Road Safety Camera Commissioner

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

Investigation into the fixed road safety cameras at the intersection of Springvale Road and Lower Dandenong Road, Braeside

Release date: 10 March 2015

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 intersection of Springvale Road and Lower Dandenong Road in Braeside.

BACKGROUND

2 The two fixed road safety cameras installed at the north bound approach to the intersection of Springvale Road and Lower Dandenong Road in Braeside, have been in operation since 7 October 2011. The west bound approach to this intersection is Cheltenham Road. The fixed road safety cameras are installed on the north bound approach to the intersection, monitoring compliance with the 80 km/h speed limit and traffic signals.

3 There are six lanes at the north bound approach to the intersection. The leftmost lane is a Bus Lane, also known as Lane One. There are three straight through lanes, also known as Lane Two, Lane Three and Lane Four. Finally, there are two right turn only lanes, known as Lane Five and Lane Six. All right hand turns at this intersection operate on what VicRoads terms "fully controlled" traffic sequences, which mean that vehicles turning right cannot enter the intersection unless there is a green arrow.

4 Due to the large number of lanes at this intersection, two fixed road safety cameras are present, one on the kerbside and one on the median strip dividing the two carriageways. The kerbside camera is dedicated to monitoring vehicles travelling through the bus lane, and the two straight through lanes immediately adjacent to the bus lane. The remaining lanes are monitored by the camera in the median strip. **Figure One**, below, shows the layout of the lanes.

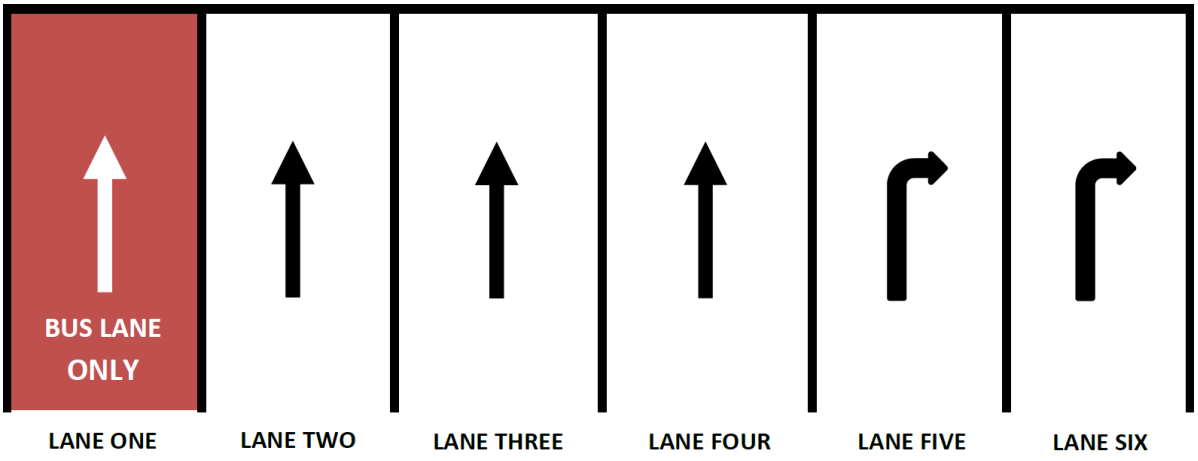

Figure One – lane layout for the northbound carriageway of the intersection of Springvale Road and Lower Dandenong Road, Braeside

5 Since 2012, I have received twelve written complaints regarding the operation of the road safety cameras at this intersection as well as numerous telephone enquiries. Motorists have also complained to the local newspaper, the *Dandenong Leader*, which published an article entitled *Red light gran helps out others* on 30 June 2014.

6 Due to the number of complaints and media attention concerning these cameras, I undertook a technical investigation into the operation, accuracy and reliability of the road safety cameras at the intersection of Springvale Road and Lower Dandenong Road in Braeside, pursuant to my powers under section 10(e) of the *Road Safety Camera Commissioner Act 2011*.

THE ROAD SAFETY CAMERA SYSTEM

7 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.

8 The type of primary device installed at the intersection of Springvale Road and Lower Dandenong Road in Braeside is a Gatsometer GTC-GS11, 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 vehicles pass over the inductive loops, the ferrous content in them alters the magnetism in the loop, which is measurable by the road safety camera system. The secondary speed calculation unit installed at this intersection is an infrared laser based device.

