Blue Reflectors: An inexpensive and effective way of managing Fatigue of Drivers of Heavy Vehicles

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Abstract

In the five years 2004 – 2008 [1] nearly 18% of all fatalities on NSW roads were from fatigue related crashes. By comparison, over 23% of heavy vehicle crash fatalities in that five year period were fatigue related. In that period there were 480 heavy vehicle crash fatalities, of which 113 were fatigue related.

The increase in registrations of heavy vehicles in NSW and a commensurate increase in road freight carried means that fatigue of drivers of heavy vehicles is an extremely important issue with major cost and trauma implications for industry and the community.

A number of formal roadside rest areas are provided in NSW. In addition, the NSW RTA has approved the use of a series of Blue Reflectors to simply, effectively and at minimal cost advise drivers of heavy vehicles they are approaching an informal heavy vehicle stopping area.

Three Blue Reflectors are mounted on guide posts 300 metres from an informal site; two on a post 200 metres away and one on a post at the turnoff to the stopping area. Blue Reflectors are only used in rural areas. The Blue Reflectors are also a clever way to remind heavy vehicle drivers of their obligation to manage fatigue.

The Blue Reflector scheme is used in other states of Australia and is recognised by the heavy vehicle industry.

Key words

Blue Reflectors, fatigue, heavy vehicles, freight

Introduction: Fatigue related heavy vehicle crashes in NSW

In the five years 2004 – 2008 [1] nearly 18% of all fatalities on NSW roads were from fatigue related crashes. By comparison, over 23% of heavy vehicle crash fatalities in that five year period were fatigue related. In that period there were 480 heavy vehicle crash fatalities, of which 113 were fatigue related.

Community Costs

The 113 fatalities in the period 2004-2008 [1] from fatigue related heavy vehicle crashes in NSW resulted in a cost to the community of over $195 Million (Human Capital Cost value of $1.732M per fatality). As well, the 715 injuries from fatigue related heavy vehicle crashes resulted in a cost to the community of over $121 Million for the period (Human Capital Cost value of $170K per casualty).

However, this would only be a small portion of the total cost to the community as many crashes are not reported. As well, crashes involving heavy vehicles often result in extensive wastage of freight and significant delays to other traffic during clean-up after the incident. Such costs are difficult to quantify. There may be conjecture about what a life or an injury is worth. However, whatever perspective is taken, these crashes cost the community an enormous amount, whether in financial terms or emotional trauma.

The Freight Industry: Growth in road freight in recent years

Up until the early 1960s, railways dominated all but the shortest land-based freight task. Since then, vast improvements in road vehicle productivity and road infrastructure quality, the gradual removal of regulations restricting road freight carriage and the exponential growth in interstate trade has broadened the range of freight tasks for which road is better suited than rail.

1. 2008 data are preliminary as at 31 July 2009 and are subject to change

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The growth in road freight in Australia in recent years is illustrated in Graph 1, below. As can be seen from the graph, there has been a significant increase in the amount of freight being carried on articulated trucks since 1990.

Graph 1: Total road freight (Australia) by vehicle type 1986-87 to 2006-07
Source: ABS (in Australian transport statistics yearbook 2009)

This growth in road freight is supported by growth in the number of truck registrations. The growth in the number of registered motor vehicles (rigid and articulated trucks) in Australia in recent years is illustrated in Graph 2, above.

Graph 2: Stock of registered motor vehicles (Australia) 1991 to 2007
Source: ABS (in Australian transport statistics yearbook 2009)

This growth in road freight is supported by growth in the number of truck registrations. The growth in the number of registered motor vehicles (rigid and articulated trucks) in Australia in recent years is illustrated in Graph 2, above.

There has been a steady growth in truck registrations since 1991, with 74,400 registrations of articulated trucks and 394,500 rigid trucks in 2007. Significantly, some 80% of Australia’s long distance freight...
travels on NSW roads for at least part of its journey and some 40% of the total Australian road freight task is performed on NSW roads.

The Australian Transport Council’s National Road Safety Action Plan 2009 and 2010 [2] claims rapid growth in the Australian road freight task in the decade to November 2008. This growth was reflected in VKT figures for trucks and light commercial vehicles. For example, over the seven year period to June 2007, the estimated number of kilometres travelled by these vehicle types increased by: 23% for rigid trucks; 19% for articulated trucks; and 17% for light commercial vehicles.

The freight task is likely to be affected by a number of factors, such as the price of fuel and the global financial crisis, in coming years. A reduction in the road-based freight task is not likely in the foreseeable future and, in fact, it is likely to increase significantly, based on the above statistics.

