TRANSPORT SCOTLAND
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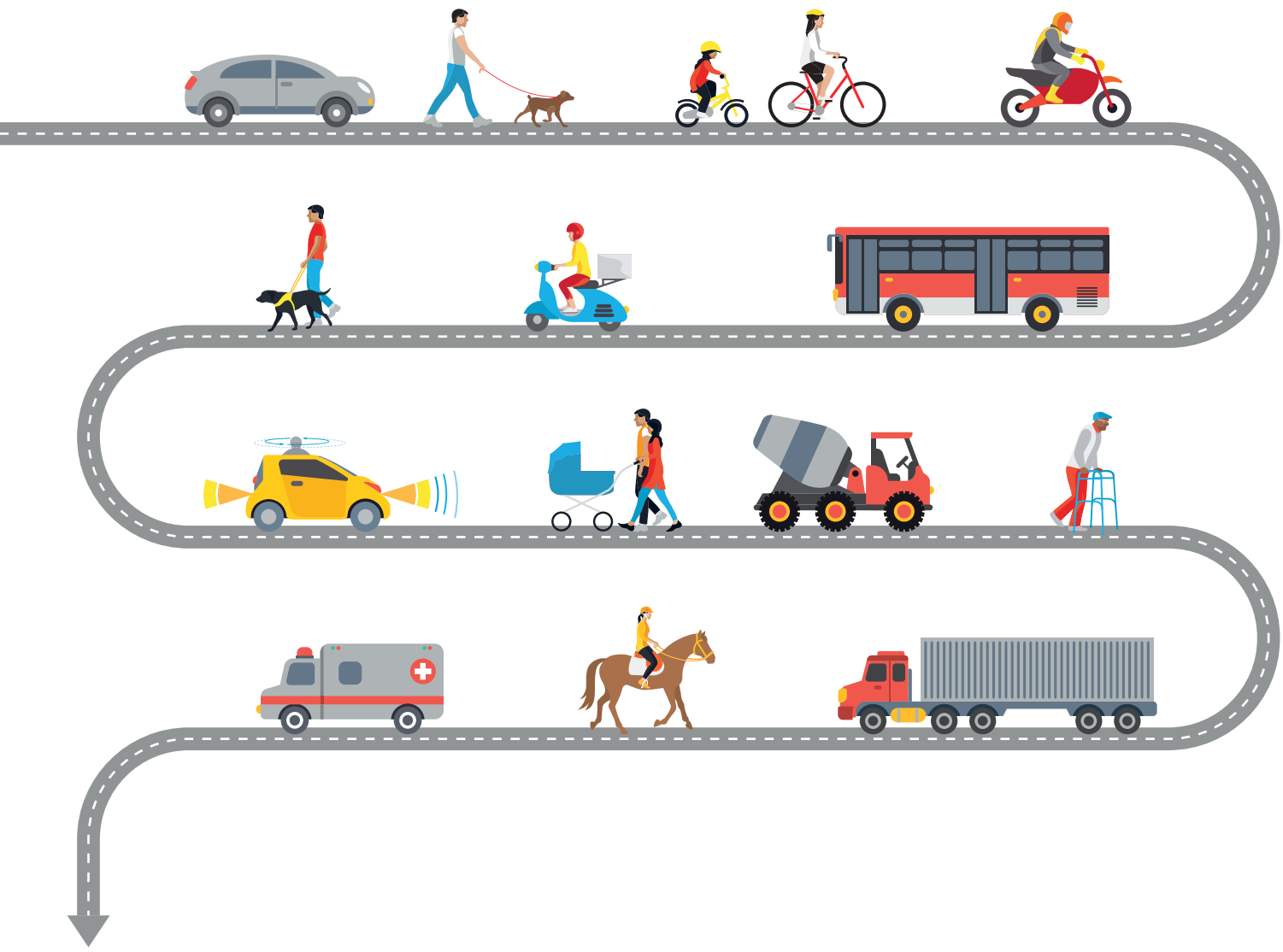
Scotland's Road Safety Framework to 2030

Together, making Scotland's roads safer



Scotland to have the best road safety performance in the world

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Ministerial Foreword

I am delighted to present Scotland's Road Safety Framework to 2030, which sets out an ambitious and compelling long-term goal for road safety where no-one dies or is seriously injured by 2050.

This document, building on the strength of the 2020 Framework, advocates a vision for Scotland to have the best road safety performance in the world by 2030. To help achieve that vision, the framework sets out five strategic outcomes which describe the road safety environment it aims to deliver. These outcomes align with the five pillars of the Safe System: Safe Road Use; Safe Vehicles; Safe Speeds; Safe Roads and Roadsides; and Post-crash Response. It also introduces a comprehensive performance management system which will help us gain a much clearer understanding of the different issues influencing overall safety performance and monitors delivery of the framework more effectively. In addition, and in order to improve communications between national and local levels, the framework creates a third tier in its governance structure – Local Partnership Forums.

The Road Safety Framework to 2020 brought forward a strong partnership approach to the delivery of many road safety strategies and initiatives, and has served us well. We could not have achieved this without the drive and determination of all our stakeholders working together to make a positive impact on road casualty reduction. We are going to build on that going forward to 2030 and beyond by adding road danger reduction. National statistics for road casualties reported to the police in Scotland in 2019[1] show the total number of casualties fell to 7,638, the lowest number since annual records began in 1950. In 2019, Scotland's overall road death rate of 30 per million population was the eighth lowest of 41 countries surveyed in international comparisons. However, one death is one too many and there is more we can do, and will do, to realise our vision.

The Scottish Government and our partners are committed to making Scotland's road travel safe for everyone. However, all road users have a part to play in the success of the framework by keeping the roads safe for themselves and others, hence the motto "Together, making Scotland's roads

safer". Embedding the Safe System approach at a national, regional, local and even individual level will play a major part in achieving this. It will require political leadership, strategic clarity and decisive action, as well as ownership by all of us – elected officials, transport professionals and citizens. This framework uses the words "we" and "our" to reflect that it is not just a strategy for Scottish Ministers or safety partners. It is a framework for all road users to be free from road harm as much as they are free to travel; therefore, its vision, outcomes, challenges, strategic actions and targets belong to each and every one of us.

Collectively, we must ensure the safety of every road user and, given the aspirations of our health and climate emergency policies, exemplified by the Scottish Government's new commitment to reduce car kilometres by 20% by 2030, this includes protection for those who choose to walk, wheel and cycle. This government is more committed than ever to its vision that communities are shaped around people, with walking, wheeling and cycling the most popular choice for shorter, everyday journeys. This framework is a great opportunity to demonstrate how road safety can contribute to cross-cutting national priorities including supporting delivery of National Transport Strategy (NTS2) outcome of having a transport system that is safe and secure for all.

I would like to thank everybody who took the time to respond to the public consultation that ran between 8 September and 1 December 2020.

Michael Matheson, MSP,
Cabinet Secretary for Transport, Infrastructure and Connectivity

1 Reported Road Casualties Scotland 2019 (transport.gov.scot)

Framework at a glance

Our Vision

For Scotland to have the best road safety performance in the world

Our Outcomes

Our Targets

Interim Targets to 2030

50% reduction in people killed

50% reduction in people seriously injured

60% reduction in children (aged <16) killed

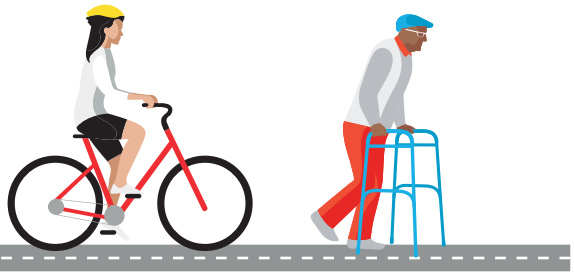
60% reduction in children (aged <16) seriously injured

Intermediate Outcome Targets

- 40% reduction in pedestrians killed or seriously injured
- 20% reduction in cyclists killed or seriously injured
- 30% reduction in motorcyclists killed or seriously injured
- 20% reduction in road users aged 70 and over killed or seriously injured
- 70% reduction in road users aged between 17 to 25 killed or seriously injured
- Percentage of motorists driving/riding within the posted speed limit
- The casualty rate for the most deprived 10% SIMD areas is reduced to equal to the least deprived 10% SIMD areas.

Intermediate Measures

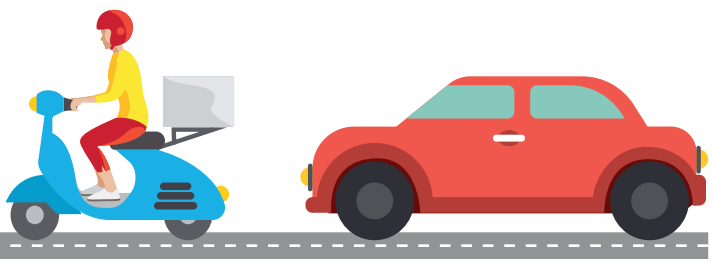
- Casualty rate per 100 million vehicle kilometers for cyclists killed and seriously injured
- Casualty rate per thousand population for pedestrians killed and seriously injured
- Number of people killed and seriously injured in collisions where at least one driver/rider was driving for work, not commuting



Key Performance Indicators

The Key Performance Indicators for the framework are currently being developed to enable the monitoring of road safety behaviours, vehicle safety and road infrastructure. We are continuing to work with stakeholders on the number of KPI's and their associated performance level that are required to be monitored as part of our intermediate outcome targets. A rationale, definition and methodology, will be developed for each KPI alongside the organisation responsible for collection of the appropriate data.

The publication of our Key Performance Indicators will be contained in the first Road Safety Framework Annual delivery plan. All targets, intermediate outcome targets and measures as well our KPI's will be monitored in the Road Safety Framework Annual Report. There will also be a number of other indicators that will be monitored at Operational Partnership Group level. The performance management framework will be a live document with KPI's that are added, modified or removed as appropriate through the lifetime of the framework.



› Challenges ⌄ Strategic Actions	Climate Emergency	Active & Sustainable Travel	Health	Safe System	Speed Management	Road Safety Delivery	Driving/Riding for Work & Workplace Culture	Emerging Technologies	Enforcement/ Deterrence	Road Infrastructure & Maintenance	Post-Crash Response	Road Users
Speed	✓	✓	✓		✓			✓	✓			✓
Climate	✓	✓	✓		✓	✓		✓		✓		
Funding				✓	✓	✓	✓	✓	✓	✓	✓	✓
Change in attitudes		✓	✓	✓	✓		✓	✓	✓		✓	✓
Technology				✓	✓			✓	✓	✓	✓	✓
Active & Sustainable Travel		✓	✓	✓		✓			✓			✓
Knowledge & Data Analysis				✓	✓	✓		✓	✓	✓	✓	✓
Enforcement		✓		✓	✓	✓	✓		✓			✓
Health			✓	✓							✓	✓
Education		✓		✓	✓	✓	✓	✓	✓			✓
Infrastructure	✓	✓	✓	✓	✓	✓		✓		✓		
Reduce Inequality		✓	✓		✓			✓	✓			✓

Overarching Context

Scotland's new National Transport Strategy (NTS2) published in February 2020 sets out an ambitious and compelling vision of our transport system for the next 20 years, in order to address the key challenges we face.

The strategy provides us with a transport system that will enhance opportunities and encourage long-term, sustainable development. It calls for an inclusive, safe and accessible system to help deliver a healthier, fairer and more prosperous Scotland for its communities, businesses and visitors alike. It sets out priorities to support that vision. These are to reduce inequalities, take climate action, help deliver inclusive economic growth and improve health and wellbeing.

In December 2020, we published our first annual Delivery Plan for the Strategy. This brings together, for the first time, Scottish Government actions for achieving the NTS2 vision and priorities which includes the publication of this Road Safety Framework as part of actions under the NTS2 Health and Wellbeing priority which support delivery of the outcome of having a transport system that is safe and secure for all.

COVID-19 has had a profound impact on transport. Car traffic levels dropped to around 25% of 2019 levels between 9 March and 6 September 2020, but had recovered to 91% of 2019 levels by the end of the six month period.[2] The reasons for how, why and when people travel have fundamentally changed. There has been a mass shift to home working in some professions. Sustained remote and local working practices could promote a better work/life balance and result in less exposure to air pollution, while also causing less congestion.

We are now in an environment where the move to low and zero carbon transport is essential to our future wellbeing. In response to the global climate emergency, the Scottish Government has made one of the most ambitious climate commitments in the world: to achieve net-zero greenhouse gas emissions by 2045. Over the 20-year period of NTS2, the role of transport in achieving this target will be crucial, requiring the further development and use of low carbon technology. It will also require significant societal changes, including a reduction in the demand for unsustainable travel. This was epitomised by the Scottish Government's commitment to reduce car kilometres by 20% by 2030,[3] through improved transport and planning approaches, better utilisation of space and place-setting, enhanced digital connectivity and an increased location focus. By 2032 and in a post COVID-19 era, the pendulum will have swung away from the dominance of private car use, particularly single occupancy, to a society which has embraced more walking, wheeling, cycling, public transport and shared transport options, particularly in urban settings.

