IN THE CORONERS COURT
OF VICTORIA
AT MELBOURNE

Court Reference: COR 2013 5924

**FINDING INTO DEATH WITH INQUEST**

*Form 37 Rule 60(1)*

*Section 67 of the Coroners Act 2008*

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| Deceased: | Pauline Mary RIORDAN |
| Delivered on: | 31 January 2019 |
| Delivered at: | Coroners Court of Victoria,<br>65 Kavanagh Street, Southbank |
| Hearing dates: | Mildura on 28, 29, and 30 November, 1 and 2 December 2016 and Melbourne on 22 May 2017 |
| Findings of: | Coroner Paresa Antoniadis SPANOS |
| Counsel assisting the Coroner: | Leading Senior Constable Remo ANTOLINI from the Police Coronial Support Unit |
| Representation: | Mr R. DONALDSON appeared on behalf of Ambulance Victoria<br>Mr S. STAFFORD appeared on behalf of State Emergency Services<br>Ms K. POPOVA appeared on behalf of the Country Fire Authority. |
| Catchwords: | Motor vehicle collision, drift or veer, lane departure technology, offset head on collision, deceased front seat passengers, difficult extrication, SES, CFA, crush injuries, tamponade |

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I, PARESA ANTONIADIS SPANOS, Coroner,
having investigated the death of PAULINE MARY RIORDAN

and having held an inquest in relation to this death at Mildura on 28, 29, 30 November, and 1, 2 December 2016 and at Melbourne on 22 May 2017:

find that the identity of the deceased was PAULINE MARY RIORDAN

born on 16 November 1950

and that the death occurred on 23 December 2013

at Calder Highway, Kiamal, Victoria 3490, between the 457 and 458 kilometre posts
**from:**
I (a) INJURIES SUSTAINED IN A MOTOR VEHICLE COLLISION (PASSENGER)
**in the following circumstances:**

INTRODUCTION[1]

1. Mrs Riordan was a 61 year-old married woman who resided in Irymple, Mildura, with her husband Jeffrey Lyle Riordan and worked as a carer for disabled people.

2. On Monday 23 December 2016, Mrs Riordan and her husband, left their home shortly after midday to drive to Melbourne to spend Christmas with their children and their families. Mr Riordan was driving the family car, a 2005 white Mitsubishi Pajero [the 4WD], and Mrs Riordan was the front seat passenger. There were no other occupants and the boot was full of personal items and Christmas presents.

3. Having travelled through Irymple, the Riordans were travelling south on the Calder Highway at Kiamal, about seven kilometres [kms] north of Ouyen. It was a beautiful day, traffic was light and there was a beautiful long straight stretch of road ahead.

4. At about 1.00pm, there was a two vehicle collision involving the 4WD and a 2012 black Volkswagen Passat sedan [the sedan] being driven by Shane Dutton in the opposite direction.

5. Mr Dutton and his family had left Mount Waverley between 7.30-8.00am to travel to Mildura to spend Christmas with his wife Julie Dutton's mother. Ms Dutton was seated immediately behind her husband, their daughter Courtney was in the middle rear passenger seat, their son Jordan was in the left rear passenger seat and their eldest daughter Emma was in the front passenger seat. Also on board, were the Dutton family's two dogs.

[1] This section is a summary of background and personal circumstances and uncontentious circumstances that provide a context for those circumstances that were contentious and will be discussed in some detail below.

6. The collision and its aftermath were the focus of the coronial investigation and will be discussed in some detail below. Suffice for present purposes to say that both front seat passengers died at the scene, Mrs Riordan after a lengthy and difficult extrication from the 4WD about two hours after the collision, and Emma on impact.[2]

INVESTIGATION AND SOURCES OF EVIDENCE

7. This finding is based on the totality of the material the product of the coronial investigation of the Mrs Riordan and Emma's deaths. That is, the brief of evidence compiled by Detective Leading Senior Constable Jamie Mitchell from the Glen Waverley Major Collision Unit of Victoria Police [MCIU] and additional material obtained by my assistant Leading Senior Constable Remo Antolini from the Police Coronial Support Unit, the statements, reports and testimony of those witnesses who testified at inquest and any documents tendered through them.

8. All of this material, together with the inquest transcript, will remain on the coronial file.[3] In writing this finding, I do not purport to summarise all the material and evidence, but will refer to it only in such detail as is warranted by its forensic significance and in the interests of narrative clarity.

PURPOSE OF A CORONIAL INVESTIGATION

9. The purpose of a coronial investigation of a *reportable death*[4] is to ascertain, if possible, the identity of the deceased person, the cause of death and the circumstances in which death occurred.[5] It is self-evident that Mrs Riordan's death was unnatural and resulted directly from an accident or injury and therefore falls within the definition of a reportable death.

10. The *cause* of death refers to the *medical* cause of death, incorporating where possible the *mode* or *mechanism* of death. For coronial purposes, the *circumstances* in which death occurred refers to the context or background and surrounding circumstances but is confined to those circumstances sufficiently proximate and causally relevant to the death, and not all those circumstances which might form part of a narrative culminating in death.[6]

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[2] Mr Riordan received only minor injuries. All members of the Dutton family received injuries from serious to life threatening.

[3] From the commencement of the ***Coroners Act 2008*** (the Act), that is 1 November 2009, access to documents held by the Coroners Court of Victoria is governed by section 115 of the Act. Unless otherwise stipulated, all references to legislation that follow are to provisions of the Act.

[4] The term is exhaustively defined in section 4. Apart from a jurisdictional nexus with the State of Victoria (see section 4(1)), reportable death includes *"a death that appears to have been unexpected, unnatural of violent or to have resulted, directly or indirectly, from an accident or injury"* (see section 4(2)(a) of the Act).

[5] Section 67(1).

[6] This is the effect of the authorities – see for example *Harmsworth v The State Coroner* [1989] VR 989; *Clancy* v *West* (Unreported 17/08/1994, Supreme Court of Victoria, Harper J.)

11. The broader purpose of any coronial investigations is to contribute to the reduction of the number of preventable deaths through the findings of the investigation and the making of recommendations by coroners, generally referred to as the *prevention* role.[7]

12. Coroners are empowered to report to the Attorney-General in relation to a death; to comment on any matter connected with the death they have investigated, including matters of public health or safety and the administration of justice; and to make recommendations to any Minister or public statutory authority on any matter connected with the death, including public health or safety or the administration of justice.[8] These are effectively the vehicles by which the coroner's prevention role can be advanced.[9]

13. It is important to stress that coroners are not empowered to determine the civil or criminal liability arising from the investigation of a reportable death and are specifically prohibited from including in a finding or comment any statement that a person is, or may be, guilty of an offence.[10]

FINDINGS AS TO UNCONTENTIOUS MATTERS

14. Despite the severity of her injuries, Mrs Riordan was able to be visually identified and a Statement of Identification was signed by Mr Riordan on 23 December 2013. Her identity was uncontentious as were the date and place of her death.

15. I accordingly find, as a matter of formality, that Pauline Mary Riordan born on 16 November 1950, late of an Irymple address, died between the 457 and 458 kilometre posts on the Calder Highway, Kiamal, Victoria 3490 on 23 December 2013.

MEDICAL CAUSE OF DEATH

16. Forensic pathologist Dr Noel Woodford (as he then was[11]) from the Victorian Institute of Forensic Medicine [VIFM] reviewed the circumstances of death as reported by police to the coroner, post-mortem CT scanning of the whole body undertaken at VIFM [PMCT] and performed an autopsy on Mrs Riordan's body at the Coronial Services Centre, Southbank.

[7] The 'prevention' role is now explicitly articulated in the Preamble and purposes of the Act, compared with the *Coroners Act 1985* where this role was generally accepted as 'implicit'.
[8] See sections 72(1), 67(3) and 72(2) regarding reports, comments and recommendations respectively.
[9] See also sections 73(1) and 72(5) which requires publication of coronial findings, comments and recommendations and responses respectively; section 72(3) and (4) which oblige the recipient of a coronial recommendation to respond within three months, specifying a statement of action which has or will be taken in relation to the recommendation.
[10] Section 69(1). However, a coroner may include a statement relating to a notification to the Director of Public Prosecutions if they believe an indictable offence may have been committed in connection with the death. See sections 69 (2) and 49(1).
[11] Dr Woodford is now Professor and Head of the Victorian Institute of Forensic Medicine.

17. Having done so, Dr Woodford provided a 20 page written report of his findings in support of his conclusion that Mrs Riordan died as a result of *injuries sustained in a motor vehicle collision as a passenger.*[12]

18. Dr Woodford summarised his anatomical findings as bilateral rib fractures; traumatic basal subarachnoid haemorrhage; T8/9 intervertebral disc fracture; haemorrhage upper posterior neck with intact cervical spine; slightly collapsed lungs and extensive; severe, bilateral lower limb blunt force injuries. As to the latter, he commented that these were major blunt force injuries or lacerations to the left upper limb and both lower limbs as well as a compound dislocation fracture dislocation of the right ankle. Dr Woodford further commented that *"Although the mechanism of death is not able to be determined with certainty, it appears likely to have been contributed to by blood loss as a consequence of the multiple blunt force injuries."*

19. As regards the significance of the traumatic subarachnoid haemorrhage to death, Dr Woodford noted that as Mrs Riordan was conscious, albeit with some impairment, at the time she was being attended to by paramedics, the contribution of this injury to the ultimate mechanism of death is likely to have been minimal.

20. Dr Woodford noted that toxicological analysis of post-mortem samples taken from Mrs Riordan showed no alcohol or other commonly encountered drugs or poisons, apart from morphine and metoclopramide, consistent with administration by paramedics in an acute setting.[13]

21. Based on all the evidence available to me, I find that the medical cause of Mrs Riordan's death is injuries sustained in a motor vehicle collision as a passenger.

THE FOCUS OF THE CORONIAL INVESTIGATION AND INQUEST

22. The initial focus of the coronial investigation and inquest in relation to both Mrs Riordan and Emma's deaths was on how the collision occurred. This was resolved on the basis of the coronial brief and not really investigated during the inquest. The primary focus of the inquest was on an important issue that arose in relation to Ms Riordan's death only. That is, on the manner in which Mrs Riordan was extricated from the 4WD and whether or not there was any avoidable delay which caused or contributed to her death.

[12] Coronial brief pages 27-44. The report includes Dr Woodford's formal qualifications and experience.
[13] Coronial brief page 19. The toxicologist's report is at coronial brief pages 23-26. Morphine is a narcotic analgesic used to treat moderate to severe pain and metoclopramide is an anti-emetic drug used for the treatment of nausea and vomiting, often administered in association with morphine to treat this anticipated side effect.

