

FCU Report

CORONERS



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QUEENSLAND POLICE SERVICE

Electronic Recording Section
Forensic Services Group
OPERATIONS SUPPORT COMMAND
200 Roma Street
GPO Box 1440
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Analysis into Vehicle Speed - North Lakes fatality

Date 30/8/2013

Reference No. FR 1175167 / ERS 3169615 / QP 1300633856

Case Officer Senior Constable Judd (4018527)

Station Pine Rivers District JAB.

Request Analysis of CCTV footage to estimate speed of vehicle.

Analyst Tim Woodcock
Technical Officer Grade 4

Qualifications: Bachelor of Music (Sonology) Griffith University
Grad Dip Computer Engineering (QUT)
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1. Preamble

On 25/6/2013, Senior Constable Judd lodged a request with the ERS requesting assistance in estimating the speed of a single vehicle involved in a traffic incident. The incident has been captured on a Main Roads CCTV camera, and comprises a single Vehicle of Interest (VOI) travelling north on the Bruce Highway that impacts with the Anzac Ave exit guard rail at Mango Hill. The incident occurs on the 30th May 2013, with the impact occurring at approx 23:32:52 hrs.

2. Submitted media

The submitted media is a Corporate Express brand recordable CD-R disc, Property tag P1300208003, FR Exhibit 222395011. The optical disc bears the hub batch number "6112PG021LH03848D1". Figure 1 shows a scan of the submitted VOI CCTV disc.

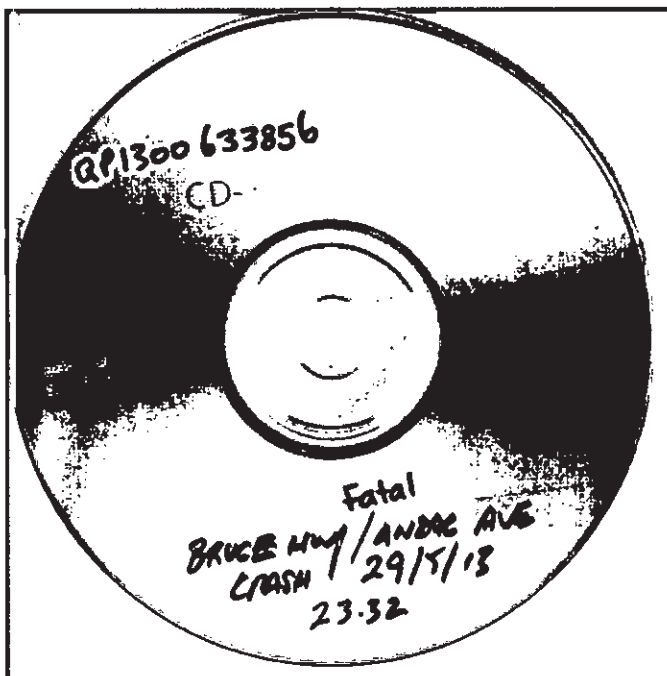


Figure 1. Scan of submitted disc containing VOI CCTV.

Figure 2 shows the contents of the submitted disc. It comprises 10 files, of which only one file is used for the analysis. The other files contain camera views or time periods that do not show the incident.

Name *	Date	Type	Size	Length
0213 Gympie Rd & Graham Rd-20130529-232832.avi	30/05/2013 9:34 AM	Video Clip	5,192 KB	00:00:31
0218 Gympie Rd & Stratpine Rd(Old)-20130529-232948.avi	30/05/2013 9:24 AM	Video Clip	5,667 KB	00:00:25
0222 BH Junction Rd [DMR 1013]-20130529-233126.avi	30/05/2013 9:22 AM	Video Clip	3,221 KB	00:00:23
0224 BH Blyth Rd [DMR 1016]-20130529-233152.avi	30/05/2013 9:21 AM	Video Clip	6,059 KB	00:00:27
0226 BH Dohles Rock Rd [DMR 1015]-20130529-233151.avi	30/05/2013 9:20 AM	Video Clip	7,324 KB	00:00:25
0228 BH Brays Rd [DMR 1016]-20130529-233207.avi	30/05/2013 9:16 AM	Video Clip	10,684 KB	00:00:28
0231 Anzac Ave-20130529-233232.avi	30/05/2013 9:24 AM	Video Clip	116,609 KB	00:18:34
0231 Anzac Ave-20130529-233244.avi	30/05/2013 9:13 AM	Video Clip	3,097 KB	00:00:26
0231 Anzac Ave-20130530-034045.avi	30/05/2013 9:47 AM	Video Clip	17,112 KB	00:02:12
0231 Anzac Ave-20130530-035844.avi	30/05/2013 9:46 AM	Video Clip	18,941 KB	00:02:17

Figure 2. Files contents of submitted FR Exhibit 222395011.

The single file used for this analysis is "0231 Anzac Ave-20130529-233232.avi". The recording is approximately 18m 34s in duration, with the crash occurring approximately 67 seconds into the recording. The footage is a single fixed camera looking south along the Bruce Highway. The recording has a pixel resolution of 384 x 288 pixels, and a reported frame rate of 12.473 frames per second (fps). Figure 3 shows the file's properties as reported by MedialInfo software version 0.7.62.

General	
<i>Complete name :</i>	EAERS JOBS\ERS 3169615 - North Lakes Fatal\Incident footage\Stolen Car Bruce Hwy rollover at Anzac Ave\0231 Anzac Ave-20130529-233232.avi
<i>Format :</i>	AVI
<i>Format/Info :</i>	Audio Video Interleave
<i>File size :</i>	114 MiB
<i>Duration :</i>	18mn 34s
<i>Overall bit rate :</i>	857 Kbps

Video	
<i>ID :</i>	0
<i>Format :</i>	MS Video
<i>Codec ID :</i>	CRAM
<i>Codec ID/Info :</i>	Microsoft Video 1
<i>Duration :</i>	18mn 34s
<i>Bit rate :</i>	827 Kbps
<i>Width :</i>	384 pixels
<i>Height :</i>	288 pixels
<i>Display aspect ratio :</i>	4:3
<i>Frame rate :</i>	12.473 fps
<i>Bits/(Pixel*Frame) :</i>	0.600
<i>Stream size :</i>	110 MiB (97%)

Figure 3. MedialInfo report on incident AVI file.

Police Drive Through footage.

On preliminary evaluation of the case, a request was made for CCTV footage of a police vehicle driving through the scene at exactly 100 km/h in the outside lane only. This was conducted, and the subsequent CCTV recording provided on a recordable 'Corporate Express' brand CD-R bearing the hub batch code 6112PG021LH03810D1. This item was lodged with the ERS as FR Exhibit 222395011. Figure 4 shows a scan of the submitted police drive-through disc.

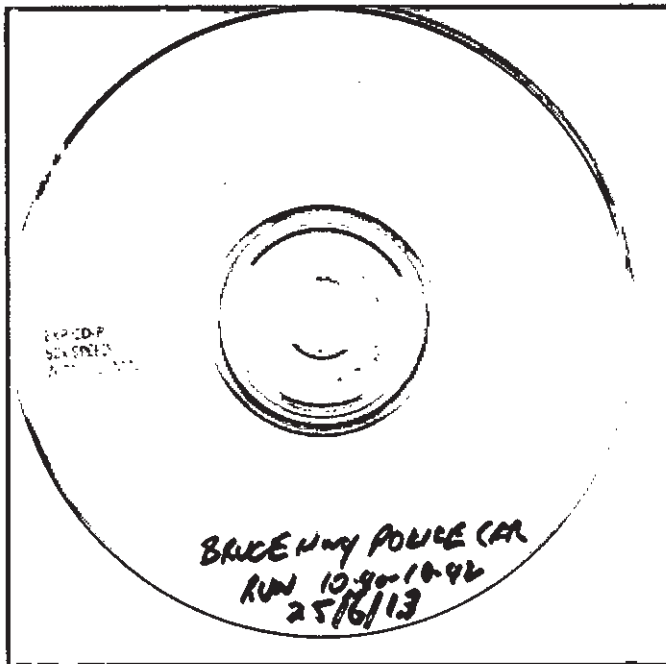


Figure 4. Scan of submitted disc containing Police drive-through CCTV.

Figure 5 shows the contents of the submitted police drive-through disc. It comprises 5 files, of which only one file is used for the analysis.

Name ^	Date modified	Type	Size
^ Files Currently on the Disc (5)			
0222 BH Junction Rd [DMR 1013]-20130625-103859.avi	25/06/2013 10:58 AM	Video Clip	75,756 KB
0224 BH Blyth Rd [DMR 1016]-20130625-103955.avi	25/06/2013 11:00 AM	Video Clip	34,893 KB
0226 BH Dohles Rock Rd [DMR 1015]-20130625-103935.avi	25/06/2013 11:05 AM	Video Clip	41,893 KB
0228 BH Brays Rd [DMR 1016]-20130625-104052.avi	25/06/2013 11:06 AM	Video Clip	51,136 KB
0231 Anzac Ave-20130625-104100.avi	25/06/2013 11:10 AM	Video Clip	50,679 KB

Figure 5. Police drive-through submitted disc file contents.

The single police drive-through file used for the analysis is "0231 Anzac Ave-20130625-104100.avi". This recording is approximately 2m 48s in duration, with the police vehicle entering the scene approximately 57 seconds into the recording. The footage is from the same camera as that used for the VOI CCTV recording. Figure 6 shows the police footage as interpreted by MedialInfo software. On comparing this with Figure 3, it can be seen that it is consistent with the format of the supplied incident footage.

General	
Complete name :	EAERS JOBSAERS 3169615 - North Lakes Fatal\Police drive through footage\0231 Anzac Ave- 20130625-104100.avi
Format :	AVI
Format/Info :	Audio Video Interleave
File size :	49.5 MiB
Duration :	2mm 48s
Overall bit rate :	2 458 Kbps

Video	
ID :	0
Format :	MS Video
Codec ID :	CRAM
Codec ID/Info :	Microsoft Video 1
Duration :	2mm 48s
Bit rate :	2 427 Kbps
Width :	384 pixels
Height :	288 pixels
Display aspect ratio :	4:3
Frame rate :	12.500 fps
Bits/(Pixel*Frame) :	1.756
Stream size :	48.9 MiB (99%)

Figure 6. MedialInfo report on police drive-through footage.

Still Image extraction.

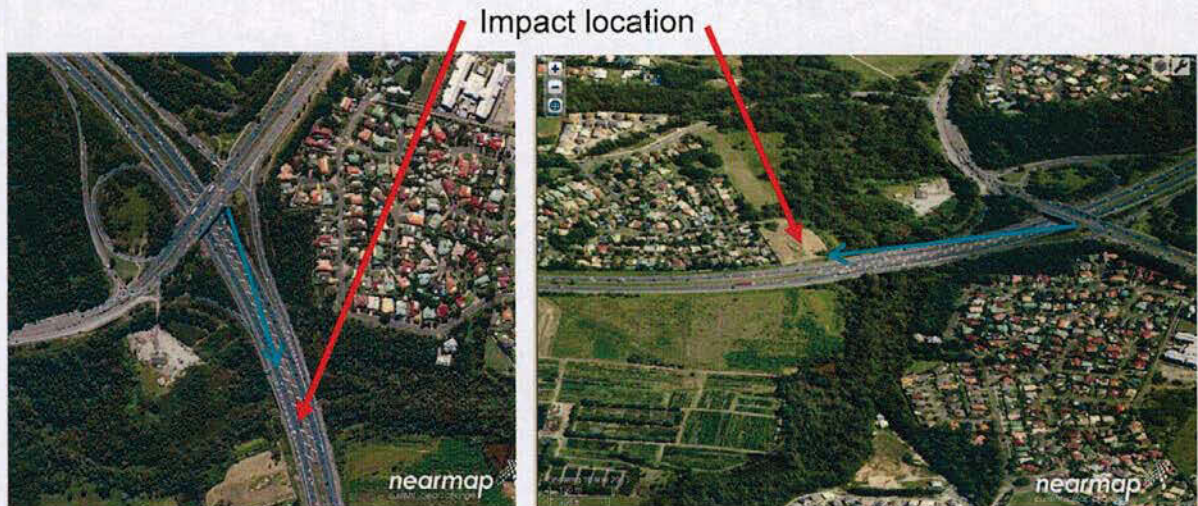
For the purposes of this analysis, both the incident and the police drive-through footages are disassembled into their individual images. These are extracted in uncompressed bitmap (*.bmp) format in order to retain quality. The extraction process was achieved using VirtualDub software V1.9.11.

- From the incident footage, the first 400 video images are extracted in bitmap format, which covers the incident. The images are extracted at double the native resolution (i.e. 768 x 576 pixels using bicubic interpolation) to assist in maintaining quality through subsequent image processing. (Later, this footage is doubled in size again to closely match the 'zoomed in' police footage size for superimposition purposes).
- From the police footage, the first 1400 video images are extracted in bitmap format, covering up to the point at which the police vehicle has exited the field of view. These images are also extracted at double their native resolution (i.e. 768 x 576 pixels) for quality retention purposes.

As the police and VOI images relate to different days entirely, VOI incident image number '100' has no bearing on police image '100'. To assist in identifying which images are being referred to in this analysis, police images will be indicated as (e.g.) 'image P-100', whilst the incident images will be referred to as (e.g.) 'image VOI-100'.

3. CCTV Camera.

The CCTV camera is located at the intersection of Anzac Ave and the Bruce Highway, Mango Hill, and is facing south along the Bruce Highway. Figure 7 shows two images of the same overpass. In both images, the camera view and direction (blue arrows) and impact locations are indicated. The camera is physically mounted on a tall pole, positioned on the south eastern corner of the overpass (See Figure 8). (The second camera mounted below this is a webcam, viewable from the Transport and Main Roads (TMR) website - and is not recorded).



* Blue arrows indicate camera view direction, and Bruce Highway South.

Figure 7. Camera location - nearmap images.



Google maps street view.

Figure 8. CCTV camera with Bruce Highway in background (looking south).

Figure 9 shows the entire scene, including approximate vehicle trajectory and impact location.

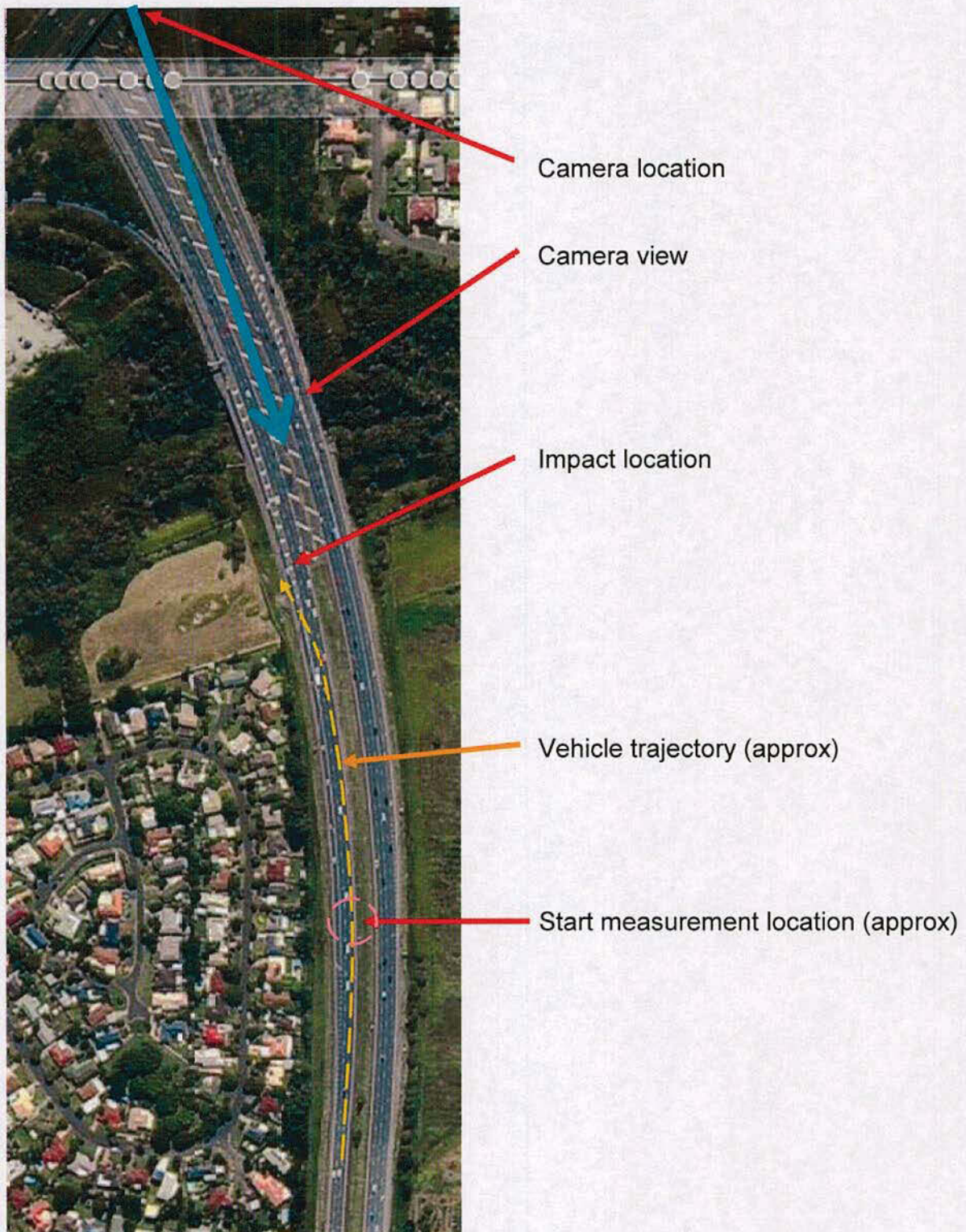


Figure 9. Nearmap image showing the section of highway.

