TRANSPORT SCOTLAND
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# Strategic Road Safety Plan 2016

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# 1. Introduction

The Strategic Road Safety Plan sets out how Transport Scotland delivers road safety on the trunk road network. The first Strategic Road Safety Plan was published in 2007 and supported delivery of the Road Safety Framework. The current Framework has reached the mid-point of its 10 year period and has been reviewed in its own right. We have taken the opportunity to update the Road Safety Plan and to refocus our work on further reducing the numbers of accidents and casualties on the Trunk Road network.

This refreshed Plan reinforces our use of a Safe System approach within the road transport system. This approach is centred around the premise that death and injury is unacceptable and that they are avoidable. The 2007 Strategic Road Safety Plan encompassed many of the elements of the Safe System approach. This refresh builds upon that approach to more clearly address risk mitigation and focus particular efforts on addressing the safety of vulnerable road users.

It includes an Action Plan aligned with the five pillars of the Safe System approach and identifies how the work of Transport Scotland's Strategic Road Safety Unit will contribute to the Government's casualty reduction targets for 2020. The Action Plan makes best use of our knowledge of both the trunk road network and how to most effectively reduce casualties. It highlights the need to remove risk and prioritise initiatives aimed at preventing accidents and mitigating the effects when accidents do occur. The plan shows how we are harnessing intelligent solutions, demonstrating innovation and working with partners, while sharing best practice with road authorities across Scotland and internationally.

Our national road safety strategy, *Scotland's Road Safety Framework to 2020,* sets ambitious targets for casualty reductions and outlines a partnership approach to achieve them. The Framework emphasises our conviction that one life lost on Scotland's roads is one too many and sets out the shared vision for:

*"A steady reduction in the numbers of those killed and those seriously injured, with the ultimate vision of a future where no one is killed on Scotland's roads, and the injury rate is much reduced."*

The Framework Review has identified that the Safe System approach should be formally adopted in progressing towards 2020 targets.

The Framework is our contribution to the United Nations Sustainable Development Goals to halve road deaths globally by 2020. This is a significant commitment to road safety and drives the road safety ambitions of the World Health Organisation (WHO) and the Organisation for Economic Co-operation and Development (OECD). It also aligns with the Decade of Action for Road Safety 2011-2020 announced by the United Nations General Assembly in 2010. The Global Plan adopts a Safe System approach within five pillars of action and was developed to assist governments and other national stakeholders to develop national and local road safety activities, while simultaneously providing a framework for coordinating activities at regional and global levels.

## 2. Background

Road accidents not only have a significant and traumatic effect on the friends and families of those involved, but also have a major impact on Scottish society as a whole. *Reported Road Casualties Scotland (2014)* estimate that the total cost of injury accidents in Scotland was around £1.19 billion for that year alone. Although Scotland's roads are amongst the safest in the world, and are becoming safer, 1,899 people were killed or seriously injured on Scotland's roads in 2014, with 363 of these casualties a result of accidents on the trunk road network.[1]

Working within the legislative framework and in accordance with wider Scottish Government policy, Transport Scotland delivers a safer trunk road network through managing a prioritised safety engineering programme that applies innovation and best available practice. We aim to reduce the number of casualties on Scotland's trunk roads through Transport Scotland's implementation of a proactive approach to road safety engineering in accordance with the vision for transport as set out in *Scotland's National Transport Strategy:*

"An accessible Scotland with safe, integrated and reliable transport that supports economic growth, provides opportunities for all and is easy to use; a transport system that meets everyone's needs, respects our environment and contributes to health; services recognised internationally for quality, technology and innovation, and for effective and well-maintained networks; a culture where transport providers and planners respond to the changing needs of businesses, communities and users, and where one ticket will get you anywhere".

The application of a Safe Systems approach recognises that accidents happen and seeks both to reduce their number and the severity of those that do take place. Transport Scotland recognises that optimum casualty reduction can best be achieved through working in partnership with organisations sharing responsibility for road safety, particularly those involved in education and enforcement. This is at the heart of our approach in the *Road Safety Framework* and our actions towards a Safe Systems approach to road safety.

Reducing the number of casualties as a consequence of the delivery of this plan will align with the Scottish Government's objectives of a healthier, safer, and wealthier nation. This takes into account the reduced costs to society from a fall in casualties, and the greater personal wellbeing and safety as a result of the reduction in risk for the members of our society.

[1] Footnote to RRCS

## 3. Scotland's National Transport Strategy

The National Transport Strategy (NTS) sets the long term vision for our transport policies. It was published in 2006 after the Scottish Government consulted the public, interested individuals and a wide range of organisations on their views for the future of transport in Scotland. The NTS was refreshed in 2015 and it was recommended that a fuller, collaborative review of the NTS in the next Scottish Parliamentary term.

The NTS provides the framework for enhancing our transport system, in response to the main transport challenges that Scotland faces, which in turn contributes to improvement in our economic, environmental and social performance. In particular, the three Key Strategic Outcomes continue to be used as the guiding principles at national, regional and local level when developing strategy and prioritising resources.

The NTS introduced three key strategic outcomes,

- Improved journey times and connections between our cities and towns and our global markets to tackle congestion and lack of integration and connections in transport
- Reduced emissions to tackle climate change, air quality, and health improvement; and
- Improved quality, accessibility and affordability of transport, to give choice of public transport, better quality services and value for money, and alternative travel by car

These outcomes feed directly into the five Strategic Objectives, providing a basis on which to develop policies, decide how to invest resources to maximum effect, and measure the effect of our work. These offer clear links to safety.

The Strategic objectives are;

- promote economic growth by building, enhancing managing and maintaining transport services, infrastructure and networks to maximise their efficiency;

- promote social inclusion by connecting remote and disadvantaged communities and increasing the accessibility of the transport network;

- protect our environment and improve health by building and investing in public transport and other types of efficient and sustainable transport which minimise emissions and consumption of resources and energy;

- improve safety of journeys by reducing accidents and enhancing the personal safety of pedestrians, drivers, passengers and staff; and

- improve integration by making journey planning and ticketing easier

## 4. Transport Scotland

Transport Scotland is the national transport agency for Scotland, supports the Government's purpose of creating a more successful country, with opportunities for all of Scotland to flourish, through increasing sustainable economic growth. Connectivity and safety are central to achieving this, and ensuring that Scotland is equipped for the challenges of the next decade and beyond.

Transport Scotland has a number of responsibilities, including the maintenance, improvement and operation of the nation's rail network, support for lifeline ferry and air services, operation of the national Concessionary Fare scheme, the promotion of active travel and work both to reduce and mitigate the impacts of climate change in the transport system.

A key responsibility is the management and maintenance of the trunk road network on behalf of Scottish Ministers. With a gross asset value of approximately £20 billion, the trunk road network is Ministers' single biggest asset, and plays an essential part in growing our economy and enabling our most dynamic growth industries. It is also crucial in connecting our cities and rural communities, as well as providing strategic links to our ports and islands.

Transport Scotland is responsible for ensuring that the trunk road network is managed as effectively, efficiently and safely as possible. Our national road safety strategy, *Scotland's Road Safety Framework to 2020,* sets out our shared vision for road safety in Scotland, underpinned by Scotland's first ever road casualty targets:

- **40% reduction in fatalities,**
- **55% reduction in serious injuries,**
- **50% reduction in fatal child casualties; 65% reduction in children seriously injured, and**
- **10% reduction in the slight casualty rate.**[2]

The Framework's strategic aims are:

- Helping to join up the strands of road safety across Scotland's delivery partners, so as to work more effectively;
- Reinforcing the message of all road users' responsibility for their own safety and that of others;
- Reducing the tolerance of risk on the roads; and
- Upholding the rights of all road users to expect safe road travel.

The Framework promotes a collaborative approach, supported and delivered by partners in road safety across Scotland including Police Scotland, Local Authorities, the Scottish Fire and Rescue Service, the NHS, the Scottish Ambulance Service and a number of other organisations.

[2] Needs a footnote to the Framework doc and context of targets iro baseline and to 2020

A range of headline policies have been rolled out in Scotland since the Framework's launch in 2009, including: a reduction in the drink-drive limit; publication of guidance to help local authorities implement 20 mph limits and zones; devolution of powers to the Scottish Parliament for school transport safety improvements; and a range of high-profile publicity campaigns and educational initiatives.

However, in order to ensure the Framework remains robust and flexible to emerging needs, and to assess progress, identify priorities and recommend an approach towards 2020, a mid-term review of the Framework was undertaken in 2015/16.[3] The Review established that a fundamental re-working of the Framework was not required. Rather, there should be continued and ongoing focus and activity on all the existing priorities and commitments, with a sharpened focus on three identified priority areas:

- Speed including motorcyclists
- Pre-drivers, Drivers aged 17-25, and Older Drivers
- Cyclists and Pedestrians

## Innovations and use of technology

Transport Scotland has a strong record in promoting innovation and using emerging technologies to reduce casualties and positively influence driver behaviour. By implementing cutting-edge solutions and bringing together best practice we have raised standards and shared knowledge amongst road safety practitioners all over the world.

