costs, particularly among small companies (Quinlan & Wright 2008); and
- tight delivery deadlines—it is increasingly common for consigners to impose fines on operators who miss delivery deadlines, a pressure that can impact on driver behaviour (Quinlan & Wright 2008).

This study

The Australian Institute of Criminology (AIC) was commissioned by the (then) New South Wales Roads and Traffic Authority (RTA) in 2011 to evaluate its former *Three Strikes and You're Out* policy, a scheme designed to improve road safety by reducing the incidence of heavy vehicle speeding through the use of certain education and enforcement measures (while *Three Strikes and You're Out* is no longer operating in New South Wales, enhanced policy responses to heavy vehicle speeding are being developed and implemented by the NSW Roads & Maritime Services). An important aspect of the evaluation included profiling heavy vehicle speeders using administrative data from the scheme, the major results of which are presented in this paper.

Under the *Three Strikes and You're Out* scheme, when a heavy vehicle was detected travelling at 15 km/h or more over the posted or relevant heavy vehicle speed limit by a mobile police unit or fixed speed camera, the RTA recorded a 'strike' against the vehicle's registration. Each strike remained active for a period of three years from the date of the first speeding incident. Where three strikes were recorded within a three year period, the RTA suspended the registration of the heavy vehicle (or driving privileges within New South Wales if the vehicle was not registered in New South Wales) for 28 days. This suspension period increased to three months if any additional strikes were recorded against the vehicle within the three years.

The Three Strikes and You're Out data

The *Three Strikes and You're Out* scheme was designed to focus on the responsibilities of heavy vehicle operators (ie vehicle owners), rather than drivers thus, speeding infringement data collected by the RTA and collated for the purposes of the scheme only related to the registration details of heavy vehicles that had been detected speeding at 15 km/h or more over the speed limit—the data collection did *not* contain driver information, or information about speeding behaviour that occurred under the 15km/h threshold (ie speeds greater than 100km/h, but less than 115km/h). As such, the speeding data that are described here relate only to *registered heavy vehicles* that were detected speeding at what could be considered excessive levels, rather than individuals.

A further caveat is that the available data were not disaggregated into fixed and mobile camera enforcement and so it was not possible to determine if the data were fully representative of these enforcement methods. Also, it was not possible to determine from the data the extent to which different enforcement activity was constant throughout the evaluation period. Each of these factors has the potential to influence the dataset. For example, if fixed speed cameras represent a large proportion of the detections, then the data will be skewed towards where they are located. Similarly, police resourcing influences the location and duration of speed enforcement, which may also influence the data.

Finally, it is not possible to determine from the dataset how representative the sample of speeding heavy vehicles is from this study compared with the population of speeding vehicles. For instance, if one characteristic of repeat or recidivist speeding offenders is that they develop effective avoidance behaviour (which means that they are less likely to be detected speeding), this will then bias the dataset towards recidivist speeders who *were* detected speeding and hence the circumstances in which they engaged in the speeding behaviour.

Results from the profiling analysis

Between 1 January 2003 and 2 April 2011 (the period evaluated), 12,107 heavy vehicles were issued at least one strike for speeding at or more than 15 km/h over the posted limit (see Table 1). Of these, 10,363 (86%) vehicles received one strike only, while 422 (3%) vehicles received three or more strikes. One percent of vehicles received four or more strikes within the period.

Table 1 Heavy vehicle speeding infringements issued under *Three Strikes and You're Out*, January 2003–April 2011

Strike group	Vehicles (n)
1 strike	10,363
2 strikes	1,322
3 strikes	294
4+ strikes	128
Total	12,107

