



Mr Michael Crawford  
Inquiry Secretary  
Standing Committee on Infrastructure, Transport  
Regional Development and Local Government  
House of Representatives, Parliament of Australia  
PO Box 6021 ACT 2600

PO Box 2797  
Melbourne, Victoria 3001  
Telephone: (03) 9655 6666  
Facsimile: (03) 9095 4096  
www.transport.vic.gov.au  
DX 210410

Our Ref:

**By Email:**

**Update to 2004 Train Illumination Report: Inquiry into some measures proposed to improve train visibility and reduce level crossing accidents.**

**1. The VRCSSC**

The attached submission is being made on behalf of the Victorian Railway Crossing Safety Steering Committee (VRCSSC). In accordance with the requirements contained in the House of Representatives submission guidelines, I advise that the submission has been approved by the Secretary, Department of Transport, Victoria.

The Victorian Railway Crossing Safety Steering Committee (VRCSSC), is the peak body to advise and make recommendations to the Minister for Public Transport on the policy directions, management and standards, for the protection and safety of the public and reduction of risk at all railway road level crossings and railway pedestrian level crossings in the State of Victoria. (*Transport Act 1983, Section 36*).

**2. Train Illumination Report June 2004 – Terms of Reference**

The VRCSSC understands that the June 2004 report contained four of five recommendations not specifically related to train illumination, and which cover a broader area of railway crossing safety matters.

We also understand that the Response of the Australian Government in December 2005 included a Background which addressed a large range of issues related to railway crossing safety management and collisions at railway crossings in Australia.

With respect to the five recommendations, we note that the Australian Government Response was to;

**Support in part Recommendation No 1** - related to the objective of improving train visibility with low-cost reflective strips, but did not support making rotating beacons compulsory without evidence that this would be cost effective.

**Support Recommendation No 2** – related to national adoption of the Australian Level Crossing Assessment Model (ALCAM).

**Support Recommendation No 2** – related to national adoption of the Australian Level Crossing Assessment Model (ALCAM).

**Do Not Support Recommendation No 3** – related to a program to install rumble strips at high accident risk level crossings, instead supporting research and trials of rumble strips.

**Do Not Support Recommendation No 4** – related to continued research into the efficacy of train activated rumble strips. and

**Support in Principle Recommendation No 5** – related to the possible adoption of the Canadian based education program ‘Operation Lifesaver’, preferring to support the investigation of education, information and awareness campaigns.

The VRCSSC notes that in the media release notifying The Standing Committee’s intention to update the 2004 report it states that;

“The Committee’s decision to re-visit this issue arose from its concern about the number of level crossing incidents since its previous report. Sadly, one day after the Committee’s resolution to update its report, a fatal level crossing incident has occurred near Cardwell, Queensland. *This tragic accident highlights the need to re-examine what measures are being taken around Australia to improve safety at level crossings.*”

On the above basis, and notwithstanding the 2004 ‘Terms of Reference’ the VRCSSC submission primarily concentrates on key railway crossing safety management changes, initiatives, information, and potential new technology applications, in Victoria and nationally, which have taken place since the Committee tabled its report in the House of Representatives on 16 June 2004.

Appendix A contains a list of the attachments to the submission including a brief summary of the key content or purpose of each supporting document.

We would particularly draw your attention to sections 1.2 to 1.5 of our submission of October 2007, to the Victorian Parliamentary Road Safety Committee: Inquiry Into Improving Safety at Level Crossings, related to the roles of the key railway crossing safety authorities in Victoria, including the VRCSSC. (Attachment No 2).

### **3. Level Crossing Accidents – Short History**

Victoria is well positioned to provide an extensive submission on railway crossing safety management initiatives introduced nationally and in this State since 2004.

In the period since the late 1960’s to the end of the last century the number of motor vehicle occupants killed in crashes with trains at road level crossings in Victoria has been reduced from an average of 22 per annum to an average of 4 per annum. This is an 85% reduction. The majority of these fatalities were motor vehicle drivers and rarely was anyone on the train killed. ( The data excludes pedestrian and suicide fatalities).

