

IN THE CORONERS COURT
 OF VICTORIA
 AT MELBOURNE

Court References: 1127/07 1126/07 1129/07 1128/07

FINDING INTO DEATH WITH INQUEST

Sections 19 & 36 of the Coroners Act 1985

INQUEST INTO THE DEATHS OF GEOFFREY KENNARD, DARREN SPORN and
 DAMIAN McDONALD

Delivered On:	30 January 2013
Delivered At:	Melbourne
Hearing Dates:	16 April 2007, 2 April 2008 and 29 June 2011
Findings of:	Judge Jennifer Coate, Coroner
Representation:	
Mr P Willee QC (appeared 16 April 2007 & 2 April 2008) with Ms Fiona Ellis of Counsel	Counsel Assisting (Victorian Government Solicitor)
Mr G Silbert SC (appeared 2 April 2008)	Director of Public Prosecutions (Office of Public Prosecutions)
Ms M Baczynski of Counsel (appeared 16 April 2007 & 2 April 2008)	RACV (RACV Legal Services)
Mr P G Priest QC with Ms Sara Hinchey of Counsel (appeared 16 April 2007 & 2 April 2008)	VicRoads (DLA Piper)
Mr B Dennis of Counsel (appeared 16 April 2007)	Chief Commissioner of Police (Russell Kennedy)
Mr D Curtain QC with C O'Neill of Counsel (appeared 16 April 2007)	CityLink (Herbert Smith Freehills)
	Transurban CML (Herbert Smith Freehills)
	Translink (Hunt & Hunt)

	Sporn and McDonald families (Ms P Toop of Clark Toop & Taylor appeared 16 April 2007 & 2 April 2008)
	Mr D Kalwig (Mr T Hargreaves of Hargreaves & Partners appeared 2 April 2008. Mr Kalwig appeared in person 29 June 2011)
	Subzero Refrigeration (Mr P Penno of Thomson Playford Cutlers appeared 16 April 2007 & 2 April 2008)
	WorkSafe Victoria
	Comcare (Ms C Ishkan of Minter Ellison appeared 16 April 2007)
Mr Steven Moore of counsel (appeared 16 April 2007)	Transport Workers Union of Australia
	VWA & QBE (Mr S Jacobs of Wisewoulds Lawyers appeared 16 April 2007)
	Metropolitan Fire Brigade (Maddocks)

I, JUDGE JENNIFER COATE, Coroner having investigated the deaths of

DARREN SPORN , GEOFFREY KENNARD and DAMIAN McDONALD

AND having held an inquest in relation to these deaths on 16 April 2007, 2 April 2008
and 29 June 2011

at MELBOURNE

find that the identities of the deceased are Darren Hartley Sporn¹, and Damian John
McDonald² and Geoffrey Stuart Kennard³

and that the deaths occurred on 23 March 2007

in the Burnley Tunnel

from: Darren Hartley Sporn⁴ 1 (a) Effects of fire⁵

Damian John McDonald⁶ 1 (a) Effects of fire⁷

Geoffrey Stuart Kennard⁸ 1 (a) Multiple injuries

in the following circumstances:

Introduction:

1. On the morning of March 23 2007, Mr David Kalwig, driving a 1986 Louisville Prime Mover, towing a refrigerated trailer entered the east bound Burnley Tunnel. A truck was stopped in the left lane of the Tunnel with a blown tyre. There was no emergency stopping lane inside the Tunnel.
2. As a result of his lack of control of his vehicle, Mr Kalwig's truck caused a major collision in the tunnel resulting in a fire and the loss of the lives of Geoffrey Kennard,

¹ Finding of His Honour Graeme Johnstone, State Coroner 29 March 2007

² Finding of His Honour Graeme Johnstone, State Coroner 29 March 2007

³ Finding of His Honour Graeme Johnstone, State Coroner 29 March 2007

⁴ Finding of His Honour Graeme Johnstone, State Coroner 29 March 2007

⁵ Autopsy report of Dr Sarah Parsons

⁶ Finding of His Honour Graeme Johnstone, State Coroner 29 March 2007

⁷ Autopsy report of Dr Sarah Parsons

⁸ Finding of His Honour Graeme Johnstone, State Coroner 29 March 2007

Darren Sporn and Damian McDonald who were each driving separate vehicles in the Tunnel on that day.

3. The deaths of these three men and the subsequent disruption to the city of Melbourne, both physically and psychologically in the wake of this collision not only left three families bereft of their loved ones, but left a fear in the minds of many using the Burnley Tunnel as to its safety. The public commentary in the wake of this incident also raised some questions about the emergency procedures and responses in place for the Burnley Tunnel which seemed worthy of addressing in this investigation.
4. These deaths sparked a number of reviews by agencies such as VicRoads, CityLink and Metropolitan Fire Brigade (MFB) as well as the investigations by Victoria Police, both for the criminal proceedings and the coronial investigation.
5. Mr Kalwig was charged with three counts of culpable driving. He went to trial before a judge and jury and was convicted of three counts of the alternative charge of dangerous driving causing death. He was sentenced to a total of five years with a non parole period of two years and 9 months.⁹
6. At the completion of the criminal trial, sentencing and appeal period, the Inquest Brief was provided to this Court and the coronial investigation resumed in 2011.

Coroners Court History

7. On 16 April, 2007, His Honour Mr G. Johnstone, the former State Coroner opened an Inquest into the deaths and appointed an expert, Mr Arnold Dix to examine a range of aspects of the collision including the design and construction of the Tunnel, the operation of the Tunnel and the safety and emergency procedures and responses in the wake of the collision and fire.
8. His Honour made some clear public statements at that time that the Government and all relevant agencies should proceed with their own reviews and introduce any necessary changes without waiting for the coronial investigation's completion, given the coronial investigation would need to await the completion of the criminal proceedings and the provision of the completed Inquest Brief.

⁹ see [2009] VSC 373, sentence of Weinberg JA at [33]-[34]

9. Consistent with the spirit of s 7 of the *Coroners Act 2008*, this investigation has endeavoured to liaise with other investigative authorities and agencies as far as practicable and not re-investigate matters which have already been the subject of extensive investigation and review.
10. By April 2008, the Interim Draft Report of the Court appointed expert Mr Arnold Dix was released only to the Interested Parties. Counsel on behalf of the Director of Public Prosecutions made strong representations to the Court about the need to ensure that the fair trial of Mr Kalwig was not compromised by the release of the Interim report. In response to these representations, Directions were given touching upon the need to ensure that the criminal trial process underway not be compromised by the public release of that report. Thus, the interim report was released with strict undertakings as to its dissemination while allowing its contents to be considered and even acted upon by agencies such as VicRoads and CityLink. The provision of the interim report to the Interested Parties on undertaking gave relevant agencies and Interested Parties the opportunity to respond to the contents of that report and for Mr Dix to consider those responses before finalising his report to the Court.
11. After the trial and sentencing of Mr Kalwig, a Brief of Evidence was prepared for this court and the final report of Mr Dix was also provided. In the wake of considering that material, and communicating with the bereaved families as to their wishes, the Court resumed on June 29 2011 to make directions as to the final stages of the Inquest.
12. At the aforementioned directions hearing a range of matters were discussed. The legal representatives for each of the Interested Parties confirmed that no issue would be taken with this Court adopting the sentencing remarks of Weinberg J A as the basis for the circumstances in which these deaths occurred. In addition no issue was taken with the identities of the three men who died or their causes of death.
13. Each of the families communicated to the Court their wish to avoid a lengthy public hearing, whilst being keen to ensure that whatever public health and safety lessons learned, and Coroner's recommendations made, formed part of the public record.
14. In my view, in the spirit of the current law, it is neither appropriate nor necessary to investigate the facts of this collision and fire again in open court, in circumstances where:

- (a) There has been an 11 day criminal trial in the Supreme Court resulting in a jury finding of guilt attached to the dangerous driving of the driver Mr David Kalwig in this tragedy in the Burnley Tunnel;
 - (b) A summary of the circumstances of that collision have been set out by the sentencing judge (*R V Kalwig* [2009] VSC.373, 1 September 2009 per Weinberg JA)
 - (c) An opinion from the experienced senior investigating member from the Major Collision Unit, Senior Sergeant Jeffrey Smith confirming that the facts surrounding the collision were properly found on trial;
 - (d) A comprehensive report (174 pages) from an independent expert appointed by the Court which sets out in considerable detail the circumstances surrounding every aspect of the collision to which each of the Interested Parties have had access to it in its draft form¹⁰ and have made comment upon; and
 - (e) An express wish from all of the families who have lost loved ones that they are not seeking any further lengthy public hearing.
15. Given this, I was satisfied as at June 29 2011 that it was appropriate to proceed to finalise the remainder of the investigation by way of exchange and examination of submissions and reports without the need to occupy further court time or have any more evidence formally examined in court. For these reasons I am satisfied it is appropriate to adopt in summary form the circumstances of this collision as summarised from His Honour's sentencing remarks.