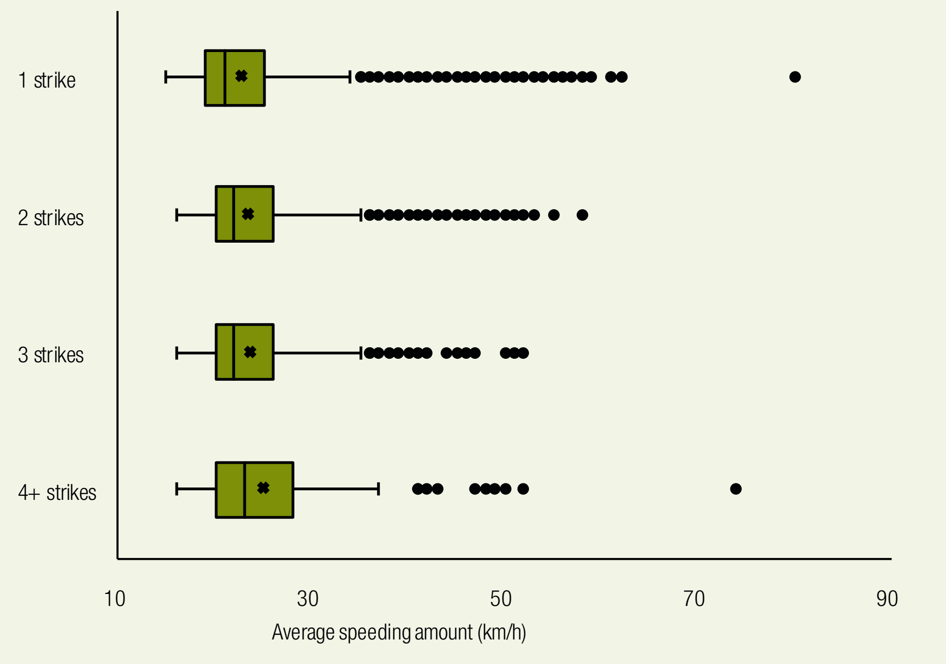
Source: AIC Three Strikes evaluation dataset

Speeding amounts

Overall, heavy vehicles that received a strike under the scheme were detected travelling an average of 24 km/h over the posted speed limit. Vehicles that received one strike only (n=10,363), the 'non-recidivist' vehicles, were detected travelling an average of 23 km/h over the posted limit, compared with 24 km/h for those that received between two (n=1,322) and three strikes (n=294), and 25 km/h for those receiving four or more strikes (n=128). Figure 1 illustrates the differences in average speed across the strike groups using box plots. Box plots are useful for displaying differences between populations, including not only group averages, but the degree of dispersion and skewedness of different groups, and any statistical outliers.

Kruskal-Wallis tests of significance were undertaken to examine the level of statistical difference across the groups for all of the analyses outlined below (Kruskal-Wallis is used to test for differences in the mean/median between groups when the samples are not normally distributed, as was the case with the Three Strikes evaluation dataset). In this instance, the difference between the average speeds across the strike groups was found to be small, although statistically significant (χ^2=127.7; p<0.001). That is, those vehicles that received the largest number of strikes (the highly recidivist vehicles) sped at (slightly) higher speeds on average than the non-recidivist vehicles.

Figure 1 Boxplot of average speeding amount by strike group, January 2003–April 2011



Note: The left side of the boxplot represents the 25th percentile and the right side of the box the 75th percentile. The black line inside the box represents the median (50th percentile) and the black 'x' the group mean. The 'whiskers' represent the lowest value within 1.5 of the interquartile range (IQR) of the lower quartile and the highest value within 1.5 of the IQR of the upper quartile. The black dots represent the values that fall outside 1.5 of the IQR; that is, the 'outliers'

Source: AIC Three Strikes evaluation dataset

Time of offence

The analysis identified a clear relationship between time of speeding offence and vehicles that had received multiple strikes (see Figure 2). In particular, there appeared to be a strong relationship between heavy vehicles that received three or more strikes and speeding at night; 36 percent of all strikes for vehicles in the three strike category and 37 percent of all strikes for vehicles in the four or more strikes category occurred between midnight and 6:00 am, compared with 31 percent of all strikes for vehicles that had received two strikes and 23 percent that had received one strike only.

If the time categories are combined into two time periods representing 'day' (6:00 am –6:00 pm) and 'night' (6:00 pm–6:00 am), the relationship between recidivist vehicles and speeding at night time is more evident. For example, 78 percent of strikes for vehicles with four plus strikes occurred at night, compared with only 48 percent of all strikes for vehicles that had received one strike only. These relationships are statistically significant (χ^2=596.9, p<0.001). The strike group most strongly influencing the level of statistical significance was the one strike only group, followed by the two strikes group (adjusted residuals 23.7 and 14.6 respectively).

