

NSW Speed Camera Strategy

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Transport
for NSW

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1. Introduction

The NSW Auditor-General recently completed an audit of speed cameras in NSW that reaffirmed national and international evidence that speed cameras change driver behaviour and have a positive road safety impact, however recommended that an overarching strategy be developed, to ensure that the most appropriate camera type was being used to reduce the road safety risk.

Transport for NSW has responded to this audit recommendation and developed an overarching evidence based speed camera strategy for NSW. This strategy aims to outline the current speeding problem, community attitudes to speeding and speed enforcement and clearly articulate the benefits of a comprehensive speed camera strategy for speed cameras in NSW. The strategy reassures the community that speed enforcement together with comprehensive public education campaigns and engineering treatments can save lives on our roads.

The current impact of road trauma

There has been a continuing downward trend in the NSW road toll since the late 1970's which can be attributed to a broad range of road safety strategies implemented to address behavioural factors that have contributed to the road toll each and every year. These behaviours – including drivers not wearing seatbelts, drinking before driving and speeding – have been addressed through the combination of proven enforcement, education and engineering solutions.

While great gains have been achieved, more can be done to reduce the number of people in NSW who are affected by road trauma. There are around 400 people killed and 24,000 injured on NSW roads each year and the NSW Government is committed to reducing these numbers. Improving the road toll requires a continued effort in improving both roads and road user behaviour. While the road toll has been generally decreasing, without this focus on continued improvement there can be sudden increases in the road toll resulting in loss of life or serious long-term injuries.

In 2009 there was a 20 per cent increase in the road toll on the previous year and a 36 per cent increase in speed-related crashes. This was the same year that mobile speed camera enforcement ceased in NSW. To address the increase, the NSW Centre for Road Safety prepared a Road Toll Response package which included significant additional funding for engineering treatments and also a greater focus on speed enforcement to address the rise in speed-related crashes. It was recognised that while NSW had a long established fixed speed camera program that supported police enforcement, more was needed to address speeding across the road network and also at high risk intersections in metropolitan areas. The re-introduction of mobile speed cameras and the rollout of red-light speed (safety) cameras were identified as critical strategies to achieve this reduction in vehicle speeds and in turn a reduction in fatalities and injuries.

It was also recognised that engineering treatments such as the installation of wire rope barriers and highway safety reviews were required to address fatal and injury crashes. Further, a systematic review of speed limits was essential in ensuring that drivers believed that speed limits set in NSW were consistent and based on road safety grounds.

Why is speeding a problem?

Speeding – which encompasses excessive speed (driving above the speed limit) or inappropriate speed (driving too fast for the prevailing conditions) – is unquestionably recognised as a major contributory factor in both the number and severity of traffic crashes.

In NSW speeding is a factor in about 40 per cent of road deaths. This means on average around 177 people die each year in speed-related crashes in NSW.

The cost of speeding is not only a human one; speed-related crashes cost the community around \$1.7 billion each year¹. Community costs include emergency services, hospital and health care and loss of productivity in the workplace.

Put simply, as a vehicle's speed increases so does the distance travelled during the driver's reaction time and subsequently the distance needed to stop. This means that as speed increases, so does the risk of a crash. Also, the potential severity of a crash increases with speed due to the amount of kinetic energy that must be absorbed by the impact in a crash. As well as being identified as a causal factor in around 40 per cent of fatal crashes, speed is an aggravating factor in the severity of all crashes.

While speeding is a commonly reported factor in crashes in NSW, few drivers view their speeding behaviour as an immediate risk to their personal safety. This has been identified in attitudinal research conducted by the NSW Centre for Road Safety that recognised that while drivers believe that speeding is dangerous they do not believe that their driving behaviour could one day contribute to a fatal or injury crash. There are many possible reasons for this and the challenge remains how we can communicate the risk associated with speeding to improve the community acceptance of the need to comply with speed limits.

Research conducted by the NSW Centre for Road Safety has identified that almost a quarter of people report that they speed all or most of the time. Annual speed surveys also identify that broadly around 8 per cent of drivers are exceeding the speed limit by more than 10 km/h.

An important part of changing drivers' behaviours is communicating the risks associated with low-level speeding. While it is widely accepted that high-level speeding places that driver and passengers or other road users at great danger, low-level speeding is often not recognised as a serious community issue. The dangers of low-level speeding are due to the cumulative effect of the risks associated with low-level speeding multiplied by the large number of drivers who speed by a small margin. This results in more casualty crashes at low-level speeding than at high-level speeding.