The factual circumstances in which the deaths occurred

16. I have extracted relevant parts in summary from His Honour's sentencing remarks as follows:
- *On the morning of 23 March 2007, Mr Kalwig commenced work at 7 am at the Sub Zero depot in Brooklyn in Melbourne's western suburbs. At the start of his shift Mr Kalwig inspected the prime mover checking the tyres and air brakes. It was a 1986 Louisville prime mover, towing a refrigerated trailer. After*

¹⁰ Exhibit 1

performing a series of deliveries between 7am and 9am, he left the depot again, not fully loaded and well within the legal maximum weight.

- *Mr Kalwig drove out along McDonald Road Brooklyn, turned right into Millers Road, and then headed up towards the Westgate Bridge. He then turned onto the Princes Highway heading towards the city. Mr Kalwig drove over the Westgate Bridge and continued on and into the Burnley Tunnel.*
- *At about 9:45 a.m. Mr Kalwig entered through the Burnley Tunnel in an easterly direction. The speed limit upon entry into the Tunnel was 80 kph.*
- *Mr Kalwig was unaware when he entered the Tunnel that a Sterling truck towing a semitrailer had sustained a blowout of one of its tyres and due to the absence of any emergency stopping lanes in the tunnel, had pulled over to the left-hand lane. This had occurred about two minutes or so before Mr Kalwig arrived at the scene. The Sterling truck was blocking the entire lane forcing traffic to diverge right and move around it. The truck had its headlights and hazard lights operating.*
- *After the Sterling truck had broken down in the Tunnel, some 108 vehicles including 23 trucks, two Double B semitrailers and 83 cars were able to pass by safely.*
- *A 2003 Mack prime mover towing a trailer entered the Tunnel in front of Mr Kalwig. The Mack truck driver moved to the left lane after which that driver gave evidence that he saw the broken down Sterling truck an estimated 700 or so metres in front of him. He calculated that he was travelling at about 80 km per hour when he saw the emergency lights flashing on the broken down Sterling truck and realised that it had stopped.*
- *The Mack driver then moved into the left lane and began to slow down so that he could stop well short of the truck ahead if he needed to do so. The Mack driver then travelled another few hundred metres at which time he was able to confirm that the Sterling truck had indeed stopped. He applied his brakes and changed down through the gears getting down to a speed of 5 km per hour and some distance west of the Sterling truck, waiting for a gap in the centre lane to appear*

so that he could change lanes and safely move around the stationary Sterling truck.

- *Mr Kalwig entered the Tunnel some time after that Mack prime mover. Mr Kalwig was travelling in the left-hand lane at a speed between 65 and 70 km per hour, noting that this was below the designated speed limit of 80 km per hour. Other vehicles slowed significantly as they became aware of the broken down Sterling truck. Mr Kalwig did not.*
- *Mr Kalwig continued along in the left lane of the Tunnel reducing his speed only marginally and by the time Mr Kalwig appreciated the danger posed by the Mack prime mover immediately in front of him it was too late.*
- *Mr Kalwig swerved suddenly into the centre lane in order to avoid colliding with the Mack prime mover. In changing lanes, Mr Kalwig sideswiped a Ford Falcon travelling in the centre lane. That car was being driven by a woman with her two-year-old son as a passenger in the rear. This manoeuvre forced the Ford Falcon into the right-hand lane.*
- *Mr Kalwig's truck then continued in the centre lane, with his trailer side swiping an Isuzu prime mover and trailer which had been travelling in the right-hand lane.*
- *Mr Kalwig's truck then ricocheted off the Isuzu prime mover and back into the centre lane. It was in those circumstances that Mr Kalwig's truck collided with the rear of the Mazda being driven by Mr McDonald forcing the Mazda to collide with the rear of a silver Subaru station wagon. As a result of that impact the Subaru station wagon diverged into the right lane colliding with the fuel tank of the Isuzu truck, and then rotated in a clockwise direction across the path of that vehicle.*
- *As a result of having been struck by Mr Kalwig's truck, Mr McDonald's Mazda was forced into the left-hand lane. The Mazda together with Mr Kalwig's truck then collided with the Toyota being driven by Mr Kennard and the Holden being driven by Mr Sporn. The Holden was forced up and along the wall of the Tunnel and effectively crushed between Mr Kalwig's truck and that wall. The Mazda*

ultimately ended up between the passenger side of Mr Kalwig's truck and the Tunnel wall.

▪ *Once in the left-hand lane, Mr Kalwig's truck collided with the rear of Mr Kennard's vehicle. The impact was so severe that it crushed the Toyota between Mr Kalwig's truck and the broken down Sterling truck. As a result of these various collisions, fire engulfed the Mazda, the Toyota and the Holden as well as the rear of the (stationary) Sterling truck.*

▪ *Mr Kalwig was spoken to by the police at the scene following the accident. He was tested for alcohol and drugs with no evidence that he was affected by either. He had been driving trucks for 17 years at that time, although most of that driving had been in smaller trucks. He was employed by a company known as Sub Zero Transport and Storage which transported refrigerated goods. He had been driving this vehicle for about 5 months at the time of the collision.¹¹*

17. His Honour interpreted the jury verdict to mean that Mr Kalwig did not drive with proper care and attention in all the circumstances, that Mr Kalwig had more than enough time to see that the Mack prime mover had either come to a complete stop or had virtually done so and that Mr Kalwig had a clear and unimpeded view of that truck and ample time to slow down and indeed stop.

18. His Honour stated to Mr Kalwig on sentencing, *"Had you been attending properly to your driving, and not being somehow distracted, you would easily have been able to avoid the need to swerve sharply into the centre lane"*.¹²

19. His Honour went on to say to Mr Kalwig on sentencing: *"Anyone driving a large semitrailer at about 65K ph through a confined space, such as the Burnley Tunnel, which has no emergency stopping lane, must be aware of the potential hazard to other vehicles if they fail to pay proper attention to the road ahead. It is obvious that there is a need, in such circumstances, to keep a careful look out for vehicles that might have stopped, or be slowing down, in a lane ahead. To drive the vehicle such as yours at such a speed in such a place without paying any attention to what was happening in*

¹¹ R v Kalwig [2009] VSC 373, per Weinberg JA at [5]-[20]

¹² at [23]

front of you for anything up to eight seconds is obviously foolhardy and extremely dangerous."¹³

20. As indicated above, with the consent of all of the Interested Parties present at the directions hearing held in June 2011, I am satisfied that it is appropriate to adopt the findings of fact from the sentencing remarks as Findings as to the circumstances in which these deaths and the fire occurred.

