



CORONERS REGULATIONS 1996

Form 1

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INQUESTS INTO NINE FREEWAY CROSS OVER RELATED DEATHS

Introduction

The Inquests into the Freeway cross over related deaths of nine people, Raymond Kirwan and Steven Orchard-Boyd, Heidi Hellingman and Adam McLean, Murtaza Uzuner and Melin Ozdemir, Mandy Jackson, Shaun Wogan and Leanne Marriott were heard at the Coronial Services Centre, Southbank on the 15th March and 2nd August 2001. Their deaths occurred on different dates between the 24th January 1999 and 7th December 1999 on the Maltby Bypass, Princes Highway, Werribee, the South Eastern Freeway, Mount Waverley, the Western Ring Road, Keilor East and the Princes Highway Little River respectively.

The common aspect of the deaths was that each of the deceased was involved in a motor vehicle collision on divided roads where vehicles left the roadway, crossed over the centre median strip and collided with oncoming vehicles. No safety barriers were in place at the time of the collisions. The major focus of the Inquests centres on the use of barriers in preventing such collisions. Although there may be other causative factors involved in each of the collisions, I have not focused on these issues for the purpose of each of the Inquests. That does not mean to say that other factors may not have played a part in each of the deaths.

A joint recommendation arising out of the deaths of these deceased is made at the conclusion of the findings.

The Inquests

Raymond Kirwan and Steven Orchard-Boyd

(Case Nos. 242/99 and 243/99)

The deaths of Raymond Kirwan and Steven Orchard-Boyd occurred on the 24th January 1999, at the Maltby Bypass, Princes Highway, Werribee approximately 300 metres south west of the Duncans Road overpass from a head injury sustained in a motor vehicle accident and multiple injuries sustained in a motor vehicle accident, respectively, in the following circumstances:

1. At approximately 1.15am on Sunday the 24th January 1999, the front offside of a 1991 brown Subaru Liberty sedan registration END 548 driven by Leigh Glanvill aged 25 years, travelling towards Melbourne in a north easterly direction, partly in the left hand Melbourne bound emergency lane, collided with the nearside rear of a 1988 red Ford Falcon station wagon registration FPG 770 driven by Raymond Kirwan, travelling in the left hand lane of the Melbourne bound lanes.
2. As a result of the impact with Mr Glanvill's vehicle, Mr Kirwan's vehicle veered out of control to the right across the Melbourne bound lanes. Tyre marks led through four median barrier posts to a tripping point on a mulch mound on the south side of the median strip, where the vehicle flipped onto its side in the right hand lane of the Geelong bound lanes.
3. A 1997 red Ford Explorer four wheel drive station wagon registration ONN 370, driven by Barry White aged 51 years, travelling in the opposite direction in the right hand lane of the Geelong bound lanes, collided with the passenger side and roof of Mr Kirwan's vehicle. As a result of the impact Mr Kirwan's vehicle continued to slide and rolled approximately 32 metres south west towards Geelong coming to rest on its roof across the left lane, facing in a southerly direction. The station wagon was observed to have sustained its greatest impact to the nearside edge of the roof, the nearside front door area and the rear nearside of the vehicle.
4. Mr White's vehicle came to rest in the centre of the Geelong bound lanes facing in a south westerly direction, approximately 20 metres from the point of impact. That vehicle sustained extensive square frontal impact. At the time of the collision twin air bags were deployed. All occupants of the vehicle were wearing seatbelts. Both deceased, Mr Kirwan, a postal worker aged 49 years and his passenger, Steven Orchard-Boyd, secondary school teacher and youth worker, aged 33 years, died at the scene. Both were wearing seat belts at the time. Toxicological analysis revealed the presence of 0.1mg/L Citalopram in Mr Orchard-Boyd's blood and 0.2mg/L Pseudoephedrine in Mr Kirwan's blood.¹ Although one passenger in Mr White's vehicle received a fractured sternum, minor injuries were sustained by other occupants.
5. A 1997 blue Ford Falcon sedan registration OQN 081 driven by George Grivas aged 62 years, travelling in the left hand lane of the Geelong bound lanes, collided with Mr Kirwan's vehicle prior to veering off the roadway onto the grassed reserve facing in a southerly direction. The Falcon had been impacted on the front offside above the moulded bumper. The offside headlight had been smashed. The offside bonnet and offside quarter panel had been torn rearward to expose the front offside wheel. The second area of impact observed was on the off side rear quarter panel adjacent to the tail light. The tail light and indicator lens had been smashed. The drivers air bag had deployed. All occupants of the vehicle were wearing seatbelts. Mr Grivas and his passengers suffered minor injuries.
6. Another vehicle travelling in the left hand lane of the Geelong bound lanes, a 1994 Blue Honda Prelude Coupe registration FIW 168, driven by Maria Romero aged 31 years, was

¹ See Toxicology Report at page 205-208 Inquest brief. Citalopram is an antidepressant agent. See Toxicology Report at page 201-204 Inquest brief. In particular, see General Comments "*Pseudoephedrine is a nasal decongestant and bronchodilator found in numerous proprietary medicines either as the hydrochloride salt or as a sulphate either by itself or in combination with other therapeutic substances including paracetamol, codeine, dextromethorphan and certain anti-histamines*".

struck with flying debris as it drove through the collision scene and parked on the right hand emergency lane of the Geelong bound carriageway, 200 metres west of the collision.

