

179. Further, the developing fatigue crack in the right forward drive axle of Mr Davies' prime mover would not generally be seen during seal replacement. This is because the crack occurred inwards of the sites checked in the seal replacement, behind the brake adapter which is not usually removed, and the cracks would be closed up when there was no load.
180. The leak could have been a symptom of the fracture and/or the oil could have contributed to extension of the fatigue cracks in the axle housing.
181. The fourth phase of the catastrophic failure of the axle housing of the right forward drive axle of Mr Davies' prime mover on 1 October 2007 occurred when the axle housing broke and the dual wheel, hub, axle and part of the fractured axle housing became disconnected from the prime mover.
182. None of the five experts addressed the possibility that a particular overload event had occurred on 1 October 2007 to precipitate the complete fracture of the axle housing of the right forward drive axle of Mr Davies' prime mover or that it could have been predicted earlier in the day.

Legislation

183. In Victoria, heavy vehicle use is controlled by the *Road Safety Act 1986*, including the Road Safety Regulations (Vehicles) 1999¹² and the Australian Road Rules. Unless otherwise stated, the content of this legislation has remained unchanged since 2007.
184. VicRoads also has authority to:
- Issue number plates and certificates of roadworthiness;¹³
 - Regulate the conditions of use of a vehicle on the road;¹⁴ and
 - Regulate the carrying of loads on motor vehicles and trailers.¹⁵
185. This legislation placed and continues to place obligations on the registered vehicle operator and on the driver of a heavy vehicle.

¹² Now replaced by the Road Safety Regulations (Vehicles) 2009.

¹³ S 5AB(1)(k)(ii) *Road Safety Act 1986*.

¹⁴ Schedule 2 para 34 *Road Safety Act 1986*.

¹⁵ Schedule 2 para 38 *Road Safety Act 1986*.

186. In 2007, no heavy vehicle operator¹⁶ or driver could use a heavy vehicle on a Victorian highway unless it was currently registered with VicRoads or VicRoads had issued a permit for restricted use of an unregistered vehicle.¹⁷
187. A person who used an unregistered vehicle was liable to a fine of 25 penalty units for a first offence and 50 penalty units for a second or subsequent offence.
188. Further:
- “A person must not use, or cause or permit to be used, on a highway a vehicle or a combination of vehicles that is not in a safe and roadworthy condition. Penalty: In the case of a large vehicle or a combination including a large vehicle-10 penalty units.”*¹⁸
189. Registration of any new vehicle required the registered vehicle operator to demonstrate that it complied with the Australian Design Rules and the manufacturer’s specifications.¹⁹
190. As relevant, the information required for registration included specification of the gross combination mass (“GCM”) of the prime mover.
191. The GCM of a motor vehicle means the greatest possible sum of the maximum loaded mass of the motor vehicle and of any vehicles that may lawfully be towed by it at one time.
192. Accordingly, the GCM can also be calculated from the maximum load specified by the manufacturer and recorded on the compliance plate of the prime mover and the tare or weight of the prime mover recorded on the registration certificate.
193. The maximum load specified for Mr Davies’ prime mover was 22500 tonnes and the tare was 12500 tonnes. Therefore, for the purposes of registration and compliance with the conditions of registration, the GCM of the prime mover was 35 tonnes.
194. This GCM must also be recorded by VicRoads.²⁰
195. If any change is made to a vehicle that affects its description as recorded in the VicRoads register, the registered operator must notify VicRoads within 14 days and ensure that the

¹⁶ The registered vehicle operator is the person who nominated his or herself in the application for registration.

¹⁷ S. 7 of the *Road Safety Act 1986*; S.50 Road Safety (Vehicles) Regulations 2009.

¹⁸ R 259 Road Safety (Vehicles) Regulations 2009.

¹⁹ R.203 Road Safety (Vehicles) Regulations 1999.

²⁰ R.217(1)(g) and (h) Road Safety (Vehicles) Regulations 2009.

vehicle is not used until after VicRoads has been notified of the change. Penalty: 2 penalty units.²¹

196. Registration of a heavy vehicle must be renewed at least every year. VicRoads has authority to renew or refuse to renew the registration of a motor vehicle or a trailer and to specify the GCM of a registered vehicle.²²

197. The Road Safety Regulations (Vehicles) 2009 also provide:

“ A person who modifies, or adds components to, a vehicle must ensure that—

(a) if the vehicle complied with the standards for registration immediately before the modification or addition, the vehicle continues to comply with those standards; and

(b) in the case of a heavy vehicle—

(i) the modification or addition is certified by an authorised person as complying with the National Code of Practice for Heavy Vehicle Modifications (1993) published by the Federal Office of Road Safety as Vehicle Standards Bulletin No. 6; or

(ii) the modification or addition is otherwise acceptable to the Corporation.”²³

198. Therefore, in circumstances where the heavy vehicle no longer complies with the manufacturer’s specifications and/or has undergone modification so that it is unable to withstand the GCM authorised by the manufacturer, the registered operator must notify VicRoads and not use the vehicle until otherwise authorised by VicRoads.

199. Further, registered vehicle operators commit an offence every time they apply for re-registration without notifying VicRoads of modifications to their vehicles so that they no longer comply with the manufacturer’s specifications and/or has undergone modification so that it is unable to withstand the GCM authorised by the manufacturer.

200. Regulation 257 of the Road Safety (Vehicles) Regulations 2009 created an offence for a person to use a modified vehicle on the road unless they have VicRoads’ approval and meet VicRoads’ guidelines.²⁴

²¹ R.225(3) Road Safety (Vehicles) Regulations 2009.

²² S 5AB (1)(b) and (h) Road Safety Act 1986.

²³ R207(3) (3) Road Safety (Vehicles) Regulations 2009.

201. Drivers of heavy vehicles must comply with the road rules that apply to all drivers. There are also some extra rules that are unique to heavy vehicle drivers.

202. In particular, section 7 of the *Road Safety Act 1986* provides:

“Offence if vehicle or trailer not registered

(1) A person must not—

(a) use on a highway a motor vehicle or a trailer; or

(b) own a motor vehicle or a trailer which is used on a highway—

unless that motor vehicle or trailer is registered under this Part.”

190. Further, r 819(1) of the Road Safety (Vehicles) Regulations 1999 provided:

“A person must not use on a highway a vehicle that has been modified from the condition in which it was in when first registered unless the modification—

(a) has the Corporation's approval; or

(b) has been carried out in accordance with guidelines published by the Corporation.

Penalty: 5 penalty units.”