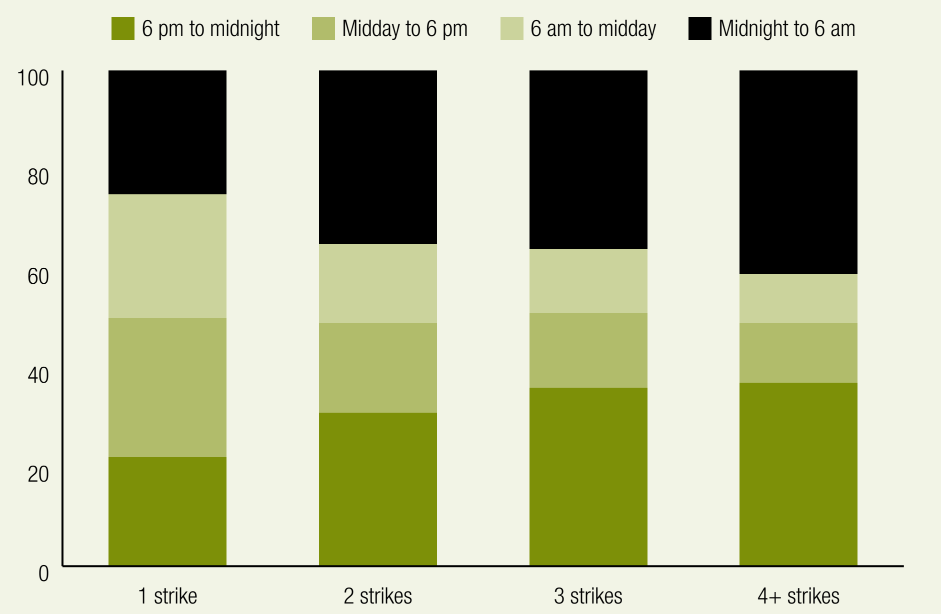
Speed zones

Overall, 35 percent of vehicles were detected speeding in zones that had posted limits of at least 90 km/h, although a third of all vehicles were also detected speeding in zones with posted speed limits of between 50 and 60 km/h. A further 24 percent of heavy vehicles were detected speeding in zones that had posted limits of between 70 and 80km/h, while eight percent were detected speeding in zones that were posted at 40km/h or less.

A breakdown by strike group again revealed a number of differences between the groups. Recidivist vehicles, especially those that had received four or more strikes, were far more likely than others to be detected speeding in high speed limit zones and less likely than the other strike groups to be detected speeding in lower speed limit zones. For example, 65 percent of four plus strike vehicles were detected speeding in 90 km/h and above zones, while less than a third (28%) of one strike vehicles were detected speeding in these same zones.

The differences between the strike groups are statistically significant (χ^2=996.8, p<0.001). The groups most strongly influencing the level of statistical significance were the one strike only and two strikes groups in the 90–100 km/h speed zone (adjusted residuals 28.0 and 16.8 respectively).

Figure 2 Time of offence by vehicle strike group, January 2003–April 2011 (%)



Source: AIC Three Strikes evaluation dataset

Road type

To explore the types of settings in which vehicles were detected speeding, the AIC used the street name where the speeding was detected to classify the location of offences into four broad road types:

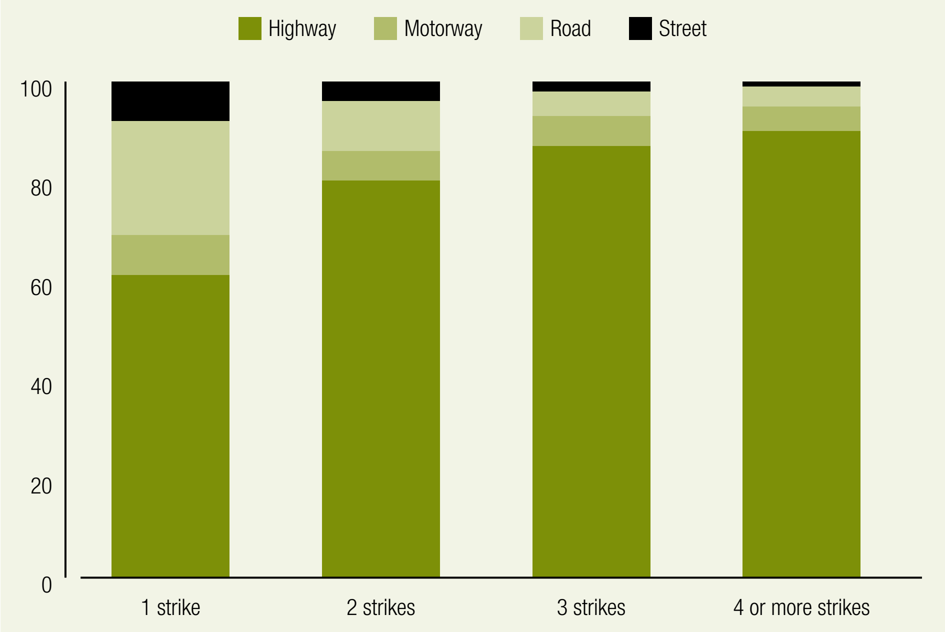
- highway (highway, bypass);
- motorway (motorway, freeway, tunnel such as the Eastern Distributor in Sydney, plus on/off ramps);
- road (road, drive, way); and
- streets (street, lane, avenue, parade, circuit and anything else not otherwise classified).

