

**Report of the**

**Controller and**

**Auditor-General**

*Tumuaki o te Mana Arotake*

**Bringing Down**

**the Road Toll:**

**the Speed**

**Camera Programme**

**April 2002**

*This is our report of an examination of  
effectiveness and efficiency carried out under the authority of  
section 16(1)(a) of the Public Audit Act 2001.*

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# Foreword

Every year, hundreds of people are killed and thousands are seriously injured on New Zealand's roads. Motor accidents cause immense pain and suffering for victims and their families and friends, and the medical and rehabilitation costs are high.

Speeding contributes to road accidents and fatalities, and successive Governments have been committed to bringing down the road toll. The Police and other agencies involved in road safety spend considerable time, and a lot of resources, controlling vehicle speeds on our roads. Speed cameras are a key tool in the Government's road safety strategy.

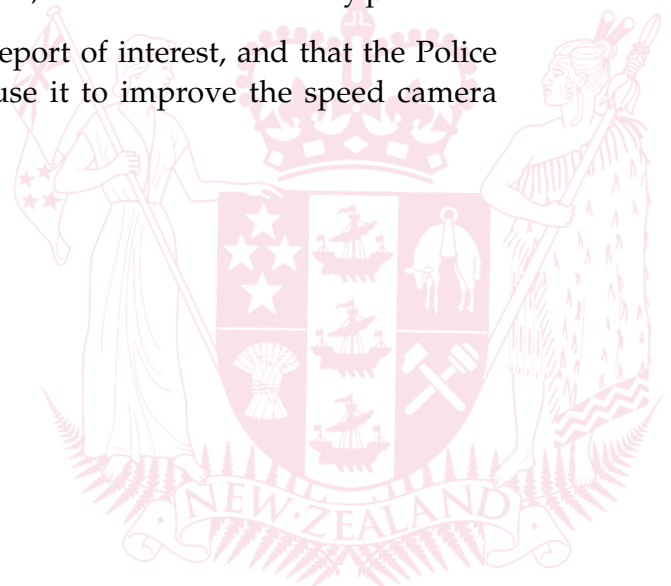
Our examination considered whether speed cameras are being used effectively and efficiently, generating the maximum road safety benefits in contributing to bringing the road toll down.

As with our earlier examination *The Police: Dealing with Dwelling Burglary*, we have been impressed by the professionalism and helpfulness of the Police. I would like to thank the Police – in particular Superintendent Steve Fitzgerald and Inspector Matt Fitzsimons – for their willing co-operation. My staff have also been greatly assisted by Tony Bliss and his team from the Land Transport Safety Authority.

As part of our examination, we were keen to find out how speed camera programmes are operated in jurisdictions similar to New Zealand. My staff met with the Victorian and Queensland Police and I would like to thank them for their assistance. I am also grateful to the management and staff of Lockheed Martin Tennix, Australia, for the information they provided.

I hope that Parliament will find this report of interest, and that the Police and other road safety agencies will use it to improve the speed camera programme.

D J D Macdonald  
24 April 2002

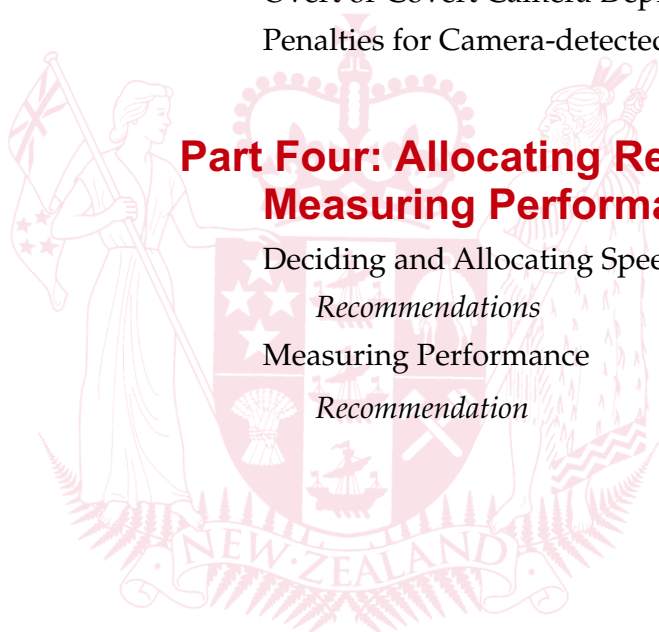




## CONTENTS

### Contents

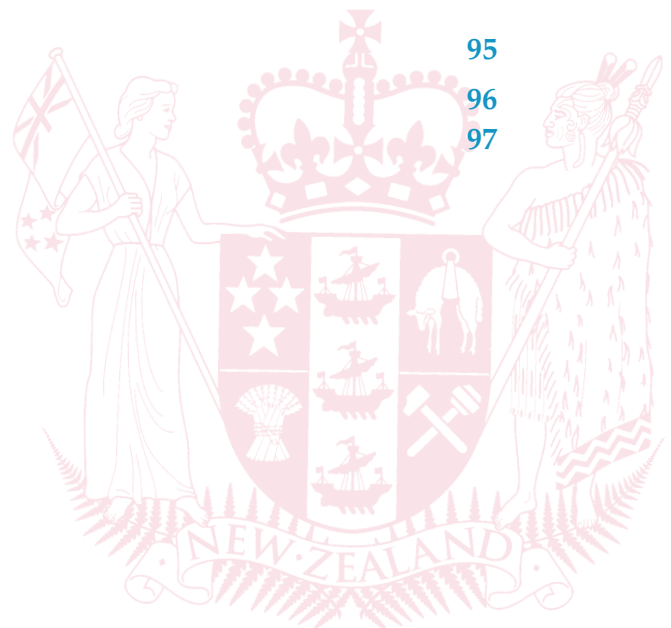
	<i>Page</i>
<b>Summary</b>	<b>7</b>
<b>Part One: Introduction</b>	<b>15</b>
Why We Looked at the Speed Camera Programme	17
What We Looked At	17
Our Information Sources	18
<b>Part Two: Why Controlling Speed Is Important</b>	<b>21</b>
The Consequences of Excessive Speed	23
International Road Toll Comparisons	26
<b>Part Three: Road Safety and the Speed Camera Programme</b>	<b>29</b>
The Road Safety Framework	31
Cost and Revenue from Penalties	33
How Speed Cameras Work	37
Objective of the Speed Camera Programme	40
Impact of the Speed Camera Programme	42
Overt or Covert Camera Deployment	44
Penalties for Camera-detected Speeding Offences	48
<b>Part Four: Allocating Resources and Measuring Performance</b>	<b>53</b>
Deciding and Allocating Speed Camera Resources	55
<i>Recommendations</i>	60
Measuring Performance	60
<i>Recommendation</i>	64





## CONTENTS

	<i>Page</i>
<b>Part Five: Speed Camera Deployment and Operation</b>	<b>65</b>
Selecting Speed Camera Sites	67
<i>Recommendation</i>	71
Planning the Deployment of Speed Cameras	71
<i>Recommendations</i>	76
Policies and Procedures for Camera Operation	76
<i>Recommendation</i>	78
 <b>Part Six: Enforcing the Speed Camera Programme</b>	 <b>79</b>
Introduction	81
Processing Infringements	81
Collecting Infringement Fees	87
 <b>Part Seven: Managing Speed Camera Assets</b>	 <b>89</b>
Maintaining the Cameras	91
Calibrating the Cameras	92
Replacement of Current Camera Technology	93
 <b>Appendices</b>	 <b>95</b>
1 Speed Cameras Internationally	96
2 Speed Cameras in Victoria	97





## CONTENTS

### Page

## Figures

1	Relationship Between Vehicle Speed and Risk of Death for Drivers, Passengers, and Pedestrians	25
2	Comparison of Road Deaths in New Zealand and Other Countries	27
3	Comparison of Road Deaths in New Zealand and Australia	28
4	Planning for Road Safety	32
5	Key Players in the Speed Camera Programme	34
6	Speed Camera Programme Cost as a Component of the Road Safety Programme 2000-01	35
7	Speed Camera Programme Cost and Revenue from Penalties for Speeding Offences	36
8	How Fixed and Mobile Speed Cameras Work	38
9A	Example of a Fixed Speed Camera Photograph	39
9B	Example of a Mobile Speed Camera Photograph	39
10	Area of Influence of a Speed Camera	46
11	Infringement Fees for Speeding Offences	48
12	Camera-detected Speeding Offences as a Proportion of All Speeding Offences Prosecuted	50
13	Allocation of Fixed and Mobile Speed Cameras	57
14	Distribution of Annual Camera Hours Among Police Districts	59
15	Length of Rural and Urban Speed Camera Sites	68
16	Strategic Deployment of Speed Cameras in Queensland	74
17	Structure of the Police Infringement Bureau	82
18	The Life Cycle of a Speed Camera Infringement	83
19	Infringement Processing – Performance Against Timeliness Targets	85
20	Penalties Paid, Transferred to Department for Courts, and Waived 26 June 2000 to 6 May 2001	87
21	Calibrating a Speed Camera	92



# Summary

## The Issue

More than 450 people die on New Zealand roads each year. Speeding contributes to some 30% of these deaths. A further 6000 people are hospitalised due to serious injuries sustained in road accidents – 20% of which occur as a result of excessive speed.

Excessive speeds affect road safety by increasing:

- the severity of injuries in a crash; and
- the risk of having an accident, because the time available for a motorist to respond is reduced.

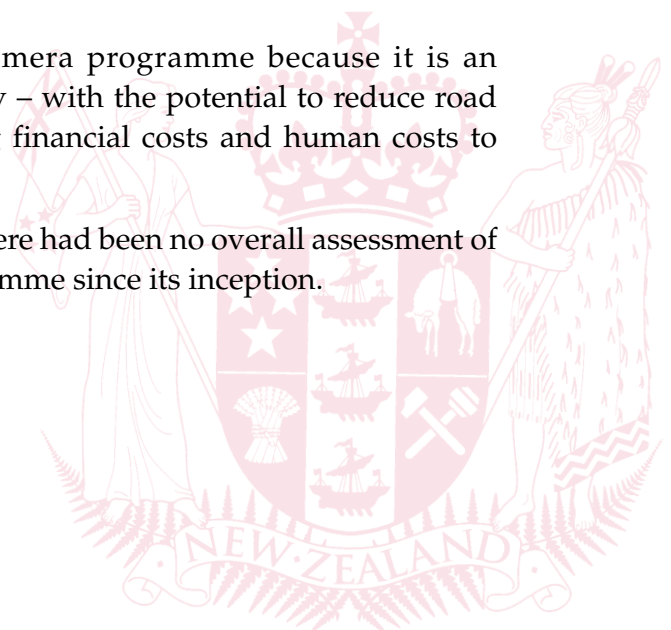
The severity of injuries resulting from a crash is directly related to the pre-crash speed of the vehicle, whether or not speeding was a factor causing the crash –

- A person is twice as likely to die in a crash at 120km/h than at 100km/h, and four times more likely to die if the vehicle is travelling at 130km/h.
- A pedestrian hit by a vehicle travelling at 30km/h has a 5% chance of dying. The chance increases to 70% when hit by a vehicle travelling at 60km/h, and to 96% if hit by a vehicle travelling at 70km/h.

## Why We Decided to Look at the Speed Camera Programme

We decided to look at the speed camera programme because it is an acknowledged key road safety activity – with the potential to reduce road deaths and injuries, and the resulting financial costs and human costs to victims, their families and friends.

We also took account of the fact that there had been no overall assessment of the impact of the speed camera programme since its inception.







## SUMMARY

### Organisation and Funding of the Speed Camera Programme

While the speed camera programme is funded out of the New Zealand Road Safety Programme (the Road Safety Programme) and the Minister of Transport is ultimately responsible for it, the Police undertake the actual delivery of the programme. Agencies such as the Land Transport Safety Authority, Transit New Zealand, the Ministry of Transport, the Accident Compensation Corporation, and local authorities also have interests in the programme.

Of the \$214.2 million allocated to the Road Safety Programme in 2000-01, \$15.6 million was allocated directly to the speed camera programme.

Two types of speed cameras operate in New Zealand – fixed and mobile. Fixed cameras operate from a pole at the side of the road. Mobile cameras are operated from the back of an unmarked Police vehicle. Under current Police operating policy guidelines, cameras should only be operated within sign-posted speed camera sites.

### Objective of the Speed Camera Programme

Speed cameras were first introduced in New Zealand in 1993 on the basis of their success overseas, which showed that they effectively deterred drivers from speeding. The objective of the speed camera programme is to reduce speeding and speed-related crashes.

To achieve that objective, the programme is designed to act as:

- an enforcement tool for the posted road speed limits; and
- a deterrent to driving at excessive speeds.



### Is the Speed Camera Programme Aimed at Generating Revenue?

Between 70% and 80% of infringement notices for speeding offences are issued on the basis of photographs taken by speed cameras. For the year ended 30 June 2001, the Police issued 523,164 speed camera infringement notices, and fees from 375,291 (72%) of the notices were collected (to a value of \$38.4 million).





## SUMMARY

Clearly, a lot of drivers exceed the permitted speed limit. Consequently, the revenue collected from camera-detected speeding infringements is substantial.

We have noted a commonly expressed view that revenue collection is an objective of the speed camera programme. This is no evidence to support this view. In particular, there are no incentives for the Police to maximise revenue generated by the programme, because:

- infringement fees are paid directly to the Crown, and are not available to the Police to spend on operations; and
- the Police's performance targets for the programme bear no relationship to the revenue collected.

### Impact of the Speed Camera Programme

Speed cameras are one of a number of speed control initiatives funded out of the Road Safety Programme which are aimed at reducing excessive speeds and speed-related accidents. And, because the various elements of the Road Safety Programme (including speed cameras) are an integrated package, it is not easy to disaggregate the impact of speed cameras alone in reducing speed and speed-related crashes.

A part-completed Police review of the speed camera programme in early-1995 showed an increase in speeds at 23% of speed camera sites examined and a reduction in speeds at 42% of the sites. Other road safety reviews since then have not attempted to isolate the impact of speed cameras.

Overseas evaluations have found that speed cameras have had a significant impact on road safety, but the speed camera programmes being evaluated may have been operated differently from the programme operated here. These differences in operation can alter the incentive on drivers to stay within the posted speed limit and may therefore influence the effectiveness of the programme. For example, in some other countries, cameras are operated covertly, and camera-detected speeding offences attract demerit points in addition to a fine.

We look at the covert deployment of cameras and the imposition of demerit points, but these are matters of policy for the Government to decide.

We conclude that, within the current limitations and operating rules, the Police have generally effective management practices and processes in place for the speed camera programme. Nevertheless, there is scope to improve the targeting of speed camera resources and to enhance existing delivery and administration of the programme.

### Allocation of Speed Camera Resources

There are 31 mobile cameras (plus one for training and back up) and 13 fixed cameras allocated between the 12 Police Districts. The Police funding for the speed camera programme is sufficient to operate speed cameras for a total of 74,000 hours each year (unchanged since 1995).

The performance of the Police in delivering the speed camera programme is assessed primarily against whether or not the Police meet the annual targets for the total number of speed camera hours they are funded to deliver. More qualitative measures of performance – such as reductions in speed-related crashes at camera sites – could help to assess the contribution of the programme to meeting road safety outcomes.

**We recommend that further measures of performance be included in the Road Safety Programme to help assess the impact of the speed camera programme in achieving road safety outcomes.**

The current pool of speed cameras could deliver more than the allocated 74,000 hours of operational camera time a year, provided that the Police were funded to deliver and process the results of the additional hours. An analysis of the potential road safety benefits of increasing the number of speed camera hours would need to be undertaken to assess the optimal level of funded hours.

The cameras could also be shared between Police Districts flexibly so that the resources can be targeted to areas of greatest risk of speed and speed-related crashes.

**We recommend that:**

- the amount of resources allocated to the Police for the speed camera programme from the Road Safety Programme be reviewed to ensure that the road safety benefits of the speed camera programme are being maximised;
- the Police consider options for the more flexible use of the existing camera resources if it can be shown that road safety gains are likely; and
- consideration is given to purchasing additional cameras as a further means of increasing flexible operation of the speed camera programme.



### Camera Deployment

Under current operational policy, the Police only operate cameras within designated speed camera sites, which must be sign-posted. Camera sites are selected on the basis that there has been an accident on the stretch of road where speed was a factor, or there is a problem with high speeds.

The Land Transport Safety Authority is currently proposing to revise this selection policy so that sites would only be established if there was a speed-related crash history. This approach would address only one part of the objective of the speed camera programme – reducing crashes. It would not address the other part – to contribute to the reduction of mean, or average, vehicle speeds.

We believe that caution should be exercised in removing camera sites that do not meet the proposed selection criteria until more is known about the impact that this change would have on speeds and speed-related crashes.

**We recommend that the LTSA reconsiders its proposal to remove all speed camera sites that do not have a crash history until more is known about the potential impact on speed and speed-related crashes.**

The degree to which camera deployments are planned varies between Police Districts. There is no national policy on the use of deployment plans for determining where and when cameras should be deployed on a day-to-day basis, to ensure that they are targeting areas of greatest risk. The Police have the information and resources to significantly improve camera deployments.

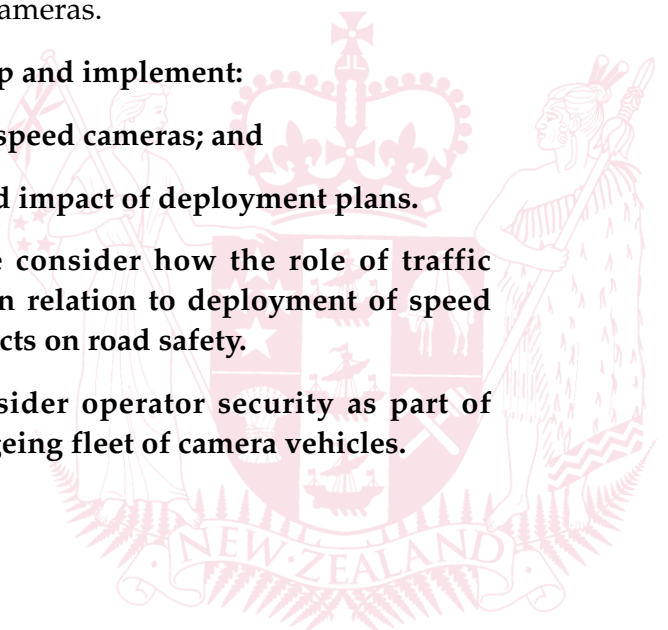
The Police have recently employed Traffic Intelligence Officers in the Districts. These staff have the potential to promote a more planned approach to the deployment of speed cameras.

**We recommend that the Police develop and implement:**

- strategic deployment planning for speed cameras; and
- a system for monitoring the use and impact of deployment plans.

**We also recommend that the Police consider how the role of traffic intelligence staff can be developed in relation to deployment of speed cameras and monitoring of their impacts on road safety.**

**We recommend that the Police consider operator security as part of the design criteria for replacing the ageing fleet of camera vehicles.**





## SUMMARY

### Processing Infringements

The Police Infringement Bureau is responsible for processing camera-detected speeding infringements. The Bureau operates an efficient system for processing infringements, including processes for adjudication. Its systems are innovative – contributing to the high quality of their service.

However, the prosecution rate (that is, the percentage of drivers detected speeding by speed cameras who subsequently receive an infringement notice) is lower than similar jurisdictions such as Victoria, Australia. At the time of undertaking our fieldwork, the New Zealand rate was 58.6%, whereas that of Victoria was over 85%.

Operational decisions by the Police provide some of the reasons for the low rate. The Police choose to issue infringement notices only when there is certainty of enforcement. We accept the need to ensure the integrity of the programme. However, we believe that there may be opportunities to increase the prosecution rate without undermining the programme's integrity.

### Asset Management

Speed camera equipment is well maintained by the Police, and this minimises camera down-time. The low down-time for high-use equipment can be attributed to the quality of the equipment originally purchased and the diligent approach taken by the Police to maintaining the cameras.

A similar approach is taken to the calibration of the cameras to ensure their accuracy. The Police Calibration Unit is an ISO-accredited testing centre for radar equipment, which means that all equipment that the Unit uses must meet international standards. Two technical audits are undertaken each year.





## SUMMARY

Legislation requires that cameras are calibrated annually and issued with a certificate of accuracy.<sup>1</sup> However, the Police undertake calibration of each camera every six months. This not only reinforces the accuracy of the equipment, but provides for early warning of any potential problems with the cameras themselves.

The speed cameras are nine years old. They will eventually need to be replaced. The Police are currently monitoring the international development of digital camera technology, and assessing any operational benefits, in anticipation of replacing the camera equipment.

### Public Attitudes Towards Speed Cameras

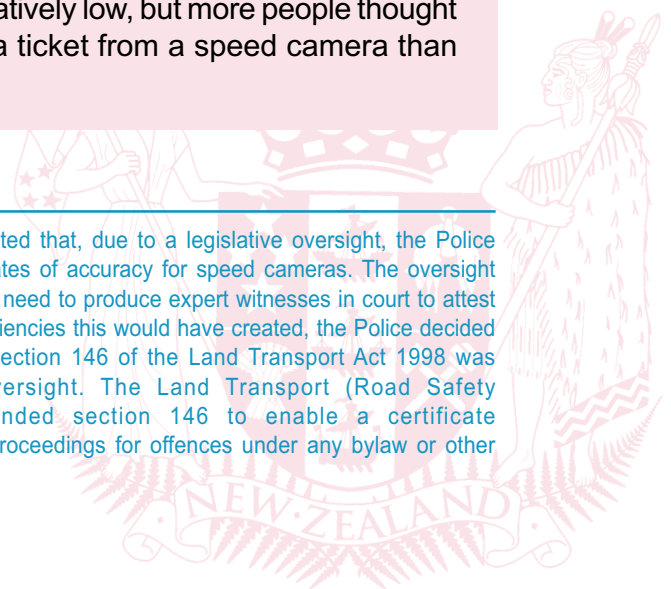
The New Zealand Public Attitudes Survey was undertaken periodically until 1974, and has been annual since 1994. The purpose of the survey is to evaluate attitudes to road safety issues – primarily drink-driving and speeding. Face-to-face interviews are conducted with people aged 15 and over, throughout the country.

In 2000, 1645 people were interviewed. The survey found that support for speed cameras had fallen, although they were still seen as a useful tool by the majority of those surveyed:

- 56% of those surveyed thought that speed cameras helped to lower the road toll;
- 60% agreed that they operated fairly; and
- 41% thought that the risk of being caught speeding was small and this was a perception that had remained unchanged over a number of years.