Conclusion as to the circumstances in which the deaths occurred

21. This collision and fire caused three men to lose their lives in the manner described above. Each were sole occupants of their own vehicles. His Honour, Weinberg JA found that none of the three men who died in that collision were in any way to blame for what occurred. His Honour ruled that the deaths of Geoffrey Kennard, Darren Sporn and Damian McDonald were brought about solely because of the manner in which Mr Kalwig drove.¹⁴
22. This collision caused a major fire within the Burnley Tunnel, causing 300 people to be evacuated. In the wake of this terrible and frightening tragedy, the Tunnel was closed to the City of Melbourne for three days. The impact of the dramatic loss of three lives in this way and the magnitude of this event on the psyche of the State cannot be underestimated.
23. I also note the obvious inference from the findings of Weinberg JA that the cause of the collision was the driving of Mr Kalwig. His Honour did not find that the design or operation of the Burnley Tunnel contributed to these deaths. Having said this, all of the relevant Interested Parties have co-operated willingly and openly with this investigation to assist in the object of improving both immediate and future safety in the design and operation of tunnels, driver education and emergency responses.
24. I have had the opportunity to receive and consider the material provided by all of the Interested Parties who wished to make a contribution in the context of the recommendations which may emerge from this inquiry. I have also taken into account the spirit of the operation of the coroner's jurisdiction which requires a coroner to liaise

¹³ at [26]

¹⁴ at [28]

with other investigative authorities and official bodies to avoid unnecessary duplication of inquiries and investigations.

25. For these reasons, having made Findings as required as to identity, cause of death and the circumstances in which the deaths occurred, I turn now to those aspects of the investigation which have examined the issues raised that may contribute to a reduction in the number of preventable deaths and fires and the promotion of public health and safety.
26. As set out above, I have endeavoured to summarise and analyse all of the investigative and considered work that has been done in the wake of this tragedy and produce a set of recommendations that are aimed at contributing to a reduction of death and injury in similar circumstances whilst endeavouring to avoid making recommendations or re-investigating areas where good work has already been completed and recommendations for change arising out of that work has already been completed.
27. Bearing that in mind, below, I have set out in summary, the background and some rationale by way of commentary for the recommendations I do make.

COMMENTS

Pursuant to section 19(2) of the Coroners Act 1985, I make the following comment(s) connected with the death:

How the coronial investigation has proceeded post completion of the criminal proceedings

28. As stated above, on 29 June 2011 at the further Directions Hearing, the issue of how to proceed with the remainder of the investigation was discussed. Whilst it was agreed as to the circumstances in which the deaths occurred based on the sentencing remarks of Weinberg JA, that still left the issue of other aspects of the coronial investigation into the deaths and the fire to be resolved, including the 52 recommendations from the 'Dix Report'.

29. At the Directions hearing on 29 June 2011 it was agreed that using the Dix report recommendations as the basis for the finalisation of the investigation would be useful. To this end, a single Chart of those recommendations was produced and circulated to the Interested Parties.
30. The Chart contained the 52 Recommendations from the 'Dix Report' and the collated responses of the Interested Parties to each of those recommendations. It was agreed that once this task was completed, the "Chart" would then be provided to me to decide whether or not any further evidence needed to be called.¹⁵
31. This process was undertaken during the second half of 2011 and the first half of 2012. It was also agreed that in the event I proposed to make a recommendation which was opposed by one of the Interested Parties, that party would be given the opportunity to respond before proceeding to that recommendation.
32. Ultimately, and bearing in mind those indications, I did not consider it necessary to bring the investigation back into the Court. On the basis of the investigations and report undertaken by Mr Dix and the material provided by the Interested Parties, and the various reviews and investigations undertaken and changes made, I am satisfied that the range of issues touching upon driver behaviour, tunnel design, driver regulation and education and the emergency response can be dealt with by way of Comments and Recommendations without the need for any further evidence or submissions.

Range of reviews, statements, reports and investigations undertaken

VicRoads Safety Review

33. In the wake of these deaths, VicRoads launched a review of the circumstances in which these deaths occurred with a view to making any necessary safety changes as soon as possible based on the information available at that time.
34. VicRoads also provided a comprehensive statement under cover of letter dated 13th of August 2008¹⁶ detailing the Safety Review it had conducted with the objective of advising the Government of possible changes to infrastructure and the traffic operations

¹⁵ Exhibit 2

¹⁶ Appendix 2

which it submitted, if implemented, would reduce the likelihood that a similar incident would occur in the future.

35. VicRoads advised that it held a range of discussions with a number of other agencies including Victoria Police and the CityLink group in coming to the position set out in that statement.
36. In its statement to the Coroner,¹⁷ VicRoads set out the key components of that Safety Review as follows:
 - (a) An analysis of reported casualty crashes in the Tunnels since their opening; and
 - (b) A comparison of the infrastructure features and operational characteristics of the CityLink tunnels with national and international standards and practices. The VicRoads Statement noted that the Review culminated in recommendations to the Minister for Roads and Ports and subsequent approval by the government of the day to a package of measures to be implemented by VicRoads and CityLink Melbourne Ltd. Details of the subject matter covered by the review together with measures recommended to the Minister are contained in that report.
37. Other measures were proposed or have been implemented by CityLink as a result of its own investigations.
38. The VicRoads review resulted in recommendations to the Minister for Roads and Ports and subsequent approval by the then Government of a package of measures to be implemented. Included in the Review, VicRoads provided an analysis of reported crashes in the CityLink Tunnels involving casualties¹⁸ for the period from the opening of the Tunnels to June 2006. This data was based on Victoria Police reports of casualty collisions.

That analysis found:

- * *There was a total of 13 casualties crashes reported for the analysis period*
- * *Of the 13 casualty crashes, two involved serious injury. There were no fatal crashes*

¹⁷ Exhibit 3 (included and tendered in the material comprising the Inquest brief)

¹⁸ Casualties were defined as death or serious injury

- * *Serious casualty crashes represent 15% of all crashes in the CityLink Tunnels. This compares to an average of 29% of the urban freeway network as a whole.*
- * *Eight of the 13 crashes involved heavy vehicles (three rear end crashes and five lane changing crashes) and three crashes involved motorcycles. Of these crashes, one involved both a truck and a motorcycle.*
- * *The proportion of crashes in the CityLink Tunnels involving heavy vehicles is 62% compared to an average of 17% of crashes on all urban freeways. (VicRoads noted however that the significance of this difference from a statistical viewpoint is not considered to be valid because of the low number of crashes in the Tunnels particularly those involving heavy vehicles.)*
- * *A comparison of crash rates showed that the rate within the Tunnels is much lower than on the adjoining sections of the Westgate and Monash freeways.*
- * *The crash rate in the Tunnels is also much lower than the average of 1.6 casualties crashes for all metropolitan freeways*

39. In the course of the Safety Review conducted by VicRoads, the statement provided noted that a range of options were considered to improve the safety of the CityLink Tunnels together with other tunnels to be constructed in the future. The review concluded with a number of recommendations for change. In its wake, a working group was set up to implement the recommended measures.

40. In summary, the VicRoads Safety Review identified 11 areas for comment or recommendation for improved safety, both in the Burnley Tunnel and tunnels generally. These comments and/or recommendations and the implementation or otherwise of those recommendations are as follows:

A ban on lane-changing in the Tunnel

41. In April 2007, the then Government announced its intention to introduce a ban on lane changes in the Tunnels (subject to advice by Tunnel operators or in an emergency) and a fine and imposition of demerit points for the offence of changing lanes in the Tunnels.

