



Road Safety
Camera
Commissioner

REPORT OF THE ROAD SAFETY CAMERA COMMISSIONER TO THE MINISTER FOR POLICE AND CORRECTIONS

Investigation into the fixed road safety cameras at the Maroondah Highway pedestrian crossing in Lilydale, approximately 100 metres west of Hutchinson Street

Release date: 16 December 2014



Office of the Road Safety Camera Commissioner

Investigation into the road safety cameras on Maroondah Highway, Lilydale, approximately 100 metres west of Hutchinson Street

PURPOSE

- 1 This report documents the findings of the Road Safety Camera Commissioner, following an investigation into the accuracy and reliability of the fixed road safety cameras at the Maroondah Highway pedestrian crossing in Lilydale, approximately 100 metres west of Hutchinson Street.

BACKGROUND

- 2 The fixed road safety cameras at the Maroondah Highway pedestrian crossing in Lilydale, approximately 100 metres west of Hutchinson Street are relatively new, and have been in operation since March 2014. Both cameras are located on the southern median strip, with one camera facing each direction of travel along Maroondah Highway, east and west, located on the south side of Maroondah Highway. They monitor compliance with the speed limit of 50 km/h and the traffic signals at the pedestrian crossing in both directions.
- 3 The road layout along Maroondah Highway in Lilydale at the pedestrian crossing has two straight through lanes in each direction, in a single carriageway. There are no turning lanes at the pedestrian crossing.
- 4 Maroondah Highway is bound by two service roads, one on either side of the central carriageway. The service roads are separated from the main road by dividing medians where there is parking and access to local shops and other businesses.
- 5 In the first eighteen days of the cameras enforcing compliance with the speed limit and traffic lights, Victoria Police issued 2,482 infringement notices for exceeding the speed limit or crossing the pedestrian crossing against a red light detected by these two road safety cameras. In their first full quarter of operation, Victoria Police issued 11,576 speed and red light infringements detected by the two cameras.
- 6 Due to the large number of infringements issued in a short period, the local newspaper, the *Lilydale and Yarra Valley Leader*, published a series of articles in relation to the road safety cameras and the number of infringements issued by Victoria Police detected at this location:
 - a. *Cash flash bashed*, published on 19 August 2014, and
 - b. *Cameras just fine: Wells*, published on 26 August 2014.
- 7 Both of these stories contained written complaints made by local residents about the cameras and the infringement notices they have received. The full articles can be found online at <http://leader.newspaperdirect.com>.
- 8 Due to the newspaper articles, motorists who had received traffic infringements or had general concerns about the operation of the two road safety cameras made written complaints to me. As at the date of publishing this report, I have received twelve complaints regarding the two road safety cameras.
- 9 Following these complaints, I decided to commence a technical investigation into the operation, accuracy and reliability of the two fixed road safety cameras at the Maroondah Highway pedestrian crossing in Lilydale, pursuant to section 10(e) of the *Road Safety Camera Commissioner Act 2011*.

THE ROAD SAFETY CAMERA SYSTEM

- 10** All fixed road safety cameras monitoring the relevant speed limit in Victoria comprise two independently operating and calibrated systems: the primary device, also known as the primary speed calculation unit, and the secondary device, known as the secondary speed calculation unit. Speed measurements recorded by the primary device are compared with measurements made by the secondary device, to ensure that the two speeds correlate. If they do not, the measurement is automatically rejected by the camera and cannot be used as the basis for a speed infringement.
- 11** The type of primary device installed at the pedestrian crossing on Maroondah Highway in Lilydale is the ROBOT TRAFFIPAX Traffistar SR520, which is prescribed for use in Victoria under the *Road Safety (General) Regulations 2009*. This type of fixed road safety camera uses a set of two inductive loops per lane, set a short distance apart, to detect a vehicle's presence and calculate speed. When the ferrous content in vehicles alters the magnetism in the loop as they pass over the inductive loops, this is used by the road safety camera system in its calculations.
- 12** The secondary system installed at this location is a type of radar that tracks vehicles over a short distance along the road and calculates their speed based on hundreds of measurements per second.
- 13** All fixed road safety camera systems in Victoria must be tested, sealed and used in accordance with the requirements in the *Road Safety (General) Regulations 2009*. An integral part of this process is the annual certification and recalibration of the primary speed calculation unit of a road safety camera by an independent Testing Officer. This process is followed to ensure that cameras accurately and reliably measure the speed of vehicles and record changes in traffic signals.

QUARTERLY TESTING OF ROAD SAFETY CAMERAS

- 14** In addition to the annual certification and calibration requirements, the Department of Justice subjects all fixed road safety cameras to a rigorous program of maintenance and testing by independent qualified organisations. This testing and maintenance program is aimed at ensuring Victoria's fixed road safety cameras are operating continuously within the requirements set out in the *Road Safety (General) Regulations 2009*.
- 15** All road safety cameras undergo and must pass three tests every quarter in order to remain operational. The first test is done to ensure that any inroad sensors used by a camera are in sound electrical condition, and that they continue to operate within the specifications and technical requirements of the manufacturer. Their physical condition is also inspected, to ensure that no environmental factors affect their operation.
- 16** The reliability of the road safety camera's speed calculations is tested by temporarily installing a third independent speed measurement device at the camera site. This allows the speeds of many vehicles to be recorded over a reasonable period. The data acquired can be compared to show the accuracy of a road safety camera's primary and secondary devices. The speed measurements of the three independent devices must correlate.
- 17** The accuracy of the primary speed calculation unit is tested by driving a vehicle with a calibrated speedometer through each lane of the camera site. The speed at which the vehicle is travelling is displayed. Photographic evidence of the vehicle's speed and its speed

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calculated by the camera's primary and secondary devices are produced for comparison, and these measurements of each drive through of the vehicle, must correlate.

PROCESSING OF DETECTED INCIDENTS

- 18** No infringement notices are automatically issued by Victoria's road safety cameras. When fixed and mobile road safety cameras detect vehicles exceeding the relevant speed limit or proceeding through a red light, also known as "incidents", the recorded images and associated data are packaged into encrypted files for further processing, as long as they pass internal software checks.
- 19** All incidents that pass the internal software checks within automated fixed and mobile road safety cameras in Victoria will then undergo manual processing by an independent organization.
- 20** Each incident is assessed by at least two trained people, who must conclude on the validity of an incident independently, by applying stringent business rules to ensure that the images and data recorded of each detected incident are correct and that an infringement notice based on that data is fair. If there is disagreement about the validity of an incident, a third person also makes an independent assessment.
- 21** If an incident is deemed as accepted after this process, it is then passed on to Victoria Police to ensure it is satisfied the evidence is accurate and fair before it authorises the issuing of an infringement notice to the registered owner of the vehicle.

NATURE OF COMPLAINTS

- 22** As at the date of this report, I have received ten written complaints regarding at least one infringement notice detected by the road safety cameras at the pedestrian crossing, located approximately 100 metres west of Hutchinson Street, on Maroondah Highway in Lilydale. In addition, I received two written complaints about the cameras generally. The complaints regarding infringements related to a mix of infringements for exceeding the speed limit, or entering the pedestrian crossing against the red light. Specifically, the issues raised were:
 - a. The cameras flash when no vehicles are travelling across the pedestrian crossing,
 - b. The short distance of the pedestrian crossing makes it easier to be caught within the pedestrian crossing when the lights turned red, compared to an intersection,
 - c. The accuracy and repeatability of the road safety cameras' speed calculations,
 - d. The large number of infringements issued in the short period of eighteen days,
 - e. Doubts as to the reasons the cameras were installed at this location,
 - f. The cameras are "revenue raisers" and do not improve safety at this location, and
 - g. A general lack of motorist confidence in the reasons for the installation of the road safety cameras at this location.
- 23** As the pedestrian crossing contains exclusively straight through lanes, all infringements detected at this location related to a vehicle travelling straight through the pedestrian crossing.