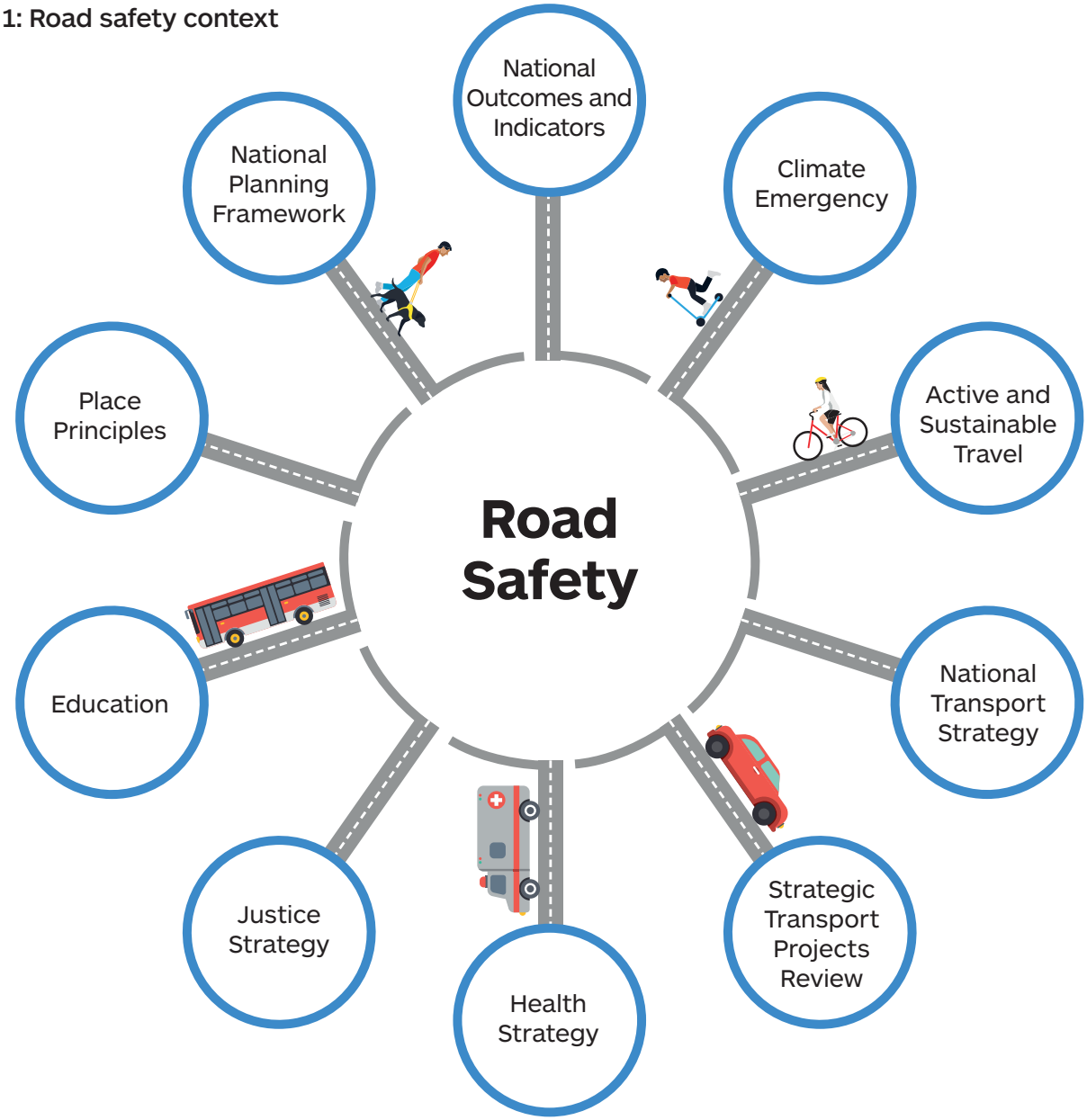
Importantly, NTS2 signals the future direction of transport and provides the context within which decisions, in and beyond government, will need to be made. These ambitions also extend into the strategic transport investment decisions that will be made a part of the second Strategic Transport Projects Review 2. The Road Safety Framework to 2030 has taken into consideration the Scottish Government's ambitions, mentioned above, as well as the overarching context in which road safety operates (see figure 1 below).

2 https://www.transport.gov.scot/media/48971/covid-19-scotland-s-transport-and-travel-trends-during-the-first-six-months-of-the-pandemic.pdf
3 https://www.transport.gov.scot/media/49098/stpr2-update-and-phase-1-3-feb-2021.pdf

Road safety policy and delivery will play a pivotal role in supporting policies and priorities, and can help achieve outcomes across a number of Strategic Priorities through its support of:

- ✓ The Climate Emergency for a 'healthier society, and a diversified, resilient and sustainable economy
- ✓ The Active Travel Vision for Scotland
- ✓ Scotland's Public Health for 'a Scotland where we live in vibrant, healthy and safe places and communities'
- ✓ Justice Strategy for Scotland where 'We live in safe, cohesive and resilient communities'
- ✓ Education to assess and manage risk, and understand the impact of risk-taking behaviour
- ✓ The National Performance Framework where 'We live in communities that are inclusive, empowered, resilient and safe'
- ✓ The National Planning Framework with 'A successful sustainable place – supporting economic growth, regeneration and the creation of well-designed places'

Figure 1: Road safety context



The place principle[4] applies to road safety partners responsible for providing services and looking after assets through 'a place to work and plan together to support inclusive and sustainable economic growth and create more successful places'.

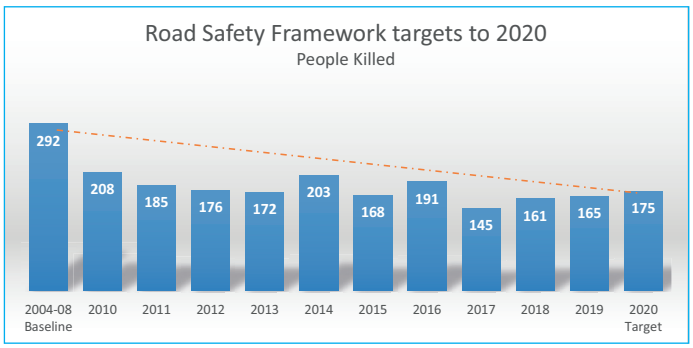
The framework sits within a wider UN/EU/UK context; for example, our road casualty reduction targets for 2030 take cognisance of the UN resolution A/74/L.86 "Improving global road safety" adopted on 30 August 2020 and the Stockholm Declaration,[5] agreed by UN Member States in February 2020, calling for a reduction in road traffic deaths and serious injuries by at least 50% from 2020 to 2030, a commitment to collect data on serious injuries and providing targets to reduce fatalities and serious injuries among pedestrians, cyclists, motorcyclists and other vehicle users. In June 2019, the European Commission published its EU Road Safety Policy Framework 2021-2030 which contains the EU's long-term strategic goal of "Vision Zero" – no deaths or serious injuries on European roads – by 2050. Road safety in Scotland is also governed by various pieces of legislation dealing with reserved issues such as motoring offences, vehicle standards and driving licencing or national speed limits.

Many of the road safety issues in the last decade at UN/EU or UK level have also been experienced in Scotland; there has been a substantial reduction in killed and seriously-injured casualties (KSIs) since the 1970s, but the recent plateauing of these reductions means road safety needs to be raised to the top of the agenda. Most developed countries recognise that, to achieve further reductions in KSIs, a step change in road safety delivery is required: from providing focus for improved joint working, to embedding the Safe System ambition and approach into the delivery of national and local activity.

Latest official data[6] allows us to measure progress against Scotland's Road Safety Framework 2020 targets; (see 4 Graphs below).

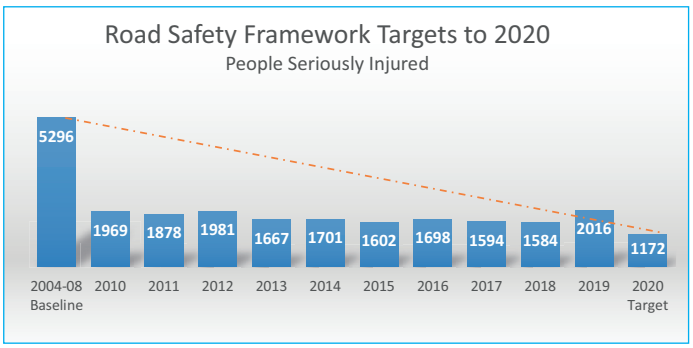
- 165 people were killed in 2019, a reduction of 43% since the baseline (performance currently exceeding the 2020 target of a 40% reduction).
- 2,016 people were seriously injured in 2019. Due to the changes in the recording of casualty severities, following Police Scotland's use from around June/July 2019 of a new accident and casualty data recording system called CRaSH (Collision Reporting and Sharing), progress against this target is measured on the basis of adjusted figures, which show a reduction of 51% from the baseline (performance not currently on track to meet the 2020 target of a 55% reduction).
- On average, there were three children killed each year between 2017 and 2019: a reduction of 83% from the baseline (performance currently exceeding the 2020 target of a 50% reduction).

4 https://www.gov.scot/publications/place-principle-introduction/
5 https://www.un.org/pga/74/wp-content/uploads/sites/99/2020/08/Draft-Resolution-Road-Safety.pdf
6 https://www.transport.gov.scot/media/48481/reported-road-casualties-scotland-2019-publication-pdf-version.pdf



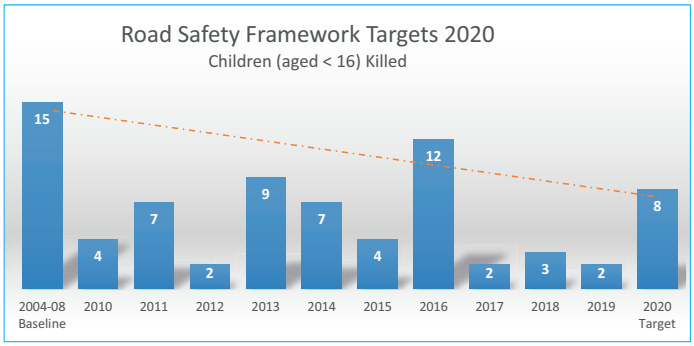
2020 Target = 40% reduction in people killed.

165 people were reported as killed in 2019, 43% (127) below the 2004-2008 average of 292. This target is currently being exceeded.



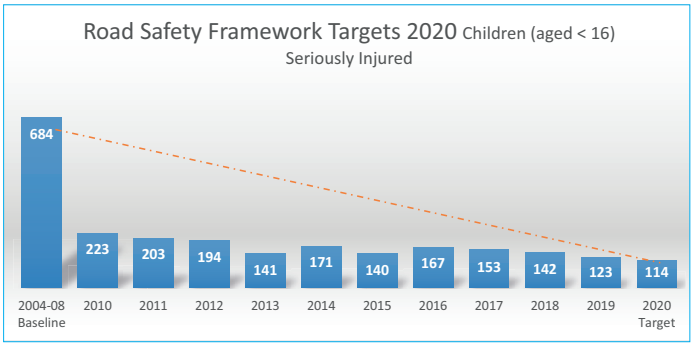
2020 Target = 55% reduction in people seriously injured.

2,016 people were reported as seriously injured in 2019, 51% (3,280) below the 2004-2008 average of 5,296. This target has significantly improved.



2020 Target = 50% reduction in children killed.

2 children were reported as killed in 2019, meaning the average for the 2017-2019 period was 3 a year, this is 83% (13) below the 2004-2008 average of 15. On track – currently exceeding target.



2020 Target = 65% reduction in children seriously injured.

123 children were reported as seriously injured in 2019, 62% (561) below the 2004-2008 average of 684. This target has significantly improved.

* adjusted figures if they had been recorded using the injury-based reporting system CRaSH
** official statistics from Reported Road Casualties Scotland

A Vision for Scotland

Our vision is for Scotland to have the best road safety performance in the world by 2030.

It is unacceptable and unethical that anyone is killed or seriously injured on our roads; any road users must be free from road traffic harm as much as they are free to drive/ride/walk/travel.[7] This framework identifies the part every one of us has to play in ensuring our long-term aspiration for Vision Zero to become a reality. It builds on the approach and actions set out in the first framework "Go Safe on Scotland's Roads – It's Everyone's Responsibility", published in 2009 and recognises the significant contribution made to meeting the 2020 casualty reduction targets. Drawing on the latest evidence, it reflects recent successes, highlights key challenges for the immediate and longer-term, and sets out new, ambitious targets, key performance indicators, and strategic actions for the next decade. This will help shape our collective efforts, inspire collaboration and frame a shared vision for the future.

The framework embeds the Safe System approach to road safety delivery as set out in the NTS2 Delivery Plan. This is international best practice (see Figure 2 below). It sets out an ambitious approach to road safety management based on well-established safety and organisational principles. It is a synthesis of current knowledge about how to effectively manage for better results, and builds on best practice using innovative solutions and new technologies. The Safe System comprises both an explicit goal and a strategy by which it can be delivered.

- The explicit, longer-term goal of the Safe System is for a road traffic system which becomes free from death and serious injury through incremental, targeted improvements within a specified safety performance framework. It is backed up by interim, quantitative targets to reduce numbers of deaths and serious injuries – usually measured over a ten-year period. There is also a focus on targeting those intermediate outcomes which are causally-related to death and serious injury, such as: average speeds; seatbelt use; sober driving; the safety and quality of roads and vehicles; and emergency medical system response. It involves an important paradigm shift away from trying to prevent all collisions towards preventing death and mitigating serious injury in collisions, a problem which is largely achievable based on current knowledge.
- The strategy puts people at its centre, and aims for a more forgiving road system that takes human vulnerability and fallibility into account; people are fragile and make mistakes that can lead to collisions. A Safe (road) System mitigates that problem with its five pillars which effectively act as layers of protection: safe road use; safe roads and roadsides; safe vehicles; safe speeds; and better post-crash response; all working in harmony to prevent deaths and serious injuries.

