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AUDITOR-GENERAL SPECIAL REPORT No. 85

Speed-detection devices

November 2009

Presented to both Houses of Parliament in accordance with the provisions of Audit Act 2008

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19 November 2009

President
Legislative Council
HOBART

Speaker
House of Assembly
HOBART

Dear Madam President
Dear Mr Speaker

SPECIAL REPORT NO. 85

Speed-detection devices

This Report has been prepared consequent to examinations conducted under section 23 of the *Audit Act 2008,* for submission to Parliament under the provisions of section 30 of the Act.

Performance audits seek to provide Parliament with assessments of the effectiveness and efficiency of public sector programs and activities, thereby identifying opportunities for improved performance.

This report evaluates Tasmania's speed-detection devices enforcement program, by looking at the efficiency and effectiveness of the program.

Yours sincerely

H M Blake

AUDITOR-GENERAL

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Foreword

The economic, emotional, health and other social impacts of motor vehicle accidents on our whole community are enormous. Since the 1950's, there has been recognition that as a society we should not accept the high rates of fatalities and serious injuries on our roads. Governments, motor vehicle manufacturers and other stakeholders have introduced initiatives to improve motor vehicle safety and to construct safer roads. Driver education and enforcement regimes have also contributed in reducing road tolls. However, the number of fatalities and serious injuries on our roads remains high.

Speed is recognised as a contributing factor to fatal and serious traffic accidents. An objective of the use of speed-detection devices is to limit instances of speeding. That strategy was the focus of this audit. We examined Tasmania's speed-detection device enforcement program with the objective of forming an opinion on its efficiency and effectiveness.

While I concluded the speed-detection device program operated efficiently and effectively, areas were identified where improvements could be made. Suggestions were aimed at better utilising available data to, for example, review speed-detection device resource allocation to provide for more even enforcement activity relative to serious crashes and to use crash data to better align speed-detection resources with peak crash times.

Staff from the Departments of Police and Emergency Management and Infrastructure, Energy and Resources contributed significant expertise to the conduct of this audit for which I thank them.

H M Blake

Auditor-General

19 November 2009

List of acronyms and abbreviations

CDM	Crash Data Manager (database)
CMG	Corporate Management Group
DIER	Department of Infrastructure, Energy and Resources
DPEM	Department of Police and Emergency Management
SCIN	Speed camera infringement notice
SDD	Speed-detection device

Executive summary

Executive summary

Background

Speed has long been recognised as a contributing factor to fatal and serious traffic accidents on Tasmanian roads. While police have been able to enforce speed limits for decades, it has only been since the early 1990's that these attempts have been ramped up through the use of speed-detection cameras and better focused enforcement strategies.

The philosophy behind the implementation of speed-detection devices (SDDs) in Tasmania was to encourage a community perception that the chance of detection was so high that speeding was not worth the risk, with SDDs operating across the State on a daily basis[1]. The objective for their introduction was to reduce the incidence of collisions through general and specific deterrence. Road users may be persuaded to modify their behaviour through a combination of police enforcement and education campaigns[2].

The Department of Police and Emergency Management (DPEM) uses various types of SDDs, including:

- hand-held devices
- vehicle-mounted mobile units
- mobile laser and radar cameras
- fixed cameras.

Audit conclusion

As to whether the speed-detection devices program has contributed to achieving road safety goals.

SDDs have been effective and have contributed to achieving road safety goals. There were indications that additional enforcement activity and lower tolerances would further reduce the level of speeding and the number of serious accidents.

As to whether speed-detection devices have been used efficiently to maximise road safety goals.

DPEM was providing some coverage of most locations, speed and time zones. However, we noted substantial imbalances between crash and speeding information and deployment of SDDs which indicated that SDDs were not being used in a manner to maximise

[1] Department of Police and Emergency Management, Deputy Commissioner of Police J Johnston, *Road Safety Camera Site Selection / Operating Criteria*, [1].
[2] Australian Transport Council, *National Road Safety Action Plan 2007 and 2008* p 37.

road safety goals. There is also a case for the greater use of fixed cameras.

As to whether speed-detection devices have been operated appropriately.

SDDs were operated in accordance with legislation and industry standards. There were some indications that SDD equipment downtime was excessive and that the level of percentage of images being adjudicated out — camera images unable to be used for prosecutions — was too high.

As to whether an operational plan existed for the use of speed-detection devices.

Operational plans existed for the use of SDDs, including objectives, strategies and performance indicators. However, lower level plans lacked substance and provided little guidance to operational personnel in making resource allocation decisions.

List of recommendations

The following table reproduces the recommendations contained in the body of this report.

Rec No.	Section	We recommend …
1	2.2	… that DPEM reviews Southern District's concerns and refers issues to the Department of Infrastructure, Energy and Resources as appropriate.
2	2.2.1	… that DPEM reviews SDD resource allocation to provide for more even enforcement activity relative to serious crashes.
3	2.2.2	… that DPEM apportions a greater emphasis of SDD deployment to 100 and 110 km/h speed zones.
4	2.2.3	… that DPEM uses crash data to better align its SDD resources with peak crash times.
5	2.3	… greater use of fixed cameras in high-volume locations such as the main arterial routes out of cities.
6	3.4	… DPEM explores ways to reduce road safety camera downtime.
7	3.6.2	… DPEM improves its processes to reduce the percentage of images excluded through adjudication.

Rec No.	Section	We recommend …
8	4.2	… that details of available resources and their deployment should be stated more specifically in DPEM's planning documents.
9	4.3	… that performance measures include infringement rates per vehicle tested rather than number of serious crashes.
10	4.3	… that performance measures are included in district and divisional planning documents.

Audit Act 2008 section 30 — Submissions and comments received

Audit Act 2008 section 30 — Submissions and comments received

Introduction

In accordance with section 30(2) of the *Audit Act 2008* a copy of this report, or relevant extracts of this report, was provided to the Department of Police and Emergency Management and the Department of Infrastructure, Energy and Resources with an invitation to make submissions or comments. In addition, the Treasurer and ministers of the two departments were provided with a summary of findings and invited to make submissions or comments.

The comments and submissions provided are not subject to the audit nor the evidentiary standards required to reach an audit conclusion. Responsibility for the accuracy, fairness and balance of those comments rests solely with the departmental head.

Submissions and comments received

Minister for Police and Emergency Management

Preliminary discussions with the Acting Commissioner of Police confirm that the Department of Police and Emergency Management will examine the recommendations contained in the report with the intention of improving road safety outcomes.

Whilst the report will be useful in informing refinements to existing practices, the Acting Commissioner of Police has drawn my attention to two areas within the report where he believes further explanation is desirable and is corresponding directly with you on those matters which relate to the effectiveness and efficiency of the speed-detection devices program.

Notwithstanding a requirement for the additional clarification, the performance audit will contribute to and inform the extensive initiatives and programs funded and announced by Government to enhance road safety in Tasmania.

Department of Infrastructure, Energy and Resources

Thank you for providing the opportunity for the Department of Infrastructure, Energy and Resources to provide comments on the Speed Detection Devices Audit.