These innovations have varied from route strategies treatments to single site installations to address specific issues.

Transport Scotland's commitment to innovate and develop best practice can be evidenced through their involvement with the A9 Safety Group, which has been responsible for fundamental change in driver behaviour along the route. The harnessing of proven technology and developing it for use along a 220 km corridor between Dunblane and Inverness, marks a first in Europe for this type of strategy, now being recognised as a benchmark for best practice in this field. Year one results has seen the number of fatal and serious collisions drop by almost 59%, with fatal and serious casualties down by over 64%. The number of vehicles travelling at excess speed (more than 10 mph above the speed limit) remains low, with the figures indicating a sustained reduction of 95% (this equates to a reduction from 1 in 10 vehicles to 1 in 250); The number of vehicles detected by the system which were considered by Police Scotland for further action remains extremely low at less than 0.03% of the overall volume of vehicles using the route.

We have harnessed intelligent solutions through the implementation of Intelligent Road Studs at Sheriffhall Roundabout on the A720 Trunk Road. The design of the installation is such that illumination of the studs is co-ordinated with the traffic signal phasing. Essentially, when the A720 City Bypass through movements are signalled

[3] Footnote to the review document

green, the studs are activated. This is the first design of its kind in Britain and results in drivers being presented with a clear, illuminated path through the roundabout. After surveys have been undertaken and it has shown a 50% reduction in people encroaching lanes whilst negotiating the roundabout.

We have installed the first set of speed activated traffic signals in Scotland on the A78 in Fairlie, Ayrshire. To address driver behaviour, we installed a simple a scheme that uses wireless advance speed detection, recognising vehicles travelling too fast and then switching the junction lights to red, forcing the vehicle to stop and wait. The installation has been well received by the community.

We look continuously at best practice elsewhere to identify potential solutions and bring new thinking and processes that can make Scotland's roads safer.

## 5. Managing a safe network

Preventing death and serious injury in road accidents requires a systematic, planned response. Transport Scotland achieve this by targeting better road safety outcomes, through investing in an evidence-based approach to intervention in accordance with *Scotland's Road Safety Framework to 2020*.

The Safe System requires strong leadership and this begins at the highest level of office, with Scottish Ministers demonstrating commitment and governance in reducing the risks on our roads. The Minister for Transport chairs the Strategic Partnership Board and is in regular contact with key delivery partners, whilst also displaying accountability through media and public statements such as those on the annual *Reported Road Casualties Scotland* statistics. Accountability is held by a number of delivery partners and organisations critical to the delivery of our vision.

Transport Scotland is responsible for the operation and maintenance of Scotland's trunk road network, which includes 3,429 kilometres of motorways and trunk roads 1,874 bridges including major estuarial crossings of strategic importance, 2,347 other structures, and over 6,400 culverts. In addition, there are 4,894 kilometres of barriers and over 109,000 roadsigns on the trunk road network along with over 20,000 lighting columns, all of which have a role to play in providing information or improving localised safety for road users.

Although the trunk road network represents around 6% of the total Scottish road network, it carries 35% of all traffic and 60% of heavy goods vehicles, and each year on average around 16% of injury accidents occur on the trunk road network.

The Scottish trunk road network is estimated to have a construction value of £20 billion (April 2015 valuation), with an annual upkeep cost of approximately £160 million.

The bulk of the trunk road network is managed and maintained by operating companies contracted by Transport Scotland. The network is separated into five areas - the North West; North East; South West; South East and Forth Bridges Unit. There are also individual 'Design, Build, Finance and Operate' (DBFO) contracts for the: M6; M77; M80; M8; and AWPR.

The operation of the trunk road network covers a broad spectrum of duties that influence efficiency and road safety on the network; these include: minor improvement schemes; maintenance schemes; winter service; incident management; driver information and intelligent transport systems; real time journey information and variable message signs; road safety schemes and safety audits overseen by the dedicated Strategic Road Safety team. The management and maintenance of individual routes is directed by Area Managers.

A core element underpinning all activities within Transport Scotland is road safety and how that may be delivered within the range of activities it undertakes. Engineers and road safety practitioners from all disciplines are united in their efforts but are tasked with considering safety in their respective roles within the Safe System. As a result there are a number of methods outwith site-specific investigations and

mitigations which seek to provide safe and improved driving conditions along routes or within specific areas. Properly integrating these methods is key to the successful delivery of a Safe System.

The Area Managers are tasked with the day-to-day management of the routes. They develop strategies for phased minor improvements and upgrades to the layout or capacity provision, as well as considering such items as lay-by provision or signing upgrades. Such items may have to be programmed over a number of years. Consideration is given, therefore, to agreed optimum improvements which can be integrated into forward planning proposals as finances allow.

**Strategic Road Safety**

The Strategic Road Safety team is the specialist accident investigation and prevention branch within Transport Scotland. Managing a comprehensive annual road safety programme, the team develops and implements a range of initiatives and projects directed at achieving our casualty reduction targets for 2020.

The team is responsible for achieving this objective by delivering effective and efficient engineering measures that support a Safe System approach to road safety. The actions include making best use of both evidence from our network and knowledge of the factors that contribute to accidents amongst all of our road users, including vehicle drivers and occupants, cyclists, pedestrians or other groups. This Plan highlights the need to remove risk, particularly for our more vulnerable road users, and prioritise initiatives aimed at preventing accidents while reducing the severity of casualties when they do occur.

The team's responsibilities are to:

- monitor the road safety performance of the trunk road network;
- manage the annual road safety programme for the trunk road network;
- deliver a programme of safety inspections and risk removal;
- promote professionalism and high standards amongst road safety engineers;
- work across a Safe System with enforcement and education stakeholders;
- partner with the Scottish Safety Camera Programme;
- instigate debate on best practice and improved standards;
- harness developments in Intelligent Transport Systems for road safety solutions;
- publish results of pilot studies and disseminate experience; and
- commission road safety research and publish findings.

Continued development and innovation is required to maintain our status as one of the safest in the world. New methods and strategies are being taken forward to ensure that accident and casualty numbers are further reduced. The less concentrated nature of today's accidents requires greater emphasis on the proactive removal of risk.

The Scottish Government contributes positively to the debate on best practice and to significant research studies. It is becoming increasingly important to find new

solutions. Through the Scottish Road Research Board, Transport Scotland is committed to developing this approach and engaging positively with all road authorities, Police Scotland, education groups and Regional Transport Partnerships in order to ensure that resources are used effectively and our combined efforts are optimised.

There remains a need to understand the dynamics behind why accidents occur and to use the evidence to produce future safety strategies. Transport Scotland is continuing to improve the analysis of trunk road accidents and take forward research on emerging safety issues.

**Safety in network operations**

Traffic Scotland forms part of the Network Operator Role within Transport Scotland, alongside the Strategic Road Safety Unit and the Development Management team, and it is the Network Operations team's activity that helps to deliver safe and reliable journeys.

Network Operations manages the Traffic Scotland Service which uses a wide range of Intelligent Transport Systems to deliver its three core functions of monitoring, controlling, and informing across Scotland's trunk road network, 24 hours a day, 365 days a year. Traffic Scotland monitors and communicates information on the roughly 17,000 incidents that take place on the network annually, including breakdowns, accidents, and severe weather events, thereby helping to minimise the impact of these incidents on the users of the network. They actively work to improve safety and security for travellers; in 2014, Traffic Scotland answered over 2,500 emergency roadside telephone calls, offering support and assistance to drivers facing difficulty on the trunk road network.

The service is based in the Traffic Scotland National Control Centre in South Queensferry. This innovative building, which opened in April 2013, provides state of the art facilities to support collaborative working between Traffic Scotland, Police Scotland, the Met Office and our Trunk Road Operating Companies. The building also houses Transport Resilience functions including the Multi-Agency Response Team (MART), which has improved integration and communication between Operational Partners, and enhanced our overall response to major incidents and extreme weather events.

Through utilising automatic queue detection and lane control signalling systems in place on sections of our motorway network, the risk of secondary incidents is minimised. Variable Message Signs (VMS) in overhead gantries and roadside signs convey up-to-date information on current incidents to approaching motorists. This information is supplemented by a wide range of travel information services including social media and public radio broadcasts. In addition, Traffic Scotland supports various year-round road safety campaigns through the display of appropriate messaging on the variable message signs on the network, including 'Don't Drink and Drive' to 'Don't Risk It'. Traffic Scotland takes a more targeted approach to background message legends on the VMS to try and address specific road safety concerns on particular routes on our network.

The Network Operator role also includes management of the Trunk Road Incident Support Service (TRISS), which reduces congestion and improves safety on the network by providing a bespoke service to improve response times to incidents such as emergencies, debris removal and assistance with broken-down vehicles. The TRISS covers the busiest sections of the trunk road network, including routes in and around Glasgow, Edinburgh and Inverness.