Figures 10 and 11 show samples of the incident footage and the police drive-through footage respectively. Note that the recorded day (police) footage is 'zoomed in' compared with the wider angled night (VOI) footage.



Figure 10. Sample image from the incident CCTV footage.



Police car, lights flashing for ID.

Figure 11. Sample of police drive-through footage showing police vehicle.

4. Method.

Speed is calculated as Distance over Time (e.g. km/h or m/s). For this analysis, a portion of the VOI's trajectory is selected over which to calculate it's average speed. This selected portion is established by choosing start and end images in the VOI CCTV footage based on the clarity of the VOI at these points. The time taken for the VOI to traverse the distance is obtained by subtracting the time displayed on the screen at these two locations. (The validity of these displayed times is addressed as part of the analysis.)

Knowing the time span between the start and end images, the crux of this analysis is thus in determining the *distance* the VOI has travelled in this chosen section. The distance travelled by the VOI is calculated from extra footage acquired of a police vehicle travelling through the scene at a known speed. Knowing the police vehicle's speed and the timing between its successive CCTV images, distance measurements can be determined. By superimposing images from this police drive-through over the incident CCTV images enables the distance travelled by the VOI to be estimated.

Alternative Methodologies.

Given the incident CCTV footage and the police drive-through footage, two methods of calculating the VOI's speed are available:

1. Select *police vehicle* start and end locations (giving a fixed **distance** span), and by overlaying and matching the VOI location, determine the time taken for the VOI to traverse that same distance. (i.e. police vehicle sets the distance, and use VOI to determine the total time span).

OR

2. Selecting start and end locations based on the *VOI position* (giving a fixed **time** span), and by overlaying and matching the police vehicle footage, determining the distance the VOI has traversed over that time. (i.e. VOI sets the time span, and use the police vehicle to determine the distance).

Method 2 is chosen as (a) the VOI is poorer footage, and establishing strong reference locations in this footage gives clearer targets, and (b) as the Police vehicle is moving slower than the VOI, there are finer choices of answer in choosing the police vehicle location Vs choosing the VOI vehicle location.

*NOTE: In this analysis, the term 'span' is used to describe the time or distance that occurs **between** two images. For example, the shortest time span encountered is that between two adjacent CCTV images - typically 0.08 seconds for the CCTV recordings in this analysis.*

Choosing the measurement Start and End locations

The start and end locations of the measurement distance are chosen using the VOI footage as follows:

- **START:** The start location chosen is VOI image VOI-244. At this point, the image is time stamped 23:32:48.423.

For abbreviation purposes, as the event falls within the minute, future references to image times will use seconds only (e.g. 48.423 s).

- **END:** The end location is chosen as image VOI-297, time stamped 52.664 s. At this point the vehicle appears to have just impacted with the guard rail. The next image (VOI-298) has the vehicle twisted clockwise due to the impact, hence the impact has occurred before image VOI-298. In image VOI-296, the vehicle appears to still be approaching the guard rail.

The choice of start and end locations has been made with the following optimising considerations:

1. At the start location, the vehicle is about to overtake another vehicle by moving into the outside lane. The start location chosen puts the VOI in the same lane (i.e. the outside lane) as used later by the police car for determining distance. Choosing an earlier VOI location would make matching the police and VOI locations difficult, as they may not be in the same lane. This could introduce possible errors.
2. The VOI position at the start location chosen is relatively clear when compared with adjacent images. Images further down the road (later) than this tend to lose clarity when the headlights merge with other vehicles, whilst a similar issue occurs earlier.
3. The start and end locations are sufficiently spaced apart that tolerances in their exact locations do not significantly impact on the results. (Start and end tolerances over a short distance results in larger errors than over a longer distance).
4. The end location chosen (the impact point) is clearly identifiable, as plans and images of the scene clearly show the damaged guard rail that is impacted. Further, the vehicle is seen in the footage to react (twist) on impact, further placing the VOI at that location.

The difference between the start and end time stamps gives a duration of 4.241 seconds. To calculate an average speed over this duration, the only task remaining is to measure the distance the VOI has travelled between these chosen start and end points.

*Note: Immediately before the impact point, the VOI is sideways, and subsequently slowing (skidding). As the chosen speed measurement distance **includes** this 'slowing' section, the resultant average speed will be slower than the VOI's **peak** speed. (The peak speed and average would only be equal if the vehicle was travelling at a constant speed. Average speed can never exceed the peak speed). Subsequently, with the distance including the skidding, the calculated average speed will be conservative, with the actual peak speed being higher than this.*

Parting Trajectories.

It will be noted that the police and VOI trajectories do not follow exactly the same path. The police vehicle remains in the outside lane; hence its "measurements" are the shortest route to an impact line established across the road. The VOI takes a slightly longer curved path, travelling slightly further than indicated by the police car distances, hence travelling slightly faster than is calculated by the police car measurements. The resultant average speed measurement from this analysis will again be slightly conservative given this difference in trajectory path distances.

5. Superimposition of CCTV footage.

Superimposing the police and incident images enables comparative positioning of the VOI in relation to the police vehicle for distance measuring purposes. This superimposition is achieved using Photoshop CS5 software. The process involves aligning, (or 'registering') the police images to match the incident footage. In order to assist in retaining the police image resolution in this registration process, the police images were extracted from the original footage at double their native size (originally 384 x 288 pixels, extracted as 768 x 576 pixels). Through this technique, high frequencies in the image (i.e. sharp edges) are less affected by subsequent translation, rotation and scaling processes.

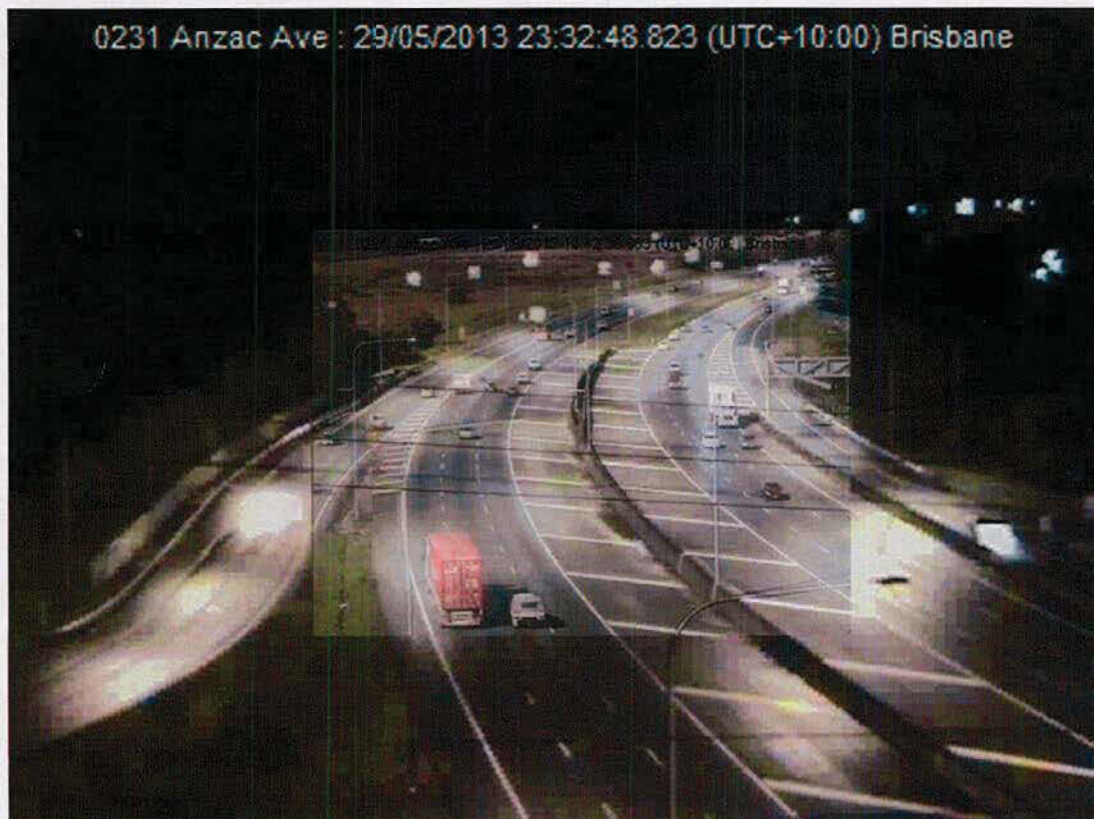


Figure 12. Day view superimposed (aligned) over night shot

Since the recorded incident footage is considerably 'zoomed out' in comparison with the recorded police footage, it is quadrupled in size from its native 384 x 288 pixels, to provide a base canvas size of 1536 x 1152 pixels. (The footage was originally extracted at double size, then doubled again using bicubic interpolation in ACDSee software V6.0). Figure 12 shows an example of the day footage superimposed (and aligned) over the night vision. With minimal adjustment, good alignment quality was achieved, with lamp posts, road markings, signs etc all lining up accurately.

Notes concerning the superimposition alignment:

- The camera is of the PTZ (Pan / Tilt / Zoom) type, and has had different zoom settings for the police and incident recordings. The daytime (police vehicle) footage was recorded "zoomed in", where as the night time incident recording has a wider field of view.
- As the same camera is being used it forms a single point source, allowing the correct overlay of the two images.
- Given it is the same camera providing both recordings, and that one is zoomed in compared with the other, the final success of the alignment is largely attributable to the quality of the lens. Significant lens distortion would have resulted in misalignment in portions of the image. This is not experienced with the footage provided, indicating it is likely a good quality lens.

6. Measured Distance - Start Location.

The start location chosen is image VOI-244. At this location the headlights from the VOI are most distinguishable from previous and subsequent images. On watching the vision, the headlights are clearly seen moving around the outside lane across and towards the camera.

Note: Events depicted in video recordings are significantly less clear when viewed as a collection of still images, or worse, as a single image alone. This is particularly the case when the vision is of poor quality. Still images extracted from vision are largely 'out of context', as information conveyed in video recordings is largely held in the sequence of events. Although the still images presented in this report are depicted as clearly as possible, significant further 'clarity' is obtained by being able to scroll forwards and backwards through the vision.

Figure 13 shows image VOI-244 with a single circle placed over the VOI's headlight 'glow'. The image is shown in full (i.e. not cropped). The accurate positioning of this circle requires the ability to magnify this section of the vision, **and** scroll between adjacent images. Under these conditions, the circle placement becomes considerably clearer.

To assist in this circle placement, additional circles are drawn around the headlight glow on the 3 images either side of image VOI-244. Using this technique, the overlapping circles indicate both the trajectory of the VOI, and spacing of its progress in time. At high speeds, it is not expected that either the trajectory or the vehicle's speed will change suddenly. Figure 14 shows the 7 circles superimposed on Image VOI-244.



Figure 13. Image VOI-244 with headlight circled

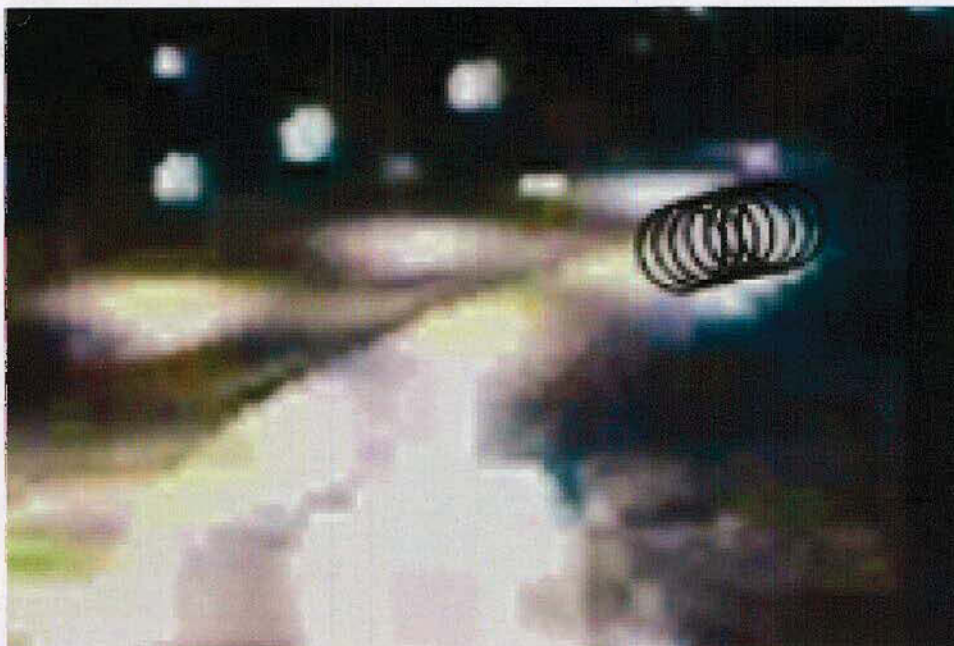


Figure 14. Seven consecutive headlight positions over central Image VOI-244.

Regarding the drawing of these circles:

- The size of the circle has been set at a uniform size that approximates that of the headlight glow (or 'ball' of light). Although the VOI is approaching the camera, the size of the headlight glow does not noticeably change due to the substantial distance from the VOI to the camera.
- The horizontal positioning of the circle (left to right) is set by the highest peak in the headlight 'ball'.
- The vertical positioning (height) of the circle is set to just touch the highest peak in the headlight glow 'ball'.

Figure 15 shows each of the 7 images centred on image VOI-244 (i.e. VOI images 241 to 247). The circle in each of these images is the headlight glow as located at image VOI-244. The sequence of images thus show the vehicle's headlight moving from before, through, and then after this image, with the circle correctly located over the headlight glow at image VOI-244.

Having (a) established a circle around the headlight of the VOI start image (244), and (b) maintaining alignment of both the day (police) and night (VOI) images, the circle can be displayed over the police images to estimate the point at which the police vehicle location matches the VOI position as located in image VOI-244.

In addition to estimating the most likely matching position, a tolerance of before and after positions can be determined. This is aided by the VOI headlight circle - as the tolerance extremities can be established as the points at which the police vehicle enters and exits this circle. Figure 16 shows the police vehicle (A) entering the circle, (B) centred in the circle, and (C) exiting the circle.

