

Transport
for NSW

NSW Automated Enforcement Strategy for road safety

November 2022



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Executive Summary

The NSW Automated Enforcement Strategy for road safety ('Strategy') provides an overarching framework to manage the automated enforcement programs used in NSW which continue to help reduce road trauma in NSW.

This Strategy is a key component in the NSW Government's 2026 Road Safety Action Plan, to achieve Transport for NSW's (Transport) long-term goal of zero road deaths and serious injuries by 2050, consistent with the vision set by both the NSW Future Transport Strategy and the National Road Safety Strategy 2021-30.

The Strategy builds on the success of the current NSW automated enforcement programs, and harnesses technological advancements to implement more innovative, flexible and sustainable solutions to respond to existing and emerging road trauma issues and risks in NSW.

Community research shows high support for camera enforcement, with 63 per cent up to almost 80 per cent of a representative sample of NSW residents supporting the different camera types¹. Additionally, almost two thirds (65 per cent) agree that using existing cameras to enforce other road rule offences would help to improve road safety².

The overarching **aim** of this Strategy is to:

- Deliver reductions in road trauma on NSW roads aligned to our trauma reduction targets, by reducing illegal and unsafe road behaviour
- Reduce the risk of trauma related crashes
- Complement on-road policing.

The expected **benefits** of this Strategy are:

- ✓ Fewer deaths and injuries on NSW roads
- ✓ Overall reduction of the risk of trauma related crashes
- ✓ The NSW automated enforcement programs are better aligned to best practice evidence in achieving trauma reductions.

- ✓ Greater compliance and behaviour change among the community due to enhanced understanding & support of automated enforcement.
- ✓ More innovative, flexible and sustainable technology solutions that further complement on road policing.

A key set of **principles** which underpin and guide the Strategy to help it achieve its aim are as follows:

- An evidence-based approach to designing enforcement solutions
- Support with positive reinforcement
- Fair enforcement
- Address a range of unsafe road behaviours
- Communicate effectively with the community
- Balance network-wide with localised deterrence
- Select enforcement locations through clear guidelines
- Flexible and sustainable solutions
- Support industry innovation
- Use existing assets efficiently

The table following summarises the **actions** to be delivered throughout the lifecycle of the Strategy.

Table 1. NSW Automated Enforcement Strategy – key areas and actions

Key Area	Actions
Automated enforcement solutions	<ul style="list-style-type: none"> Actively explore new and improved automated enforcement solutions considering: <ul style="list-style-type: none"> Enhancement of existing technology and policies; Expansion of the capabilities of existing enforcement technology to detect additional risky behaviours; and Innovation, including seeking out new solutions.
	<ul style="list-style-type: none"> Establish an expert advisory group to provide advice on automated enforcement developments.
	<ul style="list-style-type: none"> Identify and implement the most appropriate solution for speed enforcement in road work zones.
Enforcement locations	<ul style="list-style-type: none"> Use the criteria outlined in this Strategy for selecting locations for automated enforcement, and make this publicly available.
	<ul style="list-style-type: none"> Continue to allow the community to nominate locations for speed and red-light cameras, along with road network managers (including local councils) and NSW Police for all camera types.
	<ul style="list-style-type: none"> Integrate automated enforcement into road planning and design, and upgrades of key routes.
Communication and education	<ul style="list-style-type: none"> Engage the community to increase understanding of, and support for, the different ways automated enforcement is used in NSW to improve safety, to foster greater support and acceptance.
	<ul style="list-style-type: none"> Increase community awareness of the Community Road Safety Fund through enhanced information and communication, outlining where the funds are invested throughout the year.
	<ul style="list-style-type: none"> Continue to publish the locations of site and route based automated enforcement designed to address high risk locations, as well as the broad locations of mobile speed camera enforcement.
	<ul style="list-style-type: none"> Consider extending public nominations for locations for automated enforcement, beyond speed and red-light cameras.
	<ul style="list-style-type: none"> Develop public education campaigns to support any new, expanded or enhanced automated enforcement.
	<ul style="list-style-type: none"> Explore additional positive rewards or reminders for motorists to help motivate and reinforce safe road behaviours.
Ensuring fair enforcement	<ul style="list-style-type: none"> Review existing penalty related policies and develop new policies where relevant, to ensure fair and transparent enforcement processes.
	<ul style="list-style-type: none"> Work with Revenue NSW to determine the suitability of including the relevant offence image on infringement notices.
	<ul style="list-style-type: none"> Work with Revenue NSW and Service NSW to expand the possibility of the electronic delivery of infringements, and notifications of infringements, for broader implementation.
	<ul style="list-style-type: none"> Work with Revenue NSW and Service NSW to appraise the current process for requesting a review of an infringement to ensure it is straightforward and transparent.
	<ul style="list-style-type: none"> Explore additional positive rewards or reminders for motorists to help motivate and reinforce safe road behaviours.
Research and evaluation	<ul style="list-style-type: none"> Continue to monitor community attitudes toward automated enforcement.
	<ul style="list-style-type: none"> Complete an evaluation of the Strategy and its enforcement programs.
	<ul style="list-style-type: none"> Continue to monitor the effectiveness of individual camera programs and make this information publicly available.

1 Introduction

1.1 Background

Technology-based automated enforcement to improve road safety outcomes is a feature in all national and leading international jurisdictions. It is proven as a high value measure to tackle persistent risky road user behaviours and reduce road trauma. In NSW we have been delivering effective automated enforcement since 1988, having been used primarily to target speeding and red-light running to reduce crashes at high-risk locations, and more broadly across the network. Cameras also assist with fatigue compliance among heavy vehicle drivers and detecting unregistered driving.

Following the NSW Auditor-General's audit of speed cameras in NSW in 2011, Transport developed an evidence-based Speed Camera Strategy (2012) to ensure the various types of cameras being used were effective in reducing road trauma. Since this Strategy, speed cameras used in NSW have continued to deliver road safety benefits.

In 2020, NSW introduced the world-first Mobile Phone Detection Camera program to enforce illegal mobile phone use while driving, following a comprehensive pilot of new technology. These same cameras will also begin enforcing seatbelt non-use as part of the 2026 Road Safety Action Plan. As the capabilities of enforcement technology continue to advance, and the application of camera enforcement in Australia and internationally has expanded and evolved, harnessing this new technology is an opportunity for NSW to reframe our approach to automated enforcement.

In light of this, and to help achieve the long-term vision of zero deaths and serious injuries on NSW roads, the need to develop a new, broader Strategy that builds upon the success of the Speed Camera Strategy was identified.

1.2 Purpose of the NSW Automated Enforcement Strategy

The Strategy provides an overarching framework to manage the automated enforcement programs used in NSW, assist innovation in this space, and continue to help reduce NSW road trauma.

This Strategy is a key action in the NSW Government's 2026 Road Safety Action Plan to achieve Transport's long-term vision of zero road deaths and serious injuries by 2050, set by the NSW Future Transport Strategy and the National Road Safety Strategy 2021-30.