Network Operations also considers ways to improve the safe operation of the trunk road network, including winter maintenance, flooding, high wind management and safer diversion routes.

**Safety through maintenance**

Maintaining the trunk road network in Scotland is a vital part of ensuring the safety of the network. Each element of the maintenance regime plays an important part in providing a safe driving environment. Cyclical reviews of the road surface, infrastructure features, and foliage cutbacks, as well as an annual winter service programme, are used to ensure that potential hazards are identified.

Each Operating Company carries out routine inspections on all routes on the trunk road network. These inspections identify any defects on the carriageways, which are then programmed for repair based on severity, with repairs undertaken accordingly. Inspections are also carried out on road lighting, traffic signals, safety barriers, gantries, bridges and signs to ensure that any defects are identified and addressed as appropriate.

The trunk road surface undergoes a non-destructive pavement survey every year. This process allows maintenance activities to be planned to optimise the design life of the road surface and ensure that skid resistance values of the carriageways are maintained throughout the network.

The network is constantly under pressure due to changes in the volume and type of traffic and requires Transport Scotland to provide solutions in order to meet current and future challenges. Network Maintenance continually looks to improve the trunk road network by installing engineering measures to provide a safer network. This solution-led approach is adopted in all types of maintenance works, including routine and cyclical maintenance operations, as well as larger structural/carriageway schemes.

Each proposed scheme is economically assessed and consideration is given to such issues as safety, environment, economy, integration, social inclusion and accessibility. All these factors are considered in prioritising schemes; schemes invariably provide significant economic savings through casualty reduction.

As the trunk road authority in Scotland, Transport Scotland is required by legislation to take such steps as it considers reasonable to prevent snow and ice endangering the safe passage of pedestrians and vehicles over public roads. Transport Scotland discharges this duty through contracts with Operating Companies who ensure the trunk road network is safe, efficient and well managed.

## Safety through transport resilience

Transport Scotland has to respond to issues which either happen or impact on the trunk road network. These can range from individual road traffic incidents through large-scale events like severe weather to planned internationally recognised events.

Transport Resilience supports safety by considering the wider immediate impacts which occur as a result of traffic incidents. They work with the police, other emergency responders and its trunk road operating companies to ensure quick and effective reopening, and where necessary keep Scottish Ministers informed of the consequences.

It also sets out a programme to improve the winter service year on year, through new contact specifications and operating company training, better decision making by greater use of technology such as weather stations feeding back actual route conditions and research into road treatment products. It's all done with the aim of managing safety, ensuring roads stay open longer and reopen as soon as possible if closed.

Scotland's geographic location means severe weather is a regular and major challenge and Transport Scotland realises that such episodes require wider and deeper collaboration between responders. The Traffic Scotland National Control Centre also houses the Multi-Agency Response Team (MART) and Transport Resilience functions and these have improved integration and communication between operational partners including Police Scotland, Met Office, and road and rail operating companies to enhance our overall response and recovery from such events. It also provides the transport element to wider Scottish Government and Ministerial support in such circumstances.

The MART arrangements provide a platform to also coordinate major, planned events which impact the network such as the 2014 Commonwealth Games and Ryder Cup, the 2016 British Open golf, the 2017 Solheim Cup or 2018 European Sports Championships. These have international profile and expectations and require much planning and coordination. Underpinning this is a recognition that regular travel and business needs to continue and overall safe network operation is still paramount.

## 6. Safety from new infrastructure

The Major Transport and Infrastructure Projects in Scotland (MTRIPS) Directorate within Transport Scotland informs future investment decisions through expert transport modelling, appraisal and research, while ensuring the committed programme for trunk road investment is delivered in line with strategic priorities.

MTRIPS also has responsibility for the assessment, promotion, preparation, design and construction of major road schemes across the trunk road network. Safety is always a primary consideration, regardless of the principal motivation for a scheme. Major investments in our infrastructure provide an essential contribution to reducing casualties on our network. Route upgrading carries inherent safety benefits. For example, relative to traffic flows, dual carriageways typically have a better safety record than single carriageways. In other locations where traffic flows are lighter and wholesale upgrading would not be justified, improvements are carried out to provide safer overtaking opportunities than currently exist.

Trunk road schemes vary in type and size, and range from junction improvements to major route upgrading and the provision of new routes. A good example is commitment to dual the A9 between Perth and Inverness by 2025, a route that has continually had a number of people being killed or seriously injured year on year. There is also a commitment to upgrade the A96 between Aberdeen and Inverness to dual carriageway.

The upgrading of the A8 between Newhouse and Baillieston to Motorway standard will finalise the Motorway link of the M8 Motorway between Edinburgh and Glasgow, one of the busiest road in Scotland.

### Infrastructure investment plan

The Scottish Government's Infrastructure Investment Plan (IIP) sets out priorities for investment and a long term strategy for the development of public infrastructure in Scotland up to 2035 by sector. Investment in Scotland"s transport infrastructure will support the sustainable travel hierarchy as set out in the National Transport Strategy and Scottish Planning Policy. The projects and programmes listed within the IIP will make a significant contribution to meeting our targets and policies established for reducing accidents on the trunk road network.

The Strategic Transport Projects Review (STPR) is the framework for land-based transport interventions in Scotland and has been based on the most robust analysis and evidence available, taking the future needs of Scotland's strategic transport infrastructure into account.

These recommendations include improvements to the A720, the A737 and the A90, and are in addition to the economic benefits associated with the £1.4bn Queensferry Crossing, the £745m Aberdeen Western Peripheral Route project and the £439m M8 M73 M74 Motorway Improvements Project.

## Safety in assessment

Major schemes are assessed through Scottish Transport Appraisal Guidance (STAG) against the Government's five criteria of Economy, Environment, Safety, Accessibility and Social Inclusion and Integration. Safety, therefore, is included from the very earliest stages of the appraisal of potential transport interventions. The predicted cost of accidents is included in the economic assessment of schemes and safety has an important part to play in establishing whether or not a scheme is justified in economic terms.

A Route Action Plan (RAP) considers the future development needs of a route within its existing footprint. Engineers responsible for upgrading and improving the overall network may wish to anticipate future needs of the network as the dynamics and demands of the system evolve. Population and traffic growth are just two of the factors that may require the organisation to review how the network operates and help determine whether changes to the existing carriageway or junction types might be needed.

## Safety in design

Transport Scotland is responsible for making Scotland's trunk road network safer and accessible for all users through avoiding features that create physical and psychological barriers to travel. Our aim is to ensure that the design, construction, operation and maintenance of our trunk road infrastructure creates environments which can be used by everyone regardless of age or disability.

## Safety in construction

All improvement schemes involve the appointment of a Planning Supervisor at the outset in order to ensure that an independent and continuing safety assessment of the scheme design is implemented. A Health and Safety Plan must be considered by the duly appointed contractor to ensure that safety of construction is built-in. The safety plans are developed during the construction process and a final plan produced upon completion of the improvement.

## Climate Change

The *Climate Change (Scotland) Act 2009* set ambitious targets to reduce emissions by 42% by 2020 and by 80% by 2050. The nature and scale of the challenge was reaffirmed by the Paris Agreement United Nations Framework Convention on Climate Change in December 2015. The Agreement sets a new international context for nations' use of fossil fuels and action on climate change, including limiting global temperature rise to well below two degrees Celsius and pursuing efforts to limit the rise to 1.5 degrees Celsius.

The transition to a lower carbon economy aims to reduce the cost to the Scottish economy of climate change, while maximising opportunities to develop and export our technology innovations and knowledge as other economies make their own low carbon transition.

Longer term changes in the way we use our transport system can make a significant contribution to the climate change agenda. That is why our long term ambition is to largely decarbonise road transport by 2050, with significant progress towards this by 2030.

The *Climate Ready Scotland Scottish Climate Change Adaptation Programme* states that adaptation and resilience of the strategic transport networks to cope with the effects of climate change are vital to ensure the continued health of the Scottish economy and the safety and well-being of people and communities accessing lifeline services. One of the policies listed in the Adaptation programme is the *Scottish road network climate change study*, which considers potential trends in climate change in Scotland and how these may affect the road network. One of the most significant effects of increased rainfall is the increased risk of landslides, as evidenced on the A83 where the Scottish Government has spent a total of £48m since 2007.

**Safe active travel**

The Scottish Government is investing over £1bn annually in public transport and other sustainable transport options to encourage people out of their cars and onto public transport, walking and cycling. The Smarter Choices, Smarter Places projects, in partnership with COSLA, are also illustrating the type of actions that can be implemented at a local level in communities across Scotland. Car clubs, car hire, bike hire and other forms of shared provision are examples of lower emission travel. Continuing advances in mobile technology, engine standard technology and intelligent cars will also contribute to lowering transport emissions.