The holistic approach of the Safe System creates the conditions for road casualties not to occur by focusing efforts not only on road traffic casualty reduction (vulnerability of the casualties) but also on road traffic danger reduction (sources of the danger).[8]

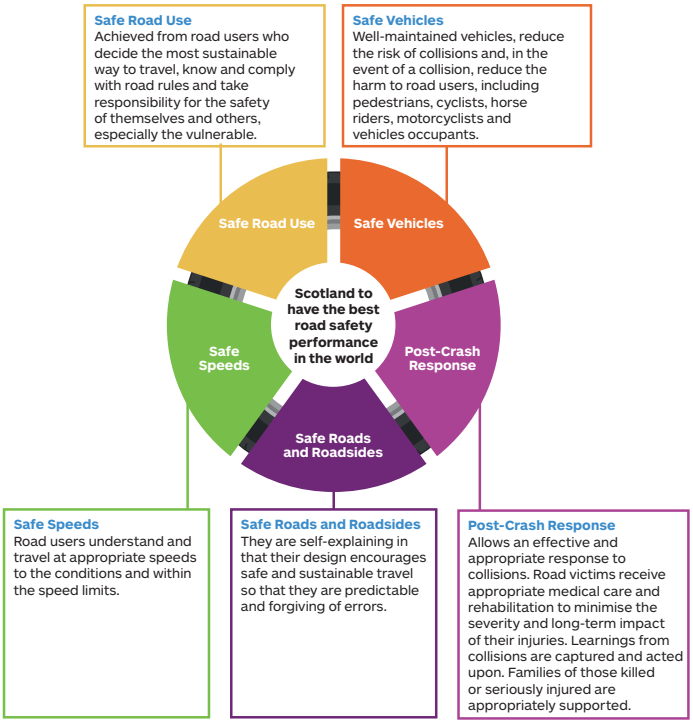
Road safety is defined as any policy, project, plan, programme or strategy which aims to reduce the number and severity of road traffic casualties or reduces road danger with better education or through the design, building, operation or use of the road system.

7 Equality of restraint: Reframing road safety through the ethics of private motorised transport – https://www.sciencedirect.com/science/article/abs/pii/S2214140520301742?dgcid=author
8 https://www.dropbox.com/s/of3eghkps9n6ihf/PACTS%20What%20kills%20most%20on%20the%20roads%20-%20Report%20%5B12.0%5D.pdf?dl=0

Figure 2: Safe System approach to road safety

A Safe System involves those who manage and design the roads as well as those who use them; each is responsible for, and must contribute to, eradicating fatal and serious injuries. Ultimately, all road users are expected to use the roads safely and comply with the rules. To help achieve our vision, the framework identifies five outcomes (Safe Road Use, Safe Roads & Roadsides, Safe Speeds, Safe Vehicles and Post-crash Response) which describe the road safety environment it aims to deliver. These outcomes align with the five pillars of the Safe System (see Fig 3 below)

Figure 3: five pillars of the Safe System



Safe Road Use

Safe road users are competent at all levels, including: paying full attention to the road ahead and the task in hand; adapting to the conditions (weather, the presence of other users, etc.); travelling at lower speeds; not driving while impaired through drink, drugs (including medicines) or fatigue; not being distracted by in-vehicle technology (mobile phones, entertainment systems, sat navs, etc.); and giving sufficient room to all other road users, no matter what their mode of travel. Safe road users are mindful of the hierarchy of road users, which ensures that those road users who can do the greatest harm have the greatest responsibility to reduce the danger or threat they may pose to others. They respect other road users at all times and assume responsibility for others' safety as well as their own.

Measures to encourage safe road use also include working together to reduce car-based traffic, inspiring people to use active modes, such as walking, wheeling or cycling or to use public transport rather than their own vehicles.

Education interventions are also important to ensure road users are risk-aware, can develop coping strategies for high-risk situations, and act appropriately to keep themselves and others safe on the road.

Safe Roads and Roadsides

In a Safe System, roads and roadsides are designed to reduce the risk of collision, and to mitigate the severity of injury should a collision occur. A combination of the design and maintenance supported by the implementation of a range of strategies to ensure that roads and roadsides can be as safe as possible can reduce casualties on our roads. One way in which this can be achieved is to both segregate different kinds of road users and the traffic moving in different directions or at different speeds. If this is not possible, promoting positive behaviours and safer sharing of spaces, as well as the appropriate use of speed limits and signage, can also be a much more affordable and sustainable way to protect the most vulnerable road users.

Safe Speeds

Speed limits in a Safe System are based on aiding crash-avoidance and reducing the speed at which impacts occur. This ensures the body's limit for physical trauma is not reached or exceeded. The Safe System aims to establish appropriate speed limits according to the features of the road, the function it serves, and the physical tolerance of those who use it.

The key factors that should be taken into account in any decisions on local speed limits are:

- history of collisions
- road geometry and engineering
- road function
- composition of road users (including existing and potential levels of vulnerable road users)
- existing traffic speeds
- road environment

Safe Vehicles

Vehicles are designed and regulated to minimise the occurrence and consequences of collisions to road users. This applies not only to vehicle occupants, but also to pedestrians, cyclists, horse-riders and motorcyclists. Making vehicles safer involves both 'active' safety measures, such as autonomous emergency braking, which can prevent collisions occurring in the first place, and 'passive' safety measures, such as seatbelts and airbags, which protect occupants (and other road users) if a collision does occur. It is also vital to ensure vehicle roadworthiness is regulated to the highest standards. Technology within vehicles, such as feedback from the speedometer and seatbelt reminders can also educate road users about safe road use.

Increasingly, roads and vehicles will be managed within an intelligent transport system, relying on ever-more autonomous vehicles and smart infrastructure. As safety becomes hardwired into vehicle technology and road design, there is potential to further reduce road casualties and deaths through this route.

Post-crash response

It is vital to work with the emergency services and the National Health Service (NHS) to enable the best possible response to collisions, ensure victims are effectively cared for, and facilitate meaningful investigations into the causes and potential solutions for the future. Health outcomes for victims rely on the ability of the system to quickly locate and provide emergency first responder care, in order to stabilise victims and transport them to hospital for further specialist treatment.

Current and Emerging Challenges

These challenges, either within or outwith the road safety system, have been identified to make an impact now, or in the near future, on road safety generally and, more particularly, on the new framework. These are encapsulated in twelve themes which map easily onto the Safe System and align with Scottish Government's policies, plans and strategies. A high-level summary of each challenge and its impact on road casualties with more-evidenced narrative is provided below.

Climate Emergency its potential effects on road casualties and the benefits that road safety can bring

Active & Sustainable Travel its potential effects on road casualties and the benefits that road safety can bring

Health improving road safety to reduce impact on public health services

Safe System implementing the Safe System at all levels

Speed Management road users not travelling at appropriate speeds, its effect on road casualties

Road Safety Delivery delivering a shift in resources and funding to focus on road safety delivery

Driving/Riding for Work & Workplace Culture its effect on road casualties

Emerging Technologies consideration of benefits and challenges of emerging technologies on road safety

Enforcement/Deterrence increasing the visibility of road policing enforcement

Road Infrastructure & Maintenance deterioration of road assets and its potential impact on road casualties

Post-Crash Response improving the fast and effective response to road collisions

Road Users unsafe road use by certain types of Road Users and its effect on road casualties

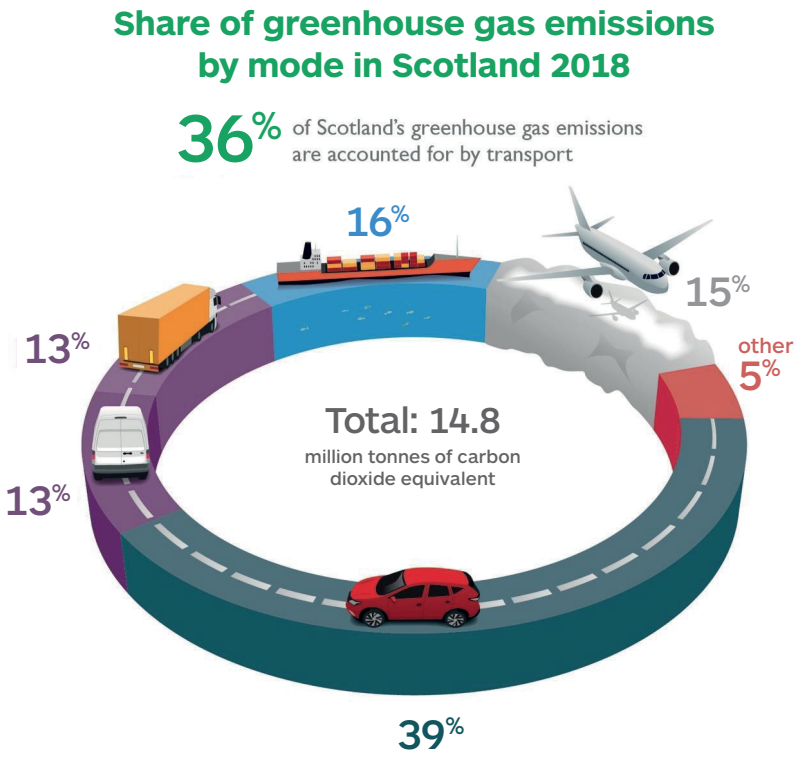
Climate emergency: the potential effects of climate change on road casualties and the benefits road safety initiatives can bring

In direct response to the Paris Agreement, Scotland's landmark Climate Change Act[9] represents a world-leading legislative framework in terms of its ambition. It commits Scotland to becoming a net-zero society by 2045, five years before the UK legislative commitment – in line with advice from the government's independent expert advisors, the UK Committee on Climate Change. The Scottish Government is also responding to the global climate emergency by adopting an ambitious new target to reduce emissions by 75% by 2030 – which goes way beyond what the Intergovernmental Panel on Climate Change says is needed globally to prevent warming of more than 1.5 degrees.

Transport is currently Scotland's largest sectoral emitter, responsible for 37% of Scotland's total greenhouse gases in 2017. The largest source of transport emissions is road vehicles, with cars contributing 40% and Light Goods Vehicles (LGVs) and Heavy Goods Vehicles (HGVs) responsible for 25%.[10]

The National Transport Strategy 2 Strategic Environmental Assessment report[11] states: "our transport system will adapt to remain resilient and reduce the harmful effects on future generations, and will help deliver our net-zero target". The Scottish Government has committed to reduce car kilometres by 20% by 2030. If the health pandemic has moved to a phase to allow more certainty on future transport trends and people's behaviours - and work lifestyle choices in future forecasting – a route-map for the reduction will be published in 2021. Promoting greener, cleaner choices by reinforcing the Sustainable Travel Hierarchy to promote and design our transport system so that walking, cycling, public and shared transport are promoted.

Figure 4: Share of greenhouse gas emissions by mode in 2018



9 Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 (legislation.gov.uk)
10 Carbon Account for Transport No. 11: 2019 Edition
11 national-transport-strategy-2-strategic-environmental-assessment-environmental-report.pdf

Road safety, as with other cross-cutting policies, must take the climate emergency into consideration and this framework will seek to do that.

Extreme changes in temperature and torrential rainfall, along with extreme weather events caused by climate change, will affect many aspects of our lives including road safety and the conservation of the pavement and road mobility. Road users will need to adapt and gain the knowledge, skills and experience required to become safe and responsible users under such conditions. Employers and employees should be encouraged to apply the Severe weather: fair work charter[12] in order to mitigate road safety risk within their organisations.

Non-road safety-related initiatives implemented to tackle the climate emergency may also have negative effects on road safety. For example, the roll-out of more electric vehicles – be it cars, vans or buses – in the next decade will continue to pose a road safety risk due to their lack of noise emissions at low speeds.[13]

In relation to vehicle emissions reduction and air quality improvement, speed management – a pillar of the Safe System, whose primary role is improving road safety – also has the potential to reduce vehicle emissions by smoothing traffic flow and thus contributing on several fronts to providing a safer environment to facilitate increases in walking, wheeling and cycling. A 2017 UK National Institute for Clinical Excellence Public Health Advisory Committee was tasked with looking at air pollutants from vehicles.[14] It advised that reducing 'stop-go' driving can help lower these. It also found traffic-calming measures like speed bumps could increase emissions.

Many traffic-calming measures are promoted as a way of making 20 mph speed limits 'self-enforcing' to ensure compliance. The Public Health Advisory committee advised the UK Government to 'promote a smooth driving style' via a range of measures that should include implementing 20 mph limits in urban areas where speeds are already low, but without additional calming measures. The Department for Transport's three-year evaluation of the HGV speed increase in England and Wales[15] (from 2015) published in July 2020, has helped develop our understanding of the impact of the HGV speed limit change on a number of fronts including: driver behaviour; vehicle speeds; the economy; the environment; and most importantly, road safety. Its key findings are that there there is no evidence of a change in collisions involving at least one HGV on all single and dual carriageway roads and no attributable change in noise and air quality due to the policy change. Our own evaluation of the potential impacts of increasing speed limits for HGVs in Scotland[16] shows there are small safety disbenefits and marginal environmental impacts. There are small safety benefits and increases in CO2e emissions when restricting the speed limit change to trunk roads. Conversely, when the speed limit increase is applied to all rural roads there are small safety disbenefits and reductions in CO2e.