This Strategy also aligns with the vision of the NSW Future Transport Technology Roadmap 2021-24 to be a leader in the use of innovative and transformative technologies for transport and mobility solutions for its customers.

The following Strategy outlines the road safety problem, and the role for enforcement including best practice principles. It covers its core aims, underlying principles to achieve these aims and how future automated enforcement will be explored, communicated and monitored in NSW.

1.3 Our commitment to reduce trauma

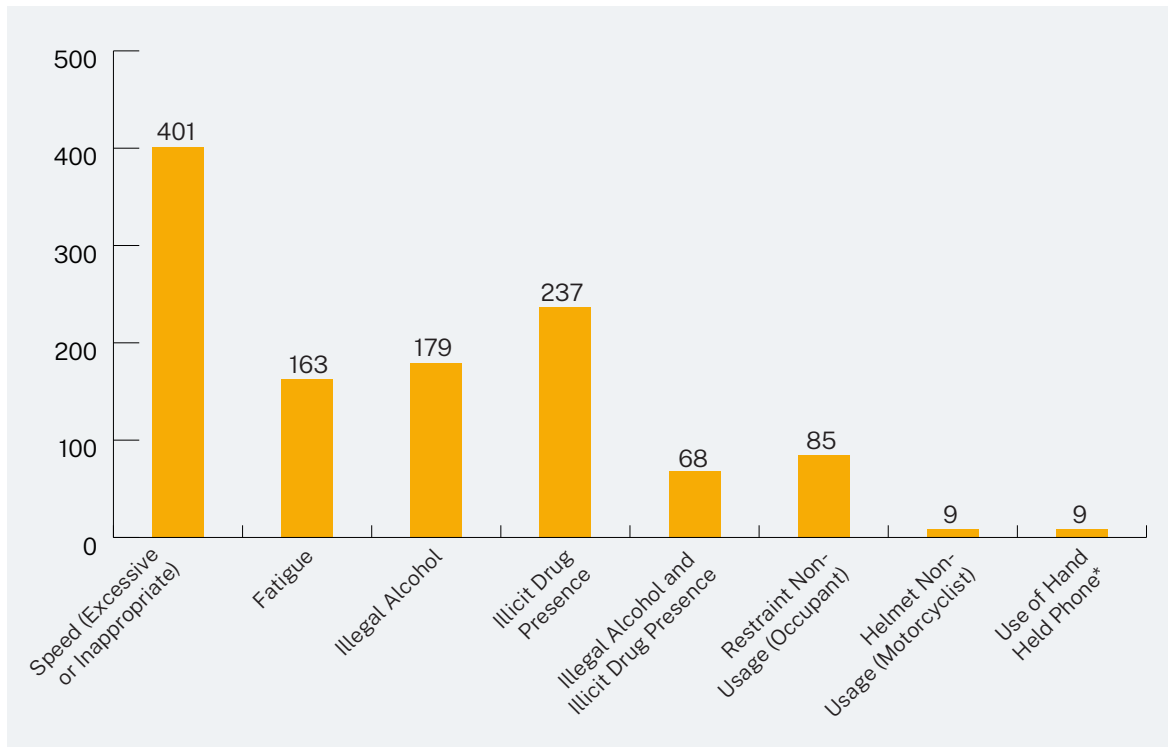
Implementation of this Strategy is a key action in the NSW Government’s 2026 Road Safety Action Plan. This new Plan builds on the previous Road Safety Plan 2021 and sets out new and proven road safety initiatives to further reduce the road toll and contribute toward achieving NSW Government road safety targets. In line with the targets set by the National Road Safety Strategy 2021–30, the 2026 Road Safety Action Plan sets new targets to reduce road deaths by 50 per cent and serious injuries by 30 per cent by 2030, compared to 2018–20 levels. These are not just strategic targets but represent real savings to people’s lives. Enhancing automated enforcement is one critical measure that will help reach these targets.

1.4 The road safety problem

Each year, on average, around 300 people are killed and 10,800 people are seriously injured on NSW roads³. The estimated cost to the community from fatalities and serious injuries is around \$8 billion per year⁴.

Road deaths can involve a range of risky behaviours. As shown in Figure 1, the biggest contributing factor in NSW is speeding (involved in around 40 per cent of road deaths), which includes both exceeding the speed limit and travelling at inappropriate speed for the conditions; followed by illicit drugs (presence of four priority illicit drugs in around 24 per cent); tired motorists (around 16 per cent); illegal alcohol (around 18 per cent); and restraint non-use among vehicle occupants (around 14 per cent).

Figure 1: Number of fatalities in NSW by behavioural factor, three-year period 2018-2020^{a,5}

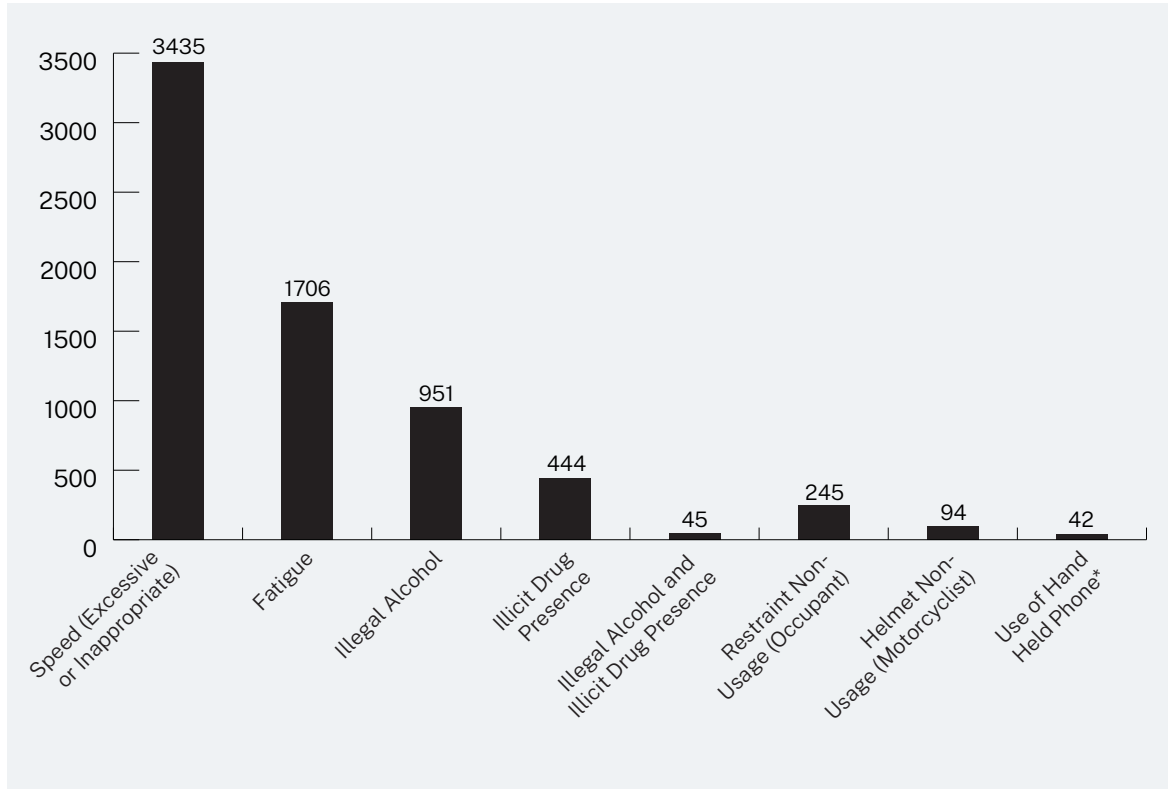


*under-reported due to difficulty obtaining evidence at crash scenes

a Totals will add up to more than the total number of fatalities as some deaths may involve more than one behavioural factor