While none of the recommendations directly relate to DIER, DIER has portfolio responsibility for recommending and implementing road safety strategies. Speed camera enforcement continues to be a critical element of the road safety response in Tasmania and any refinements and improvements to current practice are welcomed.

In relation to Recommendations 2, 3 and 4, I note that while alignment is important for enhancing the specific deterrence effect of speed camera programs, the general deterrence effect of such programs will also necessitate the randomised use of cameras at times when crashes do not occur, so as to build the perception in the general population of being caught 'anywhere, anytime'. As such I would always expect to see some use of cameras in this maintenance capacity, and hence some degree of misalignment on these measures.

In relation to Recommendation 5 relating to fixed speed cameras, it is noted that fixed speed cameras can play an important role in shaping driver behaviour at specific locations. DIER is currently investigating the use of point-to-point (distance over time) technology as another possible speed enforcement tool. Providing it is applicable to Tasmania's conditions, this technology has potential to overcome some of the disadvantages of fixed speed cameras, namely the reduced 'halo effect' per road kilometre over time.

Department of Police and Emergency Management

Thank you for the opportunity to provide comment on the draft report of your audit of speed detection devices. The Department of Police and Emergency Management will, of course, consider the recommendations contained within the report with a view to better refining our practices and procedures relating to speed detection devices. However, there are matters within the report that would benefit from additional comment in order to ensure a more complete picture is provided to the reader.

Chapter 1 — Effectiveness

The report draws a correlation between the number of vehicles tested (i.e. vehicles passing either a road safety camera site or a mobile radar operation) and the number of speeders detected per 1000 vehicles. It suggests that increasing the number of vehicles passing those sites or operations may lead to reductions in the detection rates as evidenced by the graph in Figure 4. However, there is a concession that the evidence underpinning the data is weak. It is worth noting that the vast majority of drivers are unaware that they have passed a road safety camera site. The deterrent lies in the random and often covert placement of the cameras and the subsequent receipt of an infringement notice by speeding drivers.

It is difficult to compare offence detection and vehicle testing rates across a number of years because of the many variables involved. Data from road safety camera locations will vary from site to site due to variations in traffic volume. In addition the frequency of use of those sites and the actual time spent at each may vary from year to year. Comparing a high traffic volume site with a low volume site where both produce the same number of speeding drivers over a given period of time will reveal completely different statistical results. However it is doubtful that the former could be seen as having more impact than the latter simply on the basis of more vehicles passing the site.

Chapter 2 — Efficiency

Road crash casual factors are many and varied and the fact that a crash occurred at a particular location may not, of itself, warrant the deployment of a road safety camera particularly if the cause of the crash was non-speed related. Using basic crash numbers as a guide to speed detection device deployment without analysis of the data can be problematic.

It should also be noted that many road safety camera deployments arise from complaints about vehicles speeding in particular locations, more often than not, in <60 km/h residential areas.

You will be pleased to know that many of the recommendations fit well with recent developments in relation to a range of road safety enforcement activities undertaken by this department.

Introduction

Introduction

Background

Since the 1950's, there has been a recognition that as a society we should not accept the high rates of fatalities and serious injuries on our roads. Up until the 1980's the annual road death toll regularly exceeded a hundred. The impact of motor vehicle accidents on the whole community is enormous. Apart from the immense emotional trauma caused by serious and fatal crashes on families, friends, work colleagues and emergency service personnel there is also an economic impact. The Motor Accidents Insurance Board in its 2008 annual report noted during 2007–08 alone there were 3277 claims made, and over $75 million in claims paid.[3] However, the economic cost to the whole community goes beyond insurance claims. Table 1 quantifies the total cost of road trauma.

Table 1: Cost of road trauma on the Tasmanian community 2007–08

Injury	Cost per person	Number 2007–08	Total cost
Fatal	$2 0136 102	41	$87 580 182
Serious	$462 822	278	$128 664 516
Minor	$16 535	1468	$24 273 380
Total		**1787**	**$240 518 078**

Note: Cost per person sourced from an article by Connelly and Supangan[4], which we expressed in 2008 dollars using CPI data. Road crash numbers were extracted from the Crash Data Management system.

Governments, motor vehicle manufacturers and other stakeholders have introduced initiatives to improve motor vehicle safety, including compulsory seat belts, crumple zones and air bags. Also, safer roads, driver education and enforcement regimes have all contributed in reducing the road toll. Although education and engineering have an important role to play in their own right, the aim of this audit was to focus on the impact of speed limit enforcement.

Speed has long been recognised as a contributing factor to fatal and serious traffic accidents on Tasmanian roads. While police have been able to enforce speed limits for decades, it has only been since the early 1990s that these attempts have been ramped up through the use

[3] Motor Accidents Insurance Board, A*nnual Report 2007/08,* p20.

[4] Connelly, LB. Supangan R. 'The economic costs of road traffic crashes: Australia, states and territories', *Accident Analysis and Prevention*, Vol. 38, Issue 6, 2006, pp. 1087–1093.

of speed-detection cameras and better focused enforcement strategies.

The philosophy behind the implementation of speed-detection devices (SDDs) in Tasmania was to encourage a community perception that the chance of detection was so high that speeding was not worth the risk, with SDDs operating across the State on a daily basis[5]. The objective for their introduction was to reduce the incidence of collisions through general and specific deterrence. Road users may be persuaded to modify their behaviour through a combination of police enforcement and education campaigns[6].

The Department of Police and Emergency Management (DPEM) use various types of SDDs, including:

- hand-held devices
- car-mounted mobile units
- mobile laser and radar cameras
- fixed cameras.

Audit objective

The audit objective was to examine Tasmania's SDD enforcement program and form an opinion on the efficiency and effectiveness of that program.

Audit scope

The scope of the audit encompassed:

- an examination of the SDD program and objectives within DPEM
- all SDDs
- an examination of the information provided by Department of Infrastructure, Energy and Resources (DIER) and its usefulness to DPEM
- data from 1 July 2003 to 30 June 2008.

Audit criteria

The following criteria were used to form an opinion about the audit objective:

[5] Department of Police and Emergency Management, Deputy Commissioner of Police J Johnston, *Road Safety Camera Site Selection / Operating Criteria*, [1].
[6] Australian Transport Council, *National Road Safety Action Plan 2007 and 2008* p 37.

- Effectiveness: has the SDD program contributed to achieving road safety goals?
- Efficiency: were SDDs used in a manner to maximise road safety goals?
- Other operational matters: were SDDs operated appropriately?
- Strategic management: did an operational plan exist for the use of SDDs, including objectives, strategies and performance indicators?

Audit approach

To conduct the audit we:

- consulted with employees from DPEM and DIER
- reviewed speed enforcement programs in Tasmania and other Australian jurisdictions
- conducted an analysis of data provided or collected
- reviewed files and other information (including IT systems) on SDDs and on administrative aspects of their operations and processes
- observed SDD operations and processes.