9 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.

10 In addition to the annual certification and calibration requirements, the Department of Justice subjects all fixed road safety cameras to a rigorous program of daily monitoring, monthly maintenance and quarterly testing by independent qualified organisations. This 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*.

NATURE OF COMPLAINTS

11 Since the Office of the Road Safety Camera Commissioner was established, I have received twelve complaints from ten motorists regarding the fixed road safety cameras at the intersection of Springvale Road and Lower Dandenong Road in Braeside.

12 Not all of these complaints related to traffic infringements those individuals had received, as some were more general in nature. However, the infringements received were all of vehicles effecting a right hand turn against a red arrow. The complaints focused on the following issues:

a. The motorist was "within the intersection" when the road safety camera recorded images of their vehicle, as there was insufficient time to "clear the intersection",

b. The duration of the green arrow was very short,

c. The duration of the green arrow was unpredictable, and

d. The duration of the yellow arrow was very short.

13 None of the complaints I have received related to motorists who were detected exceeding the speed limit, or travelling straight along Springvale Road against a red light.

SCOPE OF INVESTIGATION

14 The investigation focused on the issues that motorists have raised with me. As part of my investigation, I obtained data recorded during the 874 day period between 19 March 2012 and 9 August 2014. This period encompasses the dates of the complaints I have received, as well as the most recent data available for analysis. My investigation focused on:

a. The general operation of the fixed road safety cameras,

b. The testing, maintenance and certification activities performed on the fixed road safety cameras,

c. Any changes made to the design and operation of the traffic lights,

d. Traffic volume and infringement data recorded by the fixed road safety cameras at the intersection, and

e. Analysing the images of infringements that were referred to me in complaints from the public.

15 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, or the way that the intersection is designed.

16 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 intersection against a red light. These phrases do not refer to the final number of traffic infringements issued by Victoria Police, rather they are a measure of the road safety camera's effectiveness, accuracy and reliability.

17 To determine whether the road safety cameras were operating accurately and reliably, the Department of Justice provided data recorded by the cameras during the period 19 March 2012 and 9 August 2014. This data was analysed to determine the behaviour of the road safety cameras and traffic light cycles.

18 The analysis of the data recorded by the road safety cameras concentrated on examining the operation of the road safety camera, including the duration of yellow lights and arrows. During the approximately 2.4 years of data, more than 11.77 million vehicles were detected travelling through the intersection.

19 I also viewed all the images relating to individual infringement notices referred to me by motorists to determine if there was a common cause for the number of complaints. The images of infringements may also have shown whether the road safety cameras were functioning correctly.

RESULTS OF INVESTIGATION

TESTING AND MAINTENANCE OF ROAD SAFETY CAMERAS

20 In examining the calibration and certification activities carried out on the two road safety cameras during the period between 19 March 2012 and 9 August 2014, I am satisfied that they were calibrated to the accuracy and reliability standards required under the *Road Safety (General) Regulations 2009*.

21 In addition, the cameras were maintained and tested regularly, in accordance with the technical requirements set out by the Department of Justice and the manufacturer's specifications. I am satisfied that the road safety cameras were operating accurately and reliably throughout the entire period.

ANALYSIS OF DATA RECORDED BY ROAD SAFETY CAMERAS

22 Analysis of the data recorded by the road safety cameras showed that for the period 19 March 2012 to 9 August 2014, 11,772,143 vehicles were detected travelling north along Springvale Road or turning right into Cheltenham Road. **Figure Two** shows the number, type and proportion of incidents detected by the road safety cameras in each lane.