42. The evidence contained in the statement from VicRoads demonstrates that a considerable amount of work and consultations with technical experts was undertaken by the implementation team to consider how such a ban may be imposed and ultimately the workability and safety of such a ban.
43. Ultimately, the conclusion was reached by the Review that a total ban on lane changing in the Tunnels would result in "a net loss in safety over the network".¹⁹ VicRoads reviewed the analysis of the impact of lane changing restrictions and concluded that the "findings and recommendations of the consultants and CML were soundly based." Accordingly, VicRoads agreed that the introduction of a ban on lane changing in the Tunnels would not proceed. I note that there was another press release from the Government in the wake of this Review stating that the Government would not proceed to ban lane changes.
44. It was agreed by VicRoads and CityLink that existing variable message signs within the Tunnels would be used and changes to the line marking would be implemented to strengthen the advisory approach to reducing lane changing. Changes to the lane marking were completed on 12 March 2008.²⁰
45. CityLink confirmed that there are variable message signs above the roadway within the Tunnels that have messages advising drivers to avoid unnecessary lane changing.
46. CityLink also advised that it has placed a solid painted line between the raised pavement markers within the Tunnel in order to make these markings clearer and more visible.²¹
47. The Dix Report, after considering this issue also did not recommend a ban on lane changing. The Dix report noted that "*whilst it was highly desirable that the design of new tunnels should minimise the requirement for lane changing, an analysis of the Burnley Tunnel clearly indicates that with merging traffic from Kings Way and the decrease in useable lanes from three to two prior to the merging lane in the area several hundred metres preceding the Tunnel entrance, coupled with the loss of the left*

¹⁹ Exhibit 3 - VicRoads statement under cover of letter dated 13.8.2008 at p17

²⁰ Ibid

²¹ Exhibit 3 - Letter from Freehills for CityLink 22 June 2010

*hand lane after exiting the Tunnel, demands lane changing for effective traffic movement.*²²

48. In his final response on this issue, Mr Dix noted that prohibitions on lane changes are common in some countries. He also noted that *"The current approach to discouraging lane changing in the CityLink Tunnels appears to have substantially reduced the number of lane change manoeuvres. This change in lane marking and signage post dates the Burnley incident and represents an improvement in safety performance in the Tunnel"*.²³
49. Given that there is no support for such a ban in the Burnley Tunnel after considerable analysis and thought from a range of experts, I do not propose to take this proposal any further or make any such recommendation.

An education and communication campaign relating to safe Tunnel use:

50. VicRoads recommended that there be an education and communication campaign directed to speed, maintaining safe distances between vehicles, prohibitions on stopping in Tunnels, parking and manoeuvring, the requirement to listen to radio broadcasts and what to do in emergencies in the Tunnel.
51. VicRoads advised that a major driver education campaign "Share the Road Safely" started towards the end of 2007 and continued through 2008. VicRoads stated that the campaign aimed to *"promote responsible driver behaviour and encourage drivers to be aware of the needs of other road users on the road network in general and in tunnels specifically"*.

Additional requirements for learner drivers:

52. VicRoads made an incidental finding that there was an absence of specific information for learner drivers relating to rules, responsibilities and appropriate behaviour for safe driving in tunnels. This elicited a recommendation that appropriate changes be made to the learner driver Handbook *"Road to Solo driving"*.

²² Exhibit 2 - Dix Report 14.6.1

²³ Exhibit 4 - Comments recorded at 14.6.1 of the Chart

53. VicRoads confirmed that amendments have been made to the Handbook as at 1 July 2007 to provide information on driver safety in tunnels.
54. In the Dix report²⁴ a recommendation was made that the new Drivers Handbook (*Solo Driving*) (VicRoads 2007) be expanded with respect to safety in tunnels, especially with regard to safe distances, lane changing, driver distraction, special dangers in tunnels, emergency behaviour, self rescue and emergency response and that testing should include specific questions directed to these areas. VicRoads supported this recommendation noting that some specifically dedicated material about driver distraction may be included in the next reprint of the Handbook, but responded with respect to testing, that test questions are randomly generated so not all drivers will get the same question but of course must study the same material. (See RECOMMENDATION 1)

Emergency Tunnel closure barriers

55. The VicRoads review recommended that physical barriers should be installed to prevent vehicles entering the Tunnel following a serious incident. The review advised that the installation of barriers at the Tunnel entrances on the main freeway carriageways was scheduled to be completed by July 2008.
56. The CityLink group advised that installation of traffic lights and physical barriers at Tunnel entrances which were capable of being deployed to prevent vehicle access to the Tunnels in the event of the Tunnels being closed in an emergency has been completed.
57. Given this action has been taken it is not necessary to make a recommendation that it be done.

Automated enforcement of lane closures

58. This issue was considered by the VicRoads review as noted above but it ultimately found that the enforcement of lane closures of itself posed a safety risk and that conventional enforcement was problematic due to the constrained environment and

²⁴ Exhibit 2 - at 14.10.1 and 14.10.2

safety issues for police. The VicRoads review noted that the introduction of automated enforcement using cameras was recommended but not adopted.

Extension of the use of variable speed limits signs on the approach to tunnels

59. This issue relates to giving drivers entering the Tunnel advance warning with respect to any change of the speed limit. This measure was recommended. Two electronic variable speed limit signs have now been erected on the approach to the Burnley Tunnel just south west of the Kingsway overpass and on the Domain Tunnel approach, variable speed signs have been erected to give drivers advance warning when speed restrictions are active in the Tunnel.
60. These works were completed and the signs were commissioned on 9 November 2007. Further on the Domain Tunnel approach two electronic variable speed limit signs were erected and commissioned as at 19 April 2008.

Reduction of the speed limit on the Westgate Freeway

61. The VicRoads review looked at the high volumes of traffic on the Westgate Freeway between the Westgate Bridge and the CityLink tunnels and the high volumes of "weaving manoeuvres" as a consequence of vehicles entering and leaving the freeway at the interchanges at Power St, Kingsway, Montague Street and CityLink Western Link and Todd Road.
62. The Review recommended the lowering of the speed limit from 100 km per hour to 80 km per hour to reduce the risk of crashes on this section of the Freeway and allow eastbound motorists a greater opportunity to position themselves in the correct lane prior to entering the Burnley Tunnel.
63. This recommendation was completed on 11 June 2007. Further to this change, VicRoads advised²⁵ that in 2010 the variable speed limit for the Power Street and Kings Way entry ramps was reduced to 60kph to ensure safe merging into the left hand lane during peak times.

²⁵ Exhibit 3 - Correspondence from DLA Piper dated 31 May 2012

Banning trucks from using the right lanes within tunnels

64. The VicRoads review noted that the matter of “truck free” lanes on freeways has been under consideration and debated for some time. The Review noted that the introduction of lane restriction for trucks may result in frustration to other drivers, and presumably have the potential to incite more lane changing in the Burnley Tunnel. VicRoads added²⁶ the design of the Westgate Freeway approach to the Tunnel has changed and thus it is impractical for vehicles to keep left and direct trucks to keep out of the right-hand lane.
65. The Review also found at that particular time when there was heavy construction in areas around the Burnley Tunnel that it would be difficult to operate truck free lanes and hence the measure was not recommended.
66. This conclusion not to ban trucks from using the right hand lane was supported by the report of Mr Dix who concluded that given the pre-existing configuration of the Burnley Tunnel, it was not safe to do so. However, Mr Dix commented on this issue as one which should be considered for future road constructions.²⁷ VicRoads responded by indicating that such restrictions on trucks using right hand lanes have already been imposed and were operating on the Geelong Road and Eastern Freeway.
67. Given this issue is already being given proper attention by VicRoads, it obviates the need to make any further comment or recommendation.

Provision of emergency lanes or “lay-bys” in tunnels

68. On this issue the Review concluded that it was neither practical nor a cost-effective option to retrofit an emergency lane or “lay bys” in the Burnley Tunnel. The review noted that international practice and experience demonstrated that tunnels without this capacity can operate satisfactorily with appropriate mitigation measures in place such as high standard incident detection and management systems. The review noted that the CityLink Tunnels have these systems.

