THE PARLIAMENT OF VICTORIA ROAD SAFETY COMMITTEE – CALL FOR SUBMISSIONS FOR INQUIRY INTO IMPROVING SAFETY AT LEVEL CROSSINGS

Submission by the Safety Institute of Australia Inc

EXECUTIVE SUMMARY

On 5th June 2007, V/Line Passenger Pty Ltd suffered a semi trailer colliding with their train at Kerang, Victoria. The semi trailer struck the train well behind the locomotive and appeared not to recognise the crossing even though warning bells and lights were operating. Eleven (11) persons died and many more were injured and traumatised by this incident. The events that surrounded the tragic loss of life at the Kerang Railway Crossing collision on 5th June 2007 are ever present within Victoria.

It is the firm view of the Safety Institute of Australia Inc (**SIA**) that if we are to safeguard the safety and welfare of our citizens, we must persistently and constantly analyse and evaluate our operating processes to ensure safe operations and satisfactory maintenance. In this way we can assist our community to organisation to prepare, prevent and respond to such and event more effectively in the future.

We in the SIA recognise that in other forms of transport, particularly in aviation, the utilisation of transparent investigation and open discussion and analysis of causes or deficiencies, allows an emphasis to be placed on learning and improving future safety.

It is recognised that recommendations surrounding change are rarely achieved without a burden of cost to society. However, if improvements are not made, our society may be found lacking within the new paradigm of safety litigation.

The SIA commends the Road Safety Committee on initiating this inquiry and is pleased to contribute to the inquiry the views and disciplines of the safety profession that it represents.

SIA considers that a broader, strategic risk management approach is required than the consideration of existing, new and emerging technologies. That approach should include:

1. Development of a strategic plan similar to that adopted in the United Kingdom.
2. Improvements in inter-agency communication and integration of activities.
3. Consideration of other controls as long term risk control measures, together with technology; with interim risk controls to be identified and implemented while longer term measures are identified, trialled and implemented.
4. A major commitment to ongoing research and development activities.
5. An audit be undertaken of all Victorian rail crossings to assess the associated risk, suitable controls and the need for interim control measures.
6. The audit findings be analysed to identify timely, cost-effective interim controls that can be applied across the rail network, with prioritisation of crossings for interim controls.
7. GPS and other emerging technologies, used in other transport areas, be trialled for use and by trains and (at least) heavy road transport vehicles, with

investigation of any practical and commercial difficulties associated with widespread implementation, and a timeline for implementation.

8. The Victorian Government make sufficient budgetary allocation for these measures, with the aim (at least) that all crossings are compliant with AS 1742.7: 2007 within a three year timeframe.

1. Background

1.1 On 20 August 2007, the Safety Institute of Australia Inc (SIA) was formally invited by the Parliament of Victoria Road Safety Committee to make a submission to an inquiry into improving safety at level crossings.

1.2 The term of reference for this inquiry was as follows:

By resolution of the Legislative Council on 18 July 2007, the Road Safety Committee was requested to undertake the following inquiry:

That the Road Safety Committee inquire into and report by 29 February 2008 on existing, new and developing technologies for implementation to improve safety at level crossings.

2. Introduction

2.1 As the overall aim of the SIA is to promote health and safety, the Institute welcomes the conduct of this important inquiry and the invitation to make a submission. The SIA also recognises that this safety issue is certainly not unique to the State of Victoria as evidenced by the outcomes of similar inquires and research conducted at either a Federal or State / Territory level or internationally, e.g. New Zealand.

2.2 The Institute believes that the distinctive advice of qualified and experienced health and safety practitioners is a prerequisite to the specification of the health and safety responsibilities of all levels of government (Federal, State, Territory or Local), employers (across all industry sectors) and community organisations. The SIA aims toward the highest possible standards of health and safety at work, on the roads, at play and at home.

2.3 The objectives of the SIA are to:

- promote health and safety awareness;
- advance the science and practice of health and safety;
- research and develop health and safety procedures and practices.
- encourage the recognition of the Institute's involvement within health and safety; and
- promote professional recognition and develop ethical awareness and integrity through the Institute's involvement in industrial, domestic and commercial health and safety issues.