A number of major projects have been completed in recent years that facilitated heavy vehicle usage across Australia and a number of other major projects have recently been announced that will facilitate increased heavy vehicle usage.

**Safe System Approach**

The Safe Systems approach to road safety accepts that all road users will make mistakes at some time but this should not lead to death or serious injury. This approach is currently being implemented by the RTA in the design, construction, operation and maintenance of roads in NSW. The Safe Systems approach to road safety concentrates on the three areas where roads and their users can be made safer:

- Safer Roads – all aspects of the road structure and its surrounds
- Safer Speeds
- Safer Vehicles – all aspects of vehicle safety

Making a road safe doesn’t simply mean applying road design standards and practices and assuming that it will be safe. It requires a more holistic approach where the relationship of the road environment is more closely related to the crash performance to ensure an overall safely functioning transport system.

This means that road safety practitioners need to work actively with other agencies across government and the community to implement evidence based strategies to improve road safety. This also means that we must accommodate the needs of drivers in provision of infrastructure. Drivers of heavy vehicles spend long hours behind the wheel of their work place. They need to be provided with the opportunity to take a break, to rest and to check their vehicle and load.

**Recent legislation**

Heavy vehicle driver fatigue management legislation was introduced in NSW in 2008. It applies to trucks over 12 tonne GVM in NSW and focuses on the causes of driver fatigue rather than simply regulating hours at the wheel. Operators who work long hours and night shifts will be required to reduce driver fatigue risks through an audited accreditation scheme. A key component of the legislation is a duty to manage fatigue. It includes chain of responsibility provisions which extends to all parties in the transport chain who must take ‘reasonable steps’ to prevent driver fatigue consistent with existing NSW WorkCover Occupational Health and Safety laws. The new laws will enable industry to develop workable fatigue management schemes. This legislation must be supported by the provision of opportunities for drivers of heavy vehicles to rest.

**The Blue Reflector Scheme**

The RTA has developed guidelines for the provision of informal stopping opportunities for the drivers of heavy vehicles to take a rest break or to check their vehicle.

These opportunities include:

- A hierarchy of formal stopping opportunities that are provided, signposted and maintained by the relevant road authority.
- Informal areas developed through use, over time, by the heavy vehicle industry.

Drivers of heavy vehicles unfamiliar with a route are less likely to be able to identify informal sites, particularly at night when they are more likely to need them. Given the importance of being able to stop...
safely to take appropriate rest breaks, consideration has been given to the marking of informal heavy vehicle stopping areas so that they can be more readily identified.

In deciding to identify an informal heavy vehicle stopping area with Blue Reflectors, the RTA effectively takes on some liability for the site. Determining what sites are appropriate for the Blue Reflector treatment involves a site inspection and review of the region’s freight routes. This review should take into account a range of factors detailed in the guidelines developed by the RTA and assessment of “second tier” sites which would preferably be upgraded before installing the Blue Reflectors (e.g. by sealing the wearing surface).

Generally, unless there are obvious opportunities to install Blue Reflectors during other works, implementation should be carried out first on key freight routes. When determining which sites are suitable for the Blue Reflector treatment, road safety must also be considered.

A site’s location and related features might make it inappropriate for the Blue Reflector treatment. For example, a site might be close to residential or business premises or to road intersections and are therefore likely to cause amenity issues (e.g: headlight glare, noise, vehicle exhaust).

Sight distance and safe stopping distances

For a site to become a Blue Reflector site, safe sight distances are essential. If safe sight distances are not observed there is too high a risk of a rear-end collision if a heavy vehicle suddenly brakes to enter a site or re-enters the traffic stream without sufficient warning to other road users. Sight distance to and from the site can also be affected by the driver’s eye height and poor weather conditions.

The minimum ‘safe sight distance’ can depend on site conditions. A vehicle’s mass and speed also affects how quickly a driver can slow and stop. As well as this, parked heavy vehicles may influence sight lines.

In general, sight distance should be adequate to enable safe stopping with sites appropriate for Blue Reflectors having at least 250 metres sight distance to the site.

Sight distance should also be sufficient for the driver of a heavy vehicle to see whether there is already a heavy vehicle parked at the Blue Reflector site and, if so, whether there is sufficient room to accommodate more than one heavy vehicle and to safely manoeuvre at the site.

