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## Automated speed enforcement in Australia: Recent examples of the influence of public opinion on program sustainability

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### Abstract

In Australia, speeding remains a substantial contributor to road trauma. The National Road Safety Strategy (NRSS) 2011-2020 highlighted the need to harness community support for current and future speed management strategies. Australia is known for intensive speed camera programs which are both automated and manual, employing covert and overt methods. Recent developments in the area of automated speed enforcement in Australia help to illustrate the important link between community attitudes to speed enforcement and subsequent speed camera policy developments. A perceived lack of community confidence in camera programs prompted reviews in New South Wales and Victoria in 2011 by the jurisdictional Auditor-General.

This paper explores automated speed camera enforcement in Australia with particular reference to the findings of these two reports as they relate to the level of public support for, and community attitudes towards, automated speed enforcement. It also provides comment on the evolving nature of automated speed enforcement according to previously identified controversies and dilemmas associated with speed camera programs.

### Keywords

Community attitudes, Enforcement tolerance, Speed cameras, Speed management, Speeding

## Introduction

Significant gains have been made in Australia in reducing road trauma. Engineering solutions, vehicle improvements, education campaigns, legislative changes and enforcement initiatives such as random roadside alcohol and drug testing and automated speed enforcement have been key factors in achieving these gains. However, the extent to which the general public understand these important gains and the reasons for them is unclear [1].

Speed management continues to occupy an important position among Australia's road safety priorities yet, importantly, there appears to remain mixed support within the general community for the need for speed management and, more specifically, for speed camera programs [2,3,4]. Australia has some of the highest speed zones in the world, particularly when compared to Europe, and especially when compared to those European countries that have adopted systems-based harm minimisation principles such as Vision Zero (Sweden) or Sustainable Safety (Netherlands) [5]. There have been many efforts to reduce speeds in Australia. A major undertaking in this regard has been reducing speed limits [6]. Examples include 40 km/h school zones, the lowering of the default speed limits in built up areas from 60 to 50 km/h, the 2007 reduction of unrestricted speeds on major highways in the Northern Territory to 130 km/h and on other open roads to 110 km/h, and variable speed limits used for changes in traffic flow, roadwork operations, and high activity areas such as shopping/recreation precincts [2, 7, 8, 9, 10].

Another major aspect of reducing speeds in Australia is the extensive use of automated speed enforcement. Australia is known internationally for successful intensive speed camera programs which employ covert and overt methods as well as fixed and mobile deployment methods [7, 11]. The extent of the use of these approaches differs across Australian jurisdictions [4, 12, 13, 14]. Evaluations of many of these camera programs have demonstrated clear road safety benefits [13, 15]. Despite this, speed camera programs continue to be perceived negatively by some sections of the community and the media [2, 4].

It is possible that some of this negativity towards speed cameras is related to what has been termed their 'perceived legitimacy', a term used by McKenna [16] that relates to whether, and to what extent, the community accepts the concept that intervention to reduce harm is necessary. McKenna [16] noted that perceptions have changed over time in many countries regarding the legitimacy of other activities of public harm such as smoking, drinking alcohol and driving, and not using seatbelts. He further suggested that the level of perceived legitimacy of speeding behaviour has not declined to the same extent as those other behaviours. Therefore, perceptions about the legitimacy of enforcing speeding are, not surprisingly, conflicted.

In a similar light, Goldenbeld (2003, as cited in [4]) previously identified four dilemmas associated with speed camera programs: (i) the Credibility dilemma (concerns about the purpose of the countermeasure including concerns about revenue raising rather than safety motivations), (ii) the Legitimacy dilemma (fairness of the countermeasure), (iii) the Implementation dilemma (acceptance hampered by difficulties with implementation) and (iv) the Social dilemma (mismatch between individual and collective interests including that speeding is appropriate if done safely). Delaney and colleagues [4] provided a useful summary of how these dilemmas were relevant in an Australian, British and North American context in 2005 (the reader is referred to Table 1 of [4]). The current paper extends this issue with specific reference to reviews of speed camera programs in New South Wales and Victoria conducted in 2011 by the relevant jurisdictional Auditor-General. Notably, both reviews appear to have been prompted, in part, by negative perceptions of speed camera programs among some sections of the community. The paper also provides an overview of contemporary community perceptions and attitudes towards speed enforcement in Australia.