3. Team – contributors to the SIA submission

3.1 Members of the SIA's College of Fellows and other invitees who contributed to the development of this submission were:

- Dr Geoff Dell CFSIA, National President SIA & Dean, College of Fellows;
- Mr Leo Ruschena CFSIA, National Secretary SIA, Senior Lecturer OHS, School of Applied Science, RMIT University;
- Mr Neville Betts CFSIA, Senior Lecturer OHS, School of Preventative Medicine and Epidemiology, Monash University;
- Mr Barry Sherriff CFSIA, Partner of Freehills;
- Professor Derek Viner FSIA, Adjunct Professor of Risk Management, Swinburne University of Technology & Senior Research Associate, VIOSH, University of Ballarat;
- Mr Gary Lawson-Smith, Chief Executive Office SIA; and
- Ms Nicole Fauvrelle, Senior Associate lawyer of Freehills.

3.2 The SIA team appreciated the encouragement provided by other distinguished members of the SIA College of Fellows, namely Mr Graeme Johnstone and Dr Eric C Wigglesworth; as well as Mr David Calvert, Executive Director New Zealand Safety Council and Professor Rod McClure, Director Monash University Accident Research Centre (MUARC).

4. Methods

4.1 In the preparation of this submission, the methods adopted by the SIA team included:

- a literature search and examination of similar inquiries conducted in other States and Territories, nationally and internationally and the associated findings and recommendations;
- examining and considering current Australian and international initiatives aimed at implementing satellite-based navigation and surveillance safety enhancers, either for specific transport industry sectors, e.g. aviation and maritime, or by the adoption of a strategic approach to multi-modal applications of such technologies; and
- the application of acknowledged risk assessment and control principles in considering potential responses to the issue.

4.2 As noted elsewhere, while the focus of this inquiry is on existing and emerging technologies, the SIA team has considered the need to look at alternative or interim risk control measures.

5. Literature / Solutions elsewhere – discussion

5.1 The literature search undertaken, although not extensive in the time available, identified many similarities in the findings and recommendations of similar inquiries into level crossings accidents conducted for example in States such as Victoria, New South Wales; by the Australian Transport Council (ATC); and in New Zealand and the United Kingdom (UK).

5.2 Information on the types of rail crossings currently in the State of Victoria is set out in Appendix One. This information shows that there is a wide variety of conditions present throughout Victoria for the interaction between rail stock, vehicles, pedestrians and animals. It also shows different levels and types of controls, with considerable inconsistency between controls applied in similar circumstances. Of great concern is the number of crossings at which there are no, minimal or inadequate controls.

5.3 Information on investigations undertaken and outstanding in relation to rail crossing fatalities is set out in Appendix Two. This information shows that there are numerous reasons for collisions between rail and road vehicles. These include the inability of drivers of either or both to see or hear the other approaching vehicle; errors in calculation of distance and speed of the other vehicle and accordingly ability to safely traverse the crossing; the failure of existing physical controls. It is also believed that in a small number of cases, their has been deliberate risk taking by the driver of the road vehicle (or pedestrian). This demonstrates that there are numerous causes that need to be addressed, with controls to be directed at each cause.

5.4 It is clear that the upgrading of rail crossings by providing grade separation and other controls is universally considered to be the most appropriate means of controlling the risks current presented. Information on current plans for upgrading crossings is set out in Appendix Three. That information shows that the current rate of upgrading of crossings would not produce acceptable risk control across the network for decades, and that it may take many years before the crossings with the highest levels of risk are upgraded.

6. A strategic risk management approach

6.1 The SIA considers that a disciplined risk management approach needs to be taken in responding to the issue of rail crossing safety. That approach has been taken in the various investigations and inquiries undertaken on this issue in various jurisdictions.

6.2 The terms of reference for this inquiry may be predicated on a risk management approach, but may be considered to pre-suppose that the application of technology is the only or preferred response. That may prove to be accurate, at least in so far as preferred treatment is concerned. It is not clear that this is to form part of an overarching strategic approach or, if so, what the strategy provides.

6.3 The SIA team believes that the inquiry should also consider whether other risk controls are currently available for application and may eliminate risk or reduce it to an acceptable level in a more timely, cost-effective and widespread manner than the application of technology.

6.4 The accepted hierarchy of risk controls is:

- elimination of the hazard (potential interaction between trains, road vehicles, people and animals);
- isolation of the hazard;

- substitution;
- engineering controls;
- administrative controls; and
- (personal protective equipment is unlikely to be relevant to this issue).