The level of general enforcement (including other forms of speed enforcement) was perceived to be relatively low, but more people thought that they would be likely to receive a ticket from a speed camera than from a police officer.

<sup>1</sup> In September 2001 a High Court judgement stated that, due to a legislative oversight, the Police could no longer rely on courts to accept certificates of accuracy for speed cameras. The oversight meant that, until it was rectified, the Police would need to produce expert witnesses in court to attest to the accuracy of the cameras. Given the inefficiencies this would have created, the Police decided not to operate fixed cameras in the interim. Section 146 of the Land Transport Act 1998 was subsequently amended to correct this oversight. The Land Transport (Road Safety Enforcement) Amendment Act 2001 amended section 146 to enable a certificate of accuracy under that section to be used for proceedings for offences under any bylaw or other enactment involving speeding.





## Part One

# Introduction





## INTRODUCTION

### Why We Looked at the Speed Camera Programme

- 1.1 Each year on New Zealand roads more than 450 people die and over 6000 are seriously injured and require hospitalisation.
- 1.2 As at June 2001, the Land Transport Safety Authority (LTSA) assessed the social cost of the loss of one life in a road accident at \$2.55 million.<sup>2</sup> For non-fatal injuries the average social costs are estimated at \$576,000 for a serious injury and \$45,000 for a minor injury.
- 1.3 In 2000, the annual social cost of road crashes in New Zealand was estimated at \$3,200 million.
- 1.4 A proportion of these costs arises from the consequences of drivers driving at excessive speeds. The LTSA:
  - has assessed that excessive speed contributes to approximately 30% of all road deaths each year; and
  - attributes nearly 20% of all serious road injuries to excessive speed.
- 1.5 Speed cameras were introduced from October 1993 to provide added capability to achieve the road safety goals set out in the New Zealand Road Safety Programme. The objectives of the speed camera programme are to reduce vehicle speeds and speed-related crashes.
- 1.6 Speed cameras are an acknowledged key enforcement tool in efforts to reduce road deaths and injuries, and the resulting costs. We decided to look at the speed camera programme because of its potential to reduce those costs and the related human costs to victims and their families and friends. We also took account of the fact that there had been no overall assessment of the operation of the speed camera programme since its inception.

### What We Looked At

- 1.7 We examined the operation of the speed camera programme, with particular reference to whether the programme was being delivered in a manner that maximised its contribution to achieving road safety goals.

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<sup>2</sup> Expressed in June 2001 prices. Social cost includes loss of life and life quality; loss of output due to injuries; medical and rehabilitation costs; legal and court costs; and property damage.





## INTRODUCTION

- 1.8 We looked at the strategic management and operational aspects of the programme, and expected to find that:
- speed camera resources<sup>3</sup> are allocated on the basis of a transparent and quantifiable process;
  - enforcement supports and maximises the deterrent effect of the programme;
  - speed cameras are operated in a manner that maximises effectiveness in meeting performance targets and policy objectives;
  - the Police operate an asset management regime to ensure the efficient ongoing operation of the programme; and
  - the programme is subject to regular evaluations of its impact to ensure that it is operated efficiently and delivered in a manner that maximises its effectiveness.

### Our Information Sources

- 1.9 We interviewed Police staff at the Office of the Commissioner and the Police Infringement Bureau. We visited five of the 12 Police Districts, where we interviewed a sample of District Commanders and Area Managers. We also interviewed Strategic Traffic Managers, speed camera operators, and Traffic Intelligence staff.
- 1.10 We also:
- interviewed LTSA staff in Wellington and in the Police Districts;
  - collected and reviewed documents;
  - observed camera operations at the Police Infringement Bureau, the Calibration Unit, and in Police Districts (including both fixed and mobile camera deployments); and
  - met with representatives from the New Zealand Automobile Association Inc. (the Automobile Association).

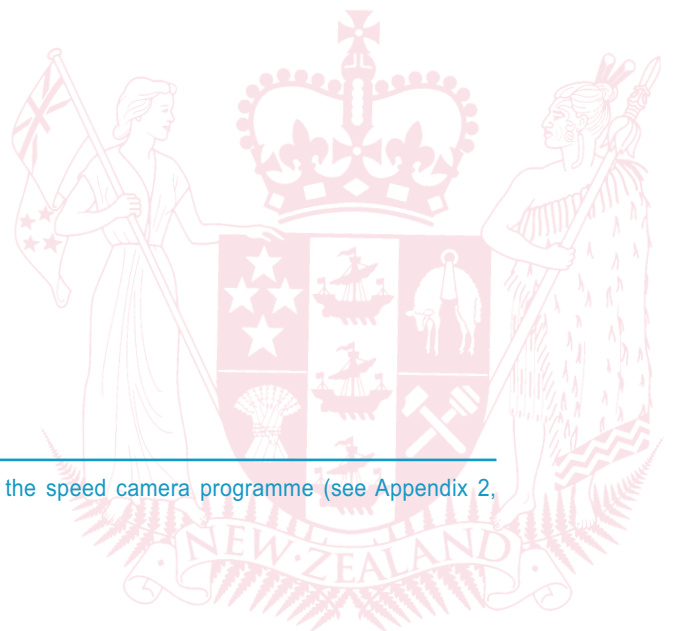
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<sup>3</sup> Speed camera resources include person hours; camera service delivery hours; the mix of fixed and mobile cameras; and camera sites.



## INTRODUCTION

- 1.11 We also observed speed camera operations in the Australian States of Victoria and Queensland, with a view to identifying opportunities for improved practice. Victoria operates a speed camera programme that is considered world-best practice. Queensland was of interest because the State had only recently introduced speed cameras and was using newer technology than other enforcement agencies.
- 1.12 In Victoria we met with representatives from the Victorian Police Traffic Camera Office, the Traffic Accident Commission, Lockheed Martin Tennix<sup>4</sup>, VicRoads, the Department of Justice, and the Accident Research Centre at Monash University.
- 1.13 In Queensland we supplemented our visit to the Queensland Police by meeting representatives from Queensland Transport<sup>5</sup>.



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4 The company that has the contract to operate the speed camera programme (see Appendix 2, page 97).  
5 The equivalent of the Ministry of Transport.

Part Two

# Why Controlling Speed Is Important





## WHY CONTROLLING SPEED IS IMPORTANT

- 2.1 In this part we discuss the problem of excessive vehicle speed and why controlling vehicle speeds on the roads is important. We also give an international context for speed control (and other road safety initiatives) by providing information on New Zealand's road toll compared with that of other countries.

### The Consequences of Excessive Speed

- 2.2 The consequences of excessive vehicle speed affect road safety in three ways – by increasing the:
- risk of having an accident, because of the reduced time available for a driver to respond to hazards;
  - impact of collisions; and
  - risk of death and severity of injuries in a crash.

#### *Risk of Having an Accident*

- 2.3 The faster a vehicle is travelling, the less time the driver has to identify hazards and respond to them. Research has shown that travelling at excessive speeds increases the chance that a driver will misinterpret potential hazards, or will even miss them completely.
- 2.4 Excessive speed increases the risk of an accident in a number of ways. For example:
- Other drivers can misjudge how fast a speeding vehicle is travelling in relation to other traffic.
  - Failure to adjust following distance to account for speed of travel increases the risk of a rear-end crash.
  - The distance needed to stop increases, so that the vehicle travels further during the driver's reaction time and under braking.

#### *Impact of Collisions*

- 2.5 The overall impact of a collision increases disproportionately with the increase in vehicle speed:
- a collision at 50km/h has been assessed as equivalent to the vehicle falling from a 3-storey building;





## WHY CONTROLLING SPEED IS IMPORTANT

- a collision at double the speed, 100km/h, has been assessed as equivalent to the vehicle falling from a 12-storey building.

2.6 Research has also shown that a person is:

- twice as likely to die in a crash at 120km/h as at 100km/h; and
- four times more likely to die at 130km/h (see top of Figure 1 opposite).

2.7 In urban areas, the risk of death to a pedestrian if hit by a vehicle increases from 5% at 30km/h to 70% at 60km/h and 96% at 70km/h (see bottom of Figure 1 opposite).

*Between 1987 and 1988, 40 American States raised the speed limit on interstate highways from 55 miles an hour (88km/h) to 65 miles an hour (104km/h). This resulted in an increase in average car speeds of about 3 miles an hour (5km/h). Over the same period fatalities on these roads increased by between 20% and 25%.*

### Risk of Death and Severity of Crash Injuries

2.8 The severity of injuries resulting from a crash is directly related to the pre-crash speed of the vehicle – regardless of whether or not speeding was a cause of the crash.<sup>6</sup>

2.9 When a vehicle crashes it undergoes a rapid change of speed. However, the occupants keep moving at the vehicle's previous speed until stopped, having been:

- thrown from the vehicle and hitting an external object;
- smashed into the vehicle interior; or
- restrained by a safety belt or air-bag.

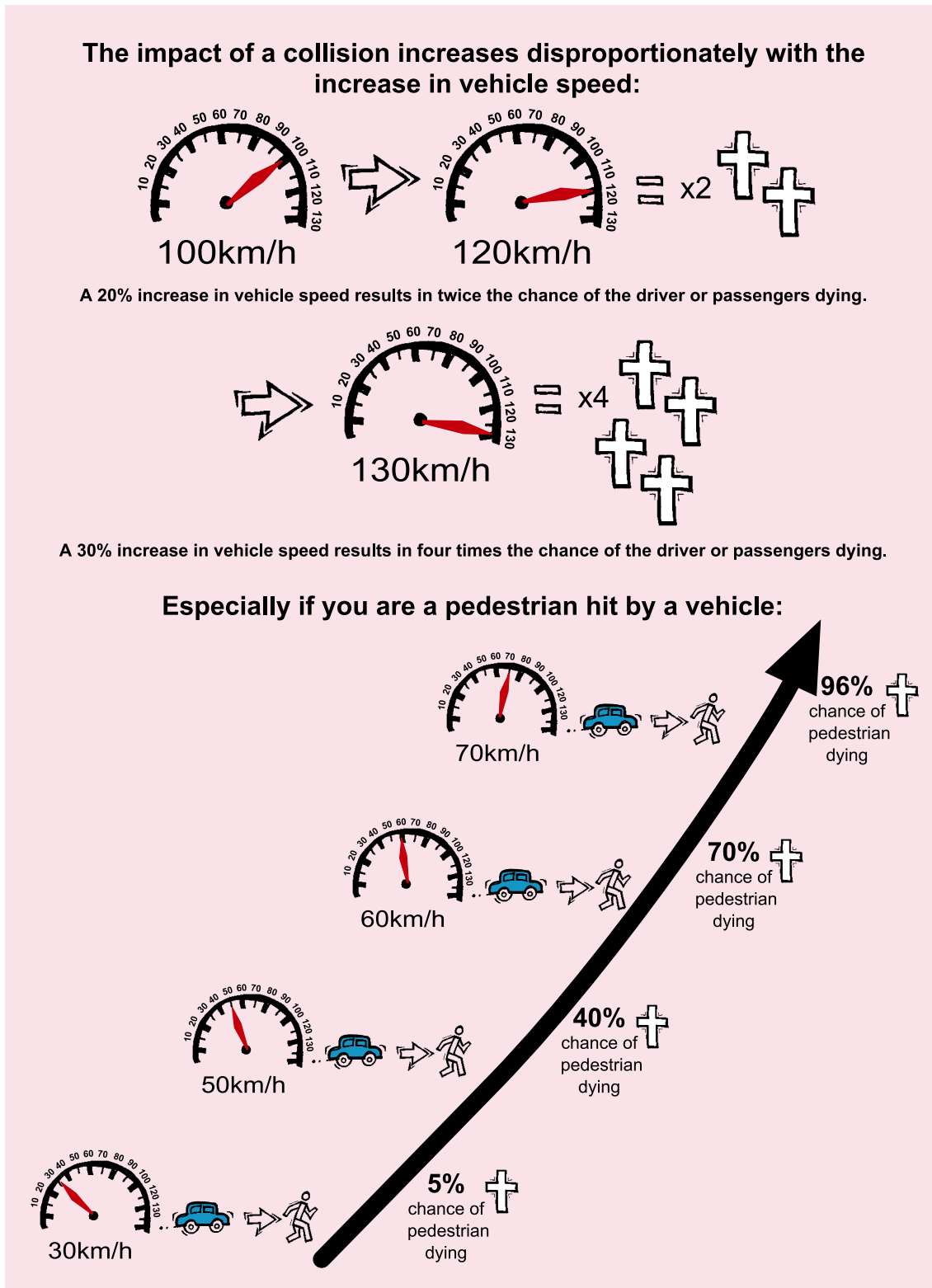
2.10 By whatever means, the human body must absorb the energy created in a crash. The greater the energy to be absorbed – directly related to speed – the greater the severity of the resulting injury.

<sup>6</sup> Where two moving vehicles crash into each other the impact speed (or “closing speed”) is a combination of both vehicle speeds. For example, two vehicles each travelling at 90km/h that collide head-on produce an impact speed of 180km/h.



## WHY CONTROLLING SPEED IS IMPORTANT

**Figure 1**  
*Relationship Between Vehicle Speed and Risk of Death for Drivers, Passengers, and Pedestrians*





## WHY CONTROLLING SPEED IS IMPORTANT

### International Road Toll Comparisons

#### New Zealand's Roads

2.11 New Zealand has approximately 92,000 kilometres of road and a unique road and driving environment. New Zealand has:

- the second highest proportion in the world of its roads in mountainous country.
- the fourth largest number of vehicles per head of population; and
- a standard of roads that is generally recognised as being equivalent to secondary roads in many other developed countries.

*There are over 15,800 bridges as part of New Zealand's road network. Of the approximately 92,000km of developed road:*

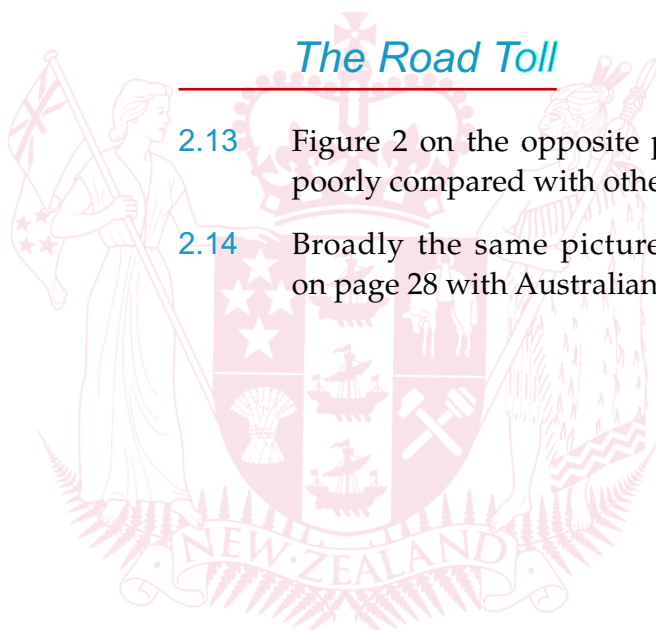
- *close to 10,500km are designated as State Highways and motorways;*
- *66,200km are rural roads; and*
- *15,300km are urban roads.*

2.12 These factors present a set of road safety risks that require targeted measures unique to New Zealand's situation in order to reduce the number of people killed and injured in road crashes.

#### The Road Toll

2.13 Figure 2 on the opposite page shows that New Zealand ranks relatively poorly compared with other developed countries in terms of road deaths.

2.14 Broadly the same picture is illustrated in the comparison in Figure 3 on page 28 with Australian States and Territories.

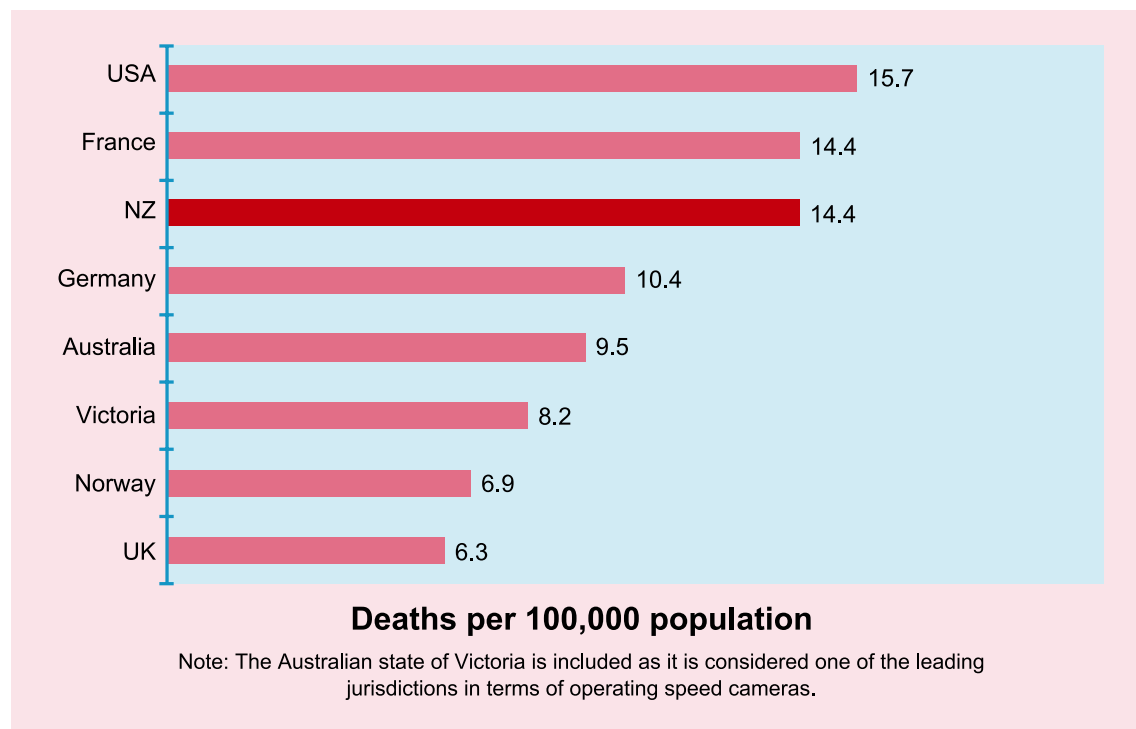
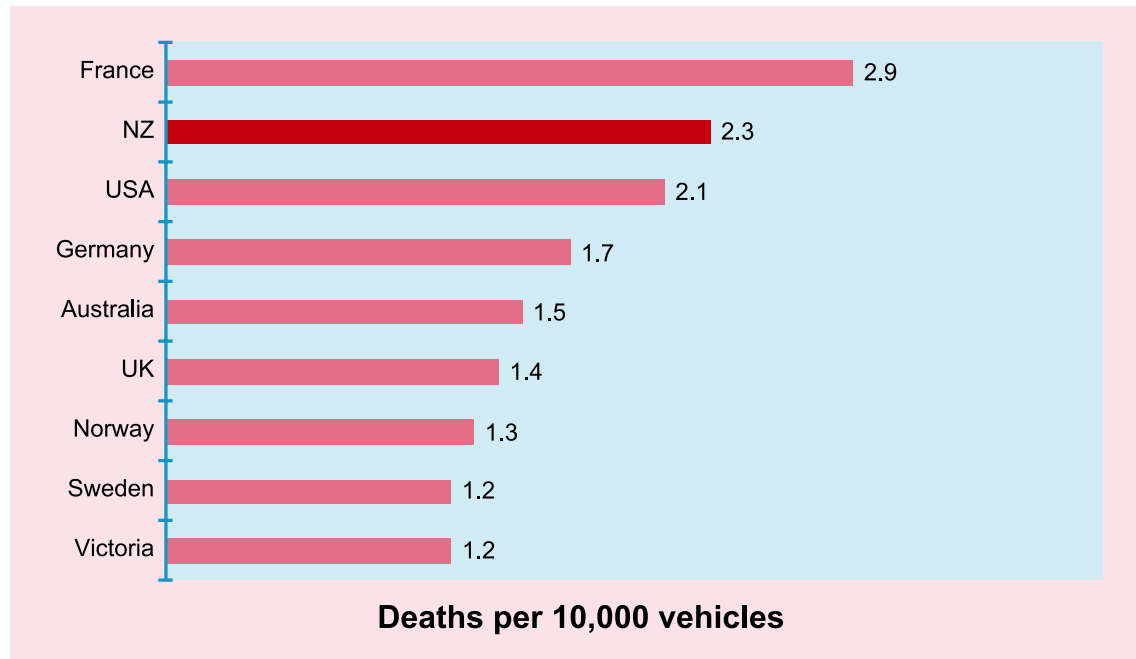






## WHY CONTROLLING SPEED IS IMPORTANT

**Figure 2**  
*Comparison of Road Deaths in New Zealand and Other Countries (1997)*

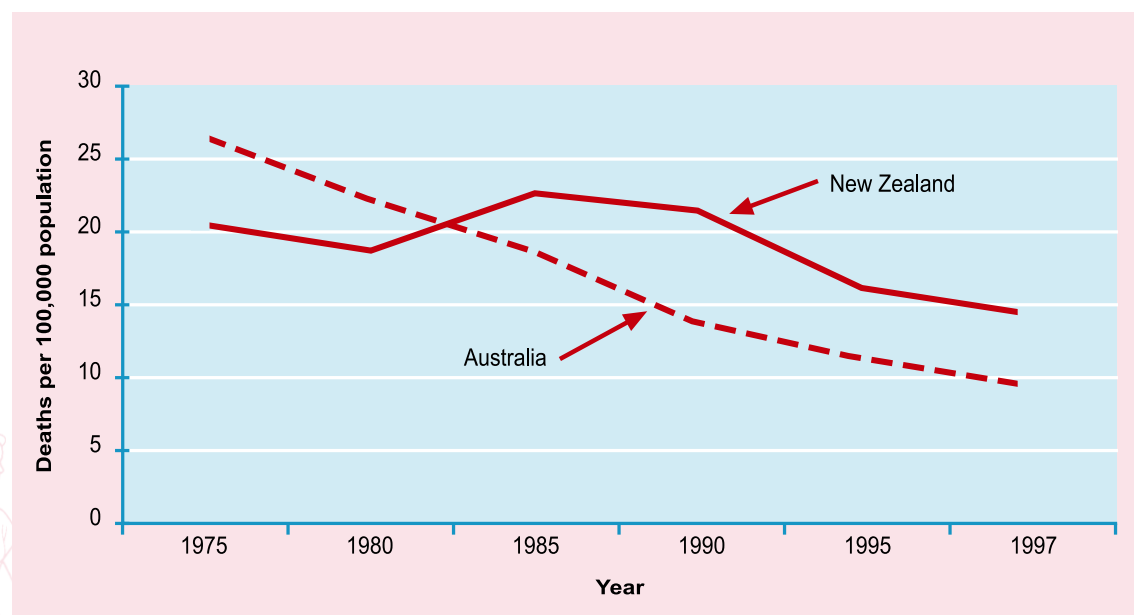
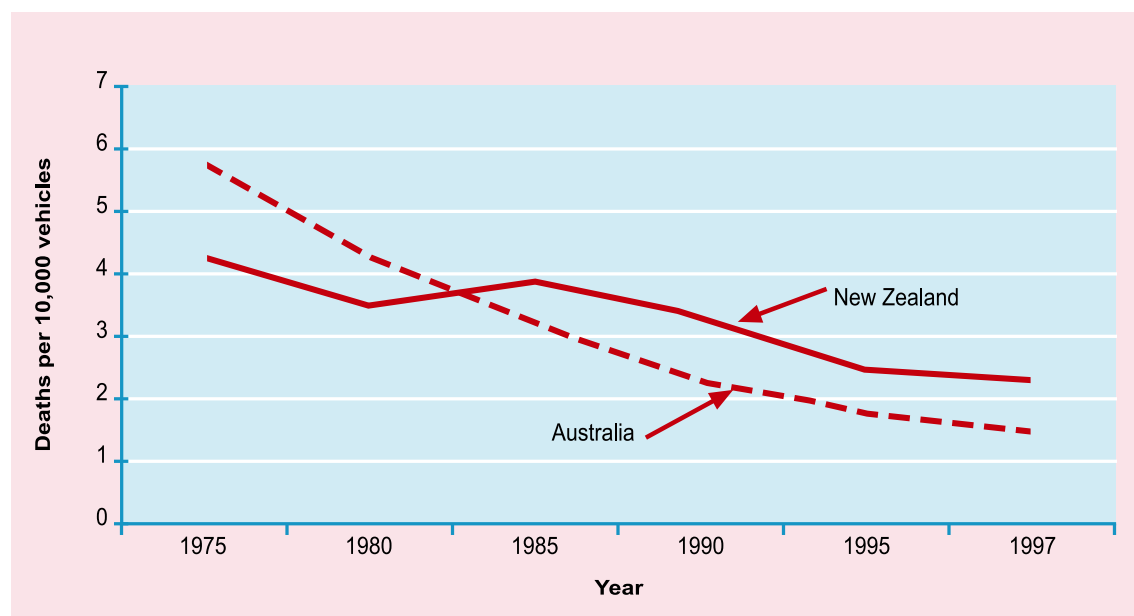


Source: *Road Safety Strategy 2010: A Consultation Document*, October 2000, LTSA.