HOW THE COLLISION OCCURRED – THE LOCALE

23. As already mentioned, the collision occurred on the Calder Highway, Kiamal, about seven kilometres north of Ouyen between the 94 and 95 km posts from Mildura. Calder Highway is the main carriageway between Melbourne and Mildura and carries a very high volume of traffic both local and in transit.[14]

24. The collision occurred within a straight section of the highway with a posted speed limit of 100km/hr. At this location the highway runs generally north-south through a rural landscape and has provision for one lane of traffic in each direction. There are audible tactile strips along both fog lines and within the centre broken white line. The bitumen surface of the highway was dry and in very good condition at the time. The reservations on each side of the carriageway were sloped and raised above the level of the carriageway, sloping away to the level of adjacent farmland.[15]

25. At the time of the collision, the weather was fine and it was daylight with no apparent obstructions to driver visibility. As the highway ran north – south, it is unlikely that sun glare would have affected the visibility of either north or south bound vehicles.[16]

HOW THE COLLISION OCCURRED – THE DRIVERS

26. Jeffrey Riordan was a 64 year old married and recently retired man who had lived in Mildura all his life, most recently in Irymple. Mr Riordan had been driving since he was 18, had a full and current Victorian driver's licence. He told police that this was his first major accident and that he had owned the 4WD for 4-5 years and had never had any problems with it.[17]

27. The Riordans were planning to spend Christmas with their children in Melbourne. Mr Riordan had slept from about 10.30-11.00pm the previous night until he woke at 7.30am on 23 December 2013 and they left for Melbourne at 12.08pm 'on the dot'. At 12.52pm, Mr Riordan remembered looking at the time. He was enjoying the drive, the beautiful weather and the beautiful long straight stretch of road ahead. There were three or four cars behind him and they remarked on how quiet the traffic was.[18]

28. Mr Riordan then noticed an oncoming vehicle ahead of him, at first travelling on the correct side of the road for some 500-600 metres, before gradually veering across onto his side of the

[14] Or, between the 497 - 498 km posts, from Melbourne. See statement of Detective Leading Senior Constable Jenelle Mehegan, Collision Reconstructionist, Major Collision Investigation Group, coronial brief page 223.
[15] Statement of Rohan Earl Courtis, coronial brief page 194. Also, DLSC Mehegan's statement, coronial brief page
[16] Ibid and statement of DLSC Mehegan, coronial brief page 224.
[17] Statement of Jeffrey Lyle Riordan dated 23 December 2013, coronial brief page 58. Also, pages 346-348 which are certificates under the Road Safety Act 1986 confirming that the 4WD was registered in Ms Riordan's name at the time and that Mr Riordan held a full Victorian driver's licence and had no recorded traffic offences.
[18] Ibid.

road. The vehicle 'got quicker and quicker and just kept coming across the road towards us and kept coming until it was completely on our side of the road.' Mr Riordan saw it was a black car and tried to get out of its way but it 'just kept coming and it all happened so fast'. He did not remember the impact other than hearing a loud crunch and the airbags deploying.[19]

29. Mr Riordan sustained minor injuries and was able to extricate himself from the 4WD, walk around and talk to emergency responders. He underwent a preliminary breath test at the scene, administered by local police, and no alcohol was detected.[20]

30. Mr Dutton was a 54 year old married man who resided in Mount Waverley with his family and retired about 14 months before the collision as a result of an eye injury. Medical reports obtained from Mr Dutton's treating doctors indicate that his overall health is good. However, in January 2012, Mr Dutton suffered a sudden onset of visual loss in his right eye and subsequently underwent a retinal detachment procedure and a vitrectomy, both in the right eye. His vision stabilised but his eyesight remained somewhat compromised following the procedures and underwent further investigations.

31. When last examined by Vitreoretinal Specialist Dr William Campbell, on 24 October 2013, Mr Dutton's vision remained compromised with visual acuities measured at 6/150 part in the right eye and 6/6 in the left. Nevertheless, Dr Campbell was of the opinion that 'Mr Dutton fulfils the minimum visual requirements to drive a car in Victoria and that it is very unlikely the poor vision in his right eye is sufficient explanation for his veering on to the incorrect side of a straight road.'[21]

32. Mr Dutton held a full and current Victorian driver's licence.[22] He underwent a preliminary breath test at the scene, administered by local police, and no alcohol was detected. Testing of a blood sample taken from Mr Dutton revealed no alcohol or other commonly encountered drugs or poisons apart from morphine and ketamine, both strong analgesics consistent with administration by medical or paramedic staff in an emergency setting, and the antidepressant citalopram at levels consistent with normal therapeutic use.[23]

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[19] Ibid.
[20] Coronial brief summary.
[21] Dr William G. Campbell's statement dated 6 March 2014, coronial brief page 337. Other medical reports from Associate Professor Justin O'Day are at coronial brief pages 338-340.
[22] At coronial brief pages 349-351 are certificates under the Road Safety Act 1986 confirming that the sedan was registered at the time and that Mr Dutton held a full Victorian driver's licence and had no recorded traffic offences.
[23] Coronial brief pages 341-343. Also, see footnote 30 below.

33. As a result of injuries sustained during the collision, and his lawyer's indication to police that he was unable to submit to an earlier interview, Mr Dutton was not interviewed by police until 14 March 2014.[24]

34. While he gave no account of how the collision occurred, as he did not remember and thought his last memory was of Wycheproof,[25] Mr Dutton gave some explanations and denied a number of potential issues or distractions put to him by the police during interview -

    a. He knew he wasn't drinking, had a rest and is not a silly driver.[26]

    b. He couldn't say definitely but did not think he went to sleep as he had gone to bed early the night before, had rested and had taken one No-Doz tablet just before they left instead of having his usual morning coffee.[27]

    c. He took no medications apart from his usual antidepressant/anxiolytic.[28]

    d. The sedan was fitted with Lane Assist Technology which was operating at the time and no alarms sounded.[29]

    e. He thought that the family's two dogs were in the back, conceded one may have been sitting on Emma's lap, but in any event, they did not distract him.[30]

    f. He was not eating food or drinking or being distracted by any mobile phones or other technology.[31]

    g. It was a beautiful day and a straight stretch of road and he was 'doing the trip easy.'[32]

HOW THE COLLISION OCCURRED – POLICE & EXPERT EVIDENCE

35. Although a number of people came upon the collision scene, rendered assistance and called emergency services, there were no independent eye witnesses to the collision between the two vehicles.

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[24] Coronial brief pages 283 and following.
[25] Coronial brief pages 299, 303 and 317.
[26] Coronial brief page 294.
[27] Coronial brief pages 295, 308 and 310.
[28] Coronial brief page 296. Mr Dutton said he took an antidepressant at night. Dr Morris O'Dell a clinical forensic clinician from VIFM advised the DLSC Mitchell that escitalopram was an antidepressant and had no effect on drowsiness or the ability to do control a motor vehicle. Coronial brief page 277.
[29] Coronial brief pages 299-303, 329. This appears to be incorrect as a report obtained from the Volkswagen corporation states, *inter alia*, that *"Lane Assist: An analysis of the control unit determined that the Lane Assist was switched on, but was not active (before or during the accident). That means that the Lane Assist could not intervene in the vehicle's steering…The data stored in the airbag control unit as a result of the crash was also analysed. This included data indicating the detection of a frontal collision, including the activation of the front airbags and belt tensioner."* See coronial brief page 344.
[30] Coronial brief pages 303-305, 312.
[31] Coronial brief pages 305, 309, 313-314.
[32] Coronial brief page 308, 316.

36. Responding police members, including the coronial investigator DLSC Mitchell, made observations of the vehicles post impact in their resting positions, noted physical evidence left by the vehicles in the vicinity, took photographs of the scene and took measurements. DLSC Mitchell concluded that the collision occurred when the sedan being driven north by Mr Dutton, veered at an angle across the centre dividing line and continued driving north in the south bound lane at an angle as it approached the 4WD. The approaching 4WD being driven by Mr Riordan slowed and he took evasive action, initially by steering as far left as possible, before swerving sharply to the right shortly before impact. The result was an offset head on collision occurring wholly within the southbound lane, both vehicles presenting their front passenger sides which took the brunt of the impact.

37. Neither driver raised any concerns with police about the performance of their respective vehicles. Nevertheless, Senior Constable Junny Hetherton from the Mechanical Inspection Unit of Victoria Police [MIU] undertook mechanical inspections of both vehicles on 14 January 2014 at a towing contractors premises in Mildura. SC Hetherton found the sedan to be in near new condition and the 4WD to be in good condition and found no mechanical faults with either vehicle which would have caused or contributed to the collision.[33]

38. Detective Leading Senior Constable Jenelle Mehegan (as she then was) from the MCIU attended the scene on the afternoon of 23 December 2013 and provided a Collision Reconstructionist Report of some pages 40 pages that is included in the coronial brief.[34] In her report, DLSC Mehegan set out the sources of evidence used in her reconstruction, indicated that she was present when another member measured the scene using a total survey station, included pertinent photographs and the formulas used to make her calculations and reach her conclusions about how the collision occurred.

39. DLSC Mehegan's expert assessment is that for an unknown reason, the sedan has crossed onto the incorrect side of the highway and collided with the 4WD in an offset head on collision causing severe damage to the front passenger side of both vehicles. The damage profiles of the vehicles indicate that at impact the front passenger side of the sedan was partially in the south bound lane and partially on the bitumen shoulder east of the south bound

[33] Coronial brief pages257 and following. I note that SC Hetherton was unable to locate the passenger side front suspension and wheel assembly of the sedan and commented that *"If there had been a run flat failure this would leave corresponding marks on the road, and tend to cause the vehicle to pull towards the passenger side. If the suspension had collapsed, this would have similar tendencies."* The movement of the sedan shortly before the collision was a drift or veer to the right or the driver's side, not towards the left or passenger side. Coronial brief page 263.
[34] Her statement is at coronial brief pages 215-216 and her report proper commences at page 217.

lane. The angle of the sedan at impact is "slight" and is more consistent with a drift or veer than a deliberate steering action.[35]

40. Significantly, DLSC Mehegan noted that the speedometer needle of the sedan was stuck at 100kph and the RPM at 1600, in her view, consistent with the vehicle having been set on cruise control at impact (and the overall drift or veer hypothesis) and also consistent with her calculations.[36] The 4WD was travelling at a lower speed that the sedan at impact, about 83.5kph.