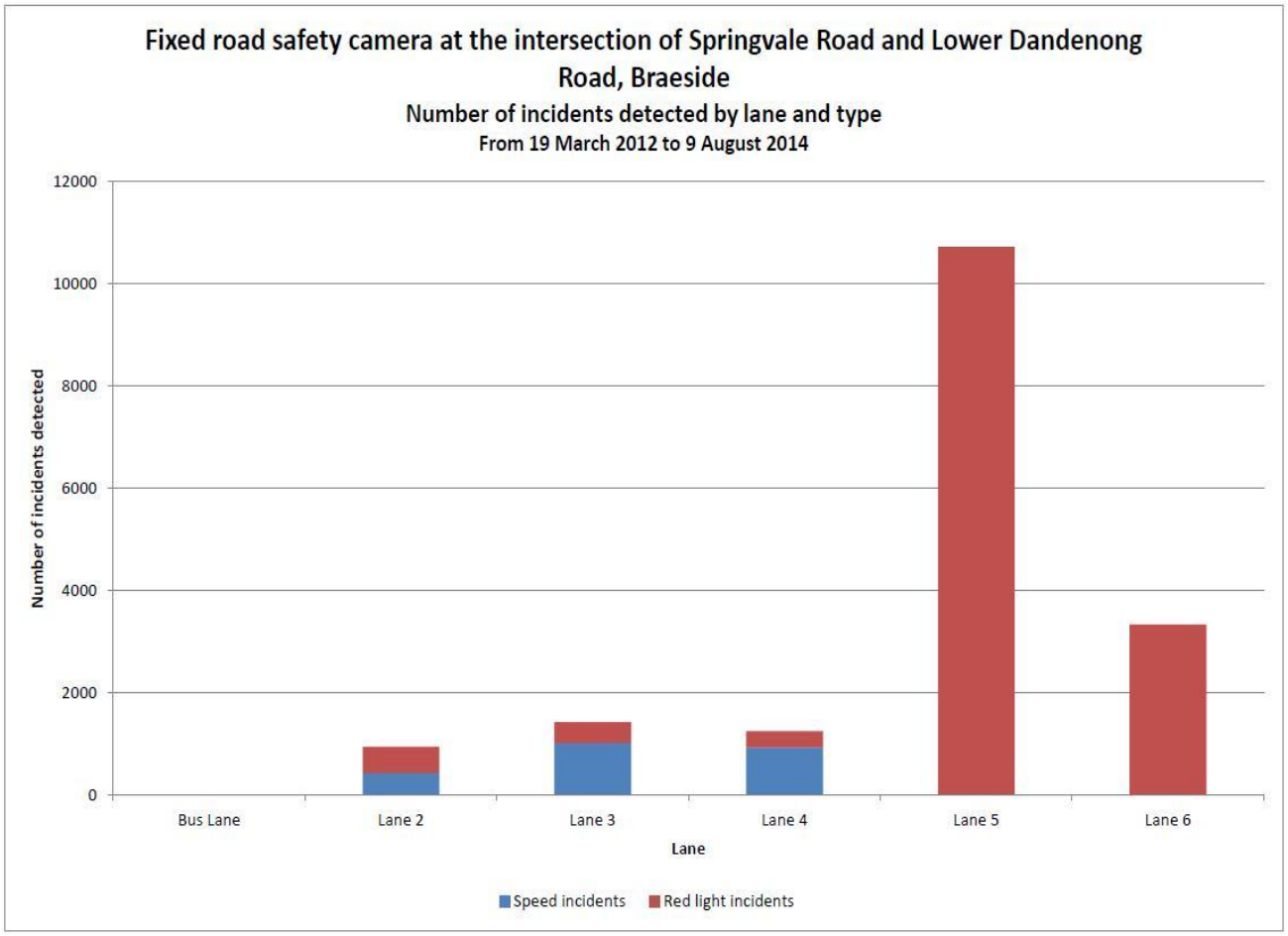

Figure Two – number and type of incidents detected per lane during the period 19 March 2012 to 9 August 2014

23 The two road safety cameras detected 17,640 speed and red light incidents during this period. The rate of compliance with the speed limit and the traffic signals at this site was approximately 99.85% of all traffic. **Table One** shows the traffic volume compared to incidents detected. For the purposes of this report, the Bus Lane will be ignored, since no incidents were detected in this lane.

Table One – Traffic volume and compliance rate

Lane	Traffic volume	Total incidents detected	Compliance rate (%)
Lane Two	4,113,953	930	99.98
Lane Three	3,320,617	1,420	99.96
Lane Four	2,865,612	1,236	99.96
Lane Five	921,131	10,725	98.84
Lane Six	550,305	3,329	99.40
TOTAL	*11,771,618*	*17,640*	*99.85*

24 The data shows that the two right turn lanes, Lane Five and Lane Six have the highest ratio of detected incidents to traffic volume. As all of the complaints referred to me have related to red light infringements involving right hand turns at this intersection, this report's main focus is upon this aspect of the intersection and the operation of the road safety cameras.