191. Therefore, to the extent that the prime mover was used after it was modified during repairs in 1989/90 without notifying VicRoads and the people who used the prime mover knew that the modifications were inconsistent with the manufacturer's advice, its use breached the *Road Safety Act 1986* and the Road Safety (Vehicles) Regulations 1999.

²⁴ The Roads Corporation operates as VicRoads.

COMMENTS

Pursuant to section 67(3) of the **Coroners Act 2008**, I make the following comment(s) connected with the death:

1. Graeme Andrew Dunn died on 1 October 2007 when he was working as a self employed contractor driving a ride-on mower in a reserve beside the Melbourne Road off exit ramp from the Westgate Freeway, 200 metres west of the intersection of Williamstown Road.
2. Mr Dunn was hit on the head by the dual wheel, hub, axle and part of the fractured axle housing from the right forward drive axle which had broken away from the prime mover of a semi-trailer driven by Raymond Davies.
3. Mr Davies was a local driver who had been employed by Traianon Transport Pty Ltd ("Traianon") for five years.
4. Traianon was an interstate and local haulage company owned by Arthur and Leanne Traianon. Their son, Peter Traianon, managed the fleet, the workshop and the local drivers. Their other son, Anthony Traianon, also worked in the business.
5. Peter Traianon and Anthony Traianon performed the general maintenance work on the prime movers owned by Traianon.
6. On 1 October 2007, Mr Davies was driving a 1988 International S-Line 2670 prime mover manufactured by International Harvester and owned by Traianon ("Mr Davies' prime mover").
7. The right forward drive axle on Mr Davies' prime mover was an SP40 designed and manufactured by ArvinMeritor in the United States. It remained on the prime mover and is the axle that failed on 1 October 2007.
8. Between 1979 and 1993, about 8500 International trucks were constructed using SP40 axles. Other truck manufacturers including Mack, Kenworth, Freightliner, Western Star, Sterling and White also use SP40 axles.
9. There is no known record of any other SP40 axle failing in the way the axle on Mr Davies' prime mover failed on 1 October 2007.

10. However, Robin Harbridge told the court he had seen five fatigue cracks in prime mover axles in his 23 years experience as a maintenance engineer.
11. Further, David Mold told the Court that there were 63 incidents of cracking of the axle housing in Iveco ACCO trucks used in concrete mixing and garbage collection between 2006 and 2009.
12. The axles in Iveco ACCO trucks differ from the SP40 axle involved in Mr Dunn's death. In particular, the cracking failures were easy to detect visually.
13. In all these cases, identification of prior warning signs of an impending catastrophic event has allowed remediation or replacement of the axle before it broke.
14. In a recent operation to identify unroadworthy heavy vehicles, VicRoads found that 85% of vehicles had defects and 77% posed an imminent and serious risk for road user safety.²⁵
15. However, the course of this investigation of Mr Dunn's death, I have become acutely aware that reporting of axle severance and preliminary cracking depends on the circumstances that brought the damage to notice and the specific expertise that was associated with its investigation.
16. In particular, four well-qualified and experienced investigators were prepared to attribute the fracture of the right forward drive axle on Mr Davies' prime mover to age-related fatigue stress. If no inquest had been held and the investigating police member, Senior Constable David Fisher, had been prepared to accept this diagnosis, nothing would have been learned from Mr Dunn's death.
17. Accordingly, I am indebted to Mr Fisher, Meritor and Dr Price for undertaking a wider investigation of the cause of the axle severance that killed Mr Dunn and identifying important long and short-term factors that may also influence axle failure in other 20 year old prime movers but would otherwise remain undiagnosed.
18. As a consequence of Dr Price's work and further evaluation by the other experts, the coronial investigation of Mr Dunn's death has identified four stages in the development of the cracks

²⁵ VicRoads, 'Operation Trishula to target unroadworthy trucks', Press release, Monday 8 October 2012.

which preceded the separation of the dual wheel, hub, axle and part of the fractured axle housing from the right forward drive axle of Mr Davies' prime mover. These are:

- The initiating event in 1989/90;
- The development and meeting of three cracks within the axle housing;
- The extension of the crack through the axle housing; and
- The complete severance of the axle housing.²⁶

19. Identification of the cracks developing in the right forward drive axle of Mr Davies' prime mover and appropriate remediation at an earlier stage in their development would have prevented the catastrophic separation of the fractured axle housing from the prime mover on 1 October 2007 and would have prevented Mr Dunn's death.

20. I will now discuss each of these four stages of development of the cracks in the right forward drive axle of Mr Davies' prime mover and look at factors most likely to prevent axle severance from occurring for the reasons that the right forward drive axle of Mr Davies' prime mover failed on 1 October 2007.

The Initiating Event in 1989/90

21. In or about 1989/90, Mr Davies' prime mover was involved in two serious incidents.
22. The evidence strongly suggests that one of these incidents involved a rollover causing damage such that the chassis rail in the prime mover required replacement. Further, the damage to the right forward drive axle on Mr Davies' prime mover was severe but did not completely sever the axle. Dr John Price said:

"It's pretty deep. I mean, it's a fairly big weld - it's - so it may have affected the inside of the axle... I don't think it broke because I don't think the top of it's been damaged."

23. Although there is some doubt as to the precise site of initiation, Dr Price and Mr Gartner agree that the three cracks that developed at the time of the initiating event and became conjoined

²⁶ I note that Dr Price has addressed my second and third stage as two phases of a single stage he calls "Fatigue crack growth".

over the subsequent 20 years originated from or near a heat affected area around the site of original welding performed during manufacture of the axle.

24. Therefore, the serious roll over event that occurred in or about 1989/90 was sufficiently severe to initiate three cracks in or near the heat affected area around a weld performed as part of the axle manufacture.
25. The expert witnesses also agreed that it was likely that the damage sustained in the serious roll over event and the repairs performed in or about 1989/90 were both factors in determining the axle's catastrophic failure in 2007.
26. Accordingly, I find that the initial events which led to eventual and disastrous severance of the right forward drive axle on Mr Davies' prime mover occurred in or about 1989/90.
27. Dr. Price has shown that damage to the right forward drive axle on Mr Davies' prime mover during the initiating incident in or about 1989/90 was repaired with welding of the axle between the spindle and the axle housing and addition of a metal plate welded to the axle housing.
28. There is no direct evidence about when the right forward drive axle on the prime mover was repaired using a weld between the spindle and the axle housing and an additional plate on the axle. However, all the witnesses in this investigation accepted that the incidents in or about 1989/90 would have been associated with severe damage to the axle sufficient to explain its remediation in this way.
29. Therefore, I accept that repair of the right forward drive axle on the prime mover using a weld between the spindle and the axle housing and an additional plate on the axle of the prime mover probably occurred after and in response to the serious roll over event that occurred in or about 1989/90.
30. Through their Counsel, Traianon told the Court that Royans in New South Wales and Queensland performed the repairs on the prime mover following the two incidents in or about 1989/90. They also said that these repairs were organised through their insurers.
31. Although Royans Wagga Ltd remember performing some insurance work on a vehicle owned by Arthur Traianon, they deny ever performing work involving a weld between the spindle and the axle housing and welding an additional plate on the axle housing of any prime mover.