41. Furthermore, DLSC Mehegan's expert assessment is that at impact the 4WD was wholly in the south bound lane but being steered to the right. The position of the 4WD at impact in addition to the pre-impact "yaw" is consistent with the 4WD having first been steered to the left and then to the right as evasive actions.[37]

42. Based on the damage to the front of both vehicles, DLSC Mehegan inferred that at impact the vehicles commenced to rate in an anticlockwise direction with the sedan continuing off the road to the east and commencing to travel up the embankment, while the 4WD has travelled onto the northbound lane towards the western shoulder.[38]

THE EMERGENCY RESPONSE SYSTEM

43. Before moving to the manner in which Mrs Riordan was extricated from the 4WD and whether or not there was any avoidable delay which caused or contributed to her death, it is important to have some appreciation of arrangements for emergency services response in Victoria in order to understand how the emergency response unfolded.

44. The Emergency Services Telecommunications Authority (ESTA) was established on 1 July 2005 as a statutory authority providing state-wide around the clock emergency call-taking and dispatch services for police, fire, ambulance and emergency services.[39] ESTA call-takers receive calls via Telstra's dedicated emergency '000' number and calls are allocated to call-takers trained specifically in the particular emergency service's requirements. Each of the emergency services provides ESTA with its service delivery requirements and ESTA

[35] Coronial brief page 248. The sedan's encroachment onto the south bound carriageway was significant, the passenger side being a *minimum of 1.8 metres* and up to 2.8 metres onto the incorrect side. Coronial brief page 254.
[36] Coronial brief page 235. See also SC Hetherton's observations at coronial brief page 257 – "The tacho needle was [sic] in found at approximately 140 rpm and the speedo needle was at approximately 99kmp which would be consistent with the vehicle travelling in top gear at the time of impact.
[37] Ibid.
[38] Coronial brief page 249. I note that DLSC found no evidence (neither physical evidence at the scene nor witness accounts) which suggested that either driver braked before impact, although she could not entirely exclude this possibility. If they braked they left no skid marks or no discernible skid marks.
[39] ESTA was established by the *Emergency Services Telecommunications Authority Act 2004 (Victoria).*

operationalise these into clear and concise instructions to all staff operating its computer assisted dispatch system (CAD).[40]

45. There are three ESTA call centres in Victoria and, while it is apparent from the ESTA Chronology tendered in evidence, that calls relating to this collision were actioned at the various call centre, the resultant CAD entries were accessible to all.[41] Aside from ESTA call-takers and other ESTA staff, present at the call centres are Victoria Police, Ambulance Victoria and fire services staff having, inter alia, a liaison role. The only service not represented on the call centre floor is the State Emergency Service (SES). Instead, the SES has a duty officer who communicates any SES requirements via ESTA call-takers and with whom ESTA and other agencies can communicate on an as needs basis.[42]

46. On 23 December 2013, Wayne Grincais was the SES Regional Duty Officer for the North West Region of Victoria based in the SES office in East Bendigo. He provided a statement for the coronial brief and gave evidence at inquest. In response to a request for back-up from Ms Leanne Boyd, a member of the Ouyen SES unit already at the collision scene, Mr Grincais called ESTA at about 13:30 hours and asked for Mildura SES to be dispatched as back-up. He chose Mildura SES in preference to other SES units in the region because of their significant experience with road rescue, their relatively easy access to the collision scene travelling along a major highway and so as not to deplete the regional rescue resources in the event of another incident.[43]

47. At about 13:33 hours, Mr Grincais became aware via a pager that ESTA had dispatched the Robinvale SES unit. He called ESTA at 13:36 hours to reiterate his request for dispatch of Mildura SES to back-up Ouyen SES and it was this second call which resulted in dispatch of Mildura SES to the incident, an unnecessary delay of six minutes.[44]

48. According to the ESTA Chronology, in the intervening period between the two calls made by Mr Grincais, at 13:33:20 hours, the ESTA Team Leader and Fire Services Communications

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[40] These matters were uncontentious and were not the subject of evidence at inquest and this summary is for context.
[41] The "Chronology Report-Event ID 74223329" provided by ESTA appears at coronial brief pages 537-575. Note that the first documented call was at 12:59:21 hours and resulted in the creation of three separate "events" one in respect of the need for ambulance services (E13122310784), fire or rescue services (F13121141) and police (P1312146194).
[42] Transcript pages 101 and following, 252.
[43] Exhibit L, statement of Wayne Edward Grincais, coronial brief pages 153-154. Mr Grincais discussed his choice with Regional Operations Manager Mark Cattell who happened to be in the office at the time. Transcript pages 93-94. Note that Mr Grincais was also aware that the Manangatang CFA had also been dispatched by ESTA but this did not 'really affect' his decision to ask that the Mildura SES be dispatched as back-up. Exhibit L and transcript page 91. Note also that the times are given here as per Mr Grincais' duty log Exhibit N and vary slightly from the time-stamps on the ESTA chronology at coronial brief pages 557-558, Exhibit M, according to which the times of Mr Grincais' requests for dispatch of Mildura SES are 13:32:29 and 13:38:01/03 and the dispatch of Mildura SES is at 13:38:29, still a difference or delay of six minutes. Transcript page 99.
[44] Transcript pages 103-104.

Controller "intervened" in the dispatch process, for want of a better word, and instructed dispatch of the "next CAD rescue" which was the Robinvale SES unit already en route. Mr Grincais testified that he only communicated with ESTA call-takers and denied speaking to either the Team Leader or the Fires Services Communications Controller in respect of this incident. He also maintained that it was within his remit as SES duty officer to override CAD for good reason and that it was not the role of the FSCC to determine deployment of SES rescue resources.[45]

49. How or why Mr Grincais' request that Mildura SES be dispatched was countermanded was not explored at inquest, as there was no plausible causal connection between a six-minute delay in dispatch of Mildura SES and Mrs Riordan's death.[46] However, in other circumstances, particularly in the context of emergency response in regional areas, such a delay in dispatching emergency responders may be critical.

50. Mr Glenn Thompson was the Country Fire Authority (CFA) Fire Services Communications Officer (FSCC) with 22 years' experience in the CFA overall as at the date of the inquest who provided a statement for the coronial brief and gave evidence at inquest.

51. Mr Thompson was the FSCC working at the ESTA call centre in Ballarat on 23 December 2013. In that role he was responsible for ensuring fire appliances are dispatched in accordance with the rules on CAD and for liaising closely with CFA operational staff and external agencies.[47] He gave a helpful description of the operation of the emergency response system including the CAD.[48]

52. While acknowledging the entry documented at 13:33:20 on the ESTA Chronology[49], Mr Thompson testified that he had no recollection of Mr Grincais' first request for dispatch of the Mildura SES unit as back-up for Ouyen SES, and no recollection of a conversation with the ESTA Team Leader whereby they determined to dispatch the next rescue unit according to CAD unit instead of the Mildura SES unit. Furthermore, if he had known of Mr Grincais' request, he would have given effect to it and would not have taken it upon himself to determine the deployment of particular SES resources.[50]

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[45] Exhibit L and transcript pages 93 and following and 102-103.
[46] See below under the heading of "The Causal Significance of Delay" especially Prof Fitzgerald's evidence. I note that Mr Grincais testified that he reported the matter up the SES chain of command and did not know the outcome of any internal review or analysis that might have taken place. Transcript page 99.
[47] Exhibit S, statement of Glenn Thompson dated 21 July 2016, coronial brief page 99.
[48] Transcript pages 235 and following.
[49] See exhibit M at page 557 "NA: TL AND FSCC – GO WITH NEXT CAD RESCUE" where NA is short for Notice of Authority and the entry was made at terminal bd024 at the ESTA call centre Ballarat by operator 81180150. Transcript pages 242-244.
[50] Transcript pages 237, 242-243, 249-250.

53. Mr Thompson also testified about the scope for emergency services to provide ESTA with a "permanent turn out note" or dual response direction such that whenever a particular unit is dispatched by CAD, another specified unit is also automatically dispatched. This enables emergency agencies to support any units known to be under-resourced whether in terms of human resources or qualifications or experience. A "temporary turn out note" is also available, has currency for 42 days but requires dispatchers to refer to a list of temporary turn out notes before dispatch and to make the required manual entry in CAD.[51]

54. These are mechanisms for ensuring back-up of emergency responders where the need for back-up can be anticipated or predicted well ahead of the incident. On my understanding of the evidence, the need for back-up of the Ouyen SES unit arose from the nature of the collision and the fact that only three of the crew of six volunteers turned out in response to this incident, could not be anticipated and fell to Mr Grincais to resolve on the day.

A DIFFICULT EXTRICATION? – AMBULANCE VICTORIA EVIDENCE

55. At inquest, the first witnesses called were the various Ambulance Victoria (AV) paramedics who attended the scene and were involved in the assessment and treatment of Mrs Riordan, some of whom tended to the other multiple casualties. Unfortunately, due to technical problems, the first day's evidence was not transcribed, a consensus about the purport of the evidence could not be agreed and the witnesses were recalled. Each witness provided a statement/s for the coronial brief and attended the inquest to be cross-examined.

56. Darren William Law was an AV paramedic working out of Ouyen. On 23 December 2013, he was on a rest day but was called in to assist and arrived at the collision scene at around 13:10 hours.[52] On arrival, he spoke to his colleague AV paramedic Brian Ladds who arrived a short time before him and was able to provide a triage update as to each patient.

57. As the senior paramedic at the scene, Mr Law became the health commander, allocated the other patients to paramedics and ambulance community officers at the scene and took over the care of Mrs Riordan.[53] Mr Law remained involved in Mrs Riordan's care thereafter but was assisted by other paramedics and ambulance community officers in caring for her and from time to time left briefly to assist others including Mr Fumberger who assumed the health commander role on his arrival at about 13:48 hours.[54]

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[51] Transcript pages 238-240 and 257-258.
[52] Exhibit A, statement of Darren William Law dated 1 January 2014, coronial brief page 100. According to his statement Mr Law arrived at 13:08. On exhibit C, his own VACIS-electronic Patient Care Report, Mr Law he was at the scene at 13:12 hours and "@ patient" or with Mrs Riordan at 13:15hours.
[53] Exhibit A and transcript page 183.
[54] Ibid and Exhibit D, transcript page 204 and Exhibit D, statement of Stephen Richard Fumberger dated 7 January 2014, coronial brief page 119.