However, in the last decade the motor vehicle/train accident fatality rate has plateaued at an average of 4 per annum and the nature and type of level crossing accidents have significantly changed.

In the decade to 2006 in Victoria there were two fatal heavy vehicle/train crashes; including a triple fatality between a B-Double flour truck and a steam locomotive at Benalla in 2002. This level crossing accident was the first involving loss of life to locomotive train crew (or anyone on the train) in Victoria in over 30 years.

Since 2002, and since 2006 in particular, Victoria and other Australian States and Territories have experienced a spate of heavy road vehicle train collisions, not the least of which was the tragic accident at Fairley near Kerang in Northern Victoria on 5 June 2007, which resulted in the deaths of 11 passengers on the train.

The nature of level crossing accidents in Victoria since 2002 is that we are now concentrating much of our efforts on the significant severity between heavy freight vehicle/bus - train collisions and with managing catastrophic consequences affecting the 'Likelihood' of the risk event consequences taking place.

#### **4. Significant Railway Crossing Safety Management Changes Since 16 June 2004**

There are three significant changes to railway crossing safety management which have taken place in the last five years, which includes;

1. **ALCAM** - National adoption of the Australian Level Crossing Assessment Model (ALCAM) risk assessment process, endorsed by the Australian Transport Council (ATC) in 2003. The ALCAM Road model was released in May 2004 and the ALCAM Pedestrian model in April 2005. Victoria completed physical ALCAM field surveys of all 2900+ public road and pedestrian crossings between December 2005 and December 2007.

In December 2008 we awarded a five year contract to continue physical ALCAM field survey updates on every public road and pedestrian crossing in the State, once every five years. The contract also provides for initial ALCAM field surveys of all 1500 (approx) 'Occupation and Private' rail level crossings throughout Victoria. In addition it requires the identification of all illegal at-grade crossings on the Victorian heavy rail networks.

2. **Victorian Rail Safety Act 2006** - Introduction of the *Rail Safety Act 2006* (RSA) on 1 August 2006 amended the *Transport Act 1983* to establish the office of Director, Public Transport Safety. This Act was also the first 'risk management' based rail safety legislation in Australia.

Through agreements at COAG and the ATC, Victoria has undertaken to implement the substantive provisions of the *National (Model) Rail Safety Bill 2006* into Victorian legislation, with the aim of achieving greater consistency in rail safety laws across Australia. In 2007 the *Victorian Rail Safety Act 2006* was amended to introduce a requirement for road managers (primarily local councils and VicRoads) and rail infrastructure managers (V/Line, Connex,

Australian Rail Track Corporation (ARTC) and Tourist & Heritage rail operators) to manage safety risks at level crossings jointly through Safety Interface Agreements (SIA's). Duty holders must have SIA's in place by 1 July 2010. The requirement to establish SIA's is a natural extension of road and rail authorities' general safety duties, requiring all risks to be eliminated, or where that is not feasible, all risks must be reduced 'in-so-far-as-is-reasonably-practicable'.

The requirement for road managers and rail infrastructure managers to establish SIA's will provide for a coordinated approach to managing risk at level crossings. This is important as level crossings are the single greatest source of risk to safety on the rail network. The benefits and outcomes from the advent of SIA's are that road and rail authorities will have far greater liaison than has been the case in the historical past, which should lead to further improvements and a reduction in risk for railway crossing safety to the general public when encountering railway crossings.

3. **Australian Standard AS 1742.7 – 2007 Manual of uniform traffic control devices Part 7: Railway crossings.** – This standard was updated from the 1993 version and released on 20 February 2007.