32. Accordingly, there is no reliable evidence before me to indicate who repaired the right forward drive axle on Mr Davies' prime mover in or about 1989/90 using a weld between the spindle and the axle housing and welding an additional plate on the axle or who authorised the repair or why the repair proceeded in this way rather than by replacing the axle.²⁷
33. Mr Dunn's death demonstrates that axle failure in the prime mover of a semi trailer is a serious long-term safety issue.
34. The only way to prevent subsequent axle severance associated with prior inappropriate remediation of axle damage is to control the circumstances surrounding its repair and re-use.
35. The long period of time between the causal event and the catastrophic failure means that short term commercial interests do not support proper monitoring and rectification. Therefore, it is important for Government and other third party agencies to maintain vigilance and intercede when necessary.
36. Victorian government and other third party agencies with a long-term interest in maintaining vehicle standards for prime movers used in Victoria include:
- VicRoads and Victoria Police;
 - Victorian Workcover Authority; and
 - Insurance companies.
35. **VicRoads and Victoria Police** are responsible for enforcing the *Road Safety Act 1986* and the Road Safety (Vehicles) Regulations 2009²⁸ as they apply to heavy vehicles.
36. VicRoads also has authority to:
- Issue number plates and certificates of roadworthiness,²⁹
 - Regulate the conditions of use of a vehicle on the road,³⁰ and

²⁷ It is speculation but it seems possible that, if the more severe incident was the second to occur in or about 1989/90, Traianon's insurer at that time was not involved in the axle's repair.

²⁸ Replacing Road Safety (Vehicles) Regulations 1999.

²⁹ S 5AB(1)(k)(ii) *Road Safety Act 1986*.

³⁰ Schedule 2 para 34 *Road Safety Act 1986*.

- Control carriage of loads on motor vehicles and trailers.³¹

37. Mr Davies' prime mover was registered and driven in Victoria on 1 October 2007. Therefore, it was always subject to the provisions of the *Road Safety Act* 1986 and the Road Safety (Vehicles) Regulations 1999.

38. Offences under the *Road Safety Act* 1986 and associated regulations are summary offences. Therefore, charges must be laid within 12 months of commission of the offence.

39. In particular, the *Road Safety Act* 1986 provided and still provides:

*"A person must not use, or cause or permit to be used, on a highway a vehicle or a combination of vehicles that is not in a safe and roadworthy condition. Penalty: In the case of a large vehicle or a combination including a large vehicle-10 penalty units."*³²

40. This coronial investigation has shown that the axle severance that occurred on 1 October 2007 and killed Mr Dunn occurred as a consequence of modifications performed in 1989/90 and its subsequent travel with near maximum permitted loads.

41. This means that, in the absence of any other known severe incident, the gross combination mass ("GCM") of the prime mover was demonstrably less than that specified by the manufacturer and recorded by VicRoads after it had been remediated in 1989/90.

42. Accordingly, the prime mover had probably been technically unroadworthy for nearly 20 years.

43. Certainly, on 1 October 2007, the prime mover was evidently unsafe and unroadworthy and did not comply with the provisions of the *Road Safety Act* 1986.

44. However, in the absence of any information about the non-compliant modifications of Mr Davies' prime mover, it is unlikely that testing would identify that the modifications had created an unroadworthy vehicle.

45. Therefore, even if Mr Davies' prime mover had been intercepted and checked for roadworthiness, breaches of the *Road Safety Act* 1986 and Regulation 257 of the Road Safety (Vehicles) Regulations 2009 associated with the damaged and remediated right forward drive

³¹ Schedule 2 para 38 *Road Safety Act* 1986.

³² R 259 Road Safety (Vehicles) Regulations 2009.

axle were always unlikely to be detected by operational VicRoads or Victoria Police heavy vehicle examinations.

46. Accordingly, the figures released by VicRoads about non-compliant heavy vehicles are an under-estimate of the true extent of the use and associated dangers of inappropriately modified and maintained heavy vehicles.
47. Therefore, in order to address their safety obligations in this area, VicRoads and Victoria Police rely on the registered operators to report heavy vehicle modifications to maintain the safety of the Victorian heavy vehicle fleet.
48. The Road Safety (Vehicles) Regulations 2009 intend to provide VicRoads and Victoria Police with the ammunition they need to compel registered operators to report heavy vehicle modifications to VicRoads and prevent use of unsafe modified heavy vehicles.
49. In particular, Regulation 225(3) of the Road Safety (Vehicles) Regulations 2009 requires the registered operator to notify VicRoads within 14 days of any change made to a vehicle that affects its description as recorded in the register and ensure that the vehicle is not used until after VicRoads has been notified of the change. The penalty for failure to report modifications to VicRoads remains two penalty units.
50. As the registered vehicle operator of the prime mover throughout its life, Arthur Traianon knew or ought to have known that the axle had been damaged and that its repair involved substantial modification. Therefore, he should have reported it to VicRoads in 1989/90 for further assessment with respect to its continuing registration.
51. Further, as the person who at that time was responsible for maintenance of the prime mover in 1989/90, Arthur Traianon also knew or ought to have known from his observations of the axle after it was remediated that the repair involved welding the axle and welding the additional plate on to the axle housing and that these modifications were contrary to the manufacturers' instructions.
52. Similarly, Peter Harbridge had worked for Traianon for 20 years. He assisted the Traianons when they required expert advice. He remembered the incident in which the prime mover was damaged. He knew or ought to have known from his observations of the axle afterwards that

the repair involved welding the axle and welding the additional plate on to the axle housing and that these modifications were contrary to the manufacturers' instructions.

53. However, there is no record that VicRoads was notified of the modifications to Mr Davies' prime mover that were performed in 1989/90.
54. There would be greater incentive for registered heavy vehicle operators to report modifications that may require re-registration if the time limit for prosecution was removed by making failure to report modifications an indictable offence and increasing the penalty for failure to report modifications. The model for these amendments had already been demonstrated in the *Occupational Health and Safety Act 1986* as it applied in 2007.