58. Mr Law described Mrs Riordan as seated in the passenger seat of the severely damaged 4WD, basically trapped from the pelvis down by the dashboard, conscious and alert, able to converse and a bit flat but stable from a haemodynamic perspective. Although Mr Law's assessment of Mrs Riordan's injuries was limited by her entrapment, he took her vital signs, initiated an IV line in her right arm and commenced administering normal saline. The same line was used to administer morphine for pain relief periodically and a collar was applied to her neck in anticipation of cervical/spinal fractures. Mrs Riordan was also given oxygen via mask.[55]

59. In terms of any other available treatments, Mr Law testified that a tourniquet was not available to him as at 23 December 2013 but that, as at the date of the inquest, tourniquets had been introduced for use by AV paramedics, in association with the relevant training. In practical terms, a tourniquet could not have been applied while Mrs Riordan was entrapped.[56] As a "road paramedic" Mr Law was not in a position to give blood (or blood products) in the field. To his knowledge, this was only available at Mildura Hospital, and he thought (correctly as it turned out) might be available to air ambulance paramedics.[57]

60. According to Mr Law, he asked Mrs Bernadette Fidge from Ouyen SES to remove the driver's side door of the 4WD to facilitate his access as the door was swinging back and forth and at times impinging on the saline line, and also asked her to remove the steering wheel/column to improve access and to allow him to lay out his equipment on the driver's side dashboard.[58] He testified that the removal of these items was very quick and estimated that it took five to ten minutes in total.[59]

61. Although he could not see the full extent of Mrs Riordan's injuries, Mr Law suspected they were serious from the first, based on his observation of blood pooling on the ground underneath her and the high impact nature of the collision. He formed the opinion early on that the dash was more than likely tamponading (or stemming) the flow of blood and that once the pressure was released, Mrs Riordan would bleed out and go into cardiac arrest. As will be discussed below[60], this proved correct, save that as matters unfolded, Mr Law noted a

[55] Exhibit A, coronial brief page 101 and transcript page 184. I note that the right arm was most accessible to Mr Law and the other paramedics who worked from the driver's seat and that injury to the left arm precluded placing a second line for the speedier administration of fluids and medication. For Mrs Riordan's vital signs and other parameters, see Exhibit C, VACIS-electronic Patient Care Record compiled by Mr Law.
[56] Transcript pages 191-192.
[57] Transcript page 190.
[58] Transcript pages 185-186. To some extent, Mr Law's needed the driver's side door and the steering column removed as he was six foot three inches tall (or 1.905 metres) and weighed about 170 kilograms.
[59] Transcript pages 186-187.
[60] See the evidence of Prof Fitzgerald at paragraphs 115 and following.

deterioration in Mrs Riordan's clinical condition immediately prior to the actual release of pressure once the dash was rolled but he could not say how long before.[61]

62. In his first statement, Mr Law had been implicitly critical of the time taken by the SES to extricate Mrs Riordan from the 4WD. In his second statement, having read the statements of certain witnesses and having reconsidered the matter, he withdrew that criticism which he felt reflected the stressful situation he was in, his emotional response to the outcome for his patient and the skewing of his perception of time.[62]

63. At inquest, Mr Law did not recall halting progress of the dash roll by asking the SES/CFA to stop the process while he tended to Mrs Riordan's needs but testified that he would accept that he did so if there evidence was given to that effect.[63] He maintained however that once the dash was rolled, he would have been prepared lift Mrs Riordan out sideways through the passenger side of the 4WD, even at the increased risk of spinal injury, so as to stem her bleeding and initiate resuscitation more quickly.[64]

64. The other significant change to Mr Law's evidence concerned the indication in his first statement that he had told the SES that he did not care what they did but to "make it fast" referring to the extrication of Mrs Riordan.[65] In his second statement, Mr Law indicated that he had thought this was directed to Mrs Fidge but having spoken to her since, accepted that he did not direct the comment to her at the scene and, on reflection, was unsure to whom he had directed the comment.[66] At inquest, some seven months after he made his second statement, Mr Law's evidence was that the comment was made after the request to Mrs Fidge to remove the driver's door, and was directed to, not a member of the SES, but a male with mousey brown hair in yellow turn out pants and a white T-shirt from which he inferred membership of the CFA.[67] At inquest, Mr Law maintained that his comment was forceful and clear about the urgent need to extract Mrs Riordan (expletives deleted).[68]

65. Mr Law's VACIS-electronic Patient Care Record (VACIS report), in respect of Mrs Riordan, was completed two days after the incident. As he had been called in on a rest day, he was wearing civilian clothes and did not have any notepaper or gloves in his truck on which he might otherwise write notes. In any event, it was his common practice not to make notes and

[61] Exhibit A, coronial brief page 102 and transcript pages 188, 196-198, 202-203.
[62] To paraphrase the relevant part of Exhibit B, Mr Law's Supplemental Statement dated 5 May 2016, coronial brief pages 104-106. The witnesses whose statements he had read which caused him to change his view of things were Mrs Fidge, Mr Heenan, Ms Boyd, all from Ouyen SES and Mr Hughes and Mr Ryan from Manangatang CFA.
[63] Transcript page 212.
[64] Transcript pages 206, 210-213.
[65] Exhibit A, coronial brief page 102.
[66] Exhibit B, coronial brief page 105, transcript pages 201-202.
[67] Transcript pages 185, 200, 211. He was not as sure about the mousey brown hair as the other parts of the description.
[68] Transcript page 185.

to rely on memory when compiling a VACIS report. Later in the day on 23 December 2013, Mr Law assisted with cleaning and re-stocking the ambulances and could have written the VACIS report that evening but 'needed to get the whole job straight in his head before committing pen to paper'.

66. While there is no suggestion that the sequence of events documented in the VACIS report is inaccurate, some of the times documented by Mr Law are at odds with the weight of other evidence, notably the time Mrs Riordan was extricated from the 4wd, the time she went into cardiac arrest, the cessation of resuscitation and time of her death. To this extent, the other evidence is to be preferred.[69]

67. Peter David Wilson is an AV paramedic working out of Sea Lake who was dispatched to the collision scene shortly after 13:00 hours, arrived at about 13:50 hours and, after a basic handover from Mr Law was tasked by him to take over the care of Mrs Riordan.[70] On assuming that responsibility, Mr Wilson gave Mrs Riordan a further 10mgs (2 x 5mgs) of morphine and a second bag of saline and continued to provide reassurance and supplementary oxygen via bag and mask. Having reached the limits of his authorisation to administer morphine, Mr Wilson obtained authorisation from AV MICA paramedic Mr Ewart to administer a further 10 mgs (2 x 5mgs) of morphine.[71]

68. On arrival, Mr Wilson testified that he did not see direct evidence of bleeding but inferred from Mrs Riordan's vital signs that she was likely bleeding, potentially from internal or lower limb injuries.[72] At inquest he recollected, apparently for the first time, that he could see the injuries to Mrs Riordan's foot (rather than leg) through little holes/gaps in the actual damage to the 4WD.[73] While caring for her, Mr Wilson was in the driver's seat and at times kneeling on the seat and leaning across to Mrs Riordan, to some extent obstructed by the deformed dashboard.[74]

69. While sitting in the driver's seat caring from Mrs Riordan, Mr Wilson recalled asking one of the SES members "How much longer guys?", not so much as a criticism, or a complaint about delay, as he knew the SES did a great job, but out of concern for his patient.[75] Overall, in the time he was caring for Mrs Riordan, he described her as relatively stable physiologically and

[69] Transcript pages 465, 471-2.
[70] Exhibit E, statement of Peter Wilson dated 6 January 2014, coronial brief page 122, and transcript pages 462-465.
[71] Exhibit E, transcript page 465 and Exhibit C wherein Mr Wilson is "Attendant 1593" and Mr Law "1403".
[72] Transcript page 463.
[73] Transcript pages 463, 478-480.
[74] Transcript page 464, 481-482.
[75] Transcript page 472.

'holding her own' until the dash was rolled off her and the pressure released, an occurrence that was not unexpected given the nature of her entrapment.[76]

70. When the dash roll was underway, Mr Wilson had handed over Mrs Riordan's care to Mr Ewart and was standing by the passenger side of the 4WD.[77] He did not recall the dash roll being a stop-start process at the behest of paramedics caring for Mrs Riordan, but thought there might have been one pause requested by one of the MICA paramedics.[78] He testified that the SES work really quickly at scenes and gave a rough estimate of ten minutes for the duration of the dash roll.

71. Once Mrs Riordan was removed from the 4WD and placed on a stretcher, Mr Wilson assisted Mr Ewart in applying large universal pads wrapped with bandages in an effort to stem her bleeding. When the suggestion of a tourniquet was put to him, Mr Wilson's evidence was that AV paramedics only use tourniquets to establish IV access and are not trained to use tourniquets to stem bleeding. In any event, Mr Riordan's injuries were not accessible or amenable to the application of a tourniquet prior to extrication.[79]

72. Mr Wilson did not compile a VACIS report, relying on Mr Law to do so. The VACIS report made by Mr Law was not a compilation in the sense that the paramedics involved collaborated to produce it. However, Mr Wilson testified as to the accuracy of the report as it pertained to his own actions and observations and its consistency with the handover of the patient given to him by Mr Law, except that he (that is Mr Law) was "wrong time wise". Mr Wilson agreed with the times put forward by Mr Ewart.[80]

73. Wesley Lawrence Ewart is an AV MICA paramedic working out of Swan Hill who was dispatched to the incident at about 13:05 hours, arrived at 14:14hours and sought direction from Mr Fumberger who was the ambulance/health commander at the time. He assisted paramedics caring for one of the other patients briefly, before being directed by Mr Fumberger to assist with Mrs Riordan at about 14:22 hours.[81]

74. Mr Ewart's initial observations of Mrs Riordan were in keeping with those of Mr Law and Mr Wilson. In his statement, he described Mrs Riordan as being "pinned from the waist down"

[76] Transcript pages 467-470, 484-485.
[77] Transcript pages
[78] Transcript page 471.
[79] Transcript page 473. Mr Wilson doubted that even AV MICA paramedics were able to apply a tourniquet.
[80] Exhibit E as amended at inquest from 1530 hours as the time the patient was released to approximately 1438 hours and transcript pages 465-466, 475, 481.
[81] Exhibit F, statement of Wesley Lawrence Ewart dated 12 August 2014, coronial brief pages 126-128. Exhibit G is the VACIS report completed by Mr Ewart, coronial brief pages 1604-1610.

and noted that her "lower extremities at this point were inaccessible due to entrapment but highly suggestive of extensive trauma".[82] Mr Ewart expanded on this at inquest.[83]