As shown in Figure 2, the key behaviours involved in serious injury trauma are somewhat similar, with speeding as the main contributing factor.

Figure 2: Number of matched serious injuries in NSW by behavioural factor, three year period 2018-2020⁶



*under-reported due to difficulty obtaining evidence at crash scenes

The majority of road fatalities in NSW happen on country roads (65 per cent), while most serious injuries happen in metropolitan areas (58 per cent). Over a third of fatalities (35 per cent) and almost two thirds of serious injuries (60 per cent) happen where the speed limit is 60 km/h or less⁷.

Road crash statistics and safety risks will be considered when reviewing potential automated enforcement solutions for use in NSW (see 'Behaviours to be targeted' in section 4.1).

2 The role of enforcement in road safety

The NSW Government adopts the Safe System approach to address road safety. The Safe System approach aims to create an environment that helps people avoid a crash and minimise the risk of injury or death if a crash occurs. It does this through a combination of infrastructure and vehicle safety features, setting safe travel speeds, and fostering safe behaviours. Effective legislation, enforcement and licensing systems, as well as education and information to make better choices on our roads, all help to encourage safe and legal road user behaviour and minimise the risk of road trauma.

Effective enforcement of road rules is essential to a safe system – be that by police enforcement, automated enforcement or a combination of both. Enforcement and effective penalties changes road user behaviour and helps encourage motorists to comply with the road rules, resulting in reduced risk, fewer crashes and reduced road trauma.

Enforcement deters motorists from engaging in illegal behaviours in two ways:

- **Specific deterrence** – occurs when a motorist who has been penalised for an offence no longer engages in that behaviour for fear of incurring additional penalties.
- **General deterrence** – occurs when a motorist refrains from illegal behaviours as a result of observing others being penalised or is warned of the penalties for illegal behaviours or likelihood of being caught.

Police enforcement and automated enforcement complement each other in deterring illegal behaviour by road users. A highly visible and sustained police presence is critical in deterring road users from a range of behaviours by increasing the perceived likelihood of getting caught.

Automated enforcement complements this by allowing for efficient, cost effective and ongoing enforcement across the road network. Automated enforcement can remain at a location on a permanent or long-term basis, as well as enforce areas where police access is difficult or unsafe, such as in tunnels, or motorways with no enforcement bays. Automated enforcement has the ability to be highly visible or covert and is used in both ways depending on the issue to be addressed. The technology also allows police more time to enforce other important road safety issues that are not detectable by automated enforcement, such as drink and drug driving.

2.1 Best practice enforcement principles

Research shows that there are key principles for achieving effective road enforcement. These principles provide a basis for the ways in which automated enforcement will be used in NSW to address different risky road user behaviours.

Deterrence before detection

The main aim of enforcement should be to promote road safety by deterring motorists from illegal or risky behaviour through evidence based best practice enforcement programs. If motorists believe it is likely they will get caught, they are more likely to comply with the road rules, which reduces the risk of crashing⁸. This highlights the role of general deterrence, as well as the importance of the principle of educating about enforcement in achieving deterrence (outlined below). Detecting non-compliance among motorists, while critical for the small proportion of regular offenders, should be a secondary aim⁹.

Effective localised and network wide enforcement

Improving compliance at specific high-risk locations can be achieved relatively easily through fixed or targeted automated enforcement. However, many risky behaviours do not only occur at specific locations, and resulting trauma is spread across the whole road network. Therefore, the use of automated enforcement across the whole network is also required to address the limited predictability of crash locations across the State, and deliver a broader road safety benefit.

Visibility should vary

Road offences can be either:

- **Fixed** – a physical or legal state that cannot be changed when the driver becomes aware of enforcement (e.g. driving under the influence of alcohol or drugs)
- **Transient** – where a driver can choose to comply at a particular time or location and not at another (e.g. speeding, hand held mobile phone use).

For fixed offences, high visibility enforcement is more beneficial in deterring the behaviour as motorists are more likely to believe they will get caught¹⁰.

For transient offences both highly visible and covert enforcement are useful for achieving different objectives¹¹. Highly visible enforcement is most effective in achieving deterrence at specific high-risk locations. Motorists are made aware of the enforcement through its visibility and can modify their behaviour if necessary. Less visible, covert operations are more effective when aiming for compliance across the road network. The unpredictability of enforcement that could occur anytime or anywhere, encourages drivers to comply with road rules at all times, not only when they see enforcement^{12, 13}.

Sufficient scale to ensure unpredictability

When aiming for network-wide compliance, the size, intensity and random nature of the program affect its success. If only a small number of enforcement locations exist – or few operating hours for mobile enforcement, that

are not sufficiently random – motorists will learn where they need to obey the road rules to avoid receiving an infringement but still offend when they believe there is little risk of detection. A larger number of sites or mobile hours across a wide range of locations, along with randomised operations, is needed to achieve an expectation of anywhere, anytime enforcement. Motorists are then more likely to obey the road rules across the whole road network. The optimal size and intensity of the program is best determined by factors such as road network size, population size, road usage and number of registered vehicles¹⁴.

Educating about enforcement

Enforcement is more effective in changing behaviour when combined with public education and communications, to ensure people are aware of the enforcement and are deterred from illegal behaviours. This may include public education campaigns, signage, or where appropriate, visibility of enforcement.

In addition, education can improve support for enforcement and subsequently, compliance. For example, in relation to speed enforcement, research shows public education to remove misconceptions of enforcement practices may increase the acceptability and support for enforcement, and result in voluntary compliance rather than just reactive compliance¹⁵.

2.2 Existing automated road safety enforcement in NSW

Since 1988, automated enforcement has been integral to road safety in NSW and supplements road safety enforcement conducted by the NSW Police. In 2022 automated enforcement used to address road safety spans speeding, red-light running, illegal mobile phone use, unregistered driving and assists with fatigue compliance among heavy vehicle drivers. Automated enforcement will also be used to address seatbelt non-use as part of the 2026 Road Safety Action Plan.