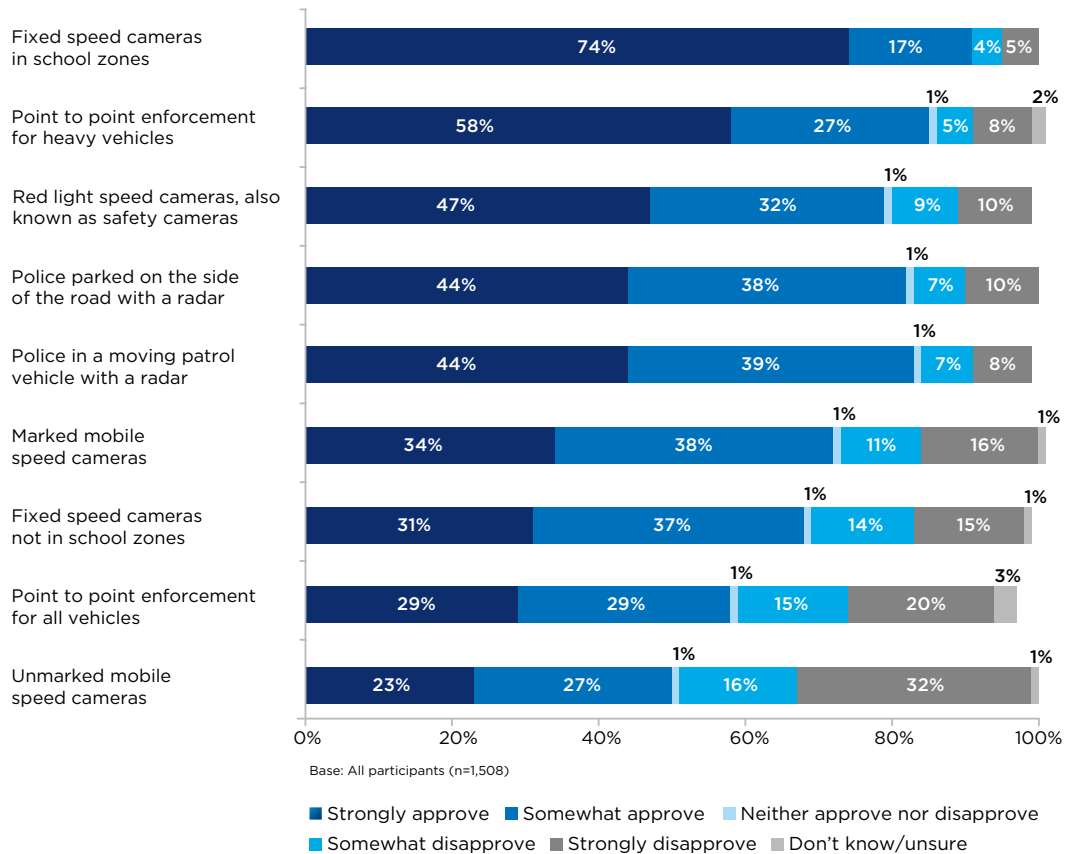
What the community really thinks about speeding and speed enforcement

The NSW Centre for Road Safety regularly monitors community attitudes to road safety issues in order to identify and address the needs and concerns of customers and develop effective road safety initiatives.

In October 2009, an independent research company conducted a comprehensive survey on behalf of the NSW Centre for Road Safety of 1,500 NSW drivers' attitudes to speeding. This research found that while speeding was recognised as the most significant factor in the road toll, there was still a large number of drivers who continue to speed and there was a high level of support for speed enforcement measures. A follow-up research survey was conducted in March-April 2011 which identified that there continues to be a high level of support for existing speed enforcement practices in NSW, including mobile speed cameras, as well as practices in other jurisdictions such as the use of red-light speed (safety) cameras and point-to-point enforcement. Figure 1, on the following page, demonstrates that there is more community support for marked mobile speed cameras than for fixed speed cameras not in school zones. In fact 72 percent of drivers either strongly approve or somewhat approve of marked mobile speed cameras.

¹ Based on the willingness to pay methodology. The willingness to pay values for road safety reflect the accumulated value the NSW community is willing to pay or forgo in exchange for a reduction in the probability of crash related injuries and road accident deaths on NSW roads (Roads and Traffic Authority, 2009). This methodology is increasingly being adopted by interstate and overseas jurisdictions as the preferred method of quantifying crash costs to the community.

Figure 1: Drivers' Attitude to Speed Enforcement Methods



Note: Chart percentages may not add up to 100% for single response questions, as a result of rounding.

Regarding the primary focus of mobile speed cameras, participants were asked about the extent to which they agreed or disagreed with two statements – that “marked mobile speed cameras are mainly about revenue raising” and that “the primary focus of marked mobile speed cameras is increasing road safety”.

A majority of participants agreed at least “somewhat” with both statements, however, participants were more likely to agree that “marked mobile speed cameras are mainly about revenue raising” (60% agreeing and 35% disagreeing) than agree that “the primary focus of marked mobile speed cameras is increasing road safety” (54% agreeing and 44% disagreeing). These results highlight that while there is a level of support for mobile speed cameras and an acknowledgement that these cameras are installed for road safety, the perception that mobile speed cameras are mainly there to raise revenue is still strong within the community.

This survey data reassures the NSW Government that the majority of the community is supportive of speed camera enforcement however more needs to be done to reaffirm the safety benefits of speed camera enforcement. The NSW Government has listened to this research and there are a number of actions in this strategy to address community concerns of revenue raising. These strategies will be outlined later in the document.