²⁶ Exhibit 4 - VicRoads response at 14.8.1 Dix Report

²⁷ Exhibit 2 - Dix Report, 14.8.1

The speed limits in the tunnels

69. The Review found that the existing speed limits in the Tunnels were consistent with international practice and that no changes to speed limits were recommended. Mr Dix, in his report, in apparent support of this conclusion added that speed restrictions on classes of vehicles would create greater tunnel risks.
70. At 14.7.1 of his report Mr Dix expressed his view that "*changing the speeds applicable to different classes of vehicles would exacerbate problems which already exist with differential speeds within the tunnel including lane changing and vehicles separation. Exit grades from tunnels directly impact speed differences between vehicles*". Mr Dix went on to note "*truck speeds should not be reduced in the CityLink tunnels. To do so would reduce the overall safety for users by substantially increasing the speed differential of cars and trucks, and thereby increase the need for undesirable lane changes and congestion.*"²⁸
71. Senior Sergeant Smith, the investigating member was also asked to address this question. Senior Sergeant Smith responded by saying the issue was not about speed restrictions in the Tunnel but rather about speed in the circumstances in which Mr Kalwig drove his truck.
72. Senior Sergeant Smith noted that the judge found that Mr Kalwig was travelling under the speed limit of 80. Senior Sergeant Smith noted that at the time of the collision the warning lights in the tunnel were operating effectively and showing 60 km per hour and had closed lane one. All vehicles with the exception of the Mr Kalwig's vehicle had complied and had slowed down. Mr Kalwig did not, despite the best efforts of all the posted warnings that were seen by everyone else.²⁹

Vehicle following distances

73. The Review noted that there are currently road rules in place which fix a safe distance to be maintained between moving vehicles. The question posed by the circumstances surrounding these deaths was whether or not there should be specific provisions directed to the maintenance of safe distances inside tunnels. It was noted that

²⁸ 14.7.2 Dix Report

²⁹ Exhibit 3 – report of Snr Srgt J Smith (MCIU), 28 December 2010

regulations had been introduced in some countries which require vehicles to maintain a specific minimum following distance when travelling in tunnels and that markings or lights have also been introduced in some places to assist motorists to judge and maintain appropriate distance.

74. The VicRoads Review found that the potential benefits of mandatory following distances in tunnels "were not clear" and further that the "practicality of motorists maintaining the required distances under heavy traffic flows presented some difficulties and thus the measure was not recommended. It was noted however that the message about maintaining safe distances inside the Tunnel was recommended for inclusion in the education and communications campaign.
75. I should add here that some of the recommendations from the Dix report addressed this issue both in terms of driver behaviour campaigns and technological solutions to address vehicle separation. It is clear from the response of the relevant interested parties that this issue is well understood as an issue, promoted as a safety message and regulated by law. No doubt the on-going development of further technology to assist drivers to maintain a safe distance in tunnels as well as on the road generally will continue.

CityLink /Transurban/CML/Translink Operations Group("The CityLink Group")³⁰

76. The CityLink group sought to establish that no act of omission or commission on its part contributed to this tragedy. Notwithstanding this, the CityLink group has co-operated fully with the coroner's investigation and provided a considerable amount of information and assistance to the Court, the investigating member and Mr Dix.
77. In a letter dated June 22, 2010 Freehills solicitors, on behalf of their clients wrote in response to a question which sought to elicit whether or not any practices or procedures had changed in the wake of the fire and deaths in the Burnley tunnel.³¹
78. The CityLink group advised that it had engaged in a number of discussions and consultations with a range of agencies in the wake of the deaths and fire in the Burnley

³⁰ The corporate structure of the various entities who own and operate the Burnley Tunnel was not particularly relevant to the coronial investigation into these deaths in the circumstances as found. Consequently, I do not consider it necessary to detail how all of the various legal corporate structures fit together or apparently derive from each other.

³¹ Exhibit 3

Tunnel and that as a result, four changes were made affecting both the Burnley and Domain Tunnels.

79. These changes were described as follows:

1. The installation of traffic lights and physical barriers at Tunnel entrances which were capable of being deployed to prevent vehicle access to the Tunnels in the event of the Tunnels being closed in an emergency
2. The addition to CityLink's variable message signs (above the roadway within the Tunnels) of messages advising drivers to avoid unnecessary lane changing
3. The placing of a solid painted line (3 m by 0.1 m) between the raised pavement markers within the Tunnels in order to make these markings clearer and more visible
4. The introduction of an additional pair of variable speed limit signs on the approach to each Tunnel to extend the amount of advance warning when speed restrictions are active in the Tunnel.

80. It has been submitted on behalf of the CityLink group that it does not believe that any of these changes would have affected either the incident in the Burnley Tunnel on March 23, 2007 or the emergency response to it. However it is submitted that they are changes that the CityLink group believe might not have been made, but for the general review of tunnel safety to which the fire and deaths gave rise.

81. The CityLink group also submitted that a number of changes have been made in and around the CityLink roadway (including the two tunnels) as a result of projects that had been commenced prior to 23 March 2007 in connection with continual improvement and updating of technology. The CityLink group gave the example of changes to signage depicting emergency exit routes and passages which were completed on March 30, 2008.

82. The CityLink group also advised that major upgrades to the M1 corridor have been carried out in conjunction with VicRoads noting that as a direct response to the Burnley Tunnel incident, the government through the VicRoads has incorporated into the M1

upgrade program a lowering of the maximum speed limit on the roadway between Westgate Bridge and the Burnley Tunnel to 80 km per hour.

83. The CityLink Group also noted that there have been other less visible changes made such as the central control computer being replaced in 2009 as part of the normal technology life cycle update, noting that whilst such changes did not directly result from the deaths in the Burnley Tunnel on March 23, 2007, there was no doubt that the discussion around these events had some influence on a wide variety of safety issues that had resulted in enhanced road/tunnel safety.

The "Dix report"

84. As noted above, in the wake of the deaths of Messrs Sporn, Kennard and McDonald, the then State Coroner His Honour Graeme Johnstone ordered an investigation and the preparation of an expert report to examine the design of the tunnel, including the design of the safety features for emergencies in the Tunnel. Mr Arnold Dix was the appointed expert to conduct this investigation. Mr Dix prepared a final report ("the Dix Report") as at June 29 2011 which runs to 174 pages.³²
85. The Dix Report contains 52 recommendations.³³ The Dix report (in an earlier form) as noted above was made available to the Interested Parties in April 2008. As a consequence, a number of the recommendations from that report have either been implemented or are underway and thus do not require a duplicate recommendation from this inquiry. Other findings and recommendations of the Dix report have been considered by a range of the professional Interested Parties (VicRoads, the CityLink group, Metropolitan Fire Brigade, Victoria Police and the Major Collision Investigation Unit.

DIX report recommendations

86. As noted above the Dix report recommendations were put into a Chart (Exhibit 2) and circulated to each of the relevant Interested Parties for review and response. I have had

³² Exhibit 2

³³ Exhibit 2 - See pages 137 to 143 Dix report

the opportunity to consider not only the report and recommendations but the responses of each of the relevant Interested Parties.³⁴

87. In so doing, I have not followed the “groupings” of the recommendations in the Dix report, nor do I propose to address each and every “recommendation” in the report. I note that some of the 52 are more comment than recommendation, some of them absorbed into other reviews and discussions in this Finding, some are not sufficiently connected to the facts in this case and for some, I have accepted the reasoning of one or more of the Interested Parties as to why it is not appropriate to adopt or pursue the recommendations of Mr Dix.
88. I have re-categorised the remaining Dix recommendations which I propose to make or discuss into Driver Behaviour; Tunnel Design, Emergency Response and Monitoring Tunnel Safety as set out below.

DRIVER BEHAVIOUR

Vehicle speeds and vehicle separation

89. At 14.1.3 of the Dix report, a recommendation was made that: “*vehicle speeds in tunnels and vehicle separation should be regulated to appropriately manage the safety of users and the flow of vehicles*”.³⁵ In response it was noted by VicRoads, CityLink and Victoria Police that speeds in tunnels are already regulated by the use of variable speed limits and separation of vehicles is also already regulated. VicRoads noted that the practicality of motorists maintaining required distances under heavy traffic flows is problematic.
90. CityLink added that regulating vehicle separation is challenging due to the difficulty in defining the required separation and the current state of technology and variable conditions inside the Tunnel. CityLink also noted that further signage could be a distraction to safe driving that would not result in a net gain to user safety.