7. Following the impact with Mr Kirwan's vehicle, Mr Glanvill's vehicle appears to have oversteered to the right with the vehicle sliding sideways and spinning out of control, coming to a stop in the Melbourne bound lanes. The vehicle was driven onto the median strip, knocking over a median barrier post and came to rest facing south, in the centre median at the Melbourne end, approximately 60 metres past the main collision scene. Police located Mr Glanvill asleep in the driver's seat of his vehicle. He suffered only minor injuries as a result of the collision. An inspection of the seat belt revealed it had been worn by Mr Glanvill at the time of the impact. He was subsequently found to have a blood alcohol reading of 0.149%. From detailed measurements taken at the scene, Sergeant Peter Bellion, an expert in collision reconstruction, estimated the speed of Mr Glanvill's vehicle at approximately 130 kph prior to impact. Mr Glanvill was the holder of a current full Victorian Driver licence expiring on 31st October 2004.²
8. The Maltby Bypass consists of two carriageways which bypass the City of Werribee. One carriageway is for Melbourne bound traffic travelling in a north easterly direction and the other for Geelong bound traffic travelling in a south westerly direction. Each carriageway consists of two marked traffic lanes with "rumble strip" fog lines delineating the outer edges of the lanes for travel and is bordered by sealed emergency lanes. The left and right Melbourne bound lanes are each 3.5 metres wide. The left lane travelling to Geelong is 3.7 metres wide, the right lane is 3.4 metres wide. Dividing the two carriageways was a 7.3 metre wide, damp, clay surfaced median strip.
9. On the northern edge of the median strip and running parallel to the traffic lanes were a series of posts for a "Brifen barrier". The wire rope barrier was still under construction as the cables which normally run through the posts had not been erected. On the southern side of the median strip, adjacent to the right side, Geelong bound, emergency lane were stockpiles of mulch. The speed limit for the Maltby Bypass was 100kph. At the time of the collision the weather was fine and the road surfaces dry. There is no independent street lighting provided at the collision site. The alignment of the dual carriageway of the Maltby Bypass at the collision scene was straight.
10. Preliminary breath testing indicated no alcohol in the blood of Mr White, Mr Grivas or Ms Romero.
11. A mechanical inspection of the four vehicles involved in the collision did not reveal any mechanical faults which may have caused or contributed to the collision.
12. Further investigation revealed completion of the Brifen Wire Rope Barrier had been delayed due to inclement weather during the period June to October 1998. Work recommenced in November 1998 and was scheduled for completion by 5th February 1999. Sergeant Peter Bellion expressed the view the road environment did not cause the collision however completion of the wire rope barrier would have prevented the subsequent impact with Mr White's red Ford Explorer.³

² Mr Glanvill pleaded guilty to two counts of culpable driving, one count of negligently causing serious injury and exceeding the prescribed concentration of alcohol at Melbourne County Court on 5th February 2001. He was sentenced to a term of imprisonment.

³ See Statement of Peter Ronald Bellion at page 172 of Inquest Brief.

13. Senior Constable Colin McKenzie, who is currently attached to the Major Collision Investigation Unit and was responsible for the investigation, told the Court it was likely that the wire rope barrier would have prevented Mr Kirwan's Ford Falcon from travelling through the median strip and crossing onto the wrong side of the road.⁴
14. Reviewing the evidence, I am satisfied and formally find that Leigh Glanvill contributed to the deaths of Raymond Kirwan and Steven Orchard-Boyd.

Heidi Hellingman and Adam McLean
(Case Nos. 1454/99 and 1456/99)

The deaths of Heidi Hellingman and Adam McLean occurred on the 15th May 1999, on the west bound lanes South Eastern Freeway, 123 metres west of the Stephenson's Road overpass, Mt Waverley from head and neck injury and multiple injuries sustained in a motor vehicle accident, respectively, in the following circumstances:

1. On Saturday 15th May 1999 at approximately 11.53am Yosef Abou-Eid aged 23 years, a probationary driver, was driving his 1996 Holden Commodore VS utility fitted with a V8 engine, registration OAT 438 in the centre lane of the eastbound traffic. Ms Hellingman, a zoo keeper aged 29 years, was seated in the passenger seat of the vehicle. The road was wet as a result of heavy rain falling at the time. Traffic was light to medium. According to witnesses, Mr Abou-Eid was travelling at a speed of between 100kph and 120kph and overtaking other vehicles on the roadway (travelling at approximately 80kph -90kph) when he executed an abrupt manoeuvre into the right hand lane. The utility appears to have lost control commencing to spin in an anti-clockwise direction across the centre median strip. It entered onto the centre city bound lane, where the rear of the utility impacted with the front drivers door of a brown 1964 Holden EH sedan registration JCJ 036, driven by apprentice electrician Adam McLean aged 23 years.
2. The utility came to rest in the right hand lane of the city bound traffic facing in a south westerly direction, whilst the sedan was forced from the road coming to rest in the emergency lane south of the carriageway, facing in a northerly direction. Ms Hellingman died at the scene of the collision. Mr McLean died some hours later at the Alfred Hospital. Mr Abou-Eid received minor injuries and was released from hospital later that day. The occupants of each vehicle were wearing seatbelts at the time.
3. Toxicological analysis in relation to Mr McLean detected the presence of cannabinoids. Toxicological examination in relation to Ms Hellingman showed the presence of cannabinoids within blood. In addition it showed the presence of Benzoyllecgonine with in urine indicating prior use of cocaine. No alcohol or drugs were found in Mr Abou-Eid's blood.
4. A mechanical inspection of Mr Abou-Eid's vehicle by Senior Constable Booth of the Accident Investigation Section, found that Mr Abou-Eid's vehicle would have been classed as being in an unroadworthy condition due to insufficient tread depth on the off side rear tyre. In addition, he found Mr McLean's vehicle would also have been classed as being in an unroadworthy condition. However, inspection did not reveal any mechanical fault with

⁴ See Transcript 15/3/2001 at page 13.

either vehicle that would have contributed to the collision. Senior Constable Booth expressed the view "*having regard to the wet road conditions at the time of the collision, the insufficient tread depth on the off side rear tyre would have reduced traction in the circumstances...the utility is relatively light in weight at the rear wheels. This factor combined with an engine which is quite powerful and very wet road surface conditions, would make the vehicle very prone to breaking traction, even with all tyres having a serviceable tread depth.*"⁵