Timing

Planning for this performance audit began in December 2008. Fieldwork was completed in August 2009 and the report was finalised in October 2009.

Resources

The total cost of the audit excluding production costs was $140 000.

1 Effectiveness

1 Effectiveness

Has the speed-detection devices program contributed to achieving road safety goals?

1.1 Background

This Chapter examines the effectiveness of SDDs in modifying driver behaviour. We looked at effectiveness in terms of:

- vehicles tested for speeding
- reduced speeding
- reduced crashes.

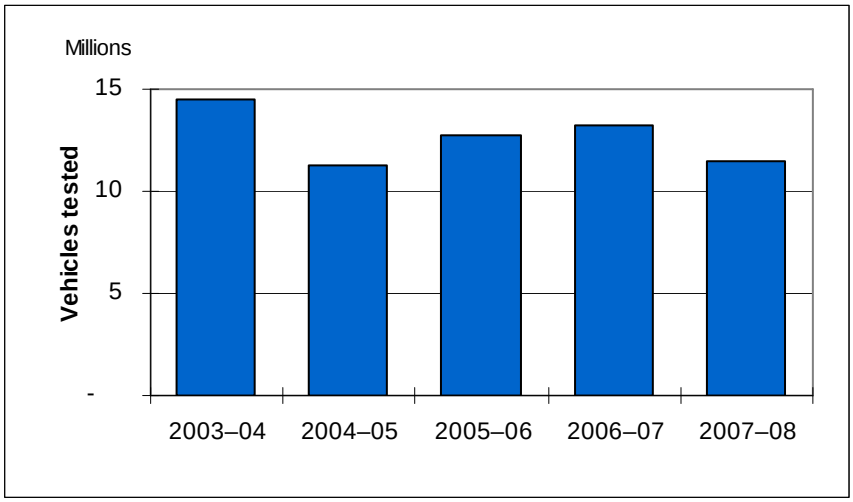
We also looked at the impact of the speeding tolerance allowed by DPEM.

1.2 Effectiveness: vehicles tested for speeding

To measure enforcement effort we looked at the number of vehicles tested for speeding by DPEM over a five-year period. Unfortunately, we could only obtain data for the number of vehicles tested by mobile cameras. It was not possible to obtain the number of vehicles tested by hand-held or vehicle-mounted devices. In order to base our analysis on testing by all SDDs, we extrapolated using offence data[7].

Our estimate of the number of vehicles tested in each year from 2003–04 to 2007–08 is shown in Figure 1.

Figure 1: Enforcement (vehicles tested for speeding)



[7] Enforcement effort calculated by using number of vehicles going past speed cameras to determine overall number of vehicles past all SDDs. The number of vehicles going past non-photographic speed-detection devices was not available. Accordingly, the total number of vehicles tested was calculated by using the ratio of speed camera infringement notices (photographic) issued to traffic infringement notices (non-photographic) to determine the proxy number of total vehicles tested.

Figure 1 shows that during the five-year period to June 2008, police tested in excess of ten million vehicles per year. Therefore, with just under 400 000 vehicles registered in Tasmania, every registered vehicle was on average tested twice monthly by an SDD. To us this suggests that the level of testing was sufficient to influence driver behaviour, notwithstanding some variability in the testing program from year to year.

1.2.1 Other jurisdictions

We also wanted to compare the number of vehicles tested in other jurisdictions against the Tasmanian results. These figures were not easily available, so instead we used the number of speeding infringements issued as a proxy. Data was obtained from three other states and compared with Tasmanian infringements in Figure 2.

Figure 2: Infringements per registered vehicle comparison with other jurisdictions[8]

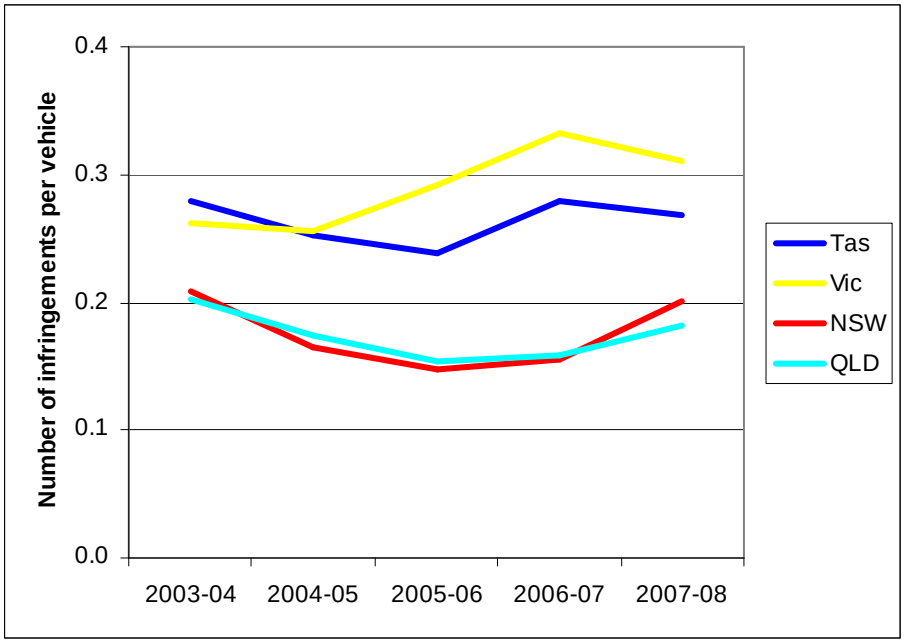


Figure 2 shows that Tasmania compares well against New South Wales and Queensland, but Victoria is outperforming Tasmania on enforcement. A variable not apparent in Figure 2 is the differing levels of speeding tolerances allowed by states. In 2001–02 Victoria arbitrarily lowered its tolerance, which resulted in a rise in the number of infringements per vehicle. Nevertheless, Figure 2 indicates that Tasmania's level of enforcement is reasonable compared to other states.

[8] Infringement data sourced from: Tasmanian Department of Police and Emergency Management, Victorian Department of Justice, New South Wales' Office of State Revenue and Queensland's Department of Transport and Main Roads. Vehicle registration data obtained from the Australian Bureau of Statistics.

1.3 Effectiveness: reduced speeding

The impact of enhanced activity on the level of speeding depends on many factors including, for example, visibility and repetition. Nevertheless, we considered that a greater number of speeding infringement notices issued would generally result in less speeding. To test the rate of infringements being issued over a period of time, we looked at the number of detections issued per vehicle tested for speeding. Figure 3 shows the number of infringements issued per 1000 tested vehicles by mobile speed cameras.