Speed and red-light cameras

Speed cameras detect vehicles that exceed the posted speed limit. They have been proven to make roads safer by reducing speeding and in turn the number and severity of crashes¹⁶. There are four types of speed cameras currently used in NSW. Each are used in different ways to encourage drivers to comply with the speed limit.

- **Fixed speed cameras** – detect speeding at specific, high risk locations.
- **Red-light speed cameras** – detect speeding and red-light running at specific signalised intersections.
- **Mobile speed cameras** – detect speeding across the road network by moving around various locations at various times, at a scale and network spread to support the perception of ‘anywhere, anytime’ enforcement.
- **Average speed cameras** – detect heavy vehicle speeding between two points on specific high volume and/or high-risk routes.

Mobile Phone and Seatbelt Detection Cameras

The Mobile Phone Detection Camera program targets drivers illegally using a mobile phone when driving and is the first of its kind globally. Both fixed and transportable cameras are used. The system operates using high-definition cameras to capture images of the front-row cabin space of all vehicles to detect illegal mobile phone use.

The program aims to achieve general deterrence of illegal mobile phone use, and produce a sustained change in driver behaviour, by promoting that the cameras operate anywhere, anytime.

The NSW Government has now approved the use of these same cameras to also detect and enforce seatbelt non-use offences as part of the 2026 Road Safety Action Plan. The cameras will capture non-use among the driver and front passenger. As with illegal mobile phone use, this program aims to achieve general deterrence of seatbelt non-use, through the anywhere, anytime operation of the cameras.

Safe-T-Cam

Safe-T-Cam is a network of digital cameras that monitor the movement of heavy vehicles, rather than automatically detecting offences. Data from Safe-T-Cam is used to target on-road enforcement towards high-risk vehicles and operators and support prosecution of safety offences. Enforcement focuses on fatigue offences among fatigue-regulated heavy vehicles bound by maximum work and minimum rest time; vehicles that are unregistered and/or uninsured; attempts to avoid detection at camera sites; and failures to enter inspection stations.

3 Automated Enforcement Strategy: Aims, Principles and Action areas

This Strategy builds on the success of the current NSW automated enforcement programs, and harnesses technological advancements to implement more innovative, flexible and sustainable solutions to respond to existing and emerging road trauma issues and risks.

The overarching aim of this Strategy is to:

- Deliver reductions in road trauma on NSW roads aligned to our trauma reduction targets, by reducing illegal and unsafe road behaviour
- Reduce the risk of trauma related crashes
- Complement on-road policing.

A set of key principles underpin and guide the Strategy to help it achieve these aims:

- **An evidence-based approach to designing enforcement solutions** – consider the road safety need, to ensure technology-based solutions will tackle areas of risk and reduce road trauma.
- **Support with positive reinforcement** – reward safe behaviour as well as enforcing risky behaviours, to further reinforce road safety benefits.
- **Fair enforcement** – policies and program settings are reasonable, privacy measures are in place, data managed securely, and technology systems are accurate, to aid community trust and compliance.
- **Address a range of unsafe road behaviours** – to maximise the road safety benefits.
- **Communicate effectively with the community** – enhance general awareness and transparency of the enforcement programs to aid community support and compliance.

- **Achieve network-wide and localised deterrence** – use enforcement to reduce crash risks at specific locations, in addition to tackling network wide behavioural issues.
- **Select enforcement locations through clear guidelines** – use set criteria to ensure locations are based on safety needs.
- **Flexible and sustainable solutions** – adapting to new, emerging or improved solutions that are practical and effective
- **Support industry innovation** – actively seek out new or improved technology-based enforcement solutions to encourage the development of new opportunities.
- **Use existing assets efficiently** – use existing infrastructure, cameras and technology, including multiple uses of technology, to achieve greater benefits while minimising costs.

These principles are reflected throughout this document and provide the foundation for the five key action areas which represent the focus of the Strategy. These action areas are listed in the box below and are described in more detail throughout the following sections.

NSW Automated Enforcement Strategy – Key action areas

- ▶ Automated enforcement solutions
- ▶ Enforcement locations
- ▶ Communication and education
- ▶ Ensuring fair enforcement
- ▶ Research and evaluation

4 Action Area – The future of automated enforcement for road safety in NSW

4.1 Behaviours to be targeted

With advances in technology it is possible for a broad range of risky road user behaviours to be targeted through automated enforcement.

The use of technology to tackle speeding, red-light running, illegal mobile phone use, seatbelt non-use (once commenced) and unregistered driving, as well as fatigue breaches among heavy vehicle drivers will continue.

This Strategy supports industry innovation and allows for the testing and adoption of new road safety solutions that may arise which address the above behaviours, as well as other key behaviours. To help complement police activities, behaviours that are difficult for police to enforce from the roadside will also be prioritised for automated enforcement. Solutions will also be explored that target behaviours affecting vulnerable road users to improve their safety. Any behaviour to be enforced must meet all of the following criteria:

- It is a road safety risk
- It is an illegal road behaviour
- Automated enforcement of the behaviour is expected to reduce the risk of road trauma and can be efficiently and effectively implemented.

4.2 Modernising enforcement solutions

This Strategy will explore new, emerging and improved automated enforcement solutions. Solutions will only be implemented if they are sustainable, easily maintained, flexible and adaptable to changes in technology, policy or behaviours. The exploration of automated enforcement solutions will focus on answering questions related to: enhancement, expansion, and innovation, as outlined in Figure 3. The road safety need, and the role of NSW Police in enforcing road laws, will remain central when considering each of these areas.

Figure 3: Areas of exploration for new and improved automated enforcement solutions**Enhancement**

Improve current technology or policies to maximise the road safety benefits

- ▶ Can our existing technology systems be improved?
- ▶ Is our existing automated enforcement based on best practice principles?
- ▶ What are the gaps within our existing use of automated enforcement?

Expansion

Broaden existing automated enforcement to detect other risky behaviours

- ▶ Can our existing technology be used to detect other risky behaviours?
- ▶ Are there any opportunities to integrate new solutions?

Innovation

Use new technology to address additional road safety risks

- ▶ Is there an opportunity to detect additional risky behaviours through new technology used in other Australian jurisdictions or overseas, or through industry innovation?

Enhancement

Under this Strategy, Transport will actively review and assess the existing suite of automated enforcement used in NSW, to determine areas for improvement. It is important that automated enforcement used across the road network adapts to changes in policy and technology. Enhancing already successful programs is also likely to achieve increased road safety benefits, cost effectively.

While automated enforcement is already in place in NSW for speed, red-light, mobile phone and soon seatbelt offences, and assists with heavy vehicle fatigue compliance, new technology may exist that offers a more efficient or cost-effective solution, or that results in greater safety benefits (such as enforcing traffic in both directions rather than one).

Enhancements in technology may also allow for enforcement to be better targeted (such as through red-light running monitoring systems), or mean that certain enforcement may no longer be necessary in some locations.