75. When Mr Ewart arrived at the scene, it was about one hour and ten minutes after the collision. He assumed that extrication was underway but could not say whether the passenger side door had been removed. His focus was on handover and on his high acuity patient who was trapped. Mr Ewart was caring for Mrs Riordan for about 16 minutes before the dash was released. He recognised the urgency of extricating her and anticipated that if the dash was having a tamponading effect, Mrs Riordan's blood pressure would drop very quickly once the pressure of the dash was released. While Mrs Riordan's condition appeared to deteriorate "before" the dash was released or "just prior", he could not say how long before.[84]

76. Consistent with this apprehension for his patient, Mr Ewart noted that Mrs Riordan continued to deteriorate after the dash was released. When her carotid pulse was "lost" while she was still seated in the 4WD, he assumed she had arrested. Resuscitation was difficult while she remained entrapped and rapid extrication followed with the use of a spinal board via a rearward path out of the 4WD. The air ambulance crew had arrived a short time before Mrs Riordan was extricated and assisted with her extrication and with CPR. Despite their efforts, Mrs Riordan could not be resuscitated and passed away at about 14:55 hours.[85]

77. Prior to Mrs Riordan's extrication, there had been a short exchange between Mr Ewart and Mr Law regarding the path to be taken. Mr Ewart disagreed with Mr Law's suggestion that Mrs Riordan be released sideways through the passenger door and supported the SES decision to remove her rearwards on a spinal board, on as straight an alignment as possible to guard against further spinal damage.[86]

78. Consistent with the evidence of the other paramedics, Mr Ewart testified that tourniquets to stem bleeding were not within the paramedic's kit on the day and that, as at the date of the inquest, while he had received the appropriate training to apply such tourniquets, they were not yet available in the field.[87] Moreover, a tourniquet could not have been used in Mrs Riordan's case until the dash was rolled off her and he likened the application of a tourniquet

[82] Exhibit F, coronial brief pages 126-127.
[83] Transcript pages 304-305, 319.
[84] Transcript pages 307-310.
[85] Exhibit F, coronial brief page 127, Exhibit G, coronial brief page 107 and transcript page 311.
[86] Transcript page 312-314, 323-325. Mr Ewart was also cross-examined about alternative aids that could be used to extricate a patient such as an L-shaped board and a Kendrick Extrication Device and, in brief, it is fair to say he identified shortcomings with both in relation to Mrs Riordan's extrication. Transcript pages 315-316, 328-329.
[87] Transcript pages 317-318.

to the upper thigh to "shutting the gate when the horse bolted".[88] Mr Ewart also agreed that blood transfusion was not available to road ambulance paramedics.[89]

79. Stephen Richard Fumberger is an AV MICA paramedic and group manager based in Mildura who was paged at about 12:59 hours, dispatched as health commander and briefed by phone shortly after receiving the page. He arrived at the collision scene at about 13:48, saw multiple vehicles indicating the presence of personnel from Victoria Police, AV, SES and CFA and obtained a situation report from Mr Law. As health commander, his role was to relay information back to the ESTA communications centre and to coordinate the transportation of Mrs Riordan and the five other people injured in the collision. This involved multiple phone calls, radio interaction, as well as endeavouring to keep treatments active and progressive.[90]

80. Relevantly, when Mr Fumberger went to the 4WD at about 14:30 hours to check progress with the extrication, it was very apparent that Mrs Riordan was rapidly deteriorating due to her decreased conscious state, pulse, blood pressure and the fact that she was being released from the car.[91] At inquest, he clarified that at that time, Mrs Riordan was still entrapped and he left before the dash roll. Mr Fumberger did not return to the 4WD but saw what was happening from afar.[92] He estimated that he was at the 4WD when Mrs Riordan was deteriorating rapidly, ten to fifteen minutes before the arrival of the air ambulance and felt that progress was being made with the removal of the dash at the time.[93]

A DIFFICULT EXTRICATION – RESCUE RESPONDERS' EVIDENCE

81. Bernadette Fidge is a full-time administration manager, a local resident of Ouyen for 18 years and an SES volunteer for 14 years who had worked her way up through various roles from general volunteer to team manager, training officer and deputy controller with the SES Ouyen (as at the date of the inquest). Her training included specific road crash rescue training and general rescue training, the former comprising an initial seven-day course followed by regular updates as required. Mrs Fidge had attended an estimated 50 road crashes ranging in severity

[88] Transcript pages 317-318.
[89] Transcript page 317. Mr Ewart's evidence was that air ambulances paramedics carried blood as at the date of the inquest, but he was unsure if that was the case on 23 December 2013.
[90] Exhibit D, statement of Stephen Richard Fumberger dated 7 January 2014, coronial brief pages 119-121 and transcript pages 380-383 where Mr Fumberger gives some sense of the complexity of the situation.
[91] Exhibit D, coronial brief page 120.
[92] Transcript page 384 – *"…I do recollect that I did see her coming out um and then ah quickly put into or placed into the ambulance um but form there ah then I must have been doing something else like on the phone … and then I was told about 15 minutes later or thereabouts that ah she had deceased."*
[93] Transcript pages 384-385.

from minor to fatal, and had assisted with traffic control, lighting or extrication of occupants. She was one of the senior people in her unit in charge of using road rescue equipment.[94]

82. Mrs Fidge was the most senior of three SES volunteers who responded to this incident out of a crew of seven (all of whom had full-time jobs), the only one who was rescue qualified and able to use the hydraulic tools used in the extrication. She was paged at 13:04 hours, advised ESTA at 13:07 hours that she would be attending and met up with her other crew members, Leanne Boyd and Phillip Heenan, at their base in Ouyen.[95]

83. On arrival at the collision scene at 13:20 hours, Mr Law drew Mrs Fidge's attention to the 4WD as the vehicle requiring her attention. She undertook a risk assessment by inspecting the damage to the front passenger side of the vehicle and the location of the dash and determined that the safest way to extract Ms Riordan was through the rear of the vehicle. Mrs Fidge tasked Mr Heenan to stabilise the 4WD so it would not move during the extrication process and tasked Ms Boyd to call Mr Gincais to ask for back up from Mildura SES.[96]

84. At Mr Law's request and using the hydraulic tools available to her, Mrs Fidge removed the driver's side door and the steering column to facilitate his access to and treatment of his patient. This led to a modest but necessary delay in the extrication of Mrs Riordan, (guess)estimated by Mrs Fidge to be about five to ten minutes, noting that it would normally take four to six minutes to remove a door and a steering column.[97]

85. Similarly, at a later point, there was some delay involved in removing the rear seat of the 4WD to enable Mrs Riordan to be removed rearwards on the spine board. Mrs Fidge could not recall what the difficulty with the rear seat was but agreed that it took 'a bit longer than expected'. Later, she changed her evidence somewhat saying there was 'a lot more difficulty removing the rear seat than expected and it took perhaps five to ten minutes longer'.[98]

86. An <u>important issue at inquest was the method used to remove the dash</u> and allow extrication of Mrs Riordan. As with other rescue qualified witnesses, Mrs Fidge was cross-examined about the feasibility of a "<u>dash lift</u>" and her preference for a "<u>dash roll</u>" on this occasion.

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[94] Exhibit I, statement of Bernadette Fidge dated 23 September 2014, coronial brief pages 138-142. See transcript pages 13-14 where her evidence was that she could not recall how many extrications she had been involved in and transcript pages 44-45 where she estimated that 35-40% of road rescues involve extrications.
[95] Ibid.
[96] Ibid. Mr Heenan was also tasked to clear the cargo area of the 4WD of its contents, assisted by Ms Boyd who then took up traffic controlling duties. Transcript page 14. See also transcript pages 43-44 where Mrs Fidge explains that she requested dispatch of Mildura SES as back-up solely on the basis that they were likely to arrive sooner than Robinvale SES and not in consideration of their greater road rescue expertise.
[97] Transcript pages 37-38, 53-54. I note that there was no suggestion by any witness during the inquest that it was other than appropriate that an SES road rescue responder comply with any request from an AV paramedic to facilitate access to or treatment of their patient.
[98] Transcript pages 39-43, compared with page 55. The need for the rear seat to be removed at all was also canvassed in cross-examination of Mr Murton. See paragraph 105 below.

Both methods were available, in the sense that Mrs Fidge had been trained in both and they each required the same heavy and powerful hydraulic tools all of which were available to her. Nor was there a differential in the time required to perform a dash lift rather than a dash roll. Mrs Fidge's evidence was that each entrapment poses different challenges and the method used to release the pressure on or entrapment of an occupant is determined at the scene by reference to the specific damage to the vehicle and the manner of entrapment.[99]

87. Mrs Fidge differentiated a dash lift from a dash roll and explained her preference for a dash roll on this occasion. The former requires the vehicle's "A" pillar to be cut by the use of hydraulic cutters and the dash lifted by pushing or stretching the metal upwards, while the latter involves using a ram and/or spreader against the vehicle's "B" pillar for leverage to roll the dash up and over thus freeing the occupant. According to Mrs Fidge (and supported by other rescue qualified witnesses) the salient feature of the dash lift which made it singularly inappropriate in this case was the need to use hydraulic cutters "blind", that is, in close proximity to Mrs Riordan's feet and lower legs which could not be visualised with the very real risk of further injury.[100]

88. At the same time as Mrs Fidge undertook her risk assessment and formulated an extrication plan, the other two members of her crew performed ancillary tasks in furtherance of the extrication plan. Mr Heenan set up a tarpaulin, laid out the tools, hooked up all the hoses and made the 4WD safe by chocking. He was the "gofer" on the day, fetching tools and other equipment as required and assisted in clearing the rear cargo area.[101]

89. The third member of the Ouyen SES crew who turned out that day was Ms Boyd who followed the truck carrying Mrs Fidge and Mr Heenan in a four-wheel drive vehicle with road signage and other equipment. On arrival at the scene, Ms Boyd commenced road management duties and called ESTA requesting back-up by Mildura SES from the SES duty manager as they were only one hour away and there were only three SES crew at the scene.[102]

90. Ms Boyd assisted in the removal of items from the rear cargo area of the 4WD and observed that Mrs Fidge had some trouble removing the rear seat in readiness for the extrication but

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[99] Transcript pages 19-24, 29-30, 37.
[100] Transcript pages 19-24, 29-30.
[101] Exhibit J, statement of Philip Heenan dated 25 September 2014, coronial brief pages 143-145 and transcript pages 70-78. While he could not say how long it took Mrs Fidge to remove the steering column of the 4WD, his evidence was that it took about as long as he expected, and that he estimated that it took about five minutes to remove the driver's side door. See transcript pages 76-77.
[102] Exhibit K, statement of Leanne Robyn Boyd dated 25 September 2014, coronial brief pages 146-150. As to the strength of the Ouyen SES crew, I note Ms Boyd's evidence (at coronial brief page 146) that *"There are only 7 members in the unit, including a new member that hadn't attended any accident scenes and 2 train drivers who are often not around for day time response. I'm never too sure who is around, especially during the day."*

eventually succeeded. Ms Boyd also assisted the AV paramedics by obtaining a cervical collar and by holding Mrs Riordan's arm at their request.[103]