OPERATION OF THE ROAD SAFETY CAMERAS

25 When reviewing the data relating to all incidents where a vehicle was detected exceeding the speed limit in Lanes Two, Three and Four, the road safety cameras:

a. Ensured that the speed recorded by the primary device correlated with the secondary system before accepting the measurement, and

b. That images and associated data recorded of each incident were correctly incorporated into encrypted files for manual processing.

26 In examining the data, the operation of the road safety cameras in relation to speed incidents was correct. I could not find any technical issues in the way the road safety cameras detected and recorded speed incidents.

27 When reviewing the data relating to all incidents where a vehicle was detected entering the intersection against a red light or arrow, the road safety cameras:

a. Recorded the duration of the yellow light or arrow available to motorists before the red light or arrow phase of each detected incident,

b. Ensured the 0.5 second grace period was observed before arming,

c. Recorded the amount of time the red light or arrow had been displayed before the vehicle entered the intersection, and

d. That images and associated data recorded of each incident were correctly incorporated into encrypted files for manual processing.

28 The data showed that the operation of the road safety cameras in relation to red light incidents was correct. I could not discern any technical issues relating to how the road safety cameras detected and recorded red light incidents.

OPERATION OF TRAFFIC SIGNALS

29 The traffic signal cycle used at this intersection was first installed by VicRoads on 28 May 2007, and has been in continuous operation since that date. There has only been one change made to the traffic signal cycle in that time.

30 After a revision of the AustRoads guidelines in early 2014, VicRoads adopted changes to the guidelines for the duration of yellow lights for vehicles travelling through an intersection at 80 km/h on 28 March 2014, and promulgated these changes on its website on the same date. The new VicRoads guidelines increase the yellow light duration for vehicles travelling straight through intersections with an 80 km/h speed limit from 4.5 seconds to 5 seconds.

31 The increase of yellow light times for vehicles travelling straight through at 80 km/h was implemented at the intersection of Springvale Road and Lower Dandenong Road on 10 April 2014. The duration of the yellow arrow for vehicles turning right at this intersection remains at three seconds, as the standard for yellow light duration did not change for vehicles travelling below 45 km/h.

32 The data recorded by the road safety cameras shows that the duration of the yellow lights and arrows was:

a. Three seconds or more for all red light incidents detected for vehicles entering the intersection to turn right against a red arrow,

b. 4.5 seconds or more for all red light incidents detected for vehicles entering the intersection and travelling straight through until 10 April 2014, and

c. Five seconds or more for all red light incidents detected for vehicles entering the intersection and travelling straight through, on or after 11 April 2014.

33 These yellow light durations are correct for all of these periods. The Department of Justice & Regulation has informed me that no red light infringements for travelling straight through the intersection were issued between the date the standard of the yellow light duration changed, and the date that change was implemented at this intersection.

IMAGES OF INFRINGEMENTS

34 As part of my investigation, I examined the images relating to traffic infringements referred to me by the public. Of the eight traffic infringements referred to me:

a. Seven were detected in Lane Five, the first right turn lane,

b. One infringement was detected in Lane Six, the second right turn lane,

c. Recorded at least 0.5 seconds after the traffic arrow had turned red, and

d. Showed the motorist entering the intersection to effect a right hand turn against a red arrow.

35 The images of the infringements were also consistent in showing motorists entering the intersection against a red arrow:

a. The first image is recorded when the rear of the vehicle is leaving the sensor area in the road, with a red arrow displayed on the traffic signals,

b. The second image is recorded a short time later with the vehicle inside the intersection, therefore

c. Showing the vehicle has entered the intersection against a red arrow through the continuity of the two images.

36 I note that the level of traffic volume and incidents detected in Lane Five is significantly higher than that in Lane Six. However, upon further research of the area, there is a Bunnings

Warehouse located on the northeast corner of the intersection, along Cheltenham Road. A large proportion of the traffic in Lane Five may have been intent on entering Bunnings Warehouse. This would lead to the higher level of traffic and incidents detected within this lane.

ADDRESSING ISSUES RAISED IN COMPLAINTS

37 In relation to complaints raised about the duration and predictability of green lights and arrows at traffic lights, these are matters for VicRoads, as it is the body responsible for the design, maintenance and operation of traffic light signals in Victoria.