The following points summarise the positioning of the police vehicle:

1. Image P-1129 has the front of the police vehicle just entering the circle. It would be expected at this point that if the police footage was at night with headlights on, that a significant portion of the vehicle's headlights would be outside the VOI light circle. If the police vehicle were earlier than this point, it would be expected that the police vehicle's headlight 'ball' would be significantly to the right of (and thus out of alignment with) that seen in image VOI-244. (See Figure 16, image A). Although car headlights are forward of the vehicle, it is not expected that the headlight 'ball' of light would peak (or be centred around) a point several car lengths in front of the vehicle.
2. Given the VOI light circle, police image P-1135 places the front of the police vehicle centrally under the peak of the light circle. This is the best match of VOI and police vehicle location. (See Figure 16, image B).
3. Image P-1142 has the police vehicle exiting the VOI light circle to the left. At night, the police headlights would extend further to the left, and not be biased to the rear of the vehicle only. The police vehicle's headlights would be centred outside the VOI image (244) ball at locations past this point. (See Figure 16, image C).



Image VOI-241



Image VOI-242



Image VOI-243



Image VCI-244



Image VOI-245



Image VOI-246



Image VOI-247

Figure 15. The 7 VOI images centred around image VOI-244 (circled).



A. Police image P-1129 - Police vehicle entering circle



B. Police image P-1135 - Front of police vehicle central to circle.



C. Police image P-1142 - Police vehicle exiting circle.

Figure 16. Police vehicle in relation to Image VOI-244 light circle.

From these observations, the police vehicle is determined as being in alignment at image P-1135, with a tolerance of -6 images (earlier) and +7 images (later).

It will be noted that in police image P-1135 (Figure 16-B) that the front of the police vehicle is central to the circle *horizontally*, but not *vertically*. Vertically, the police vehicle is positioned slightly above the horizontal centre. As the VOI is in the same lane as the police vehicle at this point, and that the headlight height above the road for the two vehicle's are unlikely to be significantly different, the vertical offset is attributed to the wet conditions, resulting in a lower extension of the light glow due to reflected light off the wet road.

7. Measured Distance - End Location.

For clarity purposes, the chosen end location of the measurement distance is the point at which the VOI impacts with the guard rail. In the VOI footage, this point is clearly observable, as the vehicle rotates clockwise on impact, with the vehicle's headlights clearly seen sweeping forward.

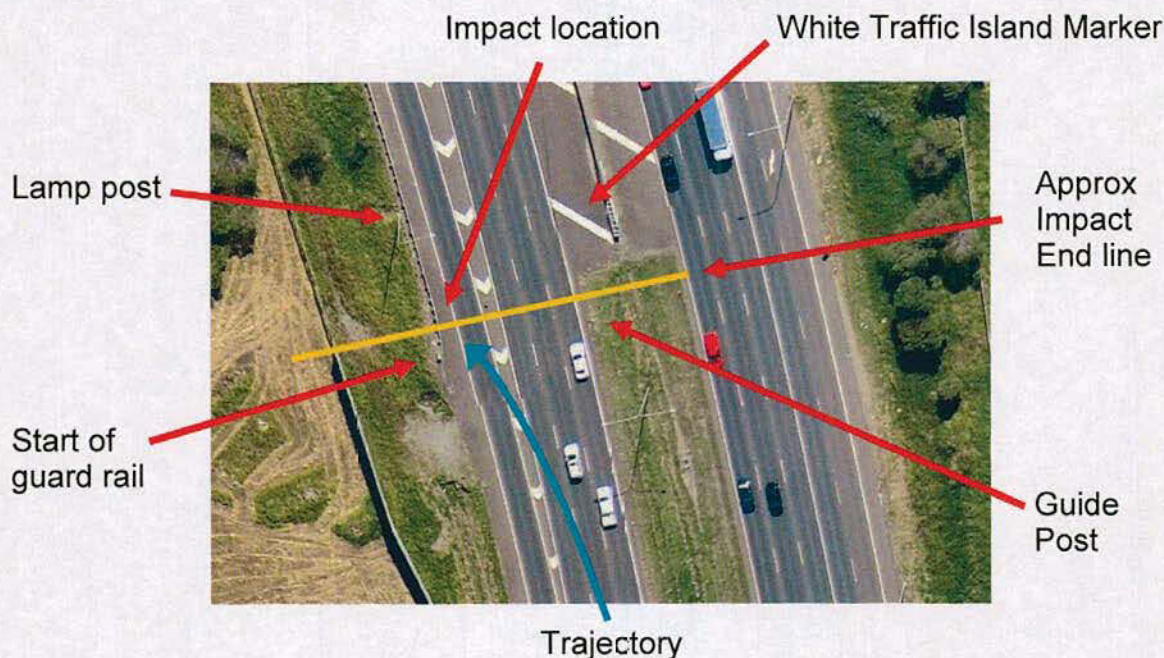


Figure 17. Nearmap image of the impact location.

Figure 17 shows the impact location, with a yellow line squarely across the road denoting the end of the measurement distance. Key items located in this image are:

- **Start of guard rail.** The VOI impacts with the guard rail, and therefore has not exited the road earlier than this point.
- **Lamp Post.** From a conversation with PCSC Judd, the lamp post is struck by the end of the guard rail as it is folded back, but is not damaged by the VOI itself. The lamp post remains standing, but the video footage shows the light extinguishing with the impact.
- **Guide Post.** The guide post on the traffic island is in alignment with the guard rail. In this analysis, it is used to help position the police vehicle.
- **Traffic Island marker.** The diagonal white line indicated is in approximate alignment with the lamp post, and represents a point past the impact location. It is used to assist in positioning the police vehicle.

The exact physical impact location is not clear, but can be positioned to within the first several metres of the guard rail. Figure 18 shows the damage to the guard rail, as photographed the day after the incident. It can be seen that the guard rail has been folded back, sheering off at least the first 7 support posts. It would appear the vehicle did not traverse the guard rail past approximately the 8th support.

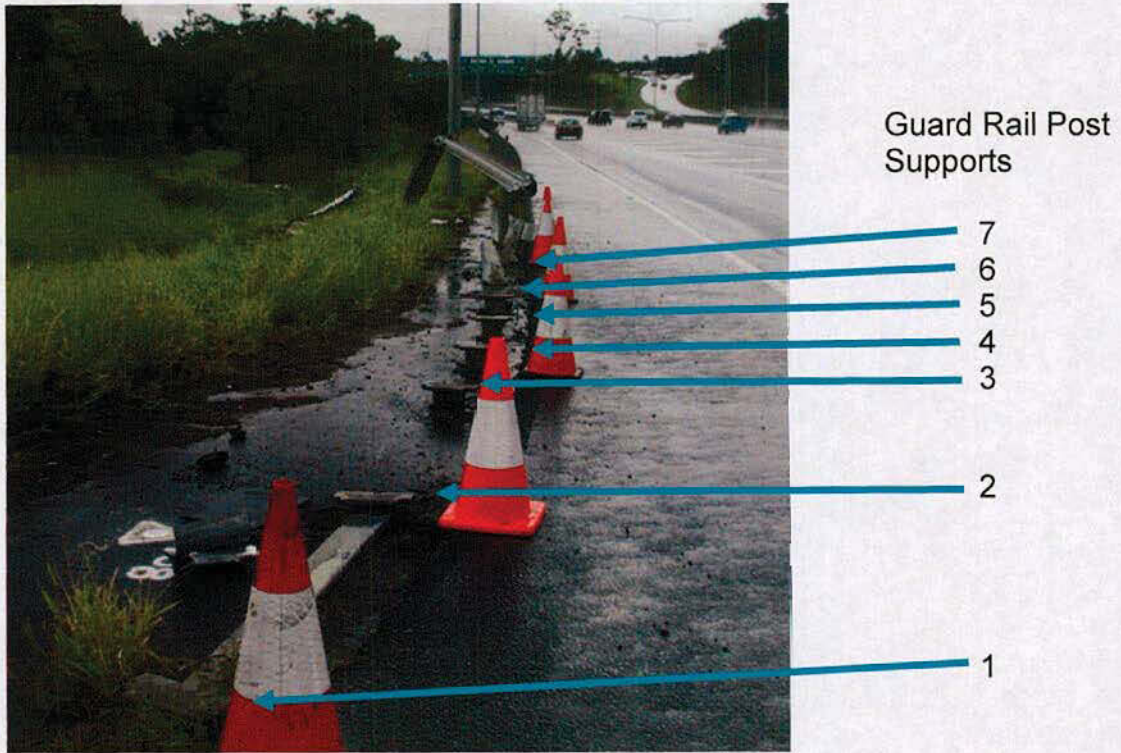


Figure 18. Damage to guard rail.

Figure 19 shows the same guard rail on plan, but prior to the incident. The 7 supports are indicated, which occupy approximately the first 8 metres of the guard rail.

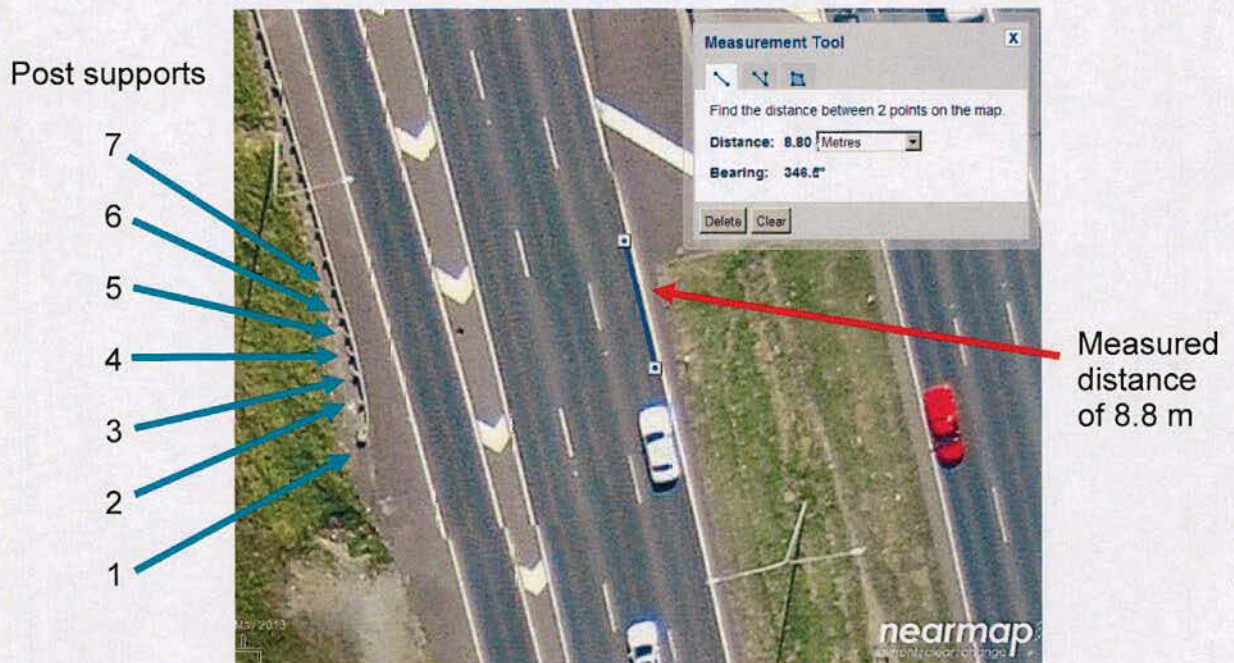


Figure 19. Impact guard rail and measurement

Also indicated in Figure 19 is a distance measurement of 8.8 m from the guide post. This distance is chosen as encompassing the 5 chosen 'end' police images, covering 4 x spans of 2.2222 m each.

Figure 20 shows the end locations for both the police vehicle and the VOI. The two columns of images (police vehicle on the left and VOI on the right) are not especially intended to be in horizontal alignment, but rather to show images that are clearly before and after the impact for each vehicle. In respect of these images:

Police images:

1. The police vehicle images start with the front of the police car in approximate alignment with the guide post (Image P-1240). As this is in alignment with the start of the guard rail, this is the earliest alignment of the police vehicle with the impact location.
2. The last police vehicle location (Image P-1244) is 4 images further on from image P-1240. At 2.2222 m per image span, this equates to a distance travelled by the police vehicle of 8.8888 m. As this is in approximate alignment with the last damaged guard rail support, this is the latest alignment of the police vehicle with the impact location.

VOI images:

3. VOI Images 295, 296 and 297 have the vehicle skidding into the guard rail. From the CCTV footage, it is not clear exactly when the impact occurs.
4. In image VOI-298, the headlights are seen to start sweeping clockwise (towards the camera). Clearly at this point the vehicle is reacting to the force of impact with the guard rail, and that the impact has thus occurred prior to this point.
5. The last VOI image chosen (VOI-299) shows the vehicle even further twisted clockwise from the impact.

Given that the VOI twists at image 298, VOI image 297 is picked as the impact point. This choice is conservative, as picking an earlier image as the impact point (e.g. image 295) will result in a shorter time period to cover the calculated distance, thus resulting in a higher calculated average speed.

8. Image Timings.

An important consideration is the timing of the images. It is not sufficient to simply accept the On-Screen Display (OSD) timing information on the recorded CCTV footage, as the CCTV system may have re-packaged the image sequence received from the video camera into its own timing intervals. The following is an investigation into the validity of the OSD image timings. Establishing that the camera is a PAL camera assists greatly in validating the image timings. The following points are noted:

- TMR confirmed that the camera that recorded the incident and police drive-through footage is a PAL analogue camera. This means the raw signal from the camera is producing 50 PAL fields per second with a high degree of stability (as dictated by this format).

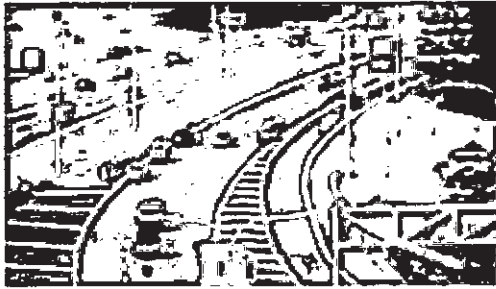


Image P-1240

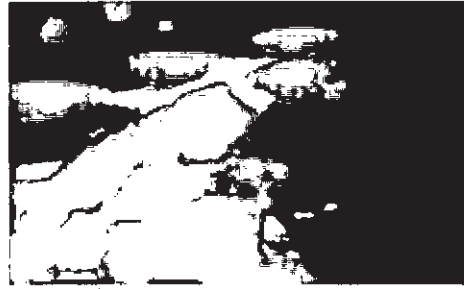


Image VOI-295

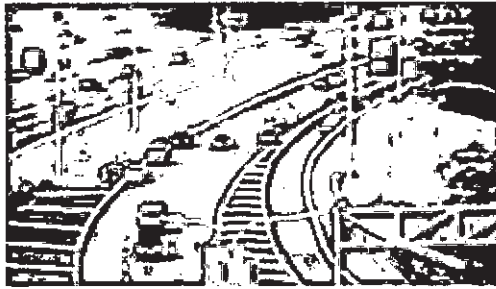


Image P-1241



Image VOI-296

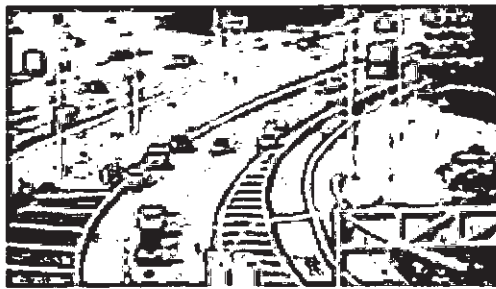


Image P-1242



Image VOI-297

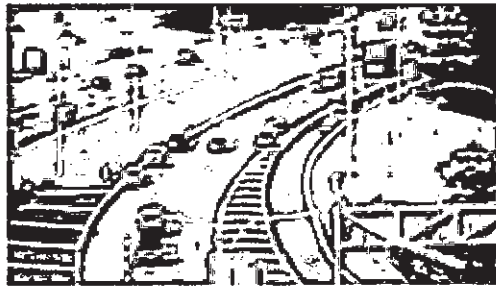


Image P-1243



Image VOI-298



Image P-1244



Image VOI-299

Figure 20. End location police (left) and VOI Impact (right) images.