Policies will also be reviewed to ensure current automated enforcement follows best practice, and that any gaps in terms of risk or application are addressed, so that the road safety benefits can be maximised.

A key gap within our existing use of automated enforcement to be addressed as a priority is enforcement in road work zones, including speed enforcement. There are often changed road conditions and additional hazards in these areas, with road workers regularly working close to traffic. Transport has a duty of care obligation under the *NSW Work Health and Safety Act 2011* to ensure the safety of these workers. Automated enforcement, combined with education, is crucial in helping achieving compliance with the road rules, including reduced speed limits, to improve safety for these workers as well as other road users.

The active review of automated enforcement will also apply to any new solutions that become part of the automated enforcement program to ensure ongoing improvement.

Expansion

One of the principles that guides this Strategy is the efficient use of existing assets. There may be the opportunity for existing technologies to enforce additional risky road behaviours and integrate new solutions to further improve safety. Doing so may achieve additional benefits, cost effectively. This includes non-road-safety related cameras and technology such as traffic flow and bus lane cameras.

Any new behaviour to be enforced would need to meet the criteria for behaviours to be targeted, outlined in this Strategy.

The capabilities of the current suite of enforcement assets will be investigated to determine the possibility of expanding these to other behaviours that would result in increased safety benefits. Non-road-safety related automated enforcement assets will also be explored for their potential use in road safety enforcement.

Innovation

Another guiding principle of this Strategy is to support industry innovation and encourage the development of new solutions.

Technological solutions exist in other Australian jurisdictions and overseas that can detect a range of risky behaviours that are not currently enforced through automation in NSW. These include tailgating¹⁷, illegal turns¹⁸, not stopping at a stop sign¹⁹, overtaking offences²⁰ vehicles in wrong lanes²¹, and illegal railway crossings²².

These will be investigated under this Strategy to determine the suitability of their use to address road safety within NSW.

Transport will also seek out solutions to known risky behaviours where automated enforcement solutions are desired but are not yet developed. It may also be possible for in-vehicle enforcement via telematics, which could be used in the future among high risk or repeat offenders.

Scope of exploration

The initial scope of exploration will primarily consider camera based enforcement, however this can be reviewed during the life of this Strategy to also include other automated enforcement solutions as technology evolves.

4.3 Expert Advisory Group for Automated Enforcement

The exploration of modernised automated enforcement solutions will be led by Transport and delivered in partnership with relevant agencies and industry. Transport will also establish an advisory group that may include road safety experts, advocacy group members, and law enforcement professionals, who will provide advice on automated enforcement developments. The purpose of the group will be to advise on areas including, but not limited to:

- Road behaviours that may benefit from automated enforcement
- Potential new or emerging automated enforcement solutions proposed by Transport that could be used in NSW to improve road safety
- The review of enforcement programs against best practice enforcement principles
- Ways in which automated enforcement programs can best complement on road policing
- Public communications related to automated enforcement.

4.4 Requirements of technology solutions

Any new solutions considered for use in NSW must have the potential to reduce road trauma. The criteria for behaviours to be enforced will also be considered: being an illegal road behaviour, a key road safety risk, and that automated enforcement of the behaviour is expected to reduce the risk of road trauma.

If the behavioural criteria is met, the technology itself will be carefully considered for use in NSW based on:

- Effectiveness and accuracy of the technology in detecting the specific offence/s
- Cost effectiveness of the technology
- Ability of the technology to meet any privacy or information security requirements
- Safety of the deployment of the technology – considering risks to workers, the community and the environment
- Success of the technology in achieving road safety benefits in other Australian jurisdictions or overseas (if relevant).

Any potential new or improved solutions will undergo significant testing and be required to meet specific performance requirements set by Transport before implementation.

Extensive public education and communication will be used to ensure the community is aware of any additional road rule offences being enforced through cameras or other technology and the road safety risk being addressed.

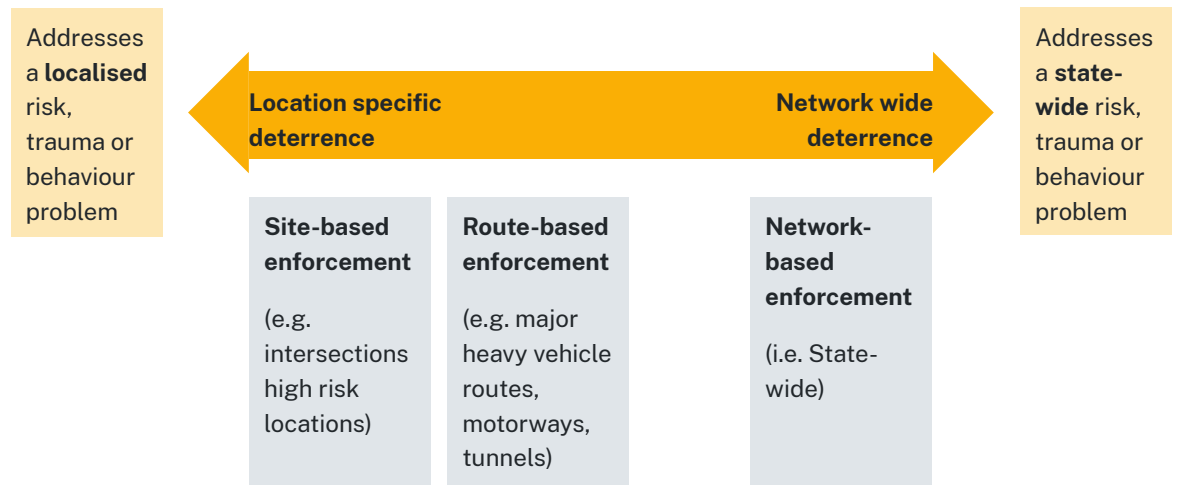
5 Action Area – Selection of enforcement locations

As is best practice, the Automated Enforcement Program will aim to achieve a balance of deterrence of illegal behaviours at high-risk locations, with deterrence across the whole network through anytime, anywhere enforcement.

Three types of location-based enforcement will be considered for each behaviour to be enforced – site-based; route-based; and network-based

(see Figure 4). Selection of these will depend on whether the aim of the enforcement is to address a particular localised issue, a network wide problem, or a combination. One behaviour may be addressed by using multiple types of location-based enforcement.

Figure 4: Three types of location-based enforcement aligned to deterrence goal



Any new automated enforcement, as well as the expanded roll out of any existing programs, will consider the following criteria to select enforcement locations. Some may be more relevant than others, depending on the intent of the enforcement and the type of location-based enforcement used.

For example, for site and route-based enforcement, risk levels will be considered at/ along specific sites and routes to help select locations, as this enforcement aims to address a safety issue at particular locations.

However, network-based enforcement aims to address a safety risk that is network wide and achieve a general deterrent effect; so location-specific risks do not need to be present for enforcement to be used at a location (although they still can be). Factors such as volumes of vehicles and other road users, geographic spread, or operational criteria may be given a greater focus to help identify enforcement locations.