Finally, in relation to promoting greener, cleaner choices by reinforcing the Sustainable Travel Hierarchy of NTS2, the new framework consistently applies the Hierarchy on road safety matters; we have intermediate outcome targets to 2030 for pedestrians and cyclists, and we propose the following two strategic actions in relation to the Hierarchy:

- ensure road safety is a key focus of active and sustainable travel in Scotland
- all road users will understand their road safety responsibilities and improve their attitudes and behaviours to ensure the safety of themselves and other road users.

12 https://www.gov.scot/publications/severe-weather-charter/
13 Until the fleet is naturally renewed with latest EU safety feature requirement that came into force on 1 July 2019 – 'Silent' electric cars to become thing of the past (roadsafetygb.org.uk)
14 Overview | Air pollution: outdoor air quality and health | Guidance | NICE
15 Final report on the increased speed limit for heavy goods vehicles – GOV.UK (www.gov.uk)
16 final-report-june-2018-evaluation-of-impact-of-increasing-speed-limit-for-hgvs-in-scotland.pdf (transport.gov.scot)

Active & Sustainable travel: its potential effects on road casualties and the benefits road safety can bring

The Scottish Government is committed to achieving a more active and healthier nation.

It is also committed to the long-term vision for active travel in Scotland,[17] where communities are shaped around people, with walking and cycling the most popular choice for shorter, everyday journeys. In order to encourage more people to choose active travel, the Scottish Government doubled the active travel budget to £80 million in 2018-19 and it is now at a record £100.5 million for 2020-21 with the commitment to provide over £500 million over five years for large scale, transformational active travel infrastructure projects, access to bikes and behaviour change schemes.[18] The main beneficiaries of this investment are local authorities, working in partnership with active travel stakeholders. In 2020, there are over 280 walking, cycling and place-making infrastructure partnership projects underway, seeking to deliver better segregated cycleways and walkways to make our towns and cities friendlier and safer. The funding is also used for urban design projects, e-bike grants, and behaviour change and education projects.

Transport Scotland invests over £1 billion per year in active and sustainable transport. As recently announced within STPR2 phase 1 we have committed to develop a national strategy for 20 mph zones and limits in Scotland to support a range of policies that assist those Government national outcomes and indicators relevant to this area. Related policy drivers include better road safety and health outcomes, promotion of active travel, climate change mitigation and place-making. The strategy will identify a number of outcomes to assist in the further delivery of 20mph zones and limits on those roads where it is appropriate to do so. It seeks to reduce perceptions of road danger, encourage people to walk and cycle, and create more pleasant streets and neighbourhoods by providing a more equitable balance between different road users, thereby promoting inclusivity. Since 2012, it has invested almost £30 million to establish one of the most comprehensive electric vehicle charging networks in Europe to support our 2032 ambition to phase out the need for new petrol and diesel cars and vans. It made an extra £17 million available through its Low Carbon Transport Loan earlier this year, and will expand the scheme to include used electric vehicles. Its transformational Bus Partnership Fund provides a long-term investment of over £500m to deliver targeted bus priority measures on local and trunk roads. This is intended to reduce the negative impacts of congestion on bus services and address the decline in bus patronage. The investment includes the roll-out of infrastructure for the trunk and local road network.

The Bus Partnership Fund will complement the powers in the Transport (Scotland) Act 2019, enabling local authorities to work in partnership with bus operators, to develop and deliver ambitious schemes that incorporate bus priority measures. The Fund will focus on the evidence of how bus services will be improved by addressing congestion, but the partnership approach is also expected to leverage other bus service improvements to help tackle the climate emergency, reduce private car use and increase bus patronage.

We envisage that more and more people, will opt to cycle (including on e-bikes[19]), walk or use micromobility devices (such as e-scooters, hoverboards or segways) be it for environmental considerations in response to our climate emergency, or for reasons of personal health and fitness – which will result in more vulnerable people on the roads. In early July 2020, the Department for Transport (DfT) introduced new regulations and guidance to allow rental e-scooter trials[20] to start for the next year across towns and cities in the UK. Stronger active

17 https://www.transport.gov.scot/media/33649/long-term-vison-for-active-travel-in-scotland-2030.pdf
18 https://www.gov.scot/publications/protecting-scotland-renewing-scotland-governments-programme-scotland-2020-2021/pages/2/
19 In July 2020 the Scottish Government is providing £900,000 to encourage the uptake of e-bikes across Scotland. Local authorities, public sector agencies, community groups and further and higher education institutions can now apply for money to adopt e-bikes, adaptive bikes and e-cargo bikes as an alternative to car journeys – https://www.transport.gov.scot/news/e-bikes-to-help-charge-scotland-s-green-recovery/
20 https://www.gov.uk/government/publications/e-scooter-trials-guidance-for-local-areas-and-rental-operators/e-scooter-trials-guidance-for-local-areas

mobility policies, especially in urban areas, can be a major game changer in reducing CO2 emissions, improving air quality and reducing congestion. We know the perception of urban and rural roads as unsafe is a barrier against these everyday journeys. That is why measures which encourage these mobility choices also need to take safety considerations into account systematically, as does this new framework. The UK Government, as part of its Future of Mobility Regulatory Review and following the publication of the Future of Mobility: Urban Strategy[21] in March 2019 recently closed a call for views and evidence[22] from all those with an interest in what an innovative and flexible regulatory framework should look like for emerging transport technologies and business models, recognising their benefits to society, the environment and the economy, but also the risks they could pose if left unmanaged.

As the active travel agenda unfolds (traffic estimates suggest a marked increase in cycling on Scottish roads since 2008[23]), Scotland may face the so-called 'safety in numbers' effect which can be defined as follows: with significant increases in walking and cycling, the safety rate improves, but the actual number of pedestrian and cyclist casualties may increase. This could be exacerbated by the current lack of knowledge of the Highway Code[24] among road users in relation to ensuring the safety of cyclists and pedestrians.

£50million from the Low Carbon Fund has been allocated to Active Freeways, which are high quality active travel corridors which provide sustainable transport infrastructure between settlements and major trip attractors. In towns and cities worldwide, the implementation of high-quality segregated networks of routes for people walking, cycling and wheeling has been a key component in promoting healthy, sustainable and inclusive travel choices.

Together with the ever-increasing number of e-bikes and the combination of dedicated segregated routes to key locations, this will provide a real alternative to those short and medium distance car journeys. The Active Freeways programme would build on the Sustrans Scotland's Places for Everyone Programme bringing the benefits to many more of Scotland's cities and towns. The next step is an appraisal methodology that is to be developed to support this investment. It will be used to identify appropriate locations for the first tranche of investment.

Due to the COVID-19 pandemic and to better enable physical distancing, the Scottish Government launched late April 2020 a £30 million Spaces for People fund[25] for a new infrastructure programme for pop-up walking and cycling routes or temporary improvements to existing routes. There appears to be a missing opportunity between the road safety benefits of supporting active travel and the benefits to active travel in supporting road safety.

Due to their numbers and greater vulnerability, pedestrians continue to represent the second – largest category of killed and seriously injured by mode of transport (27% in and 24% respectively for 2019) after car users (45% and 46% respectively for 2019). 95% of pedestrian casualties for 2019 occurred on built-up roads.

Although the number of cyclists killed remains statistically very low, the number of seriously injured showed little change between 2008 and 2018 (figures for 2019 are not directly comparable). 63% of all pedal cycle fatalities over the three years to 2019 were on non-built up roads. In 2019, cyclists accounted for 1.2% of all journeys and 0.8% of traffic in Scotland but, disproportionately, 7.5% of all casualties. Per unit distance travelled, pedal cyclists in Britain have approximately twice the level of risk of being killed than is the case in the Netherlands and Denmark where, of course, cycling is far more common.[26]

21 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/846593/future-of-mobility-strategy.pdf
22 https://www.gov.uk/government/consultations/future-of-transport-regulatory-review-call-for-evidence-on-micromobility-vehicles-flexible-bus-services – and-mobility-as-a-service
23 (DfT Road Traffic Statistics, Table TRA0423), https://www.gov.uk/government/statistical-data-sets/road-traffic-statistics-tra
24 Note that DfT on 28 July launched a consultation on The Highway Code which focuses on improving road safety for cyclists, pedestrians and horse riders until 27 October. The main alterations to the code being proposed are introducing a hierarchy of road users, clarifying existing rules on pedestrian priority on pavements, providing guidance on cyclist priority at junctions and establishing guidance on safe passing distances and speeds when overtaking cyclists and horse riders
25 This has been supported by a package of guidance and support to local authorities from Transport Scotland and Sustrans Scotland for improvements such as widened pavements and cycle lanes – https://www.transport.gov.scot/news/10-million-to-support-pop-up-active-travel-infrastructure/
26 DfT ROAD SAFETY MANAGEMENT CAPACITY REVIEW – https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/717062/road-safety-management-capacity-review.pdf

Health: improving road safety to reduce impact on public health services

This challenge looks at health holistically as issues of fatal and serious injuries sustained post-collision are covered in the separate post-crash response challenge.

Given the significant and rising costs associated with ill-health and related failure demand, there is both an economic and health benefit to a renewed focus on preventative interventions which reduce pressure on other parts of the public sector and contribute to Scotland's long-term sustainable economic growth. Public health reform is an equal partnership between central and local government, recognising that improving public health is a shared responsibility at both national and local level. Reform aims to improve public health through a 'whole system' approach, focused on prevention and early intervention, and creating the conditions for wellbeing in our communities.

Road casualty reduction is an important contributor to improving Scotland's public health by preventing premature death and injury, particularly among motorcyclists, young people, cyclists and pedestrians. Public health and road safety are linked by a number of factors, such as the speed and volume of traffic, which can cause injuries and prevent opportunities for healthy activity outside the home.[27] Safer roads and road use pave the way for more people cycling and walking which, in turn, improves their health and increases the numbers living in vibrant, healthy and safe communities. Transport Scotland published the Good Practice Guide on implementing 20 mph speed limits[28] to promote the introduction of 20 mph and are supportive of these limits in the right environment. The only major UK study into the effectiveness of sign-only 20 mph speed limits was published by the Department for Transport in 2018.[29] This three year study found that, overall, 20 mph limits are perceived to be beneficial for cyclists and pedestrians.

Thus, improved road safety would directly assist in achieving the Public Health Priority of a Scotland where we live in vibrant, healthy and safe places and communities, as well as Scotland's National Performance Framework Health outcome: We are healthy and active.

However, public perception seems to be that road death is not a public health issue when compared to other causes of sudden death such as assault. This perception is not evidenced by reported road casualty statistics and mortality statistics, which show, in 2019, around three times more people were killed on the roads[30] than were victims of assault.[31]

In addition, data collected on discharges from non-obstetric and non-psychiatric acute hospitals consistently show the c. 3000 per year admissions for those seriously injured in collisions (those requiring at least an overnight stay) is consistently double that of casualties reported via STATS 19[32] (c. 1600 per year). Looking to the future, this disparity needs to be addressed in order to understand the true picture of road casualties.

This may become more of a problem in the future as people walk and cycle more and continue to report injuries through hospitals rather than the police.

Finally, the health of our road users needs to be appropriate for the mode of transport. On physical health, good eyesight can become problematic with age and may lead to greater use of contributory factors such as 'failed to look properly' or 'failed to judge other person's path/speed'. From a mental health perspective and following a research carried out by Mercedes in 2017,[33] van drivers, particularly in the Gig economy, are especially prone to poor mental health from a combination of unpredictable journey times, traffic congestion, tight deadlines, high workload and lack of social interaction, all of which can lead to stress and fatigue, thus creating a road safety risk to themselves and others.

27 https://www.rospa.com/rospaweb/docs/advice-services/road-safety/practitioners/rospa-road-safety-and-public-health.pdf
28 https://www.transport.gov.scot/media/38640/20-mph-good-practice-guide-update-version-2-28-june-2016.pdf
29 https://www.gov.uk/government/publications/20-mph-speed-limits-on-roads
30 Reported Road Casualties 2019, https://www.transport.gov.scot/our-approach/statistics/#42762
31 National Records of Scotland, Vital Events Reference Tables 2019, https://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/vital-events/general-publications/vital-events-reference-tables/2019
32 road accidents reported to the police. These provide detailed statistics about personal injury road accidents, vehicles and casualties involved – https://www.gov.uk/government/collections/road-accidents-and-safety-statistics
33 https://www.vansdirect.co.uk/mercedes-vans-investigates-mental-health-van-drivers

The Safe System: implementing it at all levels

While the Safe System Approach has been adopted in Scotland, there seems to be a lack of knowledge, among stakeholders and members of the public, on what it is and what it means for road safety professionals and for individual road users.

As a result, many professionals continue to use traditional delivery methods which seek to correct human behaviour, rather than acknowledge that collisions are also related to the inherent risks of the existing infrastructure.

Unlike this traditional approach, the Safe System accepts that human error is no longer the primary cause of collisions. Rather, a failure of the road system is what results in death or serious injury. A Safe System also shapes interventions to meet the long-term goal of zero deaths and serious injuries, rather than relying on traditional road safety interventions to reduce collisions. The key objective for those managing the roads is to recognise that, when collisions occur as a result of road user error, high-severity outcomes, such as death and serious injury, need not occur. Therefore, roads and infrastructure need to be 'forgiving' and take account of human vulnerability.