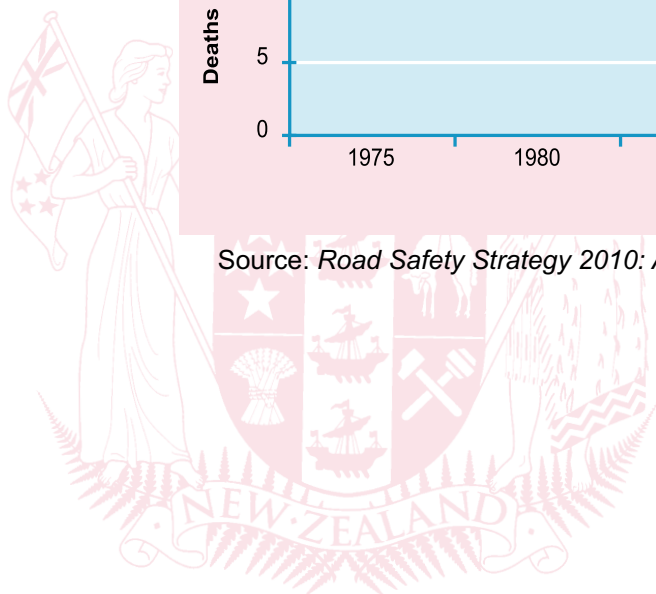


## WHY CONTROLLING SPEED IS IMPORTANT

**Figure 3**  
*Comparison of Road Deaths in New Zealand and Australia*



Source: Road Safety Strategy 2010: A Consultation Document, October 2000, LTSA.



**Part Three**

# **Road Safety and the Speed Camera Programme**





## ROAD SAFETY AND THE SPEED CAMERA PROGRAMME

- 3.1 In this part we outline New Zealand's road safety framework. We then discuss the following aspects of the speed camera programme:
- the cost of the speed camera programme and the revenue collected from speed camera infringement notices;
  - how speed cameras work;
  - the objective of the speed camera programme;
  - the impact of the programme; and
  - penalties for camera-detected speeding offences.

### The Road Safety Framework

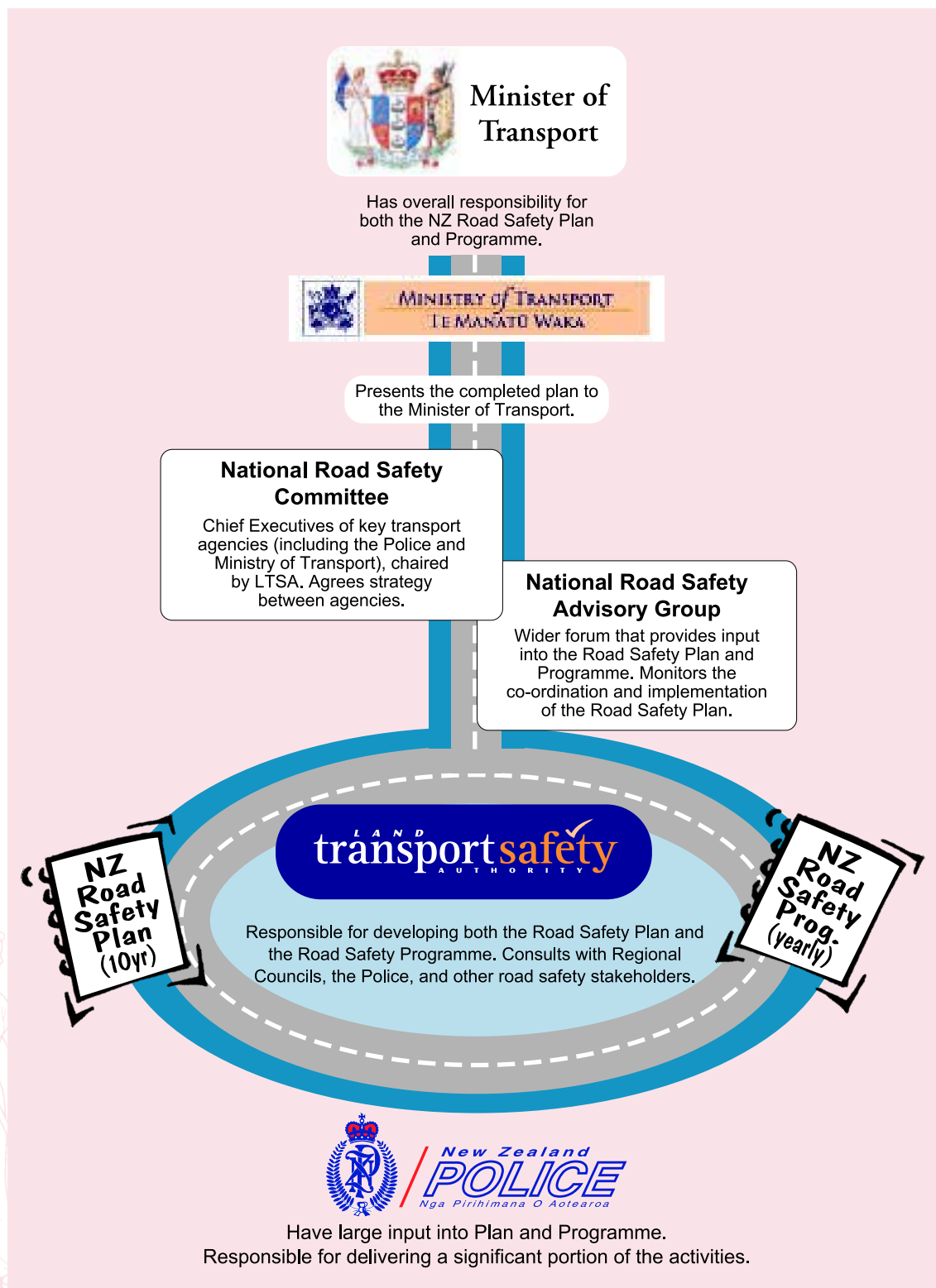
- 3.2 Road safety is co-ordinated and funded through the New Zealand Road Safety Programme (the Road Safety Programme), which the LTSA prepares annually in accordance with section 37 of the Transit New Zealand Act 1989 (where it is called the Safety (Administration) Programme).<sup>7</sup>
- 3.3 The Road Safety Programme is guided by a National Road Safety Plan, which sets out medium-term national goals and targets for government and community organisations involved in road safety.
- 3.4 In preparing the Road Safety Programme, the LTSA consults with the other key road safety agencies, including the Police, Transit New Zealand, the Ministry of Transport, the Accident Compensation Corporation and local authorities (see Figure 4 on page 32). The Ministers of Transport and Police are each responsible for delivering parts of the Programme's road safety outputs.
- 3.5 The Road Safety Programme:
- establishes the Government's annual plan for expenditure on road safety;
  - is the principal tool for planning, implementing, and evaluating road safety initiatives (other than road improvements); and
  - contains the recommended outputs for the LTSA, the Police, and regional and local authorities – including budgeted costs, objectives to be achieved, evaluations required, and performance measures for each output.

<sup>7</sup> We reported on the Safety (Administration) Programme in 1994 – *First Report for 1994*, parliamentary paper B.29[94a], pages 43–47.



## ROAD SAFETY AND THE SPEED CAMERA PROGRAMME

Figure 4  
Planning for Road Safety







## ROAD SAFETY AND THE SPEED CAMERA PROGRAMME

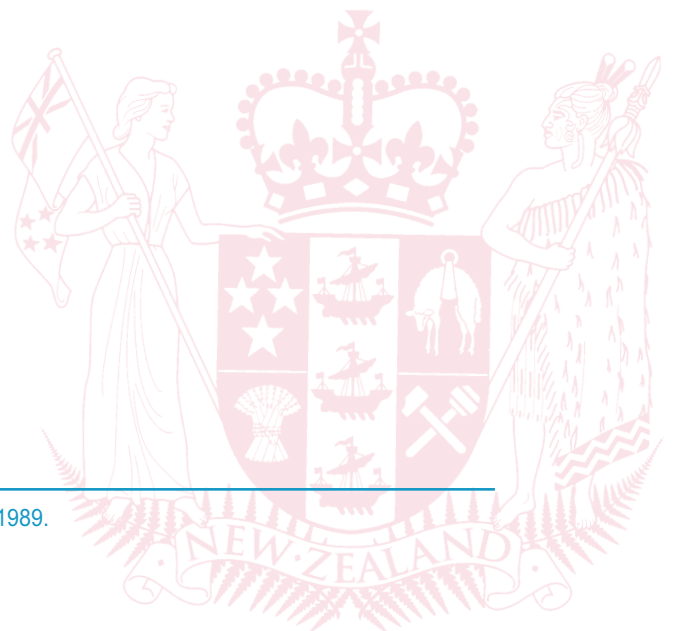
- 3.6 An independent review undertaken in 2000 concluded that the Road Safety Programme and associated processes represented world-best practice (see paragraph 3.37 on page 43).

### *Funding and Spending on Road Safety*

- 3.7 Of the \$1,800 million raised in 2000-01 by the Crown as roading revenue<sup>8</sup> and from contributions from territorial local authorities and regional councils, about 12% – or \$214.2 million – was spent on the Road Safety Programme.
- 3.8 Over the period 1992-93 to 2000-01, funding for speed control initiatives increased from \$11.5 million (10.3% of the Road Safety Programme) to \$37.3 million (17.4% of the Programme). This increase was largely due to the introduction of the speed camera programme.

### **Cost and Revenue from Penalties**

- 3.9 The Police have the main responsibility for the speed camera programme. The LTSA and the Ministry of Transport (see Figure 5 on the next page) undertake monitoring of performance.



8 As defined by section 8, Transit New Zealand Act 1989.



## ROAD SAFETY AND THE SPEED CAMERA PROGRAMME

*Figure 5*

*Key Players in the Speed Camera Programme*



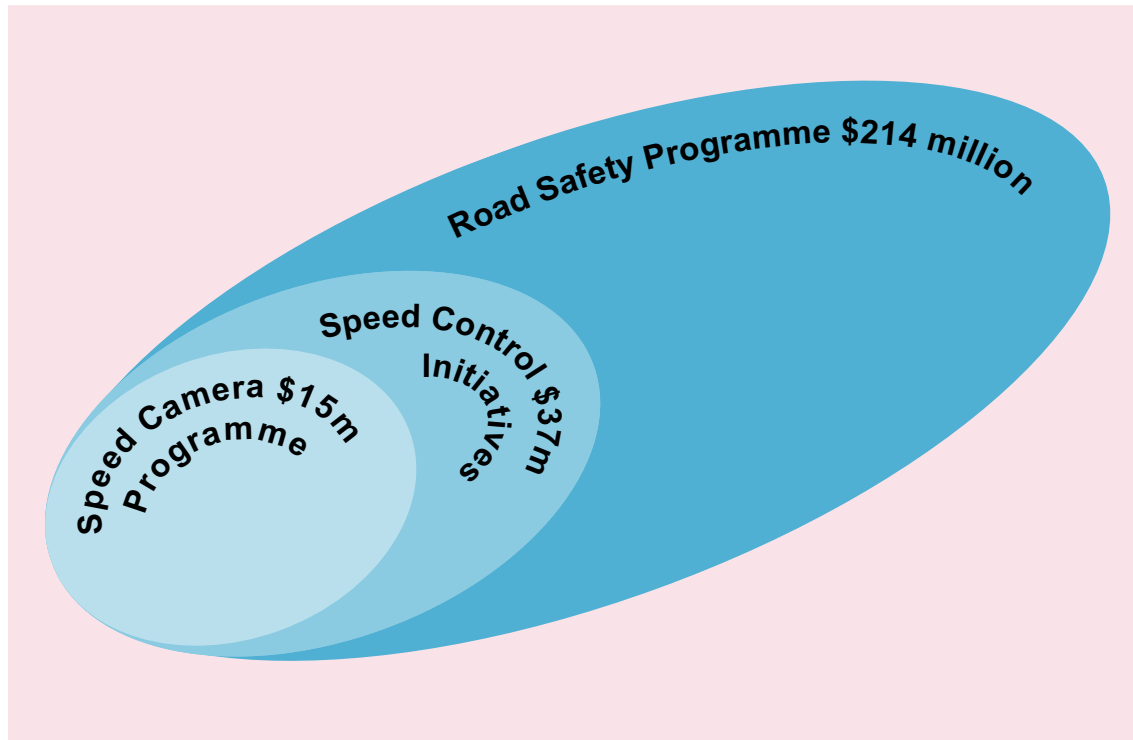
3.10 The Police received funding of \$15.6 million in 2000-01 to pay for the speed camera programme (see Figure 6 on the opposite page and Figure 7 on page 36).



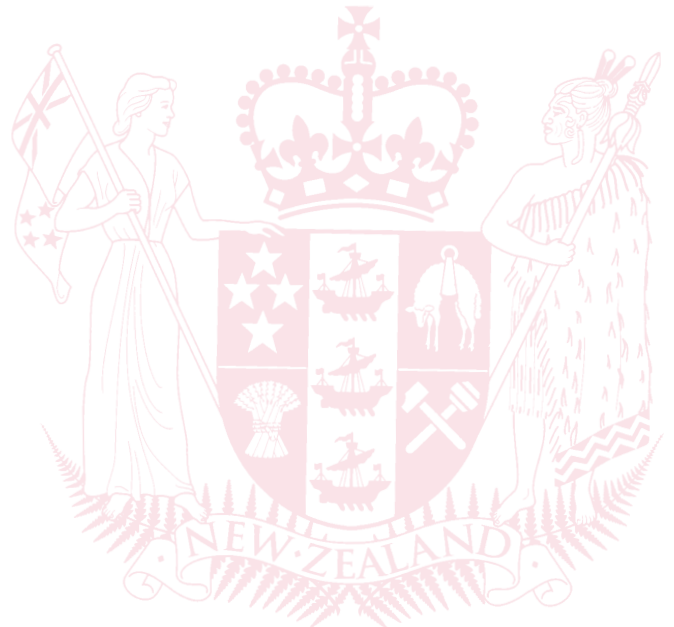


## ROAD SAFETY AND THE SPEED CAMERA PROGRAMME

*Figure 6  
Speed Camera Programme Cost as a Component  
of the Road Safety Programme 2000-01*



- 3.11 The speed camera programme generates more revenue from penalties than it costs, as shown in Figure 7 on the next page. Figure 7 also shows the revenue from penalties for all speeding offences. About 47% of all revenue from penalties for speeding offences in 2000-01 came from camera-detected offences.





## ROAD SAFETY AND THE SPEED CAMERA PROGRAMME

**Figure 7**

*Speed Camera Programme Cost and Revenue from Penalties for Speeding Offences*

	Programme Cost (\$million)	Revenue from Camera-detected Speeding Offences (\$million)	Revenue from All Speeding Offences (\$million)
2000-01	15.6	38.4	81.3
1999-2000	15.9	34.2	70.1
1998-99	15.9	26.1	56.8

**3.12** The extent to which revenue from camera-detected offences exceeds the speed camera programme cost tends to support the perception of some people that the programme is primarily a revenue-raising tool. However, there is no evidence of this. Indeed, two factors that tend to refute this perception are:

- The Police – as operators of the speed camera programme – do not benefit from the revenue from offences and their performance is not assessed on the amount of revenue collected.
- The percentage of drivers committing camera-detected speeding offences who are issued with infringement notices (the “prosecution rate”) is low and could be increased (see paragraphs 6.18-6.21 on page 86). The low rate reflects a cautious approach by the Police to pursuing speed camera offenders. However, it also illustrates how the Police’s management of the speed camera programme is not focused on maximising revenue from speed camera offences.

*For the year ended 30 June 2000 vehicles went past mobile and fixed cameras in 50km/h zones over 20 million times. Over 500,000 of these passing vehicles (2.5%) were photographed at a rate of more than 450 an hour. In the same year, vehicles passed mobile speed cameras in 100km/h zones nearly 10 million times, and over 180,000 vehicles (1.8%) were photographed.*



## ROAD SAFETY AND THE SPEED CAMERA PROGRAMME

### How Speed Cameras Work

- 3.13 Figure 8 on page 38 illustrates how fixed and mobile speed cameras work. Both types of camera consist of two main components:
- a detection system that identifies the speeding vehicle; and
  - a camera to record the image – Figures 9A and 9B on page 39 provide examples of (respectively) a fixed and a mobile speed camera photograph.
- 3.14 The camera comprises a lens, a shutter mechanism, and a film magazine unit. The shutter mechanism is activated once the detection system verifies that a vehicle has exceeded the pre-set speed limit. The image is recorded on standard 35mm photographic film. The film magazine holds 100 feet (30.48 metres) of film, enough for up to 650 photographs.

### *How a Fixed Speed Camera Works*

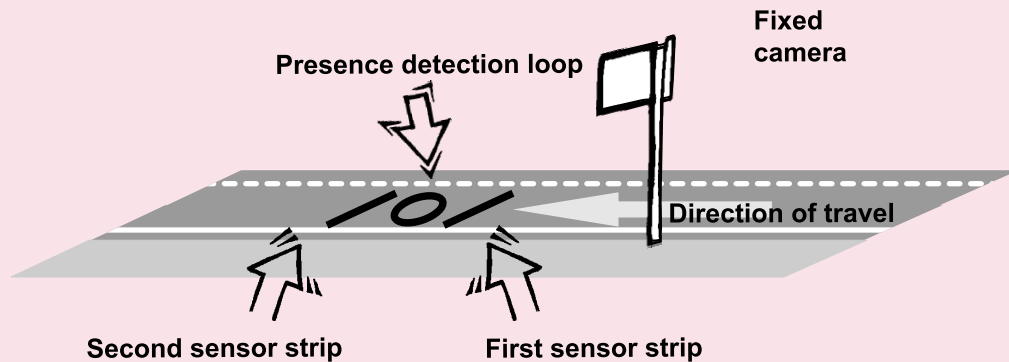
- 3.15 A fixed speed camera is operated by controlling hardware that is enclosed in a box at the top of the pole on the side of the road. Underground wires connect the hardware to sensors embedded in the road that use a time-over-distance method to measure the speed of a passing vehicle.
- 3.16 Two speed checks are made for each vehicle, one for each of the first and second pair of wheels to trigger the sensors. If the two checks do not match, no photograph is taken, as the non-match indicates that there may be an error (such as two vehicles passing over the sensors at the same time). In addition, a detection loop checks to ensure that, after the first sensor is triggered, a vehicle is actually present – if the loop does not give a positive signal, no measurement is recorded and no photograph is taken.