Our commitment to address speeding

The NSW Government is committed to improving road safety. *NSW 2021* sets a target to reduce fatalities on NSW roads to 4.3 per 100,000 population by 2016. Additionally, the NSW Government is a signatory to the *National Road Safety Strategy 2011-2020* (National Strategy) which sets out targets to adopt best practice enforcement and reduce the national annual number of deaths and serious injuries by 30 per cent by 2020. These are not just strategic targets; they represent real savings to the people of NSW. Meeting these targets means that less people will be affected by road trauma and addressing speeding will help reach these targets.

These strategies set the way forward to reduce speeding. Recommendation 8 of the National Strategy, to be completed by 2014, is to improve compliance and speed enforcement across the whole road network through the adoption of best practice enforcement using a combination of on-road policing and speed camera technologies. This action is based on recommendations by the OECD, the World Health Organisation and Austroads about best practice strategies to reduce speeding and the related crashes, injuries and fatalities.

The benefits of speed cameras are widely recognised and proven, however it is important to ensure that they are delivering road safety outcomes and that these benefits are widely publicised.

In April 2011, the Premier asked the NSW Auditor-General to complete a performance audit on fixed, mobile and red-light speed (safety) cameras in NSW to determine whether speed cameras in NSW were being used for road safety. The audit assessed whether speed cameras are located in places with significant road safety risk and whether they reduce speeding and the number and severity of road crashes. The audit was released in July 2011 and found that in general, speed cameras change driver behaviour and have a positive road safety impact. The number of speeding offences and the total number of crashes, injuries and fatalities reduced after the introduction of fixed speed cameras.

At the time the audit was conducted, only limited crash data were available to measure the effectiveness of mobile and red-light speed (safety) cameras as they had only been introduced less than twelve months prior in July 2010. However, since this time the NSW Centre for Road Safety has conducted a review of crash statistics since the re-introduction of mobile speed cameras and has found a 19 per cent reduction in fatalities and a 6 per cent reduction in the number of vehicles speeding in most speed zones compared to the previous year. While these results from quite a small program prove the benefits of mobile speed cameras in NSW, more needs to be done to ensure that the effect of mobile speed cameras is maximised and continues while also communicating the benefits of these cameras to the community.

One of the most significant findings by the Auditor-General was the recognition that reducing speeding across the entire road network was critical in achieving a reduction in the road toll. While fixed and red-light (safety) speed cameras address road safety issues at high risk locations, mobile speed cameras provide both site specific road safety benefits as well as supporting police enforcement, to achieve a general deterrence of speeding provided by the unpredictability of mobile enforcement.

A key recommendation from the audit was the need to develop an overarching strategy for all speed camera types. There are four types of speed cameras used in NSW – fixed, mobile, red-light speed (safety) and point-to-point.

An overarching speed camera strategy is necessary to ensure that the different types of speed cameras are being used to reduce speeding at the various high risk locations across the road network and are complementary to ensure their effectiveness is maximised. This integrated approach will deliver a stronger, more comprehensive framework of speed management and will enable the NSW Government to meet its commitments to reducing fatalities and increasing compliance with speed limits. It will also give the community confidence that speed cameras are being used both in high risk locations and in a way that will make NSW roads safer.

A critical pillar of this Speed Camera Strategy involves increasing community involvement in reducing speeding. One of the first steps has been the development of this strategy with key road safety leaders and stakeholders including Transport for NSW, Roads and Maritime Services, the NSW Police Force, NRMA Motoring and Services, Pedestrian Council of Australia, Transport and Road Safety Research Centre (University of NSW) and Monash University Accident Research Centre. Together these partners recognise that speed enforcement should complement other engineering and education strategies.

2. Improving community understanding of NSW speed camera programs

The NSW Speed Camera Strategy aims to improve the transparency and understanding of the use of speed cameras in NSW through increased community engagement and education. Community support and awareness are fundamental components of road safety programs. They assist in creating a general deterrence of speeding and ultimately influence drivers to improve their behaviour.

Few motorists know that over 70 per cent of all licence holders in NSW have no demerit points and around 99 per cent of drivers who drive past a speed camera are not infringed for speeding. This reflects the broad level of compliance with speed limits at camera locations and the often over-inflated perception that speed cameras are infringing a large proportion of NSW drivers. A key component of the new strategy will be about promoting the effectiveness of cameras in achieving even greater compliance across the whole road network and in turn reducing speed-related crashes, fatalities and injuries.

One of the key strategies required for meeting the objectives and requirements of NSW customers and stakeholders is to ensure that camera enforcement programs are fair, credible, effective and meet community expectations.

Redirecting traffic fine camera revenue to fund road safety improvements

In many other Australian jurisdictions, money obtained from traffic fines is redirected to fund road safety initiatives. A recent petition of NRMA Motoring and Services members tabled in Parliament supported the hypothecation of fine revenue from driving offences to fund road safety initiatives. The NSW Government has listened to the community and will use fine revenue to directly fund road safety measures such as road safety engineering works, road safety education programs, public education campaigns, additional enforcement by the NSW Police Force and other significant road safety initiatives. Fine revenue will form a core component of the funding of the NSW road safety program and revenue that is additional to the current level of allocated road safety funding will also be partially directed to fund enhanced road safety programs, including additional police enforcement.