91. The Ouyen SES crew were at the scene about forty minutes before the arrival of the Manangatang CFA crew at about 13:52 hours.[104] They relieved Mrs Fidge who had been working in the heat with heavy hydraulic tools for some 40 minutes and, effectively, took over the extrication of Mrs Riordan who was still entrapped by the dash.[105]

92. John Hughes was the captain of the Manangatang CFA and arrived at the scene at 13:52 hours after a 40 minute drive. On arrival, he saw that the 4WD had been stabilised and the Ouyen SES crew had all their tools ready to go laid out on a tarpaulin. As these were the same of similar equipment to their own, they decided to use the tools that were already laid out and proceeded to remove the passenger side door first.[106] Having done so, they could visualise just how tightly Mrs Riordan was entrapped.[107]

93. According to Mr Hughes, they could not perform a classic dash lift because the tools kept slipping and improvised, using the ram sitting level (or horizontally) off the lock from the "B" pillar and a second spreader from the base of the seat pushing the bottom of the dash upwards. They paused, at the behest of an AV paramedic, before commencing the dash roll which was performed slowly in short bursts until the dash, the firewall and the "A" pillar had been moved back towards the front of the 4WD by about 10cm, far enough for Mrs Riordan to be able to be removed rearwards.[108] Once the dash roll had started, Mr Hughes did not recall any request from the AV paramedics to stop and, overall, the dash roll took two to three minutes, if that. If there had been such a request from AV paramedics, Mr Hughes would have stopped.[109]

94. Mr Hughes testified that no AV paramedic at the scene said they wanted Mrs Riordan out yesterday or words to that effect. Nevertheless, he knew that the extrication of Mrs Riordan was time critical. Nor did they suggest a sideways removal of Mrs Riordan through the

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[103] Ibid.
[104] Transcript pages 121 as to their arrival time and the ESTA chronology.
[105] Exhibit O and transcript pages 144 and following. Mr Hughes estimated that the spreader and the cutters each weighed about 20 kgs and the ram between 10-15kgs – transcript page 148.
[106] Exhibit O, statement of John Francis Hughes dated 25 September 2014, coronial brief pages 169-172 and transcript pages 124 and following. Mr Hughes was a member of the CFA for 43 years and captain of his crew for six years. He was road rescue qualified for the last 18 years and had to re-qualify every two years. In the twelve months prior to the 23 December 2013, he estimated that he had attended 10-12 extrications. See transcript page 110.
[107] Exhibit O, coronial brief page 170 - *"Once the door was removed we could see that the entire dash and fire wall was crushed rearward onto the passenger's legs. The glove box was crushed into her legs below the knee and she was pinned in the seat. The lady was conscious and talking to the ambulance officers that were treating her."* See also transcript pages 125 and following.
[108] Exhibit O, coronial brief page 171 and transcript pages 112-116, 133, 137-139. As to his arrival time see coronial brief page 560 and transcript page121 and following.
[109] Transcript pages 134-136, 145.

passenger side door. In any event, he believed that a sideways removal was not feasible as it would have required removal of the B pillar and rear passenger door which were required to provide structural support for the dash roll.[110]

95. Furthermore, Mr Hughes gave evidence that the rear seat of the 4WD had already been removed before he arrived but he could not say whether it was necessary to remove the seat in this instance in order to facilitate Mrs Riordan's rearward extraction from the 4WD. Such assessments are made on a case by case basis depending on variables including the nature and extent of damage to the vehicle.[111]

96. Kevin John Ryan was also from the Manangatang CFA and arrived at the scene shortly before Mr Hughes. He has 30 years' experience with the CFA, is Group Officer for the Robinvale Fire Brigades Group and has road rescue qualifications. Mr Ryan obtained his road rescue qualifications some five years before 23 December 2013 and estimated that he had attended five to seven extrications before that date and four or five since. Mr Ryan spoke to Mrs Fidge on arrival and took the view that the SES were the lead agency in relation to the extrication.

97. Mr Ryan assisted Mr Hughes to remove the passenger side door and described Mrs Riordan as actually jammed against the front passenger side door such that once the door was removed 'her upper torso wanted to fall out of the 4WD and had to be supported'. He described the process used by him and Mr Hughes to roll the dash forward using the ram leveraging from the "B" pillar to the "A" pillar. According to his recollection, the dash roll was performed slowly and they stopped several times at the request of the AV paramedics caring for Mrs Riordan. He estimated that the removal of the passenger side door and the dash roll was hampered in this way and took 'maybe 15-20 minutes'.[112]

98. Like Mr Hughes, Mr Ryan did not recall an AV paramedic saying words to the effect of wanting Mrs Riordan out yesterday or saying they wanted Mrs Riordan removed sideways. He also considered a dash lift inappropriate due to the extent of entrapment and limited visibility of Mrs Riordan's legs and the dash roll the most practical option.[113]

99. Peter Fuda and Colin John Weeding were two members of Mildura SES who responded to the call by the Ouyen SES crew for back-up.[114] Both were road rescue trained. They arrived at

[110] Transcript pages 110-111, 114 and following, 145.
[111] Transcript pages 129-132, 148.
[112] Exhibit Q, statement of Kevin Francis Ryan dated 25 September 2014, coronial brief pages 173-176 and transcript pages161-165.
[113] Transcript pages 155-160,167.
[114] Both are SES volunteers who had been paged while at work and met at Mildura SES premises. Mr Fuda is an accountant and Mr Weeding a compliance manager with GDS Freight Management. Exhibit R is their combined statement.

the scene at 14:32 hours and were the first members of Mildura SES to arrive. They had driven in an SES support vehicle and were primarily there to provide additional manpower, as the required tools and equipment were already at the scene.[115]

100. By the time Mr Fuda and Mr Weeding arrived, the dash had been rolled, the equipment used to roll the dash remained under load between the A and B pillars, the rear seat of the 4WD was not in the way and the contents of the cargo area removed. All that remained was for the back rest of the seat occupied by Mrs Riordan to be removed.[116] Mr Weeding placed a hard, protective sheet of plastic between Mrs Riordan and her back rest before Mr Fuda cut the seat hinge so it could be lowered, and both of them then assisted with the extrication of the patient through the back of the 4WD. This was achieved quite quickly, in a matter of a few minutes, certainly by 14:37 hours, by reference to the arrival of Mildura SES rescue crew.[117]

101. Andrew Craig Murton, an SES specialist response officer, provided a report dated 21 November 2016 to Maddocks, lawyers representing the SES at the inquest, which was included in the coronial brief.[118] While there was no serious suggestion by any party that Mr Murton did not have the relevant expertise to provide expert opinion about the manner in which Mrs Riordan was extricated by SES members[119], he could not be said to be independent of the SES who continued to employ him as at the date of the inquest.

102. In so saying, I neither intend nor imply any criticism of Mr Murton. As was ultimately apparent at inquest, witnesses with relevant expertise are not easy to come by. For the purposes of this inquest, the expertise required was in relation to the extrication of occupants from vehicles with significant cabin intrusion damage and SES training in road rescue, rather than expertise in the structural design of vehicles and how dash lifts/rolls could be undertaken, absent a real-life occupant/patient.

103. In brief, in his report, Mr Murton confirmed that:

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[115] Transcript pages 171-173, 217-220.

[116] Transcript pages 176-178, 217-219. I note that Mr Weeding thought that if the rear seat of the 4WD had been in its usual upright position, it would pose a just another challenge to extricating the patient and was not prohibitive, suggesting that it may not have been necessary to remove it. See transcript pages 222-223. He could not recall if the rear seat had already been removed prior to their arrival or simply laid flat (possibly by the Riordans prior to the collision to accommodate their dog). In any event, the rear seat did not pose an obstacle to their access to rear of the seat occupied by Mrs Riordan. See transcript pages 224 and following.

[117] Transcript pages 170-171, 175, 178 – *"It's difficult to judge time when you're sort of in the heat of the moment … I couldn't tell you if it's one minute, two minutes, three minutes but it was reasonably quick."*

[118] Exhibit U, Mr Murton's report dated 21 November 2016, attachment A (a brief curriculum vitae) and attachment B (letter from Maddocks lawyers dated 4 November 2016 requesting Mr Murton to provide a report), are at coronial brief pages 1635-1641, 1642 and 1643-1649 respectively.

[119] Exhibit U, coronial brief page 1642 and transcript pages 388-389. *Inter alia*, Mr Murton is a trainer and assessor with over 13 years operational experience both as an SES volunteer undertaking road rescue training and as a full-time member of the SES staff from 2013 providing his opinion on all aspects of road rescue including training, equipment and response.

a. The extrication process as undertaken by the SES volunteers in this case was in accordance with the training and procedures outlined in the VicSES Manual.[120]

b. The extrication plan developed and implemented was sound and logical based on the initial assessment of the collision, with evidence of significant entrapment of Mrs Riordan's lower limbs and the existence of a clear extrication path through the rear of the 4WD. However, Mr Murton would have included a relief cut about halfway up the A pillar along with the potential implementation of a forward roof fold/flap.[121]

c. The initial removal of the driver's side door and steering column did not have any beneficial effect on the outcome of the extrication and rook up valuable time and resources.[122]

d. The salient features which determined the extrication method and route in this case were significant lower limb entrapment and a high-speed impact collision which carried an inherent risk of spinal damage and need for removal in alignment.[123]

e. Given all the available evidence, including the extent of entrapment and pain which she was suffering, extrication within 20 minutes (posited by Ms Gaffney) was not realistic.[124]

f. Side removal and dash lift were contraindicated due to the entrapment of Mrs Riordan's legs, leaving the dash roll as the most appropriate option.[125]

g. In his opinion, the extrication plan implemented complied with the VicSES manual requirement to remove the vehicle from around the casualty not the casualty from the vehicle and not to make any part of the casualty move to fit your extrication path.[126]

h. Removal of the windscreen (as posited by Ms Gaffney) provided no benefit in releasing the entrapment and, if anything, would have added to the overall extrication time and introduced further unnecessary hazards such as glass shards into an already complex rescue scenario.[127]

