RESPONSES BY DEPARTMENT OF TRANSPORT, PLANNING AND LOCAL INFRASTRUCTURE, PUBLIC TRANSPORT VICTORIA AND VICTRACK TO RECOMMENDATIONS (DATED 21 OCTOBER 2013) IN CORONIAL INVESTIGATION OF TWENTY-SIX RAIL CROSSING DEATHS IN VICTORIA

Recommendation	Relevant Entities to respond to the recommendation	Response Code	Response
1. That TSV, PTV and VicRoads adopt a systematic approach to collecting routine detailed human factors information about level crossing collisions	PTV, VicRoads, Victoria Police	4 - There are unresolved issues with the Coroner's recommendation that need to be addressed.	**Background to implementation and issues requiring resolution:** In mid-2014, responsibility for rail safety regulation transfers to a single national safety regulator, the Office of the National Safety Regulator (**ONRSR**). When this occurs, the collection of data arising from rail incidents will also become the responsibility of the ONRSR. The ONRSR requires that a national database of rail safety incidents (including level crossing incidents) be kept (**the National Database project**). ONRSR and the Rail Industry Safety and Standards Board (**RISSB**) are coordinating a project to pilot the introduction of the Safety Management Information System (**SMIS**) currently used in the UK for rail incident data. This internet based system provides the capacity for a greater range of data to be held in relation to level crossing incidents.

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			Given that this project is on the national agenda and will be used to record data for all rail incidents across Australia as soon as the National Law is implemented, the Department, PTV and VicTrack are of the view that using this national system is preferable to altering the current Victorian database. PTV will be part of the working group for the National Database project and will be providing advice in relation to incident data content and its relationship to ALCAM crossing inventory and risk data. **Range of possible solutions or alternative interventions to resolve the issues identified:** PTV will bring the Coroner's findings to the attention of the working group for the National Database project and the ONRSR. **Name, telephone number and email address of relevant contact person:** Secretary, Victorian Railway Crossing Safety Steering Committee, ph 03 90275023, vrcssc.secretary@ptv.vic.gov.au
2. That TSV and VicRoads investigate and implement new level crossing infrastructure which is designed to alert road vehicle drivers to an approaching	PTV, VicRoads	5 – The Coroner's recommendation is unable to be implemented	**Reasons why the recommended intervention is unable to be implemented:** PTV's position is that all drivers are required to comply with the law and that infrastructure should be compliant with relevant Australian Standards and conform to national practice.

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train who are unresponsive to the current suite of level crossing warning signs			However, the possibility of new technologies such as in-vehicle warnings (see response to recommendations 9 and 17 below) would, if it proves workable, have the effect of providing additional alerts to drivers, above and beyond the current signals. **Range of possible solutions/alternative interventions:** In addition to the new technologies, further enforcement of red lights at level crossings by the imposition of fines has been demonstrated to change driver behaviour at intersections. PTV regards this strategy as being more likely to contribute to a reduction in accidents. The Victorian Railway Crossing Safety Steering Committee (**VRCSSC**) has, as part of its brief, responsibility to commission research into road user behaviours and to trial new technologies which will improve the effectiveness of level crossing warnings. The VRCSSC and its members continue to be involved in developing and testing innovative level crossing warning technologies including in-vehicle warning systems. See response to Recommendation 17. The VRCSSC is currently funding the Monash University Accident Research Centre (**MUARC**) Australian Research Council (**ARC**) Linkage Grant human factors research project. This research is intended to provide a means of understanding road user behaviour at level crossings and informing the design and evaluation of new level crossing infrastructure.

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			Name, telephone number and email address of relevant contact person: Secretary, Victorian Railway Crossing Safety Steering Committee, ph 03 90275023, vrcssc.secretary@ptv.vic.gov.au
3. That TSV and VicRoads commit themselves to joint sophisticated human factors research and innovative technology to determine how best to alert drivers who will otherwise not notice an approaching train in the context of current level crossing warnings	PTV, VicRoads	1 – Coroner's recommendation will be implemented	**Outline the process by which the recommended intervention will be implemented:** DTPLI, Victrack and PTV do not agree with the underlying premise of this recommendation, namely that there is a group of drivers who will otherwise not notice an approaching train in the context of current level crossing warnings, or that at a level crossing with active protection, drivers need to notice an approaching train, rather than the warning signals in place at that location. However, the VRCSSC and its members continue to be involved in developing and testing innovative level crossing warning technologies including in-vehicle warning systems to supplement current infrastructure. See response to Recommendation 17. PTV and VRCSSC are also committed to sophisticated human factors research by way of funding the MUARC human factors research project as described above. **Name, telephone number and email address of contact person:** Secretary, Victorian Railway Crossing Safety Steering Committee, ph 03 90275023, vrcssc.secretary@ptv.vic.gov.au