5. The South Eastern Freeway between the Stephenson's Road overpass and the Huntingdale Road overpass is a 100 kph speed zone. It comprises of three lanes for both west and east bound traffic. The Forster Road on-ramp merging lane enters onto the Freeway prior to the Stephenson's Road overpass and finishes further west of the scene. The grassed and treed centre median strip is 11.9 metres wide between the east and west bound lanes at the collision scene. There is an emergency vehicle crossover at this point. There is an emergency lane on either side of the lanes approximately 3 metres in width. The three lanes are approximately 3.5 to 4 metres wide.
6. Senior Constable Paul Egan, who is currently attached to the Whitehorse Traffic Management Unit and was responsible for the investigation, told the Court Mr Abou-Eid was a probationary driver at the time having held that licence for a period of approximately four years.⁶ Senior Constable Egan stated he had attended "*about a dozen*" freeway crossover accidents in the course of his duties. He expressed the view that had a barrier been in place it was likely Mr Abou-Eid's vehicle would have collided with the barrier with the result that Mr McLean's vehicle would not have been involved in the collision.⁷
7. Reviewing the evidence, I am satisfied and formally find that Yosef Abou-Eid contributed to the death of Heidi Hellingman and Adam McLean.⁸

Murtaza Uzuner and Melin Ozdemir
(Case Nos. 3429/99 and 3428/99)

The deaths of Murtaza Uzuner and Melin Ozdemir occurred on the 12th November 1999 on the Western Ring Road, Keilor East, 50 metres south of the Keilor Park Drive Overpass from multiple injuries in the following circumstances:

1. On Friday the 12th November 1999 at approximately 7.15am, a 1981 white Diahatsu twin cab utility registration PQO owned by A.B Construction Company, left the company premises in Camp Road , Broadmeadows carrying a bricklaying work crew of six. The utility was loaded with scaffolding and work tools. At the time the vehicle was being driven by an employee and probationary licence holder Necati Ekici aged 45 years. Muzaffer Yilmaz aged 36 years was seated in the front of the vehicle between Mr Ekici and Sean Hollway aged 24 years, who was seated beside the passenger door. Cemal Erdogan aged 33 years was seated behind Mr Ekici. Melin Ozdemir aged 62 years was seated behind Mr

⁵ See Statement of Senior Constable Leigh James Noel Booth acknowledged 28th May 1999 at page 2.

⁶ Mr Abou-Eid was fined and his licence suspended in relation to charges arising from the collision. See evidence of Senior Constable Egan. Transcript 15/3/2001 at pages 23 and 24.

⁷ Transcript 15/3/2001 at page 26.

⁸ Pursuant to Section 19(1)(e) of the Coroners Act 1985, I am required to identify any person who contributed to the death of the deceased. That section was subsequently repealed and I am no longer required to find contribution in relation to a death occurring after 1st July 1999.

Hollway and Murtaza Uzuner aged 45 years was seated behind Mr Yilmaz, between Mr Ozdemir and Mr Uzuner.⁹

2. Mr Ekici travelled south along the west bound carriageway and as he approached the Keilor Park Drive Overpass in the left hand lane, the vehicle drifted a short distance over into the right hand lane. The vehicle abruptly veered back to the left when Mr Ekici overcorrected to the right, resulting in the vehicle rotating clockwise about its vertical axis as it careered out of control across the two lanes, where it commenced to roll clockwise about its longitudinal axis across the centre median strip onto the eastbound carriageway. At the time the vehicle lost control, it is estimated to have been travelling at a minimum of 90 kph.¹⁰ As the vehicle rolled from the west bound to the east bound carriageway the load was thrown across the centre median and east bound carriageway.
3. At about this time Salim Amat aged 44 years, was driving his 1982 brown Mazda sedan registration FDK119 travelling north in the right hand lane of the east bound carriageway at approximately 100kph when he observed the Diahatsu utility coming towards him from the opposite side of the carriageway. Mr Amat swerved to the left and braked heavily in an attempt to avoid the path of the vehicle but struck the roof of the utility lying on its driver's side panels, at a speed of approximately 40 kph. As a result of the impact the utility was shunted a further distance of approximately 4.5 metres to its final position partially in the emergency lane facing west at right angles to the carriageway.
4. At about the same time as the impact with the utility, Mr Amat's vehicle was struck at a speed of approximately 30 kph to the rear near side by the front offside of a 1985 green Holden Barina sedan registration NTK 462 driven by Lan Nhu Duong, aged 43 years. Mr Duong had been driving in the left hand lane travelling at approximately 90 kph prior to braking and skidding into Mr Amat's vehicle. A 1983 white Nissan station wagon registration DOF 216 driven by Matthew Brown aged 27 years, was struck with debris from the utility as he travelled in the left hand lane when the utility entered onto the eastbound carriageway. This vehicle was located 138 metres north of the collision scene on the near side grassed verge of the east bound carriageway.
5. At the time of the collision the weather was fine, the road was dry and visibility good. The Western Ring Road consists of two parallel carriageways running in a north and south direction. One carriageway provides for eastbound traffic, the other for westbound traffic. Two lanes bound by fog lines, both 3.5 metres wide, are provided for travel on each carriageway. A series of pavement markers divide each lane. A three metre wide emergency lane abuts both near side lanes. The carriageways were separated by a 10.7 metre wide grassed median strip. The median strip dipped in the centre to form a drain.
6. Mr Ozdemir and Mr Uzuner died at the scene. Mr Erdogan sustained serious injuries and remained in a critical condition for a period of approximately two weeks. Mr Ekici received moderate injuries and others involved in the collision received minor injuries. Seat belts

⁹ Mr Ekici's probationary period was due to expire on the 8th April 2000. Sergeant Cleary told the Court Mr Ekici was an experienced driver who held a driving licence in Turkey and had been driving for a period of approximately 25 years. See Transcript 15/3/2001 at pages 3, 6 and 7.

¹⁰ See measurements and calculations contained in the Statement of Sergeant Cleary at page 97 Inquest brief.

were being worn by all persons other than the deceased men and Mr Erdogan who were seated in the rear of the utility. The rear bench seat in the utility was not secure.