Recommendation 1

55. As well, in order to ensure that heavy vehicle operators put their mind to and notify them of modifications which could interfere with their vehicles' compliance, VicRoads could require heavy vehicle owners to declare any repairs or modifications that change or may change the heavy vehicle's compliance with ADR and road worthiness requirements. This declaration could be imposed when VicRoads re-register the vehicle at least every year as well as a condition of transfer of registration of the vehicle with appropriate penalties for failure to make appropriate declarations. **Recommendation 2**

56. Regulation 819(1) of the Road Safety (Vehicles) Regulations 2009 also creates an offence for a person to use or cause or permit to be used on a highway a vehicle that does not comply with any standard for registration that is applicable to the vehicle. The penalty for this offence is higher than that for failure to report a modification or prevent use of a modified vehicle: 10 penalty units.
57. Peter Traianon said that he used the prime mover for short trips when it had an oil leak. In particular, Peter Traianon specifically directed Mr Davies to go to Tullamarine, Campbellfield and Braeside on 1 October 2007.
58. I am concerned that Peter Traianon directed Mr Davies to drive his prime mover on 1 October 2007 when he knew that it had a history of recurring oil leaks from the right forward drive wheel. Further, even after replacing the hub seal for a fourth time, Anthony Traianon and Mr Harbridge were appropriately worried about the leaks to the degree that they arranged to further investigate them after the day's work was complete.

59. If he knew about the unregistered modifications that had been performed on the prime mover in 1989/90, Peter Traianon should not have directed Mr Davies to drive the prime mover.
60. There would be greater incentive for registered heavy vehicle operators to stop drivers using vehicles that did not comply with the regulations if directing a driver to use a non-compliant vehicle was an indictable offence and the penalty for directing a driver to use a non-compliant vehicle was increased. The model for these amendments had already been demonstrated in the *Occupational Health and Safety Act 1986* as it applied in 2007. **Recommendation 3**
61. Regulation 819(1) of the Road Safety (Vehicles) Regulations 2009 creates an offence for a person to use a modified registered vehicle on the road unless they have VicRoads' approval and meet VicRoads' guidelines. The penalty for use of a modified vehicle remains five penalty units.
62. Mr Davies had worked for Traianon for five years. He was not involved in its maintenance. Although he knew about the recurring oil leaks from the right forward drive wheel, there is no evidence before me to suggest that Mr Davies knew or should have known that any unregistered modifications had been performed on the prime mover in 1989/90 that could have contributed to the oil leaks. Therefore, I make no recommendation in relation to drivers of unrecorded modified heavy vehicles.
63. Vehicle Standards Information 8: Guide to Modifications for Motor Vehicles (May 2003) requires issue of an Approval Certificate for any modification of axles, suspension or steering components. Further, VicRoads' Guidelines for Assessment of Vehicle Work provides guidance for this assessment and refers to the structural integrity of the completed vehicle and quality of welding.
64. Rule 207(3) of the Road Safety (Vehicles) Regulations 2009 also places responsibility on the person who modifies or adds components to a vehicle to ensure that it continues to comply with those standards and the National Code of Practice for Heavy Vehicle Modifications (1993) or the modification or addition is otherwise acceptable to the Corporation.
65. However, even if the repair had been reported in 1989/90 or in 2007, this provision would be unenforceable by Victorian authorities against an interstate heavy vehicle repairer.

66. Since 2007, the National Heavy Vehicle Regulator has been created by National Heavy Vehicle legislation and has become Australia's first national, independent regulator for all heavy vehicles since it opened for business on 21 January 2013.
67. The Heavy Vehicle National Law is expected to become operational in Victoria from 1 September 2013. Under this legislation, owners and operators of heavy vehicles as well as drivers and other members of the supply chain will be responsible for breaches of the transport law. This includes heavy vehicle driver breaches of fatigue management requirements or speed limits and breaches of mass, dimension, or loading requirements where any instructions, actions or demands of parties in the supply chain that cause or contribute to an offence under a road transport law. That includes anything done, or not done (directly or indirectly) that has an impact on compliance.
68. Traianon was a family-run transport company. Peter Traianon and Anthony Traianon managed most of the maintenance of Traianon's heavy vehicle fleet.
69. Traianon owned the prime mover. Arthur Traianon was the registered vehicle operator.
70. Therefore, to the extent that Mr Davies' prime mover failed to comply with Australian Design Rules because of the remediation of the right forward drive axle that occurred in 1989/90, Traianon would have also been committing offences under the National Heavy Vehicle legislation if Mr Dunn had died after this legislation came into force.
71. The Chain of Responsibility component of the National Heavy Vehicle legislation also imposes liability on an operator, manager, or scheduler of a business involved in road transport for breaches of fatigue management requirements, speed limits and mass, dimension, loading requirements.
72. However, the National Heavy Vehicle legislation still does not include Chain of Responsibility liability for the maintenance of heavy vehicles.
73. For example, in 2007, Peter Traianon was Mr Davies' manager. Therefore, he was directly responsible for Mr Davies' work and for his safety.
74. Further Peter and Andrew Traianon learned their maintenance skills from their father. I do not know whether they knew about the events of 1989/90. However, if they had read the axle manufacturer's service books, they would have known or should have known that Meritor

specifically recommended replacement of the axle and advised against welding in circumstances of the incident that had occurred in 1989/90.

75. However, neither Peter Traianon nor Anthony Traianon had ever read the service manuals for Mr Davies' prime mover. Peter Traianon told the Court:

“Traianon Transport does not have the manufacturer’s service books or manual for all their trucks. The newer trucks probably would. The servicing isn’t done by looking at the manufacturer’s books. It’s just a general service. I couldn’t tell you if ‘DVG 257’ has a manufacturer’s book or manual. I have never seen one for that truck.”

76. Accordingly, there was no opportunity for Peter Traianon nor Anthony Traianon to know that the modifications performed in 1989/90 breached the axle manufacturer’s instructions about modifications to axles and welding and placed Mr Dunn, Mr Davies and the general public at risk.

77. In normal operation, the spindle forms part of the axle housing. Therefore, the extra welding and additional plate identified by Dr Price would not be visible to someone who was replacing the hub seal. Further, it would not be obvious during normal servicing because of the road grime in the area.

78. However, the Truck Service Manual³³ indicates that the brake chamber of the front drive brakes of the prime mover should be disassembled and cleaned every year or 80,000km. The Court heard that this process would have exposed the modifications to the right forward drive axle that contributed to the axle fracture.