³⁴ see Exhibit 4

³⁵ I note that the Dix report contains comments and recommendations about changes and controls of speed limits upon entering and inside the Burnley Tunnel. I have accepted the work of VicRoads in this regard and the conclusions reached by its Safety Review and thus do not propose to direct on this issue any further recommendations.

91. Senior Sergeant Smith added that vehicle separation is already legislated in relation to safe following distances.
92. I note that ultimately what was found by Weinberg JA was that Mr Kalwig committed an egregious breach of the traffic laws, but not that the laws were deficient or vague or equivocal.
93. For my own part I accept the analysis and agree with the conclusion that vehicle speeds are already regulated and adjusted according to traffic and tunnel conditions using variable message systems and adding more lights and signs may be a safety hazard and safe vehicle distances are also regulated in this State.

Speed cameras in the Tunnel

94. On a different note, at 14.1.4 Mr Dix made a recommendation about examining the impact on driver behaviour of the existence of speed cameras in the Tunnels expressing concern that it may be a distraction for drivers to be looking down and constantly monitoring their speed to avoid speeding fines. This recommendation was not supported by any of the relevant Interested Parties for the reasons extracted in the Chart³⁶ (under 14.1.4). Indeed, CityLink noted that prior to the installation of speed cameras; it regularly experienced non compliance with speed limits in the Tunnel.
95. There is no evidence in this tragedy that Mr Kalwig was distracted by monitoring his speed and unlike all of the other drivers approaching the hazard that was created in the Tunnel that morning, he was travelling at such a speed that he could not safely avoid the hazard. More importantly however, the advice from CityLink that the installation of cameras has increased compliance with speed limits is the evidentiary basis upon which I rely to take no further action on this issue.

Lane changing

96. At 14.6.1 the Dix Report did not recommend a prohibition on lane changing because he did not consider it practical given the design of the Burnley Tunnel and the roads that merge into it. VicRoads and CityLink effectively agreed with this conclusion but both

³⁶ Exhibit 4

agencies stated that new tunnels should be designed to discourage lane changing and to minimise the need for lane changing.

97. As noted above, the VicRoads review found that lane changing was identified as the cause of nearly half of the reported casualty crashes in the CityLink Tunnels. Therefore, the elimination of lane changing received considerable attention during the VicRoads review and resulted in a recommendation to the Minister that lane changing should be banned subject to it being demonstrated that safety would not be improved by such a measure.³⁷
98. Ultimately for the reason set out above it was not adopted for the Burnley Tunnel. However, for the construction of future tunnels, it should be an important consideration. (RECOMMENDATION 2)

Education campaign for safe driving in Tunnels

99. At 14.1.11 Dix recommended that a driver education program of safe driving in tunnels be developed. VicRoads responded by indicating that it supported the recommended action and noted that the safe driving in tunnels component was a significant part of the *Share the Road* safety campaign that was developed and delivered subsequent to the Burnley Tunnel crash.
100. VicRoads did note however that the campaign was not ongoing. CityLink also noted that it supported the recommended action and continues to work with VicRoads and East Link on promoting tunnel safety and giving practical advice to road users.
101. CityLink advised that in 2007 not only did it join in the safety campaign but also produced its own Tunnel safety brochure that it sent to all new customers and re-issued to existing customers from time to time with their accounts.
102. Whilst it is pleasing to note the response of both VicRoads and CityLink in the wake of these deaths in the Burnley Tunnel, maintaining appropriate safe driver behaviour will require ongoing campaigns and attention to the need for safe driving in tunnels. (RECOMMENDATION 3)

³⁷ Exhibit 3 - VicRoads Statement 31.8.2008, p 8

TUNNEL DESIGN

Consistency of vehicle speed

103. At paragraph 4.1.2 of his report Mr Dix recommends that "*tunnels should be designed and operated to promote consistency of vehicle speed*". This recommendation was either supported or not opposed by all of the relevant Interested Parties. VicRoads' position was that this was a basic principle for the design and operation of controlled access roads generally and not just tunnels and therefore should be adopted. (RECOMMENDATION 4)

Performance standards for emergency control systems

104. At 14.1.10 of the Dix report, Mr Dix made a recommendation that performance standards for emergency control systems be developed. CityLink agreed with this recommendation although noted that the standard should probably be developed at a national level to capture all the best information, developments and expertise. VicRoads set out its rationale for supporting the use of national standards too, noting that there is a forum for national standards to be developed through a body called Austroads.

105. VicRoads also advised that Austroads has released a document called "Guide to Road Tunnels" which provides a comprehensive introduction to planning for road tunnels and describes "*important issues and considerations relating to implementation, general planning, regulation, structural and geometric design, drainage, geology, the environment as well as operation, construction and maintenance. It also covers critical considerations such as flood protection, fire and life safety, ventilation and risk management.*"

106. Given the information provided, I am satisfied that the national body is the more appropriate place to develop this work given that it is a coalition of all of the State and Territory equivalent entities. Thus, rather than formalise a recommendation in this Finding, I propose to direct that a copy of this Finding together with the exhibits be directed to the Chair of the Board of Austroads to ensure that this issue is formally brought to the attention of the entity to assist in its stated continuous improvement objects for tunnel safety and design.

Incorporating emergency lay-by lanes for stranded or disabled vehicles

107. At 14.1.5, Mr Dix recommended that *“where possible, and subject to the geotechnical constraints of doing so, future tunnels be provided with emergency lay-bys, shoulders or such other equivalent stranded vehicle protection which allow disabled vehicles which cannot exit a tunnel to park without undue risk of being crashed into by other passing traffic within the tunnel.”*
108. This recommendation was either actively supported by the relevant Interested Parties or not opposed. CityLink noted in its response that this issue is dealt with in the Austroads *Guide to Road Tunnels*.
109. Given the circumstances in which these deaths occurred, the recommendation seems particularly on point and is one likely to reduce the potential for serious injury or death in similar circumstances. (See RECOMMENDATION 5)

Risks of underground intersections

110. At 14.1.6 of the Dix Report, Mr Dix recommended the *“risks caused by underground intersections both from diverging and converging traffic flows be acknowledged and actively managed in the road tunnels.”* This general recommendation was either supported by the relevant Interested Parties or not opposed. In its response CityLink commented that it had already reduced the speed limit heading into the Tunnel to 60 km/h when three lanes are open on the Westgate Freeway approach and the Kings way ramp is merging with the left lane.
111. Given the context of this recommendation and its support and acknowledgement of its importance, I have formalised this into a recommendation. (RECOMMENDATION 6)

Design features to assist maintenance of good sight in tunnels

112. At 14.1.7 of the Dix Report, Mr Dix recommended that *“the number of horizontal curves be minimised and/ or engineered so as to maximise the sight distances available to motorists”*. This recommendation was supported by the relevant interested parties. In CityLink's response it noted that the Austroads document also deals with this issue. (RECOMMENDATION 7)

Design features to assist maintenance of vehicle speed and separation

113. At 14.1.8 of the Dix Report, Mr Dix recommended that the design of future tunnels assist drivers to maintain safe speeds and vehicle separation. In considering the material on this issue and the responses by the relevant interested parties, I consider it appropriate to recommend that VicRoads refer this matter to Austroads for consideration, to enable all of the latest research, technology and data and expertise to be engaged at a national level to address this issue. (RECOMMENDATION 8)