The below criteria are to be considered in combination to select automated enforcement locations:

- **Risk levels** – the likelihood of future crashes occurring at a specific location, along a route, or network-wide. The risk should be determined and considered by reviewing a range data and information sources:
 - **Crash rates and trauma levels** – a high level of crashes, and fatalities and injuries identified through crash data is a good predictor of future trauma that needs to be addressed. This could relate to a risky behaviour that is present across the State, or a specific risk at a particular location.
 - **Crash types** – crashes that may result in greater trauma should be considered – for example, intersection T-bone crashes, or crashes on higher speed roads are likely to have a more severe outcome.
 - **Compliance rates** – the lower the compliance, the greater the risk of crashes. Data collected on speed levels and red-light running, as well as observational studies are examples of how this can be determined.
 - **Volumes of vehicles and other road users** – the higher the volumes of, the greater the risk of a crash due to more road users and more chance of an error. For vehicles is attained through annual average daily traffic (AADT) data. Specific road user groups relevant to the enforcement should also be considered (for example, pedestrian volumes for enforcement of red-light running).
 - **Risk assessment tools** – the use of specific tools to help identify risk including, but not limited to, intersection and curve risk models, infrastructure risk rating tools, and red-light running monitoring software.
 - **Specific safety risks** – locations where there are specific safety risk to all road users, or specific groups, and enforcement can be used to help reduce the risk – including but not limited to, tunnels, school zones, public transport hubs, and road work zones.
- **Safety rating of roads** – the rating of the road (where it is a State road) using the AusRAP (Australian Roads Assessment Program) Risk Rating methodology – the lower the risk rating, the safer the road. The ratings are based on features of the road such as road geometry, prevalence of and distance to roadside hazards (such as trees and power poles) and the speed motorists generally travel on the road. Note that this does not preclude enforcement locations on local roads.
- **Geographic spread** – the distribution of enforcement across the road network, including metropolitan, country urban and country rural NSW; as well as proximity to other automated enforcement.
- **High movement and place** – locations that have a high level of movement as well as a high place value using the NSW Government's Movement and Place Framework²³, to help improve the safety of these busy areas, particularly for vulnerable road users. The Movement and Place Framework recognises that streets are not just for moving people and goods – they are also places for people to live, work and spend time.
- **Nominated routes or locations** – those proposed by NSW Police, the community, local councils or Transport regional road safety teams, based on evidence of safety risks.
- **Difficult locations for NSW Police to enforce** – locations where it is not possible, or not safe, for NSW Police to enforce. For example, tunnels, road work zones, locations where there is no space for police to pull a motorist over.
- **Operational criteria** – the feasibility of the route or location for enforcement. For example, work health and safety requirements for any operators, technical requirements of the enforcement technology, or suitability of the route (such as entry and exit opportunities along average speed camera lengths).
- **Alternative road safety works** – road development or engineering works already planned that will improve the safety of the road or location, which is likely to reduce or eliminate the need for enforcement.

Other considerations:

- **Existing infrastructure** – where possible, existing infrastructure will be used for any new enforcement to help minimise costs. This is not a specific criterion for selection of locations as these should be based on the road safety need. However, existing infrastructure may determine exactly where on a route selected for enforcement, the automated enforcement may be placed.

The specific criteria for selecting locations will differ depending on the enforcement program and the deterrent goal.

As is currently the case, all enforcement locations will be determined by the NSW Centre for Road Safety, in consultation with the Transport metropolitan and regional road safety teams and NSW Police, to ensure the right solutions are being used in the right places to provide the maximum road safety gains.

All enforcement cameras, locations, or lengths will be recorded in a central database to ensure accurate consideration of geographic spread, and reporting.

5.1 Inclusion of automated enforcement in road design

To achieve the greatest safety, efficiency and financial benefits, automated enforcement should be considered during the planning and design phase of new roads, and upgrade of key routes. For example, consideration of proposed infrastructure that could also be used to house enforcement cameras, provision of enforcement bays for mobile speed camera vehicles, as well as police. This is especially key when the road environment limits the suite of enforcement options available, such as in tunnels and on motorways. The NSW Centre for Road Safety will work with other areas of Transport to embed this process.

5.2 Approval and removal of locations

New locations will be determined by the NSW Centre for Road Safety in consultation with the Transport metropolitan and regional road safety teams, and NSW Police. Locations will be approved within Transport.

Occasionally, some locations where enforcement takes place may become unsuitable for enforcement. This could be due to factors such as road engineering treatments to improve safety, road by-passes, policy or operational changes, or the site/route-based enforcement aimed at addressing a particular high-risk location is no longer effectively doing so. This will be determined by Transport informed by continued monitoring of locations.

6 Action Area – Engaging the community and fostering support for automated enforcement

Community support for automated enforcement and understanding its role in improving safety are key in helping to achieve compliance and improve attitudes and behaviour among motorists. While over 99 per cent of vehicles passing existing enforcement cameras are complying with the road rules and are not infringed^{24,25}, more can be done to educate the community on the role of these cameras in improving safety. A core component of this Strategy will be to ensure road users are aware of the rationale for automated enforcement and its benefits in reducing road trauma. This will be achieved through transparency and continued education and engagement.

6.1 Reinforcing safe behaviours

Behaviour change is best achieved through a mix of approaches and forcing a change in behaviour – such as through enforcement – is only one of these. Along with others such as education and training which are widely used in road safety, incentivisation is a key method²⁶. It is therefore important to not only enforce illegal and risky behaviour, but to reward good behaviour and reinforce it. This is particularly relevant given the large majority of motorists who comply with the road rules and are not infringed.

Currently in NSW, fully licenced motorists can receive a half price licence if they have had no demerit points recorded over the last five years. This rewards good behaviour, rather than punishing bad behaviour, however the reward

is not an immediate or regular one. Studies into human behaviour show that given the choice, people prefer a smaller reward sooner over a larger reward later²⁷. Other existing benefits for positive road behaviours are somewhat ‘unseen’, such as not having to pay fines and lower insurance costs.

This Strategy proposes the exploration of any additional or more immediate, positive rewards or reminders that may help motivate and reinforce safe behaviours on the road.

6.2 The varied use of automated enforcement in enhancing safety

As outlined in this Strategy, automated enforcement can be used in different ways to improve safety.

NSW’s existing program of automated enforcement is used for both localised and network wide deterrence, with differing levels of visibility. The NSW Centre for Road Safety will work to increase community understanding of, and support for, the different ways automated enforcement is used, as well as less visible operations, in improving safety. This aims to foster support and acceptance for automated enforcement by reassuring the community that while some enforcement may not be highly visible, or located at a known ‘black spot’, it still plays a key role in reducing road trauma.