6.5 The plans for grade separation is an example of the top two levels of risk control, at least as far as interaction with vehicles is concerned. The application of technology is an example of engineering controls. These may not be universally applicable or feasible and may need to be supplemented by training and information (administrative controls).

6.6 SIA believes that the plans to upgrade crossings to provide grade separation and other controls is commendable, as is the investigation and consideration of emerging technology. SIA is however concerned that the time needed to properly investigate and implement such solutions will be considerable, with the existing level of risk remaining.

6.7 SIA accordingly believes that consideration should also be given to the application of interim risk control measures, pending the investigation and implementation of other permanent solutions. Those controls may be one or a combination of the elements of the hierarchy of controls noted above, as determined is applicable across the rail network and in specific locations.

7. UK Rail Safety & Standards Board Railway Strategic Safety Plan 2007-2009

7.1 The SIA is most impressed with the strategic approach adopted in the UK that resulted in the development of a comprehensive 3-year strategic plan by the Rail Safety and Standards Board, titled **"The Railway Strategic Safety Plan 2007-2009".** This was the third annual Railway Strategic Safety Plan (SSP) and continues to be a joint statement by the companies responsible for Britain's mainline rail network, setting out an agreed industry approach to managing railway safety.

7.2 The SIA applauds this top-down strategic approach to railway safety which incorporates a safety planning process and identifies items such as:

The Overall Safety Performance of the Railway

- The level of risk
- Long-term trends in safety performance
- Benchmarking rail's safety performance with other modes
- Benchmarking Great Britain's rail safety performance with Europe
- Fatality risk on the railway

How Safety Management on the Railway is Changing

- Changes to Regulations and Standards
- The duty of cooperation and joint safety planning
- The Safety Decisions Programme
- Great Britain participation in the work of the European Rail Agency
- Accident Investigation
- Changes to the Safety Management Information System

- Research and Development
- High Level Output Specifications and their future relationship with the Railway Strategic Safety Plan

Key Risk Areas and Trajectories

- Key Risk Areas for Passengers
- Key Risk Areas for the Workforce
- Key Risk Areas for the Public
- Trajectory for Passengers at Stations
- Trajectory for Passengers on Trains
- Trajectory for Workforce – Train Crew
- Trajectory for Workforce – Track Workers
- Trajectory for Workforce at Stations
- Trajectory for Engineering – Track
- Trajectory for Engineering – Trains
- Trajectory for Public Behaviour – Crime
- Trajectory for Public Behaviour – Level Crossings

8 A similar strategic approach is needed

8.1 The SIA has been unable to ascertain whether in Australia an equivalent strategic plan for railway safety exists or is being developed at a State, Territory or the National level. If such a plan doesn't exist then this inquiry needs to recommend such a strategic planning approach being adopted nationally.

8.2 As an observation, it seems to the SIA that the various railways departments may have become de-engineered organisations, like so many other Government departments, with tactical decisions (or the lack of them) and internal methods determined more by bureaucratic process than anything else and subject to political cost-cutting expediency rather than strategic thinking.

8.3 Furthermore, risk analysis methods are now advanced to the extent where there is no need to wait for fatalities before deciding if there is justification for an upgrade to a level crossing. Apart from the possible use of modern technology for warning and scheduling (or grade separation) etc the core knowledge and skills that defines (or could do, or will one day do) the safety profession has immediate application given an organisation worthy of its use.

9. Need for a major commitment to Rail Safety Research & Development (R&D) and improved interagency co-ordination

9.1 The literature search also identified deficiencies in the general approach being applied to level crossing safety, i.e. a reactive more tactical bottom-up approach as opposed to the more effective proactive more strategic top-down approach.

9.2 As is evidenced by the UK Rail Safety and Standards Board "*Railway Strategic Safety Plan 2007-2009",* a proactive more strategic top-down approach would enable critical goals, objectives, major issues, key performance indicators and any associated R&D requirements to be identified, justified, approved and funded.

9.3 There are many transport and related agencies in Australia involved in the investigation of transport incidents and the identification, implementation and enforcement of risk controls. Those bodies identify and assess various technology and processes.

9.4 It is important that there is a high level of integration between of the activities of these bodies, and information sharing between them. The aim should be to ensure that available controls are considered for application across all areas of transport, information possessed by one body informs the investigations and decisions of others, and that consideration is given to cost effectiveness of risk controls through their application across different areas of the transport industry.