Image P-1240



Image VOI-295



Image P-1241



Image VOI-296



Image P-1242



Image VOI-297



Image P-1243



Image VOI-298



Image P-1244



Image VOI-299

Figure 20. End location police (left) and VOI Impact (right) images.

The DVR picks out the fields (or frames) it is programmed to record, and these will have to be in temporal increments of 0.02s (1/50th of a second) regardless of what the DVR later labels them. For the majority of both of the submitted recordings, this appears to be every fourth field, giving intervals (temporal spans) of 0.08 seconds.

- The supplied files both have a pixel resolution of 384 x 288. This is half height and half width of a standard PAL video signal (768 x 576). This shows further strong consistency with the camera being of a PAL format.

Reported Frame Rates.

In Figure 6, it can be seen that the police footage frame rate is 12.5 fps. This is exactly half of 25 fps, and shows further consistency with a PAL camera source. This frame rate is subsequently consistent with the OSD documenting that images are 0.08 seconds apart. In Figure 3 however, the incident footage is reported as having a frame rate of 12.473 fps - a difference of 0.22%. This indicates that over the duration of the VOI file (18m 34.927s) some frames have been "dropped", giving a slightly lower overall frame rate.

It is important to note that although the overall frame rate indicated may be numerically lower, the actual frame rate may still be accurately 12.5 fps, but with an occasional image not being recorded (i.e. dropped). As the source is a PAL camera, this is likely the case here.

The incident file contains 13906 images. Although unimportant, it is noted that the first image (image "0") is a blank black key frame, whilst image "1" is the first actual image at 0.08 seconds into the file. Further, image "0" has an unrelated OSD time set approximately 10 hours earlier. Ignoring image "0" allows the image numbers to match the number of spans between images - for example image "1" occurs at 0.08 s after the beginning of the file, and the 10th image occurs after 10 x 0.08 s (or 0.8 s), etc. There are subsequently only 13905 images showing valid content, and at 0.08 s spacing, this should take 1112.4 seconds (18m 32.4s). The clip's actual duration is 18m 34.884s (1114.884) seconds, which is 2.484 seconds longer than expected. By these calculations, at 12.5 fps there would appear to be approximately 31 frames dropped over the duration of the recording.

In searching for these dropped frames, the frame rate and image sequences of both the police and VOI recordings are investigated. The following points are observed.

- In the police drive-through recording, the police vehicle is seen in the vision between police images P-1117 to P-1370. Over the course of these images, there are four incidences where the image timings are out by 0.001s (1ms), but in each case immediately revert back to their correct timings. Minor timing shifts of this nature are generally referred to as jitter. As the minimum resolution is in milliseconds, a shift to the adjacent millisecond is acceptable, as the true time location may be extremely close to the boarder of these two values. This type of error adds confirmation concerning the image timings, by revealing that the errors are of a very small nature, and that they have been included in the OSD. Of the four timing shifts noted, only one occurs within the distance span used to measure the VOI speed (P-1129 to P-1244). This is image P-1236, where the

value is out by 1ms. No compensation is needed, as the next image pulls the values back into alignment.

- In the incident recording, the VOI is seen in the vision from images VOI-236 to VOI-319 (at which point the VOI has become stationary). Over the course of these images, the image timing drifts by +1ms. Initially, image VOI-276 is out by +1ms (but then reverts back to correct timing), and then from VOI-279 onwards all images are out (offset) by +1ms. Again, this drift of 1ms is not unexpected, being the smallest movement possible (i.e. the least significant digit of measurement).
- Note that for both recordings, by the time their respective sections of interest have finished (i.e. the VOI is past the impact point, and the police vehicle has exited the vision), apart from 1ms jitter, neither recordings had faltered from the standard 12.5 fps rate, and no dropped frames were detected.
- Given that the police footage reports a frame rate of exactly 12.5 fps, and that no dropped frames were detected up to the point the police vehicle has exited, the police footage is not analysed further concerning its frame rate. It is consistent with being valid.
- The first disparity in the VOI footage is found at image VOI-860, where the OSD jumps 120 ms instead of the expected 80ms. This gives a loss of 40ms, or 1/25th of a second, which equals 2 PAL fields dropped. Note that this point is approximately 45 seconds after the VOI impact.
- From VOI-865 to 866 a further 194ms jump is noted. As an 80ms jump is expected, this jump is -6ms away from a drop of 6 PAL fields (i.e. 114ms have been dropped).
- From VOI-870 to 871 a further 103ms jump is noted. Again, as an 80ms jump is expected, this jump is +3ms away from a drop of 20ms or 1 PAL field.
- Having observed some temporal jumps larger than 80ms (explaining the reduced frame rate of 12.473 fps), and noting that none of these jumps occur before the VOI comes to rest after the incident, the remaining jumps in the recording were not investigated.

In the incident footage, the above points indicate that some images are being dropped, and that these occur after approximately 1 min and 8 seconds into the VOI recording (or approx 45 seconds after the VOI impact). By the end of the recording (at 18 min 34.844 sec), approximately 31.05 frames have been dropped. This represents a dropout rate of 0.22%.

Summary of image timings:

It is established that the camera is a PAL unit, producing 50 fields per second. This indicates images *must* occur at integral multiples of 0.02s. Some jitter (e.g. 1ms) is acceptable, as this is the least significant digit in specifying the timing accuracy.

The majority of both the police and VOI footage is consistent with image intervals of 0.08 s. This is consistent with every 4th PAL field. The base frame rate of both recordings is thus 12.5 fps, with some temporal jumps (dropped frames) occurring.

Within the target areas of both the incident and police drive through recordings, shifts of only 1ms are observed (i.e. no dropped frames in these timeframes were found).

The dropped frames in the VOI footage do not occur during the actual incident. These dropped images do not indicate a flaw in the system, and are not uncommon in CCTV systems where motion sensing or other event priorities result in sporadic images not being recorded.

The resultant reported frame rate for the VOI footage of 12.473 fps comes from an overall calculation of the file (i.e. by dividing the time period by the total number of images). This results in an *average* frame rate, that is lower than the actual frame rate (which is governed by the camera specifications - in this case PAL image timing).

9. Speed Calculation.

The following calculations determine an average speed for the VOI, with the key tolerance being the ability to match the police vehicle locations with the VOI start and end points.

Time:

1. From the incident CCTV footage, a start and end point are chosen, from which to measure speed. These two points are image VOI-244 and VOI-297. By subtracting the two time stamps on these images, the time taken by the VOI to traverse that distance is calculated.

52.664 s	Time stamp at image VOI-297
- 48.423 s	Time stamp at image VOI-244

4.241 s	Duration between time stamps.

2. As the system uses a PAL camera, the images should be integral multiples of 0.02 seconds. As previously noted, there is a jitter offset of 1ms from image VOI-279 onwards.

By removing the 1ms jitter, the true temporal duration is thus : 4.24 s

Distance:

3. The police vehicle is travelling at 100 km/h. This equates to 27.7777 m/s.
4. The CCTV footage consists of new successive images every 0.08 seconds (or once every 4 PAL video fields), which equates to 12.5fps.
5. At 27.7777 m/s (100 km/h), the police vehicle thus moves 2.2222 m with each successive video image (27.7777 m x 0.08 s).
6. The VOI start location is equated to police image P-1135, whilst the end location is equated as image P-1242. Subtracting these gives 107 spans.
7. 107 Spans at 2.2222 m per span gives a total distance of 237.77 m.

Speed:

- The VOI has thus travelled 237.77 m in 4.24 s, which equates to 56.07 m/s, or 201.88 km/h.

Tolerances:

Given the fixed VOI images and times, the tolerances are generated by the approximations of the police vehicle locations when compared to the chosen VOI start and end locations.

- The 'fast' tolerance (given the fixed time duration of 4.24s) is found by using the longest distance. In this case it is from the earliest possible equivalent police vehicle position before the start point (image P-1129) to the latest possible equivalent position at the impact location (image P-1244). Subtracting these two gives the maximum distance of 115 spans.

At 2.2222m per span, this gives a distance of 255.55 m. Over the time period of 4.24s, this gives a speed of 60.27 m/s, or 216.97 km/h. This therefore represents the 'fastest' average speed.

With the main average speed estimate being 201.88 km/h, the 'fast' tolerance is thus 15.09 km/h (or 7.47%) faster than the main estimated average speed.

Figure 21 shows the distance measurements diagrammatically, including the tolerances.

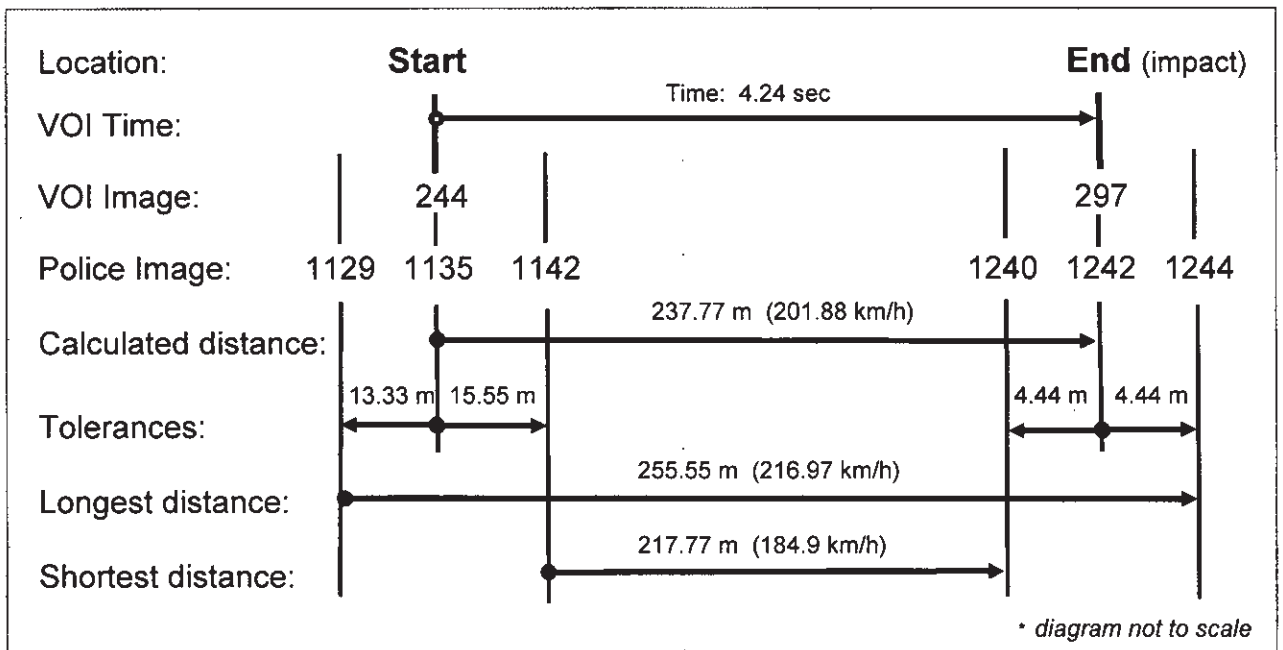


Figure 21. Diagrammatical representation of measured distance tolerances

- 2. The 'slow' tolerance is found by using the shortest possible valid distance. In this case it is from the latest suggested police vehicle position before the starting point (image P-1142) to the earliest possible position at the impact location (image P-1240). Subtracting these two gives 98 spans.

At 2.2222 m per span, this gives a distance of 217.77 m. Over a time period of 4.24 s, this gives a speed of 51.36 m/s or 184.9 km/h.

With the main speed estimate being 201.88 km/h, this 'slow' tolerance is thus 16.98 km/h or 8.41% slower than the main estimated average speed.

- 3. For convenience, the two tolerances (fast and slow) are rounded out to a common $\pm 8.5\%$
- 4. Advice from PCSC Judd is that the police vehicle maintained 100 km/h to within an accuracy of 2%. This extra 2% variance is thus added to the above calculated tolerance, to give a total tolerance of $\pm 10.5\%$. At 201.88 km/h, this gives a tolerance of ± 21.19 km/h.

As a result of the speed calculations indicated above, the VOI average speed (including tolerances) over the chosen distance is determined as:

201.88 \pm 21.19 km/h.

This figure is an average speed over the distance used, and for reasons outlined throughout this report, will be conservative compared to the peak vehicle speed.

The minimum average speed is thus 180.69 km/h, with a maximum average speed of 223.07 km/h

Verifications:

The following points are noted re the calculations etc:

- 1. At 100 km/h (27.7777 m/s), the police vehicle should have traversed the 237.77 m in 8.559 seconds (237.77 / 27.7777). Subtracting the time stamps on the start image (P-64) and the end image (P-171) should concur with this.

36.543 s	Timestamp at image P-171 (end)
- 27.983 s	Timestamp at image P-64 (beginning)

8.56 s	Duration (police vehicle over the measurement distance).

On comparison to the on-screen time stamps, the timing is accurate to 1 ms.

- 2. Over the 237.77 m, the police vehicle took 8.56 s, whilst the VOI took 4.24 s (based on 0.08 s PAL timing). As a ratio, the police vehicle takes 2.0188 times longer to traverse the distance than the VOI. This ratio correlates with the police vehicle travelling at 100 km/h, and the VOI averaging 201.88 km/h (100 km/h x 2.0188).

To aide in visualising the VOI speed in comparison to the police vehicle, Appendix A contains a further Distance Travelled Comparison analysis. In Figure A4, it can clearly be seen that the VOI has a considerable distance to catch up, in order to arrive at the impact line at the same time as the police vehicle which is travelling at 100 ± 2 km/h. See Appendix A for details.

10. Conclusion

From recorded CCTV footage, this analysis calculates the average speed of a vehicle travelling north on the Bruce Highway that is involved in a single vehicle incident. The vehicle's average speed is calculated over a chosen section of the vehicle's path. The start and end points are chosen based on (a) the clarity of the images, (b) the ability to determine the location of these points, and (c) having a sufficient measurement distance for accuracy. The distance and time components are calculated as follows:

- *Distance:* The distance between the chosen measurement start and end points in the VOI footage is calculated by superimposing extra footage of a police vehicle driving through the scene at a constant 100 km/h. Knowing the police vehicle's speed and image timings, distances can be extrapolated. Through this technique, the measurement distance is calculated at **237.77 m**.
- *Time:* The time taken by the VOI to traverse the measurement distance is calculated using the time display on the CCTV footage. This timing information is confirmed as being consistent with a derivative of PAL video signal timings. The VOI takes **4.24 s** to traverse the distance.

Using these distance and time values, this analysis calculates the average speed of the VOI (including tolerances) as **201.88 ± 21.19 km/h**.

It should be noted that this figure is an average speed, and includes the entire portion of footage where the VOI is skidding sideways and is (therefore) slowing prior to impact. The peak speed (with its associated tolerances) will thus be higher than this calculated average speed.



Tim Woodcock
Forensic Recording Analyst
Technical Officer Grade 4

11. References

- Damjanovski, Vlado. "CCTV – Networking and Digital Technology" Second Edition 2005, ISBN-13: 978-0-7506-7800-1. Elsevier.
- Hoogeboom, Bart and Alberink, Ivo. "Measurement Uncertainty when estimating the Velocity of an Allegedly Speeding Vehicle from Images". Journal of Forensic Sciences, Sept 2010, Vol 55, No.5.
- Cathey, F.w. and Dailey, D.J. "A Novel Technique to Dynamically Measure Vehicle Speed using Uncalibrated Roadway Cameras". Dpt. Of Electrical Engineering, University of Washington, Seattle, USA.
- Rahim, H.A., Sheikh, U.U., Ahmad R.B., and Zain, A.S.M. "Vehicle Velocity Estimation for Traffic Surveillance System". World Academy of Science, Engineering and Technology 45, 2010, p766.