7. No drugs or alcohol were detected in the blood of Mr Ekici, Mr Amat, Mr Duong or Mr Brown.
8. A mechanical inspection was conducted in relation to the vehicles involved in the collision. All vehicles were found to be in a roadworthy condition other than the Holden Barina driven by Mr Duong. It was found to be in an unroadworthy condition due to the off side rear tyre having insufficient tread depth. However, the inspection did not reveal any mechanical fault that would have caused or contributed to the collision.
9. Sergeant Patrick Cleary, who at the time of the collision was attached to the Accident Investigation Section (AIS) at Brunswick and was responsible for the investigation, expressed the view that had some form of fixed barrier separated the carriageways, the Diahatsu utility would not have entered the east bound carriageway and the collision with the Mazda and the Holden sedans would have been avoided. In his opinion "*there would have been some injuries as the vehicle was moving around but quite horrific injuries would have been sustained as a result of the car impacting into the soft roof of the Diahatsu utility as it lay on the carriageway*"¹¹. At the time he had been a member of the AIS for 6.5 years and had investigated numerous cross over collisions including a double fatality a few months earlier further east on the Western Ring Road. He observed the Western Ring Road normally carries an extensive volume of traffic generally travelling at 100kph. Sergeant Cleary accepted Mr O'Meara's proposition that "*there are lots of accidents where the width of the median strip allows cars to recover...gain control and direction without intruding upon the other carriageway*".¹²

Mandy Jackson, Shaun Wogan and Leanne Marriott
(Case Nos. 3706/99, 3707/99, 3708/99)

The deaths of Mandy Jackson, Shaun Wogan and Leanne Marriott occurred on the 7th December 1999 on the north bound lanes of the Princes Highway Little River, 1 kilometre North of the Little River Exit from multiple injuries in the following circumstances:

1. At approximately 7 am on Tuesday 7th December, Mandy Jackson, a housewife aged 25 years accompanied by her two children Shaun Wogan, a student aged 7 years and Leanne Marriott aged 4 years, left the Glen Waverley home of her former de facto partner Ian Marriott to return to her home in Norlane. Ms Marriott was driving her newly acquired 1981 cream Holden Commodore sedan registration FVY 771, a gift from Mr Marriott.¹³ Shaun Wogan was seated in the front passenger seat with Leanne Marriott seated behind Ms Jackson in the rear of the vehicle. Ms Marriott had not consumed alcohol or drugs. She is not believed to have been fatigued and was described as being in good spirits.

¹¹ See Transcript 15/3/2001 at page 2.

¹² Mr O'Meara appeared as Counsel on behalf of Vic Roads. See Transcript 15/3/2001 at page 6.

¹³ The vehicle was still recorded at Vic Roads as registered to Darryl Thomas. A vehicle transfer had not yet taken place. At the time Ms Jackson was not licensed to drive a motor vehicle owing to the expiry of her licence on the 6th January 2000. See Section 84 Certificate at page 133 Inquest brief and Transcript 15/3/2001 at pages 28 and 29.

2. At approximately 8am Ms Jackson's vehicle was observed by witnesses travelling in the left hand lane of the south west bound lanes of the Princes Highway towards Geelong. The vehicle was described as driving normally and within the 100kph speed limit applicable to that area. The vehicle was seen to slowly veer off to the left of the bitumen surface and travel for a short distance with the passenger side tyres on the grass edge, before oversteering to the right causing the vehicle to rotate clockwise about its vertical axis. Subsequent investigation established Ms Jackson commenced to oversteer the vehicle whilst travelling at a speed of 80 kph, at a point 30 metres from the rear of a stationary blue Honda Accord sedan registration ONL 397, parked on the grassed edge of the roadway with a flat tyre.¹⁴ Witnesses did not observe another vehicle, animal, person or any other obstruction that may have caused Ms Jackson's vehicle to veer from the roadway.
3. The vehicle travelled sideways across the emergency lane, both south west bound lanes and across the centre median strip through small shrubs before entering onto the north east bound carriageway. The passenger side of Ms Jackson's vehicle collided with a green Volvo 520 prime mover, registration SX 55DB towing a tautliner tri-axle trailer registration YCN-003 (S.A). That vehicle had been travelling in the right hand lane of the north east bound traffic and was being driven by Richard Andriolo aged 50 years. On impact Ms Jackson's vehicle separated, the rear section becoming attached to the front of the Volvo prime mover with the front section being forced onto the left hand lane travelling down the passenger side of the Volvo, as the Volvo continued to move forward. Mr Andriolo immediately braked and skidded for a total distance of 109 metres before coming to a stop in the left hand lane. Mr Andriolo did not sustain physical injuries.
4. A moment prior to the impact between Ms Jackson's vehicle and the prime mover, a 1990 white Nissan Patrol four wheel drive registration EEC 802 driven by Ian Bishop aged 51 years, had been travelling in the left hand lane adjacent to and slightly forward of the prime mover, when he observed Ms Jackson's vehicle approaching through the median strip. As he commenced to brake, the separated front section of Ms Jackson's vehicle brushed against the Nissan causing minor damage to the front driver's side guard. Mr Bishop then drove onto the left grass verge of the roadway and parked his vehicle. Mr Bishop was not injured.
5. Prior to the impact, a 1983 white Mercedes Benz sedan registration PFP 173 driven by Ross Straw aged 74 years, was travelling in the left hand lane behind Mr Bishop's Nissan, approximately in line with the rear of the trailer of the prime mover in the right hand lane. Mr Straw became aware of a collision with the prime mover, braked and steered his vehicle through a cloud of smoke and debris towards the left away from the prime mover. The front of Mr Straw's vehicle collided with part of the front section of Ms Jackson's vehicle. Mr Straw stopped his vehicle on the western edge of the north east bound lanes slightly to the rear of the Nissan. Mr Straw did not sustain injuries as a result of the collision.
6. The front section of Ms Jackson's vehicle was located traversing the western fog line on the north east bound lane, 9.6 metres from the rear of the tri-axle trailer. Ms Jackson was deceased beneath the vehicle. The rear section remained attached to the front bull bar of the prime mover with Leanne Marriott deceased in the rear driver's side passenger seat. Shaun Wogan was ejected from the vehicle and was located deceased on the western emergency lane 46.7 metres south of the front section of the vehicle.