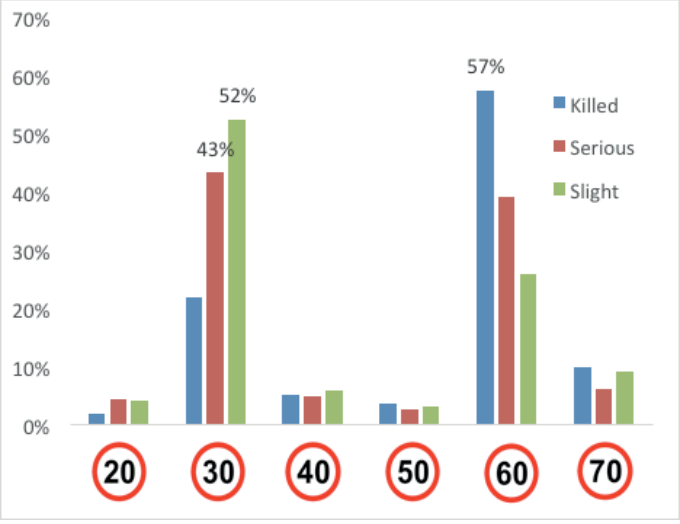
In many areas, this will require a significant shift in how road safety is delivered. We need to educate all those involved on what the Safe System entails, and why it is important everyone plays their part to ensure it is fully-implemented within every aspect of road safety delivery.

This will be difficult in the current economic environment where many areas are already unable to react to and address collision causation factors. Therefore, switching to a more proactive/preventative approach will require significant buy-in from leadership, followed up by decisive action to align objectives in public health, occupational health and safety, environmental, and social justice, in order to maximise the benefits of cost-effective investment in improving the various infrastructures. Fully-implementing the Safe System can produce economic savings for a society, as the costs of preventing casualties are usually substantially less than the actual costs of treating these casualties.

Currently, road collision costs, including for casualties, represent around 0.5% of Scotland's gross domestic product.[34]

Speed Management: road users not travelling at appropriate speeds, its effect on road casualties

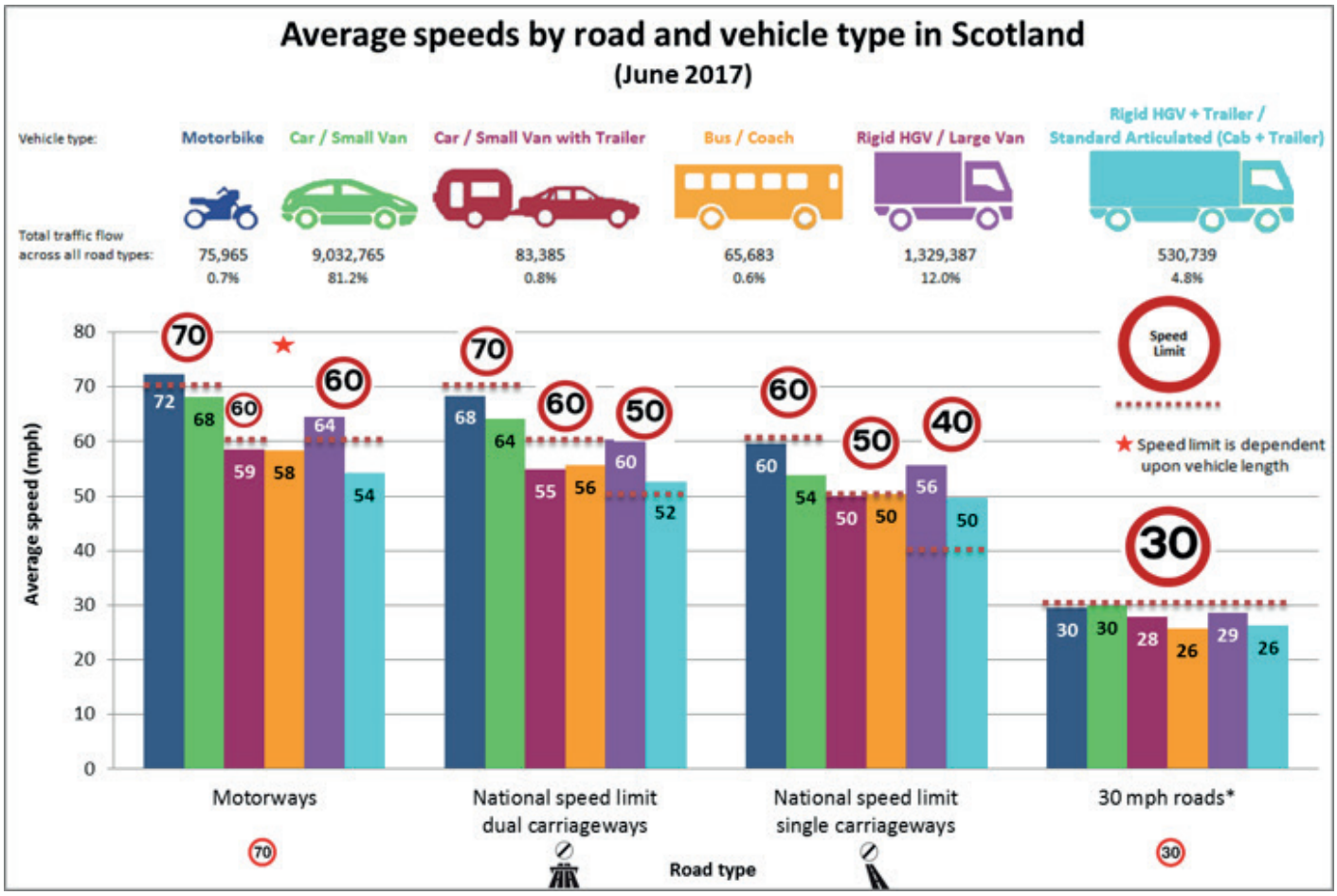
There continues to be a cultural speed issue in Scotland, evidenced through the Road Safety Information Tracking Study (RITS) 2020 of Driver attitudes and behaviour[35] Although, there has been a downward trend in reported speeding behaviours in the past few years, a number of these behaviours still remain prevalent. There are still too many collisions related to non-compliance with the speed limits or not driving/riding to the conditions. In Scotland overall, the number of fatalities due to speeding has decreased from 29% in 2013 to 23% in 2019. The following graph, which shows casualties by severity and speed limit, shows more than half of all fatalities occur on 60 mph roads (typically rural roads) and almost half of serious injuries (and 82% of all pedestrian serious casualties) occur on 30 mph roads (mostly urban and sub-urban roads).



34 The total cost of collisions to Scotland was £1 billion in 2018 compared to a GDP was £180 billion https://www.transport.gov.scot/media/46069/reported-road-casualties-scotland-2018.pdf

35 Road Safety Information Tracking Study (RITS), Wave 19, August 2020, https://roadsafety.scot/resources/rits-road-safety-information-tracking-study-wave-19-aug-2020/

The graph below shows average speeds by road and vehicle type[36] analysed at 26 sampled locations in June 2017, using four to ten counters per road type. It indicates low levels of national speed compliance – mostly from HGVs on dual and single carriageways. It is worth noting, before Average Speed Cameras were deployed on the A90, one in five vehicles were estimated to be exceeding the speed limit by 10 mph or more. This figure is now approximately 1-in-5000.[37] The same improvement has been seen across other routes where such systems have been installed.



In relation to non-national speed limits, such as 20 mph zones, road policing operations, observational studies and/or self-reporting data all indicate a low level of speed compliance. For example, the RAC Report on Motoring 2020[38] found non-compliance with 20 mph was at 39% though this had reduced from 44% the previous year. The three-year study by the Department for Transport into the effectiveness of sign-only 20 mph limits[39] found that lack of enforcement and lack of concern about the consequences of speeding were the primary reasons given for non-compliance.

The evidence above supports a National Speed Management Review. The rationale for this was also set out in STPR2 phase 1 recommendations and Transport Scotland will now take that forward, as highlighted in the NTS2 Delivery Plan.

36 All counters were desired to be at least 1 kilometre from any fixed safety camera enforcement and at a location where other elements such as roundabouts, junctions etc. would not influence a driver's speed. The majority of counters met the specified location criteria but due to both counter and data availability it was not always possible to include counters in the sample that met all the desired criteria

37 https://www.transport.gov.scot/transport-network/roads/scottish-safety-camera-programme#42385

38 https://www.rac.co.uk/drive/features/report-on-motoring-2020/

39 https://www.gov.uk/government/publications/20-mph-speed-limits-on-roads

Road Safety Delivery: delivering a shift in resources and funding to focus on road safety

Road safety funding practices vary, even across areas whose road safety records are favourable, suggesting there is not a 'one size fits all' approach.

More recently, in July 2019, the Road Safety Foundation assessed the effectiveness of road safety engineering in local government across the UK,[40] including Scotland. It found many local authority practitioners share three main concerns:

- Low levels of resourcing within engineering teams, resulting in a large proportion of time responding to public concerns and administrative duties, rather than designing and implementing life-saving schemes
- The lack of capital investment for engineering improvements
- The inability to compete with other core local authorities services, and lack of recognition (at a senior level) of both the scale of the problem of road trauma and the real opportunity to tackle the issue

Diminishing financial resources have coincided with a reduction in the number of 'traditional' road safety officers (some authorities no longer have any) and engineers across Scotland. Not only has this produced a knowledge/skills drain within local authorities but, without professional and appropriate resources, there is a significant reduction in the priority which should be given to road casualty reduction both on the roads and in our educational establishments. Furthermore, the opportunities to share information and good practice are also reduced.

In 2019 the cost of collisions in Scotland was estimated to be over £1.1 billion[41]. This serves to highlight the enormous costs that government spending on road safety has helped prevent, through its contribution to the continued drop in collisions and casualties. If widely communicated and recognised at every level of government, there is a compelling case for decision-makers to re-prioritise road safety spend within overall budgets by better aligning public health, occupational health and safety, environmental, and social justice objectives with road safety objectives. This would help maximise the benefits of cost-effective investment and funding in road safety through co-funding opportunities from various budget lines.

With this in mind, there is an opportunity to prepare a strong business case for road safety investment, using a 'willingness to pay' model: such a cost-benefit analysis would assess the value of a life saved against the negative impact of road collisions on, for example, increased journey time, to make road safety initiatives compete successfully with other funding demands.

The current Framework to 2020 established and maintained strong partnership working across the whole road safety community in Scotland, and therein lies its success. However, significant challenges lie ahead, given the increased pressure to perform better with fewer resources. With this in mind, the Framework Strategic Partnership Board developed an approach in summer 2018 which highlighted the need to strengthen how we work collaboratively, particularly at local level, to co-design and co-deliver road safety change. This has been named the 'Team Scotland' approach.

40 https://roadsafetyfoundation.org/assessment-of-the-sustainability-of-road-safety-engineering-in-local-government/
41 Reported Road Casualties 2019, Table 11, https://www.transport.gov.scot/our-approach/statistics/#42762

The main aim of Team Scotland is to ensure better connections between national and local activity and provide an evidence base for road safety delivery. Team Scotland aims to work closely with delivery partners to understand local systems and their relationship to national systems; identify those initiatives being undertaken at local level; learn from best practice; and evaluate results with a view to sharing best practice. It is also about delivering a wider understanding of the challenges we all face, and working more closely to devise and implement solutions for those challenges. The Team Scotland approach has already begun and will continue to run through the new framework.

In order to further improve connectivity between national and local levels, we have introduced a new tier in the framework governance structure – the Local Partnership Forums (see Governance section).

Driving/Riding for Work and Workplace culture: its effect on road casualties

We must strive for a future where no one is killed while driving/riding for work. Health and Safety Executive (HSE) figures[42] highlight that, in 2018-19, driving accounted for 18 of the 29 work-related deaths in Scotland, making driving the most dangerous work activity. This situation poses a risk to every road user, even more so with the increase in Light Goods Vehicles (LGVs) on our roads and the growth of the "Grey Fleet".[43]

In 2018 in the UK, LGVs were the second most – registered vehicles (10%), behind cars (83%). Over the last 24 years, vehicle stock has increased by 51%. The largest increase was for LGVs (88%), followed by motorcycles (72%), and cars (49%), and this trend looks set to continue. According to the Freight Transport Association,[44] there is a common misconception that the increase in vans on our roads is due to a soaring demand for online shopping, as part of the Gig economy: this is not true, as only one in ten vans is used for this purpose. Rather, the majority is used to support an array of trade professions, such as plumbers and gardeners, enabling them to travel to and from jobs with their equipment on board.

Health and safety law applies to work activities on the road in the same way it does to all work activities. All workers are entitled to work in a safe environment where risks to their health and safety are properly controlled. Employers have duties under health and safety legislation for on-the-road work activities, and this also extends to the self-employed. In general, this requires an adequate and suitable generic assessment of risks for the various types of driving tasks undertaken within every organisation, including: delivering goods; travelling to meetings; call-outs; emergency response; vehicle recovery operations; and courier delivery, to name but a few. In addition, employers must consider the safety-critical features of: the journey purpose; the vehicle to be used; and the driver/rider him/herself; as these are equally important factors in collision risk. Unfortunately, the HSE does not recognise the driving seat as a place of work and compliance to health and safety legislation for on-the-road work activities varies due to the size of the company and their commitment to road safety.

A recent IAM RoadSmart White paper[45] highlights some alarming practices and attitudes when it comes to employers, with almost half of them expecting employees to answer their phone at any time, including while driving for work.

The Gig economy is another area of great concern as drivers/riders have to 'chase' work, often with little or no training, nor any safety equipment, which often results in them taking greater risks and having poor wellbeing on the road.

