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Collisions at level crossings

2.1 The data published by Australian Transport Safety Bureau (ATSB), and included at Table 1, shows the total number of road vehicle collisions at level crossings in Australia (both fatal and non-fatal collisions) in the four years since the Committee released the *Train Illumination* report. The states with the highest number of road vehicle collisions at level crossings were Victoria and Queensland with 93 and 76 respectively. New South Wales and South Australia followed with 35 and 33 respectively, while Western Australia, Tasmania and the Northern Territory had the fewest over the period with 18, 15 and 2 respectively.

Table 1 Road vehicle collisions at level crossings, July 2004—June 2008

Year		NSW	Vic	Qld	S.A.	WA	Tas	NT	Australia
2004	July-Dec	8	8	11	5	1	2	0	35
2005	Jan-June	4	11	14	3	2	3	0	37
	July-Dec	2	15	7	5	4	2	0	35
2006	Jan-June	7	13	8	3	1	3	0	35
	July-Dec	2	14	14	7	3	2	2	44
2007	Jan-June	6	11	6	3	3	1	0	30
	July-Dec	4	8	7	3	2	1	0	25
2008	Jan-June	2	13	9	4	2	1	0	31
Total		35	93	76	33	18	15	2	**272**

Source *Australian Transport Safety Bureau (2008) 'Australian rail occurrence data'*

2.2 When the data is normalised at a biannual rate per million train kilometres travelled by jurisdiction and year, the order of the states is altered. The State with the highest rate of road vehicle collisions at level crossings becomes Tasmania; Victoria has the second highest, followed by the Northern Territory, South Australia, Queensland, NSW and Western Australia.[1]

2.3 These figures are approximate due to inaccuracies in data collection, according to the Cooperative Research Centre for Rail Innovation, which notes that 'it is well-known in the level crossing field that there is a distinct lack of accurate data relating to collisions at level crossings'.[2] Most jurisdictions in Australia use differing methods in the way they categorise and record the level crossing characteristics and accident data and, consequently, 'there is a lack of definitive

1 Australian Transport Safety Bureau, *Australian Rail Safety Occurrence Data 1 January 2001 to 30 June 2008,* October 2008, p. 10. Rates are: Tasmania 2.95, Victoria 0.78, Northern Territory

2 Cooperative Research Centre for Rail Innovation, *Level Crossings Research Database* website accessed on 15 December 2008, p. 5. <http://www.railcrc.net.au/publications/downloads/R2100-Level-Crossings-Research-Database.pdf>

evidence available relating to the extent and nature of level crossing collisions'. [3]

2.4 In their recent report on improving safety at level crossings, the Victorian Parliamentary Road Safety Committee concurred with this appraisal of the available data regarding level crossing collisions, stating that:

> …the Committee considers data that does exist does not assist policy makers to identify issues except in the broadest of terms.'[4]

2.5 The Committee considers a more consistent and coordinated approach to the collection of data on level crossing crashes would improve assessment of the causes of these crashes, and will discuss this further in Chapter 4 of this report.

Causes of collisions

2.6 In order to improve the safety of railway level crossings, it is first important to identify the causes of collisions. At the site at which two modes of transport meet, there are, of course, significant inherent dangers. It is, therefore difficult to identify the particular causes of collisions at level crossings, and it is certain that there is no single cause. A number of contributing factors have been identified; and in particular, it has been made clear to the Committee that the issue of motor vehicle drivers' behaviour at level crossings often has a significant role to play in these tragedies.

Motor vehicle driver behaviour

2.7 The behaviour of motor vehicle drivers has consistently been cited as the most significant factor contributing to crashes at level crossings.

2.8 The ATSB, which currently sits within the Department of Infrastructure, Transport, Regional Development and Local Government (DITRDLG), investigates approximately ten collisions at level crossings per year, across Australia. The April 2008 'Rail Safety Bulletin' published by the Bureau provides an overview of the

3 Cooperative Research Centre for Rail Innovation, 2008, p. 5.

4 Victorian Government Road Safety Committee *Inquiry into improving safety at level crossings*, December 2008, p. 24.

investigations that it conducted between April 2006 and December 2007. The Bulletin concludes thus:

> While there are many underlying factors which have led to recent collisions at level crossings, almost every time the primary factor in the accident was the failure of the motorist to abide by the traffic control measures at the crossing.[5]

2.9 This conclusion is consistently supported by evidence the Committee has received during the course of this update inquiry. In its submission to the inquiry, the Australasian Railways Association (ARA) outlined the results of the *National Road Users Survey* undertaken in 2006, conducted by the National Railway Level Crossing Behavioural Coordination Group. The survey, which involved focus groups and interviews, as well as a quantitative survey of over 4400 road users across Australia, identified significant issues regarding self-reported behaviours and attitudes at level crossings.