¹⁴ See Statement of Senior Constable Lindon Walker at page 105 Inquest brief.

7. Toxicological analysis revealed no evidence of alcohol or drugs in Ms Jackson's blood. Testing of Mr Andriolo, Mr Bishop and Mr Straw did not reveal the presence of alcohol.
8. Mechanical inspection of the vehicles involved in the collision found the Commodore and the Volvo prime mover to be in a roadworthy condition. The Mercedes Benz sedan was found to be in an unroadworthy condition due to weeping front shock absorbers. No fault was identified that may have contributed or caused the collision.
9. The investigation revealed that Leanne Marriott was wearing a seat belt at the time of the collision but due to the extensive nature of the damage to the vehicle it was not possible to determine whether seat belts were being worn by Ms Jackson or her son.¹⁵ The road surface at the time was dry and the weather fine. South bound traffic was light with moderate north east bound traffic.
10. This section of the Princes Highway consists of a bitumen surface with dual carriageways, separated by a grassed and treed median strip that measured 9.3 metres in width. The north east bound carriageway was 11.11 metres in width. There is provision for an emergency lane 3.1 metres wide, two traffic lanes, both 3.4 metres wide and a right shoulder that measured approximately one metre. The south west bound carriageway was 10.91 metres in width. There is provision for an emergency lane, 3 metres wide, two traffic lanes, the left measuring 3.6 metres, the right 3.2 metres and a right shoulder that measured approximately one metre. The lanes are divided by a broken white line. White ripple strips border the east and west edges of each carriageway. Grassed reserve line the edges of the bitumen leading to rural property.
11. Senior Constable Lindon Walker, who is attached to the Major Collision Unit and was responsible for the investigation, told the Court in the course of his duties he had investigated one other and attended twenty cross over collisions. It was his view that had a barrier been erected at the time there would not have been a collision between the Commodore and the prime mover.¹⁶
12. In the course of his evidence, Richard Andriolo the driver of the Volvo prime mover, was generally critical of the failure to install barriers and stated that the collision had changed his life forever.

General Information on Median Barriers

A range of barrier types exist for the purpose of preventing death of serious injury to the occupants of vehicles leaving the roadway and colliding with hazardous roadside objects or with vehicles travelling in the opposite direction. Nicholas Szwed, a civil engineer employed with Vic Roads for thirty years, specialising in traffic engineering and safety, gave evidence to the hearing. Vic Roads has responsibility for each of the Freeways the subject of this Inquest. The Princes Highway or Geelong Road was designed in 1955 with the last section having been constructed in 1960. The Maltby Bypass was designed in 1960 and the last section completed in 1961. Monash Freeway was designed in 1978 with the last section of construction completed in early 1997. The Western Ring Road was designed in 1992 and the last section of construction was completed in mid 1997.

¹⁵ See Transcript 15/3/2001 at page 32.

¹⁶ See Transcript 15/3/2001 at pages 33-35.

The following table provided by Vic Roads reveals the incidence of head-on collisions on Melbourne Freeways in the 10 year period from 1 January 1991 to 1 January 2001.

| | All types of collisions | | | Head-on collisions (included in 'all types of collisions') | | |
|-------------------|-------------------------|----------------|--------------|--|----------------|--------------|
| | Fatal | Serious Injury | Other Injury | Fatal | Serious Injury | Other Injury |
| Maltby Bypass | 10 | 36 | 56 | 2 | 0 | 2 |
| Geelong Road | 14 | 62 | 160 | 3 | 3 | 2 |
| Monash Freeway | 24 | 305 | 986 | 3 | 8 | 7 |
| Western Ring Road | 7 | 140 | 394 | 2 | 2 | 7 |
| Eastern Freeway | 9 | 183 | 591 | 1 | 4 | 2 |
| Victoria | 3,681 | 49,107 | 117,834 | 624 | 2,869 | 3,667 |

The functions of Vic Roads pursuant to Section 16 of the Transport Act 1983 (hereinafter referred to as "the Act"), include maintaining, upgrading, varying and extending the State's declared road network.¹⁷ In performing its functions Vic Roads must:

- Operate within Government policy
- Be subject to the general direction and control of the Minister
- Be subject to specific statutory limitations e.g that the acquisition of land for roads requires the Minister's approval and
- Operate within the budget approved by the Minister for the Corporation for the relevant financial year.¹⁸

The design of a road is carried out by Vic Roads to the design standards appropriate for the traffic function and expected traffic volumes so as to provide safe operation while meeting any environmental constraints.

In determining the width of the median and whether a median will be provided on a new road Vic Roads must have regard to the objects in Section 16(3) of the Act and design factors that include the following:

- The width of the road reserve (the land available for the construction of the road),

¹⁷ A declared road means a Freeway, state highway, main road, tourist's road, forest road, stock route, metropolitan bridge, the West Gate bridge, City Link and the Exhibition Street extension.

¹⁸ See Transport Act 1983 Sections 16(2) (b), 31, 42 and 60(4) respectively.

- Present and expected future traffic volumes,
- The width of the carriageway and the number of traffic and emergency lanes determined according to present and future needs,
- Stage development and provision for future extra lanes or widening,
- The purposes of the road and the proposed speed limit,
- Safety considerations, such as the benefits to be gained from separating traffic flows, providing protected right turn lanes, "clear zone" requirements and barrier options,
- Types of vehicles expected to enter, cross or use the road (eg. proportion and length of trucks),
- Operational needs including requirements to accommodate turning vehicles (eg. to provide indented lanes),
- Whether the road is in a rural or urban area,
- Environmental and aesthetic considerations,
- Topography and drainage,
- Any relevant Government policies or directions and
- The intended functions of the median.¹⁹

Mr Szwed outlined to the Court the Vic Roads Road Design Guidelines, the guidelines and standards applicable to Freeway design and construction. Regarding medians on high volume roads it is generally considered preferable to design for errant vehicles by providing a median of sufficient width to have a strong likelihood of recovering control or being brought to a safe stop without striking a barrier, other object or vehicle. Where there are other options a median barrier tends to be avoided as any barrier should only be installed if striking the barrier is likely to be less severe than the consequences that would result from no barrier being present.