42 www.hse.gov.uk/statistics/sources.htm
43 Grey Fleet' is a term used to describe the business miles travelled by an employee in their own vehicle. This 'fleet' of employee-owned cars is deemed 'grey' as the vehicles in use are in somewhat of a grey area of responsibility for the employer
44 https://www.drivingforbetterbusiness.com/downloads/dfbb-publications/DfBB-CV-Fleet-Review-Apr2019.pdf
45 Just over one in eight employees who drive for work (13%) and more than one in 20 leaders (6%) consider the hard shoulder a safe place to take a work call. One in six UK employees who drive for work (17%) say they have been involved in an incident when driving for work due to a phone call from a colleague.

A variety of respected organisations, such as HSE, the Royal Society for the Prevention of Accidents (RoSPA), and the Transport Research Laboratory (TRL), have consistently indicated between one quarter and one third of all collisions in the UK involve someone driving for work. In Scotland in 2019, there were 7,671 reported road casualties, of which 1,171 occurred where the journey was work-related. These resulted in 10 pedestrian deaths, 5 in a car/taxi, three in a bus/coach, two in an HGV and one in an LGV. 448 of those injured were travelling in a car/taxi, 276 were pedestrians 178 were in an Bus/coach and 142 in an LGV.

Transport Scotland has estimated that 1.1 million private vehicles are used for business on Scotland's roads. This 'Grey Fleet' can have a significant effect on both the risk profile and the operational costs of any organisation. Research carried out by Driving for Better Business highlighted a number of concerns around compliance with legislation and the wellbeing of employees driving for work.[46] These include: mobile phone usage; health & safety; business insurance; regular servicing; and vehicle safety checks. We need to ensure the 'Grey Fleet' becomes the 'black and white fleet'.

In addition, with HGVs travelling 2.6 billion kilometres on Scotland's roads every year,[47] the need for these vehicles to be properly-maintained and used safely is paramount. Concerns include issues such as driver fatigue and poorly loaded/insecure vehicles.

The Scottish Occupational Road Safety Alliance (ScORSA) was created to raise awareness of managing occupational road risk and to promote occupational road safety within Scotland, so that road safety becomes ingrained in the workplace culture. This would, for example, include applying the Severe weather: fair work charter.[48] ScORSA is the only dedicated source of free information, guidance and advice in relation to the management of occupational road risk specifically aimed at enterprises based in Scotland.

Emerging Technologies: consideration of benefits and challenges of technology on road safety

Scotland needs to be ready to embrace new trends, such as connectivity and automation, which will, in the future, create new road safety opportunities by reducing the role of human error (driver/rider error or action was reported in 90% of all reported accidents in 2019, with 'failed to look properly' the most common type at 30%). However, as we remain in the transition phase, new risks will emerge; these include vehicles with a wide range of different automated/connected capability, which will have to operate in mixed traffic conditions alongside 'traditional' vehicles and vulnerable road users, such as motorcyclists, cyclists and pedestrians.

A specific EU strategy on connected and automated mobility was adopted as part of the "Third Mobility Package". The strategy offers tremendous potential in reducing and eventually eliminating driver error, but it also creates new challenges, such as cyber-security and the interaction with 'traditional' vehicles and other road users, both of which need to be carefully monitored.

In Scotland in 2019, a total of 4,581 car users were injured in road collisions, representing 60% of all casualties. Of these, 75 died. There were 1,250 pedestrian casualties (16% of total casualties), of whom 44 died; 572 pedal cycle casualties (7.5% of the total) of whom 10 died; and 520 motorcycle casualties (6.8% of the total), of whom 25 died.

Following the adoption of an EU regulation on the general safety of motor vehicles and the protection of vehicle occupants and vulnerable road users, as of mid-2022, it will be mandatory for all new cars on the EU market to be equipped with advanced safety systems. An estimated 7,300 deaths and 38,900 serious injuries will be avoided over a ten-year period within the EU.

46 A UK government-backed Highways England programme to help employers in both the private and public sectors reduce work-related road risk, decrease the associated costs and improve compliance with current legislation and guidance – https://www.drivingforbetterbusiness.com/
47 https://www.transport.gov.scot/media/47300/scottish-transport-statistics-2019.pdf
48 https://www.gov.scot/publications/severe-weather-charter/

The infrastructure safety management work will include network-wide risk mapping and reinforced provisions for vulnerable road users. The former UK Government has committed to align its vehicle standards to that of the EU.

Using current figures, and based on the population of Scotland within the EU, the impact of adopting vehicle safety measures in Scotland could prevent around 7 fatalities and 39 serious injuries per year.

New in-vehicle safety and driver assistance systems can both mitigate the severity, and reduce the likelihood, of collisions. Furthermore, the development of safer vehicles has had a significant, positive impact on crash survivability. While road user behaviour accounts for the majority of crashes, the Safe System also identifies the need to make crashes survivable. Research and development in this area is essential.

Initially, when the fleet is mixed, there will be complex interactions between autonomous vehicles, human-driven vehicles, pedestrians and other road users. These interactions would be a first for both technology and human, and the challenge will require navigating unfamiliar and difficult situations which would typically require some form of human judgement. Another key factor is the possibility of road users purposely interfering with Connected and Autonomous Vehicles (CAVs) which brings a further risk into the mix.

In Scotland in 2019, there were 198 bus and coach-users injured, of whom 23 suffered serious injuries (3 died). There were also 248 casualties who were travelling in Light Goods Vehicles (LGVs), 51 Heavy Goods Vehicles (HGVs), 139 in taxis, 24 in minibuses and 62 people using another means of transport.

The development and deployment of CAVs has the potential to bring transformative change to peoples' lives, not just in how we travel, but in how we work, where we live, the environment, and safety. The CAV Roadmap for Scotland[49] sets out the future vision for how Scotland can benefit from and contribute to this exciting and innovative sector.

It supports the Programme for Government commitments to put sustainable transport at the heart of decision-making and ensure that transport plays a key role in delivering net-zero emissions by 2045.

The CAV Roadmap is aligned with Scotland's Future Intelligent Transport Systems Strategy and our draft National Transport Strategy (NTS2), which sets out a compelling vision for the transport system over the next 20 years, one that protects our climate and improves lives.

New technology is also being used in road infrastructure to mitigate risk. Scotland's Intelligent Transport System (ITS) makes use of Automatic Number Plate Recognition, Average Speed Cameras and Variable Message Signs to improve the journey. In addition, Temporary Average Speed Cameras at Roadworks (TASCAR) contribute towards the safety of road workers and road users, as well as improving traffic flow.

In-car technology and telematics will also play a part in helping to manage risk. The motor insurance industry recognised this and many companies offer reduced premiums, when technology helps reduce risk, particularly for young drivers. Since then, there has been a greater uptake of telematics through black box technology and, more recently, via phone apps.

With the rise in technology within and outwith vehicles, there is an ever-growing risk of overconfidence in, and over-reliance on, technology. This could lead to road users adopting more risky behaviours, believing the technology will accommodate them and adapt appropriately. Furthermore, technology is still largely unfamiliar and may lead to increased distraction and/or improper use which, in turn, increases collision risk. Hence, new and emerging technologies must be researched and evaluated to evidence whether they help or hinder road safety.

Scotland needs to be sure it embraces technology for the right reasons and this will involve not only partnership working, but also substantial investment and intensive research to determine the benefits, risks and challenges before implementing new technology.

49 https://www.transport.gov.scot/publication/a-cav-roadmap-for-scotland/

Enforcement/Deterrence: increasing enforcement of the rules of the road

Enforcement is an essential part of the Safe System. An ETSC report[50] found evidence that drivers are more willing to comply with the rules if they feel that they are otherwise likely to be caught and punished. It therefore recommends that police controls should be sufficiently publicised, regular and long-term, unpredictable and difficult to avoid, and combine both highly visible and less visible activities. A Brake and Direct Line report on Roads policing and criminal justice found almost two in three (62%) drivers said more enforcement would persuade them to take more care on the road. This would enhance road safety but this reality is felt differently by different road users. The latest RITS Driver attitudes and behaviour tracking study[51] highlights that 34% of drivers agree that "you are more likely to be stopped by the police this year". This has gradually decreased over time.

Given the above, there is an issue of road users not perceiving the police to be visible enough for them to improve their behaviour.

Technology, such as alcohol interlock for convicted drink-drivers in some European countries, can be used to enhance enforcement beyond usual road policing by combating the small minority who insist on using our roads in a dangerous and antisocial manner. They continue to present a threat to themselves and others. Other technology, such as speed and red light cameras, have been proven to reduce deaths and injuries, as demonstrated in a report by Professor Richard Allsop, on behalf of the RAC Foundation,[52] which estimated that fixed speed cameras have reduced injury collisions across all severities by 16%, and fatal and serious collisions by 14%.

The level of public support for safety cameras in Scotland[53] is high – a road user perception survey showed 76% agreed with the use of safety cameras and that they are a good thing; 71% agreed they help discourage dangerous driving in areas they are used; and 64% agreed they help prevent accidents in areas they are used.

An important development in the use of technology is the proliferation of dash/helmet cameras, providing digital video and photographic evidence which can be used in prosecutions.

Operation Snap,[54] an award winning initiative by GoSafe Wales (the Welsh equivalent of the Scottish Safety Camera Programme) enables the public to submit footage to the police for such use. Since late 2016, there has been an increase in detection rates without significant extra enforcement costs, and the public has reacted positively to this initiative, often viewed as a form of community policing.

Another form of community policing in Scotland, in which the public assist police in protecting the most vulnerable road users, especially against aggressive driving, is Community Speedwatch.[55] This initiative invites active members of local communities, with police support, to monitor speeds of vehicles using hand-held equipment. Vehicles exceeding the speed limit are then referred to the Police for further action with the aim of educating drivers and encouraging them to reduce their speeds.

50 https://etsc.eu/how-traffic-law-enforcement-can-contribute-to-safer-roads-pin-flash-31/
51 Road Safety Information Tracking Study (RITS), Wave 19, August 2020, https://roadsafety.scot/resources/rits-road-safety-information-tracking-study-wave-19-aug-2020/
52 https://www.racfoundation.org/research/safety/speed-camera-data-report
53 https://www.transport.gov.scot/media/45762/safety-camera-annual-report-2018-19.pdf
54 https://gosafe.org/faq/operation-snap/
55 https://www.communityspeedwatch.org/

Road Infrastructure & Maintenance: Deterioration of road assets and its potential impact on road casualties

The Scottish Government's Infrastructure Investment Plan (IIP) for Scotland 2021-2022 to 2025-2026 sets out a long term vision of infrastructure in Scotland, which supports an inclusive, net zero carbon economy and includes details on over £26 billion of major projects and large programmes.[56] 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 collisions on the trunk road network.

Maintaining the 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.

Our road network is constantly under pressure due to changes in the volume and type of traffic and requires that we provide solutions in order to meet current and future challenges. We must continue to improve our network by installing engineering measures to provide a safer network. A solution-led approach must be adopted for all types of maintenance works, including routine and cyclical maintenance operations, as well as larger structural/carriageway schemes.

The role of Commissioner was created in 2005 to oversee improvements to the planning, co-ordination and quality of road works in Scotland. The founding legislation envisages that this will be done by monitoring road works across Scotland by promoting compliance with legislation and promoting good practice. The Commissioner monitors performance, promotes and encourages good practice across both utility companies and roads authorities. The Commissioner also has powers to impose financial penalties on roads authorities who systematically fail in their duty to co-ordinate and upon utility companies who systematically fail to co-operate when undertaking road works.

Significant legislative reform is underway within this area. This includes a number of safety measures, such as extending the remit of Safety at Street Works and Road Works a Code of Practice 2013 to Scottish Roads authorities, and the introduction of Reinstatement Quality Plans to organisations undertaking works in the road.

In Europe it is estimated that road infrastructure and road surroundings are a contributing factor in more than 30% of crashes. Well-designed and properly maintained roads can reduce the probability of road traffic accidents, while "forgiving" roads (roads laid out on Safe System principles e.g. with the protection of roadside hazards to ensure that driving errors do not need to have serious consequences) can reduce the severity of accidents that do happen.

Route risk mapping with proactive road assessments in addition to the more traditional reactive analysis of high accident cluster sites provide useful tools to assess the safety quality of the road network and to target investment.

In addition, as in car technologies advance and become more prominent we need to ensure our infrastructure is ready for the higher levels of automation in vehicles, by launching work towards specifications for the performance of road signs and markings, including their placing, visibility and retro-reflectivity. This is important already today for the functioning of driver assistance systems like Intelligent Speed Assistance (in the case of speed limit signs) and Lane Keeping Assistance (in the case of road markings), and will become more important as the level of automation increases.

56 https://www.gov.scot/publications/national-mission-local-impact-infrastructure-investment-plan-scotland-2021-22-2025-26/

Post-Crash Response: improving the fast and effective response to road collisions

The response time and time for treatment after collision, particularly provided by first responders, are crucial; a review of European studies of death in traffic crashes concluded about 50% of all deaths occurred within a few minutes of the crash (immediate deaths), either at the scene or on the way to a hospital.[57]

It then peaks around two-hours after the crash (early deaths), followed by another peak within three to four weeks (late deaths). This curve is called the trimodal distribution of trauma deaths.

If first responders at crash sites manage to control life-threatening haemorrhage, carry out airway manoeuvres, and provide life support in the context of impact brain apnoea, then survivability is very much increased. Treatment within the first hour can largely determine a critically-injured person's chances of survival and can turn a fatal collision into a serious one. In Scotland, most road users are not trained as first responders, so casualties normally receive the first response from emergency service personnel. Transport Scotland will continue to engage with Highways England to identify the merits of improving early responses to collisions.[58]

In 2019, 168 people died in Scotland as a result of a collision and a further 2,001 were seriously injured, affecting many families, friends and the wider community. A serious pursuit of Vision Zero, necessitates improving post-crash response by the emergency services (Police, Ambulance, Fire & Rescue) but also increasing the number of other first responders, who will become essential players in mitigating the seriousness of collisions.