#### **AS 1742.7 – 2007 Changes From the 1993 Version**

“The principal changes and additions to the previous edition are summarized as follows:

- (a) The Standard now promotes use of the red background position sign, R6-25, for new or replacement signs in preference to the open 'crossbuck' sign, R6-24.
- (b) Provision is made for active advance warning of the activation of railway crossing signals under certain conditions.
- (c) *More detail is given for sight distance requirements at passive control crossings for stop and give-way sign control.*
- (d) The need to avoid unsafe queuing of traffic on railway crossings upstream of traffic signals is recognized and the use of corrective measures including signs and box markings are specified.
- (e) Standards for pedestrian crossing treatments at railway crossings have been substantially upgraded and now include provision for people with disabilities

#### **4. Key Railway Crossing Safety Initiatives Since 16 June 2004**

In addition to the above significant changes, the following is a list (but is not limited to) a range of other key railway crossing safety management changes which have taken place in recent years;

- (a) A \$33.2 million package of railway level crossing safety initiatives was announced in Victoria on 25 June 2007. The package included;
- (i) Installation of rumble strips on the approaches to more than 200 level crossings, mostly on high speed, sealed rural roads (complete).
  - (ii) Reduction of the road speed limit to 80 km/h at 75 level crossings on high speed arterial rural roads (complete).
  - (iii) The installation of active advance warning signs at 53 level crossings, mostly on arterial roads in regional Victoria (11 complete as at 18 November 2008 with 10 more scheduled in 2008/09. All 53, plus possibly four more, are scheduled for completion by 30 June 2010).
  - (iv) Penalties for level crossing infringements have been toughened, rising from \$177 and three demerit points to \$430 and four demerit points. A new offence has been introduced for speeding to beat a train, crossing tracks when lights and bells are operating, or weaving in between lowered boom gates. It carries a fine of 30 penalty units, a (\$3,304) infringement, four demerit points and automatic three month licence suspension.
  - (v) Trials of red light/speed enforcement cameras at one metropolitan and one regional railway crossing. Legislation currently in Parliament, which if passed, will allow road traffic enforcement camera infringements to commence at the two locations from 1 July 2009.
  - (vi) An accelerated program of works at approximately 75 level crossings to eliminate any 'line of sight' problems such as overgrown vegetation.
- (b) The Victorian Legislative Council on 18 July 2007 resolved that the Parliamentary Road Safety Committee inquire into 'existing, new and developing technologies for implementation to improve safety at level crossings'. *The Committee tabled its report on 18 December 2008.* (Attachment No 1).
- (c) Report on Victorian attendance at the 10<sup>th</sup> World Railway Crossing Safety and Trespass Symposium in Paris in June 2008 and UK railway crossing safety visit. (Attachment No 4).
- (d) Exploration of emerging new technology applications for railway crossing safety management, including technologies with the capacity to provide low cost and ITS in-vehicle warnings to motorists of impending hazards such as trains approaching on rail level crossings. (See Section 5 of this submission).

- (e) Significant annual increases in State funding for railway crossing control upgrades and railway crossing safety generally.
- (f) Significant increases in the total annual upgrade of railway controls at level crossings in Victoria to 46 in 2007/08 and a further 45 in 2008/09.
- (g) The VRCSSC is currently drafting a 'Towards Zero: Strategy to Improve Railway Crossing Safety in Victoria', to complement and expand upon the National Railway Crossing Safety Strategy, ARA Level Crossing Behavioural Strategy, and to interface to Victorian government policies and initiatives, including the road safety '*Arrive Alive*' strategy, as well as to include proposed future strategic directions for railway crossing safety management in Victoria over the next ten years. This strategy is likely to be ready in mid 2009.

The strategy relates to all at-grade public road and pedestrian crossings on rail lines within Victoria. It is a ten year strategy that proposes work in five areas:

- Infrastructure
- Rolling stock
- Behavioural issues
- Communications
- Emerging technologies

The strategy will also reflect consultation with major stakeholders.

- (h) The Australasian Railway Association (ARA) Level Crossing Behavioural Strategy 2006 –2011 proposes a way for stakeholders to reduce the risk at railway level crossings through collectively developing education and enforcement programs aimed at modifying driver and pedestrian behaviour.
- (i) Continuation and intensification of level crossing safety campaigns, including the *Don't Risk It!* campaign aimed at changing driver and passenger behaviour at level crossings. Various elements of the *Don't Risk It!* campaign have been specifically targeted at heavy vehicle drivers. The *Don't Risk It!* campaign has expended in the order of \$4 million since its launch in 2005.
- (j) The Railway Crossing Technical Group are investigating the 'O'Connor' low cost level crossing warning radar device, intended to alert motorists that there is a train approaching. It is intended to provide an economical treatment to augment existing passive signage at a much lower cost than providing active controls. The system could be used as an additional tool to improve level crossing safety in cases where funding is not available for active controls and will be trialled in the Latrobe Valley in 2009.
- (k) The Railway Crossing Technical Group through VicRoads, in conjunction with key rail stakeholders, have initiated a workshop to