12. Appendix A. Distance Travelled Comparison.

As a further evaluation of the VOI speed, a visual comparison is made between the distance travelled over a set period of time by (a) the police vehicle (at 100 km/h) and (b) by the VOI. Both vehicles are "moved back" from the impact location by the same time period, and their relative positions are visually compared. (A different measurement time period is used than that of the main analysis).

Note: The comparison is a visual depiction only, with no attempt being made to determine actual distances.

The time period chosen is the duration from the earliest point at which the VOI is seen, to the point of impact. This equates to 4.88 seconds. The police car and VOI's locations are subsequently identified at 4.88 seconds back from the impact point, and these two locations are visually compared by superimposing the images. The process is conducted as follows:

VOI:

1. The VOI enters the CCTV vision at image time 47.783 s (image VOI-236). This is 4.881 seconds prior to the impact point at 52.664 s (image VOI-297).

Figure A1 shows the VOI first appearing in image VOI-236.

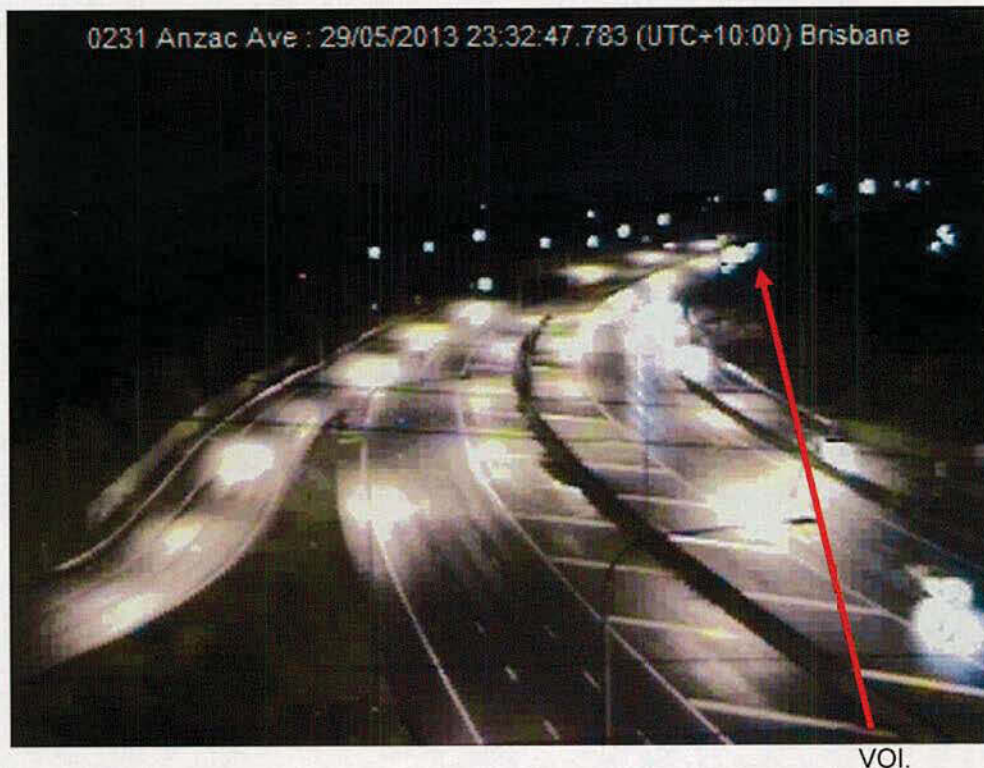


Figure A1. VOI first seen (image VOI-236), time stamped 47.783 s

- From VOI images 236 to 297, there are 61 spans between the images. Each span is 0.08 seconds, hence $61 \times .08 \text{ s} = 4.88 \text{ s}$. This correlates to within 1 ms of the time difference indicated in point 1 above, indicating the time on screen and the "0.08 s per span" information agree. (0.08 s per span is half the standard PAL video signal rate of 25 frames per second). The 1 ms (being the least significant digit) is an acceptable jitter figure.

Police vehicle:

- The police vehicle travelling at 100 km/h travels 27.7 m/s, or 2.2222 m in 0.08 seconds (1 span).
- At the point of impact, the police vehicle is positioned at approximately police image P-1242. Moving backwards from this image by 61 images (or 4.88 s) puts the police vehicle at police image P-1181, or 135.55 m prior to the impact point ($61 \times 2.2222 \text{ m}$). Figure A2 shows the police vehicle location at image P-1181.



Figure A2. Police vehicle location in image P-1181

- By comparing (overlying) police image P-1181 and VOI image VOI-236, a visual comparison of the relative vehicles locations 4.88 seconds prior to the impact location can be made. Figure A3 shows the two images overlaid in their full size, whilst Figure A4 shows the same image cropped into the area of interest. In this last image, the two vehicles and the impact line are indicated.



Figure A3. Superimposed images (VOI-236 & P-1181).



Figure A4. Both vehicles 4.88 seconds before they reach the impact line.



Coronial Investigation: QP1300633856

Fatal Traffic Accident, Bruce Highway Northlakes
on 29/05/2013.

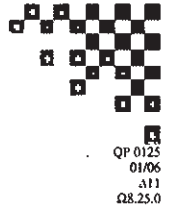
Sch4/3/3

INVESTIGATING OFFICER:

Plain Clothes Senior Constable Simon JUDD
Pine Rivers CPIU.



QUEENSLAND POLICE SERVICE
STATEMENT OF WITNESS



Occurrence #: QP1300633856

Statement no.: 1

Date: 30/05/2013

Statement of

Name of witness: HAHNE, ANTHONY JAMES

Date of birth: Sch4/3/3

Age: [REDACTED]

Occupation: AMBULANCE OFFICER

Police officer taking statement

Name of police officer: ROSSNER, James Stephen

Rank: Detective Senior Constable

Reg. no.: 8822

Region/Command/Division: Metropolitan North Petrie

Station: Pine Rivers District CIB

Statement:

Anthony James HAHNE states:

1. [REDACTED]
[REDACTED] I am employed as an Advanced Care Paramedic Level 2 and work on road as an on road paramedic.
2. [REDACTED]
3. [REDACTED]
4. I was travelling northbound on the Bruce Highway and at about 100m or so back from the Anzac Avenue turnoff I noticed debris strewn all across the road. I pulled my vehicle over to the left hand side of the road. [REDACTED]
[REDACTED]
5. As I exited my vehicle I noticed a sedan a fair way down the embankment and observed that it had caught fire and was burning around the rear of the vehicle underneath the boot. Around this time I rang triple zero on my mobile phone which is [REDACTED]

[Signature]
(Witness's signature)

(Justice of the Peace (Qual.)/
Commissioner for Declarations's signature)

[Signature]
(Signature of police officer preparing statement)

CONTINUED STATEMENT OF: HAHNE, ANTHONY JAMES

- 28. I also believe there was an RACQ mechanic there and he had deployed his amber flashing lights on the highway.
- 29. I had no further involvement in this matter and later attended at Petrie Police Station on the 30th of May 2013 and provided a statement to police.

.....
Anthony James HAHNE

Justices Act Acknowledgement

Justices Act 1886

I acknowledge by virtue of section 110A(6C)(c) of the Justices Act 1886 that:

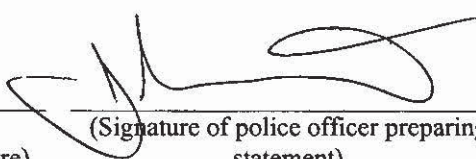
- (1) This written statement by me dated 30/5/2013 and contained in the pages numbered 1 to 4 is true to the best of my knowledge and belief; and
- (2) I make this statement knowing that, if it were admitted as evidence, I may be liable to prosecution for stating in it anything that I know is false.

..........Signature

Signed at Petrie this 30th day of May 2013

(Witness's signature)

(Justice of the Peace (Qual.)/
Commissioner for Declarations's signature)



(Signature of police officer preparing
statement)



QUEENSLAND POLICE SERVICE
STATEMENT OF WITNESS



Occurrence #: _____

Statement no.: One Date: 12/07/2013

Statement of

Name of witness: CALLEN, Barry Michael

Date of birth: Sch4/3/3 Age: Occupation: Intensive Care Paramedic

Police officer taking statement

Name: JUDD, Simon

Rank: Plain Clothes Senior Constable Reg. no.: 4018527

Region/Command/Division: Brisbane Region Station: Petrie CPIU

Statement: |
|
|

I Barry Michael Callen states:

1. 

2. On the evening of the 29th of May 2013, I was rostered to perform duty from 7pm until 7am the 30th of May 2013. I was rostered to work as the intensive care paramedic for Brisbane North in a sedan responding from North Lakes Ambulance Station designated A5175.

3. At approximately 2330 while at the ambulance station in Gregor Road in North Lakes I was alerted via pager of incident northbound on the Bruce Highway at the Anzac Avenue off ramp. I proceeded to the given address travelling with lights and siren on.

4. I arrived at the scene at approximately 23h30. I entered the Bruce highway from the off ramp heading southbound. The off-ramp had been closed by the Queensland Police Service (QPS). I immediately observed, while still travelling a vehicle off the highway in bushland next to highway to be upright and on fire I parked the Sedan facing traffic totally obstructing the lane and closing the road. An ambulance was parked in front of me and a QPS vehicle was on the

(Witness's signature)

(Justice of the Peace (Qual.)/
Commissioner for Declarations's signature)

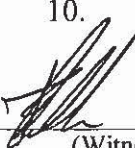
(Signature of police officer
preparing statement)

CONTINUED STATEMENT OF: **CALLEN, Barry Michael**

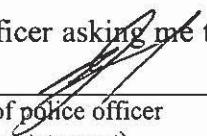
verge of the highway. The vehicle on fire was completely alight and small explosions were happening inside the car. I instructed the QPS officer on scene to remove all bystanders and secure the highway. I got back into my vehicle to ensure the Queensland Fire and Rescue Service (QFRS) had been dispatched and to report the vehicle was on fire.

5. I walked further southbound along the highway and found two QAS officers: Branch and Peters, treating two young male persons. I performed a rapid examination on them and on finding no immediate life threatening injuries instructed them to be removed from the verge of the highway in the rain into the ambulance for better examination and warming. At this point I was informed there was still a male person in the vehicle. The vehicle was still burning strongly and would be extremely dangerous to approach. I was also informed 3 other occupants had absconded from the accident scene on foot. I made sure QPS was aware of this fact.
6. QFRS arrived on scene and extinguished the fire; the fire officer approached me and informed me there was a person in the rear of the vehicle who was deceased.
7. I continued to co-ordinate the incident from the QAS side, a second ambulance from Deception Bay station with Officers Patch and Tarrant arrived. I asked for one of the young males to be transferred into that ambulance for assessment and treatment. Both male patients were under 16 years old and had minor injuries.
8. A QPS officer approached me and informed me that two of the occupants had been found at the BP service station on Anzac Avenue North Lakes and a QAS ambulance was assessing them. I asked for the police to have that ambulance move back to the incident so I could assess those persons.
9. The Ambulance that arrived from the BP service station was a vehicle from Petrie Ambulance Station staffed by Officers O'Neill and Hunter. In their vehicle were two persons. One male, one female neither who was serious injuries. The female patient was sitting in the seat wrapped in a blanket with no apparent injuries while the male patient who was older than 15 had superficial minor injuries.

10. I left all communication and treatment of all the patients to the relevant officers on each vehicle and while overseeing this I was once again approached by a QPS officer asking me to


(Witness's signature)

(Justice of the Peace (Qual.)/
Commissioner for Declarations's signature)


(Signature of police officer
preparing statement)

CONTINUED STATEMENT OF: CALLEN, Barry Michael

assess the last occupant who had been found by QPS on foot south of the incident on the Bruce highway. The male person was in the rear of a police car, he exited the vehicle by himself when asked, was able to answer my questions proving himself orientated to time and place. He informed me he had been the driver and remembered the incident. On assessing him I was not able to find any injury's, he declined any assistance and I left him in the care of the QPS.

11. After ensuring all persons were accounted for and none were seriously injured I instructed the QAS officers driving the vehicle to proceed to hospital. The North Lakes and Deception Bay ambulances were sent to the royal children's hospital due to the ages of the patients while the Petrie ambulance was sent to the Royal Brisbane Hospital.

12. I ensured QPS were aware of which hospital which patient was going to and handed the scene over to the officer in charge.



Justices Act Acknowledgement

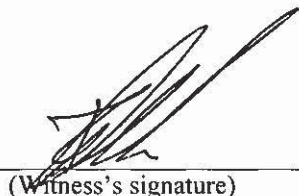
Justices Act 1886

I acknowledge by virtue of section 110A(6C)(c) of the Justices Act 1886 that:

- (1) This written statement by me dated 12/7/2013 and contained in the pages numbered 1 to 4 is true to the best of my knowledge and belief; and
- (2) I make this statement knowing that, if it were admitted as evidence, I may be liable to prosecution for stating in it anything that I know is false.

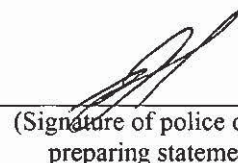
.....Signature

Signed at Petrie this 12th day of July 2013



(Witness's signature)

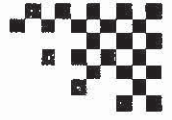
(Justice of the Peace (Qual.)/
Commissioner for Declarations's signature)



(Signature of police officer
preparing statement)



QUEENSLAND POLICE SERVICE
STATEMENT OF WITNESS



QP 0125
01/06
Δ11
•8.25.0

Occurrence #: QP1300633856

Statement no.: _____ Date: 5/7/2013

Statement of

Name of witness: BRANCH, MICHAEL JOHN

Date of birth: Sch4/3/3 Age: [redacted] Occupation: _____

Police officer taking statement

Name of police officer: MOORE, DAVID CAMERON

Rank: Sergeant Reg. no.: 4005199

Region/Command/Division: BRISBANE PETRIE Station: PETRIE CPIU

Statement:

Michael John BRANCH States:-

1. I am an Advanced Care Paramedic employed by the Queensland Ambulance Service. I am presently attached to the North Lakes Ambulance Station.
2. On Wednesday 29 May 2013 I was rostered on a 1400 to Midnight shift. I was working with Ben PETERS who is a Paramedic Student working out of North Lakes Station.
3. I remember that the weather during our shift had been raining on and off.
4. We had been at the Prince Charles Hospital in relation to another matter and were returning to the North Lakes Ambulance Station. We were travelling North on the Bruce Highway and had just crossed over the Pine Rivers Bridge when we received notification of a case being despatched to our Unit B5492.
5. At 11:37pm we received information from Comms to attend a RTC with entrapment multiple patients this being a road traffic crash with a number of persons trapped in the vehicle/s. The scene of the traffic crash was relayed as North Bound Bruce Highway just before the Anzac Avenue exit.

[Signature]
(Witness's signature)

(Justice of the Peace (Qual.)/
Commissioner for Declarations's signature)

[Signature]
(Signature of police officer preparing
statement)

40. On Friday 5 July 2013 I attended at the Petrie Police Station and provided this statement to Detective Sergeant Dave MOORE.



M J BRANCH

Justices Act Acknowledgement

Justices Act 1886

I acknowledge by virtue of section 110A(6C)(c) of the Justices Act 1886 that:

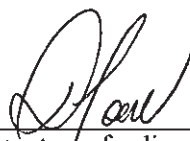
- (1) This written statement by me dated 5/7/2013 and contained in the pages numbered 1 to 5 is true to the best of my knowledge and belief; and
- (2) I make this statement knowing that, if it were admitted as evidence, I may be liable to prosecution for stating in it anything that I know is false.

.....Signature

Signed at ...Petrie.....this.....5th.....day of.....July.....2013.....