38 In relation to complaints regarding the duration of the yellow arrow and yellow light phases, I could not find any red light incident detected by the road safety cameras where the yellow light phase was shorter than that prescribed by the relevant standards and guidelines. I am satisfied that these complaints have no merit.

39 Many of the complaints addressed to me also stated that the motorists did not have time to "clear the intersection". This misconception by motorists of what the offence is, which is to **enter an intersection after the traffic lights or arrows turn red**, rather than to be within it when the lights and arrows turn red, is still prevalent today. The offences are covered under road rules 59 and 60 of the *Road Safety Road Rules 2009*, which forbids motorists entering an intersection against a red light or red arrow, respectively. Further details regarding intersections and the relevant road rules are found in **Appendix A** and **Appendix B** of this report.

40 After analysing the data recorded by the road safety cameras over 874 days and the images of infringement notices, I could not find any systemic issues with the road safety cameras that could have resulted in infringements being incorrectly issued to motorists.

41 I can only conclude that impatience is leading motorists to take a chance, by trying to enter the intersection on the yellow arrow. Invariably, when this occurs, some motorists miscalculate the amount of time available, and enter the intersection against the red light or arrow.

42 I am concerned that some motorists are exhibiting this level of impatience at an intersection where the speed limit on all approaches is 80 km/h. It is important for all motorists to remember that the yellow light or arrow is a warning to stop if it is safe to do so, as required by rule 57 of the *Road Safety Road Rules* 2009, rather than an extension of the green light or arrow.

CONCLUSIONS

43 After examining the independent testing, maintenance and certification reports provided by the Department of Justice, I am satisfied that the two fixed road safety cameras at the intersection of Springvale Road and Lower Dandenong Road in Braeside were operating accurately and reliably during the 874 day period between 3 March 2012 and 9 August 2014.

44 After analysing data recorded by the two fixed road safety cameras, and comparing that with information provided by VicRoads, I am satisfied that the traffic light system was functioning correctly. I am satisfied that the duration of both the yellow lights and arrows at this

intersection met the guidelines for traffic light design, as set out in the VicRoads *Traffic Engineering Manual*.

45 From viewing and analysing the images of the infringements referred to me by the public, I am satisfied that each and every vehicle entered and proceeded through the intersection against a red arrow, which contravenes road rule 60 of the *Road Safety Road Rules 2009*. I am satisfied that each infringement was issued correctly based on the images I viewed and the data I analysed.

46 I am satisfied that the primary reason for the infringements that I viewed was driver impatience upon seeing the yellow arrow. Instead of stopping if safe to do so, some motorists treated the yellow arrow as an extension of the green, and were ultimately detected entering the intersection against the red arrow.

RECOMMENDATIONS

47 There are no recommendations resulting from this report.

CONSULTATION

48 This report was prepared in consultation with the Department of Justice & Regulation and VicRoads.

APPENDIX A

DEFINITION OF AN INTERSECTION

An intersection is defined in the *Road Safety Road Rules 2009*. The word intersection, in this context:

Means the area where two or more roads (except any road related area) meet, and includes-

a) any area of the roads where vehicles travelling on different roads may collide, and

b) the place where any slip lane between the roads meet the road into which traffic in the slip lane may turn-

But does not include any road related area.

Note: A road related area, as defined in the *Road Safety Road Rules 2009* includes, but is not limited to, areas such as footpaths, driveways and median strips.

APPENDIX B

ROAD RULES 59 AND 60

There are two sections of the *Road Safety Road Rules 2009* relating to entering an intersection against red lights or red arrows.

Section 59 relates to proceeding into an intersection against a red 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* left turn 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.*

Section 60 relates to proceeding into an intersection against a red arrow:

If traffic arrows at an intersection or marked foot crossing are showing a red traffic arrow, and a driver is turning in the direction indicated by the arrow, the driver must not enter the intersection or marked foot crossing.

Note: Section 58 of the *Road Safety Road Rules 2009* refers to cases where motorists are able to complete a turn at traffic lights that are showing red, but with a green arrow in the direction they are turning. It also refers to a special case where there is no stop line or *stop here on red signal* sign present at or near the traffic lights.