While all heavy vehicles were more likely to be detected speeding on highways, vehicles that had received multiple strikes were much more likely than other vehicles to be detected speeding on this road type (see Figure 3). For instance, just over 90 percent of the four plus strike group was detected speeding on a highway, whereas approximately 60 percent of vehicles that had received one strike only were found to have sped on this road type. Again, the differences between the strike groups are statistically significant (χ^2=767.6, p<0.001). The strike group most strongly influencing the level of statistical significance was the one strike only group (adjusted residuals 26.5 for *highway* and 21.2 for *road*).

Speeding in metropolitan, regional and rural locations

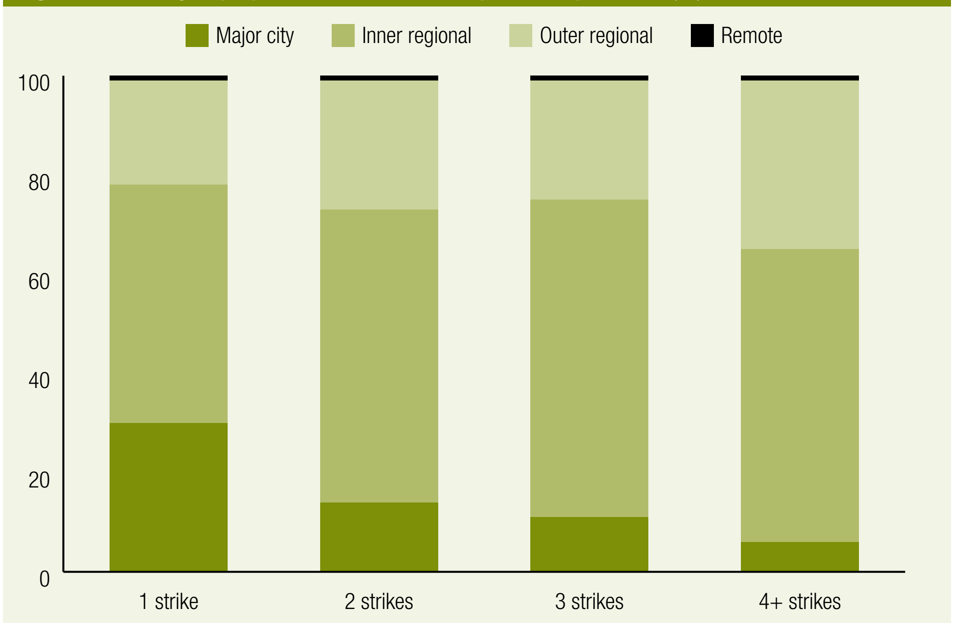
To further explore the location of the offence, the AIC examined speeding offences detected in metropolitan, regional and rural settings. Using the Australian Bureau of Statistics' (ABS) *Remoteness Index*, the AIC linked the evaluation data to infringements falling within *major cities*, *inner regional*, *outer regional* and *remote* areas. The majority of four plus strike vehicles (93%) were detected speeding in the inner and outer regional parts of New South Wales (see Figure 4); that is, where there are likely to be a greater number of

Figure 3 Road type by strike group, January 2003–April 2011 (%)



Source: AIC Three Strikes evaluation dataset

Figure 4 Strike group by NSW location, January 2003–April 2011 (%)



Source: AIC Three Strikes evaluation dataset

highways. Conversely, a large proportion of vehicles that had received one strike only (30%) were caught speeding in NSW metropolitan areas (although a further 49% were also detected speeding in inner regional locations). Again, the location of speeding offences and strike groups are strongly and significantly related (χ^2= 570.5, *p*<0.001). The strike groups most strongly influencing the level of statistical significance were the one strike only and two strikes groups (adjusted residuals 22.9 and 15.0 for *major city* respectively).