The Scottish Government has invested over £84m in active travel between 2011 and 2015. Much of the approach is set out in *Scottish Government's long term vision for Active Travel in Scotland.*

The Cycling Action Plan for Scotland (CAPS), published in 2010, stated a vision that "by 2020, 10% of all journeys taken in Scotland will be by bike". This vision evolved from extensive public consultation about barriers to increased cycle use and was developed in partnership with a wide range of interested organisations.
Progress since 2010 includes:

- an increase in the numbers of children receiving on-road cycle training, through a support package for volunteers and funding directly to local authorities;
- further extension of the national cycle network, in urban, suburban and rural areas of Scotland;
- delivery of new community cycling links in urban, suburban and rural areas of Scotland;
- a doubling of the number of I-Bike Officers working with schools;
- Cycling Scotland working with more local authorities than ever before in rolling out the 'Give Me Cycle Space' campaign;

- launch of a national ‘Mutual Respect’ awareness campaign for all road users in 2013; and

- establishment of the first Rail Cycle Hub in Scotland at Stirling Station.

A CAPS refresh was undertaken in 2013 to reinvigorate this agenda and underscore its reliance on effective partnership working among a number of delivery bodies. As a result, new CAPS initiatives include:

- an annual national cycling summit involving the Minister for Transport, Local Authority Heads of Transportation and relevant Committee Convenors to lead delivery and gauge progress; and

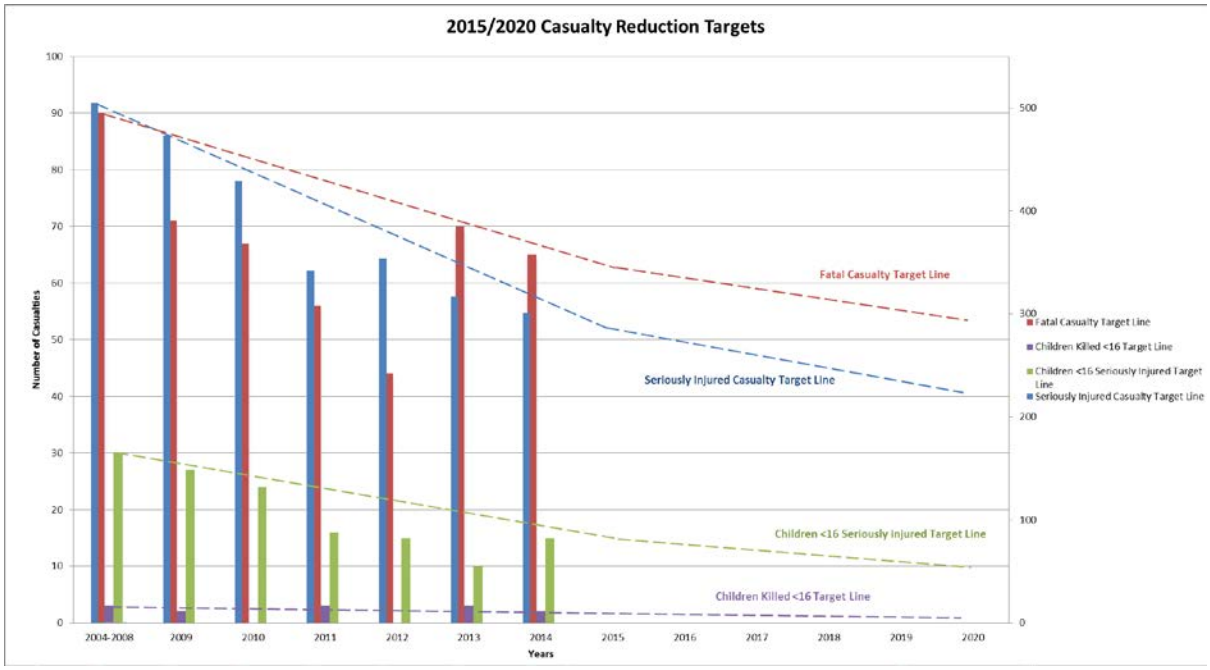
- for each local area, a strategic approach to supporting functional cycling (and active travel more broadly), mapping the appropriate infrastructure improvements required along with supporting promotional work to achieve tangible changes in travel choices.

# 7. Analysis of accidents and casualties

Accident data is at the heart of understanding, delivering and improving road safety, and is central to the work of the Strategic Road Safety Team, as it provides a means to gauge not only those areas in need of safety improvement measures but also allow monitoring of the effectiveness of such measures. This also allows decisions regarding investment to be evidence led and targeted.

### Performance against targets

The Scottish Government casualty reduction targets for 2020 are being met on the Scottish trunk road network, with reductions consistently below the current pro-rata target year on year in terms of 'Killed and Serious Casualties', 'Killed and Serious Child Casualties'.



# 8. Road Safety stakeholders

The Safe System in Scotland is supported by dedicated professionals from a wide range of disciplines. It is essential that if our common objectives to be successful, collaborative working and strong relationships must be sustained and developed across and throughout organisations. However, road safety is an issue that affects everyone in Scotland, and it's essential to ensure that, as far as possible, we can all use the roads safely. The tagline of the Road Safety Framework, *Go Safe on Scotland's Roads, it's Everyone's Responsibility*, emphasises this bottom-up approach and the duty of all road users.

Transport Scotland is responsible for a complementary range of policy initiatives in relation to the development and delivery of a co-ordinated national transport policy. In delivering a safe, reliable and efficient national transport system a wide range of issues have to be considered, covering all modes of travel. For instance, access to the more remote island communities requires specific and detailed management of aviation and ferry issues as well as consideration of the needs of ports and inland waterways. However, in relation specifically to road transport, the Directorate also encompasses such functions as guidance and policy issues on regional transport partnerships, demand management, road safety and local roads, bus and taxi policy, rural community transport, freight transport policy and the delivery of grant and funding expenditure.

### Communities and road users

Formal organisations responsible for the delivery of road safety clearly have their role to play, however road safety is everyone's responsibility and communities and road users have an important contribution to provide. Where possible we will take the opportunity to engage with communities and road users to identify and respond to local users concerns and needs.

### Emergency services

The emergency response to post-crash emergencies and improvements in the ability to provide appropriate emergency treatment and longer term rehabilitation for those involved in road accidents is also a vital contribution to the Safe System.

Scotland's emergency services play a critical role in national road safety. In April 2013 Police Scotland and the Scottish Fire and Rescue Service were created, rationalising eight regional forces and services into single national bodies. These agencies undertake a range of duties in relation to road safety, including enforcement of road traffic offences, campaigns and educational initiatives, and emergency response.

Police Scotland's *Strategic Plan* recognises that road safety is a key priority for the public and supports the operational focus on keeping people safe, whilst working towards the 2020 casualty reduction targets. The Force's 14 Divisional Road Policing Units, each under the command of a dedicated Road Policing Inspector, address local issues and concerns and assist local Police Commanders in their efforts to reduce casualties.

The Scottish Fire and Rescue Service has identified its contribution to road safety and road casualty reduction within strategic planning as well as within respective Local Fire and Rescue Plans.

The Scottish Ambulance Service and Scotland's 14 regional NHS Boards provide specialist emergency response and frontline healthcare services which are pivotal in helping to save lives on Scotland's roads.

**Local authorities**

Scotland's 32 local authorities are the Road Authorities responsible for overseeing the maintenance and operation of non-trunk roads within their geographical areas. Local authorities carry out the same functions for local roads as Transport Scotland does for trunk roads, including maintaining accident databases, identifying and producing accident remedial schemes, safety auditing new schemes and meeting accident reduction targets, as well as promoting road safety within their area and working in partnerships with the numerous other bodies involved in this area. These roads form an important and integral network that intersect and feed the trunk road network at strategic points.

There has always been a close working relationship between national and local government to ensure the effective and cohesive delivery of safer roads. The Scottish Government recognises there is no one-size-fits-all approach and local authorities should have flexibility to tailor their measures according to specific needs on the ground. Funding support reflects this, with local government in receipt of a block grant from the Scottish Government which allows councils autonomy to allocate resources to meet the varying local needs and circumstances in their area, having first satisfied their statutory responsibilities.

**Scottish Safety Camera Programme**

The Scottish Safety Camera Programme is an evidence based, casualty and collision reduction initiative. Through targeted camera enforcement and improving driver behaviour, the Programme's purpose is to contribute to our road safety vision and road safety targets as set out in the Road Safety Framework to 2020. The *Programme Handbook* ensures that cameras deployed through the Programme are done so primarily where they will have the greatest potential to reduce injury collisions. The Scottish Safety Camera Programme Office monitors Programme performance, while Police Scotland delivers operations on the ground through the three Safety Camera Units (North, East and West). National strategic oversight of the Programme is provided by the Road Safety Strategic Partnership Board with local accountability and scrutiny taking place through various existing Road Authority and Police forums.

### Road Safety Scotland

Education is a critical component of the Road User Behaviour pillar within the Safe System. Road Safety Scotland (RSS) is responsible for the development and co-ordination of national road safety education initiatives, publicity messages, and social marketing campaigns. It is committed to a lifelong learning approach to road safety and believes that to develop future generations of safer road users, road safety education needs to begin at a very young age. RSS also commissions research to help develop its resources and campaigns to ensure they are fit for purpose and contribute to the overall vision of our *Road Safety Framework*, and the casualty reduction targets which it seeks to achieve.

