

Mobile Speed Cameras in the ACT – Slashing Speeds and Cutting Crashes

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Abstract

Speed cameras were introduced into the ACT in October 1999, with subsequent widespread acceptance of the cameras as a road safety measure in the Territory. The program was expanded in August 2000 to include more speed camera sites and additional camera vans.

The NRMA ACT Road Safety Trust commissioned a study by ARRB Transport Research into the effectiveness of the program. After 18 months of surveillance of vehicle speeds, this study has found that the speed cameras have substantially lowered the speeds of drivers who previously drove at greater than 10km/h over the speed limit. It has also found that crashes at the initial speed camera sites have significantly decreased by 36% and fatalities have decreased by 74%.

This paper reports on how the speed camera program was introduced and accepted by the public, how the program evaluation was undertaken, and the important results that have come out of the effectiveness report.

Key words

Speed enforcement, speed cameras

Development and Implementation of the Speed Camera Program

It is no secret that Canberra has a good quality, well-planned road network and a very high level of car use. The propensity of ACT drivers to speed is also well documented and data analysis showed that while the number of crashes in the late 1990s was declining, their severity was increasing – with speed being the most likely culprit (Anderson (1)).

By 1999 the ACT was the only Australian jurisdiction not using speed cameras and a review of their effectiveness in Australia and overseas by ACT Urban Services confirmed cameras as a proven speeding countermeasure. A careful introduction, utilising best practice, was the basis of the speed camera program. The ACT Legislative Assembly passed relevant legislation in August 1999 to cover speed camera operations, which included a two-year ‘sunset clause’.

The speed camera program commenced in October 1999. The vans operate up to 18 hours a day, and can monitor vehicles travelling in either direction. With the digital imaging, infringement adjudication is quick, cheap and effective, and infringement notices are usually posted within three days of ‘capture’. Camera infringements are issued on an ‘owner onus’ basis, with no successful court appeals to date.

A crucial element in implementing the speed camera program was a highly successful partnership between the regulator (ACT Urban Services), the enforcer (AFP), and the community/road user advocate (NRMA). A very open approach largely defused ‘revenue raising’ criticism, and in fact the initial public reaction frequently was ‘I want a camera in my street’ – albeit often for residential amenity, rather than safety, reasons (Anderson (1)).

Progress after six months was very promising, with a 26% reduction in the proportion of vehicles speeding; a 63% decrease in vehicles exceeding the limit by over 10 km/h in speed camera zones; and a ‘halo effect’ speed reduction of 15% on roads outside the declared speed camera network (ARRB TR (2)).

Given this success, allied to strong public acceptance of speed cameras, the program was expanded in August 2000 at a cost of \$300,000. Mobile camera vans were increased from two to four, with the declared road network going from 22 to 52 roads. A key new element was expansion of the declared road network from arterials into suburban distributor streets. Site selection criteria were expanded to include crash history, speed surveys and ACT Urban Services residential area traffic management warrants. The latter include traffic volume, land-use

type, and levels of through traffic and heavy vehicles. Much less signage has been used on the new roads, with no adverse public reaction.

Program Evaluation

With a \$60,000 grant from the NRMA-ACT Road Safety Trust, ACT Urban Services commissioned a two-year evaluation of the speed camera program. The independent study by ARRB Transport Research, (ARRB TR (3)) had the following objectives:

- ?? measure the effectiveness of the speed camera program to reduce speeds in the ACT;
- ?? evaluate the long term effectiveness of the speed camera program to reduce crashes; and
- ?? determine the effectiveness of speed cameras as both a site specific deterrence and general deterrence tool in relation to speed behaviour.

To achieve these objectives two data sets needed to be collected. Crash data was accessed through the normal crash data collection by the Department of Urban Services via the AFP. ARRB Transport Research collected speed data using the following methodology. (ARRB TR (3))

“Before” measurements were compared with “After” measurements at different times after the introduction of the cameras. The “Before” speed measurements were undertaken just prior to the implementation of the speed camera program and the “After” measurements one, two, three, six, nine, twelve and eighteen months after the introduction of the speed cameras.

These speed surveys were undertaken at nine locations where speed cameras were operating and at six control locations. The camera locations were at three sites speed zoned at each of 60 km/h, 70/80 km/h and 100 km/h; and the control locations were two sites each on roads speed zoned at 60 km/h, 70/80 km/h and 100 km/h.