Where a new road is proposed or where major upgrades of existing roads are planned Vic Roads makes the decision having regard to the factors outlined earlier.²⁰ In addition, the Road Design Guidelines specify that a median barrier may be installed based on consideration of a combination of the following factors:

- Width of median,
- Traffic volumes,
- Purpose of the median,
- Crash history and/or
- Need for protection from hazards within the median (objects, steep slopes etc).

The degree of cross median access required by police and other emergency services vehicles and road maintenance vehicles must also be taken into account.

¹⁹ Pursuant to Section 3.6.7.1 of the Road Design Guidelines the main functions of medians are:

- (a) to separate traffic flows and reduce head-on collisions;
- (b) to prevent indiscriminate crossing and turning movements;
- (c) to provide pedestrian refuge and to shelter right-turning vehicles at intersections;
- (d) to shelter crossing vehicles at intersections;
- (e) to provide for planting to counter headlight glare;
- (f) to provide a recovery area for errant vehicles.

²⁰ See factors listed at page 11 herein.

Since July 1995, the guideline applicable to safety barriers has been Section 3.10 of the Road Design Guidelines. In part, Section 3.10.3.7 provides:

"Median barrier is usually omitted where the median is wider than 15 metres, unless warranted by height/slope or fixed object criteria, or there is a history of cross-median accidents."

An earlier guideline, dated February 1974, for the use of guard fence was drafted in similar terms but stated *"for median width of 14m or greater, median barrier is normally omitted."*²¹

Mr Szwed told the Court where a new Freeway is designed and the median is less than 15 metres, a barrier would be erected as a matter of course. On an existing roadway, a barrier maybe incorporated as part of an upgrade. He explained that the 15 metre median incorporated the green median combined with the width of the emergency lanes. In the course of his evidence he explained that the 15 metre width criteria had been developed on the basis of the recovery area required for vehicles which leave the carriageway to stop safely or regain control. It had been found that an area about 9 metres wide measured from the traffic lane is required for recovery of about 85% of vehicles travelling at 100kph. However, 15% of vehicles travelling out of control require a much greater area for recovery.

For existing roads the decision to install a barrier is based primarily on the crash history of the specific road section. A divided road with identifiable lengths where there has been a significant number of median entry and/or cross median casualty crashes (3 or more within a 5 year period) would be investigated. Investigations would first seek to identify possible road improvements that would reduce the probability of vehicles leaving the road (eg. improved night time delineation, correction of rough or slippery when wet pavement surface, provision of sealed shoulders, audible edge lines, etc.). If most crashes appear preventable by on-road engineering improvements then such improvements would usually be undertaken first so as to reduce the likelihood of vehicles leaving the road and entering the median. Where the initiating events for cross median collisions do not appear to be preventable by on road treatments, the installation of a median barrier may be considered.

Types of Barriers Accepted For Use On Victorian Roads

In the course of the Inquest evidence was heard in relation to the type of median barriers available for use on Victorian roads. There are currently three main types of barrier systems that have been satisfactorily crash tested and comply with recognised international standards.²²

- (a) Rigid concrete barriers, most commonly of the "New Jersey" shape which consists of two sloped sides or the "F-profile" concrete barrier. The barriers are constructed by joining a series of concrete sections together to form a long, featureless surface. These barriers are designed to redirect errant vehicles with no barrier deflection. They are used where shallow impact angles are expected, that is close to traffic lanes.
- (b) Semi-rigid steel "W" shape beam barriers (supported by steel or timber posts). These (guard rail) systems are designed to provide some deflection and to redirect vehicles.

²¹ See Section 15.5.3 (ii) of the 1974 Guidelines.

²² See attached photographs.

- (c) Flexible wire rope barriers (tensioned cables with frangible posts). Generally, wire rope safety barriers (WRSB) are comprised of a three or four "woven" rope system which are fixed to frangible posts and the ends of the wire rope are fixed into the ground. There are three variations of the WRSB that are suitable for use on roads divided by a median strip. As flexible barriers provide for significant lateral deflection they provide the lowest deceleration forces on the vehicle and occupants. Due to their design they can not however be used in situations where large deflections would result in contact with objects or oncoming vehicles. They also have limited effectiveness on the inside of curves and can not be use on sharp curves. In Australia WRSB is manufactured and distributed by Brifen as the Wire-rope Safety Fence. Another form of WRSB approved by Vic Roads in 1997 is "Flexfence" and is manufactured by Ingal Civil Products in Australia.²³ An analysis of the use of wire rope safety barriers with particular reference to "Brifen" and "Flexfence" is contained in the Vic Roads 4th May 1998 "Road Design Note 3-18b".²⁴

According to Vic Roads current research is focusing on aspects such as the nature and severity of deceleration forces experienced by vehicle occupants, the interaction between vehicle safety features, occupant protection systems and barrier systems, and safety performance of barrier systems for diverse road users ranging from containment of heavy vehicles to injury minimisation for motorcyclists.

There are advantages and disadvantages associated with each type of barrier and I do not propose to list all of the factors which are listed in some detail in the Vic Roads report tendered in the course of the proceedings.²⁵ When asked by Ms Nyholm the question whether he would consider the wire barrier to be the most appropriate barrier to install in most cases these days? Mr Szwed told the Court that *"the wire rope is the most forgiving in terms of impact and damage to human beings, so its our preferred one but there are certain circumstances where you just can't put them in, where you haven't got enough clearance because they've got to deflect like the rubber band someone was describing, they've got to move out and then they move back, so then you might have to use the other types, but they would be the preferred type."*²⁶

A report provided by Bruce Corben, a Senior Research Fellow at the Monash University Accident Research Centre, who gave evidence to the Inquest, similarly outlines the advantages and disadvantages of the various types of barrier.²⁷ According to that report, wire rope barriers appear to provide the safest form of energy transfer of the three main barrier types with the caveat, that the use of flexible barrier types is obviously limited to situations where adequate space exists for the barriers to deform without contacting other rigid objects or oncoming vehicles.