104. At inquest, Mr Murton expanded on his views. Relevantly, he agreed that removal of the driver's side door and the steering column by the SES members at Mr Law's request to

[120] Exhibit U, coronial brief page 1636 and transcript page 390.
[121] Ibid.
[122] Ibid.
[123] Exhibit U, coronial brief page 1637.
[124] Exhibit U, coronial brief page 1638. See paragraphs 107-108 below.
[125] Exhibit U, coronial brief pages 1638-1639 and transcript pages 413 and following. See also transcript page 440.
[126] Exhibit U, coronial brief pages1639-1640.
[127] Exhibit U, coronial brief page 1640. See also page coronial brief page 1641 and transcript pages 445-446 where Mr Murton discusses the resource intensive option of roof removal as part of the creation of an extrication plan/path.

facilitate his access and treatment, was reasonable.[128] He estimated that if cutters and other tools were readily available, it would take from two to three to four minutes to cut both hinges and the check strap to remove the driver's side door. While tying the door back would be quicker if rope were readily available, that is already laid out on the rescue pit/tarpaulin, generally rope is not laid out at first instance and might take longer to obtain from the rescue truck.[129] Later, he testified that if the requisite tools were already set up, three to five minutes was a reasonable estimate of the time taken to remove the driver's side door and that removal of a steering column could take between five and ten minutes.[130]

105. As to the suggestion that he would have included a relief cut halfway up the A pillar, Mr Murton clarified that this was something that *could* as opposed to *should* have been done.[131] Mr Murton expressed the view that even with the rear seat laid down flat rather than removed entirely, the dimensions of a 4WD would give rescuers more than enough space to remove the patient in alignment, thus casting a doubt on the need to expend time and resources in removing the rear seat.[132]

106. In terms of the overall time taken and the crucial issue of delay in extrication, Mr Murton the amount of work undertaken by the Ouyen SES crew in the first 30 minutes or so at the collision scene was significant – a fair amount of work.[133] He also reiterated the opinion that extrication of Mrs Riordan within 20 minutes was not achievable, particularly as the Ouyen SES crew only numbered three, only two of which were road rescue qualified. As to whether the it was reasonable for the SES to take 90 minutes to extricate Mrs Riordan, Mr Murton's evidence was that a full rescue crew of six, would take in the vicinity of 60-75 minutes working very efficiently to release an entrapment of this nature with the capacity for several tasks to be done simultaneously. Even with the arrival of the Mr Hughes and Mr Ryan from the Manangatang SES after about forty minutes, SES resources on the day fell short of a full rescue crew of six.[134]

107. Tia Gaffney is a mechanical engineer who was asked to provide an independent expert report about the process of extrication of Mrs Riordan. Ms Gaffney's curriculum vitae which

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[128] Transcript pages 391, 422, 424.
[129] Transcript pages 418-419.
[130] Transcript page 448.
[131] Transcript pages 391-392, 394-395
[132] Transcript pages 396-398.
[133] Transcript pages 399-400.
[134] Transcript pages 406 and following, 428-432. While Mr Murton conceded that a reasonable alternative approach would have been to remove the passenger side door first, before formulating an extrication plan/path, once that door was removed it merely reinforced everyone in the belief of the extent of Mrs Riordan's entrapment and the sense of the original plan. Mr Murton also supported the stop-start or slow release of the dash as appropriate irrespective of any request from AV paramedics as the release of an entrapment must be controlled and performed in a slow methodical manner – see transcript page 441.

includes her formal qualifications and details her significant experience in crash investigations and 76 page report were included in the coronial brief.[135] Without doing justice to the detail of her report, Ms Gaffney was critical of the time taken to extricate Mrs Riordan from the 4WD, in particular of the failure of road rescuers to extricate her within the 20 minute target referred to in the VicSES Road Rescue Manual and their choice of a dash roll rather than a dash lift and sideways removal which she stated could have been undertaken within a matter of minutes.

108. I have taken into account Ms Gaffney's evidence at inquest, including cross-examination as to the basis of her expertise and the submissions of counsel, in particular Mr Stafford's submissions on behalf of the SES. Having done so, I accept that Ms Gaffney has expertise in vehicle crashworthiness, collision reconstruction and other related fields. However, I am not satisfied that she is qualified to give expert evidence as to the preferred method of extrication of an injured occupant such as Mrs Riordan and have accordingly determined to disregard the evidence in her report and at inquest.

THE CAUSAL SIGNIFICANCE OF ANY DELAY IN EXTRICATION

109. Assessment of the forensic significance of any (avoidable) delay in extricating Mrs Riordan from the 4WD requires some further consideration of the medical cause of death outlined above and, if possible, further elucidation of the mechanism of death than was immediately apparent to Dr Woodford at autopsy.[136]

110. I asked Dr Woodford to review the medical cause of death and mechanism of death in light of the evidence from emergency responders (AV paramedics in particular) which went beyond the information available when he performed and reported on Mrs Riordan's autopsy. Dr Woodford's Supplementary Report was tendered at inquest[137] and he gave evidence.

111. Dr Woodford noted that while witness accounts of the extent of haemorrhage varied, the medically trained witnesses assessed Mrs Riordan as having suffered major haemorrhage such that her observed hypovolaemia (inadequate circulation) was thought secondary to haemorrhage.[138] While he noted multiple traumatic injuries at autopsy, absent circulation, it was difficult to identify the primary source of bleeding. However, there was a comparatively small but potentially significant amount of blood in the chest, and deep lacerations to the left

[135] Coronial brief pages 353-362 for the curriculum vitae and 362-438 for the report.
[136] See paragraphs 18 to 20 and footnote 12 above.
[137] Exhibit X, Dr Woodford's Supplementary Report dated 10 October 2016, coronial brief pages 1595-1597.
[138] Transcript pages 521-522.

arm and both legs which he thought would have been amendable to tourniquet if Mrs Riordan had been extracted earlier. [139]

112. While he could not be certain on pathological grounds of a mechanism of death, he said in evidence that blood loss was a likely cause of death and a likely cause of hypovolaemia which in turn caused the cardiac arrest. [140]

113. In terms of the potential significance of any delay in extraction, Dr Woodford gleaned from the additional material that AV paramedics observed Mrs Riordan to deteriorate significantly rapidly a few minutes prior to the release of her lower body from the pressure of the dash/cabin intrusion ahead of her extrication from the 4WD. He posited that the degree of steady blood loss in the 90 minutes or so following the collision had been compensated to the extent that observable cardiovascular parameters remained relatively stable until those compensatory mechanisms were no longer able to sustain the circulation and Mrs Riordan went into cardiac arrest. [141]

114. Dr Woodford conceded that he would defer to the opinion of a clinician such as Professor Mark Fitzgerald on matters of emergency management but agreed with the proposition that in the setting of blood loss of such a degree that a patient experiences hypovolaemic shock and cardiac arrest, their prognosis is dire and the prospects of reversal with cardiopulmonary resuscitation slim. [142]

115. Professor Mark Fitzgerald is an emergency physician who was asked to provide an independent expert opinion to the court based on documents derived from the coronial investigation of Mrs Riordan's death.[143] He was asked to provide an opinion in relation to three issues – the cause and mechanism of death, whether Mrs Riordan could have survived if

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[139] Transcript pages 523-524.

[140] Transcript page 525. Dr Woodford also considered other traumatic injuries which potentially caused or contributed to Mrs Riordan's death – chest trauma, rib fractures, lung collapse, pneumothorax; blunt force trauma to soft tissues, fractures and fat embolism. Transcript pages 525-526.

[141] Transcript pages 522-523. By way of explanation, Dr Woodford testified that *"…when people bleed , one of the consequences of that bleeding, is the body trying to maintain a functioning blood pressure, so that the brain and the heart are, continue to be perused with blood, and one of the ways that the body does that, is to shut down some of the more peripheral vessels and try to shunt the blood to the central portions of the body, and so there may not be, in the first instance, much of a change in the vital parameters such as blood pressure and pulse. But the next think that happens is that the blood pressure might go down or the pulse might go up to try and maintain a perfusion of the brain, so the body does have compensatory mechanisms…but eventually these mechanisms aren't able to compensate for the amount of blood loss."*

[142] Transcript pages 524-525.

[143] Exhibit V, expert report of Professor Mark Fitzgerald, coronial brief pages 1631-1634, includes his formal qualifications, a list of the documents provided to him by the court on which his opinion was based and the following statement – "*The opinions given are solely my own and are based on an examination of the documents forwarded. I do not represent the opinions of Alfred Health or Ambulance Victoria. I have no other conflicts of interest that would prejudice my opinion.*" I note that as at the time of writing his report Prof Fitzgerald had been Director of the Alfred Health Trauma Centre since 2009, an Ambulance Victoria Medical Advisor since 1989 and had been practicing emergency and trauma medicine continuously for 35 years.

extracted earlier and whether there were any additional interventions that ambulance officers could have completed while Mrs Riordan was still pinned by the dashboard or as the dashboard was being released?

116. In his report, Prof Fitzgerald expressed the opinion that Mrs Riordan sustained uncorrected hypovolaemic shock and bled to death. He described hypovolaemic shock as a condition in which the amount of blood loss is significant enough to critically reduce oxygen delivery to body tissues such that those tissues are injured. Even severely injured patients can recover from hypovolaemic shock if their haemorrhage is controlled, oxygen is administered and intravenous fluids including blood transfusion are given, in a timely fashion. Uncorrected, hypovolaemic shock can lead to cardiac arrest and if so, indicates the severity and duration of tissue injury that has occurred secondary to blood loss. Cardiac arrest in this setting is usually fatal irrespective of the resuscitation techniques employed.[144] He reiterated his opinion about the cause and mechanism of Mrs Riordan's death at inquest. [145]

117. Prof Fitzgerald's opinion was that the interventions required to correct hypovolaemic shock would *usually* need to be delivered within the first hour. In Mrs Riordan's case, prolonged extrication and inability to access her lower limbs meant that significant bleeding from severe lower limb injuries could not be controlled with splinting and pressure dressings which increased the likelihood of progressive uncontrolled hypovolaemic shock and consequent cardiac arrest. However, he did not believe it was reasonable to conclude that earlier extrication would have *definitely* saved her life. [146]

118. In terms of the other interventions required to correct hypovolaemic shock, Prof Fitzgerald noted that oxygen was administered continuously from 13:35 hours onwards; and 2.6 litres normal saline was given intravenously via a right arm cannula, the left arm being unavailable due to injuries thus limiting the amount of intravenous fluids able to be given. However, intravenous resuscitation with normal saline alone would not have ensured Mrs Riordan's survival and early administration of blood/blood products was required. In practical terms this was only available at Mildura Hospital or once the air ambulance had arrived. [147]

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[144] Exhibit V, coronial brief page 1632 where, inter alia, prof Fitzgerald notes that Mrs Riordan's blood pressure remained low and her pulse palpably weak throughout her entrapment.
[145] Transcript pages 488-490.
[146] Exhibit V, coronial brief page1633. See also page 1634 where he expressed the following opinion – "*Mrs Riordan's survival chances could have improved if she had been extricated within one hour, her haemorrhage was controlled and if she was rapidly transported to Mildura Hospital for definitive resuscitation and blood administration. However, even if this had occurred she was still more likely to die from the consequences of her uncorrected hypovolaemic shock than to survive."*
[147] Ibid page 1634.