The control sites used are not true control sites for such an evaluation. This is due to the absence of an area similar to the ACT where speed cameras are NOT being operated. Hence, a complete assessment of the effectiveness of the speed cameras could not be achieved. The evaluation could therefore only give an indication of the effectiveness of the speed cameras, although factors that might influence both camera and control sites could be accounted for using this method.

The speed measurements were taken unobtrusively using a speed laser gun to capture vehicle speeds. Most were taken in off peak periods on a typical workday. Minimum samples of 100 cars were taken at each site. On divided roads these were all for one direction, while on undivided road they were taken in both directions.

A number of challenges were encountered during this evaluation. The “Before” measurements had to be taken before the final speed camera locations were selected. This meant that when it came to the “After” speed measurements, a number of sites that were expected to have speed cameras did not. This particularly affected the 60km/h speed sites where only two camera sites being studied had “Before” data. Two additional sites were added for the “After” data as replacements. Further problems could have occurred for the other speed limits, but alternative “Before” sites had been surveyed and hence they supplemented those that had to be dropped from the evaluation.

Other possible factors that could have affected the results were changes in publicity levels, especially with the addition of the new camera sites. However, these changes are likely to have had a global affect on all traffic, not just at the camera or control sites. The increase in the number of speed camera sites with the addition of relatively fewer speed camera vans may have had an effect on the older speed camera sites as they were not being serviced as frequently by speed cameras. However, it is difficult to determine what affect this had on the results.

The speed data collected was then analysed based on the following statistics:

- ?? mean speed;
- ?? 85th percentile speed;
- ?? standard deviation;
- ?? percentage of motorists driving over the posted speed limit;
- ?? percentage of motorists driving more than 10km over the speed limit; and
- ?? percentage of motorists driving more than 20km/h over the speed limit.

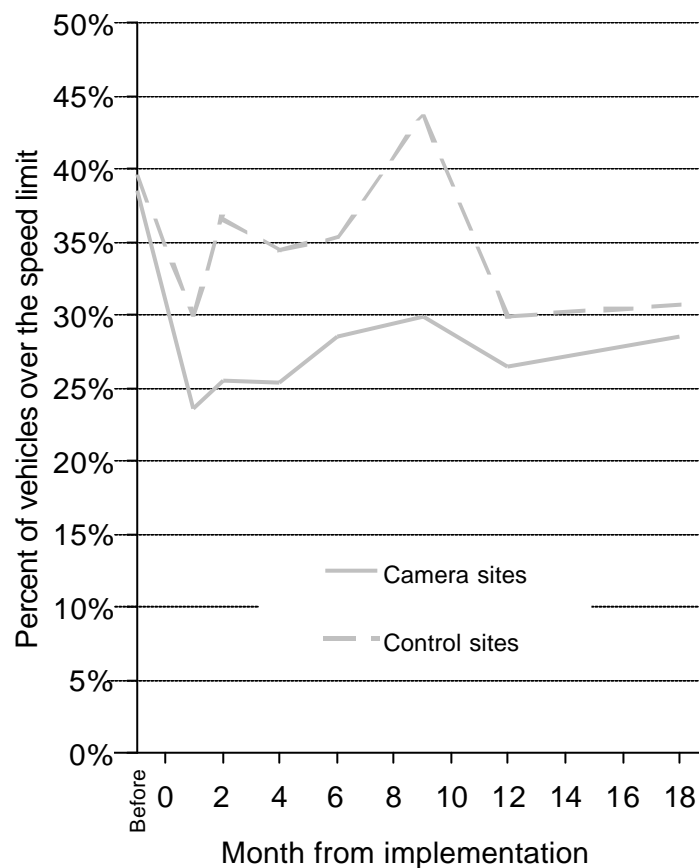
Statistical testing was used where practical to determine whether the results indicated an effect by the speed cameras, or whether random events or other factors may have influenced the result.

Results: Speed

Two important aspects of the speed results need to be considered. The difference between current traffic speeds and speeds before the cameras were introduced will be discussed further into this paper. First though, it is important to consider the trend that has been found with the introduction of the speed cameras.

The best indication of the trend in the results can be seen in the percentage of vehicles above the speed limit as shown in Chart 1. The other statistics showed similar patterns, although to a lesser extent, and in some cases, more erratic. (ARRB TR (3))

Chart 1: The percentage of vehicles above the speed limit at camera and control sites



In this chart we can see that around 40% of vehicles were found to be speeding at both the camera and control sites before the speed cameras were introduced. In both groups, there was a relatively sudden drop in the number of vehicles found speeding after the speed cameras were introduced. At the camera sites there was less than 25% of vehicles speeding while at the control sites, 30% were found to be speeding.