Much research is currently being undertaken in relation to barrier systems. Mr Corben has been involved in a whole range of road safety research projects in infrastructure, looking at road safety crash characteristics and evaluation of road structure improvements over approximately a 20 year period. He expressed the view that barrier systems have tremendous potential to reduce injury risks in high speed settings. During the course of Mr Corben's evidence a number of recent papers and reports were tendered. Late last year testing was completed in Melbourne in a joint Monash University/Swedish research project involving a series of tests with different guard rails with the

²³ See Vic Roads Road Safety Department publication entitled "Safe Roads" No 105 February 1998 (exhibit CC1)

²⁴ See appendix "D" to exhibit CC2.

²⁵ See Exhibit CC at pages 5-7.

²⁶ See Transcript 15/3/2001 at pages 62 and 63.

²⁷ See Exhibit DD at pages 1-3. Mr Corben graduated from Monash University in 1972 with a Bachelor of Science degree majoring in Physics and a Master of Engineering majoring in Transport in 1982. He is currently undertaking his PhD at Monash University.

aim to study the interaction between car structural integrity, restraint systems and guard rails. The research was sponsored by Swedish and Australian bodies including Vic Roads.²⁸ Early findings of the project have been presented by members of the Swedish research team in a paper entitled "Development of a Crashworthy System: Interaction Between Car Structural Integrity, Restraint Systems and Guardrails."²⁹ The final Australian report has yet to be finalised.

Mr Corben was one of a group of authors to publish a paper entitled "Interactions Between Guardrails, Cars and Passive Safety Systems" that presents an overview of the research in progress.³⁰ The research examines the interaction between roadside barriers, cars and their passive safety systems. The paper argues that by bringing together vehicle designers with designers and operators of the road infrastructure, society can be provided with a crashworthy road transport system, that is , a system that operates within the limits of human tolerance to violent forces.

There is compelling evidence of the benefits of road barriers presented in the draft Swedish paper entitled "Evaluation of Alternative 13 Metre Roads" dated 26th July 2001.³¹

Finally, Mr Corben produced a Monash University Accident Research Centre report commissioned by Vic Roads entitled "Motorcyclists and Barriers" dated April 2001.³² The purpose of that report is to summarise current knowledge on the interaction of motorcyclists and roadside safety barriers and to provide advice on the feasibility of undertaking further research into the issue.

Funding and the Cost Benefit Analysis

According to Vic Roads, decisions to make a safety improvement on existing roads is normally carried out under specific budget programs such as Victorian and Federal Accident Blackspot Programs, and Federal Programs such as the National Highways Program. Provision is also made in the Victorian program to pro-actively treat some high risk sites without a crash history. Most Accident Blackspot proposals follow from monitoring and identification of intersections or road lengths where a significant number of casualty collisions have been recorded by the police. Locations are investigated to identify factors which may be contributing to crashes and to develop engineering countermeasures that could be applied to reduce the number and/or severity of crashes. Estimates of the cost of treatments and the reduction in crash costs due to each treatment are then made. These estimates form the basis of a benefit cost comparison between treatment options and projects.

For projects to be eligible for Blackspot funding, the economic safety benefit must exceed the cost of the proposal. Mr Szwed explained this cost benefit analysis in the following manner. If a sum is expended to install barriers over a particular length at a location where there have been casualty crashes, that cost is weighed up against the price of the casualty crash. In calculating the average price of the casualty crash a number of factors are taken into account including hospital costs, the loss of earnings and a whole range of cost factors to the individual and to the community. The cost

²⁸ Support was provided by AUTOLIV Research, Sweden; Folksam Insurance Group, Sweden; Monash University; RACV; Swedish National Road Administration; The National Society for Road Safety; TAC, VIC ROADS and the Laverton Airforce Base.

²⁹ Anders Ydenius, Anders Kullgren, Claes Tingvall. See Exhibit EE.

³⁰ "Interactions between Guardrails, Cars and Passive Safety Systems" by Bruce Corben, Raphael Grzebieta, Robert Judd, Anders Kullgren, Christopher Powell, Claes Tingvall, Anders Ydenius and Roger Zou. This paper was published in November 2000 at the National Road Safety Conference in Brisbane. See Exhibit FF.

³¹ See Exhibit HH. The author is currently working with Mr Corben at the Monash University Accident Research Centre.

³² See Exhibit GG.

savings over the cost of the treatment would produce a benefit over cost ratio that is used to assess projects.

Over the last few years the available funding for the Accident Blackspot Program from both Federal and State sources has been about \$10 million to \$12 million per year. In 2000, the Victorian Government announced an expanded \$240 million Statewide Blackspot Program of road funding to be implemented over 4 years ending in 2003/2004. That sum includes \$48 million targeted at potential Black Spots/Black Lengths. Within this category, Vic Roads has been focussing on the treatment of rural Y-junctions and the protection of bridge ends with guardrail. In the additional material provided to the Court and in his evidence, Mr Szwed indicated Vic Roads is undertaking pro-active measures to identify potential road accident spots. *"We are starting to do that. We have introduced a pro-active component and we're trying to work out ways to predict that crashes may happen even though they may not have occurred or may be have not been too serious but you know, it all depends on funding and you've really got to fix the bad black spots that you know about before you go looking for the ones that may be causing accidents in the future."*³³ Given the random nature of the crossover accidents it is said to be difficult to anticipate the possible future locations of such accidents. Nevertheless, Vic Roads is developing guidelines for the identification and treatment of potential blackspots to extend beyond Y-junctions and bridge ends.