study a range of options related to the 'Trial of Road Traffic Signals at Level Crossings'. The options include road traffic signals 'in-addition-to, as well as in-place of' conventional railway electronic controls. The objectives of the trial are to resolve "once and for all" the disputed claim that motorists will always comply with road traffic lights more than with railway crossing lights?

- (l) A Level Crossings Research Database report, launched by the CRC for Rail Innovation in late 2008, examined the effectiveness of engineering, enforcement and education approaches to improving safety for motorists and rail users at the road-rail interface. The report includes an analysis of the impacts of sighting distance and track angles on a road driver's awareness of an oncoming train. It will be the basis for further research in 2009.
- (m) The ARA have announced a "New Approaches to Understanding and Preventing Level Crossing Incidents Workshop # 2 on Thursday 5 and Friday 6 February 2009". The New Approaches to Understanding and Preventing Level Crossing Incidents Workshop # 1 was held on 26 November 2008 in Brisbane. The aims of the first Workshop were to develop a priority a list of subject areas for future CRC research, to identify future actions and responsibilities and to conduct a costs and benefits analysis of each subject area.
- (n) Launch of the '*Victorian Transport Plan*' on 8 December 2008 which includes \$440 million to grade separate level crossings at critical locations starting with Springvale Road, Nunawading, to improve safety and reduce congestion.
- (o) VicRoads have commissioned a 'Risk Analysis of Truck Train Collisions of Significant Severity' which identifies the most likely cause of a significant severity would be a truck with a mass in excess of around 30 tonnes, travelling at relatively high speed (greater than 60 km/h) impacting the side of a high speed passenger train, causing the train to become derailed. The report identifies the most likely infrastructure situations that might lead to such crashes, environmental factors and possible risk mitigation treatments.

This report is to be workshopped in February 2008 prior to being submitted to VRCSSC for consideration and adoption.

## **5. New Technology Railway Crossing Safety Applications**

There are a number of potentially exciting new ITS technology applications which have been emerging globally over the past year or so.

The following is an attempt to capture some of the key activities associated with potential new technology railway crossing safety applications since early 2008;

- (a) **February 2008** - The inaugural *Intelligent Transport Systems (ITS) Australia and ARA 'ITS For Rail Level Crossings Workshop'*, was

held on 29 February 2008 and contained an array of potential new technologies that might be applicable to future railway crossing safety management applications. (Attachment No 7).

The workshop was attended by road and rail industry managers from throughout Australia and overseas, and a landmark decision was taken for peak transport industry bodies to collaborate in a project to develop and apply ITS technologies to reduce rail crossing crashes in Australia. This workshop may become a bi-annual event.

- (b) **June 2008 - Report on the 10<sup>th</sup> World Railway Crossing Safety and Trespass Symposium in Paris** in June 2008 and UK railway crossing safety visit. This report contains a summary of the *Symposium Paper Highlight* – ‘A Technology Comparison of Two In-Vehicle Warning Methods at Level Crossings with Human Factor Implications’.

The summary can be found on pages 25 – 28 of Attachment No 4.

- (c) **July 2008 – DOT meeting with Professor Jugdutt (Jack) Singh, Director, Centre for Technology Infusion, Research Professor, Microtechnology/Nanoelectronics, Latrobe University.** The meeting discussed **Wireless Activation in Vehicular Environments (WAVE)** and **Dedicated Short Range Communication (DSRC)** technologies and the likelihood of motor vehicle manufacturers (globally) determining when to include this technology in all new motor vehicles.

DOT is waiting for a global decision on this issue before seeking funding to develop railway crossing safety vehicle to vehicle (v2v) and vehicle to infrastructure (v2i) interface's to these new technology applications.