By redirecting all revenue collected from speed camera fines drivers can feel confident that this money is being used to improve the safety of roads and road users.

Speed Limits

Speed limits are set so that vehicles travelling at the speed limit are able to safely respond to potential risks in the road environment. Lower speed limits for example, are used where there are a greater number of potential conflict points such as pedestrian crossings and intersections. Higher speed limits are used on lengths of road where there are few or no conflict points and the road environment has been engineered to reduce the likelihood of a crash and the severity of a crash should one occur.

The NSW Government is committed to ensuring that speed limits are appropriate and has recently launched the Safer Roads NSW website that allows the community to comment on areas of the road network where they have concerns about the speed limit.

The NSW Centre for Road Safety will also continue to explore and implement technologies that alert drivers to the speed limit, for example through the use of flashing lights in school zones and the development of Intelligent Speed Adaptation (ISA).

Camera performance

In order to improve community confidence in speed camera programs, the NSW Centre for Road Safety has accepted the audit's recommendation to annually publicise trends in crashes, revenue, and speeding or infringement data for speed cameras. A dedicated website will provide this information to the public and will allow the community to easily access and view the performance of each speed camera including certification and testing documentation.

The function of red-light speed (safety) cameras

Red-light speed (safety) cameras enforce both red-light and speeding offences and improve the safety of intersections by deterring drivers from both running red-lights and speeding.

While a recent survey conducted by Ipsos Eureka on behalf of the NSW Centre for Road Safety found that 79 per cent of drivers approve of the use of red-light speed (safety) cameras, there have been some concerns raised that some drivers may not be aware that these cameras also enforce speeding offences. The Government proposes to address this issue by replacing current signage with enhanced signage that says 'red light speed camera ahead', to clarify that red-light speed (safety) cameras enforce both traffic light and speeding offences.

Further public education will be undertaken to improve driver awareness of the safety benefits of these cameras; to support the proposed enhanced signage and communicate the road safety benefits of red-light speed (safety) cameras.

Addressing community suggestions

The NSW Centre for Road Safety regularly receives requests from the community to have a speed camera installed in their local area. A new initiative of the NSW Speed Camera Strategy is the ability for NSW residents to nominate locations for speed camera enforcement. The community will be able to nominate speed camera locations online for the NSW Centre for Road Safety to review against crash criteria and prioritise enforcement. Therefore a proportion of speed camera locations will be chosen by the community.

Public education campaigns

Best practice guidelines for speed enforcement recognise that public education conducted in combination with speed enforcement achieves maximum road safety results. Education, without enforcement however doesn't have as great an effect because some drivers don't believe that their speeding behaviour will lead to a crash.

The aim of road safety education programs is to improve public awareness about road safety issues and encourage safer behaviour by road users. Education and promotion in combination with enforcement provides drivers with the opportunity to modify their behaviour and in turn less drivers are infringed for speeding.

The NSW Centre for Road Safety will continue to develop public education campaigns to support speed enforcement in NSW. By combining enforcement with public education, drivers will be aware of the types of enforcement being used in NSW and will also be informed about the justification for enforcement.

Campaigns that use powerful emotive messages will be employed in combination with other messages, to ensure that drivers recognise that road crashes (and especially speed related crashes) place a large burden on the community, and that speed cameras are there to reduce this burden.

NSW motorists and local communities will regularly be informed about new speed camera enforcement occurring in their local area and the reason for this enforcement occurring. This will include publicising crash data for locations and involving local communities in promoting new mobile speed camera locations.

3. Summary of the types of speed cameras used in NSW

Speed cameras are speed enforcement tools that supplement enforcement conducted by the NSW Police Force. They have been proven to make roads safer by reducing speeding and in turn the number and severity of crashes. A list of publications is included at the end of this strategy that detail the evidence of the road safety benefits of speed cameras and speed enforcement. The NSW Centre for Road Safety will also be publishing online a number of reports that were recently completed that investigated the effectiveness of mobile, red-light speed (safety) and fixed speed cameras.

There are four types of speed cameras used in NSW to encourage drivers to comply with the speed limit.

Table 1: Types of Speed Camera Enforcement Used in NSW

Type	Main purpose	Introduced
Fixed	Location specific (To address black spot/high risk)	1997
Red-light speed (safety)	Location specific (To address high risk intersections)	2009
Mobile	General network deterrence	First introduced in 1991. Ceased operation in December 2008 and re-introduced in 2010
Point-to-Point	Route enforcement (For heavy vehicles only)	2010