SCOPE OF INVESTIGATION

- 24** I focused the investigation on the main issues that motorists have written to me. From the complaints I have received, I concentrated on investigating the following issues at the pedestrian crossing cameras at Maroondah Highway in Lilydale:
- a. The general operation of the road safety cameras,
 - b. All testing, maintenance and certification activities of the road safety camera systems,
 - c. Traffic behaviour at the pedestrian crossing in both directions,
 - d. Data recorded by the road safety cameras for any speed and red light incidents they have detected, and
 - e. Infringements referred to me by motorists concerned about the accuracy and reliability of the cameras and hence the validity of their fines.
- 25** As the written complaints sent to me were all related to the accuracy and reliability of the road safety cameras, this investigation did not examine the manual processing of images and data recorded by the fixed road safety camera system, as those policies and procedures do not have any influence on the operation of the fixed road safety camera system.
- 26** However, I did examine all images of traffic infringement notices referred to me as part of this investigation, to satisfy myself that those infringements were correct and valid.
- 27** In this report, the phrases "speed incident" and "red light incident" refer to the road safety cameras detecting a vehicle exceeding the permitted speed limit and/or entering the pedestrian crossing against a red light. These phrases do not refer to the final number of traffic infringements issued by Victoria Police, as that number may change during manual processing.
- 28** To determine whether the road safety cameras were operating accurately and reliably, the Department of Justice provided raw data recorded by the cameras during the period 14 March 2014 and 31 August 2014. This data was analysed to determine the behaviour of the road safety cameras and traffic light cycles.
- 29** The analysis of the data recorded by the road safety cameras concentrated on examining the behaviour of the road safety cameras, including the duration of the yellow lights. The data, covering 171 days, contained nearly 3.7 million vehicle movements through the pedestrian crossing, with slightly more than half of the vehicles travelling west.
- 30** I also visited the pedestrian crossing on Maroondah Highway in Lilydale with a member of my technical staff, and met with a representative of the local Victoria Police Highway Patrol division, to understand the traffic behaviour in the area. I was also interested to see if the road safety cameras were flashing when no vehicles were moving through the sensor areas, as many of the complaints have described.

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- 31** Further, I made enquiries as to the reasons for the installation of the two road safety cameras along Maroondah Highway, as some complaints expressed doubts as to the necessity for the cameras' presence.

RESULTS OF THE INVESTIGATION

OPERATION OF THE ROAD SAFETY CAMERA

- 32** I am satisfied that the two fixed road safety cameras at the Maroondah Highway pedestrian crossing, approximately 100 metres west of Hutchinson Street in Lilydale have been functioning correctly, accurately, reliably and effectively since their activation on 14 March 2014.
- 33** Through examination of the testing and maintenance reports prepared by independent testing organisations and provided by the Department of Justice, it is clear that the camera systems were tested, sealed and used in accordance with the regulatory requirements set out in the *Road Safety (General) Regulations 2009*, and the specifications of the manufacturer and the Department of Justice.
- 34** In examining the data recorded by the cameras it was clear that all detected incidents went through the relevant electronic checks. These checks ensure that:
- a. All incidents where a vehicle was detected exceeding the speed limit have:
 - i. A correlating speed from the secondary speed calculation unit, and
 - ii. If there was no corresponding data from the secondary system, that measurement was rejected by the road safety camera,
 - b. All incidents where a vehicle was detected entering the pedestrian crossing against a red light have:
 - i. A recorded yellow light time,
 - ii. A grace time of 0.5 seconds,
 - iii. Two images recorded of the vehicle to ensure the vehicle continued over the pedestrian crossing, and
 - iv. The time after the light had turned red when the images were taken, which must be at least 0.5 seconds.
- 35** Finally, all images and data of speed and red light incidents detected by the road safety cameras were packaged into encrypted files for further processing, if the incidents passed the internal electronic checks.

OPERATION OF THE TRAFFIC SIGNALS

- 36** In examining the data recorded by the road safety cameras, all red light incidents detected by the two road safety cameras had a yellow time of at least 3.5 seconds, in accordance with the guidelines set out in the VicRoads *Traffic Engineering Manual* for a length of road with a speed limit of 50km/h.

37 Representatives from VicRoads have informed me that apart from the yellow light duration, the traffic lights at this pedestrian crossing have no other requirements to ensure their correct operation. This is because motorists will only face a red light when pedestrians request a halt to traffic to ensure a safe crossing, or when there is a vehicle attempting to exit the bus loop at Lilydale railway station.

ANALYSIS OF TRAFFIC VOLUME DATA

38 In its analysis of traffic behaviour along Maroondah Highway in Lilydale, my office examined the movement of 3,694,239 vehicles. The number of vehicles travelling in each direction, depicted in **Figure 1**, were:

- a. 1,830,713, 49.56% of the total, in an easterly direction along Maroondah Highway, and
- b. 1,863,526, 50.44% of the total, in a westerly direction along Maroondah Highway.