Figure 3: Speed detections per 1000 tested vehicles

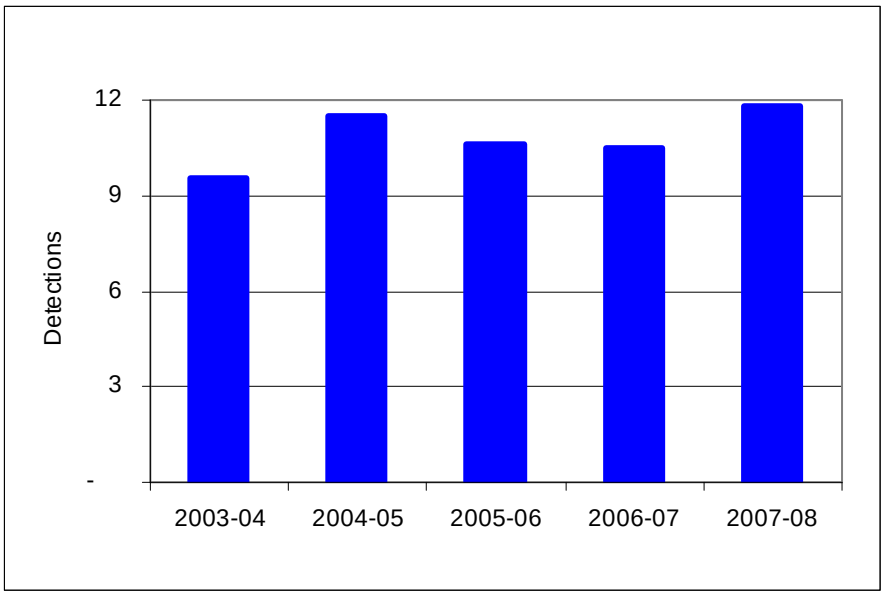


Figure 3 provides weak but inconsistent evidence that instances of speeding are increasing. In Figure 4 we examined whether there was any evidence that greater levels of speeding were related to reduced enforcement activity.

Figure 4: Enforcement activity vs speed detections per 1000 vehicles

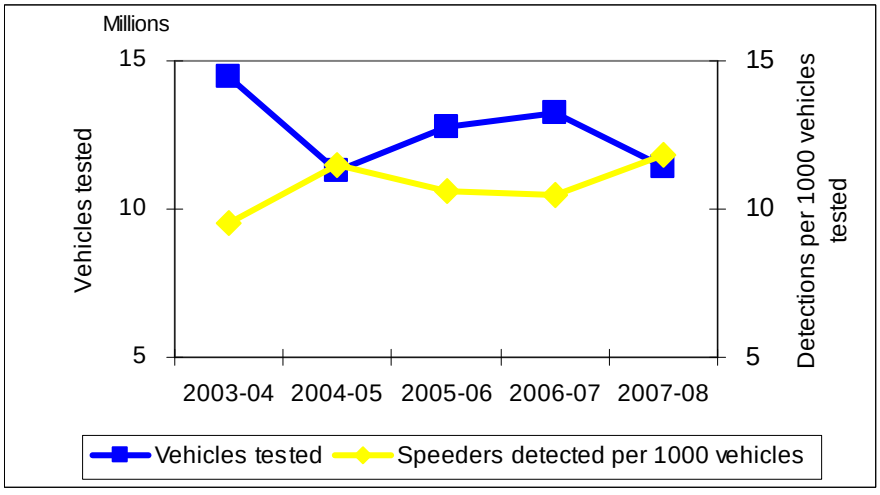


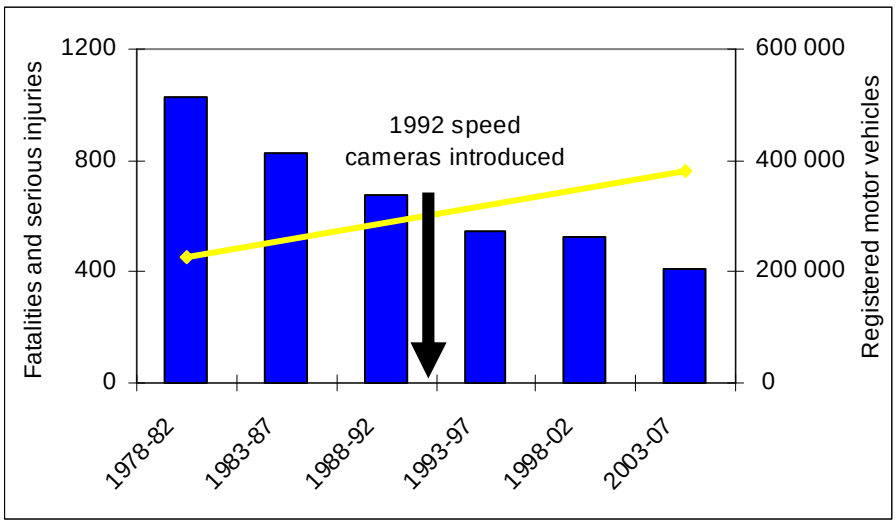
Figure 4 shows a strong inverse relationship between testing and detection rates: i.e. when testing declined, speeding rates increased and vice versa. This data suggests that increased testing may lead to reductions in the detection rate. We also noted that a similar relationship was found in Victoria when enforcement activity was increased around 2001–02. At the same time, we recognise that the SDD program must compete for resources with other police activities and as previously noted Tasmania's level of enforcement activity compares favourably with other jurisdictions.

1.4 Effectiveness: reduced crashes

The difficulty in attempting to assess the impact of SDDs using road crash data is that there are many contributing factors to crashes other than speed. Nevertheless, excessive speed is a factor in many crashes and speed also impacts on the severity and avoidability of a crash. It is reasonable to assume that if SDDs have been effective in inducing greater compliance with legal speed limits there should be fewer crashes related to excessive speed and fewer crashes in the 'serious' category.

To assess whether the introduction of SDDs had resulted in a reduction in the number of fatalities and serious injuries over time we looked at the long-term trend over thirty years. Figure 5 shows the average distribution of fatalities and serious injuries in five-year blocks between 1978 and 2007.

Figure 5: Average distribution of fatalities and serious injuries from road crashes 1978–2007



Source: [derived from] DPEM Business plan July 2008 – June 2009. Registered vehicle numbers provided by DIER.

The introduction of SDDs was just one of many initiatives — including 0.05 percent alcohol limit in 1982 and 50 km/h urban speed zones in 2002 — since 1978 that have contributed to a

reduction in serious and fatal crashes. Nevertheless, Figure 5 provides visual evidence of a distinct drop in the number of fatalities and serious injuries since the introduction of SDDs in December 2002.

1.5 Tolerance

Police routinely permit a speeding tolerance to facilitate exactitude with SDDs and speedometers, but also to allow for a small margin of driver error. We were interested in the impact of the tolerance on the level of infringements issued and the reasonableness of the tolerance. For obvious reasons this discussion will not disclose the magnitude of the tolerance.

DIER routinely collects speeding data from a site near Copping, in southern Tasmania, using axle sensors embedded in the road. The data is not used for enforcement activity but is a useful source of information. The Copping data showed that for every speeder detected exceeding the tolerance there were another six exceeding the speed limit but within the tolerance being used at the time of the audit.

We noted that a reduction in speeding tolerance in Victoria resulted in a significant reduction in the percentage of drivers detected speeding and the Copping data suggests a similar result could be achieved in Tasmania.