Access to the site

Even if there is adequate sight distance to an informal heavy vehicle stopping area, there may not be safe ingress conditions. There may be some sections of rural highway with driveways and busy local intersections near the sites. Installing Blue Reflectors at such sites is likely to add to driver confusion and increase the risk of a collision. Interference with the normal operation of the junction caused by heavy vehicles entering and exiting the site may result in conflict between vehicle movements. Generally, sites within 100m of intersections or major driveways should not be treated with Blue Reflectors.

Sites appropriate for the Blue Reflector treatment should be easy to access, with good shoulder condition, no significant drop-off and a relatively smooth transition between the highway and the site.

Site surface condition etc

Generally, these informal sites:

- have developed through use on areas outside the extent of the road pavement
- are unsealed, but have appropriate pavement material

To be considered for the Blue Reflector treatment, a site’s ‘hard stand’ area should be of a standard to accommodate a heavy vehicle without the risk of bogging in normal conditions. It is recommended that sites which become boggy in wet weather should not be marked with Blue Reflectors.

Length & Width

Sites appropriate for the Blue Reflector treatment should be able to accommodate the largest heavy vehicles that can legally use that route, with room for the heavy vehicle to manoeuvre into and out of the site without damage to the infrastructure.
Informal heavy vehicle stopping areas suitable for the Blue Reflector treatment should be wide enough to allow the heavy vehicle driver to pull off the road, clear of the shoulder, with enough space for them to walk around their vehicle safely.

Egress from the site

Sites suitable for Blue Reflector treatment should have safe egress for leaving the site and re-entering the traffic stream. Ease and safety of egress from the site, including the safety of those driving past the site, will be influenced by the volume of traffic in the main traffic stream. It will also be affected if overtaking is permitted in the ‘opposite’ direction – because of the risk of a head-on collision between a vehicle leaving the site and a vehicle overtaking in the opposite direction. Installation of barrier centre line or other appropriate treatment should be considered in the vicinity of the access points to prohibit vehicles from using the opposing lanes to overtake. Informal heavy vehicle stopping areas in these circumstances should not be treated with Blue Reflectors unless such a carriageway separator is provided.

Noise and other amenity issues

It is not recommended that Blue Reflectors sites are implemented close to residential and business areas as they may cause local amenity impacts including heavy vehicle exhaust, headlight glare and noise. Noise generated at heavy vehicle stopping areas near homes and / or businesses can result in loss of amenity to nearby residents.

Installing Blue Reflectors

The Blue Reflectors should be circular and sky blue in colour. Reflectors should be of high quality and retro-reflective. The Blue Reflectors should be placed vertically on the guide post below the existing red reflector. Where possible, spacing between the reflectors on a guidepost should be a maximum of 85mm with a minimum spacing of 50mm between reflectors.

The reflectors are installed in a 3  2   1 pattern:

- Three Blue Reflectors on a guide post 400m to 500m before the site
- Two Blue Reflectors on a guide post 200m to 250m before the site
- One Blue Reflector on a guide post immediately before the site


Blue Reflectors in NSW: Current situation

The Blue Reflector system is being progressively installed along a number of routes in NSW. Blue Reflectors have been posted on the approaches to more than 100 informal rest areas around the State to provide heavy vehicle drivers with more time to slow down and pull over. These Blue Reflectors are a practical, cost effective way to let drivers who might be unfamiliar with the road know that informal rest areas are available. The circular Blue Reflectors are also a clever way to remind heavy vehicle drivers of their obligation to manage fatigue.

The RTA also has a web page which marks the locations of the main rest areas around the State to assist in trip planning at: http://www.rta.nsw.gov.au/heavyvehicles/downloads/restareas/rest_area_dl1.html

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There are, currently, approximately 100 sites established on roads in the west of NSW with more to follow as soon as resources permit. Observations and industry inquiries reveal that Blue Reflector sites are well received & used by the heavy vehicle industry with no recorded adverse comments. Cost of reflectors is approximately $5.00 each with 6 reflectors per site.

Conclusion

The growth in freight carried by road transport and the increase in registrations of heavy vehicles in recent years, the onus of provision of safe working conditions, including in heavy vehicles, being carried by all involved in the supply chain and fatigue management legislation has required the development of strategies and options to provide stopping and rest locations for those vehicles.

One option that has been instigated in NSW is the Blue Reflector scheme. Each informal rest area location can be easily and cheaply identified. The Blue Reflector scheme does not replace the need for formal rest areas. However, the scheme does augment the existing formal rest area infrastructure by identifying, effectively and inexpensively, locations where the drivers of heavy vehicles can take a break to rest and check their vehicle and load.

References