### Royal Society for the Prevention of Accidents (RoSPA)

RoSPA is concerned with heightening awareness of safety issues affecting everyday life. One part of RoSPA's remit is to provide road safety information, education, training and publicity resources for both road users and road safety professionals. As such, RoSPA works closely with colleagues in RSS to provide the social and behavioural aspects of the tools needed to tackle road traffic accidents.

### Operating Companies

Operating Companies are contracted by Transport Scotland to carry out the day-to-day road safety management and maintenance of the Scottish trunk road network. All their activities are grounded in road safety, and all are intended to contribute to efforts in reducing road casualties. Among a host of other duties, Operating Companies are responsible for delivering a targeted casualty reduction programme. In doing so they liaise regularly with Police Scotland, local authorities and communities in matters of road safety and traffic management to ensure that a co-ordinated approach is adopted.

### Department for Transport (DfT)

The DfT's objective is to oversee the UK-wide provision of reserved transport matters. Its role is to determine UK-wide transport policy and to manage relationships with the agencies responsible for the delivery of that vision across a wide range of disciplines. The Safe Vehicle pillar within the Safe System is the responsibility of DfT and is considered through their Vehicle (Construction and Use) Regulations.

Although the establishment of a devolved government has resulted in many responsibilities resting with Scottish Ministers (with further devolution under the Scotland Bill 2015-16 around the regulation of traffic signs and the setting of speed limits), there is, nevertheless a continued need to consider UK-wide policy. Much of the legislation around road traffic law and the testing and licensing regime for Scotland is reserved to the UK Parliament, with the Road Traffic Regulation Act 1984 and the Road Traffic Act 1988 regulating a number of road safety related duties at a local level. For this reason there is constant interaction on issues such as enforcement, design standards, signing issues and the use of innovative materials and roadside furniture products.

## Celtic Roads Authorities for Safer Highways Alliance (CRASH)

The Celtic Roads Authorities for Safer Highways Alliance (CRASH) is comprised of road safety experts from Transport Scotland, Transport Infrastructure Ireland, Department for Regional Development Northern Ireland, Welsh Government and Highways England.

The group discusses all aspects of road safety and emerging trends within its respective countries, sharing knowledge and best practice of the road safety strategies and initiatives implemented across the UK and Ireland.

## European Activity

A range of road safety responsibilities are held at European Union (EU) level, such as measures around annual vehicle test requirements (MOT) and professional drivers' hours and rest periods. The EU's *Road Safety Programme 2011-2020* steers road safety initiatives at European and national level, and the European New Car Assessment Programme (Euro NCAP) enables consumers to compare the safety of vehicles quickly and easily via a ratings system.

The European Commission's work on road safety in 2011-2020 is guided by a policy framework which targets a halving of the number of road deaths over the period. The Commission conducted an interim evaluation of the policy framework, taking stock of action taken to date and assessing progress made towards the target. It recognises that more attention needs to be paid to vulnerable road-users and serious injuries. Fatalities are falling more slowly among vulnerable road-users (pedestrians and cyclists) and elderly road-users (over-65s) than for other groups. At European level serious injury statistics are not decreasing as quickly as fatalities. The EU will eventually have a role in the safety management of roads within the Trans European Network through safety audits at the design stage and regular safety inspections of the network. It has also funded projects on inspection and road safety audit, such as which examined different ways for engineers to conduct road safety inspections. It resulted in recommendations for best practice in road safety inspections. Transport Scotland will continue to contribute to the development of new legislation for EU objectives.

## 9. Safe System

A Safe System approach on the Scottish Trunk Road network is built around the premise that fatal and serious injuries are unacceptable and avoidable. This approach aims to ensure that no road user is involved in a collision that will result in death or serious injury.

The Safe System approach represents a development from the traditional road safety thinking and reaffirms the way in which the road safety performance is considered and managed. Leading countries from all over the world are adopting a safe system approach to road safety.

The 2007 Strategic Road Safety Plan highlights the need to reduce risk to road users, even where treatable patterns of accident related casualties are not occurring. It moves away from the view that road traffic injury is a price that might be regarded as acceptable in achieving improved mobility. A Safe Systems approach sets a goal of eliminating road crash fatalities and serious injuries in the longer-term, with interim targets in the intervening years.

The overarching safety principles for a Safe System include recognition that:

- Humans make mistakes that lead to road crashes.
- The human body, by nature, has a limited ability to sustain crash forces.
- All people involved in designing, building, managing and using the road traffic system have a shared responsibility to ensure that road crashes are prevented as much as possible or, when they occur, do not lead to fatal or serious injuries; and
- All parts of the system need to be integrated and strengthened so that the safety effects are multiplied and if one part fails other parts will still protect all the people involved.

The Safe System approach has five pillars and a number of supporting activities that can be adjusted and applied in accordance with the pillars to assist in making crashes more survivable.

The five pillars of a Safe System are:

- road safety management;
- road infrastructure;
- safe vehicles;
- road user behaviour; and
- post-crash response.

The key supporting Safe System elements include:

- emergency medical management for post-crash care (the fifth UN Decade of Action pillar);
- understanding of crashes on the network, which requires good data to enable risks across sections of the network to be accurately identified;
- control of admittance (entry and exit) of drivers to/from the road transport system (licensing arrangements including the potential for graduated licensing arrangements);

- effective legislation and systems, enforcement and justice system support; and
- educating and informing the public.

The last three elements in the list above support achieving road user compliance with the rules of the road.

On the trunk road network we are addressing the areas of the safe system to which we can influence:

- Safe roads and roadsides – that are consistent in their character and forgiving of mistakes. Their design should also encourage safe travel speeds and help avoid errors.
- Safe speeds – travel speeds that suit the function and level of safety of the road. Road users should be able to understand the relevance of the speed limit and both comply with these and drive to the conditions they experience.
- Safe road users – Consider the needs of vulnerable road users through improvements in infrastructure, enforcement and education
- Safe Management – Acting to Manage and maintain the network to ensure that there is shared responsibility and acceptance of the roles that we play, both as roads users and in acting to promote road safety, in various policy areas of the safe system approach

# 10. Implementing safe system principles through an action plan

Significant progress has been made in road safety and Transport Scotland will continue to exploit those methods that have delivered improvements in recent years.

The Action Plan sets out how we will complement the traditional approach with more proactive methods in order to further improve the safety performance of the Scottish trunk road network.

The action plan is broken into the relevant safe system sections listed below and includes a description of each action together with its programme for delivery.

## Safer Roads & Roadside

The trunk road network should be improved to make collisions more survivable through a combination of design and maintenance of roads and roadsides. Strategic Road Safety will implement a range of strategies to ensure that roads and roadsides can be as safe as possible and reduce casualties on our roads.

### Action 1 - Trunk Road Analysis & Collision Screening

Strategic Road Safety assesses the safety performance of the trunk road network on an annual basis. A review is undertaken considering locations and causations of accidents, with the strategies listed below implemented to form part of a comprehensive road safety programme.

### Moving Cursor Programme

The Moving Cursor Programme (MCP) is a software tool for screening accident records on the trunk road network in order to identify accident cluster sites. The MCP is run annually and forms one part of analysis for the identification of the annual road safety programme

Transport Scotland maintains the Integrated Road Information System (IRIS), a component of which is a database that contains details of all injury accidents that occurred on the network over the last three decades. The raw data for each injury accident is supplied by Police Scotland and records contain pertinent information including casualty, road and weather data.

The MCP identifies accident clusters by three elements: accident frequency, time period and length of road. The parameters for each of these are three or more personal injury accidents within the latest three-year period and within a 100 metre radius. The accident clusters identified are collated in a report format and further investigated to identify trends and the presence of any treatable causations. These are then considered for remedial action.

This comprehensive range of data enables Strategic Road Safety to carry out an annual programme of prioritised site-specific investigations in order to determine effective and efficient engineering measures aimed at reducing accident frequency.

Traditionally, the above parameters have provided quick and significant returns in relation to accident reduction figures. However, the historic levels of cluster sites that have traditionally been suitable for intervention have largely been treated and, as such, the cluster sites still being identified tend to offer a decreasing potential for reducing overall accident numbers.

As part of the focus on a Safe Systems approach, alternative strategies are being implemented to complement the MCP programme. The Programme will, however, continue to be an important tool in identifying emerging and repeat cluster sites or future issues. In addition to the application of new strategies, the criteria for intervention at cluster sites may also be reviewed.

**Route Strategies**

Accident patterns and rates are considered on an annual basis alongside the MCP in the form of Route Accident Reduction Plans (RARP). Analysis identifies sections of roads that have an accident rate 1.25 times above the national average for a road of its type. This ensures that full consideration is given to those accidents that may not be picked up by accident cluster analysis, but which are, instead, more widely spread along a corridor or route.