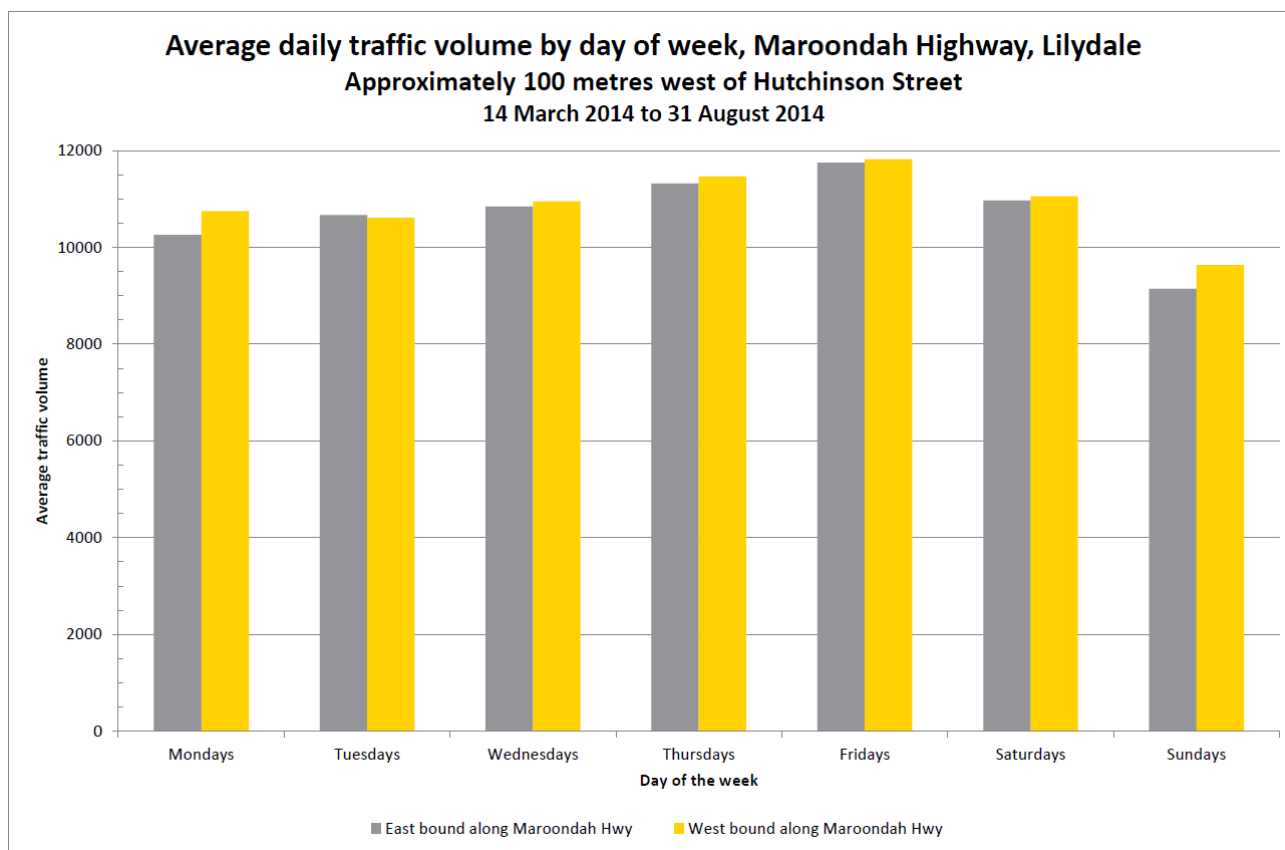


Figure 1 – Average traffic volume by day of week in each direction along Maroondah Highway in Lilydale.

39 The slight difference in traffic volume may be due to motorists accessing shops located along the adjacent service lanes, bypassing the cameras on their way home in an easterly direction.

40 Typically, the left lanes in each direction of travel carried most of the traffic volume. **Table 1** shows the distribution of traffic volume through the lanes along Maroondah Highway in Lilydale.

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Table 1 – Distribution of traffic, Maroondah Highway in Lilydale

East bound			West bound		
Left lane	Right lane	Total	Left lane	Right lane	Total
1,020,961 (55.77%)	809,752 (44.23%)	1,830,713 (100%)	1,111,668 (59.65%)	751,858 (40.35%)	1,863,526 (100%)

- 41** Also typical, are the daily traffic volume totals, which increase from Mondays to Fridays with a drop in traffic during the weekends. The hourly traffic volumes in each direction follow a defined pattern of peak hour travel in the mornings and afternoons, with a high level of local traffic throughout the day. Overall, Sundays have the lowest typical traffic volume over the week. More detailed traffic volume graphs are contained in **Appendix C** of this report.
- 42** Note that, between 24 June 2014 to 10 July 2014 inclusive, the left lane in the west bound direction of the pedestrian crossing was not operating due to maintenance. This meant that no traffic or incident data was recorded during this period.

ANALYSIS OF INCIDENT DATA AND IMAGES

- 43** In the period 14 March 2014 to 31 August 2014, 25,623 vehicles were detected exceeding the speed limit or entering the pedestrian crossing against the red light. This number amounts to approximately 0.7 per cent of vehicles that travelled past the two road safety cameras.
- 44** Of the 25,623 incidents detected during this period, 1,223 were red light incidents, comprising approximately 4.77 per cent of the total number of incidents. The majority of the red light incidents, 723, were detected by the camera monitoring east bound traffic. This difference in red light incident detections may be due to some motorists showing reluctance to stop again after they had already stopped at the level crossing, approximately 80 metres west of the pedestrian crossing.

Table 2 – Number of red light incidents detected, Maroondah Highway in Lilydale

East bound			West bound		
Left lane	Right lane	Total	Left lane	Right lane	Total
405 (56.02%)	318 (43.98%)	723 (100%)	203 (40.60%)	297 (59.4%)	500 (100%)

- 45** The comparatively low number of red light incidents in the raw camera data is reflected in the complaints my office has received. Of the twelve complaints received about the road safety cameras, only two contained a complaint about a red light infringement. The remaining complaints concerning infringements were associated with motorists who were alleged to have exceeded the speed limit.
- 46** I examined the images relating to the two red light infringements that were referred to me. In both cases, the first image was recorded just before the front of the vehicle crossed the stop line at the pedestrian crossing when the traffic lights were red. The second image was recorded a short time later, depicting the vehicle travelling over the pedestrian crossing, with

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the traffic lights continuing to display a red light. These two images showed continuity of the vehicle's journey over the pedestrian crossing against a red light.

- 47** Based on these images, and the raw data recorded by the road safety cameras in relation to the operation of the traffic signals, I could not find any technical or systemic issue with the operation of the fixed road safety cameras in relation to monitoring compliance with red lights.
- 48** I believe that within the community, there is still a general misconception of what is a red light infringement. Some motorists have written to me arguing that because the pedestrian crossing spans a short distance, it is much "easier to be caught on red" within it. However, the offence, as defined by rule 59 of the *Road Safety Road Rules 2009*, is to **enter** an intersection or pedestrian crossing against a red light. Simply put, if the traffic lights turn red while a vehicle is travelling over the pedestrian crossing, that vehicle has not committed an offence under road rule 59, and no infringement notice will be issued.
- 49** The number of speed incidents detected comprised approximately 95.23 per cent of the total of 25,623 incidents recorded by the road safety cameras over the period 14 March 2014 to 31 August 2014. The total number of speed incidents detected per lane is detailed in **Table 3** below.

Table 3 – Number of speed incidents detected, Maroondah Highway in Lilydale

East bound			West bound		
Left lane	Right lane	Total	Left lane	Right lane	Total
2,119	8,053	10,172	5,872	8,356	14,228
(20.83%)	(79.17%)	(100%)	(41.27%)	(58.73%)	(100%)

- 50** As is the norm, the number of incidents of vehicles detected exceeding the speed limit at the pedestrian crossing was higher in the right hand lanes compared with the left hand lanes, in both directions. 16,409 of the 24,400 speed incidents (over 67 per cent), were recorded in the right hand lanes at the pedestrian crossing.
- 51** Of interest is the number of incidents detected on a daily basis. In both directions, the level of incidents during the working week is relatively low. However, during the weekends and public holidays, the level of detections doubles, and on Sundays, it can be as much as four times the general weekday level. This can be seen in **Figure D1** and **Figure D3**, contained in **Appendix D** of this report.
- 52** The increase in the number of incidents detected during weekends is further illustrated in **Figure D2** and **Figure D4** of **Appendix D**, where the average detection rate per hour by days of the week, is shown. During weekdays, a repeatable pattern is seen in terms of the number of detections per hour. However, during the weekends, the number of incidents increases dramatically.
- 53** It is reasonable to assume that many of the incidents detected during weekends result from motorists who do not live locally travelling between Melbourne and the Yarra Valley tourism area and beyond.

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- 54** Of interest also, is the second peak of detections by the road safety camera monitoring west bound traffic late during weeknights, between the hours of 8PM and 10PM, shown in **Figure D4**. Consultations with Yarra Valley Highway Patrol officers, who have also observed this phenomenon during their patrols, have led me to assume that this may be due to diners at the local restaurants and workers who typically work later at night, returning home.
- 55** I also consulted the images recorded by the road safety cameras of individual speed infringements referred to me in complaints. Of the twelve complaints I received, eight concerned motorists who had received at least one infringement for exceeding the speed limit at the pedestrian crossing.
- 56** In examining these images showing the relevant vehicles travelling through the pedestrian crossing at a speed higher than the speed limit, I could not find any systemic issues with the operation of the road safety cameras.