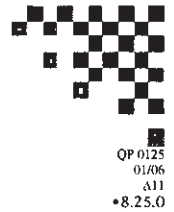

(Witness's signature)

(Justice of the Peace (Qual.)/
Commissioner for Declarations's signature)


(Signature of police officer preparing statement)



QUEENSLAND POLICE SERVICE
STATEMENT OF WITNESS



Occurrence #: QP1300633856

Statement no.: _____ Date: 23/07/2013

Statement of

Name of witness: TARRANT, CRAIG

Date of birth: Sch4/3/3 Age: Occupation: _____

Police officer taking statement

Name of police officer: MOORE, DAVID CAMERON

Rank: Sergeant Reg. no.: 4005199

Region/Command/Division: BRISBANE PETRIE Station: PETRIE CPIU

Statement:

Craig TARRANT States:

1. I am a Paramedic employed by the Queensland Ambulance Service and I attached to the Deception Bay Ambulance Station.
2. On Wednesday 29 May 2013 I was rostered on a night shift at the Deception Bay Station. I was rostered with Jessica PATCH who is also a QAS Paramedic.
3. At about 11:35pm we were at the Deception Bay Station when we received advice through the Despatch system of a RTC at The Bruce Highway, Northbound Off Ramp at North Lakes. PATCH and I then left the Station and Jessica drove our Unit. B374 to the RTC location.
4. We arrived at the scene about 10 minutes later. When we arrived I saw that there were already a number of emergency service vehicles at the scene. There were Police vehicles, Fire Brigade trucks and other QAS ambulances already at the scene.
5. We parked our ambulance on the Northbound lanes of the Bruce Highway behind the other Emergency Vehicles. I could see the crashed car to the left of highway, down an embankment quite some distance from the road. When we parked Barry CULLEN came up to us and briefed us on what was happening. Barry is an ICP Paramedic from North Lakes Station and was the QAS Scene Controller.

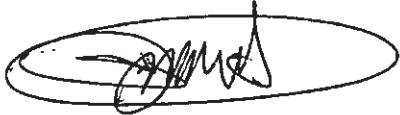
(Witness's signature)

(Justice of the Peace (Qual.)/
Commissioner for Declarations's signature)

(Signature of police officer preparing statement)

13. We then had no further contact with the patient and then left to return back to our Station.

14. On 23 July 2013 I attended at Petrie Police Station and provided this statement.



C TARRANT

Justices Act Acknowledgement

Justices Act 1886

I acknowledge by virtue of section 110A(6C)(c) of the Justices Act 1886 that:

- (1) This written statement by me dated 23/7/2013 and contained in the pages numbered 1 to 3 is true to the best of my knowledge and belief; and
- (2) I make this statement knowing that, if it were admitted as evidence, I may be liable to prosecution for stating in it anything that I know is false.

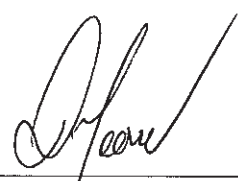


.....Signature

Signed at ...Petrie.....this.....23rd.....day of.....July.....2013...

(Witness's signature)

(Justice of the Peace (Qual.)/
Commissioner for Declarations's signature)



(Signature of police officer preparing statement)



QUEENSLAND POLICE SERVICE
STATEMENT OF WITNESS



Occurrence #: _____

Statement no.: One Date: 26/07/2013

Statement of

Name of witness: PATCH, Jessica Ann

Date of birth: Sch4/3/3 Age: Occupation: Paramedic

Police officer taking statement

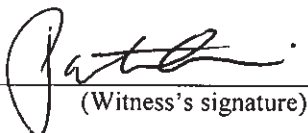
Name: JUDD, Simon

Rank: Plain Clothes Senior Constable Reg. no.: 18527

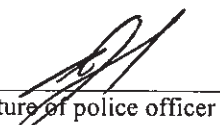
Region/Command/Division: Brisbane, Petrie Station: Petrie CPIU

Statement:

1. My full name is Jessica Ann PATCH.
2. I am a Paramedic with the Queensland Ambulance Service and have been for two years.
3. I am currently attached to the Deception Bay Ambulance Station.
4. I recall the events of the 29th of May 2013.
5. I was rostered with Paramedic Craig TARRANT working out of Deception Bay Ambulance Station. We were rostered from 7:00pm to 7:00am.
6. At approximately 11:35pm we were dispatched to attend a road traffic crash at the Bruce Highway at the off ramp to Anzac Avenue in the North bound lanes.
7. I was driving the Ambulance and we drove from the Station at Deception Bay to the accident scene.
8. I drove along Boundary Road, Deception Bay and then onto the Bruce Highway and headed south towards the location.


(Witness's signature)

(Justice of the Peace (Qual.)/
Commissioner for Declarations's signature)


(Signature of police officer
preparing statement)



QUEENSLAND POLICE SERVICE
STATEMENT OF WITNESS



QP 0125
01/06
Δ14

Occurrence #: _____

Statement no.: One Date: 24/07/2013

Statement of

Name of witness: LEMKE, Brian Frederick

Date of birth: Sch4/3/3 Age: Occupation: Station Officer

Police officer taking statement

Name: JUDD, Simon

Rank: Plain Clothes Senior Constable Reg. no.: 18527


Region/Command/Division: Brisbane, Petrie Station: Petrie CPIU

Statement:

1. My full name is Brian Frederick LEMKE. I am a Station Officer with the Queensland Fire and Rescue Service. I am currently stationed at Petrie Fire Station. I have been a fire fighter for 24 years.
2. I recall the events of Wednesday the 29th of May 2013. I was rostered 6:00pm to 8:00am. I was in charge of fire appliance 525A with a crew of three fire fighters working out of Petrie Fire Station.
3. At 11:39pm on that evening we responded to a vehicle on fire with a possible entrapment at the Bruce Highway and Anzac Avenue off ramp North Lakes.
4. We arrived at the scene in the North bound lanes at 11:46pm. I can recall that the road was wet at the time. On arrival I could see Police and Ambulance vehicles already in attendance.
5. I could see a car well involved in fire. The car was down an embankment off the highway and was upright on its wheels. I could see debris from the vehicle and damage to the guard rail on the highway.
6. The guard rail was folded back with a number of posts ripped out and a number of posts folded flat on the ground. The guard rail was folded back about 10 to 15 metres.
7. I instructed my fire officers to go into action with a high pressure hose line and breathing apparatus to extinguish the fire and search the vehicle. I also instructed them to use water with 'A' class foam to extinguish the fire. This was used due to the need to extinguish the fire rapidly.


(Witness's signature)

(Justice of the Peace (Qual.)/
Commissioner for Declarations's signature)


(Signature of police officer
preparing statement)

CONTINUED STATEMENT OF: LEMKE, Brian Frederick

21.



22.

23.

24. At this time the Police and Traffic Response Unit remained at the scene.

25. At different times during the incident I communicated to Firecomm situation reports. I have supplied a copy of the transmissions and times to police.

26. We returned to Petrie Fire Station and completed maintenance on the fire appliance. I also completed an Incident Report at this time.

27. I have supplied a copy of that incident report to police.

28. On the 24th of July 2013 I supplied this statement to police.

Brian LEMKE

Justices Act Acknowledgement

Justices Act 1886

I acknowledge by virtue of section 110A(6C)(c) of the Justices Act 1886 that:

- (1) This written statement by me dated 24/07/2013 and contained in the pages numbered 1 to 3 is true to the best of my knowledge and belief: and
- (2) I make this statement knowing that, if it were admitted as evidence, I may be liable to prosecution for stating in it anything that I know is false.

.....Signature

Signed at Petrie this 24th day of July 2013.

(Witness's signature)

(Justice of the Peace (Qual.)/
Commissioner for Declarations's signature)

(Signature of police officer
preparing statement)



QUEENSLAND POLICE SERVICE
STATEMENT OF WITNESS



Occurrence #: QP1300633856

Statement no.: 1 Date: 31/05/2013

Statement of

Name of witness: JONES, Renee

Date of birth: _____ Age: _____ Occupation: Police Officer

Police officer taking statement

Name: JONES, Renee

Rank: Senior Constable Reg. no.: 15105

Region/Command/Division: Metropolitan North Station: Mango Hill North Lakes

Statement:

Renee JONES states:

1. I am a Senior Constable of Police currently attached to the Mango Hill North Lakes Police Station.
2. I can recall Wednesday the 29th of May 2013. I was rostered to work a general duties shift commencing at 10pm on the 29th of May 2013 and ending at 6am on 30th May 2013. I was rostered to work in the company of Constable Peter BELLARS for this shift.
3. At about 11:43pm on the 29th of May 2013. Constable BELLARS and I were detailed by Police Communications to attend a single vehicle traffic crash on the northbound Anzac Avenue exit of the Bruce Highway at Murrumba Downs.
4. As I drove down the southbound on ramp at this location I observed a vehicle on fire down an embankment beside the north bound exit of the highway. I also observed several vehicles parked near to this on the northbound side of the highway with their hazard lights flashing. As I was driving down the on ramp I also observed two people jump onto the road from the shadows at the left hand side of the on-ramp waving their arms. I did not get a good look at

(Witness's signature)

(Justice of the Peace (Qual.)/
Commissioner for Declarations's signature)

(Signature of police officer
preparing statement)



QUEENSLAND POLICE SERVICE
STATEMENT OF WITNESS



Occurrence #: _____

Statement no.: 1 Date: 05/08/2013

Statement of

Name of witness: BELLARS, Peter

Date of birth: _____ Age: _____ Occupation: Police Officer

Police officer taking statement

Name: BELLARS, Peter


Rank: Senior Constable Reg. no.: 22067

Region/Command/Division: CMC Station: _____

Statement:

Peter Bellars states:

1. I am a Senior Constable of Police currently attached to the Crime & Misconduct Commission.
2. I recall the events of the 29th of May 2013, I was attached to Mango Hill/North Lakes Station (general duties) and was rostered to work a 10pm-6am shift beginning on the 29th of May 2013 and ending the 30th of May 2013. I was working this shift with Senior Constable Renee Jones.
3. At 11:43pm on the 29th of May 2013, Senior Constable Renee Jones and I were tasked by Police Communications to attend a traffic crash on the Bruce Highway north bound near the Anzac Avenue turnoff at Murrumba Downs.
4. At the time of receiving this job, we were approximately 500 metres from the location on Anzac Avenue, Murrumba Downs.
5. As we drove down the southbound on ramp to the Bruce Highway I observed a large fire on the north bound side of the highway.
6. As we continued down the onramp I recall seeing a couple of people on the left hand side of the onramp near where it merges to the highway waving their arms. Due to a number of circumstances I did not get a good look at the people however observed that one was a teenaged female.
7. We then drove in to the median of the highway and I attempted to contact Police Communications to advise that we needed Queensland Fire & Rescue


(Witness's signature)

(Justice of the Peace (Qual.)/
Commissioner for Declarations's signature)

(Signature of police officer
preparing statement)

CONTINUED STATEMENT OF: **BELLARS, Peter**

21. Once the crash site was cleaned up, Senior Constable Renee Jones and I attended the Petrie Police Station where I entered an Occurrence Report onto the police computer system Qprime.

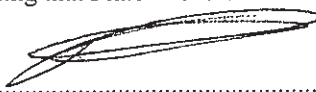
22. I have had no further dealings with this matter.

Justices Act Acknowledgement

Justices Act 1886

I acknowledge by virtue of section 110A(6C)(c) of the Justices Act 1886 that:

- (1) This written statement by me dated 05/08/13 and contained in the pages numbered 1 to 3 is true to the best of my knowledge and belief; and
- (2) I make this statement knowing that, if it were admitted as evidence, I may be liable to prosecution for stating in it anything that I know is false.



Signature

Signed at North Lakes this 5th day of August 2013

(Witness's signature)

(Justice of the Peace (Qual.)/
Commissioner for Declarations's signature)

(Signature of police officer
preparing statement)



QUEENSLAND POLICE SERVICE
STATEMENT OF WITNESS



QP 0125
01/06
411
08.25.0

Occurrence #: QP1300633856

Statement no.: _____ Date: 28/06/2013

Statement of

Name of witness: SIMPSON, BRENT THOMAS

Date of birth: _____ Age: _____ Occupation: Police officer

Police officer taking statement

Name of police officer: SIMPSON, Brent Thomas

Rank: Senior Constable Reg. no.: 20871

Region/Command/Division: Metro North Pine Rivers Station: Petrie

Statement:

1. I am a Senior Constable of Police Currently attached to the Petrie Police Station.
2. I can recall the events of Saturday the 29th day of May 2013.
3. On this day I was performing general duties that commenced on Wednesday the 29th day of May 2013 at 11:00pm and terminated on Thursday 30th day of May 2013 at 7:00am. I was in the company of Constable Barbara BELESKY.
4. At approximately 11:30pm we were patrolling in the Kallangur area and driving on Anzac Avenue when a job came over the radio for a traffic crash on the northbound side of the Bruce Highway on the Mango Hills North Lakes off ramp.
5. We proceeded to the Bruce Highway with emergency lights and siren activated, as we drove down the southbound off ramp I observed a large fire on the other side of the highway adjacent to the northbound off ramp, I directed BELESKY to proceed directly to the crash site.

(Witness's signature)

(Justice of the Peace (Qual.)/
Commissioner for Declarations's signature)

(Signature of police officer preparing
statement)

CONTINUED STATEMENT OF: SIMPSON, BRENT THOMAS

17. BELESKY and I then returned to Petrie Station and completed the required coronial paperwork.



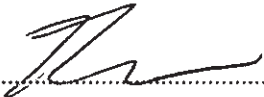
Brent SIMPSON

Justices Act Acknowledgement

Justices Act 1886

I acknowledge by virtue of section 110A(6C)(c) of the Justices Act 1886 that:

- (1) This written statement by me dated 28/07/2013 and contained in the pages numbered 1 to 5 is true to the best of my knowledge and belief; and
- (2) I make this statement knowing that, if it were admitted as evidence, I may be liable to prosecution for stating in it anything that I know is false.

..........Signature

Signed atPetrie.....this.....27th.....day of.....July.....2013....

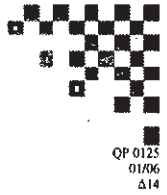
(Witness's signature)

(Justice of the Peace (Qual.)/
Commissioner for Declarations's signature)

(Signature of police officer preparing
statement)



QUEENSLAND POLICE SERVICE
STATEMENT OF WITNESS



Occurrence #: QP1300633856

Statement no.: 1

Date: 16/07/13

Statement of

Name of witness: BELESKY, Barbara Anne

Date of birth: _____ Age: _____ Occupation: Police Officer

Police officer taking statement

Name: FAMILY NAME, Given name(s)

Rank: Constable Reg. no.: 27696

Region/Command/Division: Metro North Pine Rivers Station: Petrie

Statement:

1. I am a Constable of Police currently attached to the Petrie Police Station.
2. I can recall the events of Wednesday the 29th day of May 2013.
3. On this day I was performing general duties that commenced on Wednesday the 29th day of May 2013 at 11:00pm and terminated on Thursday 30th day of May 2013 at 7:00am. I was in the company of Senior Constable Brent SIMPSON.
4. At approximately 11:30pm we were patrolling in the Kallangur area and driving on Anzac Avenue when a job came over the radio for a traffic crash on the northbound side of the Bruce Highway on the Mango Hills North Lakes off ramp.
5. We proceeded to the Bruce Highway with emergency lights and sirens and as I drove along the southbound on ramp I observed two youths standing off the road on the grass shoulder waving us down and pointing towards the traffic crash across the highway.

B. Belesky
(Witness's signature)

(Justice of the Peace (Qual.)/
Commissioner for Declarations's signature)

(Signature of police officer
preparing statement)

CONTINUED STATEMENT OF: **BELESKY, Barbara Anne**

21. SIMPSON and I returned to the station to complete paperwork. I have had no further direct dealings in this matter.



Barbara Anne BELESKY

Justices Act Acknowledgement

Justices Act 1886

I acknowledge by virtue of section 110A(5)(c)(ii) of the Justices Act 1886 that:

- (1) This written statement by me dated 16th day of July 2013 and contained in the pages numbered 1 to 4 is true to the best of my knowledge and belief; and
- (2) I make this statement knowing that, if it were admitted as evidence, I may be liable to prosecution for stating in it anything that I know is false.