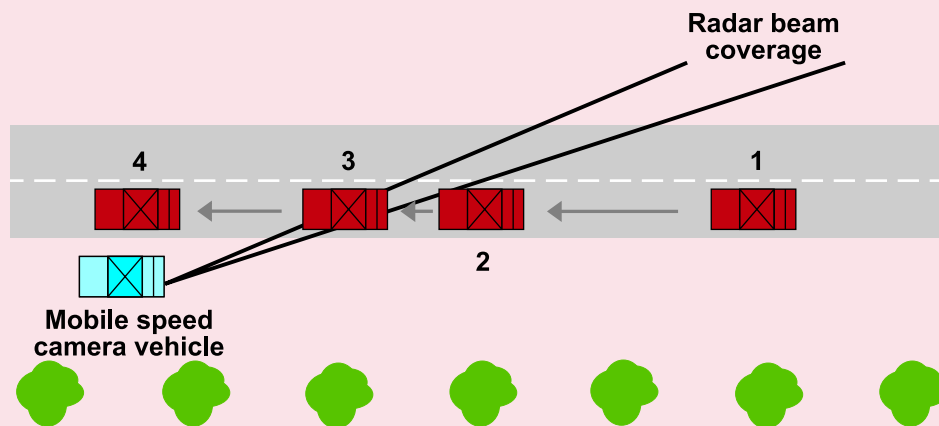


## ROAD SAFETY AND THE SPEED CAMERA PROGRAMME

**Figure 8**  
*How Fixed and Mobile Speed Cameras Work*



1. Vehicle crosses first sensor strip, alerting camera system to vehicle presence.
2. The presence detection loop serves as a check to ensure that a vehicle is actually passing between the two strips.
3. As the vehicle passes the second sensor strip, a measurement of the vehicle's speed is taken.
4. If the vehicle is travelling faster than the preset limit, a photograph is taken. (See paragraphs 3.15 to 3.17 for a full description)



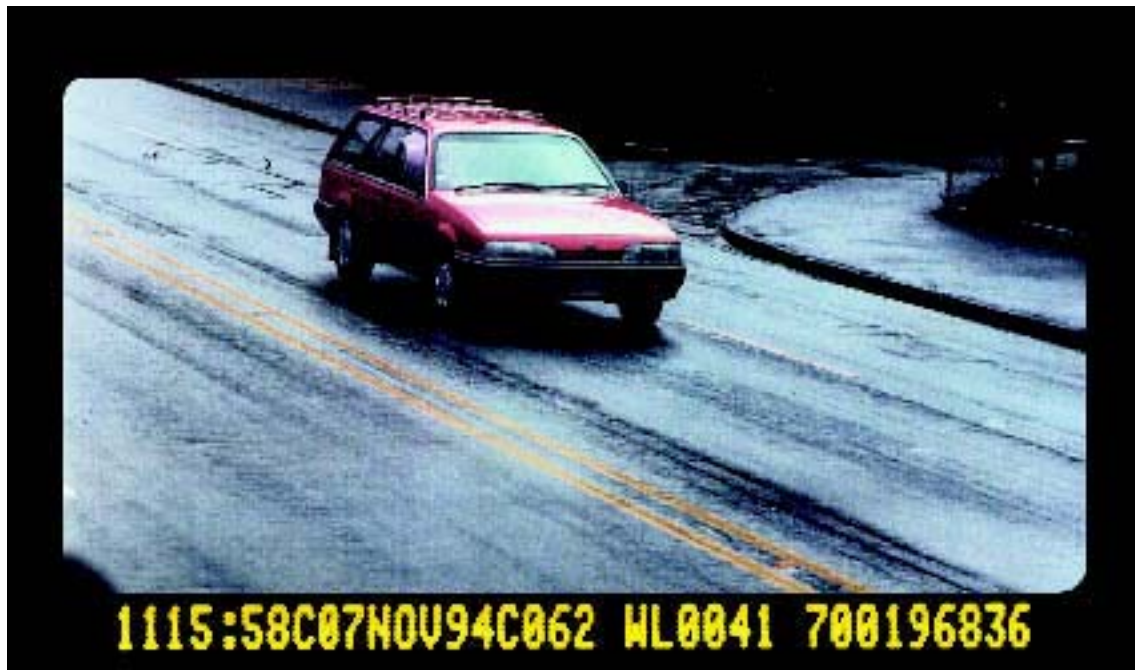
1. Vehicle enters radar beam causing radar signal to be returned to radar unit.
2. A measurement is taken of the vehicle's speed. Several checks are completed by camera system. If the vehicle is travelling faster than the preset limit, a photograph is taken of the vehicle.
3. Vehicle has passed fully through the camera beam.





## ROAD SAFETY AND THE SPEED CAMERA PROGRAMME

*Figure 9A*  
*Example of a Fixed Speed Camera Photograph*



*Figure 9B*  
*Example of a Mobile Speed Camera Photograph*





## ROAD SAFETY AND THE SPEED CAMERA PROGRAMME

- 3.17 The main operational difference between fixed and mobile cameras is that a fixed camera can be programmed to operate at certain times of the day, and on specific days of the week, without the need for an operator to turn the camera on and off.

### *How a Mobile Speed Camera Works*

- 3.18 A mobile camera is operated from the back of an unmarked Police vehicle. It works by emitting a cone-shaped radar beam of which, when it strikes an object, a small amount is reflected back to a receiver module. The frequency of the radar beam is altered when it is reflected back by a moving object – an effect known as the Doppler shift.
- 3.19 A vehicle's speed is measured a split-second after the front of the vehicle has moved into the radar beam. The radar unit continuously analyses the frequency of the signal being reflected off the vehicle, making approximately 20 measurements for every 30cm travelled. Each of these measurements is put through a verification process, checking to see whether the signal fits expected patterns. The speed of the vehicle is then recorded and, if higher than a pre-set limit, a photograph is taken. The identification, verification, and photography all occur in less than a second.

*Some British Police forces are using two digital cameras linked directly to a computer to measure a vehicle's average speed over a set distance. The first camera reads the vehicle's number plate and records the precise time of the reading. As the vehicle passes the second camera it matches the two number plate images, a second time is recorded, and an average speed is calculated. If the speed is over the set speed limit the information is recorded and a speeding ticket is issued.*

### **Objective of the Speed Camera Programme**

- 3.20 The speed camera programme has the objective of reducing speeding and speed-related crashes. To achieve that objective, the programme is designed to act as:
- an enforcement tool; and
  - a deterrent to driving at excessive speeds.



## ROAD SAFETY AND THE SPEED CAMERA PROGRAMME

### *Speed Cameras as an Enforcement Tool*

- 3.21 Speed cameras are a form of automated<sup>9</sup> enforcement. They are a means by which drivers who (actually or potentially) place other road users at risk by exceeding speed limits can be detected and punished.
- 3.22 Speed cameras were introduced into New Zealand on the basis of their success overseas, which showed that they effectively deterred drivers from speeding. A trial prior to the nationwide introduction of the programme noted speed reductions of approximately 10km/h in the trial areas and a high level of public support for the introduction of speed cameras.
- 3.23 Using speed cameras to detect offenders has a number of advantages. For example, the cameras:
- increase the probability of detection without requiring significant input from front-line Police;
  - increase drivers' expectations of being caught;
  - increase fairness of enforcement by removing discretionary aspects of a vehicle being stopped by a Police officer; and
  - can be used in locations where Police patrol vehicles cannot be safely and effectively deployed.
- 3.24 Speed cameras (like Police presence on the roads) focus on deterring drivers from speeding – as opposed to physical preventative measures such as road engineering (e.g. speed humps) or speed control devices fitted to vehicles.

### *Speed Cameras and the Deterrent Effect*

- 3.25 There are two main forms of deterrence – specific and general.
- 3.26 **Specific deterrence** is aimed at the individual speeding driver and attempts to change the driver's behaviour by detecting an offence and imposing a penalty. Specific deterrence is based on the assumption that:
- drivers who are caught and punished for speeding will be discouraged from committing further speeding offences; and
  - consequently, road safety will be improved.

9 “Automated” in the sense that no human factor is involved in determining a vehicle's speed.





## ROAD SAFETY AND THE SPEED CAMERA PROGRAMME

- 3.27 However, specific deterrence often works to deter a driver from speeding only at a particular site, so its effects can be localised.
- 3.28 **General deterrence** aims to have a more widespread effect on driver behaviour. A driver who has a high expectation of being caught speeding is more likely to modify her/his behaviour. General deterrence is based on the assumption that those exposed to the enforcement (whether apprehended or not) will be discouraged from speeding for fear of detection and punishment.
- 3.29 How a speed camera is operated determines whether its principal effect is through specific or general deterrence. For example:
- Operating highly visible speed cameras in the same areas all of the time is likely to result in drivers being deterred from speeding only in those **specific** areas.
  - Operating speed cameras anywhere and at any time (possibly covertly) could have a more **general** deterrent effect by potentially encouraging drivers to check their speed no matter where they are travelling.

### Impact of the Speed Camera Programme

- 3.30 The LTSA has attempted to quantify the impact of the speed camera programme – in particular, by the hidden speed camera trial described in paragraphs 3.48-3.53 on pages 46-47. Other New Zealand studies have referred to speed cameras, and a number of reviews have examined particular aspects of the speed camera programme.
- 3.31 The Police reviewed the impact of camera site selection on road safety 18 months after the speed camera programme started. The review was not fully completed but, on the basis of the information collected, it found a reduction in 85<sup>th</sup> percentile speeds<sup>10</sup> at 526 sites (42% of all sites) and an increase at 293 sites (23% of all sites). (More details of this and a current review of site selection are provided at paragraphs 5.11 to 5.21 on pages 69-70.)
- 3.32 An evaluation for the LTSA of the speed camera programme after its first year of operation estimated an annual social cost saving of about \$100 million. The operating cost of the programme for the same period was \$12.4 million, giving a benefit to cost ratio of 8:1. By 1995, fatal and serious crashes had fallen by 23% at urban speed camera sites and by 11% at rural sites.

<sup>10</sup> The 85th percentile is a benchmark for speed measurement. It involves the identification of the top 15% of vehicle speeds on a particular road. The Police moved away from this indicator for camera trigger speeds in 2001. A standard tolerance of 10km/h above the posted speed limit is now applied.



## ROAD SAFETY AND THE SPEED CAMERA PROGRAMME

- 3.33 The LTSA regularly undertakes speed surveys. Since July 2000, the Police have also been conducting speed surveys using speed camera equipment. The cameras covertly monitor speeds, but infringement notices for speeding offences are not issued while the surveys are conducted. The results are used to measure:
- the effectiveness of the speed camera programme; and
  - whether a posted speed limit is appropriate; or
  - whether additional enforcement is necessary.
- 3.34 A number of studies have also been completed on the impact that the Road Safety Programme has had on road safety. These studies tend to consider speed control measures without specifically examining the impact of speed cameras on road safety goals.
- 3.35 An independent evaluation of the Supplementary Road Safety Package<sup>11</sup> undertaken in July 1998 for the LTSA considered whether the increase in road safety activity between 1996 and 1998 had resulted in any road safety benefits. The evaluation concentrated on high-level outputs, grouping speed control programmes together. As a result, it was not possible to draw a direct relationship between the speed camera programme and the identified road safety impacts.
- 3.36 However, the 1998 evaluation considered the hidden speed camera trial which was undertaken in the then Midland Police District<sup>12</sup> in 1997 (see paragraphs 3.48-3.49 on pages 46-47). It recommended that, subject to an evaluation of the trial, covert camera operations should be introduced. The evaluation further recommended that demerit points<sup>13</sup> should be assigned to camera-detected speeding offences, in order to increase the specific deterrent effect on repeat offenders.
- 3.37 A February 2000 independent review for the Ministry of Transport of baseline funding for the Road Safety Programme also considered whether or not the mix of higher-level road safety outputs was appropriate. It did not examine the impact of the speed camera programme in isolation from other road safety measures. However, as part of its wider evaluation the review noted that additional speed camera resources would be of benefit – in terms of extra cameras to give wider coverage, more camera operating hours, or the introduction of covert camera deployments.

11 The package was an increase in resources across a range of road safety measures – including more drink-driving enforcement and more speed control.

12 Now Waikato Police District.

13 Demerit points are a penalty system that can result in the temporary loss of a driver's licence.

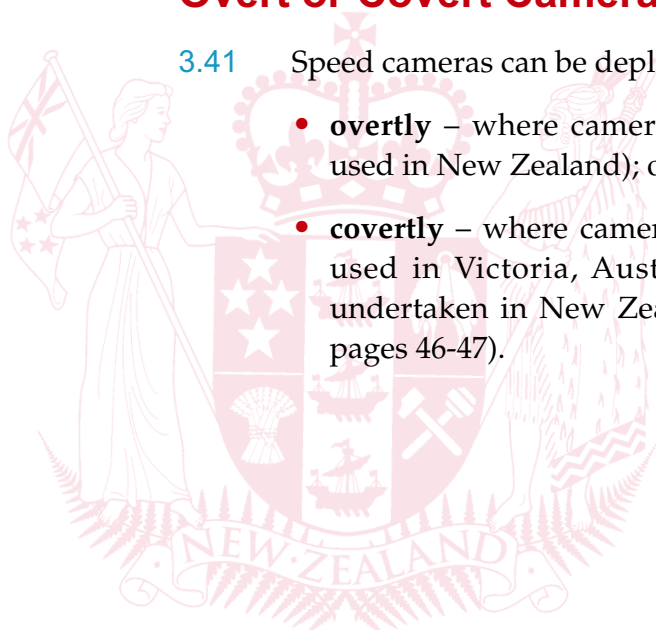


## ROAD SAFETY AND THE SPEED CAMERA PROGRAMME

- 3.38 The LTSA has considered the effects of road safety programmes (i.e. Police enforcement, driver education) compared with road improvements. The comparison has shown that road safety programmes in New Zealand (particularly those aimed at reducing high-risk behaviour) produce high incremental returns, and that there is still considerable scope for gains to be made in improving road safety. However, it is not clear which programme would produce the best return for additional investment. Despite a number of studies noting that expansion of the speed camera programme would be beneficial, no single study has considered the best way that this could be implemented.
- 3.39 International studies have assessed the effects of speed cameras – most notably a five-part study conducted into the Victorian speed camera programme during the 1990s by the Monash University's Accident Research Centre. The study looked at the effects that the programme had on localised speed-related crashes and on speed levels in general, and at the way each component of the programme (site signage, ticketing, and advertising) contributed to the results. The evaluation found that speed cameras had had a significant impact on road safety in Victoria, especially in urban areas where their use had been concentrated.
- 3.40 The Monash study demonstrated that it is possible to carry out a specific evaluation of a speed camera programme. Such studies can:
- quantify the impact that speed cameras are having on road safety; and
  - provide important information for making decisions concerning the benefits available from the speed camera programme.

### Overt or Covert Camera Deployment

- 3.41 Speed cameras can be deployed in two ways:
- **overtly** – where cameras are operated in clear view of motorists (as used in New Zealand); or
  - **covertly** – where cameras are operated in a less conspicuous way (as used in Victoria, Australia, and in the hidden speed camera trial undertaken in New Zealand in 1997 – see paragraphs 3.48 to 3.53 on pages 46-47).





## ROAD SAFETY AND THE SPEED CAMERA PROGRAMME

- 3.42 Overt deployments operate on the premise that drivers will slow down as a result of the obvious presence of a speed camera. If a speeding driver can clearly see a speed camera they are more likely to slow down, thus achieving the goal of slower speeds within the immediate area of the camera. Studies in Victoria have shown that the overt operation of speed cameras is effective at reducing speeds at and near camera sites, but is unlikely to affect speeds elsewhere.<sup>14</sup>
- 3.43 Covert camera deployments are said to have a much wider deterrent effect – because drivers are made aware that a camera may be operating without it necessarily being visible, and with no visual warning that a camera is operating. Covertly deployed cameras potentially have a much more widespread effect by causing drivers to be cautious of their speeds whenever and wherever they are travelling.
- 3.44 Research has shown that when covert cameras are used intensively and supported by high-profile publicity, they can produce widespread and long-term reductions in crashes and crash severity.<sup>15</sup>
- 3.45 Tasmania, South Australia, and Victoria currently operate *covert* speed camera programmes. New Zealand operates cameras *overtly*, in terms of the current policy that:
- camera vehicles must be visible from at least 50 metres;
  - the camera vehicle must be parked in a legal manner, with park lights turned on if operating at night; and
  - speed camera sites are signposted at the start of the site – although where two or more sites are joined the additional sites are not sign-posted.
- 3.46 The Police have observed that drivers increase their speeds once they have left an overt camera site. This small ‘halo effect’ (see Figure 10 on the next page) of overt camera operations is likely to be compounded when the cameras are deployed in a predictable manner (for instance, always appearing at the same spot on a stretch of road).

14 Cameron, M.H., Newstead, S.V. and Gantzer, S (1995). Effects of Enforcement and Supporting Publicity Programs in Victoria, Australia. *Proceedings from Conference, Road Safety in Europe and Strategic Highway Research Program*, Prague, The Czech Republic. VTI Sweden.

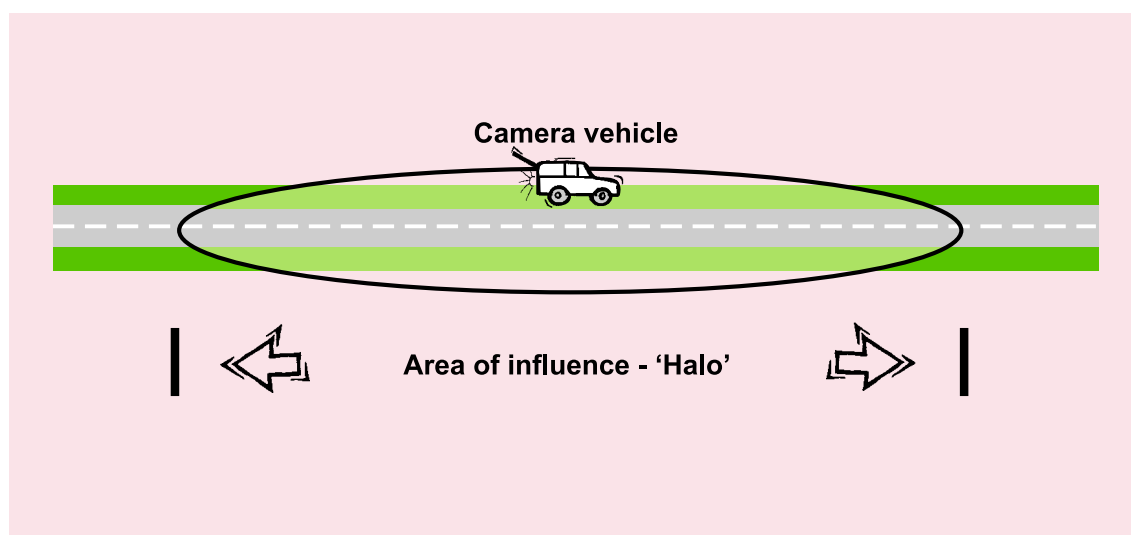
15 Ibid.



## ROAD SAFETY AND THE SPEED CAMERA PROGRAMME

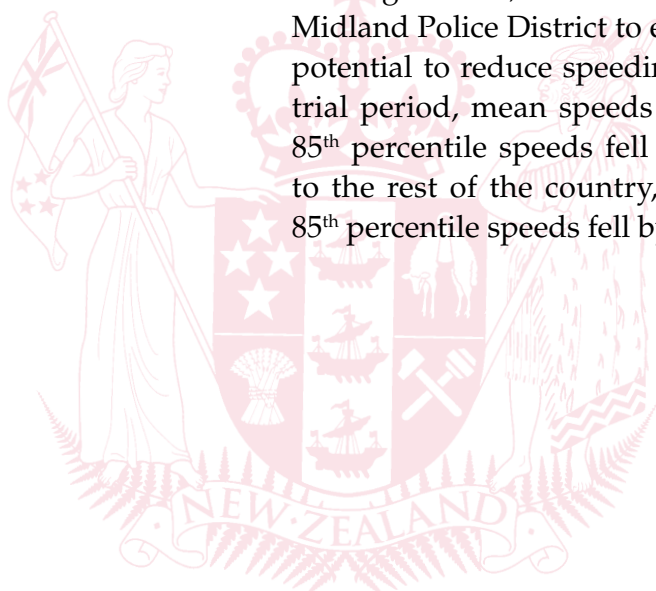
- 3.47 Motorists may also increase their speeds after passing one speed camera, on the assumption that (once they have passed the camera) there will be no other camera operating in that area. This assumption is reasonable given that current operational policy does not permit more than one speed camera to be operated in any one site at the same time (although a camera could be operated in each of two successive sites, where the start of the second site is not sign-posted).

*Figure 10*  
*Area of Influence of a Speed Camera*



### *The New Zealand Hidden Speed Camera Trial*

- 3.48 Starting in 1997, a hidden speed camera trial was undertaken in the then Midland Police District to establish whether a covert camera policy had the potential to reduce speeding beyond the immediate camera site. Over the trial period, mean speeds fell by 1.3km/h on open roads generally, and 85<sup>th</sup> percentile speeds fell by 4.3km/h. In speed camera areas compared to the rest of the country, open road mean speeds fell by 2.3km/h and 85<sup>th</sup> percentile speeds fell by 2.9km/h in the first year of the trial.







## ROAD SAFETY AND THE SPEED CAMERA PROGRAMME

- 3.49 Over the period 1 June 1997 to 30 June 1999, the open road crash rate fell by 11% and open road casualties fell by 19% – effects that have been associated with the hidden speed camera trial. The average number of casualties per crash fell by 9% compared with the rest of the country. This is consistent with decreased crash severity accompanying lower collision speeds. During the trial period the public perceived that more speed enforcement was occurring.
- 3.50 As noted in paragraph 3.36 on page 43, a 1998 independent evaluation recommended that, subject to the results of the hidden camera trial, some mobile speed cameras should be deployed in a covert manner, without the requirement for warning signs. The evaluation team noted that covert deployment would produce a general deterrent effect on speeding.
- 3.51 A number of studies have specifically evaluated the 1997 hidden speed camera trial. One study concluded that hidden cameras significantly reduced speeds, crashes and casualties over all open roads throughout the trial area. Another concluded that the hidden camera trial was significantly more effective at deterring excessive speed than the existing overt camera programme.
- 3.52 The February 2000 independent review of the Road Safety Programme (paragraph 3.37) also noted that the effectiveness of the speed camera programme (and, hence, the reduction in road speeds, deaths and injuries) would be considerably greater if covert cameras were used. The review noted that:
- ... if the results of the first two years of the hidden camera trial were achieved by allowing the use of hidden cameras on the open road throughout New Zealand, an annual reduction of about 30 deaths and 570 injuries could be expected.<sup>16</sup>*
- 3.53 A proposal was put to the Government in 2000 to introduce covert speed camera operations nationally on the basis of the trial. The proposal was not accepted.

<sup>16</sup> Vulcan, P, Gould, C, and Hannigan, M, *Review of the Safety (Administration) Programme Baseline*.



## ROAD SAFETY AND THE SPEED CAMERA PROGRAMME

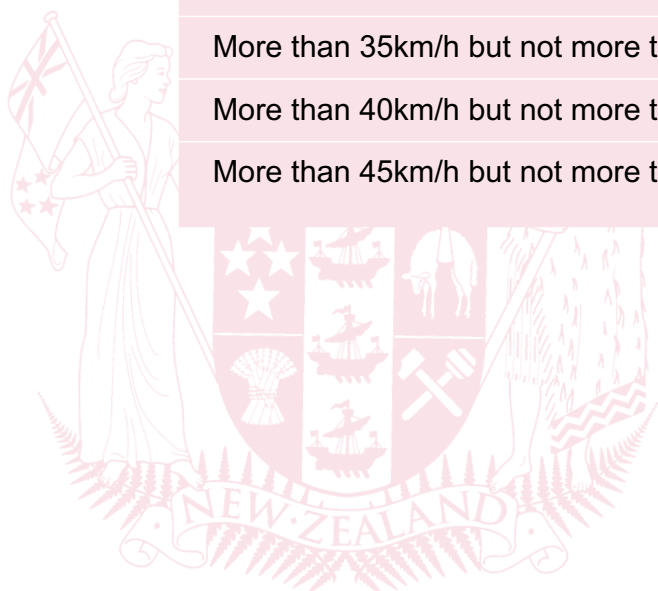
### Penalties for Camera-detected Speeding Offences

#### *Infringement Fees for Speeding Offences*

- 3.54 Infringement fees for camera-detected speeding offences are the same as those for other speeding offences, except where the driver exceeds the speed limit by more than 50km/h. Figure 11 below sets out the current infringement fees for speeding offences where the speed limit is exceeded by up to 50km/h.