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4. That VicRoads and Standards Australia amend their standards to require warning signs and visibility of the train must be at least 131 metres before the level crossing, more on B double and B-triple combination routes	VicRoads, Standards Australia	5 – The Coroner's recommendation is unable to be implemented	**Reasons why the recommended intervention is unable to be implemented:** The 131m dimension specified in the recommendation appears to be based on calculations specific to the conditions at the Kerang level crossing and, as such, should not be applied as a fixed requirement for all crossings as recommended. The requirement that visibility of a train must be provided to the road user 131 metres before the crossing is not achievable at many crossings due to the terrain and the built environment. **Range of possible solutions/alternative interventions:** The existing sighting distance requirements of the relevant Australian Standard (AS1742.7) take these factors into account and contain provisions for calculating sight distances based on the physical characteristics of the crossing and the road vehicles using it. AS1742.7 is currently under review and changes to approach and crossing visibility requirements are being considered. PTV (in conjunction with VicRoads) will continue engaging in the AS1742.7 review process to ensure the requirements for sighting distances are adequate for the various classes of vehicles. PTV will sit on the subgroup of the committee responsible for examining the sighting distance elements of this Standard.

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			PTV will ensure that the subgroup receives a copy of the Coronial findings and recommendation and that these are both considered in the course of the subgroup's work. PTV will also ensure that the ALCAM model sighting calculations reflect the requirements of the Standard. **Name, telephone number and email address of relevant contact person:** Secretary, Victorian Railway Crossing Safety Steering Committee, ph 03 90275023, vrcssc.secretary@ptv.vic.gov.au
8. That TSV and PTV investigate the way in which directed sounds from horns and sirens can be used to increase the conspicuity of locomotives in regional areas and increase the likelihood of road vehicle drivers' awareness of an approaching train	PTV	5 – The Coroner's recommendation is unable to be implemented	**Reasons why the recommended intervention is unable to be implemented:** PTV's position is that there is no evidence that train horns or trackside audible warning horns reliably penetrate the driver's cab of road vehicles approaching at speed and with in-vehicle sounds and distractions and environmental noise. **Alternative measures:** DTPLI, VicTrack and PTV's position is that the current suite of level crossing warnings are fit for purpose, effective and meet the So Far As Is Reasonably Practicable (**SFAIRP**) principles.

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			PTV's position also is that level crossing protection infrastructure and practice in Victoria is and should continue to be consistent with interstate and worldwide standards. **Name, telephone number and email address of relevant contact person:** Secretary, Victorian Railway Crossing Safety Steering Committee, ph 03 90275023, vrcssc.secretary@ptv.vic.gov.au
9. That TSV, PTV and VicRoads extend their development and evaluation of new level crossing countermeasures with specific reference to the countermeasure's capacity to alert road vehicle drivers to the presence of an approaching train	VRCSSC, PTV	1 – Coroner's recommendation will be implemented	**Outline the process by which the recommended intervention will be implemented and the timeframe for implementation:** The VRCSSC is responsible for the identification, trial and evaluation of new level crossing countermeasures via the Rail Crossing Technical Committee, which coordinates research such as the current project to develop active 'Keep Tracks Clear' warnings as a secondary control to mitigate queuing behaviour. It is anticipated that conclusion and evaluation of these trial(s) will take place in the 2014/15 financial year. The VRCSSC participates in a Rail Co-operative Research Centre project to trial and evaluate lower cost level crossing warning technologies which have the potential to provide train activated warnings to a greater number of level crossings than currently available for the majority of drivers at passive level crossings. It is anticipated that the trial and evaluation of these technologies will conclude in the 2014/15 financial year.

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			The MUARC ARC Linkage Grant human factors research project is studying and developing behavioural models for road user and pedestrian behaviour at level crossings. It is intended to provide a process by which behaviour at level crossings is understood and can inform the design and evaluation of new level crossing infrastructure. This project is due to be completed at the end of 2015. The response to recommendation 17 refers specifically to research into in-vehicle warning technologies which may have the capacity to enhance train warnings to drivers. **Name, telephone number and email address of relevant contact person:** Secretary, Victorian Railway Crossing Safety Steering Committee, ph 03 90275023, vrcssc.secretary@ptv.vic.gov.au
12. That TSV, PTV and VicRoads establish formal co-operative arrangements in relation to sharing of information required for...predictive risk assessment of level crossings, prioritization of level crossing upgrades and development of innovative train warning systems	TSV, PTV, VicRoads	1 – The Coroner's recommendation will be implemented	**Outline the process by which the recommended intervention will be implemented:** Cooperative arrangements are in place between VicTrack, VicRoads and the rail infrastructure owners regarding the sharing of data relevant to safety management at level crossings. PTV and VicRoads are members of the VRCSSC (which is a body responsible for level crossing safety strategy in Victoria). TSV acts as an observer on the main committee and the sub-committees of the VRCSSC. The organisations are also members of each of the four sub-committees which work on behalf of the steering committee.