.....Signature

Signed at Petrie this 29th day of May 2013.



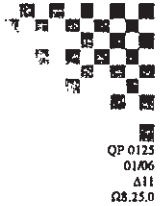
(Witness's signature)

(Justice of the Peace (Qual.)/
Commissioner for Declarations's signature)

(Signature of police officer
preparing statement)



QUEENSLAND POLICE SERVICE
STATEMENT OF WITNESS



QP 0125
01/06
A11
08.25.0

Occurrence #: QP1300633856

Statement no.: _____ Date: 22/07/2013

Statement of

Name of witness: DRUMMOND, AMY THERESE

Date of birth: _____ Age: _____ Occupation: Police officer

Police officer taking statement

Name of police officer: DRUMMOND, AMY THERESE

Rank: Detective Senior Constable Reg. no.: 4016645

Region/Command/Division: BRISBANE
BRISBANE CITY Station: BRISBANE
CITY CPIU

Statement:

Amy Therese DRUMMOND states:

1. I am a Detective Senior Constable of Police currently attached to the Brisbane City Child Protection and Investigation Unit.
2. I do not know the defendant now before the court.
3. I recall the events of Wednesday the 29th day of May 2013 I commenced duty at 10:00pm and terminated at 6:00am on the 30th day of May 2013. I performed my shift in the company of Detective Senior Constable (DSC) Genevieve DALTON.
4. On the 30th day of May 2013 at about 12:45am I received information from Police Communications. (*I was informed that there had been a fatal traffic accident at North Lakes and DSC DALTON and I were required to attend the Royal Brisbane Hospital to speak with the other occupants of the vehicle.*)
5. At about 1:00am DSC DALTON and I had a conversation with a female person I now know as ^{Sch4/3/3} [REDACTED]
6. [REDACTED] told me something. [REDACTED] stated that [REDACTED] had been picked up from an unknown park near [REDACTED] further stated

(Witness's signature)

(Justice of the Peace (Qual.)/
Commissioner for Declarations's signature)

(Signature of police officer preparing
statement)



QUEENSLAND POLICE SERVICE
STATEMENT OF WITNESS



Occurrence #: QP1300633856

Statement no.: _____ Date: 25/07/2013

Statement of

Name of witness: KLUMP, Sherryn Renae

Date of birth: _____ Age: _____ Occupation: _____

Police officer taking statement

Name: KLUMP, Sherryn Renae

Rank: Senior Constable Reg. no.: 9222

Region/Command/Division: Operations Support Command Station: Forensic Crash Unit

Statement:

Sherryn Renae KLUMP states:

I am a Senior Constable of Police, my registered number is 9222. I am currently a member of the Forensic Crash Unit Brisbane. I have been a member of this squad since January 2001.

I am the holder of a *Certificate IV in Road Incident Investigation and Reporting*.

I have completed the following courses in traffic crash investigation:

Basic Accident Investigation Course – August, 2001, facilitated by the Queensland Police Service in conjunction with TEEX University, Florida. 80 hours.

Advanced Accident Investigation Course – November, 2001, facilitated by the Queensland Police Service in conjunction with TEEX University, Florida. 80 hours.

Traffic Crash Reconstruction Course – June, 2006, facilitated by the Institute of Police Technology and Management, Florida. 80 hours.

Motorcycle Crash investigation Course – June, 2008, facilitated by the Institute of Police Technology and Management, Florida. 40 hours.

Gather, Analyse and Interpret pedestrian and Bicycle-involved Crashes – November, 2009, facilitated by Road Accident Investigation Services. 40 hours.



(Witness's signature)

(Justice of the Peace (Qual.)/
Commissioner for Declarations's signature)

(Signature of police officer
preparing statement)

CONTINUED STATEMENT OF: **KLUMP, Sherryn Renae**

Produce Forensic Maps using CAD – February, 2010, facilitated by Road Accident Investigation Services. 40 hours.

Analyse and Report on Evidence – March 2010, facilitated by Road Accident Investigation Services. 40 hours.

Vericom operators Course – November, 2010, facilitated by Mr David TULLOCH, Certified Instructor, Vericom Computers Incorporated. 2 days.

Investigative Skills Course – March 2011, facilitated by Queensland Police Service. 40 hours.

Analyse Commercial Vehicle Collisions – October, 2011, facilitated by Road Accident Investigation Services. 40 hours.

Conduct Crash Analysis using 'Crush' Application – August, 2012, facilitated by Road Accident Investigation Services. 40 hours.

I do not know the defendant in this matter.

On Wednesday 29th May, 2013, I was working a night shift, commencing at 8pm on the 29th and finishing at 6am on 30th, with Sergeant Carl CUTLER.

At approximately midnight, we received a call from Police Communications to attend the scene of a fatal traffic crash on the Bruce Highway, North Lakes, at the Anzac Avenue off-ramp, from the northbound lanes. We arrived at the scene at approximately 12.15am.

On my arrival at the scene I spoke with Plain Clothes Senior Constable Simon JUDD of Petrie CPIU, in relation to this incident. At the conclusion of that conversation I conducted an inspection of the incident scene.

The Bruce Highway at this location is a multi-lane carriageway catering for three lanes of traffic in each direction, with opposing lanes of traffic separated by a concrete barrier. A single lane exiting the main carriageway commences just south of the incident location, for traffic travelling in a northerly direction on to Anzac Avenue. The western edge of the road is bounded by a steel W-beam barrier


(Witness's signature)

(Justice of the Peace (Qual.)/
Commissioner for Declarations's signature)

(Signature of police officer
preparing statement)

CONTINUED STATEMENT OF: **KLUMP, Sherryn Renae**

(Armco). The road is of sealed bitumen construction and at the time of my attending the scene, was wet due to heavy rain falling at that time, but the surface was in good condition with no potholes or debris which may have contributed to this incident.

As I arrived at the scene, heavy rain commenced to fall, however, prior to that heavy shower the weather that evening had consisted of light periodical showers.

Whilst at the scene I took a series of digital photographs of the road, vehicle and debris. A selection of those photographs are numbered 1 to 21.

I am able to produce 21 colour photographs.

Photographs numbered 1 to 4 show the road at the incident location, and are described as follows:

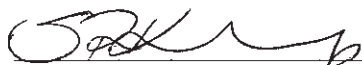
Photograph No. 1: View looking in a northerly direction on the Bruce Highway towards the Anzac Avenue exit and overpass.

Photograph No. 2: View looking in a southerly direction on the northbound lanes of the Bruce Highway. This is the direction of travel of the defendants vehicle prior to the incident. This photograph was taken from the same location as Photo No. 1.

Photograph No. 3: View looking in a northerly direction towards the commencement of the w-beam barrier damaged in this collision.

Photograph No. 4: Daytime view of the incident location, looking in a northerly direction on the Bruce Highway towards Anzac Avenue.

I then inspected the road surface for physical evidence relating to this incident. I observed a tyre mark on the white fog line delineating the western road edge. This tyre mark was only visible on the fog line, as the wet bitumen obscured any extension of this mark either side of the fog line. The tyre mark showed tread striations, however, the mark is too short to draw any firm conclusions about the type of mark, how it was created or to directly relate it to this incident.


(Witness's signature)

(Justice of the Peace (Qual.)/
Commissioner for Declarations's signature)

(Signature of police officer
preparing statement)

CONTINUED STATEMENT OF: **KLUMP, Sherryn Renae**

I observed a section of damaged W Beam barrier. This end of the barrier had been separated from the first eight support posts, and torn back to the left of the carriageway, folding back on itself toward the embankment.

I saw a set of tyre tracks commence on the road shoulder and continue into the grass, along the embankment behind the damaged guard rail. At the commencement of the tracks there are two distinct tyre marks, but soon after become an enlarged path along the embankment on the road side. This path continues along and down the embankment, through the drainage ditch and to the final rest position of the vehicle.

Approximately 31 metres along the vehicle track I located the rear boot lid of a white vehicle, with Queensland registration plate 509LYV affixed. About 10 metres further along I located the front bumper with the second registration plate for the same vehicle affixed. I photographed both these items in situ.

Whilst at the scene, Sergeant CUTLER made arrangements to close the Bruce Highway for a sufficient period of time to examine the road surface prior to the point where the vehicle left the carriageway. The road surface was wet at this time. Sergeant CUTLER informed me of the result of his inspection.

Photographs 5 to 13 show the evidence observed, and they are described as follows:

- Photograph No. 5: Photograph of the short tyre mark on the fog line.
- Photograph No. 6: Photograph of the start of the damaged section of w-beam barrier. Visible in this photograph are the commencement of wheel tracks into the grass.
- Photograph No. 7: Daytime photograph taken from a similar position on the road as photograph number 6. This photo shows the tyre tracks more clearly.
- Photograph No. 8: View looking towards the vehicle in situ with the damaged section of w-beam in the foreground. The flattened grass around the w-beam is evidence of the passage of the vehicle through that area – the vehicle track mark.


(Witness's signature)

(Justice of the Peace (Qual.)/
Commissioner for Declarations's signature)

(Signature of police officer
preparing statement)

CONTINUED STATEMENT OF: **KLUMP, Sherryn Renae**

- Photograph No. 9: This photograph shows the position of the rear boot lid and front bumper relative to the final position of the vehicle.
- Photograph No. 10: Close up of the boot lid in its final rest position.
- Photograph No. 11: Close up of the boot lid, turned over to see the registration plate, 509LYV, affixed.
- Photograph No. 12: This photograph shows the front bumper in situ relative to the vehicle in the background.
- Photograph No. 13: Close up of the front bumper in situ showing the registration 509LYV affixed.

I observed the burnt remains of a white Subaru sedan, which had come to rest a distance of about 60 meters longitudinally from the damaged barrier, and 16 metres laterally from the road edge. This vehicle had sustained extensive contact damage to the both front and rear ends.

Contact damage is that damage which is caused when the vehicle comes into contact with another vehicle or object. The contact damage to this vehicle is consistent with impacts with the W-beam barrier and the sides of the embankment and water run-off ditch.

The contact damage to the rear end consists of panel damage evenly distributed across the width of the vehicle, having been forced downwards over the rear wheels. The contact damage to the front is more severe to the front left corner, with the front left wheel bent and skewed to the axle, and the shock tower forced upwards past the height of the bonnet.

The rear end and passenger compartments had been extensively damaged by fire. The front of the vehicle was spared from fire damage, enabling me to identify that it was a white vehicle.


(Witness's signature)

(Justice of the Peace (Qual.)/
Commissioner for Declarations's signature)

(Signature of police officer
preparing statement)

the rear left seat of the vehicle.

Photograph No. 20:



Photograph No. 21:

Sergeant CUTLER and I then used a Total Station to take a series of measurements of the incident scene, the vehicle and debris and the physical evidence of the incident. I then down loaded the measurements obtained in to a computer aided drawing program (Mapscenes) and then used the image created to prepare a Forensic Map of the incident scene. I am able to produce that Forensic Map.

I had no further involvement in this investigation.

Sherryn R KLUMP

Justices Act Acknowledgement

Justices Act 1886

I acknowledge by virtue of section 110A(6C)(c) of the Justices Act 1886 that:

- (1) This written statement by me dated 25/07/2013 and contained in the pages numbered 1 to 7 is true to the best of my knowledge and belief; and
- (2) I make this statement knowing that, if it were admitted as evidence, I may be liable to prosecution for stating in it anything that I know is false.

.....Signature

Signed at Boondall this 25th day of July, 2013.

(Witness's signature)

(Justice of the Peace (Qual.)/
Commissioner for Declarations's signature)

(Signature of police officer
preparing statement)

13. I have had nothing further to do with this matter.

H. A. Wheatley

Helen Anne WHEATLEY

Justices Act 1886

I acknowledge by virtue of section 110A(6C)(c) of the Justices Act 1886 that:

- (1) This written statement by me dated 15/6/13 and contained in the pages numbered 1 to 3 is true to the best of my knowledge and belief; and
- (2) I make this statement knowing that, if it were admitted as evidence, I may be liable to prosecution for stating in it anything that I know is false.

H. A. Wheatley

Signature

Signed at Petrie this 15th day of June 2013.

H. A. Wheatley
(Witness's signature)

(Justice of the Peace (Qual.)/
Commissioner for Declarations's signature)

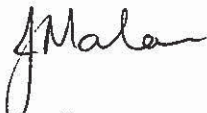
(Signature of police officer preparing
statement)

CONTINUED STATEMENT OF: **MALONE, Donna Janelle**

7. Sch4/3/3 spoke about the events of the night and the incident itself.

8. During the conversation I took notes in my official police notebook number J000547 between p.288 and p.295.

9. I am able to produce my notes taken at the time in my official police notebook number J000547 between p.262 and p.265.

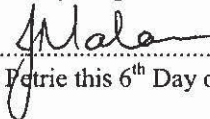


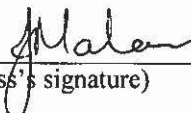
PCSC Janelle MALONE

Justices Act 1886

I acknowledge by virtue of section 110A(6C)(c) of the Justices Act 1886 that:

- (1) This written statement by me dated 6th July 2013 and contained in the pages numbered 1 to 2 is true to the best of my knowledge and belief; and
- (2) I make this statement knowing that, if it were admitted as evidence, I may be liable to prosecution for stating in it anything that I know is false.

 Signature
Signed at Petrie this 6th Day of July 2013


(Witness's signature)

(Justice of the Peace (Qual.)/
Commissioner for Declarations's signature)

(Signature of police officer
preparing statement)

CONTINUED STATEMENT OF: MALONE, Donna Janelle

7. Sch4/3/3 spoke about the events of the night and the incident itself.

8. During the conversation I took notes in my official police notebook number J000547 between p.288 and p.295.

9. I am able to produce my notes taken at the time in my official police notebook number J000547 between p.262 and p.265.

J Malone

PCSC Janelle MALONE

Justices Act 1886

I acknowledge by virtue of section 110A(6C)(c) of the Justices Act 1886 that:

- (1) This written statement by me dated 6th July 2013 and contained in the pages numbered 1 to 2 is true to the best of my knowledge and belief; and
- (2) I make this statement knowing that, if it were admitted as evidence, I may be liable to prosecution for stating in it anything that I know is false.

J Malone

.....Signature
Signed at Petrie this 6th Day of July 2013

J Malone
(Witness's signature)

(Justice of the Peace (Qual.)/
Commissioner for Declarations's signature)

(Signature of police officer
preparing statement)



QUEENSLAND POLICE SERVICE
STATEMENT OF WITNESS



Occurrence #: QP1300633856

Statement no.: 1 Date: 17/07/2013

Statement of

Name of witness: PASCOE, LINDA MARIE

Date of birth: _____ Age: _____ Occupation: Police officer

Police officer taking statement

Name of police officer: PASCOE, LINDA MARIE

Rank: PCSC Reg. no.: 4009227

Region/Command/Division: BRISBANE PETRIE Station: PETRIE CPIU

Statement:

Linda Marie PASCOE states:

1. I am a Plain Clothes Senior Constable, registered number 9227, currently stationed at Petrie Child Protection and Investigation Unit.
2. I do not know the defendant in this matter, Sch4/3/3
3. On the 30th day of May 2013 I was rostered to perform duty between 6.00am and 2.00pm. At the commencement of my shift I was brief by PCSC Simon JUDD of Petrie Child Protection and Investigation Unit about a fatal traffic incident that had occurred on the previous night, namely the 29th of May 2013 on the Bruce Highway, North Lakes. I conducted computer inquiries and telephone inquiries in regards to this incident.
4. At approximately 11.25am I attended Transport and Main Roads, situated at floor 10 at 313 Adelaide Street Brisbane where I had a conversation with Alan GRAHAM. I seized 1 x CD of CCTV footage of the Bruce Highway from the previous evening,

Linda Marie Pascoe
(Witness's signature)

(Justice of the Peace (Qual.)/
Commissioner for Declarations's signature)

(Signature of police officer preparing
statement)

CONTINUED STATEMENT OF: PASCOE, LINDA MARIE

9. On the 26th day of June 2013 I was rostered to perform duty between 8.00am and 4.00pm in the company of PCSC Simon JUDD. After 10.00am that day we attended some addresses to locate Sch4/3/3 however with no success.