9.5 Relevant agencies should include, but may not be limited to:

- Federal and State and Territory departments of transport and infrastructure
- Coronial services in each jurisdiction
- Comcare and the occupational health and safety regulators in each State and Territory
- ATSB
- CASA
- State and Territory rail regulatory bodies
- State and Territory road transport regulatory bodies

9.6 There are obviously existing formal mechanisms in the form of national, state planning arrangements, e.g. the Australian Transport Council; the Victorian Road Safety Committee, National and State / Territory Disaster Plans that facilitate the developing, enhancement and periodic testing of interagency co-ordination.

9.7 The SIA considers that this is a major issue to be included in any new rail safety strategic planning process.

10. Interventions

10.1 As outlined above, the SIA would strongly advocate the adoption of a new strategic approach to improving rail safety generally in Victoria and nationally, and level crossing safety in particular.

10.2 Such an approach would enable the development of a 10-year rail safety plan that involves the adoption of an incremental approach to identifying, evaluating, testing (through R&D government grants), justifying, approving and funding the implementation of appropriate safety countermeasures over the following periods:

a. ***Short Term (less than 1 year);***

b. ***Medium Term (1-5 years); and***

c. ***Long Term (5-10 years).***

10.3 This type of strategic approach would, the SIA believes, complement that recently being advocated by the RACV to improving safety at level crossings in Victoria.

11. Satellite-based Navigation and Surveillance Technology initiatives

11.1 Satellite navigation and positioning provided by Global Navigation Satellite Systems (GNSS) is becoming integral to a wide range of sectors in the Australian economy, and is also becoming increasingly important for personal use.

11.2 GNSS is a generic term covering a number of existing and planned constellations of satellites together with supporting infrastructures.

11.3 Examples of applications include maritime and aviation navigation and surveillance, timing, commerce, agriculture, mining, water catchment and environmental management, tracking of trucks and freight consignments, in-car navigation systems and recreational uses such as fishing and bushwalking.

11.4 The availability of GNSS has created opportunities for new Australian and international technological advances resulting in a wide range of economic and social benefits. This led the Federal Government in 2002 to develop "Positioning for the Future Australia's Satellite Navigation Strategic Policy". This policy document recognised the need for coordination and standardization at the state, territory, national and international levels in order to reduce duplication and inefficiencies while encouraging innovation, development and commercialisation of new ideas. Various modes of satellite positioning usage, including aviation, maritime, land transport, timing, commerce, surveying and personal location-based services, have been developed independently. This could lead to multiple GNSS infrastructures that are incompatible and unnecessarily over-invested. Australia requires a multimodal approach that utilises interoperable GNSS infrastructure.

11.5 With respect to aviation GNSS-based navigation and surveillance initiatives, e.g. Automatic Dependent Surveillance – Broadcast (ADS-B), in August 2007, the Federal Department of Transport and Regional Services (DOTARS) issued a Joint Consultation Paper titled "Transition to Satellite Technology for Navigation& Surveillance".

11.6 It was issued as part of a process of public consultation by Airservices Australia, the Australian Defence Force (ADF), the Civil Aviation Safety Authority (CASA) and DOTARS. This paper was directed at members of the aviation community, e.g. Pilots, Passengers, Air Traffic Controllers, Aircraft Owners, Aircraft Maintenance Engineers and Aircraft Operators.

11.7 Australia's aging ground-based navigation and surveillance infrastructure provides the aviation industry with a unique opportunity to transition to satellite-based technology due to the convergence of end-of-life of both existing conventional radar and navaid systems.

11.8 Locally and internationally, the bodies that provide global aviation oversight have recognised ADS-B and GNSS as key elements of Air Traffic Management

worldwide. The International Civil Aviation Organisation (ICAO) has recognised ADS-B as a major element of future air traffic management worldwide.

11.9 Similar transitions to satellite-based navigation and surveillance are occurring in the maritime industry locally and internationally through standards and recommended practices promulgated by the International Maritime Organisation (IMO).

11.10 The questions the SIA would therefore pose to the Road Safety Committee are:

(i) Is it aware of any similar satellite-based initiatives being pursued locally, nationally or internationally in other transport modes, in particular rail and road; and

(ii) Would it support a multi-modal approach be adopted to investigate satellite-based navigation and surveillance initiatives being proactively advanced in aviation and maritime, to assess whether they can assist in improving safety at level crossings etc.