Emergency egress pathways

114. At 14.1.9 of the Dix report, Mr Dix recommends that *“greater emphasis be placed on the design of emergency egress pathways which will be chosen by evacuees in preference to the tunnels themselves as emergency escape routes”*. The relevant Interested Parties supported this recommendation. VicRoads noted in its response that not only did it support this recommendation it advised that appropriate changes have already been implemented to better highlight emergency passageways by CityLink. In its response CityLink confirmed that it had completed upgrades in its tunnels since 2007 consistent with this principle and made its cross passages and refuges both more appealing and obvious to the passing motorist consistent with the concept of self evacuation as per European Union standards.
115. CityLink noted at (14.2.2 of the Chart responses³⁸) that its upgrade work had included life size exit symbols (white man on green background), lighting that makes the exits more obvious, upgraded exit and lighting signs and green lines painted on the floor of egress pathways. (RECOMMENDATION 9)

Placement of driver information signs to minimise distractions

116. Mr Dix recommended at 14.2.4 minimising driver distraction by ensuring the placement of driver information signs well before a tunnel entrance. Whilst Mr Dix did not conclude that this was the cause of the collision in the Tunnel causing these deaths, he did conclude that it was an issue for driver safety in tunnels generally. This appeared to be a non controversial conclusion and CityLink advised that it had placed its signage prior to the entrance to the Tunnel to achieve this objective. VicRoads agreed,

³⁸ Exhibit 4

confirming that changes had been made to the approaches to the Tunnel including commencing variable speed limits further in advance of the Tunnel. (RECOMMENDATION 10)

EMERGENCY RESPONSE

117. Senior Sergeant Smith, the investigating member for the coroner was asked to comment as to whether there were any issues or comments arising from this investigation that he wished to bring to the attention of the coroner. In answer to this Senior Sergeant Smith drew attention to the evidence of Mr McKernan during the trial of Mr Kalwig in the Supreme Court, evidence which appeared to have been accepted by the jury, that the emergency response systems in place in the Tunnel were virtually world's best practice. His evidence in relation to signage and training of personnel was backed up by numerous training manuals and records that he was able to produce. It was the opinion of Senior Sergeant Smith that the operators performed their duty in line with the training and there was little to criticise about the performance.
118. At 14.2.3, 14.3.1, 14.3.3, 14.3.4 and 14.3.5 of the Dix report, Mr Dix recommended a range of reviews, enhancements and upgrades to all of the emergency systems and subsystems of CityLink including that the performance of the CityLink emergency control computers be regularly assessed and upgraded when necessary to ensure that in an emergency, the operator can command all emergency equipment in an effective and timely manner.
119. All relevant Interested Parties agreed to these recommendations noting that CityLink advised that it completed an upgrade of its emergency control system in May 2009 and sought to modify some aspects of the recommendation made at 14.3.3. Given the evidence that some of this work has already been completed, I propose to make a general recommendation on this issue which is intended to address the range of matters raised about the emergency response systems in the Tunnel covered by those points set out by the Dix report. (RECOMMENDATION 11)

Installing emergency barriers at the entrance to the tunnel

120. Both the VicRoads review and Mr Dix recommended (14.3.5) installing emergency barriers at the entrances to the Tunnels to stop drivers continuing to enter the Tunnel after a major incident has occurred. VicRoads has advised that boom barriers and traffic signals have now been installed and thus it is not necessary to make this recommendation as part of the completion of the coronial inquiry as it has already been done.³⁹

Responding to the need for multiple deluge events

121. At 14.2.1 of the Dix report, Mr Dix recommended that the *“impact on hydrant pressure and volume of three or more deluge zones operating should be investigated to assist preparing response plans for multiple incident (multiple deluge) events.”* CityLink supported this recommendation as did the MFB and advised that they were currently meeting to discuss “deluge” issues. I note that at 14.3.2 of the Dix report, Mr Dix recommended a systems performance review of the deluge system be undertaken. It makes sense to incorporate this issue in a review of the deluge system. No Interested Party opposed this recommendation. (RECOMMENDATION 12)

Evacuation messages

122. At 14.2.11 Mr Dix recommended that there be a review of the message(s) broadcast inside the Tunnel in the event of an emergency. Mr Dix recommended that the radio broadcast message be simplified to simple and direct language such as **“Evacuate now”**. CityLink indicated that it supported the review but did not accept Mr Dix’s suggestion of language such as **“Evacuate Now”**, maintaining that this was too simple and lacked direction to people as to where and how to leave the Tunnel. Given this, I am satisfied it is appropriate to recommend a review. (RECOMMENDATION 13)

Emergency Services Communications

123. At 14.2.12 Mr Dix made some observations and recommendations about emergency services communications within CityLink. CityLink noted that the emergency services

³⁹ Exhibit 4 - Chart of Recommendations and responses

communications are the province of ESTA. ESTA has not been given an opportunity to respond to this, not having been involved in this investigation.

124. I note however that it was the opinion of the investigating member, Senior Sergeant Smith that there were no issues with the way in which the Emergency Services responded to the catastrophe on this day. Senior Sergeant Smith stated that the overall response was excellent. In his view there were small issues about notifications and not unexpectedly some issues about who should be doing what, but given the magnitude of the catastrophe, and that no further injuries were attributable to the evacuation procedures, it is on that basis that one can conclude that the system generally worked well.

125. At page 230 of the Brief, Assistant Chief Fire Officer Alan Quinton describes the response to the collision in the following manner:

"Overall I feel that if it wasn't for the CityLink operators acting as they did there would have been a far greater catastrophe. Had they not acted the way that they did when they did there would have been many more fatalities. Potentially everyone inside the tunnel that day could have perished. Victoria Police and their traffic management were exceptional. In the circumstances involving the heat of the day, the firefighters were simply fantastic and the way they did the job and their attitude towards it. All emergency services including Red Cross and SES were also fantastic in their care of evacuated persons and emergency service personnel. I am very concerned about the community knowledge or lack of in that many stood around to watch the fire. It was something I really learned from the incident. I think further study into human behaviour is necessary. Their lack of response was potentially life-threatening to many of them.

From the Metropolitan Fire Brigade point of view the incident ran in accordance with our procedures that were in place to manage this type of incident. The incident ran well in only minimal changes would need to be considered. Radio communications was the main area of concern. From where I was we had set up a separate command channel and we were able to communicate within our personnel but there were some issues with the crews. This is something that we have looked at and our

communications department is currently making changes to prevent similar issues in the future”.

126. On the basis of the evidence about some aspects of communication in the Tunnel and other evacuation passages, and the responses of the relevant Interested Parties, I consider it appropriate to recommend that Metropolitan Fire Brigade (MFB) satisfy itself, in consultation with the other relevant entities that all relevant emergency communications systems operating inside the Burnley Tunnel have addressed the issues raised by the Dix report at 14.2.12. (RECOMMENDATION 14)
127. At 14.4.1 to 14.4.5, the Dix report makes a number of recommendations about possible enhancements to the MFB emergency response equipment and capability in similar situations. The MFB responded by confirming that it had conducted a review in the wake of the Burnley Tunnel fire and further it was regularly engaged in reviews of its communication systems and regularly engaged in reviewing its procedures for safe entry and exit of structures in emergency conditions.
128. Given this indication from MFB, I do not propose to make a recommendation as it would be superfluous. MFB will have a copy of all of the relevant material to take into consideration when conducting its regular reviews of equipment and operations.

MONITORING TUNNEL

129. At 14.1.1 of the Dix Report, Mr Dix recommended *“that a centrally administered database of tunnel incidents be created to facilitate open data collection and analysis of tunnel incidents with the objective of identifying emerging trends or recent problems”*. In response to this, CityLink noted that whilst such a database would be useful that there were a number of practical difficulties in operating such a scheme.
130. VicRoads supported this recommendation, but noted that it already collected, stored and made available road incident data in a manner which can be used in the analysis of tunnel incidents. VicRoads advised that its Road Crash Information System (RCIS) contains information on all casualty crashes (that is a crash where at least one person is killed or injured) on Victorian roads including tunnels.⁴⁰ VicRoads added in its response that as incidents can be grouped by location in the RCIS, it is possible to identify tunnel

⁴⁰ Exhibit 3 - Correspondence from DLA Piper 10 August 2012

incidents for analytical purposes. Given the advice from VicRoads that such a data base exists and is operating and capable of providing such data, I am satisfied it is not necessary to make a recommendation to establish what already exists.