FLASH UNITS ACTIVATING

- 57** One of the biggest issues which motorists have complained about, is that they have witnessed the cameras' flash units trigger when they do not recall any vehicles travelling over the pedestrian crossing. This has inevitably led to some motorists doubting the accuracy and reliability of the road safety camera systems at Lilydale.
- 58** Unfortunately, without any specific times and dates associated with complaints where motorists have witnessed the camera allegedly flashing, it is very difficult to determine what in fact was happening at the pedestrian crossing.
- 59** Following these complaints, I requested that the Department of Justice, VicRoads and the manufacturer of the road safety cameras investigate the operation of both the cameras and the relevant flash units. However, no malfunction could be found in any of the hardware components or the software used by the camera systems.
- 60** Subsequently, VicRoads found that a power cable it had installed leading to the traffic light control systems and some components of the road safety camera system was underrated for the amount of power used. This underrated cable was causing power fluctuations into the road safety camera system, which may have caused the flash unit to activate, however there is no record to show that this in fact did occur at any time. The underrated cable has since been replaced with one that meets the power requirements.
- 61** I visited the road safety cameras with a member of my technical staff prior to the replacement of the VicRoads power cable, and neither of us witnessed either flash trigger when no vehicle was travelling over the pedestrian crossing. However, we did witness a vehicle apparently exceeding the speed limit, and another vehicle entering the pedestrian crossing against the red light. Both of these were recorded by the relevant road safety camera as incidents.
- 62** As part of this investigation, my office also carried out a week of video surveillance of the road safety cameras, between 10 November 2014 and 17 November 2014, to ensure that the flash units are not activating independently of their respective cameras. Reviewing this surveillance footage did not disclose any malfunction of the road safety cameras or the flash units.

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- 63** Reviews of the video footage showed multiple instances of motorists being flashed when their vehicle stopped over the stop line, as the road safety cameras would interpret this as a vehicle entering the pedestrian crossing against a red light. To oncoming vehicles, it may appear that the road safety camera was activating without any triggering event.
- 64** Further, in my discussions with members of the Yarra Valley Highway Patrol division, I was advised that they had also received complaints regarding the cameras flashing when no vehicles were perceived to be moving over the pedestrian crossing. However, when questioned further, those motorists admitted to "creeping forward" while waiting at the crossing, in anticipation of the green light. This behaviour of "creeping forward" can trigger the camera to record a red light incident, as the ferrous content in the slow moving vehicle changes the magnetic inductance of the sensors.
- 65** However, it is important that motorists are aware that if a camera is triggered by something other than a motor vehicle exceeding the speed limit or entering the pedestrian crossing against a red light, as evidenced by the flashing of the flash unit, two people must independently agree, upon viewing the images taken, that an offence has been committed. In short, the activation of the flash mechanism, in isolation, has no effect if no images of a motorist committing an offence are recorded.
- 66** I can only conclude, based on my observations of video footage recorded at the location, and discussions with the Department of Justice, that the "flashing" motorists wrote to me about most likely occurred during the commissioning phase of the road safety camera's installation. This was prior to its activation, when it was being regularly tested remotely to ensure all of its systems were functioning correctly.

THE REASONS FOR THE ROAD SAFETY CAMERAS' INSTALLATION

- 67** As these cameras are the first in Victoria to be installed at a pedestrian crossing, I wanted to understand the reasons for their presence. As part of this investigation, I consulted with the Department of Justice, Victoria Police and the office of Ms Christine Fyffe MLA, regarding the installation of the cameras.
- 68** In August 2010, the state member for Evelyn, The Honourable Christine Fyffe MLA wrote to the then Minister for Ports and Roads, The Honourable Tim Pallas MLA, expressing the concerns of local business owners and herself in relation to motorist behaviour along Maroondah Highway in Lilydale, particularly at the pedestrian crossing approximately 100 metres from Hutchinson Street.
- 69** These concerns were brought to the attention of the Fixed Camera Site Selection Committee (FCSSC), comprising representatives of Victoria Police, VicRoads and the Department of Justice.
- 70** As part of the FCSSC's analysis of the location, two technical specialists from the Department of Justice visited the location to determine whether the concerns had any merit. During this visit, they observed and recorded multiple instances of vehicles exceeding the speed limit or entering the pedestrian crossing against red lights, despite pedestrians having the right of way and attempting to cross the road.
- 71** In addition to the general attitude displayed by motorists towards pedestrians, it was noted that a high school with approximately 2,200 students is located near the pedestrian crossing

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and that many students are permitted to travel to the shopping strip during lunch times. This means that there is a high level of pedestrian traffic along this road throughout the day.

- 72** The Yarra Valley Highway Patrol division informed me that the cameras' activation, coincided with an eighteen month long operation it had been running along this section of Maroondah Highway, due to large numbers of nose-to-tail collisions as a result of distracted driving and speeding, in addition to concerns about pedestrian safety.
- 73** These risk factors have satisfied me that the two road safety cameras have been installed as a preventative measure against pedestrian injuries in the area. While the perception that road safety cameras are revenue raising devices is still alive and well, there is certainly no basis for that allegation in this instance.

CONCLUSIONS

- 74** After examining the testing, maintenance and certification reports provided by the Department of Justice, I am satisfied that the fixed road safety cameras at the pedestrian crossing along Maroondah Highway, Lilydale, approximately 100 metres west of Hutchinson Street, has been operating accurately and reliably since its activation on 14 March 2014.
- 75** After analysing data of red light incidents recorded by the road safety cameras, I am satisfied that the yellow timing at the pedestrian crossing is in accordance with the guidelines set out in VicRoads' *Traffic Engineering Manual*.
- 76** After analysing data of speed incidents recorded by the road safety cameras, I am satisfied that the cameras, together with the independent secondary speed verification systems, accurately calculated and recorded the speeds of vehicles as they passed the camera. Any vehicles detected travelling above the speed limit, with a correlating speed from the secondary system had their images recorded. The data and images were correctly enclosed in an encrypted file and sent for manual processing.
- 77** From my analysis of the infringements referred to me by motorists, I could not find any systemic or technical issues with the operation of the camera system. I am satisfied that the infringements were issued correctly and fairly by Victoria Police, following manual analysis of the images and data by at least two independent people.
- 78** Neither my technical staff, the cameras' manufacturer or the technical specialists could identify any malfunction in the road safety cameras in relation to complaints that their flashes were being triggered when no vehicles were perceived to be travelling over the pedestrian crossing. Without a specific time and date associated with these complaints, it is extremely difficult to determine what was occurring at the pedestrian crossing prior to the camera's activation.
- 79** I am also satisfied that, after consultations with the Yarra Valley Highway Patrol Division and the office of The Honourable Christine Fyffe MLA, that the two road safety cameras were installed at the pedestrian crossing along Maroondah Highway as a preventative measure against accidents involving pedestrians, and not a "revenue raising" exercise. In this regard, accident statistics show they have been very successful.