12. Validation Trials and Simulation

12.1 The aviation and maritime industry sectors have learnt, nationally and internationally, over many years that preventative safety and continuous improvement can best be enhanced by the adoption of a strategic top-down proactive approach that also includes the funding and conduct of R&D and associated validation trials and simulation.

12.2 The SIA considers it essential that this inquiry support the adoption of such a strategic approach and the identification and conduct of relevant R&D and associated validation trials and simulations of countermeasures (short, medium or long-term) that can enhance rail safety and safety at level crossings in particular.

13. Conclusions

13.1 At the Australian Transport Council (ATC) meeting on 2 June 2006, the Australian Government and State and Territory Transport Ministers agreed to commence innovative work on implementing a national level crossing behavioural strategy. The behavioural strategy forms part of the ATC's National Railway Level Crossing Safety Strategy and builds on the work of the National Road Safety Strategy. The Behavioural Strategy will work towards the national development and delivery of programs though each jurisdiction aimed at modifying road user behaviour to improve railway level crossing safety.

13.2 The SIA strongly suggests that this behavioural action, in itself, is insufficient to reduce to any great measure the likelihood of continuing carnage at railway crossings. Behavioural programs are not as effective as active engineering measures to alter motorists' decisions at rail crossings.

13.3 The analogous situation exists in each States' occupational health & safety laws, where the law rates administrative controls as less effective that engineering controls. Human nature is the same, whether on the factory floor, or on the road. If employers suggested that it would be sufficient for them to provide training programs for employees to be alert in the factory, and then not have to do anything else, there would be an understandable howl of derision from the State safety regulators, unions, professionals and employees. The safety regulators such as WorkSafe Victoria demand through legislation that higher order controls, including elimination of hazards, or engineering controls to be applied where practicable. Yet the Transport Ministers are suggesting exactly that. Advertising campaigns advising motorists to be careful are the same as telling workers to be careful – important, but by themselves, wholly insufficient.

13.4 The road rules, together with effective motorist education, the design of level crossings, road alignment and the provision of stop and approach warning signs are all defences that help to prevent road and rail systems coming into conflict. However, prima facie, a driver of a motor vehicle errs if they enter a level crossing when a train is approaching the crossing or where there is a risk of a collision with a train. While it is the cheapest option to focus on the driver, it is not the most effective option, as has been shown within the OHS arena.

14. Recommendations

14.1 The Australian Transport Safety Board has investigated a number of fatal railway crossing accidents, and their recommendations should be generalised into this inquiry.

14.2 The SIA strongly urges the following:

a. **All 2267 rail road crossing within Victoria should be audited for compliance with AS1742.7:2007 – Manual of uniform traffic control devices Part 7: Railway crossings.** In particular attention needs to be given to the alignment of the road and rail-line, and the provision of warning signs. The Standard notes that "railway crossings should be located to avoid sub-standard geometric features of the road, such as sub-standard curves, reduced pavement widths and vertical obstructions. … Sub-standard geometric features can lead to increased numbers of crashes not involving trains as well as having an effect on the incidence of vehicle/train collisions."

b. **All rail crossing should be modelled within ALCAM** to assess whether they have the correct level of active/passive defences commensurate with the risks of each crossing. This process should be undertaken at least every three years to take into account any changes in traffic patterns as a result of population growth or redistribution.

c. **The State Government should budget for sufficient funds to allow all Victorian railway crossings to be upgraded to the requirements of AS1742.7:2007 by 30 June 2010.** This would take into account the ALCAM modelling and provide for:

- Elimination where possible of the risk by grade separation of the rail and road system;
- Appropriate conversion of passive to active protection systems; and
- Appropriate alignment of road and rail systems by altering the road approach to provide for optimum vision for motorists in relation to approaching trains. This alignment should also include removal of vegetation where it significantly interferes with motorists' vision of the railway. A program of vegetation clearance, similar to that used for electricity line clearance should be required to be implemented by all relevant municipal and shire authorities, in conjunction with the rail bed authorities.

14.3 The SIA considers it essential that this inquiry support the adoption of a proactive strategic planning approach (similar to the "UK Railway Strategic Safety Plan 2007-2009" example) that would involve the identification and conduct of well-funded R&D, and associated validation trials, data collection and analysis and simulations of countermeasures (short, medium or long-term) that can be incrementally implemented to enhance road and rail safety, at level crossings in particular.