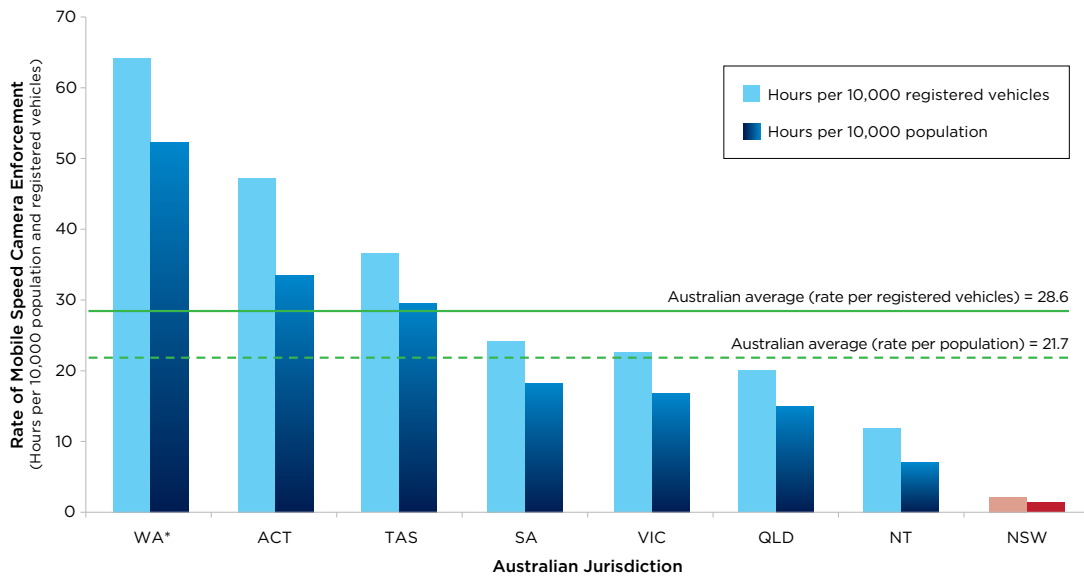
The suite of speed cameras used in NSW have different roles in reducing speed-related crashes. An effective speed management strategy should incorporate each type of camera enforcement to address the speeding problem.

Mobile speed cameras produce a sustained change in driver behaviour by creating a perception that speeding can be enforced anywhere at any time. Therefore they reduce speeding not only at identified enforcement locations but also across the road network. This is because drivers are less able to predict where the enforcement will occur; the less predictable the enforcement, the more broadly speed limit compliance can be achieved and the greater the crash problem that is addressed.

Mobile speed cameras can be moved around the road network at various times and locations and, like police enforcement, this mobility increases the deterrence effect due to the unpredictability of the exact location of speed enforcement.

Mobile speed cameras used in NSW are in marked vehicles with signage placed both before and after the vehicle. A further initiative of the NSW Speed Camera Strategy is enhancing warning signage for mobile speed camera vehicles to ensure motorists see and recognise the enforcement activity. In addition to current signage, a further warning will be provided in each direction of enforcement.

Figure 2: Rate of Mobile Speed Camera Enforcement, NSW versus Other Australian Jurisdictions



*Once increase in program has been implemented.

Figure 2. Comparison of rates of mobile speed camera enforcement by Australian jurisdictions, January 2012.

As illustrated in Figure 2, the current NSW mobile speed camera program is small compared to other jurisdictions. The program is managed by Transport for NSW in consultation with NSW Police with operations outsourced to a private contractor. This outsourced model is also used in Victoria and cameras are operated by technicians, freeing up police for hands on enforcement.

In most jurisdictions in Australia, fixed speed cameras are located at specified road lengths or intersections where there is a demonstrated crash history. A recent analysis of fixed speed cameras in NSW has found that overall they have demonstrated a positive road safety impact but results varied at some sites. The analysis has shown that overall, 36 lives and 549 injuries have been saved at fixed speed camera locations in the 5 years after fixed speed cameras were installed. We know that fixed speed cameras are very effective at reducing speeding for approximately 500 metres around the camera location. However this means that the 131 fixed speed cameras operating at 103 locations in NSW currently only enforce 103 km of the 188,000 km NSW road network.

Red-light speed (safety) cameras are also location-specific as they address speeding and red-light running at signalised intersections where drivers and pedestrians are vulnerable to right angle crashes.

While we know that fixed cameras and red-light speed (safety) cameras reduce speeding at specific locations, more can be done to reduce speeding across the road network. As already outlined, the NSW Auditor-General recognised this during the recent review of speed camera enforcement in NSW. A recent analysis of the initial 57 locations where red-light speed (safety) cameras have been installed has found that since the cameras were installed crashes reduced by 26 per cent and injuries by 34 per cent.

Lastly, point-to-point enforcement addresses speeding along travel routes with a demonstrated history of crashes. Point-to-point enforcement in NSW targets heavy vehicles as they are over-represented in crashes on known heavy vehicle routes. Based on the crash benefits experienced in other jurisdictions there should be significant reductions in heavy vehicle crashes on the 22 point-to-point lengths.

4. The next steps for speed cameras in NSW

The NSW Centre for Road Safety has conducted extensive reviews of international research on speed cameras as well as analysing the performance of current NSW speed camera programs. These reviews include a comprehensive analysis of mobile speed camera enforcement, fixed speed camera enforcement and red-light speed (safety) camera enforcement and will be published on the NSW Centre for Road Safety website.