10. I am unable to provide any further information in relation to this matter and completed this statement on the 17th day of July 2013.

L. Pascoe
L.PASCOE

Justices Act Acknowledgement

Justices Act 1886

I acknowledge by virtue of section 110A(6C)(c) of the Justices Act 1886 that:

- (1) This written statement by me dated 17/07/13 and contained in the pages numbered 1 to 43 is true to the best of my knowledge and belief; and
- (2) I make this statement knowing that, if it were admitted as evidence, I may be liable to prosecution for stating in it anything that I know is false.

L. PascoeSignature

Signed atPetrie.....this....17th..day of...July....2013

L. Pascoe
(Witness's signature)

(Justice of the Peace (Qual.)/
Commissioner for Declarations's signature)

(Signature of police officer preparing
statement)



QUEENSLAND POLICE SERVICE
STATEMENT OF WITNESS



Occurrence #: _____

Statement no.: One Date: 26/06/2013

Statement of

Name of witness: MUDGWAY, Kurt Norman

Date of birth: Sch4/3/3 Age: Occupation: Police Officer

Police officer taking statement

Name: _____

Rank: _____ Reg. no.: _____

Region/Command/Division: _____ Station: _____

Statement:

1. My full name is Kurt Norman MUDGWAY.
2. I am a Constable of Police currently attached to Mango Hill Northlakes General Duties.
3. My registered number is 24906.
4. On Tuesday the 25th of June 2013 I received a request from Plain Clothes Senior Constable Simon JUDD of the Pine Rivers Child Protection and Investigation Unit.
5. This request was to drive a marked police car north bound along the Bruce Highway between Dohles Rocks Road, Murrumba Downs and Anzac Avenue Northlakes.
6. Additional to this request I was instructed by JUDD to stay in the right lane of the North bound lanes driving at 100kph with the red and blue lights activated.
7. On the 25th of June 2013 at approximately 10:41am I attended at the Bruce Highway by entering from Strathpine Road on ramp. I then drove to a point just before the Dohles Rocks Road exit and pulled over.
8. I was driving marked police vehicle 702MED. This is a Toyota Aurion with a calibrated digital speedometer.
9. At this time I got my partner to use my Iphone 5 to record my driving and the speedometer.

[Handwritten Signature]

(Witness's signature)

(Justice of the Peace (Qual.)/
Commissioner for Declarations's signature)

(Signature of police officer
preparing statement)

CONTINUED STATEMENT OF: **MUDGWAY, Kurt Norman**

10. I then activated the red and blue flashing lights and pulled out into the right hand lane of the North bound lanes and accelerated to 100kph and activated the cruise control.
11. I then said the word "Start" as I passed the Dohles Rocks Road exit. This was for the purpose of the recording.
12. I then maintained my position in the right hand lane at 100kph with the cruise control activated until I went under the Anzac Avenue overpass.
13. At this time I said "Stop".
14. I then stated on the recording the time and date and what the purpose of the recording was.
15. I then attended back at the Pine Rivers Child Protection and Investigation Unit and had a conversation with JUDD.
16. I then copied the video from my iphone 5 to a disk and supplied this to JUDD.
17. I have had no further dealings in this matter.



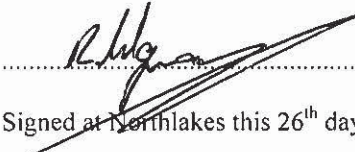
K. MUDGWAY

Justices Act Acknowledgement

Justices Act 1886

I acknowledge by virtue of section 110A(6C)(c) of the Justices Act 1886 that:

- (1) This written statement by me dated 26/06/2013 and contained in the pages numbered 1 to 2 is true to the best of my knowledge and belief; and
- (2) I make this statement knowing that, if it were admitted as evidence, I may be liable to prosecution for stating in it anything that I know is false.



Signature

Signed at Northlakes this 26th day of June 2013.



(Witness's signature)

(Justice of the Peace (Qual.)/
Commissioner for Declarations's signature)

(Signature of police officer
preparing statement)


I saw that due to fire damage both left rear and both right rear flexible brake hoses were missing, with only their swaged ends present. The foot brake pedal bushes were fire damaged causing foot brake pedal free-play.

5 Due to fire damaged at the left and right rear flexible brake hoses, there were visible brake fluid leaks when the foot brake pedal was applied.

Four testing, I cut and then sealed both the left and right rear steel brake pipes. The foot brake pedal then appeared to be full and hard when applied, with the left and right front brakes operating.

10 I saw that the front and rear disc brake pads were in a satisfactory condition, with no other visible or apparent leaks in the hydraulic braking system.

I inspected the steering and saw that due to fire damage the steering wheel was
15 missing and the alloy steering column support brace had melted with the steering column assembly dropping to the floor of the vehicle. I saw that due to impact damage the left tie rod was bent.


All other steering components were connected and in a satisfactory condition,
20 with no wear in any of the movable joints.

For testing, I repositioned the steering column and used vice-grips on the steering wheel retaining nut. I then saw that the steering operated satisfactorily.

25 I inspected the suspension components and saw that due to impact damage the left front McPherson strut bearing plate rubber was torn and the McPherson strut was separated from its misaligned strut tower. The left front lower control arm was bent and forced from its rear body mount bush.

30 I saw that the right front lower control arm was bent due to impact damage.

Due to fire all rear suspension bushes were damaged.

I saw that due to impact damage the rear stabiliser bar and its left and right body mounting were bent with the right link-pin broken. Both left rear lower control arms were bent.

5 I saw that both right rear lower control arms were bent; the right rear trailing arm was bent and broken and the right rear top control arm was torn from the bent and misaligned rear sub-frame.

10 All other suspension components were connected and appeared in a satisfactory condition.

15 I was unable to test the electrical system due to the extent of impact and fire damage to the electrical components and wiring.

15

I inspected the tyres and saw that all four tyres were deflated and all tyres appeared to be in a satisfactory tread condition.



20

I saw that the left front tyre was deflated due to impact damage, with the inner and outer tyre bead partly forced from their rim flanges. The outer rim flange was striated and dented; the inner rim flange and wheel well were broken with the inner and outer tyre sidewalls and tread width impact cut.

25 I saw that the right front tyre was deflated due to incident damage with debris (grass and dirt) forced between the inner and outer rim flanges and their tyre beads. I inflated this tyre and used water for testing. I saw air bubbles from between the debris impacted area of the outer rim flange.

30 I saw that the left rear tyre was deflated with extensive fire damage to the tyre; however, I saw no significant rim damage.

I saw that the right rear tyre was deflated with extensive fire damage to the tyre with inner rim flange and wheel well impact broken.

35

As a result of my inspection, I am unable to make an accurate mechanical assessment of the vehicle due to the extent of fire damage. However, I found no mechanical defects which may have contributed to the cause of the incident.

5



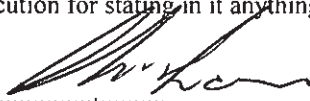
A. R. McLaren
Vehicle Inspection Officer

10

Justices Act 1886

I acknowledge by virtue of section 110A (6C) (c) of the Justices Act 1886 that:

- (1) This written statement by me dated 7 JUNE 2013 and contained in pages numbered 1 to 4 is true to the best of my knowledge and belief; and
- (2) I make this statement knowing that, if it were admitted as evidence, I may be liable to prosecution for stating in it anything that I know is false.



.....Signature

Signed at BARBARA this 7 day of JUNE 2013.



QUEENSLAND POLICE SERVICE
STATEMENT OF WITNESS



QP 0125
01/06
Δ11
Q8 25.0

Occurrence #: QP1300633856

Statement no.: 1 Date: 03/08/2013

Statement of

Name of witness: CAVE, MARK ANDREW

Date of birth: _____ Age: _____ Occupation: Police officer

Police officer taking statement

Name of police officer: CAVE, MARK ANDREW

Rank: Constable Reg. no.: 4022287

Region/Command/Division: BRISBANE PETRIE Station: PETRIE CIB

Statement:

Mark Andrew CAVE States:

1. My full and correct name is Mark Andrew CAVE. I am a Plain Clothes Constable of Police currently attached to the Pine Rivers District Criminal Investigation Branch. My registered number is 22287.
2. I can recall the events of the 29th day of May 2013. On this day I was rostered to work from 10.00pm until 6.00am on the 30th day of May 2013. I was rostered to work with Plain Clothes Senior Constable Simon JUDD of the Pine Rivers District Child Protection and Investigation Unit.
3. I know the defendant in this matter as Sch4/3/3
4. I can recall, at approximately 11.30pm I received information, via the Police radio that there had been a single vehicle traffic crash along the Bruce Highway at North Lakes. The details stated that the vehicle was on fire and there was information that someone may still be inside the vehicle.

(Witness's signature)

(Justice of the Peace (Qual.)/
Commissioner for Declarations's signature)

(Signature of police officer preparing
statement)

5. JUDD and I immediately headed in that direction along Anzac Avenue, Kallangur.

6. I can recall observing a Queensland Fire and Rescue vehicle travelling in the same direction with its lights and sirens activated. We followed the QFRS vehicle along Anzac Avenue until we reached the Bruce Highway.

7. As we travelled over the highway, I could see to the right, a number of vehicles had stopped on the hard shoulder of the North bound Lanes. I could also see flames and smoke coming from the grass verge next to the hard shoulder.

8. We drove down the on ramp onto the Bruce Highway and travelled along the south bound lanes for approximately hundred metres. We then traversed the central reservation and parked our vehicle in the North bound side of the central reservation, on the hard shoulder, next to lane three of the highway.

9. JUDD and I then crossed the lanes to reach the incident location. I could see a Marked Police vehicle and an ambulance in attendance, along with a number of vehicles that had stopped and parked along the hard shoulder.

10. I can remember the QFRS truck arriving and deploying its hoses and equipment. I can remember the road surface was wet upon our arrival and the rain was still falling.

11. I can remember seeing a severely damaged guard rail which had been folded back on itself from a substantial impact. I could also see debris from the vehicle scattered along the hard shoulder and grass verge. I can remember seeing a vehicle fully engulfed with flames.

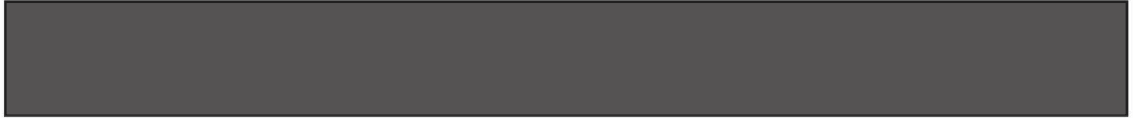


(Witness's signature)

(Justice of the Peace (Qual.)/
Commissioner for Declarations's signature)

(Signature of police officer preparing
statement)

12. I can recall speaking to Senior Constable Renee JONES from North Lakes Police Station. JONES was standing with a Male juvenile whom I now know as Sch4/3/3



13. I now know this male to be [REDACTED] the defendant before the court. I can recall PCSC JUDD have a conversation with the defendant prior to him being placed in the rear of a marked Police vehicle. Myself and JUDD then had a conversation.


14. I then activated my digital voice recorder and got into the vehicle with the defendant. I had a conversation with him. I advised him again that he was under arrest and cautioned him. I did not question the Defendant in relation to the incident.

I am able to produce a copy of this recording that I have described in my evidence.

15. During the conversation I submitted the defendant to a roadside breath test. The breath test result on the alcometer was 0.000. I remained in the vehicle with the defendant for approximately 25 minutes before JUDD and I transferred the defendant from the marked Police vehicle to an unmarked Police vehicle

16. JUDD and I then transported the defendant to the Pine Rivers Watchouse where he was charged. JUDD and I were unable to interview the defendant in relation to the incident due to the time of night and that the defendant was a juvenile.

17. I then attended to paperwork in relation to the arrest and charging of the defendant, including Objecting to his Bail. I then returned to the Petrie Police Station and completed the remainder of my shift.


(Witness's signature)

(Justice of the Peace (Qual.)/
Commissioner for Declarations's signature)

(Signature of police officer preparing
statement)

18. I have had no further involvement in this matter or any dealings with the defendant.



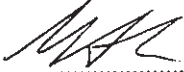
Mark Andrew CAVE

Justices Act Acknowledgement

Justices Act 1886

I acknowledge by virtue of section 110A(6C)(c) of the Justices Act 1886 that:

- (1) This written statement by me dated 03/08/2013 and contained in the pages numbered 1 to 4 is true to the best of my knowledge and belief; and
- (2) I make this statement knowing that, if it were admitted as evidence, I may be liable to prosecution for stating in it anything that I know is false.



.....Signature

Signed at Petrie this 3rd day of August 2013



(Witness's signature)

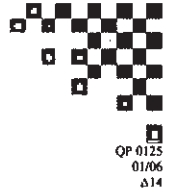
(Justice of the Peace (Qual.)/
Commissioner for Declarations's signature)

(Signature of police officer preparing
statement)



QUEENSLAND POLICE SERVICE

STATEMENT OF WITNESS



Occurrence #: QP1300633856

Statement no.: One

Date: 01/08/2013

Statement of

Name of witness: JUDD, Simon

Date of birth: Sch4/3/3

Age: [redacted]

Occupation: Police Officer

Police officer taking statement

Name: _____

Rank: _____

Reg. no.: _____

Region/Command/Division: _____

Station: _____

Statement:

1. My full name is Simon Peter JUDD. I am a Plain Clothes Senior Constable of Police currently attached to the Pine Rivers Child Protection and Investigation Unit.
2. My registered number is 18527.
3. I recall the events of Wednesday the 29th of May 2013.
4. On that day I was rostered from 10pm to 6am in company with Plain Clothes Constable Mark CAVE of the Pine Rivers Criminal Investigation Branch.
5. At approximately 11:30pm or shortly there after, on the 29th of May 2013 we were at an incident when we heard a job being dispatched by Police Communications over the radio.
6. This job related to a car accident on the Bruce Highway, North Lakes in the north bound lanes near the Anzac Avenue off ramp.
7. Other details were that the car was on fire and a person was trapped in the vehicle.
8. CAVE and I immediately headed in that direction from Petrie.
9. As we were travelling along Anzac Avenue towards the Bruce Highway we took up a position following a Queensland Fire and Rescue (QFRS) truck heading in the same direction.

(Witness's signature)

(Justice of the Peace (Qual.)/
Commissioner for Declarations's signature)

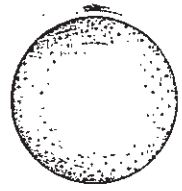
(Signature of police officer
preparing statement)

Do not leave disc in direct sunlight or in a hot, humid location. Do not place any stickers on the disc. The information on this disc is legally privileged and confidential. Any unauthorised reproduction of this information is prohibited.

DTMR CCTV footage.

Date 29.5.13

Occurrence no.



Video Data Copy CD ___ of ___

Queensland Police Service

This Disc remains the property of the Queensland Police Service

Do not leave disc in direct sunlight or in a hot humid location. Do not place any stickers on the disc. The information on this disc is legally privileged and confidential. Any unauthorised reproduction of this information is prohibited.

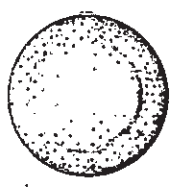
Date: 29.5.13

Photographs of the

Seems.

Paula Henry's Neighbours

Occurrence no.



Video Data Copy CD ___ of ___

Queensland Police Service

This Disc remains the property of the Queensland Police Service