Current and Proposed Installation of Median Barriers

Vic Roads current Blackspot proposals include median barriers for the Western Ring Road and the Eastern Freeway. With regard to the Western Ring Road, Mr Szwed told the Court there had been sufficient scattered encroachments into the median and some crossover accidents to warrant the installation of barriers along the entire length of that road and it was proposed that would occur. Despite a median of between 16 and 23 metres on the Eastern Freeway, flexible barriers (Flexfence) have recently been installed in order to protect vehicles from striking the light towers or crossing the median.³⁴

Mr Szwed indicated the Princes Highway or Geelong Road is currently being upgraded with the addition of a third lane. He stated Geelong Road would be brought up to the latest standards and that meant, if the median is less than 15 metres wide barriers would be installed, if not already in place. Further information provided to the Court on behalf of Vic Roads reveals that wire rope barriers will be installed in the median at the site of the deaths of Mandy Jackson and her two children, on Geelong Road near Little River. Brifen wire rope safety barriers will be positioned about 0.5 metres from the median shoulder of the Melbourne-bound carriageway. The reconstruction of this section of median is programmed to begin in late 2001 and the wire rope barriers are scheduled to be installed by the second quarter of 2002.³⁵ At the time that the upgrade of Geelong Road commenced, wire rope safety barriers and guardrails protected a total of 13.4km of the median. A further 4.1km was protected by concrete "New Jersey" barriers. After the reconstruction and upgrade, a total of 28.6 km of the median will be protected by wire rope safety barriers and 4.6km by New Jersey barriers. A further 1.4 km of wire rope safety barriers will protect the outside shoulders of the road.³⁶

³³ See Transcript 15/3/2001 at page 75.

³⁴ The Flexfence was completed in late May 2001 and extended from the Merri Creek to Bulleen Road. A map disclosing the system of wire rope safety fencing on the Eastern Freeway has been provided to the Court. See Exhibit CC2 appendix "G".

³⁵ A draft plan marking the positioning of the wire rope safety barriers on the site is attached as appendix "E" of Exhibit CC2.

³⁶ A map highlighting the existing and post up-grade protection was provided to the Court as appendix "F" to exhibit CC2.

Comments and Recommendation

I propose to forward a copy of my Findings and the Comments and Recommendation to the following:

- Chief Executive Officer, Vic Roads
- The Minister for Roads
- The Chief Commissioner of Police
- Director, Transport Accident Commission
- Chief Executive Officer, RACV
- Accident Research Centre Monash University

It is acknowledged that an enormous amount of work has already been done by Vic Roads and the Federal and State Governments to reduce the risk of death and injury on our roads. In the course of his evidence Mr Szwed told the Court that Vic Roads continually reviews and monitors changing traffic patterns, traffic conditions, vehicular usage and accident patterns. It is said that it has been difficult for Vic Roads to anticipate the possible future location of "cross-over" incidents as such incidents are essentially random. Certainly in each of the four cross-over incidents in this investigation it could not be said that the road environment caused the collision.

Freeways are designed to carry a large volume of traffic travelling at a fast rate of speed. Despite the best endeavours of legislators, police and road authorities, driver error whether due to negligence, inadvertence, inexperience, medical related issues, fatigue, the effects of alcohol and drugs, excessive speed or other causative factors, will continue to lead to collisions on our roads. In each of the nine deaths in this investigation it is likely had median barriers been installed that deaths would have been avoided and the number of those injured reduced. Research to date, in particular the material emanating from Monash University and Sweden, would tend to suggest that much greater emphasis should be placed on the use of barriers in the prevention of such cross over collisions. Vic Roads has actively supported this research. The notion of a more co-operative approach bringing together vehicle designers with designers and operators of the road infrastructure as suggested by Mr Corben and his co-authors in their report, is to be commended.

The economic and emotional cost of these collisions to the community cannot be underestimated. Mr Andriolo described his life as having been changed forever since the collision with Ms Jackson's vehicle and it is almost impossible to measure this in monetary terms.

Notwithstanding the issue of funding, there is persuasive evidence that urgent attention is required to address the issue of cross over fatalities.³⁷ The current Vic Roads Road Design Guidelines at Section 3.10.3.7 in part, provide:

³⁷ Since the close of the evidence in this investigation on the 2nd August there has been further loss of life and serious injury resulting from another cross over collision that occurred on the Monash Freeway on the 4th August. Without pre-empting the coronial finding in that matter, it is fair to say that the installation of median barriers may have prevented the devastating outcome of that collision. See article Sunday Herald Sun 5/8/2001 at page 9.

"median barrier is usually omitted where the median is wider than 15 metres unless warranted by height/slope or fixed object criteria or there is a history of cross-median accidents".

In the course of his evidence Mr Szwed indicated that the 15 metre median distance included the width of the emergency lanes. He went on to describe the recovery area required for vehicles which leave the carriageway to stop safely or regain control, acknowledging that the 15% of vehicles travelling out of control required a much greater recovery distance. Ideally, where possible roads are designed and built to incorporate a wide median strip to allow vehicles to recover without intruding upon the other carriageway but often geographical constraints do not permit this. Despite a median of between 16 and 23 metres on the Eastern Freeway flexible barriers have been installed in order to protect vehicles from striking light towers or crossing the median. This reflects the proactive approach adopted by Vic Roads to detect the location of potential road accidents. However, accepting the random nature of such collisions, in my view consideration should be given by Vic Roads to reviewing the current median barrier guidelines.³⁸

I recommend that Vic Roads consider a review of the current median barrier guidelines with a view to installing appropriate median barriers on all Freeways or State Highways where necessary to prevent errant vehicles travelling onto carriageways in the opposite direction of travel.

Noreen Toohey
Coroner
9th August 2001

Mr O'Meara for Vic Roads
Senior Constable Nyholm, Assisting the Coroner in all Inquests.

³⁸ For example reviewing the median width where barriers are installed; reviewing the inclusion of the width of the emergency lane as part of the median; reviewing the methodology for installing barriers whereby it relates to actual collisions etc.

