

ACRS Submission on ONRSR Code of Practice – Level Crossings and Train Visibility



About the Australasian College of Road Safety

The Australasian College of Road Safety was established in 1988 and is the region's peak organisation for road safety professionals and members of the public who are focused on saving lives and serious injuries on our roads.

The College Patron is His Excellency General the Honourable David John Hurley AC DSC (Retd), Governor-General of the Commonwealth of Australia.

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Introduction

The Australasian College of Road Safety is the region's peak membership association for road safety with a vision of eliminating death and serious injury on the road. Our members include experts from all areas of road safety including policy makers, health and transport professionals, academics, community organisations, researchers, federal, state and local government agencies, private companies and members of the public. The purpose of the College is to support our members in their efforts to eliminate serious road trauma through knowledge sharing, professional development, networking and advocacy. Our objectives include the promotion of road safety as a critical organisational objective within government, business and the community; the promotion and advocacy of policies and practices that support harm elimination; the improvement of relative safety outcomes for vulnerable demographic and user groups within the community; the promotion of post-crash policies and practices; and the promotion of a collegiate climate amongst all those with responsibilities for and working in road safety.

The College believes that we should prevent all fatal and serious injuries on our roads; the road traffic system must be made safe for all road users; system designers should aim to prevent human error and mitigate its consequences; life and health are not exchangeable for other benefits in society; and that all College policy positions must be evidence based.

Background

According to the Australian Rail Track Corporation (ARTC), there are more than 23,500 railway level crossings in Australia, of which approximately 80% do not have lights or boom gates⁽¹⁾. In contrast to more heavily trafficked active crossings, passive crossings provide less protection to road users, significantly increasing risk to the road users who cross them due to a lack of physical protection and lighting. Seventy-nine per cent of level crossings in Australia are passive rather than active, meaning that road users need to check for trains themselves and rely on lighting, line marking and signage to reduce the risk of error. This type of level crossing is common in regional areas throughout Australia, for example the New South Wales, Western Australian and South Australian wheatbelts.

The aim of the National Road Safety Strategy 2021-2030 (NRSS) is to eliminate deaths and serious injuries on our roads by 2050⁽²⁾. The current target is to reduce this trauma by 50% by 2030, just six years away. For such targets to be achieved, all crash types need to be reduced, including those at level crossings. All elements of our road transport system need to be strengthened through improvements under three key Safe System themes underpinning the NRSS: Safe Roads, Safe Vehicles and Safe Road Users. Speed management is embedded within all three themes and it is important to highlight the first principle of the Safe System approach to road safety; being that people will always make errors. The opportunity to make errors should not be introduced by less adequate infrastructure or vehicles, including trains. Train visibility is one such weakness in the system that facilitates errors.

The National Level Crossing Safety Strategy 2023-2032 (NLCSS) is also underpinned by the current Safe System approach for road safety, which recognises the same key road safety principles as the road network⁽³⁾.

People by nature will inadvertently make mistakes, which happens frequently even when they are not being irresponsible. When mistakes occur on the road, they can lead to crashes with serious outcomes such as death and serious injury. Road trauma will not be eradicated just by improving road user behaviour. A safe transport system must accommodate and compensate for people making mistakes, and importantly, to minimise those errors. The transport system needs to eliminate the opportunity for errors to have serious consequences and enable system users to travel safely at all times and in all circumstances.

The human body can only tolerate limited transfer of kinetic energy before being injured or dying. The human body is vulnerable and not built to withstand impact forces greater than 30km/h. For a right-angle crash between motor vehicles, this increases to impact forces greater than 50 km/h(4, 5). Given the transfer of kinetic energy in a train collision far exceeds that of a car, a 'safe speed' for a crash with a train must be less than 50 km/h.

The Safe System approach includes transport safety being a shared responsibility. Whilst everyone has a part to play the greatest onus should not be placed upon the system users who have the least control over the system. Infrastructure providers and asset owners, such as train and rolling stock owners have the greatest control over major parts of the system and therefore the onus for providing a safe transport system should be greater for them, in comparison to individual users who are expected to use the system without error yet have the least control over that system.

One of the NLCSS's guiding principles is shared responsibility using a cooperative approach between road and rail transport networks, and the collaboration required between relevant authorities. It is important that all levels of government and the relevant rail and road authorities, owners and operators agree on the guiding principles underpinning The Office of the National Rail Safety Regulator's (ONRSR) *Consultation Draft Code of Practice – Level Crossings and Train Visibility* which is an important part of improving level crossing safety.

Layered protection around people keeps them safe from death and serious injuries on the road. If one part of the system fails, the other parts should compensate and still protect people from harm. The transport system must be designed to be safe and forgiving so that, even if a driver makes an error like not seeing the side of a train during the night, the layers of protection built into the system prevent or reduce the impact of crashes which cause death and serious injury. Given train speeds are unlikely to be reduced to a safe level, the system must be better designed so that fatalities and serious injuries are eliminated through other means. In particular with the rail network, reducing the opportunity for errors such as misjudgements due to inadequate lighting is paramount. It is crucial that the ONRSR specifies the highest standards of train lighting and visibility that are possible to ensure people are protected, particularly at passive level crossings, which have fewer layers of protection.

From a human factors' perspective, negotiating level crossings involves a range of complex elements, including hazards, situations and tasks, different contexts, as well as human capabilities and individual differences. Organisations like TrackSAFE Foundation(6) illustrate that rail operators expect road users to respond correctly to the train as a hazard without providing the necessary information and visual cues that are relevant to vehicle drivers and other road users, such as colours and lighting according to their experience in roads.