**Figure 11**  
*Infringement Fees for Speeding Offences*

Offence	Infringement Fee \$
Any speeding offence, where the speed exceeds the speed limit by –	
Not more than 10km/h	30
More than 10km/h but not more than 15km/h	80
More than 15km/h but not more than 20km/h	120
More than 20km/h but not more than 25km/h	170
More than 25km/h but not more than 30km/h	230
More than 30km/h but not more than 35km/h	300
More than 35km/h but not more than 40km/h	400
More than 40km/h but not more than 45km/h	510
More than 45km/h but not more than 50km/h	630





## ROAD SAFETY AND THE SPEED CAMERA PROGRAMME

- 3.55 Drivers detected as travelling at more than 50km/h over the speed limit can face potentially very different penalties depending on the method of detection. When a Police officer detects a motorist travelling more than 50km/h over the limit, the driver automatically loses their licence and the vehicle can be impounded for up to 28 days. A Traffic Offence Notice is also issued, requiring the driver to appear in Court.
- 3.56 Offenders similarly detected by a speed camera do not (for practical reasons) have their cars automatically impounded and licence suspended. Rather, a Traffic Offence Notice (rather than an infringement notice) is issued and the matter is referred to Court for a decision, which has the discretion to impose a lesser penalty.
- 3.57 Problems arise in applying impoundment and loss of licence penalties to camera-detected speeding offences, because of time lags in processing and identifying offending drivers. There is an argument that (to be effective) penalties must be immediate, and that prompt penalisation of speeding offences maintains the association between the offence and the penalty received (reinforcing the deterrent effect).
- 3.58 The counterview is that drivers who engage in the same high-risk behaviours should attract an appropriate penalty, irrespective of how the offence is detected. The same view could be extended to comparisons with other high-risk behaviours.
- 3.59 We did not undertake any in-depth comparisons of penalties for camera-detected speeding offences as opposed to other high-risk driving behaviours, such as drink-driving. However, it is worth noting that for offences creating similar road safety risks the severity of penalties can be different.
- 3.60 International research has shown that driving under the influence of alcohol creates very similar risks to being involved in a crash as travelling above the speed limit. For example, the risks associated with driving with a blood-alcohol level of 120mg/100ml (the legal limit is 80mg/100ml) equates on average to speeding at 75km/h in a 60km/h zone.
- 3.61 However, while a mandatory six-month loss of licence will apply to the drink-driving offence,<sup>17</sup> a driver will only be fined \$120 for the speeding offence. Repeat drink-drivers can lose their licences for extended periods of time, while camera-detected speeding offenders would generally only pay an infringement fee.

<sup>17</sup> Section 56(3), Land Transport Act 1998.



## ROAD SAFETY AND THE SPEED CAMERA PROGRAMME

### *Applying Demerit Points to Speeding Offences*

- 3.62** On 1 November 1993, a graduated demerit points regime was introduced for speeding offences under the Transport (Demerit Points) Regulations 1993.<sup>18</sup> Demerit points are a penalty system that can result in the temporary loss of a driver's licence.
- 3.63** Speeding offences detected by a Police officer attract demerit points. Speeding offences detected by speed cameras (which comprise about 75% of all speeding offences detected – see Figure 12 below) do not.

**Figure 12**  
*Camera-detected Speeding Offences as a Proportion of All Speeding Offences Prosecuted*

	Total Speeding Offences Prosecuted	Camera-detected Speeding Offences Prosecuted	Proportion of Camera-detected Offences to All Offences %
2000-01	699,046	523,362	75
1999-2000	565,578	441,408	78
1998-99	578,705	428,502	74

- 3.64** A speeding offence detected by a speed camera differs from other speeding offences in that the car is not stopped nor the driver identified by a Police officer.
- 3.65** Non-camera-detected speeding offences attract *driver* liability, whereas camera-detected offences attract *owner* liability. With owner liability, the owner of the offending vehicle is liable for the offence unless they can invoke one of the statutory defences or transfer liability. The principle that owners are responsible for the way their vehicles are used on the road is well established in other areas (such as parking offences).

<sup>18</sup> Revoked from 3 May 1999 and replaced by the Land Transport (Offences and Penalties) Regulations 1999.



## ROAD SAFETY AND THE SPEED CAMERA PROGRAMME

- 3.66 Section 145 of the Land Transport Act 1998 provides that a speed camera photograph can be used as evidence of a moving vehicle offence. This provision, coupled with owner liability for a moving vehicle offence<sup>19</sup>, may mitigate difficulties in providing the evidentiary basis for imposing demerit points on speed camera offences.
- 3.67 Applying demerit points to camera-detected speeding offences may provide an incentive for some owners and drivers to supply false information about who was driving at the time of the speeding offence, or for some people to falsely accept demerit points. However, there are provisions in the Transport Act 1962 and the Crimes Act 1961 to penalise individuals who make false declarations.
- 3.68 Other jurisdictions apply demerit points to camera-detected speeding offences. Demerit points were introduced for such offences in 1989 in Victoria, when the current speed camera programme was introduced. The proportion of drivers who exceeded the speed limit by more than 10km/h dropped from 15% to less than 2%. Research has suggested that the success of the Victorian speed camera programme is strengthened by the inclusion of demerit points as part of the penalty – because the points accumulated will ultimately lead to loss of the driving licence of repeat offenders.

*In New South Wales, speeding drivers detected by speed cameras are subject to demerit points. At certain times of the year, stipulated by legislation, double demerit points apply to speeding offences. These periods align with public holidays.*

*In Victoria, if 12 or more demerit points are accrued in any 3-year period, an 'option letter' is sent to the driver. The driver is given the choice of deciding whether to:*

- *accept suspension of their licence; or*
- *elect to keep their licence on the basis that if they incur further demerit points within a set period, they will lose their licence for 6 months.*

19 Section 133, Land Transport Act 1998.





## ROAD SAFETY AND THE SPEED CAMERA PROGRAMME

- 3.69 In paragraph 3.12 on page 36, we offered arguments against the suggestion that the speed camera programme as operated in New Zealand is just a revenue-raising tool. However, the application of infringement fees alone lends some support to the view that the speed camera programme is about raising revenue rather than road safety. Applying demerit points as part of the penalty for camera-detected speeding offences might reinforce the message that speeding is dangerous – and at the same time demonstrate that speed cameras are about deterring unsafe behaviour, rather than collecting revenue.
- 3.70 The LTSA has estimated that the introduction of demerit points for camera-detected speeding offences, along with increased police surveillance, could reduce the projected social costs of road accidents by 11.6%. The draft *Road Safety Strategy to 2010* contains a recommendation that demerit points should be introduced for camera-detected offences.
- 3.71 In 1996 an independent peer review group<sup>20</sup> recommended that demerit points be introduced for all speeding offences. The review held that demerit points would play an important part in the deterrent effect of speed cameras, and that it was inconsistent to not apply demerit points to camera-detected offences. The 1998 review outlined in paragraph 3.50 (on page 47) also recommended the application of demerit points to camera-detected offences, as an added deterrent to repeat offenders.
- 3.72 The Police do not hold data on repeat speeding offenders detected by speed cameras because of the uncertainty about who might actually have been driving the vehicle at the time. If demerit points were introduced in the future, owners might be more likely to identify the driver of the vehicle at the time of the offence – enabling the Police to collect fairly reliable data on repeat offenders.



<sup>20</sup> New Zealand Police Peer Group Review of Traffic Enforcement, March 1996.

Part Four

# Allocating Resources and Measuring Performance





## ALLOCATING RESOURCES AND MEASURING PERFORMANCE

- 4.1 In this part we consider the allocation of:
- resources to the speed camera programme at the national level; and
  - speed camera resources<sup>21</sup> to Police Districts.
- 4.2 We expected to find that:
- the level of resources allocated at the national level is decided on the basis of a transparent, quantifiable process; and
  - the allocation of resources to Police Districts is based on an analysis of potential effectiveness in terms of road safety risk and accident reduction.
- 4.3 We also looked at whether appropriate performance measures and targets were being set and (if so) how they linked to the objectives of the speed camera programme.

### Deciding and Allocating Speed Camera Resources

- 4.4 As explained in paragraph 3.2 on page 31, road safety is co-ordinated and funded through the Road Safety Programme. In 2000-01, \$214.2 million was allocated to the Programme, of which \$15.6 million was allocated to the speed camera programme.
- 4.5 Funding for the speed camera programme is appropriated annually to the Police through Vote Police. The Commissioner then allocates resources to the twelve Police Districts.

#### *How the Number of Cameras was Determined*

- 4.6 The Police bought 31 mobile cameras in 1993. One mobile camera was allocated to each of the then 29 Police Districts. The Northland and Te Awamutu Districts received an extra camera each to reflect the higher than average number of speed-related crashes in those districts. In 1994-95, one further mobile camera was purchased for training and back-up purposes.

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<sup>21</sup> Resources include person hours, camera service delivery hours, the mix of fixed and mobile cameras, and camera sites.



## ALLOCATING RESOURCES AND MEASURING PERFORMANCE

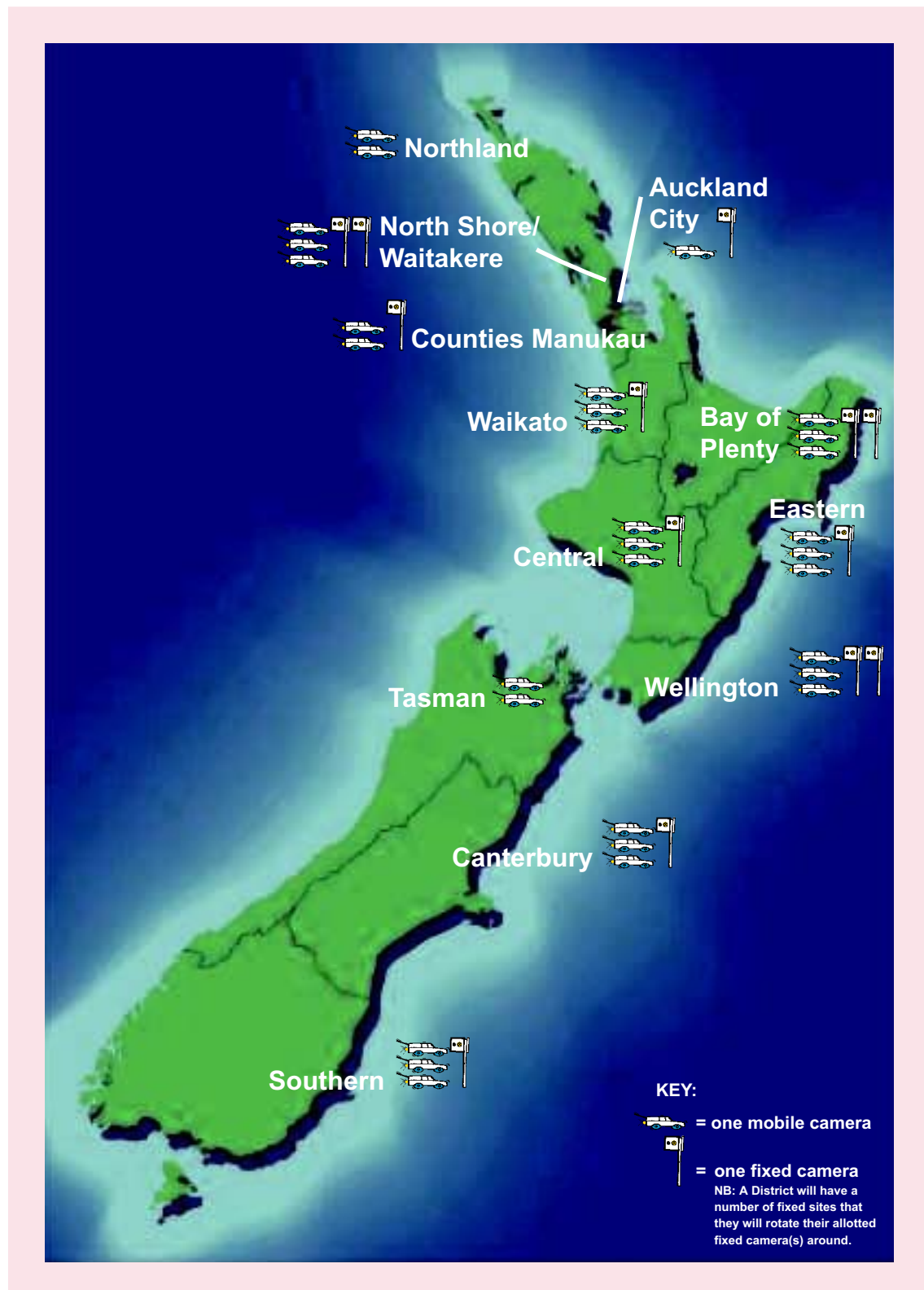
- 4.7 In 1994, 13 cameras for fixed sites were bought and allocated (one each) to Auckland City, North Shore, Waitakere, Manukau, Rotorua, Tauranga, Hamilton, Palmerston North, Napier, Hutt City, Wellington City, Christchurch, and Dunedin Police Districts. The Police could not show us the logic for deciding on the need for 13 fixed cameras or how the cameras were allocated. We were offered no evidence that the original number of cameras bought, or the hours allocated to the speed camera programme, were based on any risk-targeting model.
- 4.8 Rationalisation of the Police District structure in 1994-95 did not lead to any change in the way speed camera resources were allocated among Districts. The newly-formed Districts inherited the cameras that the old Districts previously had.
- 4.9 The current allocation of speed cameras among Police Districts is shown on the map in Figure 13 on the opposite page.
- 4.10 Since the speed camera programme started in 1993-94:
- no more cameras have been bought;
  - the mix of mobile and fixed cameras is unchanged;
  - allocated camera hours are unchanged; and
  - resource allocation has not been reassessed to reflect any changes in demographics, speed/crash data, and the roading environment.
- 4.11 Distributing resources for mobile cameras equally among Districts supports a general deterrent approach by ensuring that cameras are deployed across the entire country at any one time. However, the risk is that resources may be spread too thinly in areas with high road safety risks – undermining the optimal effectiveness of the programme.
- 4.12 A better way would be to allocate resources on the basis of greatest speed-related road safety risk (rather than geographical spread). For example, a District with a speeding problem three times greater than average would receive proportionately more resources to match the risk. Resources could be reallocated as risk profiles change.
- 4.13 A potential difficulty with allocating the existing cameras on a risk basis might be that some areas are left with very low speed camera coverage. To enable a risk-based approach to work effectively, more cameras might need to be bought.
- 4.14 A further alternative would be greater flexibility in the use of resources between Districts. By borrowing camera(s) for short periods of time, a District with a higher than average speed problem could conduct more concentrated campaigns using the extra cameras.





## ALLOCATING RESOURCES AND MEASURING PERFORMANCE

Figure 13  
*Allocation of Fixed and Mobile Speed Cameras*







## ALLOCATING RESOURCES AND MEASURING PERFORMANCE

### *Determining the Number of Camera Operating Hours*

- 4.15 The speed camera programme is funded for each speed camera to deliver a certain number of operating hours annually. The rate of funding is \$175 for each speed camera hour – which includes an allowance for factors such as the time it takes operators to travel to camera sites and set up the cameras.
- 4.16 The number of funded hours has remained the same since the speed camera programme started. The national total comprises:
- 89,000 camera service delivery person hours (i.e. cameras are in the hands of operators and are available for use); of which
  - a minimum of 74,000 of actual camera hours (i.e. on site and in operation).
- 4.17 The 74,000 actual camera hours are divided by the number of cameras and apportioned accordingly to Districts as targets for the year.
- 4.18 At the time we undertook our examination, the hourly rate did not fully cover operational costs of the Police – particularly in Districts where operators need to travel to remote locations. A review on behalf of the National Road Safety Committee subsequently led to increased funding for the Police from the Road Safety Programme to ensure that they can maintain the required levels of service.
- 4.19 Figure 14 on the next page shows the distribution of camera hours among Districts. Both fixed and mobile cameras are expected to deliver 1680 hours a year each – equating to approximately 33 hours of operation a week for each camera, and 7 hours for operator time (i.e. travelling time, meal breaks etc). In other words, providing a 40-hour working week.
- 4.20 Both mobile and fixed cameras could operate well in excess of 33 hours a week if the Police were funded to deliver – and process the results from – additional hours. The relatively low rate of utilisation means that the deterrent effect of the speed camera programme may not be fully realised.



## ALLOCATING RESOURCES AND MEASURING PERFORMANCE

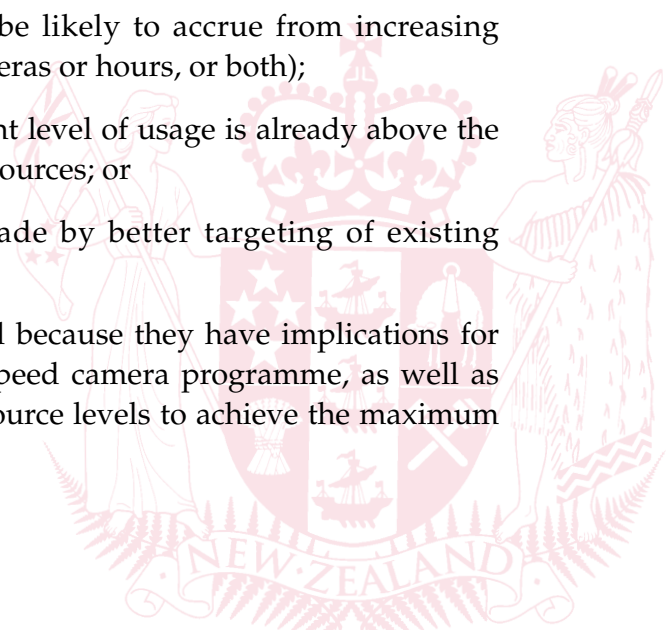
**Figure 14**  
*Distribution of Annual Camera Hours  
Among Police Districts*

District	Mobile Camera Hours	Fixed Camera Hours
Northland	3,360	Nil
North Shore/Waitakere	5,040	3,360
Auckland City	1,680	1,680
Counties Manukau	3,360	1,680
Waikato	5,040	1,680
Bay of Plenty	5,040	3,360
Eastern	5,040	1,680
Central	5,040	1,680
Wellington	5,040	3,360
Tasman	3,360	Nil
Canterbury	5,040	1,680
Southern	5,040	1,680
<b>Total</b>	<b>52,080</b>	<b>21,840</b>

**4.21** Similarly, there may be benefits in changing the total number of cameras. After more than eight years of operation, in our opinion it would be timely to review:

- what road safety benefits would be likely to accrue from increasing speed camera resources (either cameras or hours, or both);
- whether, on the contrary, the present level of usage is already above the point of most efficient use of the resources; or
- whether greater gains may be made by better targeting of existing resources.

**4.22** These questions need to be addressed because they have implications for future purchasing decisions for the speed camera programme, as well as for the appropriateness of current resource levels to achieve the maximum road safety benefits.





## ALLOCATING RESOURCES AND MEASURING PERFORMANCE

### *Recommendations*

#### 4.23 We recommend that:

- the amount of resources allocated to the Police for the speed camera programme from the Road Safety Programme be reviewed to ensure that the road safety benefits of the speed camera programme are being maximised;
- the Police consider options for the more flexible use of the existing camera resources if it can be shown that road safety gains are likely; and
- consideration is given to purchasing additional cameras as a further means of increasing flexible operation of the speed camera programme.

*The LTSA survey of public attitudes to road safety for 2000 found that 75% of New Zealand adults agree that enforcing the speed limit helps to reduce the road toll. 56% think that speed cameras help to lower the road toll and 60% agree that they are fairly operated. More people think they would be likely to receive a ticket from a speed camera than from a police officer.*

### Measuring Performance

4.24 Individual actions to improve road safety are rarely effective on their own. The Road Safety Programme is made up of a mix of activities, each of which is designed to contribute to the effectiveness of the Programme as a whole.

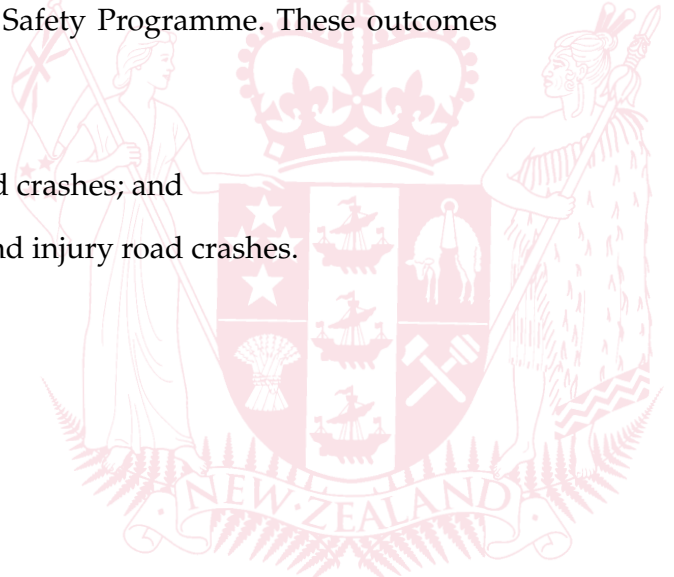
4.25 Ideally, the performance measures and targets set for each road safety activity should link into the overall goals of the Programme. Integrated and consistent measures and targets enable judgements to be made on the optimal mix of road safety actions for the achievement of road safety goals. Therefore, it is important that the targets set for the speed camera programme are well-designed, realistic and practical.



## ALLOCATING RESOURCES AND MEASURING PERFORMANCE

### *Performance Measures and Targets*

- 4.26 The speed camera programme is designed around the following parameters:
- Police deployment of resources to deliver 74,000 hours of on-site speed camera operations (see paragraphs 4.15-4.20 on page 58);
  - the issuing annually of between 515,000 and 610,000 infringement notices for camera-detected speeding offences (see Part 5 on pages 65-78); and
  - targets such as for the timely issue of infringement notices (see Part 6 on pages 79-88).
- 4.27 Parties other than the Police have set all those parameters. The basis for the first two is difficult to establish, other than:
- someone's assessment that 74,000 on-site camera hours were likely to result in the issue of 515,000 infringement notices annually; and
  - the 74,000 hours derives from the decision to fund speed cameras to operate for 40 hours a week throughout the year.
- 4.28 The issuing annually of between 515,000 and 610,000 infringement notices is also the basis for determining the resources required for the Police Infringement Bureau.
- 4.29 In addition to those imposed parameters, the Police set their own internal performance measures and standards for accuracy, integrity, deployment, and times for processing infringements.
- 4.30 Together with other Strategic Traffic Safety initiatives (such as Highway Patrols and surveillance using hand-held radar detectors), speed camera operations that reach the parameters set are expected to contribute to a number of the outcomes in the Road Safety Programme. These outcomes include reductions in:
- mean rural vehicle speeds;
  - the number of casualties due to road crashes; and
  - the number of speed-related fatal and injury road crashes.