In mapping the offence locations, the differences between the strike groups are underscored. Figure 5, a map of the locations by suburb in which all one strike vehicles were detected speeding, illustrates the broad spread of offence locations for this strike group. By contrast, Figure 6, a map of locations in which all four plus strike vehicles were detected speeding, confirms that the offence locations for these vehicles are limited to a handful of major highways (the Hume, Pacific, New England and Newell Highways).

These findings highlight the difference between highly recidivist vehicles and others. In particular, it indicates that non-recidivist vehicles, which were detected speeding more often during daylight hours, were also typically caught speeding in lower speed zones and in a wider range of locations.

Interstate vehicles

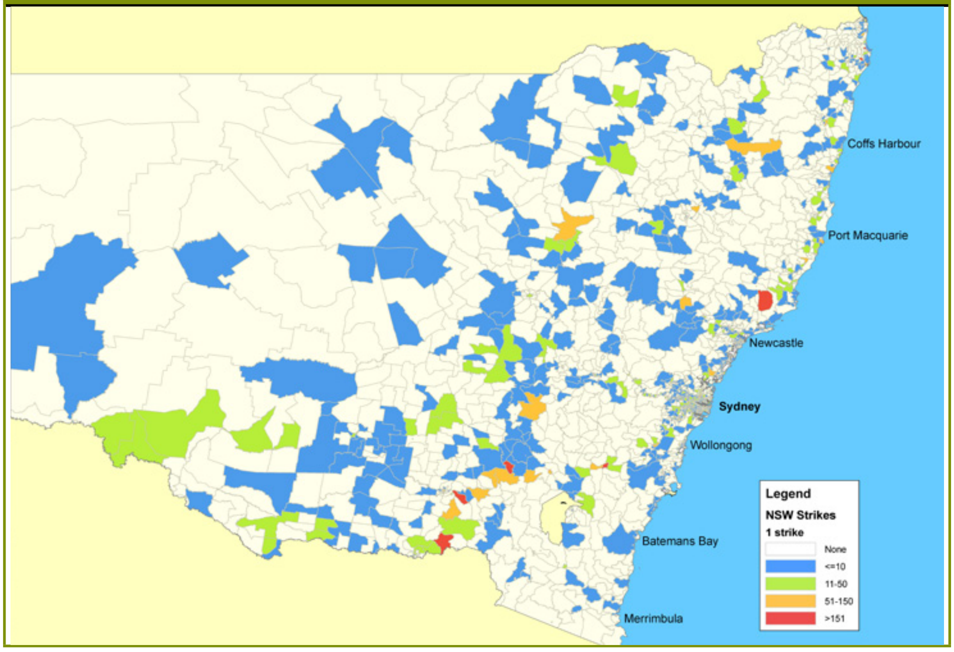
The analysis indicated that slightly more New South Wales registered vehicles compared with interstate vehicles (53%, compared with 47%) received a strike. However, vehicles that received multiple strikes were more likely to have been registered outside of New South Wales. For example, within the four plus strike group, 97 vehicles were registered in New South Wales, while 471 vehicles were registered elsewhere. These results are statistically significant (χ^2=978.8, *p*<0.001). The strike group that most strongly influenced the level of statistical significance was the one strike only group (adjusted residuals 30.0 for New South Wales registered vehicles and 23.5 for Victorian registered vehicles in this strike group).

This pattern does not mean that interstate registered vehicles are more problematic than New South Wales registered vehicles per se. Rather, the pattern is likely to be evident because New South Wales acts as an important transit state between other jurisdictions (such as between Victoria and Queensland) and there is simply a very large volume of interstate heavy vehicle traffic traversing New South Wales at any given time that makes it more likely that these vehicles will be detected speeding. It is also possible that those interstate drivers may be less familiar with the locations of active speed enforcement than local drivers, or that there is heavier enforcement of the roads where interstate vehicles are likely to pass through.