79. There is no indication in the Traianon service records that the brake chamber on the right front drive brakes of Mr Davies' prime mover was disassembled in the two years prior to 2007.

80. Therefore, at least in the two years for which records are available, there was no opportunity for Peter Traianon or Anthony Traianon to become aware of the modifications to the right front drive axle performed in about 1989/90.

³³ Iveco Service Manual for International Trucks S & T Series Basic Manual, CTSA-2800.

81. The new Heavy Vehicle National Law does not yet include liability for inadequate maintenance of heavy vehicle or failure to obtain approval from VicRoads or the National Regulator for vehicle modifications which have been performed contrary to manufacturers' advice.
82. However, the National Heavy Vehicle Regulator has introduced a voluntary National Heavy Vehicle Accreditation Scheme based on that already operating in Queensland.³⁴
83. Under this National Heavy Vehicle Accreditation Scheme, heavy vehicle operators accredited in the Maintenance Management module are exempt from the requirement to have vehicles inspected annually for the purposes of registration. To be provided with the exemption vehicles must be adequately maintained and comply with all applicable vehicle standards at all times.
84. The Traianon heavy vehicle maintenance procedures in 2007 would not have complied with the requirements now imposed by the National Heavy Vehicle Regulator for accreditation under this National Heavy Vehicle Accreditation Scheme. In particular, maintenance of Mr Davies' truck in the three months before Mr Dunn died did not include any or adequate:
- Documentation of the daily check;
 - Recording of faults;
 - Recording of fault repairs;
 - Documented roadworthiness of vehicles;
 - Documentation of maintenance tasks;
 - Routine audits of written documentation; or
 - Formal training in the tasks performed by the mechanics and those who allocate the work.
85. However, in Victoria, there is no requirement for annual roadworthiness checks as part of re-registration of heavy vehicles.³⁵ Therefore, heavy vehicle operators in Victoria have less

³⁴ See National Heavy Vehicle Regulator, Maintenance Management Accreditation Guide, January 2013.

incentive than those in other States to voluntarily seek and comply with accreditation of their maintenance arrangements under the National Heavy Vehicle Accreditation Scheme.

86. In other words, to the extent that Traianon management and employees knew or ought to have known that the right forward drive axle of the prime mover should have been replaced in or about 1989/90, Victoria Police would still not have been able to enforce the Heavy Vehicle National Law and no one would be liable under the National Heavy Vehicle legislation for severance of the right forward drive axle of the prime mover which caused Mr Dunn's death.

87. Review of the National Coronial Information System identified at least three deaths that were caused by inadequate heavy vehicle maintenance:

- Jason Frank Nicholas Moore³⁶ died when a rigid tip truck towing a laden dog trailer hit his car at the intersection of the Williamstown/ Melbourne Road and the west bound off-ramp from the West Gate Freeway. Police investigation of the incident in which Mr Moore died showed that the brakes on the tip truck had not been properly maintained and were unroadworthy. There was no evidence that the truck driver was aware that they were faulty.

On 25 September 2007, Deputy State Coroner Iain West recommended, without holding an Inquest, that:

“Owners, operators and drivers of commercial heavy vehicles be required to undertake training in basic vehicle maintenance to enhance their understanding and appreciation of regular maintenance in an effort to improve safety awareness.”

Coroner West further recommended that:

“Relevant industry bodies undertake a prevention study to provide insight into motivational factors behind a vehicle owner/operator's failure to regularly maintain their vehicles.”

³⁵ S.95(8(b) *Road Safety Act* 1986 prohibits regulations which require annual tests of roadworthiness of registered motor vehicles or trailers.

³⁶ Case No 1562/02.

- Paul Gerard Joseph Robinson³⁷ died when he lost control of his truck in Conondale, Queensland and the vehicle overturned. The front brakes of the truck had operated to some degree and the rear brakes had not operated at all.

The Coroner attributed this brake failure to inappropriate speed and inadequate servicing of the brakes. Further, the vehicle and the operator were accredited under the National Heavy Vehicle Accreditation Scheme. However, after Mr Robinson's death, an audit indicated failure to comply with a number of the requirements of the Maintenance Management module of the scheme. The operator's accreditation was temporarily removed but later re-instated.

- Lorraine Patricia Brown³⁸ died when a fully loaded rigid truck struck the car she was driving at Red Hill in the Australian Capital Territory. The truck driver said he was unable to change into fourth gear as the brakes would not slow it down to be able to go down another gear. The qualified mechanic employed by the truck's owners said that he had conducted a full service including adjusting the brakes eight days before Mrs Brown died.

The Coroner found that the only inference that could be drawn was that the cause of the accident could be attributed to either incorrectly adjusted brakes or non adjusted brakes, needing adjustment on the Volvo truck. However:

“(The truck driver) had no warning of the impending drama about to unfold in front of him and that he was unaware of any problems or potential problems with the brakes. Nor was there any evidence that the brakes were not operating correctly before they failed on the downhill run.”

The Coroner's recommendations included:

“That the ACT Government consider legislating to permit only those persons who are trained to adjust brakes to perform such adjustments on heavy vehicles. This knowledge could be tested when a person presents for their heavy vehicle licence. “

³⁷ Queensland file No 4454/07.

³⁸ ACT CD185/02.

88. Although these previous coronial findings all relate to the more immediate effect of failure to properly maintain brakes, they underline the danger inherent in unregulated, inadequate, in-house heavy vehicle maintenance arrangements.
89. Later in 2013, the National Heavy Vehicle Regulator is expected to deliver a comprehensive range of services (including the regulation of heavy vehicle standards and modifications) under a consistent regulatory framework and Code of Practice.
90. Therefore, I have formed the view that the National Heavy Vehicle Accreditation Scheme should also be expanded to include all Victorian heavy vehicle operators who perform their heavy vehicle maintenance in-house. **Recommendation 4**
91. At a more specific level, the Code of Practice adopted by the National Heavy Vehicle Accreditation Scheme should also ensure mechanics performing maintenance work on heavy vehicles have access to and comply with the manufacturers' instructions in relation to maintenance. **Recommendation 5**
92. Further, the National Heavy Vehicle regulator intends to take over responsibility for regulation of heavy vehicle standards and modifications in mid-2013. Victoria Police and VicRoads will continue to enforce this legislation.
93. The new National Code of Practice for Heavy Vehicle Modifications of drive axles also includes a requirement for all welding on the axle housings to be performed in accordance with the axle manufacturers' recommended procedure. The replacement axle must also have mass ratings that are suitable for the vehicle.³⁹
94. Repair to the right forward drive axle of Mr Davies' prime mover in 1989/90 was performed contrary to the Rockwell International service bulletin dated 15 June 1982 which states:

"... Rockwell International will allow only the repair welding of rear axle assemblies in the following areas: cover welds, snorkel welds, and housing seam welds... Repair welding should be performed only if the crack/porosity is located within the weld material."