## Public attitudes towards speeding and enforcement

### Public awareness of the risks of speeding

Public awareness of the risks associated with speeding and awareness and acceptance of speed enforcement are important considerations and are of direct relevance to the four dilemmas outlined above (i.e., Credibility, Legitimacy, Implementation and Social). Despite extensive efforts to promote the safety benefits of speed management in Australia, the most recent NRSS highlighted the need to harness community support for current and future speed management strategies. It also called for 'ongoing public engagement to build sufficient acceptance of new initiatives' [2].

Central to these comments were calls for three tasks to be undertaken. Firstly, the need for ongoing dialogue with key stakeholders was identified. This point included the need to continue engaging with motoring groups, some of whom have, historically, been cautious in offering support for reduced speed limits and more intensive speed enforcement. Secondly, the need to convince the community of the importance of complying with speed limits was highlighted. Aligned with this concept, the need to improve 'appreciation of the social costs associated with low level speed offences' [2] was highlighted, a point made more difficult to 'sell' because of the trade off of limited personal risk relative to the overall gains made by society in reducing road crashes (related to the Social dilemma).

Thirdly, the need for a national community dialogue to explain the safety rationale for speed management was identified (related to the Credibility and Social dilemmas). Clearly, the presence of this recommendation in the NRSS indicates that part of the Australian community does not understand/accept the risks of speeding and the need for speed management. The Strategy also suggested that additional information on the economic and environmental benefits of lower speeds (e.g., reduced fuel consumption, emissions, and noise) might assist in promoting speed limit compliance. The relevance and importance of these issues to Australian motorists are not well understood. However, the concept of ecodriving, a ‘smooth’ way of driving that incorporates such things as anticipating changes in traffic flow and avoiding substantial braking or acceleration, has received growing interest because of potential cost savings [17].

Public attitudes towards speeding, enforcement and related issues have been tracked for almost two decades nationally. Encouragingly, over time, awareness of the risks associated with speeding appears to be increasing [18]. The proportion of the community holding the view that the chances of being crash-involved increase significantly if driving speed increases by 10 km/h has risen from 55% in 1995 to 70% in 2011. Responses varied across jurisdictions; the Australian Capital Territory recorded the lowest level of agreement (62%) and South Australia the highest (78%). Similarly, the level of agreement (already quite high in 1995 at 80%) has steadily increased to 92% in 2011 for the proposition that ‘an accident at 70 km/h will be a lot more severe than an accident at 60 km/h’. The Northern Territory recorded the lowest level of agreement (89%), and Victoria and South Australia the highest (95%). Additionally, 81% of respondents reported agreement that speed limits are generally set at reasonable levels, although this figure has been declining over the last decade. Responses ranged from 75% agreement in New South Wales to 86% in Queensland.

### Public attitudes towards penalties and enforcement tolerance thresholds

Despite this apparent increasing recognition of risks associated with speeding, the public remain relatively sceptical about speed enforcement. In the 2011 annual community attitudes survey, approximately two thirds of respondents (62%) reported agreement that ‘fines for speeding are mainly intended to raise revenue’ (a steady increase over time from 1995 where the level of agreement was 54%) [18]. This issue is central to the Credibility dilemma because it relates to perceptions about why speed enforcement is conducted (i.e., safety vs. revenue raising). Of all the survey items discussed here, this item produced the most jurisdictional variation. In the Northern Territory, 49% of respondents expressed agreement that fines for speeding are mainly intended to raise revenue while in