Humans cannot reasonably be expected to respond to information that is uncommon or unexpected if they are not adequately informed by measures such as lighting to illuminate a significant hazard. The 'triangle of light', a United States of America standard of 'visibility' lighting adopted in Australia whereby lamps are installed on the train in a triangular arrangement, is one example that is likely to be meaningless to drivers, particularly if they don't often drive in regional areas and it is not used on passenger trains.

Light and weather conditions, including night and day, dawn and dusk, fog, snow, rain and other conditions can also affect visibility and perception. Given trains operate in all locations around Australia, the *Code of Practice* must be applicable for all visual contexts such as the outback, agricultural areas, towns and cities, forests and natural environments. For example, road drivers may have difficulties identifying a train or estimating its approach speed or distance in poor light conditions where a single headlight, or closely spaced pair, can be easily confused with other lights. This scenario does not provide good information about speed or distance.

Train wagons are also dark, often impossible to see at night or in other poor lighting conditions. This is particularly problematic when the wagons get dirty, reflectors are not well maintained or are defaced. Therefore, wagon visibility needs to be improved beyond the minimum requirements stipulated in the Australian Standard AS7531 Rolling Stock Lighting and Visibility.

Reflectorised tape does not work at acute angles and is placed too far apart on the wagons to accommodate road user visibility. Reflectorised tape is also an inferior product compared with the best reflectors available on the market. For example, Aurizon road vehicles have flashing lights on the roof and full length 'green-yellow' coloured reflector strips along the side of the vehicle, which has good reflectivity and is more conspicuous in poor light conditions. Some mining companies also use full length 'green-yellow' coloured reflector strips, outlining the entire side profile of their heavy vehicles for better visibility.

Given the many complex factors involved in negotiating level crossings which impact drivers' visual perception, a high standard of visibility must be mandatory for freight and passenger operations. These factors illustrate that relying on the current version on AS7531 *Rolling Stock - Lighting and Visibility* is not sufficient; higher levels of safety are possible and should therefore be applied.

The standards for the transport network, including crossing design, level crossing technology and regulation for both road and rail needs to improve. However, these are beyond the scope of the *Code of Practice* and therefore not described further here.

The ACRS notes that while road users should be a primary beneficiary of improved level crossing safety, there are many others who would also benefit from reduced road trauma, including train drivers, affected families, emergency services personnel, cleanup crews and many more.

ACRS response to the Consultation Draft

The Code of Practice being developed by the ONRSR needs to improve level crossing safety not merely add another layer of data collection, auditing, consulting with railways and reporting which achieves absolutely nothing in itself.

The College contends that the draft Code relies on inaccurate assumptions:

1. That Governments, ONRSR, road users and the general public can rely on Australian Standards (AS). The AS process is not sufficiently robust to ensure public safety because it is overly influenced by industries with conflicting objectives. So, public safety is compromised in favour of private profit.
2. That AS7531 is, and always will be a good Standard. The Rail Industry Safety and Standards Board (RISSB) announced following their 2023 review that further review, trials and consultation are required to ensure the Standards are fit for purpose and meeting the needs of end users(7).

There are sections in the Code that encourage railways to do as little as they would like. Such implications should be completely avoided, and the opposite should prevail – railways must understand that they need to do much more than they have been.

In this regard a main message is for railways to shift from doing as little as possible, to as much as possible.

The College also recommends that application of the Code must be mandatory. Rail safety is facing increased scrutiny for being self-regulated and inadequate. The ONRSR Code is the chance to demonstrate that rail safety is being taken seriously by legislators and can be enforced. Evidence of railways practice indicates that mandatory regulation in some form is essential.

RISSB hasn't included adequate standards of locomotive and wagon lighting and visibility in the recent update to AS7531, so these should therefore be specified in this Code including:

- Locomotives and passenger rolling stock must have flashing beacon lights illuminated when approaching level crossings.
- Locomotives and passenger rolling stock must have side lights illuminated when approaching level crossings.
- Wagons must have a higher level of visibility than specified in AS7531.

Rolling stock operators may apply for and be granted an exemption by ONRSR if they can demonstrate that doing so is not reasonably practicable or does not reduce risk.

It should be noted that these requirements are already known to be feasible and affordable. They should have been applied years ago, and the lack of action suggests an unacceptable reluctance of railways to research, innovate and engineer their rolling stock properly and their lack of consideration for public safety.

Significant changes to the Code are required in order to meet the Minister's objectives and public expectations. The most basic issues are:

- it's not clear that it will improve level crossing safety,
- it relies on AS7531 which is a minimal standard and inadequate for high risk train operations (e.g. high use, high speed, or passenger trains),
- ONRSR can already do everything in the Code, so it's actually unnecessary and doesn't add any value,

Railway operators and rolling stock asset managers should recognise the value given to their employees by investing in safety measures that reduce fatalities or injuries to their staff, and less disruption where crash incidents close important rail links. Rolling stock operators should take inspiration from mining and industrial operators whose emphasis on workplace safety is paramount. The Code provides an opportunity to extend this approach across the whole rail network.

Conclusion and Recommendations

The ACRS supports the development of a draft Code of Practice for Level Crossing Safety to reduce trauma levels. However, the Code must adopt the highest evidence based standards to be effective. We recommend:

- The Code must be specific, mandatory and enforceable with penalties;
- ONRSR needs to be diligent and proactive in enforcing the Code, in a timely manner (i.e. quickly);
- Railways must not be able to avoid the Code or delay any activities; and
- ONRSR must report on its enforcement of the Code, in detail, at least annually, with the report made available to the public.

The ACRS appreciates the opportunity to make this submission and contribute to improved level crossing safety. Please do not hesitate to contact me should you require any further information.



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