## ALLOCATING RESOURCES AND MEASURING PERFORMANCE

### *Monitoring Operating Hours*

- 4.31 On the basis of the total of 44 cameras and the 74,000 hours of on-site camera operation, each Police District is funded and required to operate each camera on-site for just over 140 hours a month. This monthly target is set to help achieve an even flow of work for the Police Infringement Bureau. An even workflow is important because backlogs in the Bureau's processing could reduce the deterrent effect of speed cameras if offenders were receiving infringement notices some time after the offence.
- 4.32 The Commissioner is responsible for the Police's performance in delivering the speed camera programme. The responsibility for managing and meeting the District targets for camera hours rests with District Commanders who are responsible for determining how Police resources are deployed locally.
- 4.33 Each speed camera records the number of hours it has been operating, and these hours are recorded separately from other activities within the Police time-recording system. It is therefore possible to identify the extent to which Districts have met the monthly target.
- 4.34 The Police Infringement Bureau monitors performance against camera hour targets, reports monthly on the results, and formally requests that Districts adjust hours to rectify variances. However, the Bureau's role is advisory – it cannot penalise poor performing Districts or influence how cameras are deployed.
- 4.35 We found monthly and annual variances representing under- and over-delivery in Police areas<sup>22</sup> and Districts. In total, for the 12 months to 31 March 2001 the Police operated mobile cameras for fewer hours than the target, and operated fixed cameras for more hours. An excess of operating hours for one kind of camera should not (in theory) be used to offset a deficiency of operating hours for the other kind.
- 4.36 One possible reason for the excess of fixed camera operating hours is that, unlike mobile cameras, fixed cameras can be switched on and left until the film runs out. However, we found no evidence that Districts were deliberately attempting to manipulate the targets. Unexpected events (such as operator illness) can create temporary problems for the Police in meeting monthly targets for mobile cameras – which must be accompanied by a full-time operator at all times during deployment.

<sup>22</sup> The 12 Police Districts (see map in Figure 13 on page 57) are divided into a total of 52 areas, which are the local operational units. Each area can have several Police stations.





## ALLOCATING RESOURCES AND MEASURING PERFORMANCE

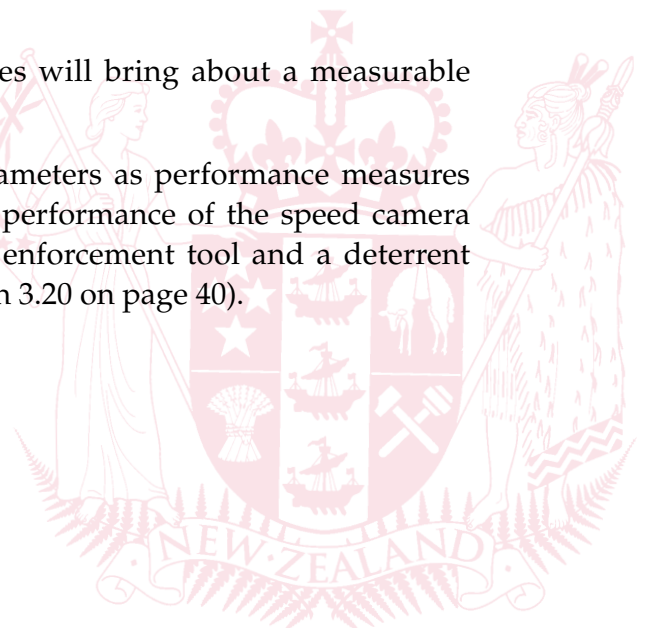
- 4.37 Camera operating hour variances indicate poor planning of camera deployment – which we examine in the Part 5 on pages 65-78. The variances can affect the effectiveness of the speed camera programme. For example, excess hours may result in cameras not being deployed for a period of time to avoid further over-expenditure (either until the variance is redressed or until the end of the financial year). If excess hours are detected too late in the financial year, the Police have to fund the over-expenditure from other operational areas.

### *Appropriateness of the Measures and Targets*

- 4.38 The parameters described in paragraph 4.26 on page 61 are a mixture of performance measures:

- The number of camera operating hours (74,000 annually) is essentially the product of the inputs available – the number of cameras, the number of vehicles and fixed site equipment, the number of operators, and the number of hours that an operator is expected to work. There has been no determination that 74,000 hours annually is the number required to produce a quantified impact on, for example, the behaviour of drivers who tend to speed.
- Similarly, the issuing of a specified number of infringement notices (515,000 to 610,000 annually) seems to be no more than a calculation that this is the number of infringements that will result from the 74,000 hours of camera operation. The main deficiencies about a “target” number of infringement notices issued are that it assumes –
  - a constant number of drivers will continue to speed and be caught by the cameras; and
  - the issue of that number of notices will bring about a measurable modification in driver behaviour.

- 4.39 The conclusion must be that those parameters as performance measures and targets cannot be indicative of the performance of the speed camera programme in achieving its aim as an enforcement tool and a deterrent to driving at excessive speeds (paragraph 3.20 on page 40).





## ALLOCATING RESOURCES AND MEASURING PERFORMANCE

- 4.40 Performance measures and targets are needed that are more directly related to the effect of the speed camera programme in meeting road safety outcomes. As well as improving measurement of the effectiveness of the speed camera programme, such measures could provide information to help enhance the operation of the programme. The measures might include:
- reduction in the number of crashes at high-risk sites;
  - reduction in vehicle speeds in and around sites; and
  - offence prosecution rate, as used in Victoria (see paragraphs 6.18-6.21 on page 86).
- 4.41 The 2000 independent external review of the Road Safety Programme (see paragraph 3.37 on page 43) commented in respect of speed cameras that: *while the delivery of hours is recorded and generally targets are being achieved, the type and quality of traffic enforcement delivered is even more important.* Road safety is a co-operative exercise, and any new measures along the lines of those above would most appropriately be included as part of the Road Safety Programme's overall performance monitoring regime.

### **Recommendation**

- 4.42 We recommend that further measures of performance be included in the Road Safety Programme to help assess the impact of the speed camera programme in achieving road safety outcomes.



## Part Five

# Speed Camera Deployment and Operation







## SPEED CAMERA DEPLOYMENT AND OPERATION

- 5.1 To ensure that speed camera operations are targeted at the locations where speeding poses the greatest road safety risk, the first step is to identify those locations. By planning deployment according to a risk profile, relatively scarce speed camera resources can be targeted to best advantage. Consequently, we expected to find that cameras were being deployed in a way that took account of road safety risk.
- 5.2 We also expected to find that:
- speed cameras were being used to their full potential within current resource constraints; and
  - there were defined policies and guidelines governing the deployment and operation of the cameras.
- 5.3 In this part we address these expectations insofar as they apply to:
- selecting speed camera sites<sup>23</sup>;
  - planning the deployment of speed cameras to the sites; and
  - the policies and procedures governing the deployment and operation of the cameras.

### Selecting Speed Camera Sites

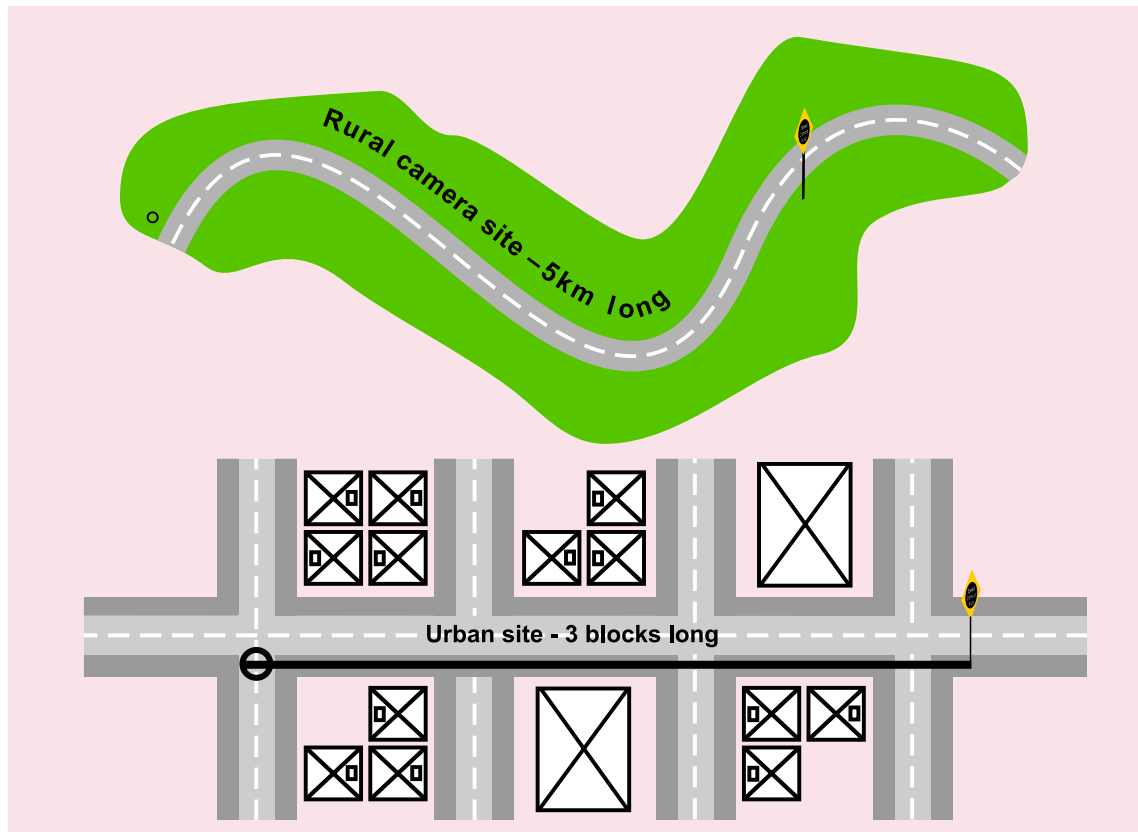
- 5.4 Under current Police operational guidelines, speed cameras can only be operated within designated speed camera sites, which must be sign-posted. There are currently over 1200 sites.
- 5.5 Figure 15 on page 68 illustrates the length of speed sites in rural and urban areas. The length in rural areas may be up to 5 kilometres, and two or more sites can be made contiguous.
- 5.6 Speed cameras can also be used on stretches of road with temporary speed restrictions imposed as a result of road works.
- 5.7 Speed camera sites are selected on the basis of criteria reflecting a speed-related crash history or a problem with high speeds. The selection criteria are therefore directly linked to the objectives of the speed camera programme.

23 The term “site” applies to both a stretch of road that is designated as a “Speed Camera Area” and a place where fixed speed camera equipment is erected.



## SPEED CAMERA DEPLOYMENT AND OPERATION

*Figure 15  
Length of Rural and Urban Speed Camera Sites*



**5.8** A team of representatives from the LTSA, the Police, the Automobile Association, and local authorities selects each speed camera site on the basis of:

- crash history (based on LTSA crash data);
- speed survey data; and
- the practicality of deploying a speed camera at the particular site.

**5.9** If deployment at a particular site that meets the other criteria is not practical, alternative enforcement or engineering solutions are considered to ensure that some resources are applied to alleviating the road safety risk.

**5.10** As the authority responsible for operating the speed camera, the Police District Commander takes the final decision on whether or not a proposed site in their District is designated as a speed camera site.

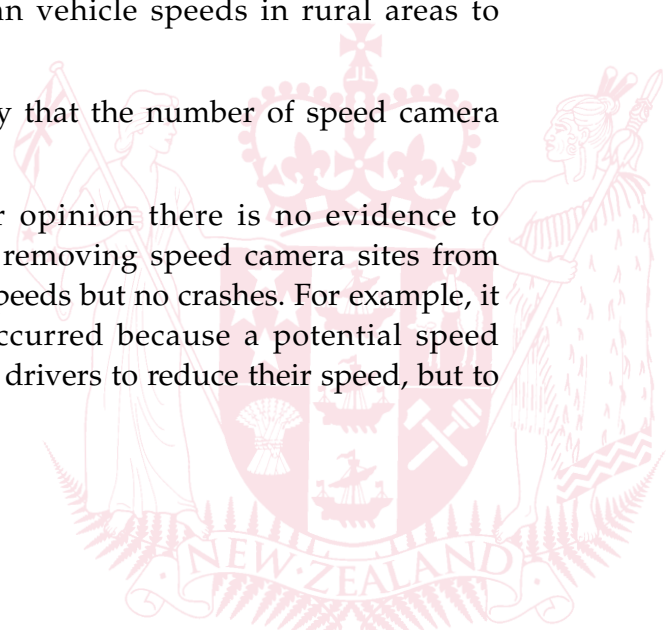




## SPEED CAMERA DEPLOYMENT AND OPERATION

### *Reviews of Speed Camera Sites*

- 5.11 About 18 months after the speed camera programme was introduced, the Police undertook a review of the site selection process in order to determine its effectiveness in improving road safety. The review examined the need for each site based on speeds and crash history. One of the purposes of the review was to examine whether it was possible to determine an optimum number of sites for each camera.
- 5.12 The review had mixed success, primarily because some Districts did not commit the resources to complete it. However, on the basis of the information collected there was a reduction in 85<sup>th</sup> percentile speeds at 526 sites (42%) and an increase at 293 sites (23%). The review resulted in the removal of 186 sites considered to be no longer required.
- 5.13 A further national site selection review is currently being undertaken to assess the effectiveness of the site selection process in terms of improved road safety.
- 5.14 At the time of writing this report, the LTSA was proposing changes to the Standard Operating Procedures for site selection to allow speed cameras to be operated only in sites with a speed-related crash history. The rationale for this proposal is that, in an absence of crashes, there is no evidence that the site is a road safety problem.
- 5.15 The proposed change would be a departure from the existing policy of selecting sites on the basis of crash history or a history of excessive speeds. The revised policy would also only address one part of the objective of the speed camera programme – reducing crashes. It would not address the other part of reducing mean vehicle speeds. A key outcome of the Road Safety Programme is to reduce mean vehicle speeds in rural areas to 102km/h.
- 5.16 If the proposal is adopted, it is likely that the number of speed camera sites will be reduced.
- 5.17 Contrary to the LTSA view, in our opinion there is no evidence to determine the road safety effects of removing speed camera sites from locations with a history of excessive speeds but no crashes. For example, it is possible that crashes have not occurred because a potential speed camera presence has caused speeding drivers to reduce their speed, but to a level that is still excessive.



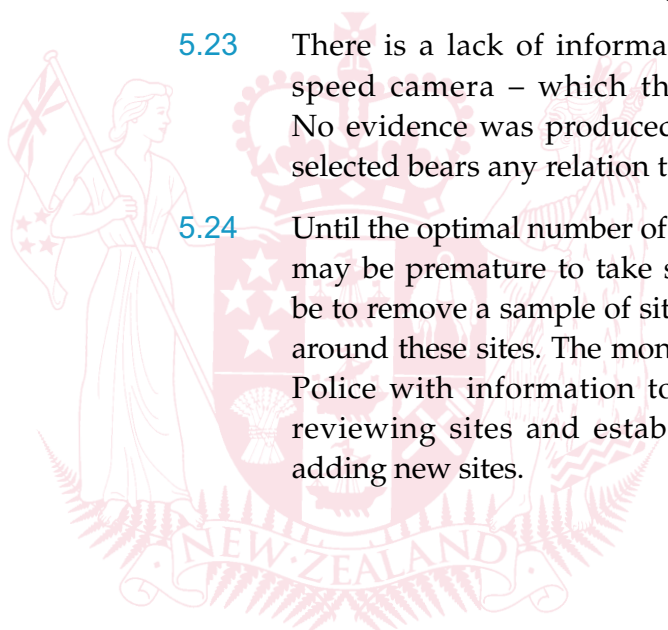


## SPEED CAMERA DEPLOYMENT AND OPERATION

- 5.18 There is also the possibility that removal of these speed camera sites could cause speeds to creep up and crashes to occur. If this happened, the stretch of road might require to be redesignated as a speed camera site – with the cost that that would incur.
- 5.19 Operating cameras only in areas with a crash history may also send a message to drivers that it is safer to speed in one area but not in another. This is despite the fact that the risk of death in an accident increases disproportionately as speeds increase, no matter where a driver is.
- 5.20 Furthermore, limiting the places where cameras can be operated can be criticised for taking a reactive approach to road safety. That is, an action designed to improve road safety is put in place only once crashes have occurred.
- 5.21 Views varied among Police Districts on site reviews and the criteria for removal of sites. Some site selection groups in Police Districts are currently implementing the LTSA's proposed revised Standard Operating Procedures. Some have already removed marginal or hard-to-operate sites, while other Districts want to keep sites even if cameras are not operated in them.

### *Achieving an Optimal Number of Speed Camera Sites*

- 5.22 With limited speed camera resources it is important to know how far the resources can be stretched before the marginal benefits begin to decrease. For example, operating a speed camera for 40 hours a week over 10 sites may return a different hourly level of road safety benefits than operating the camera for the same length of time over 20 sites or five sites.
- 5.23 There is a lack of information on the optimal number of sites for each speed camera – which the current site review is aiming to address. No evidence was produced to us that the number of speed camera sites selected bears any relation to an optimal number of sites for each camera.
- 5.24 Until the optimal number of sites for each speed camera has been assessed, it may be premature to take steps to remove sites. A better approach might be to remove a sample of sites on a trial basis and monitor driver behaviour around these sites. The monitoring results would provide the LTSA and the Police with information to help them develop an effective method for reviewing sites and establishing criteria for either removing them or adding new sites.





## SPEED CAMERA DEPLOYMENT AND OPERATION

### **Recommendation**

- 5.25 We recommend that the LTSA reconsiders its proposal to remove all speed camera sites that do not have a crash history until more is known about the potential impact on speed and speed-related crashes.

### **Planning the Deployment of Speed Cameras**

#### *Sign-posting of Speed Camera Sites*

- 5.26 Police operational speed camera policy requires speed cameras to be deployed only within designated sites, which must be sign-posted. While it is not a legal requirement that sites are sign-posted, generally the Police will not deploy cameras in areas where there are no signs. However, a lack of signage is not a legal defence against a camera-detected speeding offence.
- 5.27 By using signs, drivers are alerted to the fact that a camera may be operating, giving them the opportunity to reduce speed when travelling through the site.
- 5.28 An independent review of traffic enforcement in New Zealand in 1996 recommended that specific site signage for speed cameras be discontinued and replaced with an effective system of generalised sign-posting at significant locations. This would be in line the Victorian approach – which simply advises motorists that speed cameras operate in the State. The recommendation of the independent review was not adopted.
- 5.29 Queensland does not use fixed signs. Instead, signs are placed in front of the camera vehicle advising motorists that they have just passed a speed camera.

#### *Deployment of Speed Cameras to Specific Sites*

- 5.30 In Police Districts we expected to find sound processes for identifying and planning where and when speed cameras should be deployed. We expected that this would involve, for example:
- ranking sites according to their risk profile;
  - developing deployment plans that ensure deployment of speed cameras to particular sites according to the risk profile;



## SPEED CAMERA DEPLOYMENT AND OPERATION

- targeting cameras particularly to sites with the greatest road safety risks, which might be expected to benefit most from the deterrent effect of a speed camera; and
- adjusting site deployment plans to also take account of the best times of day and days of the week for deploying speed cameras at particular sites.

5.31 The Police have no national standard or policy on the use of deployment plans for determining speed camera deployment on a day-to-day basis. The degree to which speed cameras are deployed in a strategic or planned manner is at the discretion of District Commanders and their Area Traffic Managers – and actual practice differs markedly between Districts.

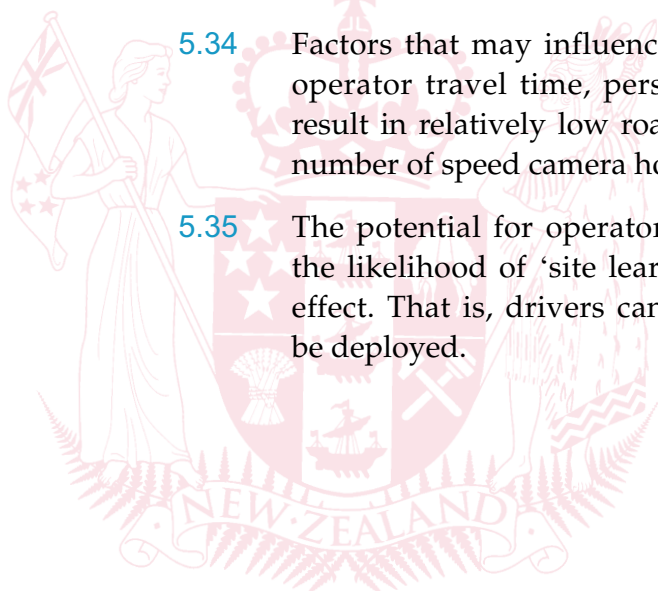
5.32 In the Districts we visited we found:

- some planning and deployment of speed cameras to sites according to risk, but to varying degrees;
- one District that was monitoring the number of speed camera infringements by site as a measure of the speeding problem, and using the information to determine how to best deploy their speed cameras; and
- a more general practice of leaving deployment strategies almost entirely to operators.

5.33 If deployment is left to operators, there is a risk that they will tend to deploy to the most convenient sites – particularly for mobile speed cameras where the operator has to remain on-site while the camera is operating. Without clear direction, operators may give preference to these “favourite” sites rather than to sites chosen according to risk.

5.34 Factors that may influence an operator’s deployment decisions include operator travel time, personal comfort, isolation, and safety. This may result in relatively low road safety risk sites receiving a disproportionate number of speed camera hours.

5.35 The potential for operators to deploy at “favourite” sites also increases the likelihood of ‘site learning’ by drivers, and a reduction in deterrent effect. That is, drivers can begin to predict where cameras are likely to be deployed.