South Australia the figure was 66%, followed closely by NSW and Victoria (65%). It is not clear why, in these three states, over two thirds of respondents agreed with the concept of revenue raising. It could be argued that at the time the survey was conducted (May-June 2011), public awareness of speed camera programs was heightened (at least in NSW and Victoria) because of the reviews that were being conducted in those jurisdictions (see later section of the current paper for further information on these reviews). Interestingly, a survey conducted some years earlier in NSW and reported in 2006 [19] examined levels of agreement with a similar statement (i.e., that ‘penalties for speeding are just revenue raising’) across NSW. Levels of agreement with ‘revenue raising’ were substantially lower overall (approximately 35%) compared to 65% agreement from the national survey in 2011. There was also some variation reported across NSW with metropolitan respondents reporting higher agreement (40.7%) compared to regional (38.2%) and rural respondents (26.1%), although these differences were not statistically significant [19]. Such variations across geographic areas and time characterise the fluctuating nature of public attitudes towards speeding and enforcement. They also emphasise that controversies associated with speed camera programs change over time as programs evolve [4].

The national survey results from 2011 also provide evidence of a mismatch between driving speed preferences and attitudes towards the risks of speeding [18]. For example, when asked how fast people should be allowed to travel on a 60 km/h urban road without being booked by police, approximately half (49%) the sample reported speeds of 65 km/h or higher as acceptable. Although the proportion was not as high, one third of the sample (33%) were supportive of being able to travel at 110 km/h on 100km/h rural roads without being booked. Overall, these findings suggest that many drivers report acceptance of travelling at speeds that equate to a level roughly 10% higher than the posted speed limit, a finding consistent with previous Australian research that is possibly linked to perceptions about ‘safe speeding’ and speed enforcement tolerances [20, 21]. The issue of perceived enforcement tolerances (the speed at which one can/should be allowed to travel above the posted speed limit) is relevant to three of Goldenbeld’s dilemmas: the Social (i.e., travelling at speeds slightly above the posted speed limit is not perceived as unsafe), the Legitimacy (i.e., tolerance levels related to perceived fairness of speed cameras), and the Implementation dilemma (i.e., perceptions of tolerance levels can be linked to perceptions of equipment reliability and appropriateness of speed limits) [4].

### Attitudes towards speed enforcement

Levels of acceptance of current speed enforcement are also surveyed nationally. In 2011, half the sample reported no

desire to see levels of enforcement change, while a third (35%) supported increased enforcement levels and 12% supported a decrease [18]. Some jurisdictional variation was reported, with New South Wales recording the lowest level of agreement for increases in enforcement (30%) and the Australian Capital Territory recording the highest (44%). There was significantly greater support for a reduction in the amount of speed enforcement reported by males, full motorcycle licence holders, and those who identified as ‘commuters’, compared to other respondent groups.

Attitudes towards a newer form of speed enforcement were also assessed [18]. Two thirds of respondents (65%) reported approval of the use of point-to-point speed enforcement (also known as section control or average speed enforcement) on main roads, with almost one third indicating strong support. Interestingly, at the time of the survey, only two jurisdictions were operating point-to-point speed enforcement (Victoria and NSW, with the NSW system only enforcing heavy vehicle speeding). Since then, two additional jurisdictions have introduced point-to-point enforcement systems (Australian Capital Territory and Queensland - see Table 1) and several others are contemplating its use. Despite it being a new and arguably less well known/understood enforcement method, it is encouraging that such a large proportion of respondents expressed support for its use in Australia. Point-to-point speed enforcement is used extensively in the United Kingdom and parts of Europe. Various evaluations indicate that it appears to be a positive addition to current speed enforcement strategies [22, 23]. To date, however, evaluations of this enforcement approach in Australia have not been published. The National Road Safety Strategy indicated the need for Australia to move towards greater

adoption of point-to-point enforcement, one that offers the opportunity to enforce speed limits across larger sections of the road network than is possible with traditional fixed or mobile speed camera deployments [2].

## Recent reviews of speed camera programs – New South Wales and Victoria

In response to perceived concern about automated speed enforcement voiced by certain vocal sections of the community, the Auditor-General’s Office of New South Wales and the Victorian Auditor-General’s Office conducted reviews of speed camera programs in 2011. In both instances, the safety outcomes of the programs were reviewed and reported publicly. While findings overall were extremely positive, areas for improvement were identified in both jurisdictions. Each review will now be discussed and Table 2 summarises key findings.