6.3 The role of signage and publication of locations

Best practice evidence, outlined earlier, highlights that the degree to which automated enforcement is highly visible on the network is best determined by its aim. High visibility operations are more successful to address high risk locations (such as site or route-based enforcement), as they provide motorists with the opportunity to modify their behaviour if necessary. Covert operations are more useful when aiming to achieve network wide compliance through the unpredictability of anytime, anywhere enforcement.

As an example, independent modelling²⁸ found that, all other things being equal, if the Mobile Phone Detection Camera locations were marked with advance warning signs, it would take five years to achieve the same safety benefits that a program without advance warning signs would achieve in one year.

The visibility of automated enforcement including signage and the publication of the site-specific enforcement locations will therefore depend on the purpose of the enforcement. In line with the automated enforcement principles, fixed, red-light and average speed cameras use advance signage immediately before the point of enforcement to help improve compliance at those specific, risky locations and reduce the likelihood of a crash. Safe-T-Cam also uses advance signage to provide drivers with the opportunity to modify their behaviour if necessary and reduce the likelihood of a crash, particularly related to fatigue. Site-specific details of these cameras are published.

From January 2023, mobile speed cameras will also have warning signage before and after the vehicle. This, along with fixed signs across the network, is intended to raise driver awareness that speed enforcement occurs on NSW roads, to reduce speeding more generally across the network.

For Mobile Phone and Seatbelt Detection Cameras, advance warning signage located immediately before the point of enforcement is not used to ensure unpredictability and help achieve compliance across the whole road network.

For both mobile speed cameras and Mobile Phone and Seatbelt Detection Cameras, site-specific details of enforcement will not be published in order to increase unpredictability and help achieve network wide deterrence. Other advisory signage will be used to raise public awareness of these automated enforcement programs, such as the use of permanent signage or Variable Message Signs (VMS) placed across the road network. In addition, the broad areas of enforcement may be made publicly available if it does not compromise the likely deterrent effect, such as the continued publication of the broad locations of mobile speed camera enforcement.

Where automated enforcement is not highly visible, other measures will also be used to ensure the public are aware of the enforcement. This includes public education campaigns; information on the NSW Centre for Road Safety website; media, including social media; as well as warning letter periods prior to infringing drivers.

6.4 Redirecting fine revenue to fund road safety improvements

All money obtained from fines through camera detected speeding, red-light, mobile phone use and seatbelt (when commenced) offences will continue to be invested directly back into road safety through the Community Road Safety Fund (the Fund), as required in legislation. This money directly funds measures in the 2026 Road Safety Action Plan such as road safety infrastructure upgrades, road safety education programs, public education campaigns, additional enforcement by NSW Police and other significant road safety initiatives.

The use and expenditure of the Fund will continue to be included in the annual NSW Road Safety Progress reports. Transport will also work to increase community awareness of the Fund through enhanced information and communication outlining where the funds are invested throughout the year.

6.5 Ongoing community research

Regular research with the NSW community about their attitudes and behaviours toward automated enforcement is conducted by Transport. Findings show high support for camera enforcement, with 63 per cent up to almost 80 per cent of a representative sample of NSW residents supporting the different camera types²⁹, and almost two thirds (65 per cent) of respondents agreeing that using existing cameras to enforce other road rule offences would help to improve road safety³⁰.

Research among the community will continue as part of this Strategy. These attitudes and behaviours are important to understand in order to direct communications with the public and help inform decisions around any new or expanded technologies or other behavioural measures.

6.6 Continued community input

Each year on average, almost 1,000 nominations for speed cameras are received through the Safer Roads website³¹. The NSW Centre for Road Safety will continue to accept nominations from the public for speed camera locations and consider expanding this to automated enforcement that detects other behaviours where relevant. All nominations will continue to be reviewed against the selection criteria.

6.7 Public education campaigns

Enforcement works best in combination with public education to achieve maximum road safety results. Educating road users about the risks of unsafe driving behaviours and informing them about enforcement, gives road users the opportunity to modify their behaviour, and in turn fewer are infringed for unlawful driving behaviours.

The NSW Centre for Road Safety will continue to develop public education campaigns on the road safety issues being addressed via automated enforcement and encourage safer behaviour by road users. All campaigns will follow requirements of the *Government Advertising Act 2011*, as well as associated regulations and guidelines.

Extensive public education will also be used to ensure the community is aware of any new or expanded automated enforcement, being used across NSW – particularly if any additional road rules will be enforced.

7 Action Area – Ensuring fair enforcement

7.1 Automated enforcement policies

There are a range of ways in which automated enforcement in NSW is managed and monitored to ensure it is fair for road users, and this will continue. Measures to ensure fairness will include the following, with specific, detailed policies developed where relevant:

- **Placement of enforcement locations** – selection of enforcement locations will use the criteria outlined in Section 5 of this Strategy. This includes consideration of the location of other automated enforcement that address the same behaviour, to ensure they are located at a fair distance and motorists are not penalised repeatedly for the same occasion of offending.
- **Multiple penalties from one camera/ technology** – individual cameras that enforce multiple behaviours present the potential for a motorist to lose their licence from one occasion. This will be assessed as part of the ongoing monitoring of enforcement programs, to determine if further consideration of the impact of this is required.
- **Enforcement in warning mode** – any new enforcement program deployed will remain in warning mode for a period. This means motorists who are detected by the camera are sent a letter warning them about the enforcement, rather than a fine. This gives motorists time to modify their behaviour before they are penalised. Motorists who display extreme behaviours, such as excessive speeding, will continue to be penalised.
- **Images of offence on infringement notice** – research has shown that the greatest factor in a motorist considering a penalty to be fair, and more willing to pay a fine is to include a photographic image on the notice, which captures them doing the wrong thing³². This is viewed as proof that the technology can be trusted and therefore a fair penalty. It is currently possible to view a photograph of the offence on the Revenue NSW website. Transport will work with Revenue NSW to determine the suitability of including offence images on infringement notices, including reviewing additional research, assessing privacy implications and thoroughly testing the technology.
- **Electronic delivery of infringement notices** – Deterrence Theory suggests that the swifter the penalty, the more effective it is in deterring the behaviour³³. The electronic delivery of an infringement notice, or an electronic notification that the motorist will receive one, shortens the time between committing a driving offence and receiving a penalty. Transport will work with Revenue NSW and Service NSW to expand the electronic delivery of fines and notifications, for broader implementation.
- **Accurate camera technology and systems** – as is currently the case, all cameras, technology and measurement systems will be checked frequently – consistent with legislation. Fines will only be issued where it can be proven a behaviour occurred, taking into account the limits of measurement error of the device.
- **Motorist ability to review penalty** – road users who receive a fine will continue to be able to challenge the penalty and have it reviewed if they believe it to be false, by requesting a review of the penalty through Service NSW or Revenue NSW. Transport will work with both Revenue NSW and Service NSW to appraise the current process to ensure it is straightforward and transparent.

- **Measures to assist those disadvantaged**
 - existing measures to help motorists who receive an infringement and may have difficulty paying the fine will remain in place. These include the ability to have the penalty reviewed, and where eligible, payment plans or orders to complete unpaid work, courses or treatments in place of payment.