2.10 Significant results included:

- 24% reported engaging in illegal usage of a level crossing one or more times. This included:
  - ⇒ crossing when a train was visibly approaching;
  - ⇒ not stopping at a Stop sign;
  - ⇒ accelerating to pass under a lowering boom barrier;
  - ⇒ not waiting for the lights and boom barriers to cease operation before proceeding across train tracks;
  - ⇒ avoiding the boom barrier by driving around it; and
  - ⇒ becoming trapped between lowered boom barriers in their effort to rush across a level crossing.
- driver inattentiveness and impatience were collectively identified as the greatest factors contributing to increased risk at railway level crossings;
- one in four reported engaging in risky behaviour at railway level crossings, yet not all participants classified crossing when a train is approaching as risky; and
- 16 to 25 year old drivers were identified as the group most at risk at railway level crossings. Interestingly, this group was self-aware of their heightened risk, yet older drivers were less aware of their own risk.[6]

5 Australian Transport Safety Bureau, *Rail Safety Bulletin*, April 2008, p. 4 .

6 Australasian Railways Association (ARA), *Submission no. 10,* p. 16.

2.11 The results of the survey demonstrate the severity of the issues regarding the behaviour of motor vehicle drivers at level crossings. Kevin Taylor, General Manager of the ARA confirmed this severity by stating in evidence to the Committee at a public hearing that 'driver behaviour is the biggest single problem at level crossings.'[7]

Heavy vehicle driver behaviour

2.12 Investigations by the ATSB between April 2006 and December 2007 found that out of twelve accidents which it investigated, nine involved heavy road vehicles and four of the nine were collisions with long distance passenger trains. In the same period, three other significant accidents between heavy vehicles and passenger trains were investigated by State authorities. Nineteen people lost their lives in these accidents, thirteen on board the trains and six occupants of the road vehicles. Additionally, over 60 people were injured and the damage bill was estimated at well over $100 million.[8]

2.13 The Rail, Tram and Bus Union (RTBU), in its submission to the inquiry states that heavy vehicle driver behaviour is of particular concern:

> The RTBU argues that driver behaviour issues, particularly heavy vehicle drivers, are a crucial issue if we are going to address the biggest rail safety risk issue the rail industry faces, a repeat of the Kerang rail disaster.[9]

2.14 In 2008, the Queensland University of Technology (QUT) published the results of a study[10] which aimed to capture the experiences of heavy vehicle drivers and train drivers at level crossings to determine what factors contribute towards these accidents.

2.15 The study found that design issues and behavioural issues were perceived to be the main causes of heavy vehicle level crossing incidents. The configuration of level crossings was found to affect heavy vehicle driver visibility and effective vehicle clearance. It also found that 'wilful violation of crossing protocols, often as a time-

7 Mr Kevin Taylor, Australasian Railways Association, *Transcript of Evidence,* p. 13.

8 Australian Transport Safety Bureau, *Railway Level Crossing Safety Bulletin,* April 2008, p. 1.

9 Rail, Tram and Bus Union, *Submission no. 12*, p. 11.

10 J. Davey, A. Wallace, N. Stenson and J. Freeman, *The experiences and perceptions of heavy vehicle drivers and train drivers of dangers at railway level crossings*, June 2008.

saving measure, as well as driver complacency due to high levels of familiarity'[11] was seen as a significant behavioural factor.

2.16 Improving heavy vehicle driver behaviour at level crossings is of particular importance due to their capacity to cause more catastrophic damage when involved in a crash with a train. The RTBU states:

> Heavy road vehicles such as road trains and larger freight trains have become the norm .It used to be somewhat rare to hear of a train derailing and/ or significant casualties on board the train as a result of a collision with a road vehicle. This is not the case today.[12]

Other factors causing level crossing collisions

2.17 There are a number of other factors which have been identified through evidence and research as contributing to the causes of collisions at level crossings. Other factors are largely based on the awareness of the motor vehicle driver of an approaching train. In the CRC's Level Crossings Research Database, it is stated that:

> …the majority [of experts] would argue that under certain conditions, the failure of a motorist to detect an approaching train is a major contributing factor in vehicle-train collisions.'[13]

2.18 The Committee has received evidence that vegetation at level crossings can obscure the motor vehicle driver's sighting of an approaching train. In their submission to the inquiry, the Australian Trucking Association states that:

> Priority [must be given] to … clearing of vegetation well back from each level crossing so as to ensure clear line-of-sight for the road-user back along the rail line.[14]

2.19 Motorists' awareness of trains is also impacted on by the design or engineering of certain level crossings. In his submission to the inquiry, Mr John McCulloch explains that it is:

> …often very difficult to know exactly which direction to look to locate any fast approaching trains. (Tracks at crossings are not always at right angles to the road).

11 J. Davey, et.al., June 2008, p. 3.

12 RTBU, *Submission no. 12,* p. 12.

13 Cooperative Research Centre for Rail Innovation, 2008, p. 33.

14 Australian Trucking Association (ATA), *Submission no. 9*, p. 6.

2.20 The Committee itself experienced this during a site inspection of railway level crossings in Victoria, where the railway line met the road at an extremely acute angle.

2.21 As discussed in the 2004 report, the illumination of an approaching train can also have a major impact on the motorist's awareness of it. The CRC Research Database quotes from a 1995 report by Carroll et. al., stating:

> One important factor in the failure of motorists to detect an approaching train is the lack of visual properties on the train, other than its standard headlight.[15]

2.22 The 1995 report obviously pre-dates the introduction of the 2007 Australian Standard 7531 which will be discussed in more detail in the following chapter. The standard sets conspicuity requirements and guidelines and has had a major impact on the rate of level crossing collisions caused by poor illumination of trains.

2.23 The Committee concludes that while there is no single cause for all level crossing crashes, and therefore no one solution, the most significant factor leading to level crossing collisions is the behaviour of motor vehicle drivers, including drivers of heavy vehicles. As such methods to adapt and improve this behaviour have the potential to drastically reduce the number of level crossing crashes across Australia.

15 A. Carroll, J. Multer & S. Markos *Safety of highway- railroad grade crossings: Use of auxiliary external alerting devices to improve locomotive conspicuity*, 1995, cited in Cooperative Research Centre for Rail Innovation, 2008, p. 33.