3

Other measures to improve awareness of trains.

3.1 The Committee notes that there is a need for more work to be undertaken in the analysis of fatalities at level crossings. In particular there is a need for closer examination of pedestrian fatalities at level crossings.

3.2 The Committee has identified some modest measures to improve train visibility in chapter 2. It believes that in the long run, and short of converting all passive crossings to controlled crossings, further significant safety improvements will come from developments in Intelligent Transport Systems, (as discussed below). In the meantime, a lot can still be done to improve the safety of level crossings, such as improvements to active equipment, and improving signage at passive crossings.

3.3 The Rail Infrastructure Corporation (RIC) is proactively upgrading level crossings in New South Wales. In the last financial year, RIC upgraded 124 level crossings at a cost of nearly five million dollars. Another 300 further level crossings are in the process of being upgraded to having remote monitoring across the state.[1] This will still take time to deliver significant benefits and, as noted in Chapter 2, will not entirely eliminate the problem.

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1 Rail Infrastructure Corporation website, Level crossings http://www.ric.nsw.gov.au/safety/

Approaches to crossings

3.4 The angle at which the road approaches a level crossing is a major issue for both road users and train drivers. A poorly designed approach can hide an approaching train until the last seconds of the approach to a level crossing. The time required for drivers to stop a vehicle travelling at 100kph is at least 8 seconds. Dr Cairney calculated that, 'in order to detect and respond to the presence of a train the car driver should have detected it at least 8 seconds before arriving at the track' this is so the driver has at least 2.5 seconds to register the train, and 5 seconds braking time.[2]

3.5 One tool to better assess poor approaches to level crossings is the Queensland Risk Based Scoring System.[3] Queensland Transport and Queensland Rail have developed this scoring system to assess and quantify risk at level crossings. Some of the elements the scoring system looks at are:

- physical layout of the level crossing, e.g. sight distances, road alignment, speed of vehicles;
- volumes of road and rail traffic; and
- presence of existing protection devices.

3.6 This system is attracting support and interest in other jurisdictions. Austroads supported the scoring system in its report into reducing collisions at passive railway level crossings,[4] and it has been adopted by several other states, including Victoria and New South Wales[5].

2 Prospect for improving the conspicuity of trains at passive level crossings, Australian Transport Safety Bureau, CR 217, December 2003. p.21

3 The Risk Scoring Matrix is a scientific tool providing a consistent approach to all level crossings, one of the matrix's uses is to determine if a level crossing is needed for upgrade. It is discussed further in Chapter 3.

4 Austroads, Reducing Collisions at Passive Railway Crossings in Australia, 2002.

5 SCOT Rail Group: Australian Railway Crossing Safety Implementation Group,

3.7 The Committee considers that the national adoption of a risk scoring system based on the Queensland model and adapted for local conditions, would facilitate the removal of hazards in the approaches to level crossings. The system may provide a sound basis for improving the approaches to level crossings but improvements are likely to take a long time to implement for all level crossings in Australia.

Recommendation 2

3.8 **The committee recommends that the Australian Government seek the national adoption of a level crossing risk scoring system based on the Queensland model and adapted for local conditions.**

Road Signage

3.9 Road signs are placed at every railway crossing in Australia. This practice is controlled by the Australian Standard 1742.7, which identifies the minium requirement for signage at railway level crossings. While this does not improve train conspicuity, it alerts vehicle drivers to the presence of a railway level crossing.

3.10 In a recent paper, produced by Austroads, Dr Wigglesworth recommends that four issues be investigated to enhance signage at level crossings:

> The first is how best to present railway level crossing numbers to road users to enable them to inform control centres in the event of problems. The second is whether it is possible to develop an advance warning sign which intuitively conveys the message of a passive crossing. The third is whether it is feasible to provide a warning that a railway line is used by high-speed trains. The fourth is whether it is feasible to provide an indication of the general level of risk associated with railway level crossings – one suggestion is to use advisory speed as a way of indicating the risk to road users. These issues should be referred to Standards Australia.[6]

6 Austroads, Reducing Collisions at Passive Railway Crossings in Australia, 2002

3.11 The committee considers that road signage and markings, including rail crossing signage, should be standardised across Australia. This needs attention and should be investigated by Standards Australia. The committee considers that level crossing signage should include standardised markings on the road surface at the approach to level crossings – the standard rail crossbuck symbol or perhaps the train silhouette symbol could be adopted as a national standard for this purpose.