- (d) **August 2008 – VicRoads Railway Level Crossing Collision Warning Device Proof of Concept Trials.**

VicRoads has completed expressions of interest from three organisations to participate in a cooperative Proof of Concept trial of Collision Warning Devices that would warn drivers of approaching trains at level crossings. Initially this is being trialled in trucks in both metropolitan and rural areas.

The proof of concept is expected to run for approximately 9 months with up to 3 different technologies being trialled. The technology that will be trialled currently exists.

The trial will involve a small number of trucks and trains. Ideally, the trial will be biased towards rural regions due to the higher incidence of collisions and passive crossings compared with the metropolitan areas.

The proof of concept project is a cooperative project involving VicRoads, Department of Transport, technology suppliers and truck and train operators.

- (e) **September 2008 – ATC, Safety & Security Working Group – In-Vehicle and At-Roadside Technologies – Reference Group.** The



inaugural meeting of the above reference group took place in Brisbane on 18 September 2008.

This reference group has been created as part of the National Transport Policy - Key Reform Priority, to manage, develop and regulate the evolving Information and Communications Technologies (ICT) transport safety and security applications.

As part of the work of the Safety and Security Working Group Queensland has agreed to lead the development of a work program on technology based solutions that facilitate safety outcomes.

Current and soon to be released vehicles are using pre-emptive safety systems where sensors make the vehicle aware of potential dangers and either alert the driver or take action to avoid or lessen the impact of an accident. The current autonomous systems are limited to their sensor range and can be significantly improved with vehicle to vehicle and infrastructure communications. USA, Europe and Japan are developing advanced driver assistance systems and the associated vehicle network that enables cooperative safety systems. Australia may wish to consider these developments and determine whether it develops a network to maximise the opportunities that in vehicle systems offer. Linking intelligent vehicles and roadside to move from an autonomous to a cooperative intelligent transport system provides the opportunity to improve safety and mobility.

(f) **November 2008 – DOT Satellite Navigation Technology Railway Crossing Safety Trial.**

GPS initiated satellite – navigation (sat-nav) technology is currently commercially available globally and already built into some overseas motor vehicle models sold in Australia.

The Department of Transport, has commissioned a trial of this technology. The scope of the trial includes;

- GPS units will be fitted to approximately ten trucks, (five each in two different Victorian regional locations) selected for frequency of crossing rail tracks on lesser roads, for a period of about 20 days.
- The GPS units are pre-configured with data identifying location and control details of all rail crossings in Victoria, and will announce a warning to the driver that he/she is approaching a rail crossing and should :
  - "stop",
  - or "obey signage".

The GPS units will also record location data during the trial, so that it will be possible to calculate the number of rail crossings undertaken by the truck/s.

A report on the GPS Sat-Nav trials should be available in April 2009.

## 6. Conclusion

The VRCSSC believes that in order to overcome the exponential difficulties of trying to reduce the current annual average motor vehicle/train fatality rate of four per annum over the last decade in Victoria, 'Towards Zero', as indicated in 4 (h) above, it is necessary to continue with the range of railway crossing safety management initiatives, which have successfully contributed to an 85% reduction between the 1960's and 1990's. As well as to the addition of a range of new railway crossing safety management applications outlined in this submission. Including, but not limited to;

- Adoption of the Victorian Parliamentary Road Safety Committee recommendations, as determined appropriate and where additional funding via VRCSSC initiated Business Case is provided or required.
- Ongoing use of the ALCAM risk assessment process and analysis of the field survey data as a means of prioritising and funding safety upgrade works and reducing public risk and catastrophic risk likelihood consequences.
- Ongoing application of the recent NTC (Model Rail Safety Bill 2006) amendments to the *Rail Safety Act 2006* and in particular with respect to the implementation of legal Safety Interface Agreements, (based upon ALCAM analysis of risk mitigation prioritisation for compliance with AS1742.7-2007), which legislatively come into effect on 1 July 2010 in Victoria.

This particular initiative is very significant to future success and will ensure far greater liaison between responsible road and rail authorities in Australia than has been historically evident in the past, and for which Australia is seen as a world leader.