7.2 Legislative frameworks

For any new or improved automated enforcement that is proposed, legislation will be reviewed to ensure the appropriate frameworks are in place.

Legislation should be an option to support industry innovation, where there is a demonstrated road safety need. For example, for camera-based detection of mobile phone use offences, legislation was amended to enable cameras (that met robust standards) to be approved and used to detect mobile phone use offences before the enforcement technology was fully available. This sent a strong signal to industry that NSW was open to developing a solution in partnership to tackle illegal use of mobile phones while driving. The specific device was approved under the legislation, but only once the technology and systems were developed and successfully tested.

Before any new automated enforcement becomes operational, policy, privacy and governance measures, including risk management and data protection, should also be in place to support the program. This ensures the consistency and security of enforcement and builds further trust in the enforcement.

8 Action Area – Evaluating the Automated Enforcement Strategy

A core stage in any strategy is evaluation; to determine if it is successful in achieving its aims and identify ways in which it can be improved. Evaluation, performance monitoring and subsequent review of the Strategy are therefore key to ensuring its success and ongoing improvement.

8.1 Evaluation of the Strategy

An independent evaluation of the Strategy and its enforcement programs will be undertaken. This will consider whether the Strategy and its enforcement programs have been implemented as planned, how well the Strategy is working, whether it is achieving its aims, and what impact it is having on road safety. It will also consider the impact of automated enforcement on the court system. The results of the evaluation will be used to guide the future shape of the Strategy.

8.2 Monitoring the performance of automated enforcement programs

In line with the Auditor General's recommendation, Transport will continue to monitor the effectiveness of individual camera programs and make this information publicly available—in replacement of its annual review of speed camera programs.

8.3 Review of the Strategy

This Strategy will be reviewed in 2026, to determine if it remains suitable for use. A recommendation will be made on whether the Strategy should continue to exist in its current form; remain with some modifications; or be replaced in full.

9 Summary of actions

The actions to be delivered by the Strategy for road safety are outlined below. Some actions will be ongoing to ensure continuous improvement in automated enforcement throughout the life of the Strategy.

Table 1. NSW Automated Enforcement Strategy - key areas and actions

Key Area	Actions
Automated enforcement solutions	<ul style="list-style-type: none"> • Actively explore new and improved automated enforcement solutions considering: <ul style="list-style-type: none"> – Enhancement of existing technology and policies; – Expansion of the capabilities of existing enforcement technology to detect additional risky behaviours; and – Innovation, including seeking out new solutions. • Establish an expert advisory group to provide advice on automated enforcement developments. • Identify and implement the most appropriate solution for speed enforcement in road work zones.
Enforcement locations	<ul style="list-style-type: none"> • Use the criteria outlined in this Strategy for selecting locations for automated enforcement, and make this publicly available. • Continue to allow the community to nominate locations for speed and red-light cameras, along with road network managers (including local councils) and NSW Police for all camera types. • Integrate automated enforcement into road planning and design, and upgrades of key routes.
Communication and education	<ul style="list-style-type: none"> • Engage the community to increase understanding of, and support for, the different ways automated enforcement is used in NSW to improve safety, to foster greater support and acceptance. • Increase community awareness of the Community Road Safety Fund through enhanced information and communication, outlining where the funds are invested throughout the year. • Continue to publish the locations of site and route based automated enforcement designed to address high risk locations, as well as the broad locations of mobile speed camera enforcement. • Consider extending public nominations for locations for automated enforcement, beyond speed and red-light cameras. • Develop public education campaigns to support any new, expanded or enhanced automated enforcement.

Key Area	Actions
Ensuring fair enforcement	<ul style="list-style-type: none"> <li data-bbox="635 371 1441 439">• Explore additional positive rewards or reminders for motorists to help motivate and reinforce safe road behaviours. <li data-bbox="635 450 1441 551">• Review existing penalty related policies and develop new policies where relevant, to ensure fair and transparent enforcement processes. <li data-bbox="635 562 1441 629">• Work with Revenue NSW to determine the suitability of including the relevant offence image on infringement notices. <li data-bbox="635 640 1441 741">• Work with Revenue NSW and Service NSW to expand the electronic delivery of infringements, and notifications of infringements, for broader implementation. <li data-bbox="635 752 1441 853">• Work with Revenue NSW and Service NSW to appraise the current process for requesting a review of an infringement to ensure it is straightforward and transparent.
Research and evaluation	<ul style="list-style-type: none"> <li data-bbox="635 871 1441 938">• Continue to monitor community attitudes toward automated enforcement. <li data-bbox="635 949 1441 1016">• Complete an evaluation of the Strategy and its enforcement programs. <li data-bbox="635 1028 1441 1095">• Continue to monitor the effectiveness of individual camera programs and make this information publicly available.

Endnotes

- 1 Kantar Colmar Brunton (2021) December results. Community Satisfaction with Camera Enforcement. Unpublished report for Transport for NSW
- 2 Ipsos Public Affairs (2021). 2026 Road Safety Action Plan: Community Attitudes. Prepared for the Centre for Road Safety, Transport for NSW
- 3 NSW Centre for Road Safety crash data, three year period 2019-2021, provisional fatalities for 2021, preliminary serious injuries for the period July 2019- June 2021
- 4 Based on the Inclusive Willingness to Pay methodology. Willingness to Pay values represent the amount people are willing to pay to avoid road death or serious injury. Inclusive Willingness to Pay represents the Willingness to Pay costs as well as the cost to society due to the crash such as vehicle, emergency and other costs. The methodology is in accordance with 'Transport for NSW Economic Parameter Values' June 2020, NSW Government, Transport for NSW.
- 5 NSW Centre for Road Safety crash data, three year period 2018-2020
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- 14 Mobile speed camera operations in other Australian jurisdictions: Research Report (2020). <https://roadsafety.transport.nsw.gov.au/downloads/msc-better-practice-review-research-report.pdf>
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- 16 New South Wales Auditor-General's Report (2011) Performance Audit. Improving Road Safety: Speed Cameras. Roads and Traffic Authority
- 17 <https://www.parifex.com/en/>; <https://redflex.com/solution/halo/>;
- 18 <https://www.jenoptik.com/products/road-safety/>
- 19 <https://redflex.com/solution/halo/>
- 20 <https://www.jenoptik.com/products/road-safety/speed-enforcement>
- 21 <https://redflex.com/solutions/lane-enforcement>; <https://roadsafetygb.org.uk/news/camera-enforcement-of-red-x-offences-begins/>
- 22 <https://www.antai.gouv.fr/controle-automatise?lang=en>
- 23 <https://www.transport.nsw.gov.au/industry/nsw-movement-and-place-framework>
- 24 Speed Camera Programs: 2020 Annual Review. Transport for NSW, Centre for Road Safety. <https://roadsafety.transport.nsw.gov.au/downloads/2020-speed-camera-review.pdf>
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