## SPEED CAMERA DEPLOYMENT AND OPERATION

- 5.36 Funding considerations also reduce the incentives for Police Districts to deploy cameras in more remote locations. Travel costs (including accommodation costs in some of the more remote sites) are funded out of general policing operational budgets, not the speed camera programme. The actual camera hours target (see paragraphs 4.16-4.19 on page 58) also provides no incentive to focus on road safety risk, because the target is likely to be met most easily by operating in sites that are close by and require less travelling time.
- 5.37 A national Police policy that influences deployment planning is a directive that speed cameras must be deployed at least 40% of the time in 100km/h zones. This policy was implemented in response to too many deployments occurring within urban areas, whereas the majority of serious accidents occur on the open road network in 100km/h zones. It matches the high-level road safety risks identified in the Road Safety Programme.
- 5.38 However, the policy does not always translate into effective risk targeting at a District level. We found that some Districts struggle to meet the target because of the nature of their road network. For example, much of Auckland City's open road network is motorway, where it is difficult to deploy mobile cameras safely.
- 5.39 In our view, a more strategic approach to camera deployment would improve the effectiveness of the speed camera programme. Strategic deployment would seek to ensure that resources are targeted to the highest-risk sites, while still ensuring that lower-risk sites receive some coverage. (Retaining a random element to deployments is important in creating unpredictability for drivers, in order to minimise the scope for site learning and the consequent weakening of the deterrent effect.)
- 5.40 There is considerable potential to improve targeting by developing a ranking system for sites, and using the ranking to direct operator deployment. The Police have the information (in monthly reports from the Police Infringement Bureau) and capability (in the Area Traffic Managers) to produce strategic deployment plans along these lines and to monitor their implementation. Figure 16 on page 74 explains the system of strategic deployment that Queensland operates.
- 5.41 For targeted camera deployments to be effective, Police Districts need to be convinced of the benefits. We consider that achieving this will require continued training and support from the Commissioner's Office and Police Infringement Bureau, combined with appropriate incentives to achieve the results sought. Operators and Districts would need to be held accountable for their performance in camera deployments, and for evaluation and monitoring of the impact of cameras on speeds and crashes in the area.





## SPEED CAMERA DEPLOYMENT AND OPERATION

### *Crash Analysis Data*

- 5.42 Non-reporting of crashes reduces the quality of data to support intelligence on traffic matters and the information needed to apply camera resources more strategically. It also undermines the quality of data required for appropriate site selection.

### *Figure 16 Strategic Deployment of Speed Cameras in Queensland*

The Queensland Police operate a computer-based deployment planning system that ranks sites according to road safety risk. Deployment plans are produced automatically for operators, directing them where to deploy the speed cameras on any one day. This *scheduler* system functions so that speed camera deployments are unpredictable to the public, and every site has an opportunity to be targeted.

#### **How does it work?**

After a site is approved as a speed camera site, it is assigned a weighting according to its crash history and road safety risk. The site is then entered into the *scheduler* system.

Before an operator starts their shift, the *scheduler* system provides a list of three speed camera sites. The operator can choose to operate at any one of the sites, taking into consideration factors that may make a deployment impractical (such as peak traffic causing traffic jams, or road works at a particular site that the *scheduler* system does not cover).

Operators can override the *scheduler* system by designating a site themselves. Operator designated sites are monitored to ensure that they do not comprise more than 10% of all deployments.

- 5.43 A Memorandum of Understanding between the Ministers of Police and Transport requires the Police to report every motor vehicle accident that is reported to or attended by the Police. The LTSA collates road crash statistics from these reports.



## SPEED CAMERA DEPLOYMENT AND OPERATION

- 5.44 However, there are difficulties with the completeness of crash information provided by the Police. Not all traffic crashes are reported and, of those that are reported, not all have traffic crash reports completed and forwarded to the LTSA.
- 5.45 The total number of people with serious injuries as recorded in Police crash reports is around 60% of the number of hospitalisations recorded as resulting from road crashes. Reporting rates vary widely between Districts. We have previously identified these difficulties from our annual audits of the Police.
- 5.46 An independent review of Strategic Advertising and Enforcement that reported in 2001<sup>24</sup> canvassed the issues affecting crash reporting in some detail. The review noted that under-reporting, and variations in reporting road crashes, potentially distort the allocation of resources for both enforcement and road improvements, because of incomplete data.
- 5.47 The review made a range of recommendations designed to improve road crash reporting. We support these recommendations, which we consider would improve the information available for the strategic deployment of speed cameras and for establishing the risk profile of current and future camera sites.

### *Risk-targeted Patrol Plans*

- 5.48 For general road safety enforcement, the Police use Risk-targeted Patrol Plans. These Plans use data to identify crash trends and to show enforcement officers where, when, and how to address road safety problems in their area. They are based on 'Bullseye' software, which provides a means of allocating enforcement resources to locations and at times when the risk of accidents is greater than average.
- 5.49 The current Police priority is to develop the application of Risk-targeted Patrol Plans to general traffic functions. The Police should also examine how they could apply the technology to speed camera operations.
- 5.50 This work would need to occur alongside the development of strategic deployment plans for speed cameras, rather than have the speed camera programme await the outcome of work that might prove relatively complex. Eventually, merging strategic speed camera deployment planning with Risk-targeted Patrol Plans would bring advantages in enabling speed camera operations to be integrated with other road safety initiatives.

24 *Strategic Advertising and Enforcement Review*. Hayes, Superintendent I.W. and Vulcan, P. Report to both the LTSA and the New Zealand Police, May 2001.



## SPEED CAMERA DEPLOYMENT AND OPERATION

### *Traffic Intelligence Analysis*

- 5.51 A number of traffic intelligence positions have been established in the Police Districts. The last of these positions were being filled as we completed our fieldwork. The appointments indicate a commitment to developing the level of sophistication of traffic intelligence and to using traffic risk analysis to support active traffic enforcement.
- 5.52 The traffic intelligence function is similar to the criminal intelligence function that we described in our September 2001 report *The Police: Dealing with Dwelling Burglary*.<sup>25</sup> One of the tasks of the new staff is to implement Risk-targeted Patrol Plans for all traffic services. These staff also have the potential to provide a more structured basis for speed camera deployments and end the practice in some Districts of operators alone determining deployments.
- 5.53 Traffic intelligence staff will be co-located with criminal intelligence staff in Districts' Intelligence Units. This arrangement will enable the two types of staff to share intelligence and common analytical skills and methods. However, in order to maximise the road safety potential of the traffic intelligence staff, Police managers need to ensure that these positions remain focused primarily on traffic intelligence.

### **Recommendations**

- 5.54 We recommend that the Police develop and implement:
- strategic deployment planning for speed cameras; and
  - a system for monitoring the use and impact of deployment plans.
- 5.55 We also recommend that the Police consider how the role of traffic intelligence staff can be developed in relation to deployment of speed cameras and monitoring of their impacts on road safety.

### **Policies and Procedures for Camera Operation**

- 5.56 The incorrect operation of speed cameras has a direct impact on the effectiveness and efficiency of the programme. For example, if cameras are not set up properly or operated in the correct manner, the quality of the photographs is likely to be poor. Poor quality photographs make it difficult to prosecute the offence. It is important that there is some certainty that speeding drivers will receive an infringement notice for the offence.

<sup>25</sup> ISBN 0 477 02881 0, pages 64 to 68.



## SPEED CAMERA DEPLOYMENT AND OPERATION

- 5.57 Each film in a speed camera has the capacity to record 650 images. An incorrect deployment at one site results in the whole roll of film being rejected, causing a significant effect on the prosecution rate. Therefore, it is important that camera operators are properly trained, and follow clear operating standards.
- 5.58 Speed camera operators attend a one-week training course conducted at the Royal New Zealand Police College. The course covers 18 aspects of the camera programme – including operating site selection, maintenance, court evidence, and how speeds are measured by radar.
- 5.59 The operators are given clear instructions on how they should operate the cameras. They are expected to follow a standardised series of steps for deployment – the instructions also briefly explain the reasons for the standards in order to provide operators with a complete understanding of speed camera operations.
- 5.60 Safeguards are in place to prevent untrained people from operating cameras. The cameras can only be accessed and operated by fully trained staff – for example, an operator must be recognisable by the computer system when logging on to set up the camera.

### *Safety of Operators*

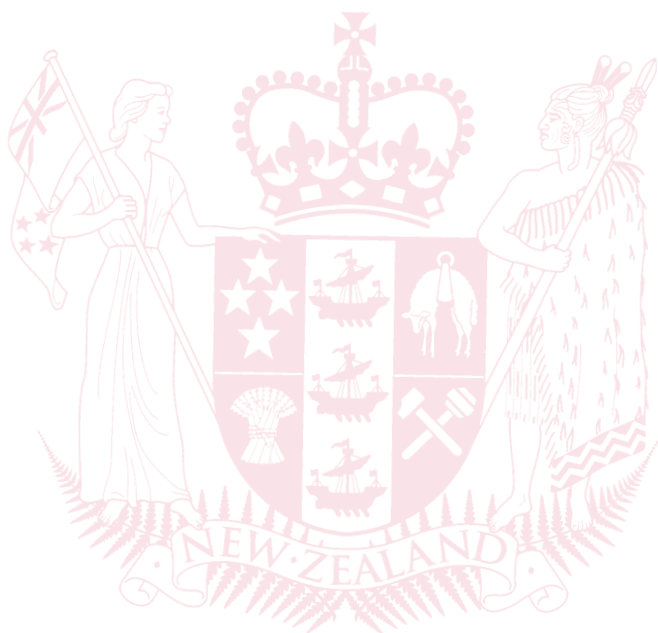
- 5.61 Speed camera operators are needed to correctly set up the equipment and provide security supervision. When the programme was introduced speed cameras were operated by Police officers. But, as the operators require no Police powers, most camera operators are now civilians operating out of unmarked Police vehicles. The main advantage from having civilian camera operators is that Police resources are freed up to undertake other policing duties.
- 5.62 However, having civilians operate speed cameras has raised safety and security issues. We were told of instances where members of the public had threatened operators, or had thrown objects at the vehicle. Civilian operators do not have the authority, for example, to arrest members of the public who have assaulted them.
- 5.63 Concerns over personal safety may also deter some operators from deploying cameras in more remote areas, or at night – even though these may include circumstances under which the greatest road safety benefits could be realised. Such concerns may have implications for the ability of the Police to fully implement strategic deployment plans.



## SPEED CAMERA DEPLOYMENT AND OPERATION

### ***Recommendation***

- 5.64 We recommend that the Police consider operator security as part of the design criteria for replacing the ageing fleet of camera vehicles.





## Part Six

# Enforcing the Speed Camera Programme

**ENFORCEMENT AUTHORITY**  
New Zealand Police

**Moving Vehicle Offence Infringement Notice**  
(Issued under authority of the Transport Act 1962)

Notice Number: PC085120  
ICN: 51721872  
SMS: AWD0000

Date of Birth: [Redacted]  
Driver's License Number: [Redacted]

TO: Name: [Redacted]  
Address: [Redacted]

Being: at the time of the alleged offence, the registered owner or one of the registered owners of the vehicle involved in the following alleged offence:

**Alleged Infringement Offence Details**  
Time: 11:30 hrs  
Vehicle Make: TOYOTA  
Day of Week: MONDAY  
Registration Number: [Redacted]  
Locality: SW ANSON

Date: 24/09/2000  
Type of Vehicle: CAR  
Road/Street: SCENIC DRIVE  
Location: BETWEEN TONGA ROAD AND AWHIRANGI PROMENADE  
Offence: EXCEEDED 50KM/H RESTRICTED AREA - SPEED CAMERA

The infringement fee payable is: \$80.00  
Details of Infringement Offence: Speed Limit: 50 Km/h

The infringement fee is payable within 28 days when (insert date when due) 25/10/2000  
Least Extended by: 14 days

Speed Alleged: 60 Km/h

Personal Verification Stamp: [Redacted]

**PROCEDURES FOR PAYMENT OF PENALTY**  
Infringement fees may be paid using any of the following methods:  
1. By cheque, using the enclosed envelope.  
2. By cash or charge to my bank of the Westpac Trust Banking Corporation, or to the New Zealand Police 275-283 Cuba Street, Wellington, or send by "FREEPOST" 9879, P.O. Box 6041, Wellington.

**THE RECEIPTS MUST BE ACCOMPANIED BY ALL PAYMENTS**  
**CHEQUES SHOULD BE CROSSED AND MARKED NOT TRANSFERABLE**  
**IMPORTANT - PLEASE READ THE SUMMARY OF RIGHTS PRINTED OVERLEAF**

**REMITTANCE ADVISE**  
REMITTANCE ADVISE MUST ACCOMPANY ALL PAYMENTS

Notice Number: PC085120  
ICN: 51721872

Personal Verification Stamp: [Redacted]

PAYABLE TO: NEW ZEALAND POLICE

**REMITTER NOTICE IN RESPECT OF INFRINGEMENT OFFENCE**  
SECTION 133(1) of the Transport Act 1962, Section 140 of the Land Transport Act 1998

**INFORMANT**  
New Zealand Police

**TO DEFENDANT**  
Name: [Redacted]  
Address: [Redacted]

Notice No.: PC085120  
ICN: 51721872  
SMS: AWD0000

Date of Birth: [Redacted]  
Sex: F  
Occupation: [Redacted]  
Driver's Lic. No.: [Redacted]  
Reg. No.: [Redacted]

Address: [Redacted]  
At: 0832 hrs  
ON A ROAD STATE HIGHWAY  
DROVE A MOTOR VEHICLE AT A SPEED EXCEEDING 50 KILOMETRES PER HOUR BEING AN OFFENCE DETECTED BY APPROVED VEHICLE SURVEILLANCE EQUIPMENT BETWEEN MONROE DRIVE AND OTONGA ROAD

**SECTION 133(1) LAND TRANSPORT ACT 1998 AND SECTION 140(A) TRANSPORT ACT 1962**

Vehicle infringement offence:  
Speeding to the offence:  
Speed was: AS THE PRESCRIBED LIMIT WAS 50

The due date for payment is 28 days after service of this notice.  
The due date is: 6/11/2000

**PENALTY**  
of the following nature:  
[Redacted]

Personal Verification Stamp: [Redacted]

**SUMMARY OF RIGHTS PRINTED OVERLEAF**  
Notice Number: PC085120  
ICN: 51721872



## ENFORCING THE SPEED CAMERA PROGRAMME

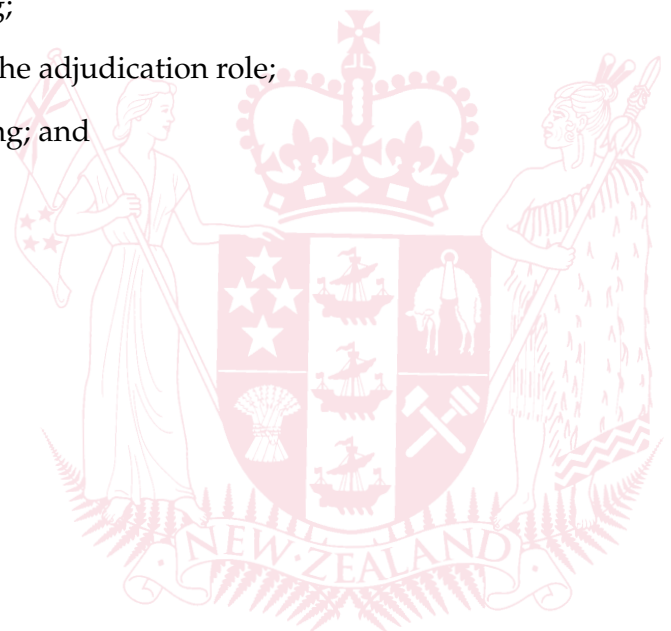
### Introduction

- 6.1 The speed camera programme's effectiveness relies on speeding drivers expecting to get an infringement notice. Enforcement of camera-detected infringements is therefore a key element of the programme.
- 6.2 In this part we set out our findings on the following aspects of enforcement:
- processing of infringements; and
  - collection of infringement fees.

*In the year ended 30 June 2001, 523,164 infringement notices were issued, to a total value of \$49.9 million. The infringement fees from 375,291 (72%) of these notices were collected, to a value of \$38.5 million.*

### Processing Infringements

- 6.3 Issuing infringement notices and following them up is the responsibility of the Police Infringement Bureau (the PIB). Figure 17 on page 82 gives an outline of the PIB's structure, and Figure 18 on page 83 illustrates how an infringement notice is generated.
- 6.4 We identified four aspects of infringement processing that have a direct effect on the effectiveness of enforcement:
- accuracy of infringement processing;
  - clear procedures and processes for the adjudication role;
  - timeliness of infringement processing; and
  - a high prosecution rate.



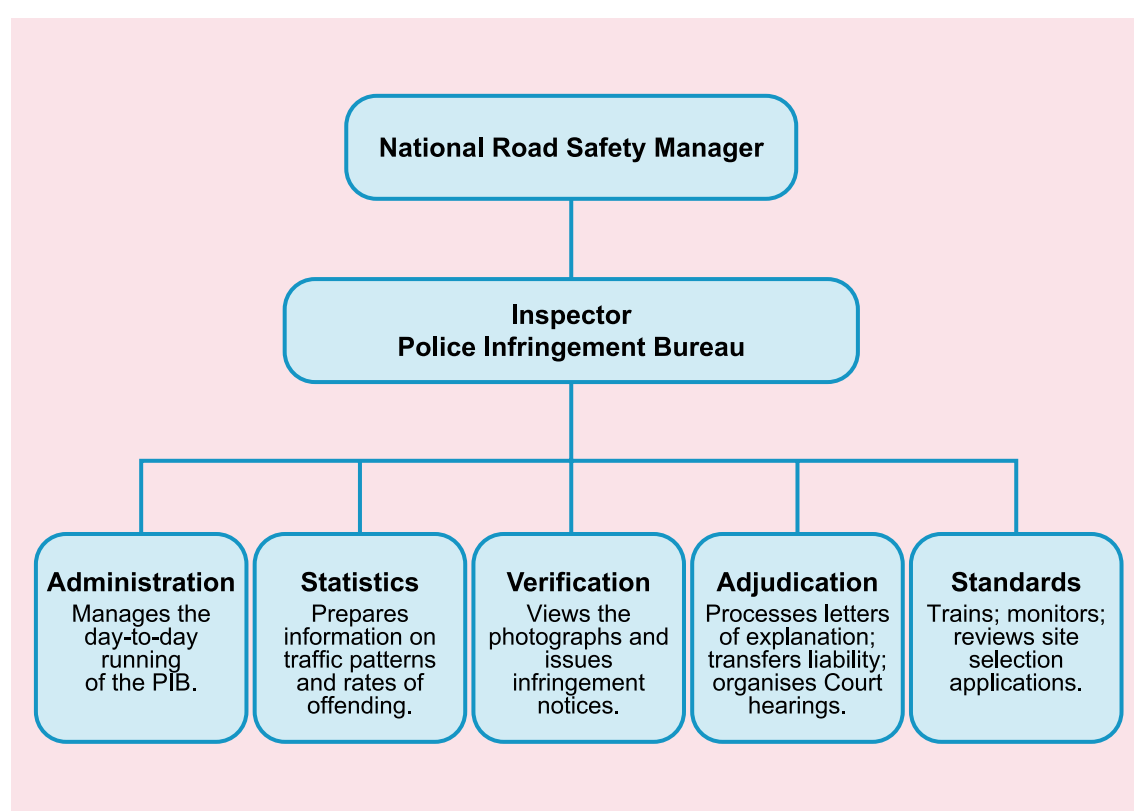


## ENFORCING THE SPEED CAMERA PROGRAMME

*Figure 17*  
*Structure of the Police Infringement Bureau*

The PIB is responsible for processing all Police-initiated infringement notices, including notices for speed camera-detected infringements.

The PIB is located in Wellington, with the Officer in Charge reporting directly to the National Road Safety Manager. It has five main units. The roles, particularly in respect of speed camera offences, are:

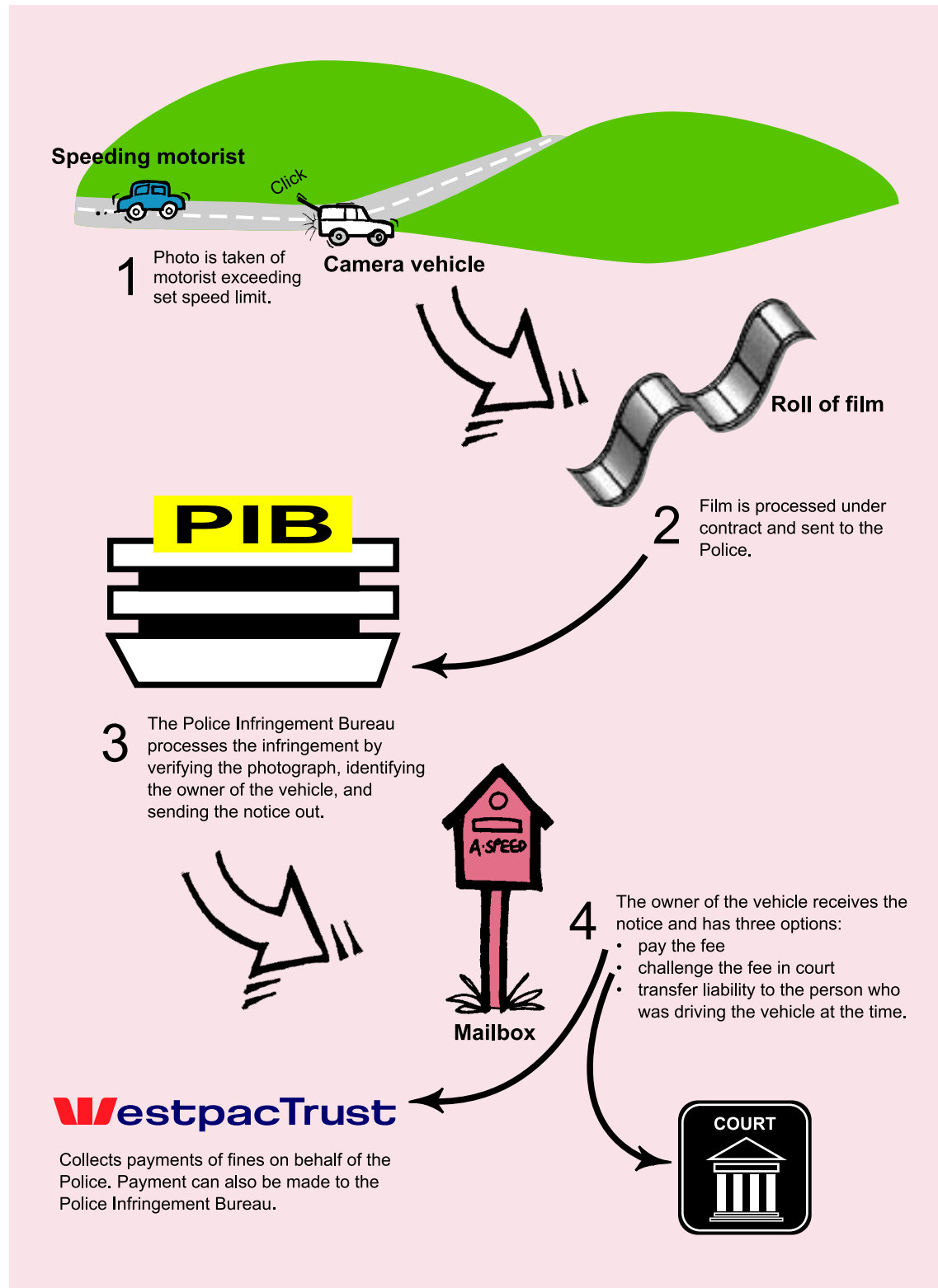


The PIB has an electronic infringement documentation system that facilitates the processing of infringements by enabling staff to access the information electronically without needing to use paper files. This process does not currently encompass speed camera infringements, but there are plans to include them in the near future.