Just before the completion of this audit, DPEM announced that it was about to permanently reduce the tolerance on Tasmanian roads.

1.6 Conclusion

SDDs have been effective and have contributed to achieving road safety goals. There were indications that additional enforcement activity and lower tolerances would further reduce the level of speeding and the number of serious accidents.

2 Efficiency

2 Efficiency

Were speed-detection devices used in a manner to maximise road safety goals?

2.1 Background

Enforcement of speed limits involves a mix of overt and covert policing, provided by:

- on-the-spot policing (44 percent of speeding infringements)
- mobile cameras (53 percent of speeding infringements)
- fixed cameras (3 percent of speeding infringements).

SDDs are used to provide general deterrence, through covert activities and the impact of demerit points. They are also used to target specific times, speed zones and locations.

In this Chapter we looked at whether the timing and placement of SDDs represented efficient use of resources to reduce speeding and reduce the number and impact of crashes. We also looked for any evidence of resource wastage.

2.2 Mobile cameras

Police deployed mobile speed cameras widely across the state in both rural and urban settings. For instance, during the first six months of 2008 Southern District police visited in excess of 130 different roads.

DPEM's internal operating procedures required districts to plan and structure their road safety camera program to take into account a number of factors, including recent serious road accidents and complaints about speeding. Information about road accidents was provided in a database maintained by DIER: Crash Database Manager (CDM).

The CDM provides up-to-date information on road fatalities and serious injuries, including location and detailed data on crash factors, crashes by road user type, age and speed zone. We found that Northern, Eastern and Western districts used the CDM, but Southern District used a separate database due to its perception that crash causal factors were not an accurate reflection of actual crash causes.

Recommendation 1

We recommend that DPEM reviews Southern District's concerns and refers issues to DIER as appropriate.

2.2.1 Site selection (crash related)

In Figure 6 we compared speed testing deployments with crashes to see whether similar levels of testing per crash had been performed for different locations around Tasmania.

Figure 6: Deployments per crash[9]

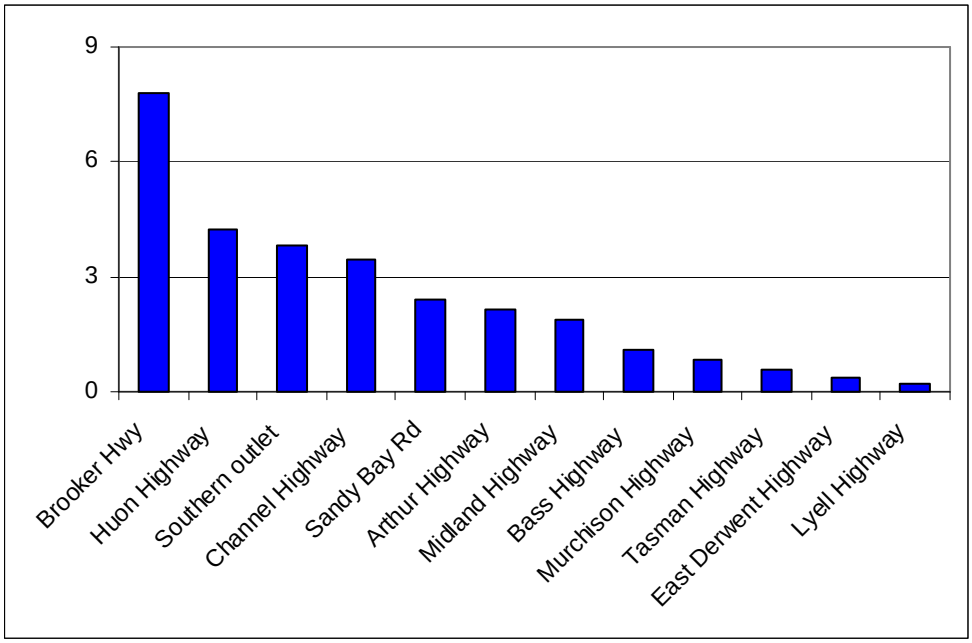


Figure 6 shows a large disparity in the level of enforcement per crash for different locations. There appears to be an excessive focus on some locations, such as the Brooker Highway. This suggests that SDD resources could be more efficiently deployed with a more consistent response to crash data.

Figure 6 also seems to show that Southern sites attract more visits per crash. This is reinforced in Figure 7, where we compared serious crashes and speed camera infringement notices (SCIN) by district.

[9] Crash data extracted from Crash Data Manager from January 2003 to the early part of 2009. Speed camera deployment data supplied by individual police districts and relates to deployments between July 2008 and December 2008.

Figure 7: Comparison of serious crashes and SCINs by district 2003–08

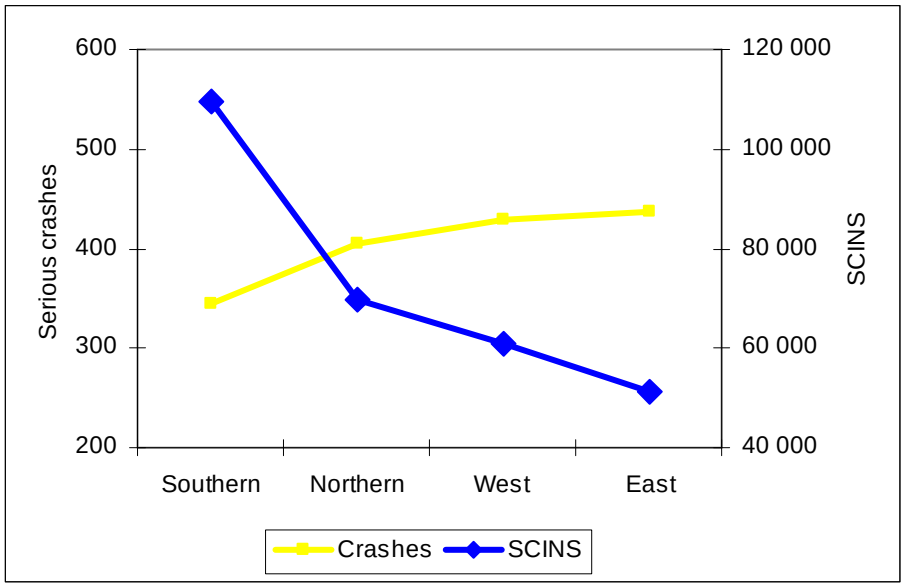


Figure 7 shows that there has been less enforcement activity in the Western and Eastern districts than would have been expected given the crash distribution between the districts. Similarly, there has been a relatively high level of enforcement activity in Southern District.

Recommendation 2

We recommend that DPEM reviews SDD resource allocation to provide for more even enforcement activity relative to serious crashes.

2.2.2 Speed zone selection (crash related)

Research and road safety campaigns have shown that a pedestrian hit by a vehicle travelling at 50 km/h has a better than 50 percent chance of survival than someone hit at 60 km/h who has just a 15 percent chance. While the above relates to vehicle impacts on pedestrians the same analogy can be used for the impact of vehicle crashes on drivers and passengers. Accordingly, we were not surprised to find that 63 percent of all fatal crashes in Tasmania occurred within the 100 and 110km/h speed zones.