Discussion and implications

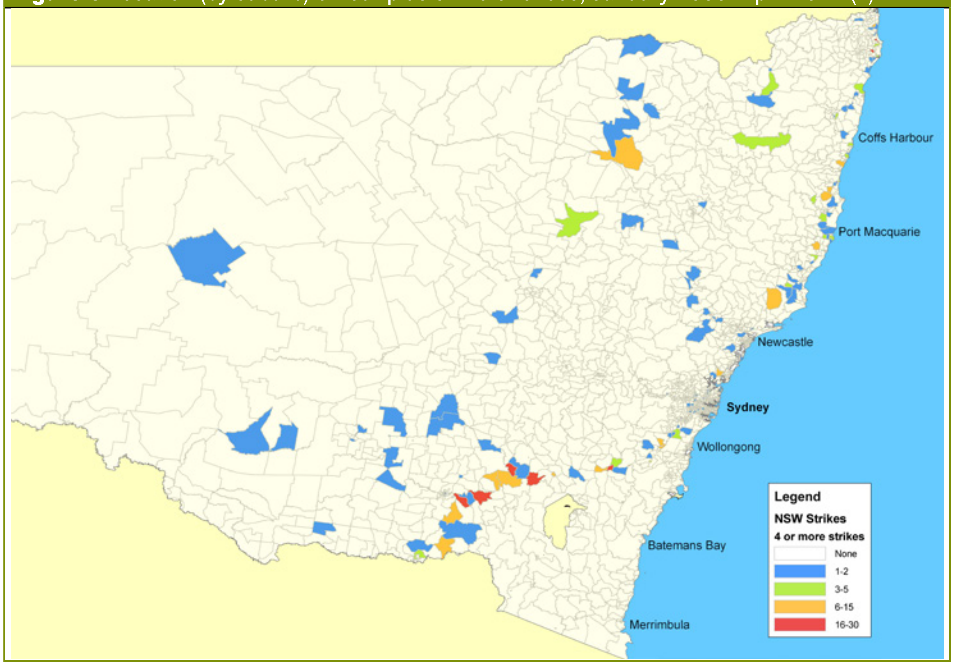
Taken together, the findings indicate that heavy vehicles that are detected speeding on multiple occasions (particularly vehicles that had received 4 or more strikes) were typically travelling in regional settings, at

Figure 5 Location (by suburb) of one strike only offences, January 2003–April 2011 (n)



Source: AIC Three Strikes evaluation dataset

Figure 6 Location (by suburb) of four plus strike offences, January 2003–April 2011 (n)



Source: AIC Three Strikes evaluation dataset

night, along highways and were detected travelling at greater speeds than vehicles with fewer strikes. While some caution should be exercised in interpreting the findings because of uncertainty about the representativeness of the *Three Strikes and You're Out* evaluation dataset, the findings suggest two broad offender groups. That is, one large group of 'offenders' (ie heavy vehicles) that was only ever detected speeding on one or two occasions and that was generally made up of local New South Wales registered vehicles and a smaller group of heavy vehicles that was detected speeding on multiple occasions and was predominantly comprised of interstate registered vehicles.

This difference could be attributed to more active speed enforcement along the highways, although this is unlikely to explain all of the discrepancies. The momentum that these vehicles can build on the long stretches of highways in these locations, which makes it more difficult than smaller heavy vehicles to rapidly slow down, may also play a part. Further, there is simply a very large volume of interstate heavy vehicle traffic travelling through New South Wales that makes it more likely that long haul vehicles will be detected speeding on highways in regional locations. To put this into some context, in 2011 there were over 500,000 registered heavy vehicles operating in Australia (ABS 2011a). Moreover, the ABS estimated that in 2010, the total tonne-kilometres travelled by freight vehicles in Australia was 185,911 million (a tonne-kilometre is a metric used to measure the quantity and traffic of transportation. One tonne-kilometre equals 1,000 kilograms/kilometre; ABS 2011b). Leaving aside the other jurisdictions, around 19 percent of all traffic on the Pacific Highway south of Coffs Harbour in New South Wales is estimated to comprise heavy vehicles, which translates to an average annual daily traffic rate in this area alone of between 1,283 and 2,575 heavy vehicles, depending on the specific location (the average annual daily traffic rate is the total volume of vehicle traffic of a road for a year divided by 365 days. It is a measurement of how busy a road is and is often used in transport planning; SKM 2010).

While the research literature (George 2003; NTC 2005) indicates that only a minority of heavy vehicle drivers exceed the speed limit by 10km/h or more, it is still concerning that excessive speeding does occur. In the evaluation period, 2,047 heavy vehicles were detected travelling at, or in excess of, 30km/h over the speed limit. As noted above, speeding is a critical risk factor in heavy vehicle crashes because of their (among other things) greater collision energy and requirement for longer breaking distances.

Current strategies used to respond to speeding

The research evidence suggests that if heavy vehicles fully complied with the speed limit then this would translate into a 29 percent reduction in heavy vehicle crashes, not only saving lives, but also costs to the trucking industry, police, health and other sectors (Brooks 2002). So, what is being done to prevent trucks from speeding?