RECOMMENDATIONS

80 There are no recommendations resulting from my findings in this investigation.

CONSULTATION

81 This report was prepared in consultation with:

- a. The Department of Justice,
- b. The office of The Honourable Christine Fyffe MLA,
- c. Victoria Police Yarra Valley Highway Patrol division,
- d. EyeFi Pty Ltd, and
- e. VicRoads

APPENDIX A

DEFINITION OF A MARKED FOOT CROSSING

A marked foot crossing, also known as a pedestrian crossing, is defined in the dictionary section of the *Road Safety Road Rules 2009*. In this section, it is defined as:

Marked foot crossing means an area of road-

- (a) At a place with pedestrian lights facing pedestrians crossing the road and traffic lights facing vehicles driving on the road, and
- (b) Indicated by a different road surface, or between 2 parallel continuous or broken lines, or rows of studs or markers, on the road surface substantially from one side of the road to the other;

For the purposes of this investigation, the pedestrian crossing along Maroondah Highway in Lilydale is marked substantially by two parallel continuous white lines across the road surface.

APPENDIX B

ROAD RULE 59 – PROCEEDING THROUGH A RED TRAFFIC LIGHT

- (1) If traffic lights at an intersection or marked foot crossing are showing a red traffic light, a driver must not enter the intersection or marked foot crossing.
- (2) However, if the traffic lights are at an intersection with a *turn left on red after stopping sign* and the driver is turning left at the intersection, the driver may turn left after stopping.
- (3) Also, subrule (1) does not apply to a driver if rule 58(1) or (2) applies to the driver.

For the purposes of this investigation, subrule 59(2) is irrelevant, as there are no turning lanes at this marked foot crossing. Subrule 59(3), which refers to other sections of the *Road Safety Road Rules 2009*, deals with turning vehicles and is also irrelevant to this investigation.

APPENDIX C

TRAFFIC VOLUME GRAPHS

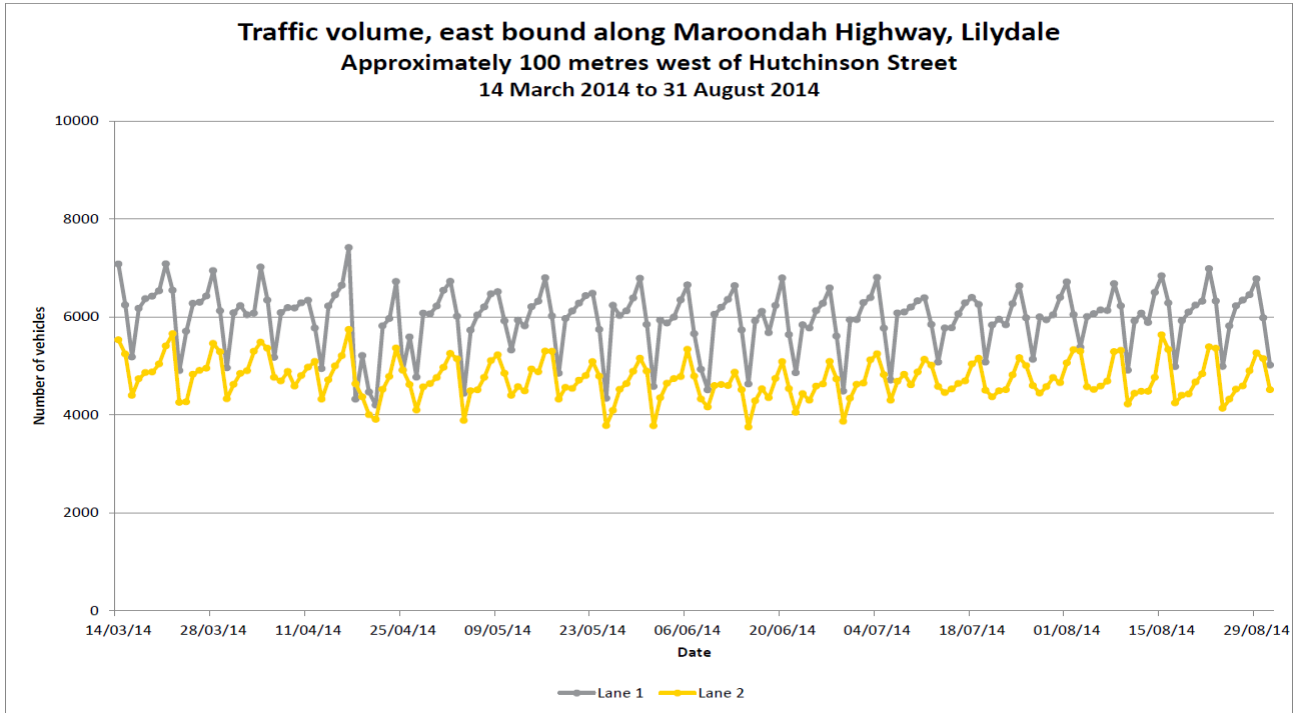


Figure C1 – Daily traffic volume of vehicles travelling east along Maroondah High, Lilydale

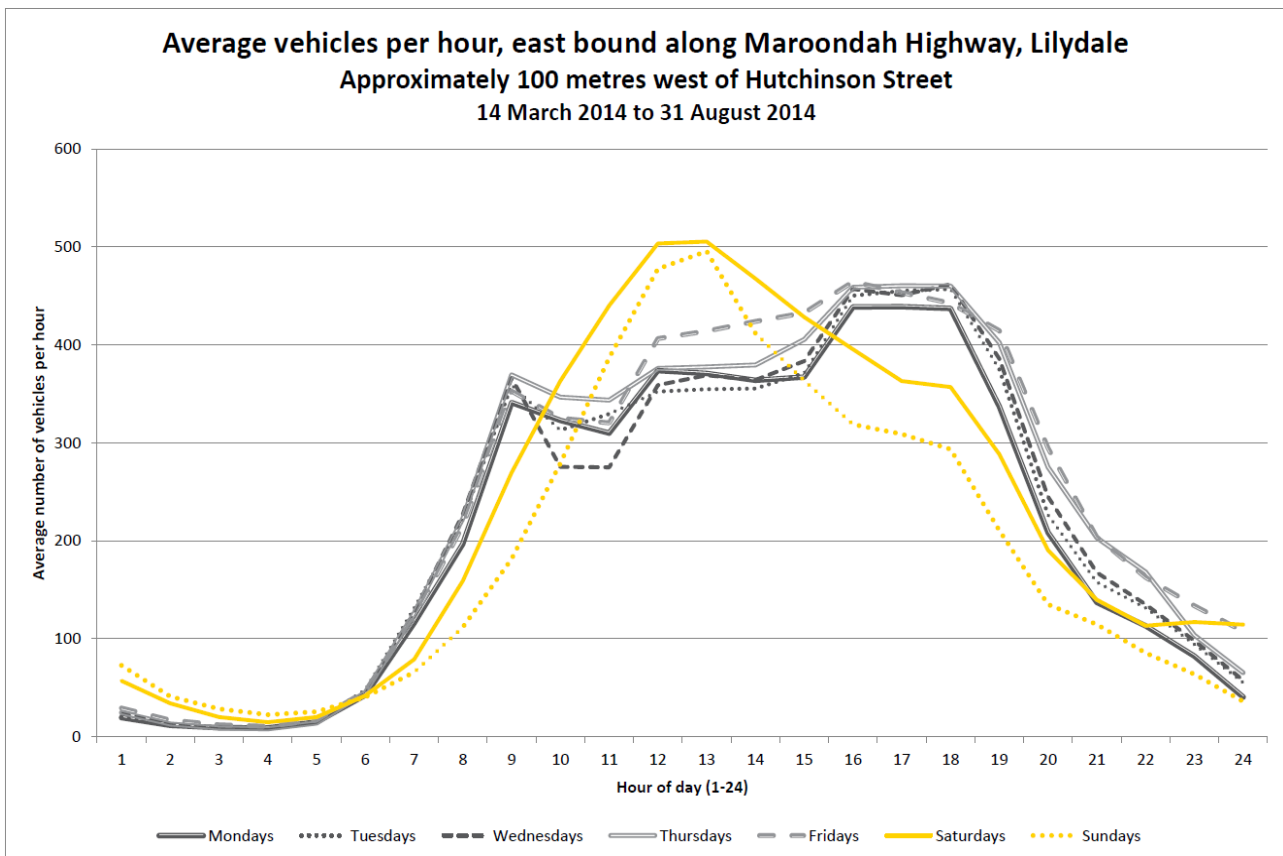


Figure C2 – Average hourly volume of vehicles travelling east along Maroondah High, Lilydale