Given this substantial body of evidence and the known speeding and crash problem in NSW, the future speed camera strategy for NSW will use a suite of speed camera programs to address speeding related death and trauma. This suite of camera programs can be described as a hierarchy of programs to address speeding; from broadly across the network right down to addressing a known history of crashes at identified crash locations and lengths of road.

Mobile speed camera enforcement

Given that we know that an overall reduction in speeding leads to a reduction in the frequency and severity of crashes, a camera program that achieves network wide speed compliance is the top priority for NSW. Mobile speed cameras will be deployed across NSW in greater levels on all types of roads that meet agreed site selection criteria. This enforcement will be supported by an extensive public education campaign advising NSW drivers about the enforcement and all mobile speed camera locations will be available online.

Fixed speed camera enforcement

Fixed speed cameras will continue to be deployed at locations with a known crash history or that are identified as high risk. However the program will continually be improved, with locations regularly reviewed and cameras relocated if the camera is not achieving results. In circumstances where cameras are removed, alternative treatments for the location will be determined by a multidisciplinary team of road safety experts.

Red-light speed (safety) camera enforcement

Red-light speed (safety) cameras will be deployed across NSW at signalised intersections that need them most. The identification of locations will be based upon a statewide review of crashes at signalised intersections and will be of a similar scale to programs operating in other jurisdictions where they have successfully reduced road trauma at intersections such as Victoria and South Australia. All intersections will be signposted, locations will be published online and new camera locations will be supported by local public education alerting drivers of their installation. Like the fixed speed camera program, locations will be regularly reviewed with cameras relocated if they are not achieving results.

Point-to-Point camera enforcement

In NSW, point-to-point enforcement targets heavy vehicle speeding only and will continue to be rolled out on routes with a history of heavy vehicle crashes. Developments in other Australian jurisdictions will be monitored to help guide any further roll-out of the program.

5. Speed Camera and Site Selection Criteria

As each type of speed camera addresses a particular crash problem on the road network, site selection criteria have been developed for each camera type to ensure they are placed on roads according to their intended purpose.

We know from a recent crash review completed by the Monash University Accident Research Centre that 86 per cent of all fatalities in NSW occur at intersections and on rural high-speed roads. Therefore our speed camera program needs to address this type of speeding behaviour and site selection criteria must ensure that speed enforcement can be concentrated at these locations.

Mobile speed cameras

The purpose of mobile speed cameras is to reduce speeding not only at identified enforcement locations but also across the road network through the use of anywhere, anytime enforcement. There are broadly three ways of selecting mobile speed camera locations to achieve network wide benefits.

The first is assessing road safety risk through the review of crashes at a particular location or identifying the road as high risk. In metropolitan areas and large rural centres where there is easily identifiable crash clusters and a high frequency of crashes, mobile speed camera locations will primarily be selected based on crash history.

However in more remote regional areas of NSW where a large proportion of fatal crashes occur it is critical that mobile speed cameras are regularly deployed to areas that have been identified as having potential for high risk crashes or have had a fatal crash. Accordingly, identifying high risk lengths of roads will be the primary criteria for selecting mobile speed camera locations in regional and rural areas. This will ensure that the selection of camera locations considers both the crash history of a location as well as the potential risk of a crash.

Secondly, the NSW Police Force has invaluable insight into driver behaviour and speeding patterns and therefore will have the ability to routinely nominate sites for mobile speed camera deployment. There are also circumstances where the police identify locations that are high risk and difficult to enforce using conventional methods including school zones and high speed roads.

Lastly, road safety experts recognise that the majority of motorists support speed camera enforcement as an effective tool in reducing the road toll and often request speed enforcement in their local community. Therefore a proportion of all mobile speed camera enforcement will occur at locations that have been nominated by the community.

The actual deployment of mobile speed cameras to these locations will be based on findings from evaluations conducted of well established mobile speed cameras programs in jurisdictions such as Victoria and Queensland. In these jurisdictions deployment is determined based on prioritising locations on crash history and risk including times of previous crashes, and increasing the general deterrence of speeding through anywhere, anytime enforcement.

Mobile speed camera criteria

- **Frequency and severity of crashes and/or**
- **Risk of road trauma or previous fatal crash or**
- **Police nominated or**
- **Community nominated or**
- **Location is difficult to enforce by Police using conventional methods.**

Red-light speed (safety) cameras

Intersections with traffic lights are high risk locations due to the potential for right angle crashes. These types of crashes are often more severe as drivers and passengers are not as protected from side impact crashes, with low-speed side impact crashes potentially resulting in severe injury. Signalised intersections are also used by pedestrians so the potential for serious injuries to this user group at intersections is high because they are unprotected in a crash (See Figure 3).