## ENFORCING THE SPEED CAMERA PROGRAMME

**Figure 18**  
*The Life Cycle of a Speed Camera Infringement*







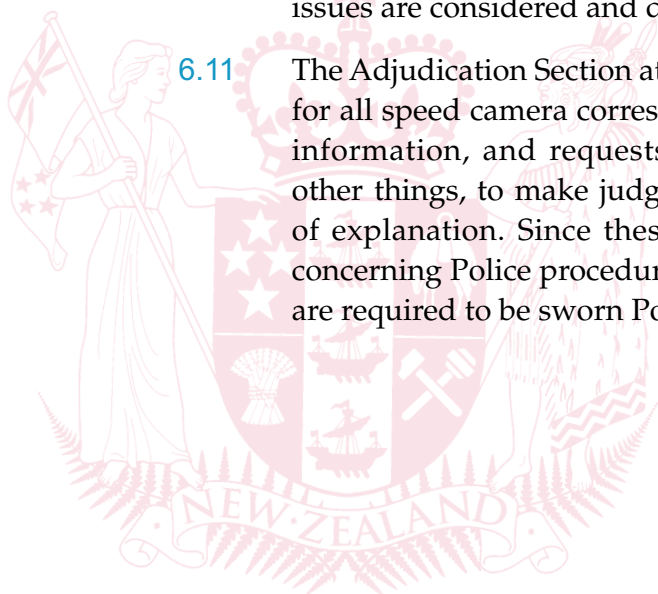
## ENFORCING THE SPEED CAMERA PROGRAMME

### *Accuracy of Infringement Processing*

- 6.5 An independent review of the PIB in 1998 concluded that there were no significant uneconomic or inefficient processes in speed camera infringement processing. We found that infringement processing is carried out in a sound manner, and there are standards and processes in place to maintain the credibility and integrity of the speed camera programme.
- 6.6 The PIB processes computer disks received from speed cameras daily. The batching, scanning, CD-ROM creation and film processing functions are managed under contract to the Police.
- 6.7 The PIB has policies and procedures to ensure the security, accuracy and reliability of speed camera photographs. For example tracking procedures are in place to ensure the integrity of photographs, and standards exist for dealing with requests from drivers for photographs. We found good compliance with these policies and procedures.
- 6.8 Speed camera photographs are retained for seven years, after which they are destroyed. Security of storage and disposal of confidential information are managed by contract.
- 6.9 The PIB has sound internal control procedures in place and a system of quality control focused on reporting errors and faults. Innovative systems contribute to the high quality of processing.

### *Clear Processes and Procedures for Adjudication*

- 6.10 We expected to find standardised rules and procedures for adjudication of matters relating to camera-detected offences, in order to ensure that issues are considered and decisions reached in a consistent manner.
- 6.11 The Adjudication Section at the PIB (see Figure 17 on page 82) is responsible for all speed camera correspondence – including explanations, requests for information, and requests for court hearings. The Section has, among other things, to make judgements over denials of offence and over letters of explanation. Since these tasks require a detailed level of knowledge concerning Police procedures and the law on traffic offending, adjudicators are required to be sworn Police staff.







## ENFORCING THE SPEED CAMERA PROGRAMME

- 6.12 We found that clear standards are in place that adjudication staff must adhere to in reaching decisions. Adjudicators have access to comprehensive guidance on the various responsibilities and on the framework within which they may make decisions. This guidance also defines what follow-up actions are required in various circumstances.

### *Timeliness of Infringement Processing*

- 6.13 It is important that drivers receive an infringement notice as soon as practicable after committing the speeding offence. Prompt issue maintains the association between the offence and the penalty imposed, reinforcing the deterrent effect. If the time lag between offending and receipt of the notice is too long, it may be difficult for the driver to remember the specific event – leading to a disassociation between the punishment and the act that led to the offence.
- 6.14 The Police *Forecast Report* for 2000-01 includes the following performance measures and targets relating to the timely issue of camera-detected infringement notices:
- that 95% of notices be issued within 14 days of the photograph being taken; and
  - that 100% of notices be issued within 30 days.
- 6.15 Figure 19 below shows performance against timeliness targets for the three years 1998-99 to 2000-01.

**Figure 19**  
*Infringement Processing –  
Performance Against Timeliness Targets  
1998-99 to 2000-01*

	Target	1998-99	1999-2000	2000-01
Notices issued within 14 days	95%	94.3%	97.6%	99.0%
Notices issued within 30 days	100%	100%	100%	100%



## ENFORCING THE SPEED CAMERA PROGRAMME

- 6.16 The PIB has standards in place to ensure that notices are issued within the target times. Compliance with the standards is strictly monitored.
- 6.17 The standards apply to all stages of processing (including the maximum number of days that a film can remain in a camera), and impose procedures to ensure that out-sourced contractors (such as for film processing) also comply. The effectiveness of these standards is demonstrated in reporting against timeliness measures.

### *Importance of a High Prosecution Rate*

- 6.18 It is important that the chance of a driver receiving an infringement notice after being photographed is as high as possible. If the chance is low, the credibility of the speed camera programme may be questioned – because a large proportion of drivers will realise that they have been detected speeding but will receive no punishment for doing so. Research has shown that increasing the prosecution rate is effective in reducing the social cost caused by speed-related accidents.<sup>26</sup>
- 6.19 To maximise the effectiveness of the speed camera programme, it is important to have a high prosecution rate. The rate in New Zealand is low in comparison to Victoria. At the time of undertaking our fieldwork, the New Zealand rate was 58.6%, whereas Victoria has consistently achieved a rate in excess of 85%. That high rate has been identified as an important component of the deterrent effect of the Victorian speed camera programme.
- 6.20 Police internal operational policies regarding enforcement provide some of the reasons why the New Zealand prosecution rate is low. The Police will issue an infringement notice only where there is certainty of enforcement. For example, when two vehicles appear in a speed camera photograph, an infringement notice will not be issued for either vehicle.
- 6.21 There may be opportunities to increase the prosecution rate by reconsidering these policies, provided that any efforts to increase the rate does not undermine the integrity of the speed camera programme (by, for example, decreasing the certainty of enforcement as a result of pursuing unenforceable infringements).

<sup>26</sup> Cameron, M.H., Cavallo, A. and Gilbert, A (1992). Crash-based Evaluation of the speed camera program in Victoria 1990-1991. Phase 1: General Effects. Phase 2: Effects of programme mechanisms. Report no. 42 Monash University Accident Research Centre, Victoria, Australia.



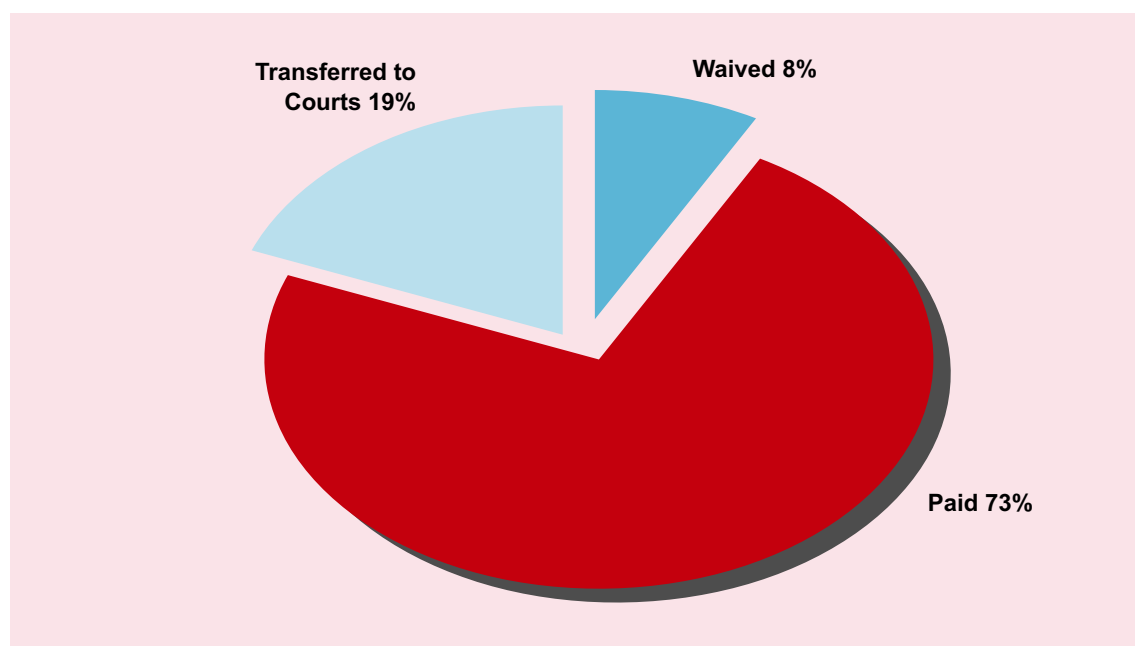
## ENFORCING THE SPEED CAMERA PROGRAMME

*Some Police jurisdictions in Australia attempt to electronically read the vehicle licence plate from a digital speed camera image. This would save the time of someone having to visually identify the number from the photograph. The technology currently available does not allow for a high enough percentage of number plates to be read for electronic recognition to become the standard.*

### Collecting Infringement Fees

- 6.22 Camera-detected offenders have 28 days to pay the prescribed fee, after which a reminder notice is issued. As at 31 March 2001, 57.1% of offenders issued with infringement notices required reminder notices.
- 6.23 Failure to pay the fee within 28 days of the reminder notice being issued results in a transfer to the Department for Courts Collections Unit for action. Figure 20 below illustrates the percentages of infringement notices issued between 26 June 2000 and 6 May 2001 that were paid, transferred to the Department for Courts, and waived.

**Figure 20**  
*Penalties Paid, Transferred to Department for Courts, and Waived – 26 June 2000 to 6 May 2001*





## ENFORCING THE SPEED CAMERA PROGRAMME

### Road Safety Advertising

It is internationally recognised that speed camera operations can be enhanced by support from advertising campaigns. In Victoria, hard-hitting advertisements focusing specifically on speeding and speed cameras were run in conjunction with the introduction of their speed camera programme. This advertising increased public awareness of the programme, and is seen as one of the reasons for its success.<sup>27</sup>

In New Zealand, a small amount of funding was provided for the advertising and promotion of speed cameras when the programme first began in 1993-94. In addition, the LTSA is funded to conduct road safety publicity campaigns, with speed as one of the three key areas. These publicity campaigns cover television, radio, and print media.

An independent review was undertaken in 2001 of Strategic Advertising and Enforcement as part of the New Zealand Road Safety Plan. This review noted that the road safety publicity is working well with target audiences for which the advertisements were developed.

Speed-camera-specific television advertisements in Victoria directly link speed cameras to dealing with the speed problem, making it clear that speed cameras are aimed at reducing speed and thereby saving lives. Road safety advertising in New Zealand focuses on the more general level of speed, rather than featuring speed cameras.

**We believe that raising public awareness of speed camera operations through publicity campaigns could increase the deterrent effect of the programme.**



<sup>27</sup> Cameron, M.H., Newstead, S.V. and Gantzer, S (1995). Effects of Enforcement and Supporting Publicity Programs in Victoria, Australia. *Proceedings from Conference, Road Safety in Europe and Strategic Highway Research Program*, Prague, The Czech Republic. VTI Sweden.



## Part Seven

# Managing Speed Camera Assets







## MANAGING SPEED CAMERA ASSETS

- 7.1 The reliability and accuracy of speed cameras is essential. We expected to find that:
- cameras were being maintained to a prescribed standard;
  - the accuracy of cameras was verified regularly; and
  - consideration had been given to consider the life expectancy of the current cameras and their eventual replacement.

### Maintaining the Cameras

- 7.2 Speed cameras are owned by the Police and maintained by the PIB. The mobile cameras were purchased in 1993 and the fixed cameras in 1994 (both types from American Traffic Systems). While these cameras were more expensive than some of the others considered by the selection team, the quality of the equipment was seen as superior.
- 7.3 There are no significant issues with the maintenance of the cameras, and we found that the equipment was being well maintained. Given the age of the technology, the equipment is still in relatively good working order. While there is only one spare camera for the whole of the country, camera breakdowns do not appear to be a particular problem and (in general) any faults are rectified quickly.
- 7.4 The cameras are reliable. Camera down-time as a result of failure or repairs is only 3.8% of operating time (or approximately 14 days down-time for every 365 days operated). The low down-time rate for high-use equipment can be attributed to the quality of the equipment originally purchased and the diligent approach taken by the Police to maintaining the cameras.
- 7.5 Operators are trained and required to undertake minor maintenance of the cameras – such as cleaning the lens and checking the body surfaces for damage. Routine maintenance and repairs is contracted out to a local company, certified by the camera manufacturer to carry out maintenance. A focus on preventative maintenance has enabled camera down-time to be minimised.
- 7.6 Good records of camera maintenance are kept. Faults are recorded and reported to the PIB, as well as the time taken for repairs. This information is useful in identifying patterns of failures and rectifying equipment-wide problems.



## MANAGING SPEED CAMERA ASSETS

### Calibrating the Cameras

- 7.7 Calibration is the process by which speed cameras are checked to ensure that they are accurately measuring the speed of a vehicle. The PIB's Calibration Unit undertakes regular checks of both fixed and mobile speed cameras (see Figure 21 below).
- 7.8 The Calibration Unit is an ISO-accredited testing centre for radar equipment. This accreditation requires testing of all equipment that the Unit uses to ensure that it meets international standards.

*Figure 21  
Calibrating a Speed Camera*



- 7.9 The Land Transport Act 1998 requires cameras to be certified annually. However, the Police certify cameras twice a year as a matter of policy. Six-monthly calibration of the cameras also provides an opportunity for the early identification of faults or maintenance needs. In addition, any camera that undergoes repairs is re-calibrated before further use.
- 7.10 Cameras are calibrated according to defined policy, and two technical audits of the Calibration Unit's systems and processes are undertaken each year. Once a camera has been calibrated, a certificate of accuracy is issued under section 146 of the Land Transport Act 1998. The certificate (in the absence of evidence to the contrary) is sufficient proof that the camera measures speed accurately.



## MANAGING SPEED CAMERA ASSETS

### Replacement of Current Camera Technology

- 7.11 There is no plan to replace the cameras in the immediate future. The Police are monitoring and assessing advancements in camera technology, with particular attention on the development of digital speed camera equipment.
- 7.12 Digital technology is currently being used in Victoria as part of enforcing payment of tolls on a recently constructed private road. Digital equipment is also being used in some countries for fixed speed camera sites.
- 7.13 Digital mobile camera technology has the potential to increase the efficiency of the speed camera programme – a number of processing tasks currently being undertaken manually could be computerised. For example, there are no film processing requirements with digital cameras, which (in theory) would speed up the issue of infringement notices.
- 7.14 Currently, in order to meet Police timeliness targets, a reel of film must be processed within five days, even if only a small number of photographs have been taken. With digital cameras, this inefficiency would be avoided.
- 7.15 Changing to digital technology was considered when buying the present cameras, which are capable of being re-configured to replace the film magazine with a digital recording unit. However, the advantages of this option over purchasing a complete new camera have yet to be considered. Purchasing complete cameras may offer operational benefits, and may prove to be cheaper than having to maintain the existing cameras as they get older.



# Appendices



## APPENDIX 1

### APPENDIX 1

## Speed Cameras Internationally

New Zealand is the only police jurisdiction operating a national speed camera programme. Europe has a number of smaller programmes. British Columbia in Canada has a programme of comparable size to New Zealand and uses the same camera technology. Australia has two similar-sized programmes in Victoria and Queensland. New South Wales and South Australia operate smaller programmes. Northern Territory, Tasmania, and Western Australia all have relatively small speed camera programmes.

International experience and research has shown that speed cameras can be an effective contribution to the mix of road safety interventions. Throughout the world speed cameras have reduced both the number of fatal crashes and the likelihood of being seriously injured in a vehicle accident. For example:

- In the city of Mesa, Arizona, a control study showed that speed cameras were effective in reducing the number of vehicle accidents by 16%.
- In Norway the success of speed cameras has been even greater, being attributed with a 20% drop in vehicle accidents.
- The British Medical Journal reported that speed cameras were responsible for a threefold decrease in fatalities, and a 25% drop in serious injuries in a test corridor in London. This effect occurred within two years.
- In Victoria, Australia annual road fatalities fell from 777 to 378 over the eight years that speed cameras had been operating.
- In British Columbia research showed that there had been a 7% decrease in road accidents and a 20% decline in road fatalities after the speed camera programme had been introduced.

From the same experience and research it can be seen how important utilising the correct policies are to ensuring that speed cameras are fully effective. A United States assessment of speed camera programmes in Germany and Sweden notes that the requirement in these countries to ticket the driver, not the owner, of the vehicle has reduced the ability of the programmes to impact on road safety. Likewise, in the United Kingdom some areas have noted that a low prosecution rate has led to a low perception amongst drivers that they will be caught speeding.

Australian studies have assessed a number of factors concerning speed cameras. Early studies noted how important a high ticketing rate was to the effectiveness of a speed camera programme. In addition, utilising sworn police officers to operate the cameras was seen as inefficient. More recent reports include comments on improving use of speed cameras to increase driver perception of being caught, better site selection and camera utilisation rates, and how utilising speed cameras outside of normal operating can increase road safety benefits.





## APPENDIX 2

## Speed Cameras in Victoria

The Victorian State Government has been operating a speed camera programme for approximately 13 years and is achieving impressive results. It is considered one of the best in the world. Victoria operates a system very similar to New Zealand, but the Victorian model has a number of key differences:

- Cameras can be operated covertly.
- Demerit points are attached to camera offences.
- The programme has been operated by a private sector company since November 1998.

We visited Victoria to observe its programme in practice. While there are key differences, Victoria is similar enough to New Zealand to enable some meaningful comparisons and benchmarking. However, when making comparisons with Victoria it is important to remember that there are major differences in roading infrastructure, population distribution, and driver attitudes.

The objective of the speed camera programme in Victoria is the reduction in the incidence and severity of road trauma by changing driver behaviour. The programme is considered to be a core business function of the Victoria Police and the operation of speed cameras is unfettered. Speed cameras can be used anywhere, are not sign-posted, and have recently begun operation in flashless mode during daylight hours. Motorists caught by speed cameras are both fined and given demerit points.

Below we outline who the key parties are and their responsibilities. We also outline how the performance of the speed camera programme is maintained as part of such a model.

### Who Are the Key Parties?

**Victoria Police** – operate a separate Traffic Camera Office (TCO), although it is part of the wider Traffic Support Division. Management in the TCO act in an oversight/purchasing role.

**Lockhead Martin Tennix (LMT)** – is the private sector company that was awarded the speed camera contract in 1998. LMT delivers a wide range of civic compliance services to the State of Victoria, of which speed cameras are one.

**Traffic Accident Commission (TAC)** – has as its primary role to act as third-party insurer for all transport accidents. As part of this role TAC actively seeks to help change attitudes and behaviours towards road safety, thereby reducing the incidence and cost of road trauma.





## APPENDIX 2

**VicRoads** – is similar to New Zealand's LTSA and Transit New Zealand, in that it has responsibility for the management of the overall transport system, including driver licensing and registration, and road safety.

### Who Is Responsible for What?

The TCO has four main functions. It:

1. Develops deployment plans for the cameras – defining where cameras will be placed, when they will be operated, and for how long. This enables the Police to retain control of the risk targeting process and also enables them to use speed cameras as part of an integrated road safety package.
2. Sets policy for the operation of speed cameras. LMT has no discretion unless specifically delegated.
3. Authorises infringements before LMT can send them out. This system ensures that it is still the Police that are ultimately issuing the infringement.
4. Reviews any pleas for reconsideration of a speeding infringement, so that the judgement over whether an infringement is waived or not is made by sworn Police officers. In Victoria this also serves to ensure that there is no conflict of interest on the part of LMT.

LMT has the biggest role in the speed camera programme. LMT is responsible for the whole range of speed camera operations, from operation of the cameras through to infringement processing. This includes processing the images, maintenance of the cameras, recommending prosecution (which the Police must approve before an infringement notice is sent out), and administrative support for issues such as transfer of liability, payments, customer service and initial processing of pleas. LMT also owns the camera technology.

By owning and controlling such a major part of the programme, LMT has an incentive to continually improve these in order to meet its performance targets. For example, LMT monitors developments in emerging technology, and assesses the potential to enhance their ability to meet their targets. Likewise, LMT has an incentive to continually improve aspects of its processing systems.

TAC's involvement in the speed camera programme includes funding of initiatives, supporting policy development, and speed camera advertising. TAC provided the funding for the cameras when they were first introduced, noting the benefits of the investment for TAC as third-party accident insurers. TAC's other involvement is through the funding of speed camera specific advertising, especially on television. These advertisements are hard-hitting and graphic depictions of speed-related accidents, and are shown as a way to develop wide public acceptance for the speed cameras.



## APPENDIX 2

VicRoads is involved in formulation of speed camera policy and is one of three agencies responsible for the development of Victoria's *Road Safety Strategy*. VicRoads considers speed cameras to be a very cost-effective intervention within the package of road safety initiatives.

### How Is Performance Measured?

The contract with LMT is incentive-based. The key target for LMT is the prosecution rate. This measures the number of infringement notices issued against the number of vehicles detected speeding above the threshold limit – that is, if you detect 10 cars speeding but only eight infringement notices are issued, your prosecution rate will be 80%.

This type of performance measure provides incentives to ensure that deployments and processing are as accurate as possible. Furthermore, given that the programme seeks to deter speeding behaviour, maximising the number of enforceable infringement notices issued is critical.

LMT's performance is not, therefore, based on catching as many speeding motorists as possible. Instead, the aim is to ensure that those caught speeding have the highest chance possible of receiving an infringement notice.

