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Chairperson  
Senate Inquiry into Level Crossing Road Safety  
Parliament House  
Canberra ACT 2600

Chairperson

I write to advance the following suggestions to improve level crossing safety:

1. All stop signs adjoining rail level crossings on redundant, low use (ie less than once per week) or seasonal operation rail lines be removed. Subsequently, if relevant, prior to any authorised rail operation along same (eg occasional historical train operation, irregular functional or seasonal primary industry rail operation) temporary updated signage should be installed. Furthermore immediately prior to the temporary signage installation all level crossings should be checked for adequate rail unit approach visibility and be maintained in regard vegetation / weed control. Furthermore, immediately post, or as soon as practical, of the rail operation the temporary signage, at each subject level crossing, should be removed.
2. Since rail vehicle / unit driver cabins constituent a work environment the lead carriage roof / upper face of all moving rail equipment (including historical rail units) should be affixed with an operating sufficiently luminous orange flashing light. This light should only flash whilst ever the rail unit is actually in motion. To aid imminent approach, movement direction (ie approach or departing), day time visibility and approach speed identification the flashing light must operate in addition with any other constant light beams emanating from the front of the moving rail unit. Further, rail unit drivers should be instructed to dim the major constant beam lights when approaching and passing through each level crossing road traffic visibility zone, to ensure the flashing orange light is the dominant light source on or near the rail unit lead face.
3. It should be the responsibility of all rail authorities to improve the approach visibility of rail unit movements at 'black spot' level crossings. Namely visibility limiting embankments in close proximity to rail lines should be suitably trimmed back or removed.
4. It should be the responsibility of all rail authorities to regularly maintain the approach visibility of rail unit movements at all level crossing via adequate vegetation / weed control operations. Here monitoring of, and hence maintenance scheduling operations for, remote level crossing vegetation extent could be assisted by use of 'on line' Google Earth Satellite images

depicted at appropriate resolution or other techniques (eg low level helicopter rail route aerial inspection).

5. The signage at all level crossings, on active rail routes (ie rail lines / routes used at least once per regular working week) should be replaced with a sign, which indicates to the road user; To stop should a rail unit be passing through or approaching the level crossing or should the installed flashing level crossing lights be in operation .**OR.** to proceed at 15 km/h should no approaching rail unit be initially visible.

A suitable tentative signage proposal could be advanced should the Inquiry so desire.

Here the signage recommendation for the road user to stop should a moving rail unit be initially visible is obvious. In the case that no moving, in particular approaching, rail unit is initially visible it is recommended that all road users proceed across the level crossing at slow speed to minimise the road user clearance time across the same. The need to minimise clearance time, should a rail unit suddenly approach, is paramount for heavy vehicles noting, over the last decade, the same have significantly increased in combination mass and length. It is expected heavy vehicle combination mass and length will increase further in the future.

Unfortunately expediency and time limitations prevent advance of calculated clearance time requirements for the various heavy vehicle configurations in common application. These clearance times could be calculated for differing engine power, transmission ratios and approach speeds. With availability of suitable software packages this analysis could be readily extended to identify the optimum approach speed to minimise clearance time yet facilitate a safe braking distance, for each heavy vehicle configuration. The most conservative and / or 'global' optimum approach speed, for all road users should then be applied to the proposed improved level crossing signage (ie in lieu of the fore stated tentative 15 km/h recommendation).

This improved signage should be applied as the temporary signage discussed in Item 1 above.

6. Due to the increase in general traffic speed, traffic density and heavy vehicle mass limits and configuration dimensions the signage should be situated at an approach distance three times that of the existing signage approach distance. (Again the optimum (in terms of clearance time versus safe braking distance) set back or approach distance could be calculated for the various heavy vehicle combinations using readily available software packages.)
7. The actual track safe stopping set back distance should be indicated by another hardware sign or solid white pavement marking spanning across the vehicle lane. This sign and/or pavement markings should be kept in high state of repair and be installed to each approach vehicular lane.
8. The imminent approach of a level crossing should be made apparent at least 250 m from the actual crossing. This awareness to apply caution and reduce vehicle speed should be effected by use of existing level crossing approach signage and/or pavement edge cats eyes and/or pavement lane marking ( in the form of an elongated 'X' preceded by three off suitably spaced broken lines followed by a single solid line (all in white)). This signage and/or

pavement markings should be kept in high state of repair and be installed to each approach vehicular lane.

9. The implications of the changes to the adopted level crossing signage should be disseminated to all licence holders.
10. The level crossing (both signal and multiple track) clearance time of all heavy vehicles designed in accord with Performance Based Standards (PBS) should be assessed and submitted with the vehicle's PBS application. In no case should a PBS vehicle application be approved if the calculated clearance time and safe stopping distance is inferior to that of a typical in service 'B Double'. On PBS approval the predicted clearance times and stopping distances, of each specific rig, should be calibrated by conduction of simulated level crossing situation testing.
11. In view of the grossly superior braking and traction characteristics exhibited by heavy vehicles fitted with dynamic load sharing air suspensions Road Authorities should demand upgrade of VSB 11<sup>1</sup> to stipulate heavy vehicle air suspensions exhibit optimum **dynamic** (in lieu of the existing inferior static) load sharing characteristics to attract road friendly certification.

I hope these suggestions assist. I look forward the possible opportunity to assist the Senate Inquiry further and the recommendations advanced from the same.

Yours faithfully



Dr A. G. McLean  
Senior Partner

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<sup>1</sup> Australian Government (2004) Certification of Road Friendly Suspensions. Vehicle Safety Standards: Vehicle Standards Bulletin VSB 11