### New South Wales Auditor-General’s review – *Improving Road Safety: Speed Cameras*

Announced as an election commitment prior to the 2011 state election and released in July 2011, the review in New South Wales was a performance audit covering two key issues [24]

- Were speed cameras located in areas identified as having the greatest road safety risk?
- Do speed cameras reduce speeding and the number and severity of road crashes in these locations?

**Table 1. Use of point-to-point speed enforcement systems in Australia**

Jurisdiction	Specifications	Vehicles detected	Date Implemented
Victoria	5 camera sites along 54 km of major highway, bi-directional measurement	All vehicles	1 <sup>st</sup> jurisdiction to implement (2007) for all vehicles
New South Wales	21 bi-directional lengths (6km – 75 km) throughout the State, multiple speed limits	Heavy vehicles only (vehicles registered above 4.5GVM)	2010 with full roll out throughout 2011
Queensland	1 site on major highway (14.7 km), 110 km/h throughout section, uni-directional measurement	All vehicles	December 2011
Australian Capital Territory	2.7 km stretch of road, 80 km/h speed limit	All vehicles	February 2012

Public submissions were invited on how to improve camera programs and speed management generally in New South Wales. The public was also invited to nominate fixed speed camera locations that they believed were improving road safety as well as those that were not. More than 1700 public submissions were received on this issue. Additionally, more than 150 submissions were received from citizens and organisations wishing to provide more extensive feedback. The majority (69%) of these submissions viewed speed cameras as revenue raisers, a situation that illustrates the Credibility dilemma. Overall, despite the negative views expressed in many of the public submissions, the outcome of the review was extremely positive from a road safety perspective and generally supportive of the way in which the jurisdictional authority administers the speed camera program (see Table 2 – Appendix 1).

An interesting situation occurred after the release of the report that relates to the recommendation to review and relocate 38 fixed cameras because they were not delivering road safety outcomes. There was public outcry from some communities at the idea of removing a camera that, in some cases, community members had campaigned to have installed to improve road safety in their area. For example, media reports indicate that communities such as the town of Clunes were successful in reversing the original decision to remove the fixed speed camera [25]. In response to public outcry, the Roads Minister agreed to retain and reactivate some cameras and to conduct a public consultative process to determine the future of the remainder. At the time of writing, that consultative process was incomplete and, therefore, the status of the 38 fixed cameras earmarked for review and relocation is unclear. The pressure applied by a community to reverse the announced decision and the subsequent consultative review process that it triggered illustrates the impact of the public voice in contemporary speed management in Australia.

Another interesting finding of the NSW review relates to the issue of revenue raising; the face value of fines issued by speed cameras in 2010 was no different from those issued in 2003, despite some increases in the value of fines during that time. In other words, contrary to the view often portrayed in the media, the overall revenue raised by speed cameras had not been increasing. Furthermore, it was noted that there seems to be much less public concern about revenue raised by police conducting speed enforcement (i.e., not automated enforcement) and yet both raise almost identical monetary amounts. This issue relates to the Credibility dilemma because it is linked to perceptions of fairness about the two different speed enforcement approaches. The public of NSW appear more supportive of speeding offenders being apprehended by police officers than by speed cameras, a finding replicated in research conducted recently in Queensland [26]. This may or may not be linked to the outsourcing of mobile

camera operations to private contractors in NSW – a point which is representative of the Implementation dilemma, and one that was not previously described when linking the four dilemmas to Australia's speed camera programs in 2005 [4]. Importantly, however, the review found no evidence that payments to contractors were related to the number of speeding offences that they issued, a topic that had received media attention in NSW with claims that contractors had 'targets' to meet. This issue is also potentially relevant to the Victorian speed management context, since speed management in that state has been, for over a decade, a public/private partnership approach [27]. However, there were no findings relating to this issue in the review conducted in that jurisdiction in 2011 (see next section).