³⁹ Vehicle Standards Bulletin VSB6 Section D.

95. In the same service bulletin, Rockwell International also state that all damaged drive axle housings should be replaced:

“CAUTION; ... REPAIR WELDING AT LOCATIONS OTHER THAN THOSE INDICATED ABOVE MAY RESULT IN PREMATURE HOUSING FAILURE AND AFFECT THE SAFE OPERATION OF THE AXLE ASSEMBLY”

96. Therefore, to the extent that the modifications of the right forward drive axle on the prime mover performed in 1989/90 breached the requirements of the manufacturer, the vehicle repairer could now be prosecuted by Victoria Police and VicRoads even though the modifications were performed interstate.

97. In submissions, VicRoads indicated that they routinely distribute information to heavy vehicle repairers in Victoria to assist them in understanding that all repairs must be performed consistent with manufacturers’ advice and the latest applicable industry standards and codes of practice. They must also maintain the vehicles’ compliance with the relevant Australian Design Rules.⁴⁰

98. There is no evidence before me to suggest that Mr Davies’ prime mover was assessed by VicRoads after its registration in 1989 or after its modifications were performed in 1989/90 or at any other time.

99. Accordingly, the welding repair and addition of a metal plate welded to the right forward drive axle on the prime mover in 1989/90 was contrary to VicRoads advice circulated to major heavy vehicle repairers in Victoria. Use of the prime mover on the road was also contrary to the provisions of the Road Safety (Vehicles) Regulations 2009.

100. In the context of new arrangements involving the National Heavy Vehicle Regulator, it is also timely for VicRoads to review and re-publish their advice to heavy vehicle repairers in Victoria using Mr Dunn’s death as an example of the long-term consequences of inappropriate modifications. **Recommendation 6**

101. **The Victorian Workcover Authority** is still responsible for enforcing the provisions of the *Occupational Health and Safety Act 2004*. Further, prime movers are work places and safety

⁴⁰ See for example, VicRoads’ Vehicle Standards Information 25: Motor Vehicle Body Repairs (May 2006), VicRoads’ Vehicle Standards Information 32: Heavy Vehicle Modifications (November 2007), Vehicle Standards Information 8: Guide to Modifications for Motor Vehicles (May 2003).

of drivers⁴¹ and the public is within the compass of sections 21, 22, 23 & 32 of the *Occupational Health and Safety Act 2004*.

102. These provisions place responsibility on employers and employees to maintain a safe work place and protect the safety of the public.
103. In submissions, the Victorian Workcover Authority indicated that it established a prevention file in relation to health issues that could arise from the severance of a drive axle on a prime mover. However, they did not distribute information using an Industry Alert because the failure was isolated to the particular truck involved in the fatality and most likely related to an earlier weld on the axle.
104. While I understand the rationale in relation to the cause of the axle severance in Mr Davies' prime mover, the Court heard evidence that other prime movers have suffered axle cracking and potential failure. Therefore, the Victorian Workcover Authority can play an important role in ensuring that damaged axles are replaced or remediated according to manufacturers' instructions before they fail completely.
105. In order to achieve this aim, Workcover should distribute an Industry Alert to heavy vehicle operators and to heavy vehicle repairers to notify them of the long-term consequences of performing inappropriate repairs and inadequate maintenance on prime movers.

Recommendation 7

106. **Insurance companies** are responsible for authorising and paying for repairs to insured vehicles including prime movers. Accordingly, damage of the type sustained by Mr Davies' prime mover in 1989/90 would usually be managed through the insurer.
107. Arthur Traianon and the Managing Director of Royans Wagga confirmed that the service providers for repairs of the prime mover in 1989/90 were selected, directly authorised and managed by Traianon's insurer.
108. Further, the evidence provided to this coronial investigation indicates that the repairs to the right forward drive axle on Mr Davies' prime mover in 1989/90 did not comply with the requirements imposed by the axle manufacturer or the *Road Safety Act 1986*.

⁴¹ Inspector Campbell v James Gordon Hitchcock [2004] NSWIRComm 87; Inspector Stephen Campbell v James Gordon Hitchcock [2005] NSWIRComm 34.

109. To the extent that the memories Arthur Traianon and the Managing Director of Royans Wagga are correct about the way in which their claims against an un-named insurance company were managed in 1989/90, the repairer of the right forward drive axle on Mr Davies' prime mover and the insurance company contributed to its failure in 2007 and Mr Dunn's death.⁴²
110. In May 2013, the Insurance Council of Australia published the report of an independent review of the Code of Practice undertaken by Ian Enright.⁴³ In that report, Mr Enright emphasised that there are still sufficient instances of matters which involve a breach of the law, policy or the *Insurance Contracts Act* 1984 (Cth) as well as the Code of Practice to cause concern.
111. Mr Enright has proposed a revised Code of Practice that applies to all service suppliers as well as insurance providers. In particular, the proposed revised Code of Practice commits insurers and their service suppliers to high standards of customer service. In practice, this means that insurers commit to appointing only service suppliers who are qualified by education, training and experience for a service in relation to a matter under the Insurance Council of Australia Code of Practice.
112. It is within the terms of the proposed revised Code of Practice for customers like Traianon to expect insurance companies to appoint heavy vehicle repairers who will replace all damaged drive axles on prime movers unless welding remediation is within the scope of advice provided by the axle manufacturer.
113. The Insurance Council of Australia is aiming to release a further draft of the revised Code of Practice for consultation by October 2013. The new Code of Practice is due to come into effect in 2015.
114. The Insurance Council of Australia could use the example of Mr Dunn's death caused by failure of the right forward axle of a prime mover 20 years after its inadequate repair as part of the education package which is also recommended by Mr Enright. **Recommendation 8**

⁴² See for example, para 3.14 of the current General Insurance Code of Practice, 1 July 2012.

⁴³ Ian Enright, General Insurance Code of Practice, Independent Review 2012–2013, Final Report, May 2013.