Such reviews are intended to enable engineers to standardise treatments at similar layouts and locations, thereby providing drivers with consistent messages that enable them to make informed decisions about appropriate speeds and actions. The measures include simple engineering treatments or improvements to signing, lining, bend assessments, drainage and the use of vehicle activated signing where appropriate. These measures can be implemented quickly, cost-effectively and provide a positive impact on the road safety performance of routes. Given their promotion of consistency, and the opportunity afforded by route based treatment to manage risks, the proactive application of route based treatments can directly support a safe systems approach.

**Safer Rural Junctions**

Available evidence and wider experience indicates that certain elements of road design provide a greater risk of injury should an accident occur. We also know that the risk is generally increased in the rural environment where vehicle speeds are higher. Much of our rural network contains a high density of junctions and accesses, both to farms and residential properties, and many older road layouts which have more restricted geometry and visibility.

An increased risk of accidents can occur where there is a mix of high-speed through traffic and lower-speed turning traffic. In those situations where conflicting traffic movements can result in high energy side impacts, such as at T-junctions, there is often an increased risk of severe injuries as vehicle occupants are particularly vulnerable to side impacts. Roundabouts, while often recording higher frequencies of ‘damage only’ or ‘slight injury accidents’, are less likely to experience accidents resulting in death or serious injuries due to lower vehicle speeds and lesser impact angles.

Improving rural junction safety, considering elements such as protected right turns and improved sightlines, or revising the junction provision, may have a positive influence on our targets to reduce the number of road users killed or seriously injured.

Strategic Road Safety will review rural junctions to identify junctions that may not have been addressed through the MCP analysis. This allows the implementation of programme for locations not scheduled for improvements through other initiatives and ensure safety at the local road network interface is investigated and addressed sequentially according to merit.

**Higher Value Road Safety Schemes**

Many of our accident cluster sites have been largely treated by lower cost accident remedial measures. We have also seen that some of these sites are still being identified through our annual assessment of accidents.

For this reason we should consider higher value road safety improvements to engineer out risk at locations where more significant investment is needed. Improvements such as roundabouts, junction improvements, and carriageway widening are among the toolbox of measures that should be considered where there are demonstrable safety needs. These higher value road safety schemes should also consider alternative methods of economic evaluations to allow the correct engineering measure to be implemented and ensure maximum casualty reduction from available investment.

***Action: Strategic Road Safety will review the network safety performance and implement an evidence led casualty reduction programme to meet our casualty reduction targets to 2020.***

**Action 2 - Develop Improved Collision Management Software**

The Integrated Road Information System (IRIS) database contains details relating to all aspects of Scotland's trunk road network, from pavements and street furniture to road accident and casualty details. It constitutes a vital part of Transport Scotland's efforts to maintain and improve the road network, including its levels of safety. Strategic Road Safety relies heavily on a component of the database system named Accident Manager.

Accident Manager is a collection of tools that are used to interrogate the road accident database. This allows engineers and analysts to access accident details in varying depths as well as view video footage of the entire network, Ordinance Survey mapping from a national scale down to street level and several other interactive features.

IRIS undergoes continuous review and enhancement in line with current advances in technology and in response to user feedback. Further development is expected to lead to the increased automation of common processes, queries and report outputs. The aim is to continually improve the system's operation and functionality whilst

maintaining a high level of accuracy and depth of detail in terms of the information stored.

Transport Scotland also considers enhancements in technology in areas such as GIS management systems and will seek to use innovative ways to analyse accident data that is gathered by Police Scotland to ensure that we are using the data to identify targeted safety improvements.

Work will go on through 2016 to improve our ability to use analytical and presentational tools and to deploy these in support of our analysis of accidents on the Trunk Road network.

***Action: Strategic Road Safety will continue to enhance the capability, flexibility and accuracy of the accident manager systems***

**Action 3 - In depth analysis of fatal and serious collisions**

Fatal accidents not only have a significant and traumatic effect on the families, friends and colleagues of the deceased but also have a major impact on society as a whole. For this reason, every attempt should be made to understand the circumstances of these tragic incidents with a view to preventing future fatalities. Strategic Road Safety attends the locus of all fatal accidents with the Police and Operating Company in order to collate information and establish whether there is a case for a more detailed engineering accident investigation.

Strategic Road Safety maintains its own records of fatal accidents as collated from information provided by the police at the time of the incident and, subsequently from observations at the site meeting. This comprehensive database of such accidents will help to develop a better understanding of fatal accidents and lead to improved safety solutions.

By their nature there can be very little difference between a serious or fatal accidents and for that reason we also carry out in depth analysis into serious collisions occurring on the trunk road network. Strategic Road Safety will liaise with Police Scotland to obtain more detailed information and identify common themes and trends in serious accidents. A focus on the most common accident types resulting in death or serious injury will help to identify intervention options for each Safe System element.

***Action: Strategic Road Safety will identify the most common accident types resulting in death and serious injury and develop countermeasures***

**Action 4 - Proactive Risk Removal**

The Scottish trunk road network is diverse and includes some stretches of route that have evolved over the years using design standards of the time. Contemporary design standards offer improved levels of safety over older design standards. Similarly, different carriageway types have varying levels of safety when exposure is considered. The majority of Scotland's trunk road network is rural with varying geometry and alignment where the roadside may present a range of hazards for

vehicles leaving the carriageway. The proximity of trees, walls, larger signposts, water features, telegraph poles, etc. can present an unforgiving and disproportionate penalty for vehicle occupants.

Accident rates allow for comparisons to be made between different roads as they consider the frequency of accidents against the number of vehicle kilometres travelled. Whilst dual or motorway standard carriageways may represent the safest driving environment, with respect to accidents, such infrastructure is not always appropriate or viable.

We know from experience that certain elements of a road environment can create a hazard or provide a greater risk of injury should an accident occur and these are areas that should be investigated further in order to develop appropriate mitigation.

Areas of risk or areas with a higher than average proportion of particular accident types will be identified through accident analysis, route assessments and road safety inspections.

Road safety inspections are useful as they can:

- allow for proactive treatment of potential crash locations (before crashes occur);
- check for consistency of road features;
- complement cluster site treatments;
- identify issues with current maintenance procedures;
- identify locations for mass action treatments (i.e. hazardous features across a whole road network);
- check for adequacy of traffic management features

Higher than average accident rates or proportions overlap with areas where surveys have identified potential risk in the road environment, proactive risk removal strategies will be developed

***Action: Strategic Road Safety will develop and implement a number of annual proactive risk removal strategies aimed at reducing the severity of collisions on the network***

**Action 5 - Road Safety Audit**

The existing trunk road network is regularly monitored and assessed to ensure that improvements can be introduced through a structured programme; this makes sure the infrastructure provides a safe and efficient facility for all road users. There will, however, be occasions when circumstances dictate that existing sections of road are replaced or upgraded in order to provide greater capacity, to cater for development, and improve safety or improve journey times. When this happens, comprehensive design manuals provide engineers the tools to produce modern structures and road layouts using the latest techniques and materials. Ultimately, however, there is a need to ensure that the sum of the individual features incorporated in the new scheme do not conflict with each other or with the existing road environment. The safety audit process is designed to check the scheme as it develops and design out potential safety problems before the new facility is completed. It also enables

Transport Scotland, as the overseeing organisation, the opportunity to ensure that the integrity and standards required by the specialist safety auditors are uniformly maintained by all practitioners.

***Action: Strategic Road Safety will consider the requirements of the current road safety audit process and further develop a robust quality system that meets the requirements of the road safety audit standard (HD19/15)***

**Action 6 - Interactive Sign Programme**

Advances in sign technology and the need to engage and inform drivers in a more focused manner has led both roads authorities and sign manufacturers to look closely at the development and use of intelligent road signs. Such signs are becoming more sophisticated and cost-effective and may be used on a site-specific or route strategy basis in order to direct information to users who drive at speeds which are inappropriate for the prevailing conditions. The signs' ability to be powered by solar or wind powered is also particularly attractive for rural locations. Studies have also shown that the signs' impact on driver behaviour can be significant and their benefits need not be short-lived.

The benefits of this technology are harnessed to produce long-lasting and positive road safety benefits the use of vehicle activated signs must be structured and monitored in order to ensure their most effective use. We have installed various types of interactive signs that have provided drivers of potential hazards ahead.

***Action: Strategic Road Safety is committed to more widespread use of interactive signs. An annual programme will be developed and delivered, considering the requirements for monitoring, management and maintenance all interactive signs.***

## Safer Users

Road users who may be considered vulnerable are those who are at a higher risk of being involved in an accident and/or may be more likely to suffer death or injury should an accident occur. Both the young and elderly are classed as vulnerable as pedestrians and cyclists. Disabled road users, whether through physical or mental impairment, can be more vulnerable in the road environment. The trunk road network should be designed to ensure that all road users, particularly vulnerable road users (VRUs) are considered as part of the function of the network. Strategic Road Safety will implement a range of strategies to improve the provision for VRUs.