### Victorian Auditor-General's Report – Road safety camera program

Released in August 2011, the report of the Victorian Auditor-General's Office (VAGO) investigated the effectiveness of speed and red-light cameras. In the opening statements of the report, it was noted that 'sections of the community and media have shown significant interest in the road safety camera program, voicing concerns about whether using cameras is appropriate, the accuracy of cameras and the validity of infringements' [28]. Furthermore, it was recognised that previous instances of faults in two of the state's automated camera installations (i.e., the Western Ring Road in 2003 and the Hume Freeway point-to-point cameras in 2010) 'have served to erode public confidence in the program' and that some sections of the community allege that road safety cameras are solely for revenue raising purposes. These issues are directly related to the Credibility, Legitimacy and Implementation dilemmas. The 2003 fault concerned inappropriate issuing of infringements for speeds that were subsequently determined not to be possible under the circumstances [4] while the more recent fault (2010) refers to nine incorrectly issued infringement notices that were related to time synchronisation between adjacent cameras in Victoria's point-to-point enforcement system [23]. In response to these concerns, the report examined

- whether there is a sound rationale for the road safety camera program
- whether cameras are sited for road safety outcomes
- the accuracy of the camera system
- whether the public can be confident that infringements are valid.

Table 2 (Appendix 1) summarises the key review findings. Consistent with the findings from NSW, the Victorian review found strong positive road safety benefits from the camera program, no evidence of revenue raising being the purpose of the programs, and the existence of

accurate, robust, and reliable systems at the heart of the road safety camera programs (a finding that reflects the extensive work undertaken by Victorian agencies to address previous system failures). These findings provide important information that can and should be used to help redress the previously identified Credibility (safety vs. revenue raising) and Implementation dilemmas (reliability and accuracy of equipment and systems) in Victoria [4].

One point worth emphasising from the VAGO report is that the relevant road safety partners in Victoria and, arguably, elsewhere in Australia, have not been able to educate the whole community about the fundamental aspects of the safety camera program, despite good supporting research evidence. As noted by the Auditor-General, ‘this has placed the program’s ongoing legitimacy at risk’ [28]. The recommendation to develop a coordinated communication strategy to counter negative misconceptions and promote the positive contribution of speed camera enforcement mirrors the NRSS recommendation discussed above [2]. This is particularly relevant because Australia has a strong emphasis on automated speed enforcement [13].

## Conclusion

The four dilemmas associated with speed camera programs identified by Goldenfeld (2003, cited in [4]) relate to the rationale for, the fairness of, the logistics associated with implementation of, and the social acceptance of, automated speed enforcement. In Australia, despite an extensive body of evidence from domestic and international jurisdictions to justify the use of speed cameras in reducing the road trauma burden (for example [29]), issues pertaining to these dilemmas are still evident. Moreover, they represent a significant challenge to the future sustainability of speed camera programs, particularly if public confidence in the accuracy and fairness of them is diminished.

The two recent reviews conducted in New South Wales and Victoria [24, 28] have shed light on the contemporary controversies facing automated speed enforcement in Australia while simultaneously providing important information to combat them. Specifically, the findings that there was no evidence of camera siting for revenue raising purposes, that there are appropriate criteria used for siting cameras, and that the public can have a high degree of confidence in the reliability and integrity of camera systems and the accuracy of infringements issued can be used to counter the Credibility, Implementation and Legitimacy dilemma issues previously outlined. These findings should assist in boosting public confidence and must be used at every opportunity by the road safety community to promote the benefits of automated enforcement. As McKenna noted, ‘trust in the motivation of authorities’ is a critical component of the perceived legitimacy of an intervention such as speed cameras [16]. The perceived legitimacy of

automated enforcement in Australia received a huge boost from the findings of these two reviews, particularly since neither found any evidence of camera siting for revenue raising purposes, the primary controversy associated with the Credibility dilemma identified previously across many jurisdictions [4].

However, the findings also point to dilemmas still requiring attention. For instance, the inability of systems to detect speeding motorcycles (Victoria) and change the behaviour of high-level speeders (NSW) relates to the Implementation dilemma and represents ongoing challenges for authorities. The identified need to communicate the positive contributions made by speed camera enforcement and dispel negative misconceptions more effectively (Victoria) relate to the Social dilemma. The VAGO report identified key misconceptions such as ‘low-level speeding is safe’ and ‘speed cameras should not be placed on freeways because they are safe’ [28]. Together, these issues underpin beliefs about safe/appropriate speed by individuals vs. the broader community – a basic controversy relevant to the Social dilemma – that could be targeted in future media campaigns [4].