The Scottish Trauma Network[59] is progressing Key Performance Indicators, some of which will align with this framework; for example, access to Major Trauma Centres, for the majority of the population, within 45 minutes by road. The Scottish Trauma Network consists of four regional networks (North, East, South East and West), and the Scottish Ambulance Service (SAS). The Major Trauma Centres at Aberdeen Royal Infirmary and Ninewells Hospital Dundee, treat the most severely-injured casualties to ensure they have the best chance of a speedy recovery. Similar centres are being established in Edinburgh and Glasgow, but will not be operational for another five years.

The clock starts ticking as soon as a collision occurs; if it is on a rural road, or at a time of day when there is little passing traffic, it can be some time before the alarm is raised. To combat and reduce the time lag, an eCall system has been mandatory in all new EU-registered cars since April 2018. Separate legislation already required Member States to put in place the infrastructure to handle eCalls. In the UK, BT is the current provider for all the emergency 999 calls. There is no indication from the UK Government that they will disalign from these EU regulations following our departure from the EU. Since 2010, Euro NCAP's Advanced Rewards has recognised car manufacturers who make available new safety technologies which demonstrate a scientifically – proven safety benefit for consumers and society.

In addition to eCall, 70% of smartphones can now provide the exact location of a 999 caller by sending an automatic text to the call handler, including precise GPS position to within three metres.

57 https://ec.europa.eu/transport/road_safety/sites/roadsafety/files/pdf/ersosynthesis2018-postimpactcare.pdf
58 They are training their roads teams in defined first aid to offer a greater resource to address this issue and are looking at the possibility of working with the haulage and distribution industry to broaden knowledge in the professional driving group that could increase the resource available to provide immediate post-crash care
59 https://www.scottishtraumanetwork.com/

Once the emergency call is made, the triage phase starts. In November 2016, the Scottish Ambulance Service began to pilot the New Clinical Response Model (NCRM) for emergency 999 calls with the aim of saving more lives and matching response – to-patient needs more effectively. Under the new system, patients with immediately life threatening conditions, such as cardiac arrest, or who have been involved in serious road traffic incidents, are prioritised and receive the fastest response. It aspires to provide more at-the-scene patient care and the evaluation report of 2019 found a 43% increase in 30-day survival for all patients requiring the most acute level of care. This equates to 1,182[60] lives saved.

The UK Rescue Organisation[61] brings together fire and medical services to deliver and develop training, technologies and techniques to improve road safety. This includes new training and better extrication techniques to save time getting treatment to casualties trapped after a collision.

The European Transport Safety Council also recommends emergency services should be provided with and use vehicle rescue sheets[62] to accelerate the victim extrication.

Road Users: unsafe road use by certain types of road users and its effect on road casualties

This challenge covers a range of issues from the perspective of various road user categories – such as young drivers – and from a more generic point of view – such as not wearing seatbelts or people living in areas of deprivation.

Lifelong road use learning

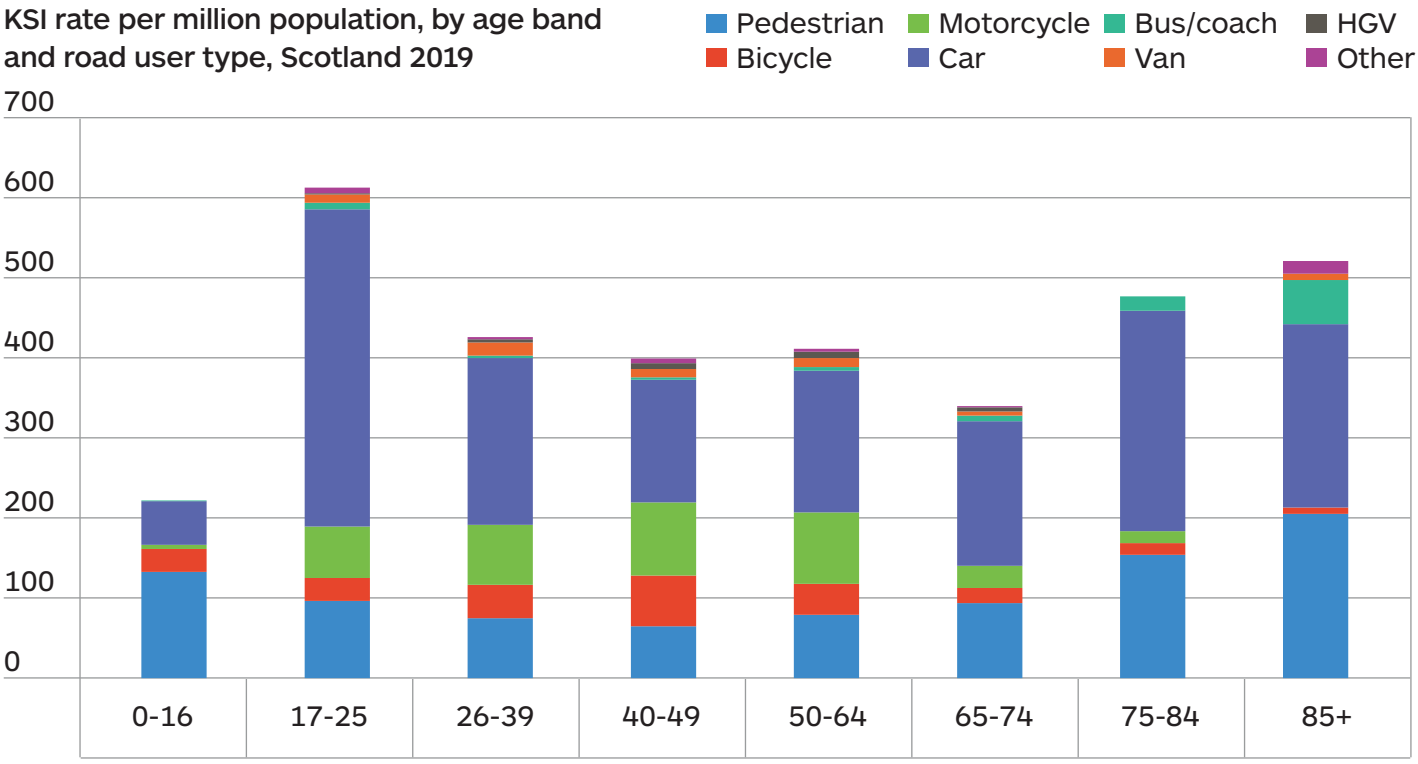
Traffic safety and mobility education, particularly applying its Key Principles,[63] is vital to implementing the Safe System,[64] as it helps develop safe road users. Road safety is a lifelong learning process and education is critical, especially in early years: what our children learn (knowledge), what they are exposed to (experience), and how they behave (skill) at a young age can remain with them throughout their lives. However, excellence in this particular area, is already evident in many parts of Scotland, but it is inconsistent. Using road safety learning resources developed specifically to support Curriculum for Excellence[65] in all schools, teachers, early years staff, parents, carers, road safety officers and lecturers should continue to work in partnership by engaging children and young people in active and experiential learning.

60 http://www.scottishambulance.com/userfiles/file/TheService/Publications/SAS%20-%20NCRM%20Evaluation%20-%20Feb%202019.pdf
61 https://www.ukro.org/
62 https://etsc.eu/post-collision-response-case-study-rescue-sheets/
63 ETSC Key Principles for Traffic Safety and Mobility Education – https://etsc.eu/wp-content/uploads/LEARN-Key-Principles.pdf?utm_source=ETSC&utm_campaign=e5b4abe700-20200124_education_report_2020&utm_medium=email&utm_term=0_3a7b55edbf-e5b4abe700-307154369
64 For more information on the Safe System approach to road safety: OECD/International Transport Forum (2016), Zero Road Deaths and Serious Injuries: Leading a paradigm shift to a Safe System. http://bit.ly/2QF2shw
65 https://roadsafety.scot/wp-content/uploads/2018/09/CfE-2019-20-booklet.pdf

Young drivers (17-25)

In 2019, young drivers (aged 17-25) accounted for 12% of Scotland's licence holders, but accounted for 18% of drivers involved in fatal and serious collisions. Road collisions are one of the biggest killers of young people: in 2019, they accounted for 5% of deaths amongst 17-25 year-old.

Graph 1 shows this age group has a much higher KSI rate per million people, compared to the average rate of the overall population, 611 v 399 respectively.



Graph 1: 2019 Killed and seriously injured per million population, by age band and road user type, Scotland 2019

Road users aged 65 and over

Scotland's population is ageing and, in 2019, 19% of people in Scotland were aged 65 or over. By 2043, the proportion of those of pensionable age is projected to increase to 22.9%.[66] By 2040, this figure is projected to grow to 0.79 million, an increase of nearly 79%.[67] This increase has already had an effect on the total number of casualties for the over 60s[68] which has not reduced markedly since 2004 when compared to the population as a whole (33% v 54%). In relation to driver KSIs, when comparing the average between 2004-2008 and 2014-2018, the trend for the over 60s shows that the proportion of KSIs, has increased by around 7 percentage points. In other age groups, the trends have either reduced, or only slightly increased.

While historically people have tended to travel less as they get older, the current generation is healthier, fitter and more mobile than previous generations. They are likely to travel more but this brings increased risk, often because of frailty. What constitutes a relatively-minor crash for a younger driver or passenger, may be serious or fatal for an older person. Age-related frailty[69] is one of the main reasons why older road users are more likely to suffer death or serious injury in a collision.

66 https://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-estimates/mid-year-population-estimates/mid-2019
67 https://roadsafety.scot/wp-content/uploads/2018/09/CfE-2019-20-booklet.pdf
68 Statistics, from Key Reported Road Casualties Scotland 2018 – Web Tables 12
69 Serious crashes are more likely to result in fatalities for older drivers compared with younger drivers, due to their increased frailty (Staplin et al, 2001) extracted from RAC Foundation report of April 2010 on Maintaining safe mobility for the ageing population – https://www.racfoundation.org/wp-content/uploads/2017/11/maintaining-safe-mobility-rac-foundation-140410-report.pdf

Motorcyclists

2019 data show there has been little reduction in fatal or all serious motorcyclist casualties compared to the 2004-08 average. While all modes of transport have shown reductions of 43% (fatals) and 45% all (injuries) in that same period, motorcyclist data shows reductions of 40% and 38% respectively.[70] In 2019, motorcyclists accounted for less than 1% of all journeys and less than 1% of traffic in Scotland but, disproportionately, they represented 7% of casualties. On average, over the years 2015-2019, the motorcyclist casualty rate was highest for the 23-25 age group per thousand population followed by the 16-22 year old age group (0.20 per thousand population).

Seatbelts, drink, drugs and mobile phones

The four biggest dangers whilst driving/riding have been commonly identified as the fatal four. They are still a challenge in Scotland: speeding is covered in a separate challenge, but seatbelts, drink/drug-driving, and mobile phone use are important issues too.

For the period 2015-2019, 16% of in-car fatalities in Scotland[71] were not wearing seatbelts. A PACTS report[72] states that seatbelt wearing reduces both fatal and non-fatal injuries by 60% among front-seat passengers, and by 44% among rear-seat passengers. Seatbelt-wearing by rear-seat passengers also halves the fatality risk for belted front-seat occupants, given the dynamics in a vehicle after a collision. Child car seat specialist, Good Egg Safety, has consistently found, during its popular Community Checking Events across Scotland, the suitability of the child car seats or restraints used in them were inappropriate in 57% of cases.

They also found, during a mystery shop of car seat retailers (74 premises), 96% of staff failed to ask the necessary questions to identify the most appropriate seat for the child and the vehicle.

Over the period of 2014-2018, an estimated 20 people were killed each year in Scotland as a result of drink-drive accidents.

Driving under the influence of alcohol was a factor in 131 or 3% of all accidents in 2019, with drug impairment a factor in 53 or 1% of accidents.

However, evidence shows that drivers with blood alcohol content level (BAC) between 0.1g/l and 0.5g/l are up to 3 times more likely to be involved in a fatal collision than sober drivers and drivers with BAC between 0.5 and 0.8g are 20 times more likely to be involved in a fatal collision.[73] Driving over the drink-drive limit, individuals are six times more likely to die[74] in a road accident because alcohol and drugs affect the body and mind in the following ways: slower reaction times; blurred vision; being unable to judge speed and distances properly; loss of concentration; difficulty in making rational decisions; impaired coordination; increased risk-taking.

As far as mobile phone use is concerned, a 2016 study[75] found the extra mental workload and cognitive functions drivers have to undertake reduces their reflexes and slows reaction times (both the time to mentally register the event and the time to physically react to it), thus creating a major road safety risk. The latest mobile phone survey undertaken in Scotland[76] recorded the behaviour of 14,427 drivers and found that, while compliance was good, it is decreasing over time.