14.4 In relation to item 11.4 above, and the term of reference of this inquiry, the SIA strongly recommends that the Road Safety Committee support a multi-modal approach being adopted to at least investigate whether satellite-based navigation and surveillance initiatives being proactively advanced in aviation and maritime, could assist in improving safety at level crossings.

14.5 The SIA would welcome an opportunity to present this submission to the Road Safety Committee.

Point of contact:

Mr Gary Lawson-Smith
Chief Executive Officer
Safety Institute of Australia Inc

T: 03 8336 1995
M: 0419 491 547
F: 03 8336 1179
E: garyls@sia.org.au

APPENDIX ONE

Current status of rail crossings in the State of Victoria

Background information from Department of Infrastructure

http://www.doi.vic.gov.au/DOI/Internet/transport.nsf/AllDocs/0DB4DDE6BA12FB8A4A256AEA00049654?OpenDocument

(i) Types of railway crossing

There are two types of railway crossing:

- road level crossings where roads and railway lines intersect
- railway pedestrian crossings where footpaths and railway lines intersect

(ii) Level crossings

There are 2,267 level crossings where roads and railway lines intersect in Victoria. There are several types of level crossings including:

- 1,441 crossings described as 'open' or 'passively protected'. These crossings have road signs and markings to warn motorists they are approaching a railway line.
- 463 crossings which have flashing lights and warning bells in addition to signs.
- 361 crossings which have automatic boom gates as well as signs, lights and bells.
- Two level crossings that are heritage listed. (A third heritage-listed crossing at Rutherglen is located on a closed line)

There are also approximately 150 railway crossings along tourist and heritage lines.

Heritage-listed railway crossings

Of the three heritage-listed crossings:

- Two have hand-operated gates. They are in Rutherglen in central Victoria and New Street, Brighton Beach in Melbourne.
- One, at Lydiard Street in Ballarat is an 'interlocked signal-operated' crossing. A person in the nearby station presses a button to close the gates when a train is approaching. The gates are

The interlocked signal-operated crossing at Lydiard Street, Ballarat

interlocked with the railway signals so the signals for the train to proceed cannot be operated until they are shut.

(iii) Railway pedestrian crossings

There are 708 railway pedestrian crossings, where a pedestrian path crosses a railway line, on active railway lines in Victoria - 478 on the metropolitan railway network and 230 in regional Victoria. Railway pedestrian crossings may be located:

- on one or both sides of a road-rail level crossing.
- as a 'stand-alone' crossing at one end of, or between railway stations.

There are two types of railway pedestrian crossing protection:

- actively-protected crossings have train-activated mini booms, gates or barriers, audible warnings, line markings and safety signs
- passively-protected crib crossings have a maze and safety signs.top

(iv) Railway crossing maintenance and upgrades

The State Government, through its agency, VicTrack, owns the land and infrastructure associated with railway crossings. VicTrack leases the land and infrastructure to the Public Transport Division of the Department of Infrastructure, which sub-leases it to public transport operators.

The public transport operators are responsible for ongoing maintenance of railway crossings. They are:

- Connex for the metropolitan rail network
- V/Line for country rail lines
- Australian Rail Track Corporation for interstate rail lines.

The Victorian Government has programs to increase the level of protection at railway crossings. See Railway crossing safety projects.

APPENDIX TWO

Investigations

(i) Rail Crossing Investigations completed

There are three completed reports and 4 under active investigation. Collision between Prime-mover/low loader combination and Ballast train 4MR1 Tailem Bend, SA 4 October 2006

The investigation concluded that it is likely that the truck did not come to a halt at the 'Stop' sign controlling the crossing. The driver was possibly distracted by the presence of the road-junction ahead and/or a preoccupation with arriving at his destination on time, which may have diverted his attention from the risks associated with negotiating the level crossing. The investigation also found that the viewing angle to the north-west of the crossing was substandard and coupled with restricted visibility from the truck driver's cab would have made it difficult for the truck driver to sight the train.