Development of the crack within the axle housing

115. Fine cracks can occur within the axle housing on a prime mover. They are not detectable from the outside of the axle because no oil is able to leak from within the axle housing until the axle housing is breached. However, they create the environment which allows or encourages the second stage of more significant damage to develop.
116. Further, Dr Price noted that the remedial welding appeared to be sub-standard or performed contrary to usual welding practice.
117. However, in the context of Dr Price's evidence that the three cracks that led to the ultimate fracture of the right forward drive axle on the prime mover were not initiated in the remedial weld, there is also no evidence before me to suggest that the remedial but inadequately performed weld of the right forward drive axle on the prime mover in 1989/90 caused or contributed to the axle's catastrophic failure in 2007.
118. Therefore, the critical issue for development of the cracks that had been initiated during the roll over event in 1989/90 was the placement of an additional plate on the right forward drive axle on the prime mover.
119. I accept the opinion of Dr Price and Meritor that the remedial plate would have distributed the forces imposed by overload or critical events on the axle differently from that expected by the design engineers. This re-distribution probably caused the continuing progressive cracks in the axle housing.
120. The rate of development of existing cracks within the axle housing would depend on the frequency with which the prime mover was used, the conditions of its use including the types of road and the way it was driven, and the loads it carried.
121. Retrospective metallurgical analysis displays differences in the rate of growth of a crack over time in a manner similar to the way that rings in a tree trunk display evidence of changes in its growth during different seasons and growing conditions.
122. Analysis by Dr Price and Mr Gartner confirmed that the development and confluence of the three cracks did not proceed in a linear manner between 1989/90 and 2007. However, in the

absence of any real knowledge about the specific long-term exposure of the prime mover to external forces such as heavy loads, long distances and difficult roads, I am unable to comment further.

Extension of the Cracks through the Axle Housing

123. A crack in the axle housing becomes evident when it breaches the inner wall so that oil can leak from the differential into the wheel area of the prime mover.
124. Vehicle maintenance workers are most likely to have the opportunity to identify these warning signs early and remedy their cause or advise that the vehicle should not be used.
125. Peter Traianon identified at least three oil leaks from the forward right hand side wheel on the prime mover after 1 June 2007. These occurred on or about 9 June, 10 August and 21 August 2007.
126. On one view, these three oil leaks were caused by and indicated that the cracks in the axle housing had breached the inner wall of the axle. That is, they had entered the third phase of development of the eventual severance of the axle.
127. Therefore, it would have been appropriate for Peter Traianon to remove the prime mover from service until the axle was replaced.
128. However, the only evidence before me to suggest that the three oil leaks from the forward right hand side wheel on and before 21 August 2007 were associated with the subsequent severance of the right forward rear axle of Mr Davies' prime mover is the circumstance that they occurred on the same wheel and this was the axle that required remediation in 1989/90.
129. In the alternative, the evidence from all the witnesses in this investigation is consistent that a failed or inappropriately seated seal is the usual cause of an oil leak from the wheel area of a prime mover.
130. Mr Davies drove his prime mover from 9 June to 10 August 2007 after the first oil leak was remedied by replacing the seal. On 10 August, Peter Traianon replaced the seal but the truck was not used until 21 August.
131. On or about 21 August 2007, the third oil leak was remedied by Mr Nash and Mr Harbridge replacing the hub seal which they found had been incorrectly fitted on 10 August.

132. Mr Davies' daily records indicate that he was able to drive the semi-trailer 6220 km between 3 and 27 September 2007 without recording any complaints about oil leaks.
133. Therefore, it seems more likely that the oil leaks that occurred around the right forward drive wheel of Mr Davies' prime mover before 21 August 2007 were caused by failed hub seals.
134. Accordingly, I do not accept that the oil leaks that occurred around the right forward drive wheel of Mr Davies' prime mover necessarily indicated that the cracks in the right forward drive axle of Mr Davies' prime mover had breached the inner wall of the axle housing before 21 August 2007. At most, the cracks which may have breached the right forward drive axle housing were a minor factor contributing to and, without removal of the axle housing, indistinguishable from the oil leaks attributable to the identified failed hub seals.
135. I also accept that the appropriate management of these leaks was to check and change the hub seals when the leaks occurred.
136. However, in the absence of any recorded inspection between 22 August and 30 September 2007 of the right forward drive wheel of Mr Davies' prime mover immediately after use, I am not confident that oil from the pending rupture of the right forward drive axle housing did not also contribute to the oil leak which was remedied by a new seal on 21 August 2007. I am also not confident that there was no leak from the right forward drive axle housing between 22 August and 27 September 2007.
137. In the context of the long-term history of Mr Davies' prime mover and the short term history of three oil leaks from around the right forward drive axle over a period of three months, I have formed the view that the prime mover should have been reviewed by Peter Traianon and Mr Harbridge more often during September 2007 particularly immediately after use while it was still warm and had the trailer attached.
138. Accordingly, I adopt Deputy State Coroner West's recommendation that VicRoads require registered owners, operators and drivers of commercial heavy vehicles to undertake training in basic vehicle maintenance to enhance their understanding and appreciation of regular maintenance in an effort to improve safety awareness. **Recommendation 9**

Complete Severance of the Axle Housing

139. On 30 September 2007, Anthony Traianon told Mr Harbridge that Mr Davies' prime mover had another oil leak and that Mr Davies had told him that he could smell differential oil and see a leak around the plastic mudguard and drive wheels.
140. Mr Davies had last used his semi-trailer on 27 September 2007 and the odometer readings on his daily work sheets indicate that his prime mover had not moved between then and 1 October 2007. Therefore, Mr Davies must have made and reported these observations on 27 September 2007.
141. Mr Davies told the Court that he checked his semi-trailer before he left the yard on 1 October 2007. He was adamant there was no oil leak.
142. Mr Davies was confused about the dates that he reported oil leaks from the right forward drive wheel of his prime mover. He did not tell the police investigator that he had reported a further oil leak to Anthony Traianon on 27 September 2007. This fourth oil leak in four months was not recorded in Mr Davies' daily work sheet or in the Traianon maintenance records for Mr Davies' prime mover.
143. After Mr Dunn died, Mr Le Guier noted that the seal on the right forward drive wheel of Mr Davies' prime mover had been recently replaced. Therefore, it seems that Peter Traianon or Anthony Traianon replaced the hub seal in response to Mr Davies' complaint on 27 September 2007. Depending on when the hub seal was replaced, this may explain Mr Davies' observation that there was no oil leaking from his prime mover when he left the Traianon yard on 1 October 2007.
144. On the morning of 1 October 2007, Mr Davies carried two 21 tonne loads from Tullamarine to Campbellfield. According to the evidence of all the expert witnesses, these loads would be expected to further extend the still undiagnosed but developing crack in the shaft of the right forward drive axle of Mr Davies' prime mover.
145. I note that the distance from Tullamarine to Campbellfield is only about 14km and Peter Traianon told the Court that he restricted the distance the semi-trailer travelled with an oil leak.