We tested to see whether deployment of SDD resources to the various speed zones was a reasonable reflection of the proportion of accidents occurring within them. Figure 8 illustrates the result of this comparison.

Figure 8: Percentage comparison between serious and fatal crashes to SCINS 2003–08

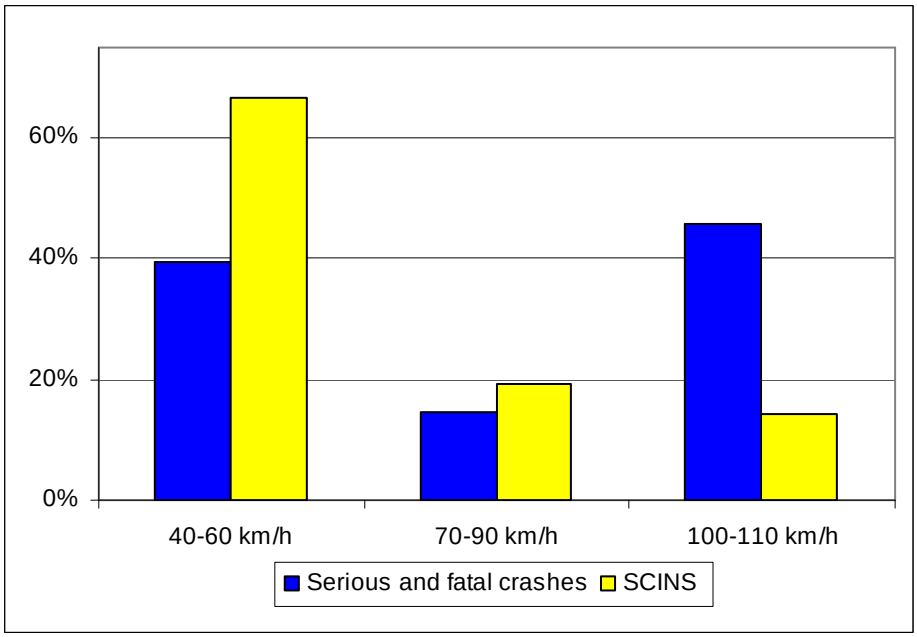


Figure 8 appears to show a low correlation between the level of enforcement and serious and fatal crashes on a speed zone basis. DPEM has directed a disproportionate percentage of its speed camera enforcement resources towards the 40–60 km/h zones, despite a higher percentage of serious and fatal road crashes occurring in the 100 and 110 km/h zones.

Recommendation 3

We recommend that DPEM apportions a greater emphasis of SDD deployment to 100 and 110 km/h speed zones.

2.2.3 Timing selection (crash related)

The use of SDDs also needs to take into account the best time of day for deployment. To determine this we looked at the times at which most fatal and serious accidents occur. In Figure 9 we compare times of crashes with speed camera deployment times to determine whether current usage patterns were providing the optimum effect on serious crashes.

Figure 9: Crash time and speed camera deployment comparison

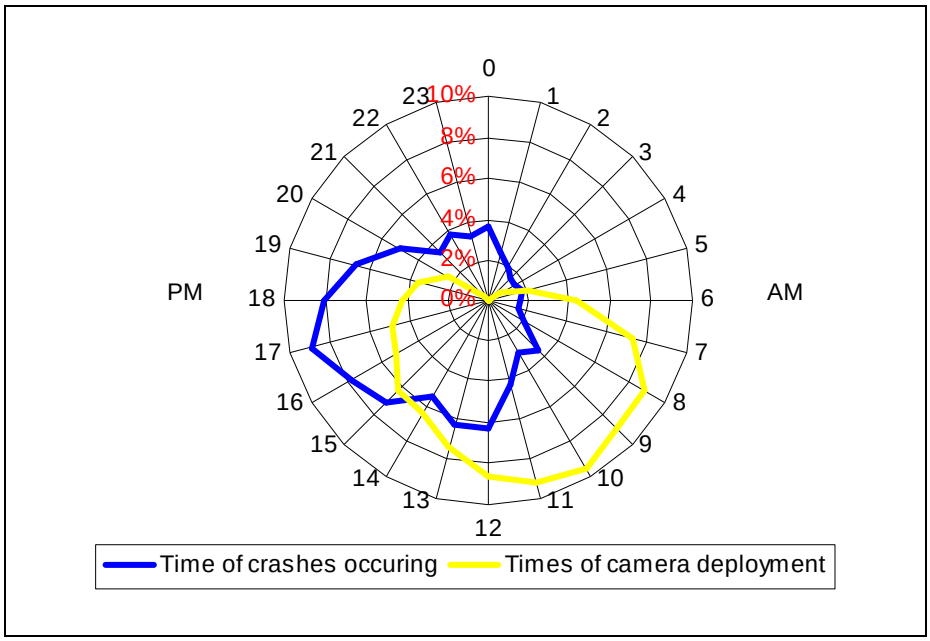


Figure 9 shows that the majority of fatal and serious crashes happened in the afternoon, but that most speed camera deployments occurred in the morning. We recognise that other factors need to be considered when planning the timing of SDD coverage, such as:

- 24-hour coverage
- school zones.

Nonetheless, we believe the disparity between the timing of crashes and SDD deployment was excessive.

We also found that speed cameras were rarely deployed in the early hours of the morning, but we accept that police routinely provide coverage at those times through routine patrols.

Recommendation 4

We recommend that DPEM uses crash data to better align its SDD resources with peak crash times.

2.3 Fixed cameras

During the period covered by this audit only two fixed speed cameras operated in Tasmania — Tasman Bridge and Longford (one speed camera for every 200 000 vehicles). This contrasts with the situation in Victoria where there are 168 fixed road safety camera locations (one speed camera for every 20 000 vehicles).

Fixed cameras have significant limitations, for example, their location tends to be public knowledge, which reduces the likelihood of regular motorists being caught. They also cannot detect truck drivers

and provisional-license motorists who exceed their specific speed limits but not the general limit. In addition, fixed cameras cannot be easily moved, which makes them unsuitable for reactive policing. On the other hand:

- fixed cameras can reduce speeding within a zone as knowledge of their locations becomes widespread — the 'halo' effect
- the accumulation of demerit points provides a general deterrent to speeding, even if the locations are not high-risk areas for crashes
- fixed cameras can free up resources for more reactive policing.

In addition, fixed cameras are not resource intensive and represent good value for money in locations with high-volume traffic. We also noted United Kingdom research that concluded, in urban sites, fixed cameras were more effective than mobile cameras in reducing speed[10].

Recommendation 5

We recommend greater use of fixed cameras in high-volume locations such as the main arterial routes out of cities.

2.4 On-the-spot police patrols

Infringement data for 2007–08 shows that nearly 44 percent of all infringements issued were for on-the-spot-fines by police officers. These fines result from overt police activity including hand-held radars and marked and unmarked police patrol vehicles fitted with SDDs. In 2009, DPEM operated a total of 181 hand-held and vehicle-mounted devices, over double what was available in 2003.