Heavy vehicle speed management is the joint responsibility of:

- state and territory transport authorities;
- the police;
- insurance companies;
- road freight industry accords;
- heavy vehicle operators; and
- state and federal governments (NTC 2005).

Australian road transport authorities and law enforcement agencies use a range of measures to reduce speeding, including through specific legislation, policies, education programs, vehicle and road-based prevention measures (like speed limiter and other technologies), and the enforcement of speeding penalties through a range of camera and other technologies. This suite of measures belongs to the broader regulatory environment that is intended to improve overall road safety, including at the national level through the *National Road Safety Strategy 2011–2020* and at the jurisdictional level through Chain of Responsibility legislation (Chain of Responsibility is soon to be reflected at the national level in the Heavy Vehicle National Law). Chain of Responsibility recognises that the actions, inactions and demands of any party in the supply chain can have a significant impact on heavy vehicle safety.

Table 2 Examples of situational prevention measures targeting speeding

Increase effort	Increase risks	Reduce rewards	Reduce provocations	Remove excuses
Target harden Speed limiters Intelligent speed technologies Vehicle schedules Log books	Extend guardianship Visible police presence Speed cameras Automatic number plate recognition Weigh-in stations	Conceal targets	Reduce frustrations and stress Efficient administration and operations	Set rules Policies Regulations Legislation
Control access to facilities Driver screening programs	Assist natural surveillance Public	Remove targets	Avoid disputes Effective partnerships	Post instructions Guidelines Advertisements/ campaigns Correspondence
Screen exits	Reduce anonymity Automatic number plate recognition Registration systems Licensing systems	Identify property Registration systems Licensing systems	Reduce emotional arousal	Alert conscience Guidelines Advertisements/ campaigns Correspondence
Deflect offenders	Utilise place managers Visible police presence Speed cameras Weigh-in stations Public	Disrupt markets Monitor speeding Intelligence systems Inform operator of offending vehicle/ driver	Neutralise peer pressure Targeted operator/driver education Awareness-raising	Assist compliance Efficient administration Operator/driver education Awareness-raising Recognise, reward and publicise 'good' behaviour
Control tools/ weapons Speed limiters Intelligent speed technologies	Strengthen formal surveillance Visible police presence Speed cameras Automatic number plate recognition Weigh-in stations	Deny benefits Penalties Vehicle and license suspensions	Discourage imitation Censor details of 'modus operandi' Recognise, reward and publicise 'good' behaviour	Control drugs and alcohol Random roadside testing Driver screening programs

The role of situational crime prevention

Modern crime prevention approaches provide a useful method for preventing or minimising certain crime and disorder problems and could be considered as a means to further reduce speeding behaviour among heavy vehicle drivers. Situational crime prevention focuses on addressing the immediate and direct causes of a problem (rather than distant and indirect causes, such as underlying social issues). According to situational crime prevention, rapid and sustained reductions in a problem can only result from addressing its immediate causes; unless these are dealt with, the problem will continue to exist (Clarke & Eck 2003, Cornish & Clarke 2003).

Cornish and Clarke (2003) outline 25 different techniques of situational prevention, falling into five separate mechanisms, which attempt to increase the effort and risks to commit an offence, reduce any potential rewards to the offender, as well as reduce or remove any provocations and excuses. When these mechanisms are applied to road safety measures that are designed to prevent the incidence of speeding, it is possible to see the potential gaps and opportunities for enhanced responses. Examples of the situational measures intended to prevent heavy vehicle speeding are outlined in Table 2. While it is likely that there are more situational measures available than listed in the Table, this exercise reveals some important patterns. Key among these is that there are numerous existing responses that fall under the *increase risks* and *reduce excuses* mechanisms, but that there are comparatively fewer under the 'increase effort' mechanism. This may suggest that further thought needs to be given to designing and implementing strategies that address the other general techniques under this crime prevention mechanism.

Conclusion

The findings presented in this paper suggest that simplistic responses are unlikely to be an effective way of addressing heavy vehicle speeding because the circumstances in which speeding offences occur differ across time and offence location. In the current study, differences were particularly marked between the highly recidivist vehicles (vehicles that had received 4 or more strikes) and other heavy vehicles.