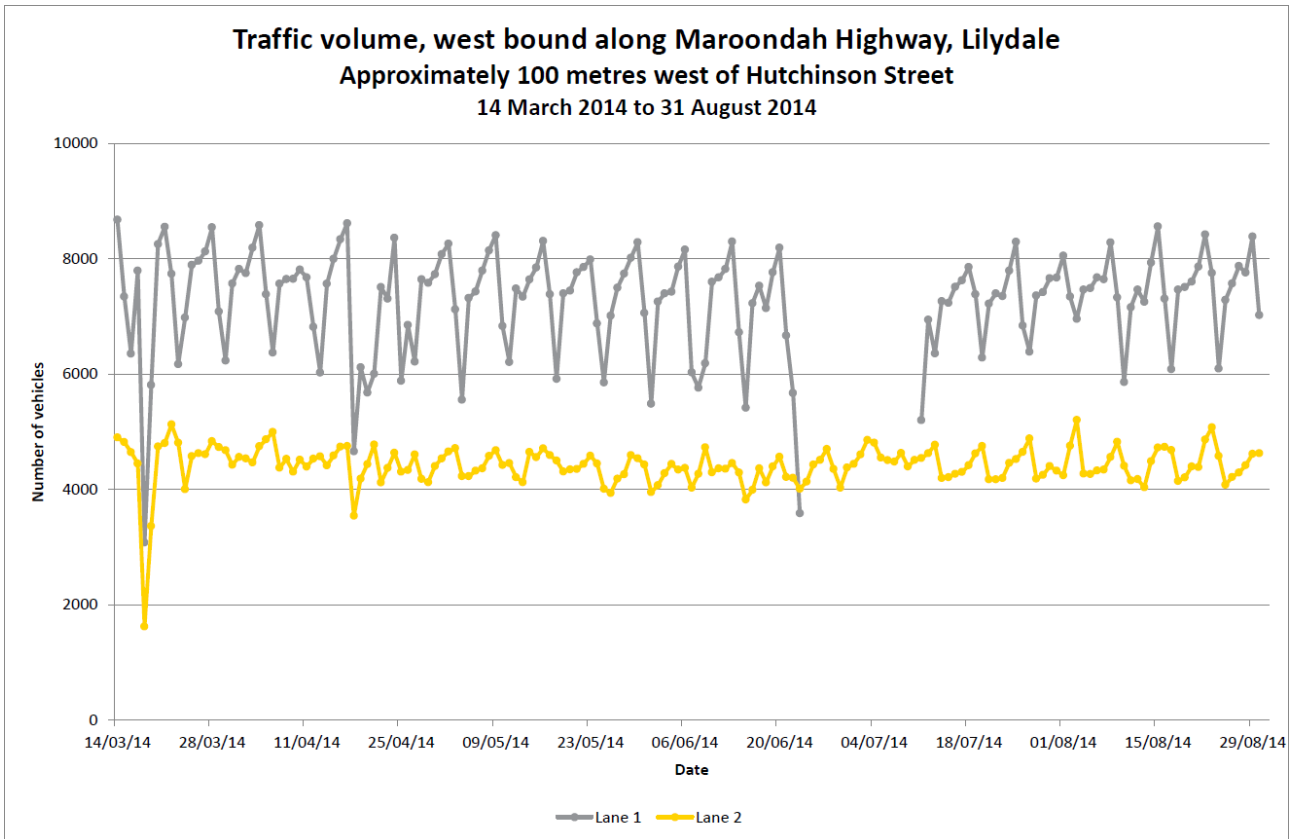


Figure C3 – Daily traffic volume of vehicles travelling west along Maroondah High, Lilydale

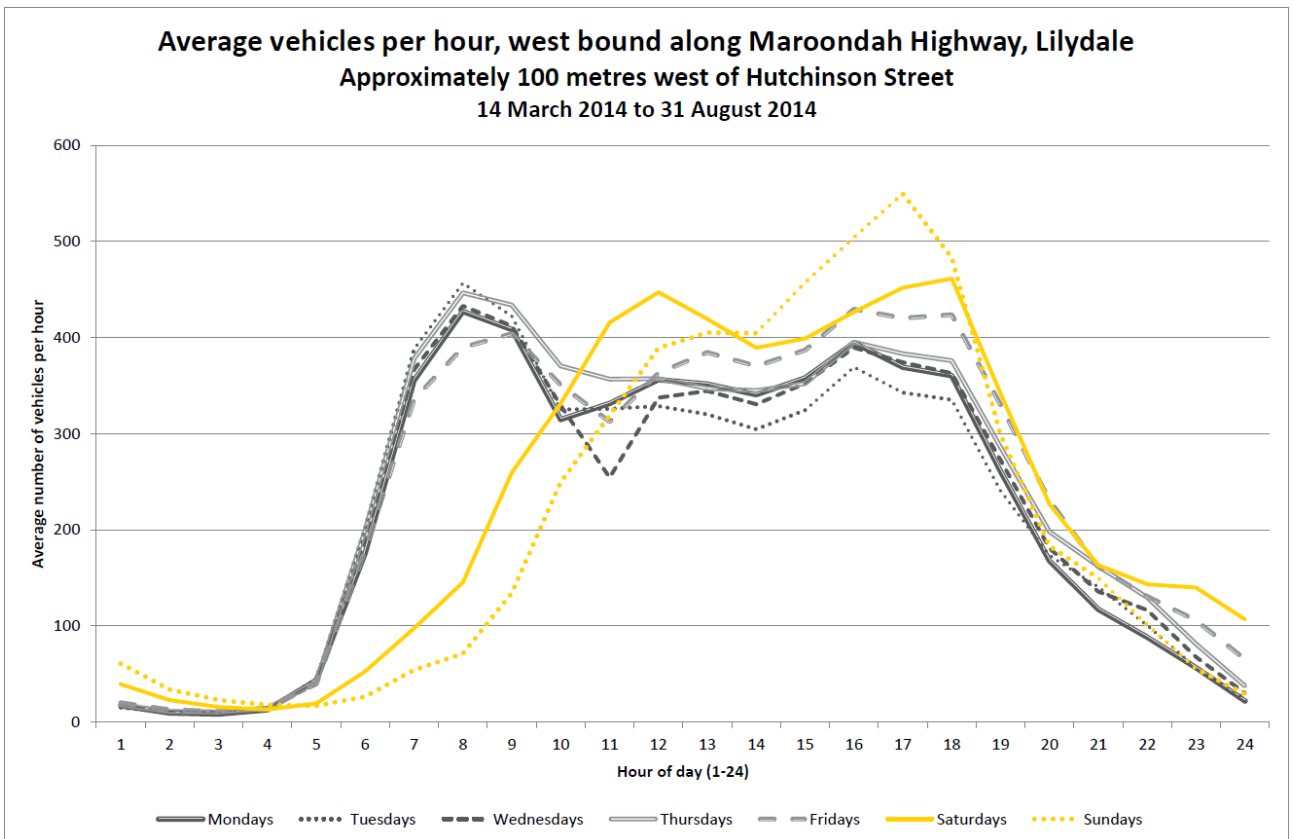


Figure C4 – Average hourly volume of vehicles travelling west along Maroondah High, Lilydale