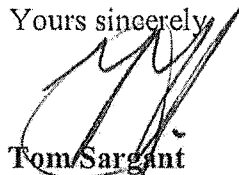
- Ongoing research and application of railway crossing safety 'Human Factors' strategies.
- Increased research based and evidence driven Public Education & Awareness communication campaigns.
- Increased railway level crossing enforcement programme's.
- Improvements to rail industry rolling stock and infrastructure.
- Trial and adoption of new ITS railway crossing safety management applications, once the global motor vehicle manufacturing and road safety industries determine exactly which technologies will be built into all new vehicles and the timing for such a decision.

It is specifically with respect to new technology applications that the Standing Committee can be of particularly assistance, by supporting the ATC implementation of the National Transport Policy - Key Reform Priorities, to manage, develop and regulate the evolving Information and Communications Technologies (ICT) transport safety and security applications and to ensure that adequate Commonwealth funding is

available to support the development and trial of new railway crossing safety management ITS technologies.

Should you have any queries related to any of the matters raised in this submission, please feel free to contact Terry Spicer, Manager Railway Crossing Safety,

Yours sincerely



**Tom Sargent**  
**Chair - VRCSSC**  
**Deputy Director of Public Transport**  
**Safety and Asset Management**

*5 February* 2009

**LIST OF KEY RAILWAY CROSSING SAFETY MANAGEMENT  
CHANGES, INITIATIVES AND INFORMATION DOCUMENTS  
SINCE JUNE 2004**

- 1. Victorian Parliamentary Road Safety Committee (PRSC) – Inquiry Report - ‘Improving Safety at Level Crossings’ – 18 December 2008.**

The Terms of Reference were ‘to inquire into and report on existing, new and developing technologies for implementation to improve safety at level crossings.’

The Public Transport Division of DOT are coordinating a ‘whole of government response’ to the 44 recommendations of the PRSC, which is scheduled to be tabled in Parliament in June 2009.

- 2. Joint DOT/VicRoads/VRCSSC Submission to the PRSC Inquiry - ‘Improving Safety at Level Crossings’ – October 2007.**

A complete list of submissions to the PRSC can be located in Appendix A of the above report.

- 3. State Coroners Office Victoria (SCV) – Director of Public Transport 8 February 2007 response to questions related to the Lismore fatal accident on 25 May 2006.**

The above involved a very extensive response to five open ended questions posed by SCV which were designed to ascertain a virtual A to Z status report on everything happening in the area of railway crossing safety management, not only in Victoria but also nationally and internationally.

- 4. Report on ‘10<sup>th</sup> World Level Crossing Safety & Trespass Symposium – Level crossings 2008, 24 – 27 June 2008 – Paris France and Subsequent UK Meetings and Railway Crossing Inspection Tour 30 June – 3 July 2008.**

This report is from Manager Railway Crossing Safety – PTD/DOT on the above proceedings and inspection tour. One of the key observations from the symposium included;

“Australia and Victoria in particular, are considered to be world leaders in a number of railway crossing safety initiatives, with many countries maintaining a watching brief on Australian railway crossing safety activities.”

**5. Major Programme to Improve Level Crossing Safety In Victoria – Media Release – 25 June 2007.**

This document contains a media release from the Premier of Victoria, outlining a \$33.2 million package of railway crossing safety initiatives.

**6. Road Speed Limit Reductions at 72 Level Crossings – Media Release – 14 April 2008.**

This document contains a media release from the Minister for Public Transport indicating that most of the 72 sites would be reduced from 100 kph to 80 kph.

**7. Intelligent Transport Systems (ITS) Australia/ARA ‘ITS For Railway Level Crossing Workshop’ – 29 February 2008 – Agenda and Post Media Release.**

Contained an array of potential new technologies that might be applicable to future railway crossing safety applications. The workshop was attended by road and rail industry managers from throughout Australia and overseas.

**8. Victorian Parliamentary Road Safety Committee (PRSC) – Inquiry Report - ‘Improving Safety at Level Crossings’ – 18 December 2008**

See attachment No 1 – Chapter 4, which contains an extensive review and a summary of findings related to new and developing technology railway crossing safety applications, including Low Cost Warning Device and ITS applications.