Up to nine months after the cameras were implemented, both the camera and control sites showed increasing percentages of people speeding. However, at the control sites this was at a much greater rate to the point where more people were speeding after the cameras had been introduced than before.

The introduction of more speed cameras had an effect at both the camera and control sites. As this introduction would have been just a reminder for drivers at the existing camera sites, the change in speeds was a lot less than at these sites compared to the control sites. The location of the second group of speed camera sites was not advertised as widely and fewer signs were installed compared to the initial release of speed camera sites. It is therefore possible that this uncertainty in the location of the extra speed cameras meant a decrease in speeds across all of Canberra, including the control sites.

After the initial effect of the second implementation of speed cameras, the number of vehicles found over the speed limit began to increase again at both the camera and control sites. Further investigation of the speeds is needed to show how this trend will continue.

After eighteen months, the following results found by ARRB TR (3) in the main statistics considered were:

- ✂✂ The level of drivers exceeding the speed limit fell by 26 per cent at the speed camera sites compared to 22 per cent at the non-camera sites.
- ✂✂ There was a substantial reduction in those exceeding the speed limit by more than 10km/h, with a 59 per cent decrease at the speed camera sites compared with a 39 per cent fall at sites without speed cameras.
- ✂✂ There was no statistically significant change in mean speeds or 85th percentile speeds when comparing camera and control sites.
- ✂✂ The percentage of vehicles travelling at speeds greater the 20km/h was too small in both the before and after results to report.

Global effects of the speed cameras are difficult to demonstrate with out a suitable control area. However, for speed zones of 70km/h and above, mean speeds and the 85th percentile speeds have reduced at the control sites as well as at the treatment sites since the speed cameras have been in operation.

Results: Crashes

A limited crash analysis was carried out to determine whether speed cameras were having the overall intended result of reducing road trauma. (ARRB TR (3))

Three years (36 months) of before data, between October 1996 and October 1999, were compared with after data, up to the end of February 2001 (17 months). The selection of February 2001 was to allow for the time between an injury crash occurring and it being recorded on the crash database, a three-month lag at the time of writing the report.

A decrease of 74% was found in fatal crashes at the initial speed camera sites compared to a 41% increase at sites without speed cameras. However, these findings are of limited value because of questionable statistical validity due to the small number of fatalities involved. However, when injury crashes are included a more useful sample size is created. In this case a 36% decrease in fatal and injury crashes at these initial sites was found, compared with no change on roads without speed cameras.

The severity of crashes, that is the percentage of fatal crashes in all fatal and injury crashes, at the locations without cameras before the cameras were introduced was 2.3%, less than a quarter of the severity of the crashes at the speed camera sites. However, the severity of crashes at the camera sites dropped substantially to 4%, while the severity at the control sites increased to 3.2%.

The 36% decrease in fatal and injury crashes at the initial 22 speed camera sites is reasonably statistically robust. This seems to indicate that the policy of targeting locations with a history of speed-related crashes, for the first set of cameras, was effective. There is, as yet, insufficient crash data to give statistically significant results from the second group of camera sites. However, we can probably say that where speed cameras have targeted speed related crash sites, gains have been made in reducing both extreme speeds and crashes.

Where to Next?

The final ARRB TR evaluation report on the effectiveness of the speed camera program was published and released by the Trust and the Minister for Urban Services in July 2001.

The positive outcomes identified in the report provided key input for the debate in the ACT Legislative Assembly in August 2001 which formalised the speed camera program by removing the 'sunset clause' in the legislation.

Information provided in the ARRB TR report will also be invaluable in the provision of better targeted enforcement, identification of traffic engineering projects and providing support for road safety campaigns.

ARRB TR has recommended that the evaluation be extended to analyse at least three years crash data, especially for the 'second wave' of camera sites. Also, on-going monitoring of speeds at initial and second round camera sites, as well as control sites, could be continued to determine whether speed reductions are being maintained. This should be accompanied by an expended crash analysis to ensure the program is meeting its goal of reducing road trauma. DUS is sympathetically considering this extension.

In conclusion, it seems fair to assert that the ACT speed camera program has taken advantage of new technology and best practice experience in other jurisdictions to implement a very efficient and effective speed camera program over the past two years. The positive outcomes in terms of both speed and crash reduction have confirmed speed camera's road safety value. Indeed, they are now accepted by the community in general as a valuable and valid deterrent to speeding and have become a stable and important element of the ACT's road safety strategy.

References

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