New South Wales, like its jurisdictional counterparts, has in place a range of interventions designed to address heavy vehicle speeding, although excessive

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speeding is still evident. The findings suggest that enforcement and regulatory agencies in New South Wales may have further success in targeting repeat speeding offenders if they work collaboratively to enhance detection measures along the state's regional highways at night time (such as through a combination of greater police presence and camera technologies). It would be of additional benefit if these agencies worked closely with road transport industry groups, including interstate stakeholders, to identify agreed strategies that tackle the behaviour of highly recidivist operators/drivers, a group that all sectors would presumably seek to address. Situational crime prevention provides a useful means for understanding what interventions are already in place and how they work to effect behaviour change. It also provides an insight into possible intervention gaps and additional responses that may further reduce speeding behaviour and improve overall road safety.

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References

All URLs correct at August 2012

Australian Bureau of Statistics (ABS) 2011a. *Motor vehicle census, Australia, 31 Jan 2011*. cat. no. 9309.0. http://www.abs.gov.au/ausstats/abs@.nsf/mf/9309.0/

Australian Bureau of Statistics (ABS) 2011b. *Survey of motor vehicle use, Australia, 12 months ended 31 October 2010*. cat. no. 9208.0. http://www.abs.gov.au/ausstats/abs@.nsf/mf/9208.0

AMR Interactive 2006. *Speed behaviours of heavy vehicle driver—a national study*. Melbourne: National Transport Commission

Bishop R, Murray D, McDonald W, Hickman J & Bergoffen G 2008. *Safety impacts of speed limiter device installations on commercial trucks and buses: A synthesis of safety practice.* Washington: Transportation Research Board

Brooks C 2002. *Speed and heavy vehicle safety*. Paper to NRTC/ATSB National Heavy Vehicle Safety Seminar. Melbourne: 22–23 October http://www.ntc.gov.au/DocView.aspx?DocumentId=490

Clarke R & Eck J 2003. Become a problem solving crime analyst: In 55 small steps. London: Jill Dando Institute of Crime Science

Cornish DB & Clarke RV 2003. *Opportunities, precipitators and criminal decisions: A reply to Wortley's critique of situational crime prevention*. Crime Prevention Studies vol. 16. Devon: Willan Publishing

Cuneo C 2012. Fatal truckie Vincent Samuel George lost driving licence five times. *The Telegraph* 16 February. http://www.dailytelegraph.com.au/news/sydney-news/fatal-truckie-vincent-samuel-george-lost-licence-five-times/story-e6freuzi-1226272221755

Ellison AB & Greaves S 2010. *Driver characteristics and speeding behaviour*. Australasian Transport Research Forum. http://www.patrec.org/atrf.aspx

Friswell R, Irvine P & Williamson A 2003. *Heavy vehicles and speeding: Evidence from traffic survey data*. Paper to Road Safety: Research, Policing and Education Conference. Sydney: 24–26 September. http://www.rsconference.com/pdf/RS030063.pdf

George R 2003. *Heavy vehicle compliance with speed and mass limits: Evidence from weigh-in-motion devices*. Sydney: Austroads

Hensher D & Battellino H 1990. Long-distance trucking: Why do truckies speed? *Papers of the Australasian Transport Research Forum* 15(2): 537–554

Hensher D, Battellino H, Gee J & Daniels R 1991. *Long distance truck drivers on-road performance and economic reward*. Sydney: Institute of Transport Studies Graduate School of Management & Public Policy, University of Sydney

National Transport Commission (NTC) 2005. *Heavy vehicle speed compliance: Review of regulatory approaches. Discussion paper*. Melbourne: NTC

Quinlan M & Wright L 2008. *Remuneration and safety in the Australian heavy vehicle industry: A review undertaken for the National Transport Commission*. Melbourne: National Transport Commission

Roads and Traffic Authority of NSW (RTA) 2003. *Heavy vehicle safety: Issues and countermeasures*. Publication no 03.073. Sydney: RTA

Sinclair Knight Merz (SKM) 2010. *Warrell Creek to Urunga: Upgrading the Pacific Highway*. Environmental assessment vol 3, working paper 6. http://commcons.skm.com.au/macksville-urunga/

Waters J 2012. Supermarket pressure blamed for road deaths. *ABC News* 10 May. http://www.abc.net.au/news/2012-05-10/supermarkets-road-deaths/4001982

Watson B, Watson A, Siskind V & Fleiter J 2009. *Characteristics and predictors of high-range speeding offenders*. Australasian Road Safety Research, Policing and Education Conference. Sydney: 10–13 November