Safety actions recommended as a result of the investigation relate to:

Consideration of measures to reduce the road/rail interface risk at the Magpie Drive level crossing. Such measures should include the practical application of the ALCAM, including opportunities for level crossing closure and/or options for improving sighting and viewing angle for conformance with the Australian Standard AS1742.7-2007, Manual of Uniform Traffic Control Devices, Part 7: Railway Crossings

Collision between Rigid Tipper Truck/Quad Axle Trailer and Freight Train 4AM3
Lismore, Victoria 25 May 2006
The investigation found that that the truck was not being driven in a manner consistent with the prevailing conditions of reduced visibility or at a speed that would have allowed the truck to be stopped short of any hazard on the road. The investigation found that the Lismore Skipton Road level crossing did not comply fully with the relevant standards relating to road signage or the guidelines for sighting distances for passive level crossings controlled by give way signs. However, it is unlikely that these factors contributed to the accident.

Safety actions recommended, as a result of this investigation, relate to:

Audits aimed at ensuring compliance with the relevant level crossing signage standards and sighting guidelines across Victoria.

Level Crossing Collision Edith Street, Horsham, Victoria 11 August 2005

The crossing is protected by flashing lights a bell, approach warning signs and road markings.

As a result of its investigation, the ATSB finds that the conditions that increased safety risk and contributed to the accident at Edith Street level crossing were:

The collision occurred because the driver of the motor vehicle did not stop and give way to the locomotive as required by 'Road Rules – Victoria'. The motor vehicle entered the level crossing while the active level crossing protection system was operating.
The driver of the car was not alerted by the crossing protection system to the train's presence and was probably distracted by internal and/or external factors.

The ATSB recommends that the Victorian Department of Infrastructure, through the Victorian Railway Crossing Safety Steering Committee, re-examine the Edith Street level crossing, including the use of the ALCAM, to determine whether an upgrade of this site is warranted.

(ii) Reports still outstanding.

(a) Level crossing collision near Two Wells SA, 6 August 2007

At approximately 1138 on 6 August 2007 a truck drove into the path of 'The Ghan' scheduled passenger train 7DA8 at a passive level crossing near Two Wells SA. Initial reports indicate that the truck driver suffered chest injuries and two passengers were treated for minor injuries. The locomotive crew were shaken-up but passenger services crew were not injured. The train sustained substantial damage and the truck was extensively damaged

(b) Level Crossing Collision, Kalgoorlie, WA 14 May 2007

At approx 1930 WST a motor vehicle collided with an AWR mineral train on the Chapple St, Kalgoorlie active level crossing (flashing lights & boom gates). Initial reports indicate that the level crossing was not operating at the time of the accident. The vehicle driver was not injured but was treated for shock and the train crew were not injured.

(c) Level crossing collision near Wingeel, VIC 15 Nov 2006

At approximately 1650 ESuT on 15 November 2006, a rigid tipper truck & 'dog' trailer drove onto the passive level crossing at Barpinba Road, near Wingeel VIC, in front of a scheduled interstate passenger train. The train crew and passengers were not injured, the truck driver was killed, the train sustained minor damage and the tipper truck was extensively damaged.

(d) Level crossing collision at Illabo NSW 2 Nov 2006

At approximately 2324 on 2 November 2006, grain train 9351 collided with an already overturned semi-trailer truck on a level crossing at Illabo NSW. The train crew and semi-trailer driver were not injured, the train sustained minor damage and the semi-trailer was extensively damaged.

APPENDIX THREE

Current plans for upgrades

Background information is available from Victrack at

http://www.victrack.com.au/?action=AssetManagement/RailwayCrossingUpgradeProgram/CompletedLevelAndPredestrian

(i) Status of level and pedestrian crossing upgrades

VicTrack plans to upgrade 45 level and pedestrian crossings during 2007-08. The following table details the proposed crossings to be upgraded and the status of each upgrade project. The crossings were chosen based on a state-wide risk analysis.

The timing of completion of each crossing upgrade is confirmed after completion of the preliminary planning and design phase, which includes extensive consultation with rail and road stakeholders. The planning phase ensures that stringent safety and operational requirements are identified and met.

More complex crossing upgrades can take longer to complete and are progressed along with the other crossing upgrades in the program. Should particular crossing upgrades from the current program need to be completed during 2008-09, VicTrack will ensure that the target of 45 crossing upgrades is achieved in 2007-08 by fast-tracking completion of the next highest priority crossings.