Delaney and colleagues acknowledged that ‘the controversies associated with speed camera use are not stagnant’ [4]. Importantly, over time, additional controversies can surface as enforcement programs evolve. The outsourcing of speed enforcement is an Implementation dilemma relevant in both New South Wales and Victoria, yet the use of private agencies in conducting speed enforcement was an issue of concern only for the NSW review, and not previously identified by Delaney et al. in 2005 in relation to Australia [4]. It is possible that other controversies relevant to the four dilemmas may surface as the use of point-to-point speed enforcement increases. The ongoing roll out of point-to-point enforcement in Australia offers an opportunity to enhance public acceptance of automated enforcement because it monitors speed over a longer section of the road network, rather than at one specific location. In that sense, it may be perceived as a fairer approach (linked to the Credibility dilemma) in that it can detect motorists who are intentionally speeding for longer periods, rather than those who may be detected inadvertently exceeding the speed limit for a shorter period by a camera that only measures spot speeds. There is, however, a challenge in promoting the benefits of point-to-point enforcement. If it were to be promoted solely as a ‘fairer’ way to enforce speed, this may inadvertently create the impression that other forms of automated enforcement are not/less fair. Caution is required here.

Overall, the findings of the two recent jurisdictional reviews provide important ammunition with which to combat many of the controversies associated with automated speed enforcement in Australia, particularly those relevant to the

Credibility and Implementation dilemmas. The findings also indicate that more work needs to be done to address the speeding behaviour of specific groups of road users and that public education is needed to continue to explain the following issues: the dangers of speeding, the rationale for speed enforcement, the rationale for the mix of enforcement approaches used, the benefits already obtained from speed camera enforcement, and the rigorous approaches used to

deploy and monitor speed enforcement which are driven by both road safety and public integrity concerns.

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### Appendix 1.

**Table 2. Summary of findings from 2011 NSW and Victorian Auditors-General reviews of speed camera programs**

Question/Issue	Jurisdiction	
	New South Wales	Victoria
<i>Cameras effective in reducing speeding/crashes?</i>	Cameras change driver behaviour, positive road safety impact; Speeding and crashes reduced after fixed cameras introduced; Mixed results for individual cameras (crashes only decreasing at some locations).	Evaluations of mobile and fixed speed/red-light cameras demonstrate effectiveness in reducing frequency and severity of road trauma.
<i>Criteria for camera locations?</i>	In place for each camera type, though criteria for mobile cameras less comprehensive; Locations broadly met criteria although documented reasons for some locations inconsistent with criteria.	In place for fixed cameras and siting has met these criteria; Mobile camera deployment criteria based on crash severity risk though may diminish general deterrent effect.
<i>Cameras sited for safety and not revenue raising purposes?</i>	No evidence that revenue is a factor in camera location decisions.	Revenue generation demonstrably not the primary purpose of camera program.
<i>Limitations of current speed camera program</i>	Cameras do not change behaviour of high-level speeders (e.g., 45+ km/h above posted speed limits); No overall criteria to determine most appropriate camera type for black spots.	Limited ability to detect speeding motorcyclists.
<i>Other issues</i>	Private contractor payments not related to number of speeding offences.	Current processes and controls give particularly high level of confidence in reliability and integrity of road safety camera system; Gaps in evaluation research -fixed cameras on freeways not yet extensively evaluated, point-to-point cameras not yet evaluated.
<i>Improvements recommended</i>	Develop overarching strategy for all cameras to include definition of how each camera type will be assessed; Annual review of existing site locations and publication of trends in crashes, revenue, and speeding or infringement data for each camera, updated annually.	Need to address gap in enforcement for motorcyclists; Pilot and evaluate alternative site selection and rostering including random rostering for mobile cameras; public concerns about purpose, effectiveness and integrity not adequately addressed; Coordinated communication strategy to counter negative misconceptions and promote positive contribution of camera program needed.

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