131. I should add that VicRoads has set out a comprehensive explanation of what data is available and to whom it is available and where it is available which confirms my view that it is not necessary to proceed to make a recommendation of the nature proposed.
132. As noted above, there were a number of recommendations contained in the Dix report which have already either been adopted in full or were reflective of current practice already. As noted, I have not addressed each of these individually as the report and responses are available in full for examination.

THE FIRE

133. Two of the three deaths inside the Tunnel were caused by the effects of fire. Consequently it was appropriate to examine the fire separately.
134. The evidence is that the fire started upon the impact of the truck being driven by Mr Kalwig with the car being driven by Mr McDonald. It was the opinion of Senior Sergeant Smith⁴¹ that Mr McDonald's car was struck in such a way that it fractured the fuel tank causing the fire. Senior Sergeant Smith also stated that the fire spread rapidly as there was ample fuel in the form of rolled up paper in the Prime Mover.
135. Sixty seven seconds after that fire commenced, the Tunnel operator enabled emergency mode in preparation for the smoke extraction, deluge operation and evacuation. 27 seconds later the emergency response plan was activated by the Tunnel operator and this activated the emergency smoke extraction and the deluge system.
136. Several hundred people were evacuated from the Tunnel. None of the evacuees or their vehicles appeared to have suffered any physical injury. Fire fighters extinguished the fire inside the prime mover.

⁴¹ Exhibit 3 - Senior Sergeant Smith was the investigating member in this investigation. He is a senior member of the Major Collision Investigation Unit, Traffic and Transit Safety Department of Victoria Police. He provided a written report to the court dated December 28 2010.

137. In Senior Sergeant Smith's statement⁴² he addressed several questions directed to him by me which went to the cause of the fire and the circumstances surrounding the fire. Senior Sergeant Smith quite properly qualified his comments by explaining that he was not an expert in the area of fire.
138. In answer to the question: "*Was there any issue about the flammability of the cars involved in the collision?*" In short, he concluded the answer to this question was that in the circumstances of this collision a fire would not be unexpected.
139. Senior Sergeant Smith stated in his view the actual cause of the fire appeared to be the result of a small car being wedged between two semitrailers in circumstances where the car being driven by Mr McDonald was struck in exactly the right position to fracture the fuel tank and given that there was ample fuel in the form of rolled up paper in the prime mover, fire in those circumstances was "almost inevitable" according to Senior Sergeant Smith.
140. Senior Sergeant Smith stated that the MFB were praiseworthy of the fire system in the tunnel and the extraction of smoke. They were less than happy however with the fact that when the tunnel was built, the deluge system was not included in the plans and was only included after a strong representation from the fire service.
141. MFB were requested to provide a copy of the 'Vehicle Fire Investigation Report' and asked to respond to a range of questions about whether or not they had observed any increases in motor vehicles igniting in the wake of collisions. This material was provided to the Court by letters dated 16 August 2012 and 12 September 2012.⁴³ The material provided included information that MFB did not collect or keep separately identifiable data with respect to vehicle fires resulting from motor vehicle collisions. MFB advised that "*to ascertain the number of vehicle fires resulting from motor vehicle accidents requires manually reading through the description of the incident for every one of the above incident types provided by the relevant commander. This equates to around 3000 incidents per year.*"⁴⁴

⁴² Exhibit 3

⁴³ Exhibit 3

⁴⁴ Exhibit 3

142. Notwithstanding this, the MFB advised that it was not aware of an increase (during the period of record keeping) in motor vehicles igniting in the wake of collisions, but qualified this by advising that these fires would only be investigated by the MFB Fire Investigations and Analysis Unit if there were fatalities associated with the events.
143. Whilst this advice appears to suggest a gap in the data collection of MFB, the advice from VicRoads is that through its Road Crash Information System (RCIS) and liaison with the data systems of Victoria Police, all casualty related motor vehicle crashes are recorded extracting considerable detail from the incident which is available to a range of relevant agencies.
144. Given the state of the evidence in this particular case, I do not propose to pursue by way of any recommendation, the issue of whether the current data collection and analysis of motor vehicle fires in the wake of collision is adequately understood and tracked, but simply make the observation that it is a matter that the relevant agencies should satisfy themselves is collected and tracked as far as is practicable.

For all of the above reasons, I make the following recommendations

RECOMMENDATIONS

Pursuant to section 21 of the *Coroners Act* 1985, I make the following recommendation(s) connected with the death:

Recommendation 1 That VicRoads consider including in the next reprint of the New Drivers Handbook more advice and information about safety in tunnels, especially with regard to safe distances, lane changing, driver distraction, special dangers in tunnels, emergency behaviour, self rescue and emergency response.

Recommendation 2 That VicRoads reconsider and request Austroads to re-consider its position on banning lane changing in all future road tunnels to minimise the possibility of collisions as a result of lane changing in tunnels.

Recommendation 3 That VicRoads ensure that it maintain regular promotion and delivery of public safe driving in tunnels campaigns including the importance of keeping a safe distance in tunnels.

Recommendation 4 That VicRoads ensure that at the design approval stage of all new tunnels, (i) promotion of consistency of vehicle speed is incorporated into the design and (ii) the proposed plan of operation of the tunnel promotes consistency of vehicle speed.

Recommendation 5 That VicRoads ensure that as far as is possible, approval for the construction of future road tunnels requires a design that incorporates an emergency lay-by or equivalent for stranded or disabled vehicles inside the tunnel.

Recommendation 6 That VicRoads ensure that in the design, construction, operation and management of road tunnels that the risks inherent in underground intersections both from diverging and converging traffic flows be actively managed.

Recommendation 7 That VicRoads ensure that in the design and construction of road tunnels the number of horizontal curves be minimised and/ or engineered so as to maximise the sight distances available to motorists.

Recommendation 8 That VicRoads request Austroads to consider incorporating into its current Guide to Road Tunnels the best and most up to date information as to the design of road tunnels to assist drivers to maintain safe speeds and vehicle separation.

Recommendation 9 That VicRoads ensure that in the design of approved road tunnels, emphasis be placed on the design of emergency egress pathways to ensure that evacuees are assisted to make appropriate choices for emergency escape routes.

Recommendation 10 That VicRoads ensure that in the design, construction and operation of tunnels the placement of driver information signs is done to ensure minimising the risk of driver distraction and maximising driver safety.

Recommendation 11 That CityLink in conjunction with all other relevant agencies regularly assess the CityLink emergency control computer systems to ensure that in emergency conditions, all emergency systems and operators are able to command the emergency in a safe, effective and timely manner.

Recommendation 12 That CityLink and MFB (i) review the deluge system generally to ensure it is operating at its maximum in terms of speed and efficiency and (ii) develop an agreed plan to investigate and respond to the impact on hydrant pressure and volume, of three or more deluge zones operating simultaneously, to assist in preparing response plans for multiple incident (multiple deluge) events.

Recommendation 13 That CityLink and VicRoads review the current directions as to messages to be broadcast in the event of an emergency in the Tunnel to ensure clear and simple directions are given to minimise confusion and maximise safe and orderly evacuation.

Recommendation 14 That MFB satisfy itself, in consultation with the other relevant entities that all relevant emergency communications systems operating inside the Burnley Tunnel have addressed the issues raised by the Dix report at 14.2.12..

I direct that a copy of this Finding be published on the internet.

I direct that a copy of this finding be provided to the following for action:

CEO, VicRoads

CityLink Group

CEO, Metropolitan Fire Brigade

I direct that a copy of this finding be provided to the following for information only:

Family of Messrs Kennard, Sporn and McDonald

Investigating Member, Senior Sergeant Smith

Chair of the Board of Directors of Austroads P/L

Chief Commissioner of Police, Mr Ken Lay

Signature:


JUDGE JENNIFER COATE

CORONER

Date: 30 January 2013