119. At inquest, Prof Fitzgerald was pressed to identify a point in time before which, if extricated, Mrs Riordan would probably have survived. He was not prepared to do so, testifying that 'there is no specific time or cut-off point but a sort of linear deterioration or decline in survivability', confounded by the fact that patients can keep talking right up until their circulation collapses.'[148] Moreover, 'sometimes releasing a patient from entrapment causes their death as patients who are very shocked can be so critical that the slightest movement can precipitate cardiac arrest.'[149] Although appropriately given to relieve pain, the morphine given just before the dash roll, in conjunction with the release of the pressure, were enough to precipitate Mrs Riordan's cardiac arrest and the same could be said of an extrication 30 minutes earlier. [150]

120. Given the current paradigm for the clinical management and care provided by AV paramedics in the field, Prof Fitzgerald was not critical of the treatment provided to Mrs Riordan at the scene, noting that the provision of oxygen, intravenous normal saline[151] and analgesia was in accordance with current standards and was indicated for the treatment of blood loss/hypovolaemic shock. The application of a cervical collar in apprehension of neck/spinal injuries was indicated and appropriate. Prof Fitzgerald did not suggest that there were any other treatment modalities available to AV paramedics at the time which could have been used while Mrs Riordan was still entrapped to improve her chances of survival.

121. Prof Fitzgerald also testified about some changes to AV paramedic practice which might have changed the outcome if they were available as at 23 December 2013. Training around the use of tourniquets to stem bleeding, even arterial bleeding, had been introduced by AV as at the date of the inquest. While not yet available (as at the date of the inquest) it was expected that AV paramedics would be provided with tourniquets developed from those used in battle to stem bleeding in the field. However, in Mrs Riordan's case, it has to be reiterated that her limbs were inaccessible for assessment let alone amenable to tourniquet for some 90 minutes while she was still entrapped and this change is unlikely to have altered the outcome for her.

122. Prof Fitzgerald testified about other advances such as synthetic blood which was still being developed and though not readily available which might soon be available for use in the field to correct significant blood loss without the need to cross-match blood and the logistics involved in carrying blood or blood products. He also described real-time decision-making

[148] Transcript pages 490-491.
[149] Transcript page 492.
[150] Transcript page 493.
[151] Prof Fitzgerald described the choice of an 18gauge cannula as an 'excellent choice/the best choice' for a shocked patient as their veins are usually constricted and there is a risk of damaging the vein with anything larger. Transcript pages 497-499.

tools currently used in trauma centres to support the myriad of clinical decisions made for seriously injured patients and hypothesised that such tools might be able to be used in the field with the appropriate technological support. He estimated that such a possibility was still about two years away.[152]

123. Although beyond the reasonable scope of a coronial investigation, Prof Fitzgerald also made some observations about the contemporary paradigm of emergency response which sees minimal interventions occurring at the scene with an emphasis on transporting patients to the nearest tertiary hospital or trauma centre where feasible. He noted the prevailing view that there are gains to be made in trauma care outcomes overall by improving pre-hospital care and that AV were reviewing the deaths of patients who died before getting to hospital in order to identify those areas of paramedic practice which could be improved, for example should blood transfusion be available to AV paramedics or should trauma clinicians be able to communicate directly with AV paramedics.

124. The standard of proof for coronial findings of fact is the civil standard of proof on the balance of probabilities, with the *Briginshaw* gloss or explications.[153]

FINDINGS/CONCLUSIONS

125. Adverse findings or comments against individuals in their professional capacity, or institutions, are not to be made with the benefit of hindsight but only on the basis of what was known or should reasonably have been known or done at the time, and only where the evidence supports a finding that they departed materially from the standards of their profession, and in so doing caused or contributed to the death under investigation. By analogy, a driver's contribution to the death of a passenger, is measured against the standards reasonably expected of a driver.

126. Having applied the applicable standard of proof to the available evidence, I find that:

    a. At all material times, Mr Dutton was driving the sedan and Emma was the front seat passenger.

    b. The sedan drifted or veered across the centre dividing line into the south bound carriageway and into the path of the oncoming 4WD.

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[152] Transcript page 504. Prof Ftizgerald gave an example form his own hospital where computers run resuscitation as well as doctors. They have calculated that in the first 30 minutes a clinical decision is needed every 72 seconds. In modern trauma centres only one in six patients get through the first 30 minutes without a significant error or omission.

[153] *Briginshaw v Briginshaw (1938) 60 C.L.R. 336* especially at *362-363. "The seriousness of an allegation made, the inherent unlikelihood of an occurrence of a given description, or the gravity of the consequences flowing from a particular finding, are considerations which must affect the answer to the question whether the issues had been proved to the reasonable satisfaction of the tribunal. In such matters "reasonable satisfaction" should not be produced by inexact proofs, indefinite testimony, or indirect inferences…"*

c. Despite steering the 4WD as far left as possible and then steering sharply to the right to avoid imminent impact, Mr Riordan was unable to avoid a collision with the sedan.

d. The available evidence does not enable me to make a positive finding as to the reasons why the sedan veered or drafted across the centre dividing line into the path of the 4WD.

e. That said, such evidence as there is, *is consistent with, as opposed to indicative of,* Mr Dutton being asleep, distracted by something or otherwise oblivious of his surroundings for a period immediately before the collision.

f. Emma was wearing a seatbelt and the sedan's front airbags deployed on impact providing her with some protection.

g. Nevertheless, Emma sustained severe injuries, including severe head and neck injuries, and died on impact or immediately thereafter.

h. Mrs Riordan was wearing a seat belt but sustained multiple traumatic injuries and was entrapped by the dashboard such that she could not move from the waist down and the extent of injury to her legs and feet was not able to be assessed.

i. The emergency response to the 000 call/s made in respect of the collision was reasonable and appropriate in all the circumstances, particularly given the relatively remote location of the collision and the number of passengers injured.

j. The clinical management and care provided to Mrs Riordan by AV paramedics was reasonable and appropriate given their limited ability to assess the full extent of her injuries, her clinical presentation and the treatment modalities available to them.

k. Mrs Fidge's removal of the driver's side door and the steering column at Mr Law's request to facilitate his access to and treatment of Mrs Riordan was reasonable and appropriate.

l. Mrs Fidge's extrication plan which involved the choice of a dash roll over a dash lift to release Mrs Riordan's entrapment and a rearward 'in alignment' extrication path, was reasonable and appropriate in all the circumstances, and in accordance with the VicSES training manual and practice.

m. The Ouyen SES crew of three who turned out in response to their dispatch to the collision did well to formulate and execute the extrication plan as far as they did

prior to arrival of the Manangatang SES crew, including stabilising the vehicle, managing traffic, clearing the rear cargo area of the 4WD and removing the rear seat.

n. The dash roll performed by Mr Hughes and Mr Ryan, involving as it did a slow controlled release of the dash, was reasonable and appropriate in all the circumstances, and in accordance with their training.

o. The weight of the evidence supports a finding that the dash roll was stopped at least once at the behest of AV paramedics concerned to minimise Mrs Riordan's pain and that this is a reasonable and appropriate approach for road rescuers to take.

*p.* Mrs Riordan's medical cause of death is aptly formulated as *injuries sustained in a motor vehicle collision as a passenger*.

*q.* The weight of the evidence supports a finding that the mechanism of death is *blood loss from injuries leading to hypovolaemic shock and cardiac arrest.*

*r.* While there was a delay in dispatch of Mildura SES of the order of six minutes, the weight of evidence does not support a finding that this delay caused or contributed to Mrs Riordan's death.

s. While the weight of the evidence does not support a positive finding that Mrs Riordan would have survived if she were extricated earlier and transported to a tertiary hospital or trauma centre, the *possibility* remains that the outcome would have been better for Mrs Riordan if she could have been extricated earlier before suffering significant blood loss

**COMMENTS**

Pursuant to section 67(3) of the ***Coroners Act 2008,*** I make the following comments in connection with the death:

1. The circumstances in which Mrs Riordan died highlights the particular vulnerability of people who are seriously injured in motor vehicle collisions in regional Victoria.

2. The emergency response system functioned well on this occasion with the timely arrival of a range of emergency responders – police within about ten minutes, ambulance within about twelve minutes and Ouyen SES as the first road rescue crew within about 20 minutes of the first 000 call.

3. Staffed by volunteers who give generously of the time and effort, the Ouyen SES crew that responded was at about half strength and undertook a significant amount of work aimed at

facilitating access by the AV paramedics treating Mrs Riordan and extricating her, prior to arrival of back-up road rescue crews some forty minutes later.

4. The seriousness of the collision, the injuries sustained by Mrs Riordan and the extent to which she was entrapped in the 4WD combined with the tyranny of distance to lead to her death.

5. A number of developments in medical care highlighted by Prof Fitzgerald have the potential to improve outcomes for regional Victorians in this regard, all involving improvements in the pre-hospital care of trauma patients - the use of tourniquets by AV paramedics to stem bleeding (now available to AV paramedics), the anticipated availability of synthetic blood (still under development) and supported real-time clinical decision making tools (currently available in some trauma centres) and/or direct communication between trauma experts and paramedics in the field.

6. Any efforts made by health services, trauma centres and/or the Department of Health and Human Services to bring these improvements to fruition would mean gains for public health and safety and, potentially, for a reduction in the number of preventable deaths.

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

The family of Pauline Mary Riordan

Ambulance Victorian

State Emergency Services

Country Fire Authority

Dr Mark Fitzgerald c/o Alfred Health

Safer Care Victoria

Department of Health and Human Services

DLSC Jamie Mitchell (#30704) c/o O.I.C. Glen Waverley Major Collision Unit

Traffic Accident Commission

Signature:

PARESA ANTONIADIS SPANOS
Coroner
Date: 31 January 2019 Cc: Professor Noel Woodford, Director VIFM