**Action 7 - Safer Active Travel**

The Scottish Government has a clear long term vision for active travel in Scotland. It aims to create the types of place where active travel is popular and will help us achieve many outcomes, including better health, having attractive, safe communities and increased economic activity. This will require many disciplines to work together such as planning, regeneration, economic development, transport, climate change and education and involved a wide range of partners from local authorities, NHS, local businesses and volunteers.

Production of the **Good Practice Guide for Roads** was one of the objectives of Transport Scotland's Trunk Road Action Plan - *Roads for All*, published in December 2006. The Good Practice Guide for Roads was updated and republished in 2013 to take account of the requirements of the **Equalities Act 2010**.

The Good Practice Guide for Roads sets out Transport Scotland's requirements for inclusive design in the construction, operation and maintenance of road infrastructure. The Guide provides practitioners with current international good practice and advice on providing for the needs of people with sensory, cognitive and physical impairments, within the road environment. The Good Practice Guide is targeted at everyone who makes design and management decisions which affect the road network. This includes external consultants and contractors as well as Transport Scotland staff.

The National Walking Strategy aims for a Scotland where everyone benefits from walking as part of their everyday journeys, enjoys walking in the outdoors and where places are well designed to encourage walking. Its three Strategic Aims are:

- To create a culture of walking where everyone walks more often as part of their everyday travel and for recreation and well-being
- Better quality walking environments with attractive, well designed and managed built and natural spaces for everyone
- Enable easy, convenient and safe independent mobility for everyone

The Scottish Government published the first ever Cycling Action Plan for Scotland (CAPS) in 2010 and it sets out how cycling, within the wider context of walking and active travel, contributes to improving health, reducing congestion, reducing carbon emissions and providing a good transport alternative to persuade people out of cars. Currently 1% of all journeys are made by bicycle, and we would like to see this increased to 10% by 2020.

While cyclists account for a small proportion of the total Scottish trunk road accidents (less than 2%) cycling is increasing in popularity both with commuters and leisure users. Transport Scotland is working to improve cycling provision with cycle friendly design and the expansion of the National Cycle Network.

However we have seen a marked increase in the number of pedestrians and cyclists being involved in accidents on our network. We continue to work with our safe active travel team within Transport Scotland and organisations such as SUSTRANS, Living Streets and Roads for All to bring forward road safety improvements in areas that require them the most.

***Action: Strategic Road Safety will engage with key partners on a regular basis to identify and implement specific improvement for pedestrians and cyclists on the trunk road network.***

## Action 8 - Motorcyclists

Transport Scotland is committed to taking into account the needs of motorcyclists and to find ways to increase their safety.

Analysis of motorcycle accidents on trunk roads has identified that there has been a steady reduction since 2005. However, we're likely to demonstrate higher numbers of fatal and serious casualties and that, of those accidents, left-hand bends and an age group of between 40 and 49 were likely to be factors. As a result, issues such as inappropriate placement of white lines or ironworks, the foreshortened lengths of anti-skid surfacing in braking zones and off-road hazards are now forming the basis of specific measures targeted at reducing the frequency and severity of motorcycle accidents.

Targeting specific measures will form part of an ongoing strategy aimed to ensure the percentage of motorcycle accidents reduces in line with the 2020 targets. Transport Scotland will continue to improve its knowledge of motorcycle accidents and develop appropriate interventions. Every effort will be made to ensure road designs and standards consider fully the needs of motorcyclists.

***Action: Strategic Road Safety will further develop and implement road safety measures specifically for motorcyclists as well as supporting enforcement and education campaigns where appropriate***

## Action 9 - Young Drivers

Young drivers are at greater risk of being involved in road accidents due to inexperience in the roads environment. A lack of ability in anticipating potential hazards, combined with potential peer pressure, may be some of the factors which result in speeds which are too high, or are inappropriate for the conditions or the location.

The total number of accidents involving young drivers on trunk roads has seen a noticeable decrease since 2009. Nevertheless, any over-representation within this group has to be seen as unacceptable and worthy of particular attention. Engineering measures are continually being reviewed and improved to ensure that adequate information is given to road users to allow them to make more informed choices. However, these are not always enough and programmes have been developed to better train novice drivers. Training gives new drivers additional tuition in safe driving, covering potential dangers such as driving in town, driving in all weathers, driving at night, and driving on rural roads, dual carriageways and motorways.

Campaigns orchestrated by RSS and funded by the Scottish Government are also helping to raise awareness about many of the issues that affect the safe and responsible use of vehicles. RSS also contributes to national safety campaigns.

Accident analysis of trunk roads has highlighted where young drivers are involved in a disproportionate number of accidents. This can often point to behavioural issues and, whilst engineering measures can convey awareness of hazards through 'self-

explaining' roads or provide protection from hazards, we will work with our partners in Education and Enforcement to address these behavioural issues.

Partnership working in this area will be key in ensuring individual efforts are combined to form an effective complementary strategy. Transport Scotland has experience in working with Police and education organisations through a number of initiatives. It will be important to build upon that experience to ensure that the key messages are conveyed to Young Drivers.

More in-depth analysis of trunk road accidents involving Young Drivers will help to understand where and when they are experiencing problems. This will help in the development of key messages to this group. Transport Scotland will develop its analysis of Young Driver accidents and use its experience to work in partnership with stakeholders in education and enforcement.

***Action: Strategic Road Safety remains committed to lower the incidence of collisions involving this high risk group. It will develop a targeted road safety programme and liaise with other road safety partners in education.***

**Action 10 - Older Drivers**

Older drivers have also been identified as being at a greater risk of being involved in road accidents. This can be as a result of mobility issues as well as not being familiar with the modern roads environment. A lack of ability in anticipating potential hazards quickly and the ability to judge a vehicles speed when manoeuvring from junctions may be factors which have seen a rise in their involvement in accidents.

Campaigns orchestrated by RSS are helping to raise awareness about many of the issues that affect the safe and responsible use of vehicles within this group. RSS also contributes to national safety campaigns organised by Police Scotland that are specifically looking at older drivers.

More in-depth analysis of trunk road accidents involving Older Drivers will help to understand where and when they are experiencing problems. This will help in the development of key messages to the age group. From an engineering point perspective we need to consider the design of all types of road layouts as well as the signage used to highlight junctions or potential hazards.

***Action: Strategic Road Safety remains committed to lower the incidence of collisions involving this emerging high risk group. It will develop a targeted road safety programme and liaise with other road safety partners to assist in the implementation of education programmes.***

**Action 11 - Trunk Road User Information Website**

Sharing information with key stakeholders and users of the trunk road network is vitally important. In the digital age there is an expectation that information should be readily available across all platforms, and the work of Transport Scotland should be no different.

Strategic Road Safety is committed to developing a trunk road user website that will hold the pertinent knowledge of a route together with accident statistics and planned improvements.

It will continually updated as and when changes take place, enabling each route to be considered against the performance of other routes and the national road safety performance targets. This will allow road safety to be considered within an evidence base.

***Action: Transport Scotland will develop a web based interface to share road safety performance information to all road users in Scotland.***

## Safer speeds

The trunk road network should be assessed to ensure that safe speeds are achieved across the trunk road network. Strategic Road Safety will implement a range of strategies to encourage safe speeds and improved driver behaviour.

### Action 12 - Review of Speed Limits

An accessible Scotland with safe and efficient trunk roads providing reliable journey times and supporting economic growth requires appropriate speed management.

Upgrading and improving the network is a continuous programme. Infrastructure is steadily improving and has largely evolved from traditional historic routes into the modern standards of highway design enjoyed by road users on much of the network today. Whilst the network must demonstrate efficient and safe routes for all road users, it must also recognise that existing road geometry, natural features, and the presence of towns or villages impose constraints. Such constraints regularly dictate that the national speed limit is not always appropriate and, as such, we should endeavour to provide appropriate local speed limits.

Speed limits should be consistent, understood by drivers, and appropriate for the environment and circumstances of their use. Any change in speed limit should focus on improving driver behaviour within the roads environment and enable consistent compliance of realistic speed limits that will help contribute to the identified accident reduction benefits accruing from lowered speeds.

We are committed to continue to consider a change in speed limits if there is evidence to show it will reduce casualty reduction or if there is a significant change to trunk road network.

***Action: Strategic Road Safety will continue to monitor the trunk road network and identify speed limit changes where these support casualty reduction or significant change to the network.***

### Action 13 - Trunk Road Enforcement

Through targeted safety camera enforcement and improving driver behaviour, the purpose of the Scottish Safety Camera Programme is to contribute to Scotland's

road safety vision and road safety targets as set out in the Scottish Government's Road Safety Framework to 2020.

Safety cameras deployed through the Programme must be done so primarily where they have the greatest potential to reduce injury collisions, and where there is evidence of both collisions and speeding.

Strategic Road Safety will work with the Programme Office and Safety Camera Units and assist in identifying locations on our trunk roads where camera enforcement can do most to improve driver behaviour and reduce casualties. When identifying or reviewing sites consideration will be given to the most appropriate camera technology.