We were told that tolerances for on-the-spot fines can be lower than those set for speed cameras. Police also have the discretion to issue formal warnings to offenders rather than issuing fines, though the use of formal warnings has been recommended to be reduced during the latter part 2009 due to the alarming increase of fatalities.

Our major difficulty in examining on-the-spot police patrols was that we could obtain little data on police activities other than the number of infringements issued. This was because police officers perform a variety of duties in addition to SDD operation, making it hard to measure time spent using SDDs. We concede that it is possible that

[10] PA Consulting Group, *The national safety camera programme: Three-year evaluation report June 2004*, PA Consulting Group, London, 2004.

some of our findings about mismatches between crashes and SCINs might to some extent be compensated by the activities of police patrols.

2.5 Conclusion

DPEM was providing some coverage of most locations, speed limit and time zones. However, we noted substantial imbalances between crash and speeding information and deployment of SDDs which indicated that SDDs were not being used in a manner to maximise road safety goals. There is also a case for the greater use of fixed cameras.

3 Other operational matters

3 Other operational matters

Were speed-detection devices operated appropriately?

3.1 Background

DPEM operates a variety of SDDs that make use of different technologies, e.g. photographic or non-photographic and radar or laser. Operators must be adequately trained to be able to test, set-up and operate the different types of SDDs. Certain SDDs, e.g. hand-held devices, can only be operated by sworn police officers. Usually, civilian contractors operate mobile speed cameras.

In this Chapter, we looked at whether DPEM operated SDDs in accordance with applicable legislation, internal regulations and relevant industry standards. We also examined and tested the adjudication process.

3.2 Legislation

The primary pieces of legislation authorising DPEM's control and use of speed-detection devices were the *Traffic Act 1925* and the *Vehicle and Traffic Act 1999*. We were satisfied that the legislation provided a legal basis for:

- setting of road-traffic rules related to speeding
- enforcement of those rules
- serving of infringement notices
- use of SDDs and requirements for the installation, operation and testing of these devices.

We found that DPEM complied with its legislative obligations.

3.3 Calibration and maintenance

Considerable reliance is placed on the reliability of SDDs so all equipment needs to be maintained to a high standard. Legislation and industry standards guide DPEM on the timing for service intervals of all equipment. Responsibility for ensuring SDDs are properly maintained is centrally coordinated and controlled by DPEM's Operations Support Section. It ensures all speed-detection equipment is annually withdrawn from service and sent to an accredited certifier for testing.

Our testing of a selection of SDDs found that all of the equipment had up-to-date certification. New equipment found to be faulty before deployment had been sent back to the manufacturer for rectification under warranty.

3.4 SDD downtime

We examined the SDD program for any apparent indications of non-availability. In the five-year period covered by this audit, we found there was an average downtime for speed camera equipment of 22 percent, varying from eight percent for Eastern District to 34 percent for Western District. It is possible that relatively high downtime was a contributing factor to substantially less enforcement activity per crash in the Western District. Reasons for downtime, included operator leave, faulty equipment, or equipment transport delays.

Recommendation 6

We recommend DPEM explores ways to reduce road safety camera downtime.

3.5 Training

To effectively use SDDs and receive certification, operators must receive a mix of technical off-site and practical on-site training. This is especially the case with radar-based technology.

Accordingly, operators are required to undertake a standard training course before being allowed to operate any of the equipment. Whilst legislation governing the use of SDDs is silent on the required level of training, there are a number of industry standards providing guidance[11]. Training should include:

- a theory component
- practical training
- examinations
- accreditation and reaccreditation of operators.

Our review of DPEM's training program found that all operators were trained in accordance with applicable industry standards.

3.6 Adjudication of speed camera images

Speed cameras record digital images of all detected speeding vehicles. These images are stored on the camera's hard drive, before being downloaded onto disk and onforwarded for adjudication.

[11] AS 2898.2-2003 *Radar speed detection — Operational procedures* and AS 4691.2-2003 *Laser-based speed detection devices — Operational procedures*.

3.6.1 Reliable adjudication process

Operators at DPEM's Hobart headquarters examine the images to determine whether an infringement notice can be issued. Adjudicators can refer images to more experience personnel if necessary. An adjudicator must:

- ensure the image taken is clear
- match the vehicle description with held registration details
- check the image for interference
- reject images where there is a possibility that an incorrect speed has been recorded.

It is important that adjudicators are well trained and have clear guidelines to follow. We found that all adjudicators were trained in accordance with the applicable industry standards and were subject to an acceptable level of supervision.

3.6.2 Infringement rejections

Whilst it is important for infringement notices to be only issued if correctly adjudicated, it is equally desirable for all speeders, correctly detected, to be fined. Figure 10 shows the main reasons why 22 percent of images collected in 2007–08 did not result in fines.

Figure 10: 2007–08 adjudicated out categories

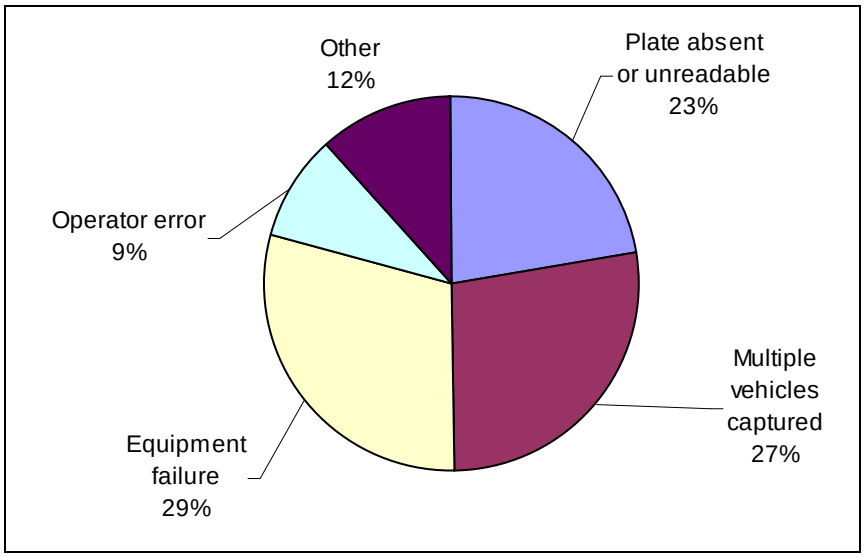


Figure 10 indicates a number of main reasons for images to be adjudicated out, including equipment failure, operator error and unreadable licence plates. Our impression was that the 22 percent fail

rate was high. We also noted that Victoria had been able to achieve a 15 percent fail rate[12].

Recommendation 7

We recommend DPEM improves its processes to reduce the percentage of images excluded through adjudication.