Figure 3: Fatality risk by collision speed for different crash types

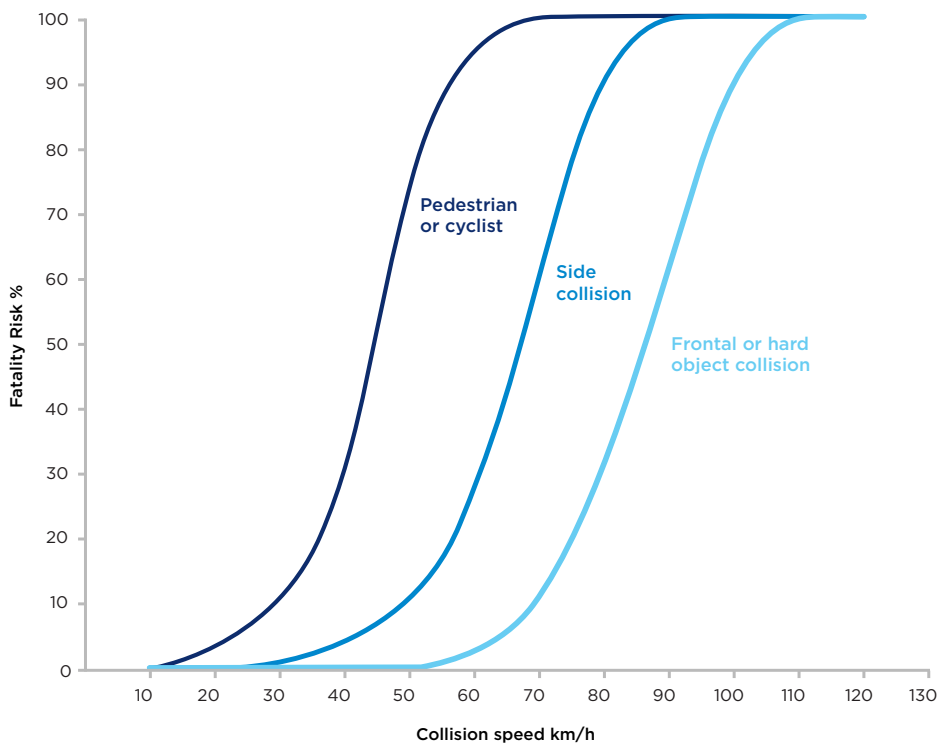


Figure 3 shows that for the main types of crashes at intersections the risk of a fatality increases significantly at lower speeds.

The purpose of red-light speed (safety) cameras is to improve safety at intersections by enforcing red-light running and speeding. The combination of red-light and speed enforcement improves safety at intersections by reducing crashes associated with red-light running, and controlling speeding at an identified high risk location.

The use of speed enforcement further improves safety because red-light enforcement alone, while very successful at reducing adjacent vehicle crashes, can lead to an increase in rear-end collisions. Speed enforcement coupled with red-light enforcement minimises this issue.

Intersections are prioritised for the installation of red-light speed (safety) cameras based on the frequency and severity of crashes and a risk assessment of the intersection in relation to the broader road network. All signalised intersections in NSW are routinely ranked based on crash history to ensure that intersections that need enforcement most are prioritised.

Consideration is also given to placing red-light speed (safety) cameras at locations where there is a potential for severe crashes. This pre-emptive deployment is also used in Victoria where it has been recognised that waiting for a potential crash to occur to justify enforcement is not always the most suitable methodology.

The overall deployment of red-light speed (safety) cameras also considers the location of enforcement in relation to other red-light speed (safety) cameras and other types of camera enforcement. This ensures that there is a sufficient geographic spread and a minimum amount of deployment in regional areas.

Red-light speed (safety) camera criteria

- **Frequency and severity of crashes at an intersection and/or**
- **Assessment of high road safety risk and/or**
- **Regional priority.**

Fixed speed cameras

Fixed speed cameras reduce speeding in the immediate vicinity of the camera. Fixed speed cameras are used in high risk locations or in locations with a known history of severe crashes and therefore have the most prescriptive site selection criteria. Fixed speed cameras are also used on freeways and motorways as they carry high volumes of traffic at high speeds, and consequently require speed compliance along the entire length of the road to ensure the inherent safety of these roads is maintained.

Fixed speed camera criteria

- **High frequency and severity of crashes over a length of road no longer than 1000m or**
- **School zone with a high frequency and severity of crashes and/or high risk of a pedestrian crash or**
- **High risk location that is difficult for Police to enforce using traditional methods such as tunnels.**

Point-to-Point speed enforcement

Point-to-point speed enforcement involves measuring a vehicle's average speed over a larger distance to determine if they were speeding. It is suitable for enforcing speeding over long distances and is used in NSW to enforce heavy vehicle speeding. Point-to-point reduces speeding between two points, and therefore enforcement lengths are based on an assessment of the crash history or speeding behaviour along the entire enforcement length.

Point-to-point speed camera criteria

- **High frequency and severity of heavy vehicle crashes and/or**
- **Evidence of heavy vehicle speeding problem.**

Other requirements

To ensure fairness for motorists, fixed speed cameras are not typically located within 300m of a change down in speed limit, except in the case of red-light speed (safety) cameras or in school zones where this is not always possible or reasonable for shorter school zones. The use of multiple cameras in close proximity will be minimised, as will the use of speed cameras on down-hill slopes, unless there is an identified speed related crash problem related to vehicles speeding at that location.