Completed crossing upgrades		
North Melbourne, Arden St	Crib Crossing	Pedestrian Gates
Warncoort, Princes Hwy	Flashing Lights	Boom Barriers/active advance warning signs
Crossing upgrades under construction		
Blackburn, Cottage St	Crib Crossing	Pedestrian Gates
Barnawartha, Indigo Crk Rd	Flashing Lights	Boom Barriers
Fairley (Kerang), Murray Valley Hwy	Flashing Lights	Boom Barriers/active advance warning signs
South Kingsville, Birmingham St	Crib Crossing	Pedestrian Gates
Springvale, Queens/Regent Ave	Crib Crossing	Pedestrian Gates
Sandringham, Abbott St	Crib/Level Crossing	Pedestrian Gates
Tyabb, Mornington-Tyabb Rd	Flashing Lights	Boom Barriers
Westgarth, Mason St	Crib Crossing	Pedestrian Gates
Crossing upgrades in the design stage		
Ararat, Greenhill Lake Rd	Passive*	Flashing Lights
Ararat, Heath St	Passive*	Flashing Lights
Baddaginnie, Erreys Rd	Passive*	Boom Barriers

Benalla, Witt St	Flashing Lights	Boom Barriers
Bendigo, Midland Hwy	Flashing Lights	Boom Barriers
Bowser, Three Chain Rd	Flashing Lights	Boom Barriers
Buckley, Buckley Rd	Passive*	Flashing Lights
Colac, Hart St	Flashing Lights	Boom Barriers
Colac, Queens St	Flashing Lights	Boom Barriers
Dennis, Victoria Rd	Crib/Level Crossing	Pedestrian Gates
Euroa, Lydiards Rd	Passive*	Boom Barriers
Garvoc, Sampsons - Ford Rd	Passive*	Flashing Lights
Garvoc, Station St	Passive*	Flashing Lights
Hastings, Reid Pde	Flashing Lights	Boom Barriers
Highett, Wickham Rd	Crib/Level Crossing	Pedestrian Gates
Inverleigh, Hamilton Hwy	Flashing Lights	Boom Barriers
Jung, Wimmera Hwy	Flashing Lights	Boom Barriers
Maryborough, Dooleys Rd	Passive*	Flashing Lights
McLeod, Ruthven St	Crib/Level Crossing	Pedestrian Gates
Merbein, Paschendale Ave	Passive*	Flashing Lights
Nhill, Queen St	Flashing Lights	Boom Barriers
Pirron Yallock, Settlement Rd	Passive*	Flashing Lights
Pirron Yallock, Swan Marsh Rd	Passive*	Flashing Lights
Riversdale, Prospect Hill Rd	Crib Crossing	Pedestrian Gates
South Geelong, Swanston St	Flashing Lights	Boom Barriers
South Geelong, Yarra St	Crib/Level Crossing	Pedestrian Gates
Stawell, Sloane St	Flashing Lights	Boom Barriers
Swan Marsh, Swan Marsh - Stonyford Rd	Passive*	Flashing Lights
Trawalla, Black Bottom Rd	Passive*	Boom Barriers
Trawalla, Scullin (Ercildone Rd)	Passive*	Boom Barriers
Trawalla, Trawalla - Waterloo Rd	Passive*	Flashing Lights
Vite Vite, Vite Vite Rd	Passive*	Flashing Lights
Wangaratta, Burrows St	Passive*	Boom Barriers
Wangaratta, Delloro Rd	Passive*	Boom Barriers
Wangaratta, Shanley St	Flashing Lights	Boom Barriers

* All passive crossings have road signs and markings to warn motorists they are approaching a railway line.

(ii) ALCAM

Upgrade works at level and pedestrian crossings are prioritised according to a risk based model. A nationally accepted model is currently being rolled out across the State, called the Australian Level Crossing Assessment Model (ALCAM). All public level and pedestrian crossings throughout Victoria (approximately 3,100) will be assessed by the end of 2007, enabling strategies to be put in place to improve safety.

(iii) Railways Fatalities

http://www.atsb.gov.au/publications/2004/Rail_Fat_1.aspx

Notes that Australia has a fatality rate that is consistent with the OECD average.

(iv) National Action – ATC - Safety at Railway Level Crossings

At an Australian Transport Council (ATC) meeting on 2 June 2006, the Australian Government and State and Territory Transport Ministers agreed to commence innovative work on implementing a national level crossing behavioural strategy. The behavioural strategy forms part of the ATC's National Railway Level Crossing Safety Strategy and builds on the work of the National Road Safety Strategy. The Behavioural Strategy will work towards the national development and delivery of programs though each jurisdiction aimed at modifying road user behaviour to improve railway level crossing safety.