Cameras may also be deployed at: relevant road works where speed enforcement contributes to road worker, driver and other road user safety, as well as improving traffic flow; and through Intelligent Transport Systems based Managed Motorways through which journey time reliability, journey times and road safety can be managed.

***Action: Strategic Road Safety will continue to participate in all aspects of the Safety Camera Programme to promote improved speed compliance and a consequent reduction on speed related accidents.***

**Action 14 - Speed Management in Towns and Villages**

Transport Scotland aims to promote the safe and efficient use of the roads it is responsible for. Where these pass through towns and villages, there are frequently competing pressures between their strategic purpose, and community interests relating to safety and amenity.

The promotion of the pilot 20 mph limits proposed for the trunk road network is intended to support road safety generally, but target safety benefits for vulnerable road users in particular. This is reflected in the selection criteria for the pilot areas. There have been a number of calls for lower speed limits and specifically 20 mph limits in some towns and villages on the trunk road network. These were included in the wider list of potential candidate sites considered. Sites were also identified for consideration on the basis of the evidence of safety issues that may be addressed by a locally reduced speed limit.

The proposed pilot focuses on the use of 20 mph limits where there is an evidence led criteria, specifically;

- Personal Injury Accidents particularly those involving vulnerable road users
- Vehicle speeds – not being significantly above an average of 24 mph
- Traffic volumes
- Vehicle composition including the HGV proportion of total traffic volume
- Road Environment including layout, key buildings and social amenities

The pilot sites should not require significant engineering or Police enforcement to support their operation. There will be many situations across the country where the

introduction of a 20 mph limit would require more extensive and expensive engineering to force vehicle speeds to drop.

Typically, more heavily engineered speed reductions are not appropriate for the strategic network. There can be an adverse impact from such interventions on routes with high traffic volumes, and when considering the use of Emergency vehicles, HGVs and other large vehicles. Any such proposals should be considered separately and as part of our wider approach to speed management.

***Action: Strategic Road Safety will develop and implement a range of appropriate speed management measures to positively influence driver behaviour and deliver benefits to vulnerable road users.***

## Safer Management

Everyone has a role to play in ensuring that the trunk road network is managed is a safe and efficient manner. Strategic Road Safety will work with partners to ensure that the network is managed appropriately and implement a range of strategies to ensure that we are working in partnership and sharing knowledge to reduce casualties on our roads.

### Action 15 - Developing Stakeholder Liaison

Road safety is a shared responsibility, and a key component in achieving the Government's casualty reduction targets for 2020 is partnership working. Transport Scotland's experience gained through participation in many road safety forums has shown that effective formal and informal partnering structures provide a successful framework for delivery of a co-ordinated road safety programme.

Transport Scotland continues to operate an open approach environment and actively engages with relevant stakeholders. Particular consideration will be given to Transport Scotland Policy, regional road safety forums, Society of Chief Officers of Transportation Scotland (SCOTS), Cycling Scotland, SUSTRANS, Living Streets, Paths for All and other forums to ensure cross-organisation interests are met and that our respective efforts are integrated and complementary.

***Action: Strategic Road Safety will develop and better inform liaison with all parties to ensure effective delivery of the wider road safety programme.***

### Action 16 - Trunk Road Safety Partnership

For route strategies and mass actions to be successful, ownership has to be taken by all relevant stakeholders.

A recent example of a co-ordinated road safety strategy that specifically includes the pillars of the safe system approach is the work of the A9 Safety Group. It is comprised of experienced representatives from public and private sectors who shared a strong interest in a safe and efficient A9. Their work was undertaken in the context by the Scottish Government's decision to dual the A9 between Perth and Inverness by 2025. On this basis the Group set out to develop an Interim Safety Plan

which would positively influence driver behaviour through a combination of management, engineering, education, speed, and enforcement. A partnership approach in the delivery of measures such as Average Speed Cameras and road safety campaigns have had a positive impact on reducing accidents and speed of vehicles. Transport Scotland will consider further routes that could benefit from a similar partnership approach to Road Safety.

***Action: Strategic Road Safety will ensure that the successful elements of existing partnerships are implemented elsewhere on the network.***

**Action 17 - Road Safety Research**

Road safety, and the influences upon safety or relative danger, is complex. Accident causation rarely falls purely into the category of the road environment and more often has influences from across the system such as road user behaviour. A greater understanding of the problems faced by road users when confronted with the various aspects that influence road safety may allow more targeted remedial action.

Road safety research is an important part of Transport Scotland's strategy to reduce casualties. Through undertaking research it is hoped that improved and more sustained safety solutions can be developed. It is critical that all research is published and disseminated so the broader industry can consider the findings.

***Action: Strategic Road Safety will work with Scottish Road Research Board to commission, publish and disseminate research findings to the road safety community***

**Action 18 - Demonstration Road Safety Projects**

'Demonstration' projects, by their nature, implement cutting-edge solutions, and can bring together existing best practice, raise standards and share knowledge. For the benefits of innovation and technology are to be maximised, it is essential that controlled trials are undertaken to evaluate new solutions.

Developments in technology can often have practical applications in the field of accident prevention. The potential of Intelligent Transport Systems (ITS) solutions and innovative materials and products will play a large part in future casualty reduction. For this reason it is intended to develop a receptive culture within which manufacturers and designers are encouraged to work with Transport Scotland in developing new ways forward.

We have harnessed intelligent solutions through the implementation of Intelligent Road Studs at Sheriffhall Roundabout on the A720 Trunk Road. The design of the installation is such that illumination of the studs is co-ordinated with the traffic signal phasing. Essentially, when the A720 City Bypass through movements is signalled green, the studs are activated. This results in drivers being presented with a clear, illuminated path through the roundabout. After surveys have been undertaken and it has shown a 50% reduction in people moving lanes whilst negotiating the roundabout.

We have also demonstrated innovation by installing the first set of speed activated traffic signals in Scotland on the A78 in Fairlie, Ayrshire. We analysed the route and determined that there was indeed driver behaviour issues as vehicles passed through the village. Working with industry experts we introduced a Scottish first, a system that would curb excessive speed by signalling drivers to stop. The simple but effective scheme uses wireless advance speed detection, recognising vehicles travelling too fast and then switching the junction lights to red, forcing the vehicle to stop and wait. We continue to monitor and evaluate the effectiveness of this system allowing us to assess the further benefits that can be recognised for this scheme or other areas with similar circumstances.

***Action: Strategic Road Safety will harness developments in technology and bring forward demonstration projects that will raise awareness and disseminate knowledge and best practice.***

**Action 19 - Road Safety Business Plan**

Injury accidents have a negative impact on the Scottish Government's aim of "promoting economic growth, social inclusion, health, and the protection of our environment", and can be expressed in terms of a monetary value.

Signing, lining and anti-skid treatment can be effective at mitigating hazards at accident clusters and demonstrate very good economic benefits. Accident remedial measures demonstrate economic savings commonly referred to in terms of a First Year Rate of Return (FYRR). However, low-cost remedial measures often require additional maintenance over the life of the road in order to keep their effectiveness, and mitigating a hazard is never as effective as removing it. Though more expensive, improving the standard of the road infrastructure be designing out the hazards will reduce more accidents over time and provide a more sustainable and safer road environment.

We know that many of our accident cluster sites have been largely treated by lower cost accident remedial measures. We have also seen that some of these sites are still being identified through our annual assessment of accidents.

Higher value road safety improvements may be required to engineer out known accident locations where more significant investment might be needed. These higher value road safety schemes should also consider various methods of economic evaluations to allow the correct engineering measure to be implemented and ensure maximum casualty reduction from available investment.

A Road Safety Business Plan should be developed to better facilitate road safety investment aimed at reducing the heavy cost of accidents on Scotland's society.

***Action: Strategic Road Safety will review the current economic evaluation criteria and consider how a Road Safety Business Plan can be developed to give a greater weighting to more substantial solutions that design out risk.***

## Action 20 - Continuing Professional Development

Continuing Professional Development is vital to the improvement, broadening of knowledge, skills and development of personal qualities through a practitioners working career. It is essential that we share knowledge within fields of expertise. Transport Scotland has carried out a number of training courses and seminars on various key road safety topics. For example the Road Safety Engineering course that is delivered to new road safety practitioners who are required to learn new techniques in delivering road safety improvements. We have also delivered Road Safety Audit Training through the Society of Road Safety Auditors in Scotland (SoRSA) to ensure that auditors in Scotland are adequately trained to the current road safety audit standard.

Training and seminars play a very important role in maintaining the high standards within the road safety profession in Scotland. These standards are largely responsible for Scotland having one of the safest road networks in the world. The investment required to facilitate training and seminars is nominal when considered against the wider benefits gained across road safety in Scotland.

***Action – Strategic Road Safety Unit, will continue to facilitate road safety training and seminars open to all road safety practitioners in Scotland.***

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Published by Transport Scotland, March 2016

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