146. However, I am unable to understand why Peter Traianon directed Mr Davies to carry two maximum loads on 1 October 2007 when he knew that the prime mover had a history of oil leaks from the right forward drive wheel and, even after replacing the hub seal for the fourth time, Anthony Traianon and Mr Harbridge were appropriately worried about these leaks and had arranged to further investigate them after the day's work was complete.
147. Accordingly, I adopt with relevant amendments Deputy State Coroner West's recommendation that VicRoads undertake or authorise a prevention study to provide insight into motivational factors behind heavy vehicle operators use of their vehicles when they have not been properly maintained. **Recommendation 10**
148. However, I am unable to say whether Mr Davies was aware that the hub seal on the right forward drive axle of his prime mover had been replaced.
149. Then, at about 12:15pm, Mr Davies returned to Tullamarine to pick up 21 pallets of jeans. These would have weighed about 12 tonnes.
150. Mr Davies stopped to pick up lunch before he proceeded on to the Westgate Freeway heading towards the Westgate Bridge. He drove the semi-trailer at about 100kph towards the City on the Westgate Freeway. By this time, Mr Davies' prime mover had travelled 139km since it left the yard.
151. There is no evidence before me to suggest there was anything different about this trip which could have precipitated the catastrophe that occurred:
- The load was unusually light;
 - The road from Tullamarine to the Westgate Freeway is high quality; and
 - Mr Davies did not notice anything about the operation of the truck at this stage to indicate that there was anything wrong with it.
152. Therefore, with the benefit of hindsight, the crack in the shaft of the right forward drive axle of the prime mover must have been connected by a thread when Mr Davies left Tullamarine at 12:15pm on 1 October 2007 and when he stopped to pick up lunch.

153. This means that the developing crack must have been leaking oil during travel by the end of the two earlier 21 tonne jobs between Tullamarine and Campbellfield and during the trip from Tullamarine to the Westgate Bridge.
154. I am also unable to say whether or to what degree the oil leak reported on 27 September 2007 related to severance of the right forward drive axle of Mr Davies' prime mover.
155. Mr Davies did not check the wheel when he stopped for lunch. I do not know whether he checked it at Tullamarine. However, if he had, he would certainly have seen the oil that had been leaking since he picked up his first load on 1 October 2007.
156. Mr Davies had previously exhibited an acute awareness of the smell and other indicia of oil leaking from the right forward drive axle of his prime mover. I am unable to understand why he did not notice this oil leak at about 12:30pm on 1 October 2007.
157. However, even if he had noticed the oil leak from the right forward drive wheel of his prime mover, Mr Davies would probably have attributed it to the faulty seal that had been diagnosed on four previous occasions. In the absence of any other immediate threat, it is unlikely that Mr Davies would have aborted his delivery on 1 October 2007.
158. For this reason, I find that Mr Davies could not have prevented severance of the right forward drive axle of his prime mover on 1 October 2007 or its contribution to Mr Dunn's death.

RECOMMENDATIONS

Pursuant to section 72(2) of the **Coroners Act 2008**, I make the following recommendation(s) connected with the death:

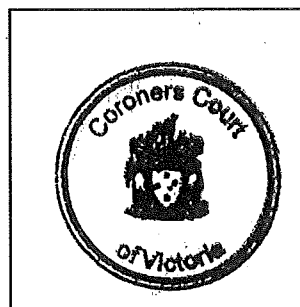
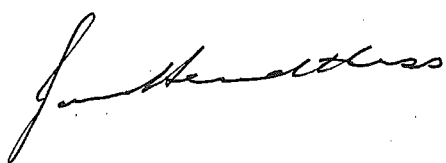
1. That VicRoads provide greater incentive for registered vehicle operators to report modifications that require re-registration by making the failure to do so within the relevant timeframe an indictable offence and by increasing the penalty. This would have the additional benefit of removing the 12 month time limit for prosecution.
2. That VicRoads, in addition to the ongoing requirement of notification pursuant to Regulation 225(3) of the Road Safety (Vehicles) Regulations 2009, require registered heavy vehicle operators to declare any repairs or modifications that change or may change the heavy vehicle's compliance with Australian Design Rules and road worthiness requirements.

3. That VicRoads provide greater incentive for registered vehicle operators to prevent drivers using vehicles that do not comply with the regulations. To do this, it should be an indictable offence for a registered vehicle operator to direct a driver to drive a non-compliant vehicle. The penalty attached to the offence should also be increased accordingly.
4. That the National Heavy Vehicle Regulator ensure that the National Heavy Vehicle Accreditation Scheme is expanded to include all Victorian heavy vehicle operators who perform their own maintenance in-house.
5. That the National Heavy Vehicle Regulator ensure that the Code of Practice adopted by the National Heavy Vehicle Accreditation Scheme also ensures that mechanics performing maintenance work on heavy vehicles have access to and comply with manufacturers' maintenance instructions.
6. That VicRoads review and re-publish their advice to heavy vehicle repairers in Victoria in the context of new arrangements involving the National Heavy Vehicle Regulator using Mr Dunn's death as an example of the long-term consequences of inappropriate repairs.
7. That WorkSafe distribute an Industry Alert to heavy vehicle operators, using Mr Dunn's death as an example, to promote industry awareness about the long-term consequences of performing inappropriate repairs on heavy vehicles and inadequately maintaining fleets,
8. That the Insurance Council of Australia ensures that their new Code of Practice encourages heavy vehicle repairers to become aware that they must comply with manufacturers' advice when they repair damaged drive axles on prime movers under an insurance contract.
9. That VicRoads require registered owners, operators and drivers of commercial heavy vehicles to undertake training in basic vehicle maintenance to enhance their understanding and appreciation of regular maintenance in an effort to improve safety awareness.
10. That VicRoads undertake or authorise a prevention study to provide insight into motivational factors behind heavy vehicle operators use their vehicles when they have not been properly maintained.

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

- The Honorable Terry Mulder, Minister for Roads;
- Gary Liddle, Chief Executive, VicRoads;
- Denise Cosgrove, Chief Executive, WorkSafe;
- Richard Hancock, CEO, The National Heavy Vehicles Regulator; and
- Rob Whelan, Executive Director & CEO, Insurance Council of Australia.

Signature:



DR JANE HENDTLASS

CORONER

Date: **13 August 2013**