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			A website housing the Safety Interface Agreements (**SIA**) for all level crossings in Victoria provides the facility for road and rail infrastructure managers to obtain current level crossing data which may be used to inform prioritisation of upgrades. Proposed further steps are: 1. Level crossing stakeholders are currently committed under Victorian Safety Interface Agreements to freely sharing information relevant to interface management. This includes road and rail traffic information. PTV will work with road and rail managers to improve the accuracy of the data provided under the Agreements. 2. The ALCAM database is being internet-enabled and, when completed, the ALCAM database will provide a streamlined mechanism for stakeholders to update the data live on the system. **Timeframe for decision about the recommended intervention:** Ongoing **Name, telephone number and email address of relevant contact person:** Secretary, Victorian Railway Crossing Safety Steering Committee, ph 03 90275023, vrcssc.secretary@ptv.vic.gov.au

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13. That TSV co-operate with the National Rail Safety regulator in establishing a system for undertaking and analysing the results of root cause analyses for fatal level crossing collisions to better inform improvements in level crossing infrastructure and level crossing safety	PTV	3 – Coroner's recommendation is under consideration	**Outline the process by which the recommended intervention will be considered:** Refer to the response under recommendation 1 in relation to the national data strategy. PTV has requested the cooperation of the independent rail investigators (ATSB, OCI, TSV), Victoria Police, and VicRoads in gathering data in the course of the conduct of any of their relevant investigations, in a form suitable for root cause analysis. **Timeframe for decision about the recommended intervention:** The first stage pilot of the National Incident Database project is anticipated to be completed by the end of 2014. **Name, telephone number and email address of contact person:** Secretary, Victorian Railway Crossing Safety Steering Committee, ph 03 90275023, vrcssc.secretary@ptv.vic.gov.au
14. That TSV and PTV improve the accuracy, content and relevance of data used in predictive risk analysis used to inform decisions about upgrading of level crossings in Victoria	PTV	1 – The Coroners' recommendation will be implemented	**Outline the process by which the recommended intervention will be implemented:** Following the completion of the ALCAM redevelopment project, the ALCAM database will provide an internet based on-line platform for rail and road managers to regularly update level crossing data. This is intended to promote improvements to the accuracy, content, relevance, and timely input of the data.

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			Timeframe for decision about the recommended intervention: The ALCAM redevelopment project is due for completion in the second half of 2014. **Name, telephone number and email address of relevant contact person:** Secretary, Victorian Railway Crossing Safety Steering Committee, ph 03 90275023, vrcssc.secretary@ptv.vic.gov.au
17. That VicTrack, VicRoads, TSV and rail operators co-operate with each other to implement innovative in-vehicle warning systems as the next stage of warning road vehicle drivers who fail to respond to existing level crossing paraphernalia that a train is approaching	PTV	3 – Coroner's recommendation is under consideration	**Outline the process by which the recommended intervention will be considered:** VRCSSC has funded and provided support and expertise for two Victorian trials of in-vehicle warning systems. Further trials of these technologies are continuing in Queensland. PTV will continue to cooperate with other key stakeholders to assess whether in-vehicle warnings are suitable and meet the SFAIRP principles. This technology should be applied uniformly across jurisdictions to avoid introducing significant new risks. A national strategy would be required to achieve this. PTV in cooperation with the VRCSSC members (in particular VicRoads) will adopt the following process in so far as it is able to:

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			1. The results of the further field trials will be evaluated once available. 2. If the technology performs as expected and specified, then the viability of these systems for level crossing applications will be assessed in order to determine whether: 2.1 any technology is technically capable of being applied to level crossing safety applications; 2.2 there is a practical mechanism within existing legislative frameworks governing rail and road vehicle fleets to have the equipment fitted to vehicles; and 2.3 any technology is able to be applied at a cost which makes it financially viable. 3. If the systems are found to be viable in a way which adequately meets railway SFAIRP risk mitigation requirements, then input will be provided into the development of technical, regulatory and licensing standards leading to manufacturing processes being put in place so that the road vehicle equipment and software is fitted into new vehicles and is able to be retro-fitted into existing vehicles and that train and rail infrastructure equipment is able to be manufactured. 4. If the technology platform is available and a practical mechanism exists to have it fitted into road and rail vehicles then input will be provided into the development of a national roll-out strategy covering road and rail in a manner which does

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			not introduce additional level crossing risk. This strategy will cover safety procedures for trains operating across State boundaries. 5. If a suitable national strategy can be agreed and signed off by road and rail authorities then: 5.1 Funding arrangements for the implementation of the system into the road vehicle fleet in accordance with the national strategy will be sought by VicRoads. 5.2 Funding for the implementation of the system into the Victorian rail network and rolling stock will be sought by PTV. 5.3 Funding for the fitting of the system into rolling stock operated in Victoria by rail operators based elsewhere will be provided by those operators or Jurisdictions. **Timeframe for decision about the recommended intervention** The results of the Queensland trials of the in-vehicle warning systems are expected to be available by the end of 2014. **Name, telephone number and email address of relevant contact person:** Secretary, Victorian Railway Crossing Safety Steering Committee, ph 03 90275023, vrcssc.secretary@ptv.vic.gov.au