APPENDIX D

DETECTED INCIDENTS GRAPHS

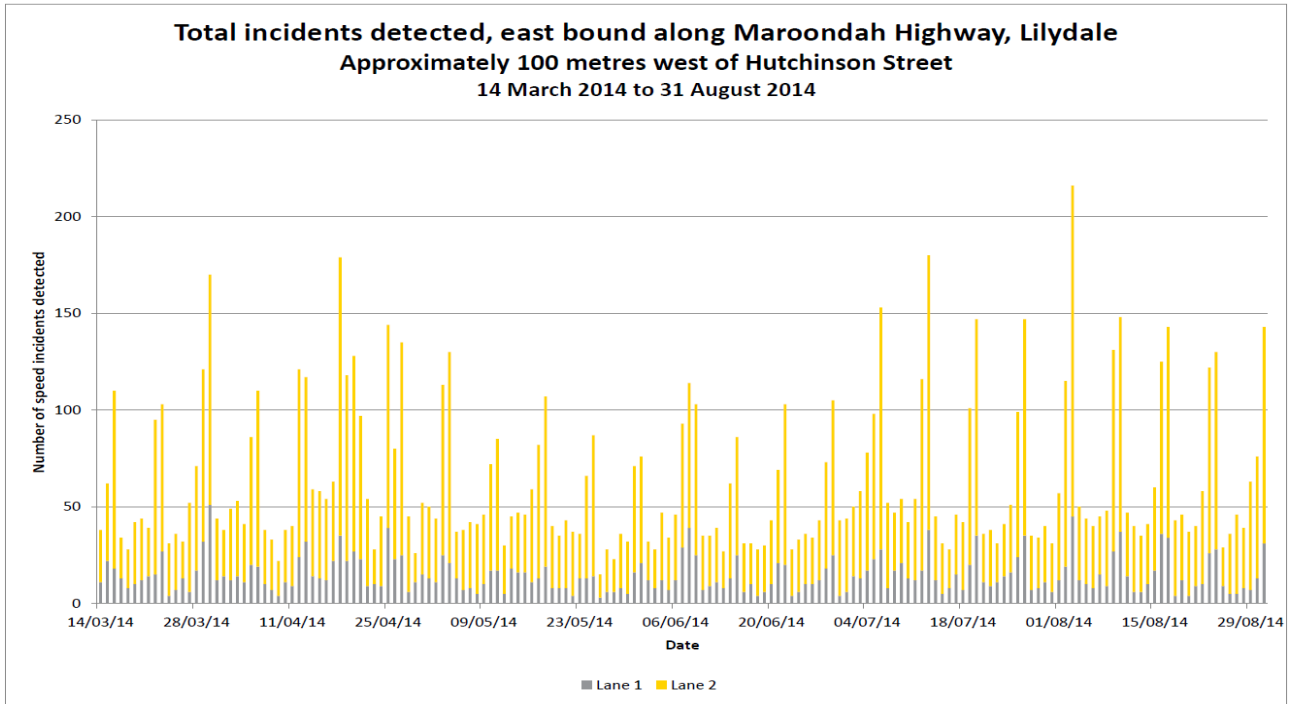


Figure D1 – Daily incidents detected travelling east along Maroondah High, Lilydale

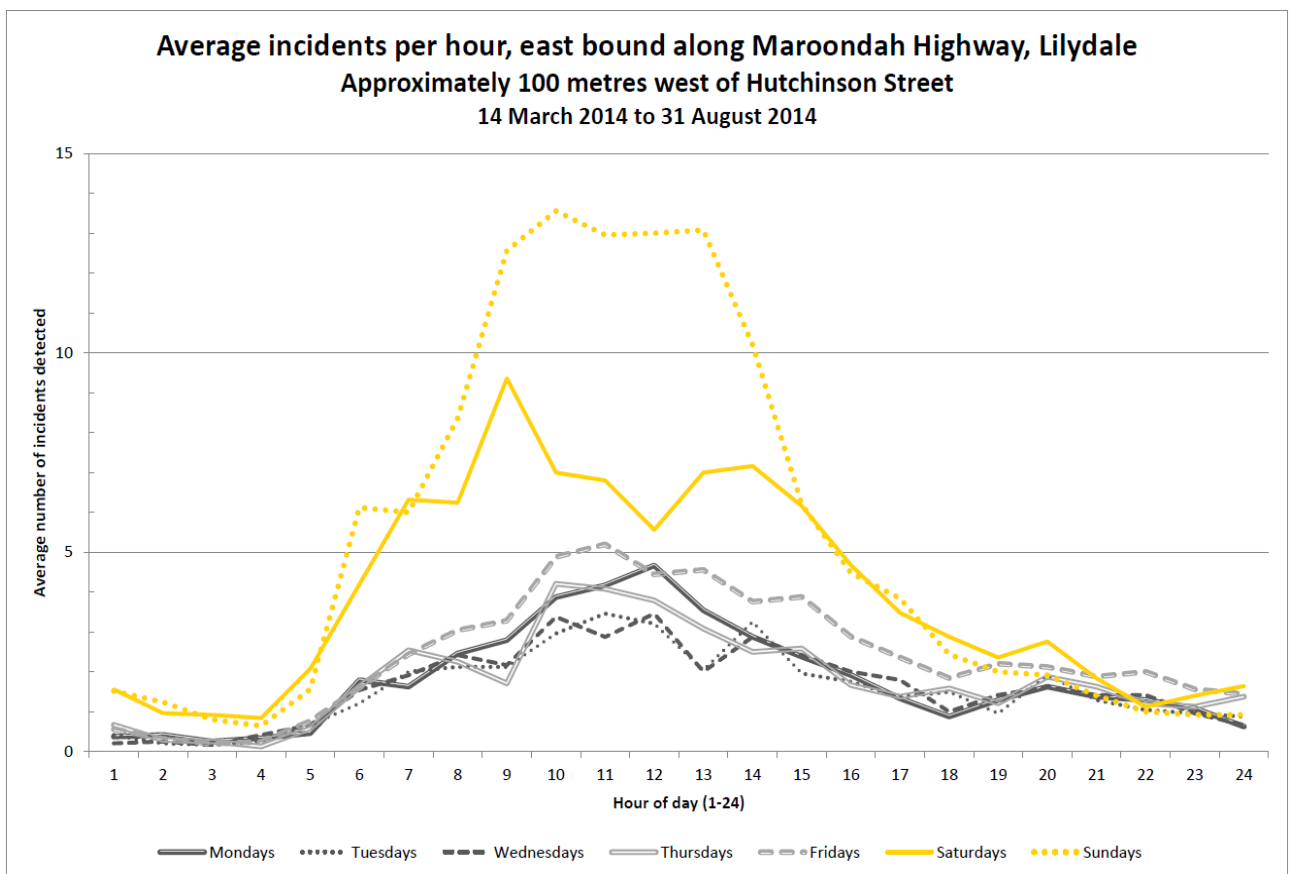


Figure D2 – Average incidents detected per hour travelling east along Maroondah High, Lilydale