Finally, all speed cameras have certain technical and site specific considerations to ensure the cameras can operate effectively. Each and every speed camera enforcement location will have to comply with technical, operational and safety requirements that are assessed and evaluated by approved camera technicians. This certification and testing documentation will be available online for the community to review.

6. Evaluation

The ultimate indicator of performance for all speed cameras in NSW is a reduction in people killed and injured in crashes. Speed enforcement in conjunction with other initiatives such as engineering treatments, education and safer vehicles should lead to a continued reduction in the road toll. In order to assure the community that speed enforcement is being monitored and evaluated for performance, a range of evaluation criteria have been developed for each camera type.

The following tables outline criteria that will guide the evaluation of the effectiveness of individual cameras, as well as the overall effectiveness of the NSW Speed Camera Strategy.

Table 2: Criteria for Measuring Camera Effectiveness

Enforcement type	Evaluation data	Measure of effectiveness
Mobile speed cameras	Annual speed surveys	Reduction in vehicles exceeding speed limit across the road network/ random sample of locations
	Compliance data	Increase in compliance rates/Reduction in infringement rates
	Crash data	Reduction in crashes and casualties across NSW
Red-light speed (safety) cameras	Speeds	Reduction in vehicles exceeding speed limit at intersection
	Compliance data	Increase in compliance at intersection/Reduction in infringement rates
	Crash data	Reduction in casualties and crashes at intersection
Fixed speed cameras	Speeds	Reduction in vehicles speeding within 500 metres of the camera
	Compliance data	Increase in compliance at camera location/Reduction in infringement rates
	Crash data	Reduction in casualties and crashes within 500 metres of the camera
	Risk	Level of risk continues to be reduced at the location (for example low level of speeding and/or crashes in tunnels)
Point-to-Point enforcement	Speeds	Reduction in heavy vehicle speeding within enforcement length
	Compliance data	Increase in compliance within the enforcement length/Reduction in infringement rates
	Crash data	Reduction in crashes within enforcement length

Table 3: Criteria for Measuring Overall Effectiveness of Enforcement Programs

Program	Outcome
Mobile speed camera	Reduction in road trauma, speed-related crashes and speeding across the whole road network
Red-light speed (safety) camera	Reduction in frequency and severity of crashes at enforced intersections (and at all signalised intersections due to deterrent effect across the network)
Fixed speed	Reduction in vehicles speeding and the frequency or severity of crashes at fixed speed camera locations
Point-to-Point	Reduction in speeding and the frequency or severity of crashes on point-to-point enforcement lengths

The effectiveness of all speed cameras will be measured through the analysis of behavioural factors. That is, measures that are directly attributed to driver actions which include vehicle speeds and compliance rates, and crash outcomes including the frequency and severity of crashes. This information will be obtained from systematic reviews of crash data, monitoring of infringement rates and other speed data.

The NSW Centre for Road Safety conducts annual on-road speed surveys to gather current information about speeding behaviour. These speed surveys are conducted across NSW on a range of roads with a range of speed limits. By monitoring vehicle speeds across the road network, we can determine broadly the level of compliance over time. Annual speed surveys will be used to measure the impact of mobile speed cameras across the road network.

The Office of State Revenue maintains up-to-date infringement data for speed camera offence types by location and month or year. These are publicly available online for the community to review. As drivers become more compliant with the speed limit, less infringements are issued relative to the amount of enforcement. It is envisaged that infringement rates will reduce over time, both at specific speed camera locations and also statewide.

The NSW Centre for Road Safety and Roads and Maritime Services maintain a comprehensive database of crashes that occur on NSW classified and local roads, as provided by the NSW Police Force. This information is used to justify enforcement and also evaluate the effectiveness of enforcement over time.

7. Summary of Actions

Initial actions to be completed in the first year	
Communications	1. Develop a dedicated website to provide speed camera enforcement information to the public
	2. Annually publish information on trends in crashes, revenue, speeding and infringements
	3. Publish performance information on each speed camera including certification and testing documentation
	4. Allow customers to nominate locations for speed cameras online
	5. Develop public education campaigns to support speed enforcement in NSW
Camera Programs	6. Implement revised speed camera and site selection criteria
	7. Enhance mobile speed camera program
	8. Enhance red-light speed (safety) camera program
Hypothecation	9. Establish a dedicated program for re-directing fine revenue from driving offences to fund road safety improvements
Future and ongoing actions	
Communications	10. Regularly inform the community about new speed camera enforcement in their local area and the reason for this enforcement occurring
Camera Programs	11. Regularly review fixed speed camera locations and relocate any camera not showing a road safety gain
	12. Regularly review red-light speed (safety) camera locations and relocate any camera not showing a road safety gain
Research	13. Monitor developments in the implementation of point-to-point enforcement across other Australian jurisdictions to guide further rollout of the program.
	14. Continue to develop Intelligent Speed Adaptation (ISA)
	15. Continue to explore and implement other technologies that alert drivers to the speed limit

8. List of publications

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