3.6.3 Police infringements

Police and other emergency vehicles are subject to a separate adjudication process. Where the adjudicator can clearly see that an emergency vehicle is flashing its emergency lights the image is excluded and no further action taken. However, in the absence of flashing lights an infringement notice is issued. At DPEM, infringements are sent to the relevant department with a driver nomination requested. Once the driver is identified the responsible District Commander must decide that a valid reason exists before authorising the withdrawal. Failing this, the driver must pay the fine and be awarded the demerit points.

We obtained details of all speed camera infringements initially issued to police officers between July 2008 and April 2009. We found that 42 percent of police officers paid their fines and had demerit points awarded, with the remaining 58 percent of infringements either being withdrawn for a valid reason or not yet finalised. We were satisfied that DPEM had robust procedures in place to deal with adjudication of emergency vehicles.

3.7 Conclusion

SDDs were operated in accordance with legislation and industry standards. There were some indications that equipment downtime was excessive and that the level of percentage of images being adjudicated out was too high.

[12] Auditor-General Victoria, *Making travel safer: Victoria's speed enforcement program,* July 2006, p.98.

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4 Strategic management

4 Strategic management

Did an operational plan exist for the use of speed-detection devices, including objectives, strategies and performance indicators?

4.1 Background

To ensure the adequacy of any program, such as the deployment of SDDs, an examination was undertaken of the strategic management function. Therefore, we undertook an assessment of how well DPEM managed the operation of its SDDs. We examined whether the operational plan included:

- relevant objectives and strategies
- performance measures and whether they were the right ones
- monitoring and review.

4.2 Objectives and strategies

In its overarching *Strategic Directions Framework 2006–09*, DPEM stated that its mission was to make Tasmania safe. In order to achieve that a number of high-level key strategies were outlined, which were in turn linked to annual business plans. For instance, the traffic management section of the 2008–09 business plan had an outcome that was to 'improve driver behaviour through traffic law enforcement'[13]. Similarly, DPEM's annual business plan provided only high-level direction.

Therefore, we expected to see in the district plans detailed resource allocation strategies for SDD enforcement. For example, plans might specify hours of enforcement for high-incidence crash zones, responding to complaints and general radar operation. Instead, we again found only high-level direction in these plans:

> Conduct a large number of high and low volume high visibility operations across all areas of the District focusing on all types of traffic breaches with a view to reinforcing the message that 'breaches of traffic laws are unacceptable'.[14]

We expected planning documents at this level to be far more specific.

[13] Department of Police and Emergency Services, *Business Plan 2008–09*, p10.

[14] Southern Police District, *Southern District Action Plan 2008–09*, Department of Police and Emergency Management, 2009.

Recommendation 8

We recommend that details of available resources and their deployment should be stated more specifically in DPEM's planning documents.

4.3 Performance measures

Performance measures allow an organisation to gauge how well it is doing and whether it is achieving its objectives.

DPEM's plans did not include details of specific performance measures related to SDDs. Instead, performance measures were separately communicated directly by the Corporate Management Group (CMG) that is the upper tier of management in the department.

Over the last few years, the performance measures used have varied to some extent with those in 2008–09, being serious injury crashes and traffic infringement notices issued. We were satisfied that metrics included an activity measure and a measure of results. However, the number of serious crashes is also affected by non-controllable factors, such as road condition and vehicle safety. It might be better to use more closely related outcome measures, such as a reduction in infringement rates.

Recommendation 9

We recommend that performance measures include infringement rates per vehicle tested rather than number of serious crashes.

Recommendation 10

We recommend that performance measures are included in district and divisional planning documents.

4.4 Monitoring and review

The CMG has ultimate responsibility to monitor and review information flowing up through the organisation. The CMG meets weekly with internally collated data provided monthly or as requested. District Commanders and their management group meet with the CMG three times a year. At these meetings, overall performance of the district, including traffic enforcement, is discussed.

DPEM's business plan is prepared and reviewed annually by the CMG. Discussions held with senior management indicated that performance measures were generally not altered outside of this annual process.

After the tragic loss of life experienced on Tasmanian roads on 9 July 2009, when nine fatalities occurred on a single day, we enquired as to whether there had been any formal adjustment to DPEM's traffic operational plan in light of these events. The districts were issued with verbal instructions from CMG to 'ramp up' the policing effort on speeding and driver inattention until further notice. Benchmarks had not been adjusted but policing activity had been increased and the speeding tolerance lowered in an effort to increase enforcement of speed limits.

4.5 Conclusion

Operational plans existed for the use of SDDs, including objectives, strategies and performance indicators. However, lower-level plans lacked substance and provided little guidance to operational personnel in making resource allocation decisions.

Independent auditor's conclusion

Independent auditor's conclusion

This independent conclusion is addressed to the Speaker of the House of Assembly and the President of the Legislative Council. It relates to my performance audit of the management, efficiency and effectiveness of speed-detection devices by Tasmania Police. My audit was based on the audit objective, audit scope and audit criteria detailed in the Introduction to this Report.

In developing the scope of this audit and completing my work, two departments provided me with all of the information that I requested. There was no effort by any party to the audit to limit the scope of my work. This Report is a public document and its use is not restricted in any way by me or by any other person or party.

Responsibility of the Secretary of the Department of Police and Emergency Management

The Acting Commissioner is responsible for ensuring that an efficient and effective speed-detection device program is being run by the Department of Police and Emergency Management (DPEM).

Auditor-General's responsibility

In the context of this performance audit, my responsibility was to express a conclusion on whether or not the DPEM managed an efficient and effective speed-detection device program.

I conducted my audit in accordance with Australian Auditing Standard ASAE 3500 *Performance Engagements*, which required me to comply with relevant ethical requirements relating to audit engagements. I planned and performed the audit to obtain reasonable assurance of whether DPEM managed its speed-detection program efficiently and effectively.

In this circumstance, my work involved performing procedures to obtain evidence about performance of DPEM's speed-detection device program based on the objectives and criteria outlined in the Introduction to this Report. The criteria were established by me without influence. The procedures depended on my judgement, based on the criteria and on my assessment of the risks of material misstatement of the information obtained by me as part of this audit.

In making this risk assessment, I considered the efficiency, effectiveness, operational performance and strategic management of the speed-detection device program.

I believe that the evidence I have obtained was sufficient and appropriate to provide a basis for my conclusion.

Auditor-General's overall conclusion

Based on the audit criteria and for reasons outlined in the remainder of this Report, it is my conclusion DPEM efficiently and effectively maintains the speed-detection device program in Tasmania.

However, my work did result in findings leading to ten recommendations DPEM should consider.

H M Blake

Auditor-General

19 November 2009

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Current projects

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Title	Subject
Profitability, and economic benefits to Tasmania, of Forestry Tasmania	Evaluates Forestry Tasmania's long-term financial and economic performance.
Teaching of science in public high schools	Examines the quality of science teaching in Tasmanian high schools.
Public service productivity	Looks at the trends, prevention and management of stress leave, long term sick leave, suspension and poor performance. Also considers broad public sector efficiency measures.
Employment of family members by Members of Parliament	Examines process applied when recruiting staff in Electoral offices and in the offices of Ministers.