Rumble Strips

3.12 Main Roads Western Australia is trialling cost effective rumble strips at 16 passive level crossings. The trial, due to be completed at the end of July 2004 has collected data from some level crossings where there is both high speed road traffic and high speed trains, and includes the crossing at Yarramony were the tragedy referred to in paragraph 1.2 above occurred. The trial involves the placement of rumble strips on the road before the approaching signage, to alert the road vehicle operator to the upcoming crossing, in addition to the warning provided by the road signs.

3.13 Dr Wigglesworth advised the committee of a developing technology involving rumble strips, that is not currently being used in Australia. He referred to train activated rumble strips that are operated by hydraulic pressure and triggered by an approaching train. [7] Given that level crossing accidents can often be attributed to lack of driver alertness, such a system would be a useful addition to the warning devices at crossings. It would also help overcome the problem of complacency and over-confidence based on local knowledge or repeated crossing use. If activated only when a train is nearing a crossing the strips would alert drivers approaching the crossing to the changing situation. Such rumble strips would be particularly helpful where train lines are used infrequently or seasonally.

Recommendation 3

3.14 **The Committee recommends that the Australian Government initiate, through the Transport Ministers Council, a program to install, as a minimum, rumble strips at high accident risk level crossings.**

7 Transcript 24 March 2004, p.6

Recommendation 4

3.15 **The Committee recommends that the Australian Government through the Transport Ministers Council, support continued research into the efficacy of train activated rumble strips with a view to the installation of these strips at the most dangerous level crossings.**

ITS and train conspicuity

3.16 Intelligent Transport Systems (ITS) provide possible solutions to increase train conspicuity. ITS are already being used as effective safety tools in the transport industry and the committee has recently reported on this matter in relation to road transport.[8] Further developments of ITS specifically for the rail industry could help to achieve a reduction in road-rail fatalities. Such systems would alert a train or a road vehicle entering a level crossing to the presence or approach of the other.

3.17 Currently there are several systems available for use in level crossing situations. One in particular, mentioned to the committee by Mr Robert James of the Sugar Research Industry, is used by the sugar industry in Queensland.[9] It is called the EV-Alert. A radio transmitting device is fitted to all locomotives, and constantly sends out a coded signal. This signal is received by an in-car (or in-tractor) device and decoded to activate a flashing light in the cabin, with a sound to warn vehicle drivers that a train is approaching or that it is in the vicinity of a train.

3.18 The system can also use the transmitting signal to activate an active crossing. The bells, flashing lights and boom barrier would only return to open status after the train had left the defined area.

8 House of Representatives Standing Committee on Transport and Regional Services, *Moving on ITS, Report on aspects of intelligent transport systems*, December 2002.

9 Transcript 24 March 2004, p.8

Education

3.19 The committee heard from Dr Cairney about the role that education can play in helping to reduce level crossing fatalities. He explained that the means already exist to deliver education programs in this area already:

> … much of Australia has very active community road safety programs which are often run by local governments and, if we are going to embark on education, this is really a ready made infrastructure for delivering this type of message.[10]

3.20 The expansion of level crossing safety education programs was supported by Austroads, which commented that:

> …many of the stakeholder organisations recognized that hardly any educational activity was undertaken in relation to safe procedures at railway level crossings.

3.21 Austroads also supported the adaptation of 'operation lifesaver', a Canadian based level crossing education program that runs in Canada and the United States of America. It was suggested by Austroads that this is a cost effective, non-profit, education program that in the USA costs US$2.5 million annually.[11] The Committee believes it would be worth investigating whether this program could be adapted for Australian conditions and culture.

Recommendation 5

3.22 **The Committee recommends that the Department of Transport and Regional Services, with state transport departments, formally look at the Canadian based level crossing education program, 'Operation Lifesaver', for the possible adoption into Australian state road safety programs.**

10 Transcript 24 March 2004, p.5

11 Austroads, Reducing Collisions at Passive Railway Crossings in Australia, 2002, p.19.

3.23 The Committee has, on occasion, visited the Cooperative Research Centre for Railway Engineering and Technologies, and has held discussions with Centre staff. The CRC is currently undertaking a major study into level crossing risk management. The project aims to address the 'lack of research in evaluating community education and intervention programs targeting level crossing safety'.[12] Specific objectives of the project include the development of a community based intervention and education program to promote safe level crossing behaviour.

3.24 This project will take some time to complete and the final development of the intervention and development model is not scheduled until December 2006. It may, however, lead to a better understanding of how and why level crossing fatalities occur most often in daylight and at active crossings. The Committee strongly endorses the value of such research and considers that the Australian, state and territory governments ought to support and participate in the development of the CRC's program.

Paul Neville

Committee Chair

16 June 2004

12 Program outline for Level crossing risk management: The development of a community intervention program for level crossing safety (Project 83), supplied by the CRC.