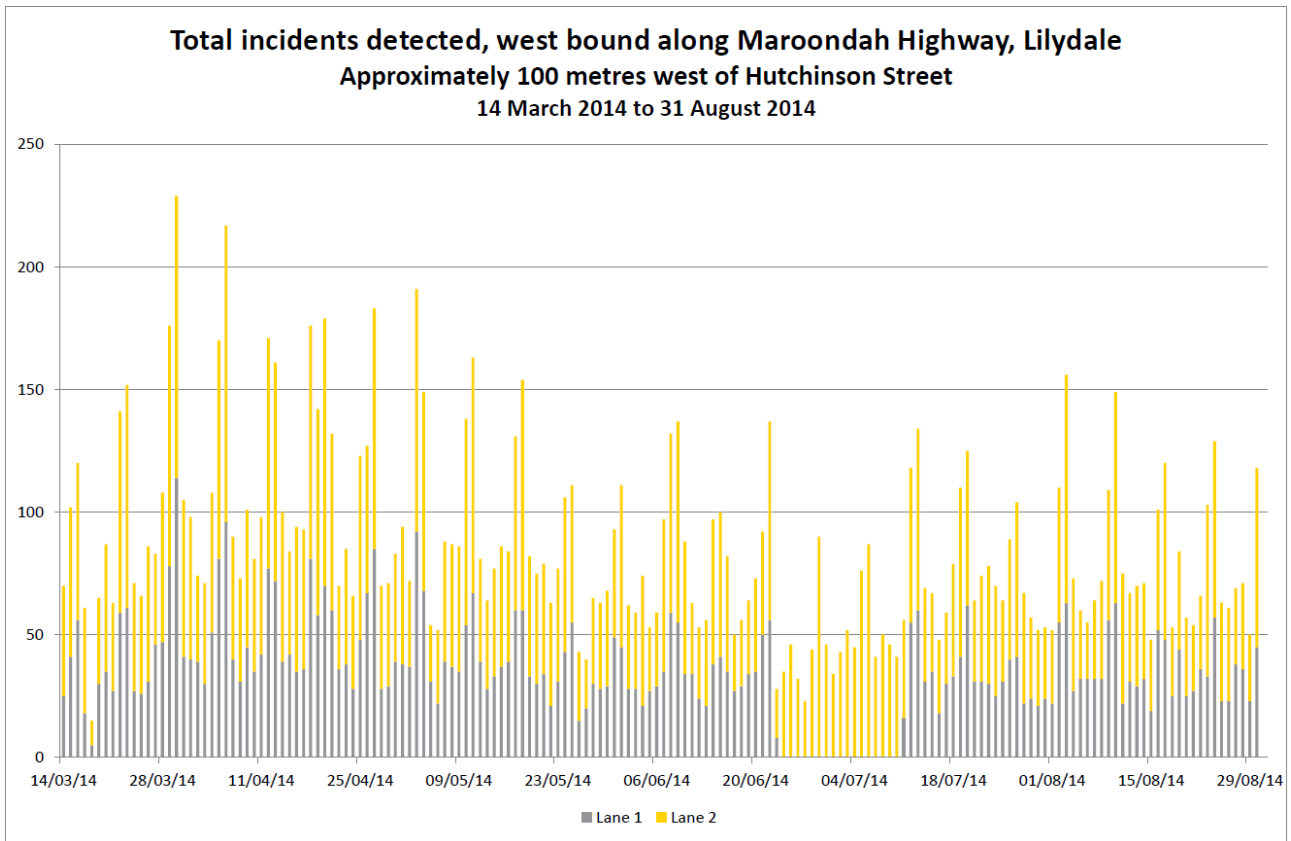


Figure D3 – Daily incidents detected travelling west along Maroondah High, Lilydale

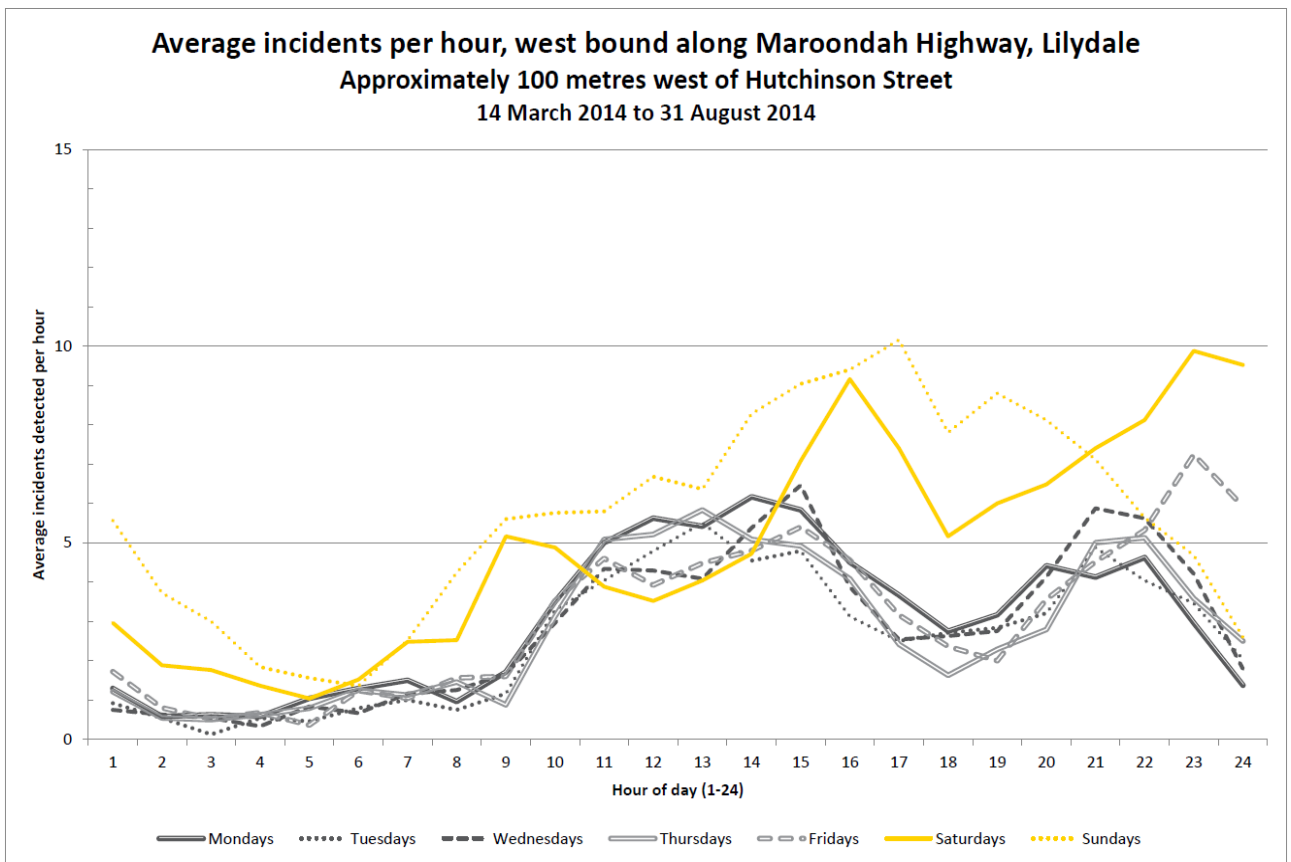


Figure D2 – Average incidents detected per hour travelling west along Maroondah High, Lilydale