70 Table 23 of RRC Scotland 2018 page 114 – https://www.transport.gov.scot/media/46069/reported-road-casualties-scotland-2018.pdf
71 % not actually published in a table but the values for 'all casualties' can be found in Appendix F of RRC 2018
72 https://www.pacts.org.uk/2019/04/pacts-launches-new-report-seat-belts-the-forgotten-road-safety-priority/#:~:text=A%20report%20published%20by%20PACTS%2C%20in%20association%20with,deaths%3B%20an%20additional%201%2C000%20people%20were%20seriously%20injured.
73 https://ec.europa.eu/transport/road_safety/sites/roadsafety/files/newspdf/study_alcohol_interlock.pdf
74 the 2010 North Report found drivers are six times more likely to die in a road traffic accident with a blood alcohol concentration between 50mg and 80mg than with zero blood alcohol
75 Ziakopoulous A, Theofilatos A, Papadimitriou E, Yannis G, 2016 'Cell Phone Use – handheld', European road safety decision support system, developed by the H2020 project, SafetyCube
76 Seatbelt and Mobile Phone Usage Survey Scotland, 2017 – https://www.transport.gov.scot/media/43968/seatbelt-and-mobile-phone-usage-survey-scotland-2017.pdf the proportion of car drivers observed using a mobile phone whilst driving was at 1.8% at moving (free-flowing) sites, a marginal increase from the 2014 figure (1.3%). At stationary (traffic light controlled junction) sites, the proportion observed using a mobile phone was 2.4%, an increase from 2014 figure (1.6%)

Being distracted in the car is one of the main contributory factors to road casualties amongst 20–29 year-olds; there is also the obvious issue of pedestrian distraction. In 2019 in Scotland, a distraction to the driver from inside the vehicle was a contributory factor in 2% of recorded collisions[77]; there is also the obvious issue of pedestrian distraction. It is anticipated that distraction will continue and possibly increase as a road safety concern as use of mobile technology remains prevalent.

Fatigue

Driver fatigue is also a factor in collisions[78] and such collisions are around 50% more likely to result in death or serious injury.[79] Police Scotland data suggest fatigue is a contributory factor in 5.7% of fatalities (5-year average) equating to around ten deaths each year. In 2019, fatigue was a contributory factor in 2% of all collisions.[80]

To illustrate this better, a person who drives after being awake for 17 hours has impaired driving skills comparable to a driver with a BAC of 0.05 mg/ml[81] (the legal limit). When drivers fall asleep, they do not brake or swerve, so any resulting collisions tend to be at higher speeds.

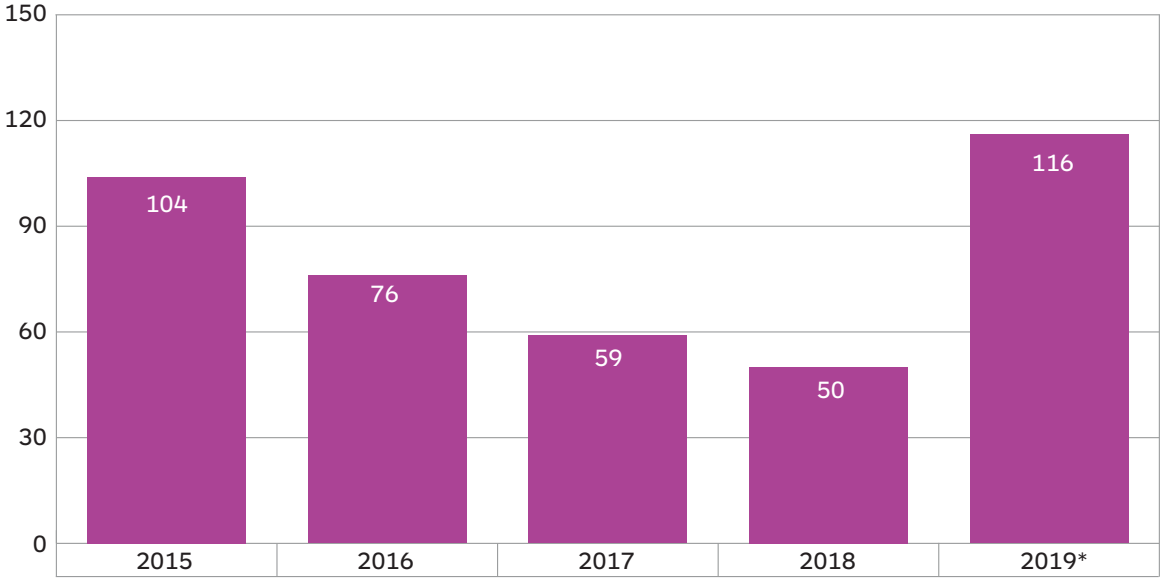
Foreign drivers

Scotland's roads are used by residents and visitors alike, for business, recreation and commuting. All road users have a responsibility to understand and conform to the rules of the road, not only to ensure the safety of themselves, but also that of all road users with whom they interact on a daily basis.

Graph 2 provides statistics on collisions where left-hand drive vehicles were involved.

Every country has its own individual traffic laws, and those who drive in different countries must adapt their behaviour to comply. For example, the HGV (>7.5 tonnes) speed limits in Scotland are lower than in England and Wales on dual and single-carriageway roads. In addition, custom and practice may differ from country to country; different Give Way rules, for example, could lead to confusion among foreign drivers resulting in them moving at incorrect times or in a manner that alarms other road users. The causation factor most commonly-anoted for left-hand drive vehicles involved in collisions is 'failed to look properly'.

Graph 2: Left hand drive vehicles involved in collisions 2015-2019



* Police Scotland's move to a new reporting system for collisions (CRaSH) in mid-2019 led to an increase in the number of left-hand drive cars being recorded.

77 Reported Road Casualties 2019, Table M, https://www.transport.gov.scot/our-approach/statistics/#42762
78 Research suggests that sleep-related vehicle accidents are under-reported and are likely to account for 16% to 20% of UK vehicle accidents and up to one quarter of fatal and serious accidents – Anund, Kecklund, Vadeby, Hjälmdahl & Åkerstedt, 2008; Schwarz et al., 2012
79 https://www.rospa.com/road-safety/advice/drivers/driver-health
80 Table M: Contributory Factors: Reported accidents by severity, 2018 – https://www.transport.gov.scot/media/46662/sct10192798881.pdf
81 A driver who hasn't slept for 24 hours has impaired driving skills comparable to a driver with an illegally high blood alcohol concentration of 0.1 g/l – https://ec.europa.eu/transport/road_safety/specialist/knowledge/fatique/effects_of_fatigue_on_driving/driving_behaviour_en

Overseas drivers may also be unfamiliar with Britain's imperial system. This could lead to confusion trying to reconcile roadside signage and information with in-vehicle readings (miles vs kilometres). A lack of knowledge of UK and Scots law, practices and measurements could confuse and frustrate drivers, possibly leading to rash actions and a lack of concentration.

If Scotland continues to be promoted as a tourist destination, more effort is required to improve safety for all road users. Furthermore, the number of collisions involving foreign drivers/riders should be monitored to mitigate any emerging trends.

Scotland has promoted itself as having some of the most attractive roads in the world for tourists such as NC500 and this has resulted in an increase in the number of drivers/riders unfamiliar with driving on the left.

A mix of individuals – families and friends – in a variety of vehicles – such as bikes, cars and campervans – driving/riding unfamiliar roads, guided by unfamiliar rules and sharing the space with everyday users makes it essential to address this issue, particularly during the peak touristic months.

Educational resources have been produced on this topic for a number of years through 'Driving in Scotland' leaflets. One was designed specifically for migrant workers (in English, Russian, Polish, Lithuanian and French), but demand for this has tailed-off substantially in recent years and it is now an online-only publication. The second is designed for tourists (in English, French, German, Spanish, Italian and Polish) and includes information on a number of issues including single-track roads.

In addition to the leaflets and website, wristbands in eight languages (English, French, German, Spanish, Italian, Dutch, Hindi and Chinese) saying "DRIVE ON THE LEFT" have been distributed through a number of channels, mainly via car-hire companies. This practical solution aims at encouraging companies to engage with drivers in a consistent and informed way.

The drive on the left campaign was launched in the Highlands, an area which attracts a large number of tourists, and drivers and motorcyclists were issued with the leaflets, wristbands and windscreen stickers reminding them to drive on the left and demonstrating the correct position at junctions.

As well as improving foreign driver education we need to apply the correct engineering and enforcement measures, and monitor incidents to ensure we capture any emerging trends and react to them accordingly.

People living in areas of deprivation

There is clear evidence that lower speeds reduce the number of casualties and there is specific evidence of casualty reduction in 20 mph speed limit zones. It is argued that this is particularly true for disadvantaged areas and communities, and could therefore help to reduce the inequality of outcome of lower healthy life expectancy.

Most deprived areas are more prone to road casualties so are people with vision impairment. Increased road safety in deprived areas gives residents more confidence to use streets and cross roads, and therefore safer access to their communities. For children, road traffic injuries are a major cause of preventable death during childhood and adolescence, and on average three children (under 16 years) died annually on Scotland's roads between 2017 and 2019. According to the Glasgow Centre for Population Health Scotland, child pedestrians from more deprived areas in Scotland are three times more likely to be injured on the roads than those from less deprived areas.[82]

A 2019 Report[83] entitled Inequalities in Mobility and Access in the UK Transport System found that disadvantaged road users are at higher risk of injury and death. There is a significant causal relationship between increased motorised transport and increased road casualties and deaths: people from deprived neighbourhoods are more likely to be injured or killed as road users. People in the highest socio-economic groups (SEGs 1 & 2) were found to be substantially less at risk of death as car occupants than people in the lower groups (SEGs 4 & 5). An exploration of the root causes of the high risks of traffic injury in deprived areas in England found a strong relationship between deprivation and pedestrian casualties among all age groups. In particular, children (11–15 years) and young people from disadvantaged areas were found to be involved in traffic injuries, for whom the risk was highest on main roads and on residential roads near shops and leisure services. Despite the fact that rates of death from injury among children have fallen in England and Wales over the past 20 years, serious inequalities in injury and death rates remain, particularly for pedestrians and cyclists. People living in disadvantaged areas tend to live in more hazardous environments, with greater proximity to high volumes of fast-moving traffic and high levels of on-street parking. As such, they have higher levels of exposure to road traffic risk, which is exacerbated by their reliance on walking, and the lack of safe spaces for children and young people. In addition, high levels of hazardous and illegal driving behaviour posed a risk to people living in disadvantaged areas. Children's exposure to higher risks of traffic injury is mainly related to few safe, secure, and well-maintained public spaces and costly leisure venues.

82 Glasgow Centre for Population Health, Pedestrian and cyclist casualty trends in Scotland, https://www.gcph.co.uk/publications/572_pedestrian_and_cyclist_casualty_trends_in_scotland

83 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/784685/future_of_mobility_access.pdf

Strategic Actions

In order to address current and emerging challenges, the following twelve Strategic Actions have been identified. These are meant to be overarching, and are not allocated to any nominated road safety partners. They must be seen instead as the collective responsibility of all stakeholders and road safety partners, labelled throughout the naming of the actions as "we".

They will have to be translated and expanded into sub-actions through the development of both national and local delivery plans which will sit outwith the framework. These plans should be flexible, in order to address current and emerging casualty or danger trends.

The delivery of the strategic actions underpinned by the sub-actions contained into subsequent national delivery plans will be monitored through the three-tier structure of the framework governance and reported through national annual reports.

Speed: we will deliver a range of speed management initiatives to support the Safe System.

Education: for example social marketing campaigns or (potential) speed awareness, as part of wider Road Traffic Diversionary Courses, will be key to ensuring road users understand why speed limits are set in any particular area and the need to comply with them. Driving/riding to the conditions, particularly in bad weather and on congested roads, is an important skill to gain.

Engineering: A National Speed Management Review will be undertaken in 2021 and 2022. It will look at what appropriate speeds mean in a Scottish context and recommend changes to national speed limits accordingly. It will support a range of policies that assists those government national outcomes and indicators that are relevant to this area. Related policy drivers include better road safety and health outcomes, promotion of active travel, climate change mitigation, place-making and economic growth.

Enforcement: of speed through traditional use of road policing, and fixed and mobile safety cameras will also form part of this strategic action. Continuing to embrace new technology and opportunities, such as processing dashcam footage will also be key to achieving success.

Climate: we will deliver road safety initiatives that positively impact the climate emergency and we will mitigate the negative impacts climate change may have on road safety.

In relation to climate change adaptation, road users will need to gain the knowledge, skills and experience required under extreme weather conditions to become safe and responsible.

Employers and employees should be encouraged to apply the Severe weather: fair work charter[84] in order to mitigate road safety risk within their organisations. By smoothing traffic flow, good speed management has the potential to reduce emissions and improve air quality. As far as promoting greener, cleaner choices is concerned, the new Framework consistently applies the NTS2 Travel Hierarchy to road safety matters.

Funding & Resourcing: we will improve funding streams for national and local road safety delivery.

A national Road Safety Improvement Fund will be considered to help road authorities meet the challenging 2030 road casualty reduction targets. Road policing will also remain a key priority for Police Scotland. All road safety partners should seek to utilise opportunities across relevant policy areas. This will assist in achieving shared outcomes with the overall aim of reducing casualties and improving our road safety performance.

84 https://www.gov.scot/publications/severe-weather-charter/

Change in Attitudes & Behaviour: we will engage in partnership working to enable all road users to understand their road safety responsibilities, allowing them to improve their attitudes and behaviours for the safety of themselves and others.

Over the next three years and at the national level we will implement a national conversation on road safety to encourage greater personal responsibility and a change in perception which, ultimately, should lead to a transformation of the road safety culture. The over-riding priority is to highlight the traumatic and lasting impact of road users killed or seriously-injured on communities and the costs to everyday people and their families; while also important to the economy, the emphasis should not simply be about the inconvenience of road closures and delays to one's travel. Any road users must be free from road harm as well as free to walk/cycle/wheel/ride/drive. Potential activities could include a road safety week with planned events; an online knowledge portal; social media campaigns; and competitions for children and their parents/carers. Educating road users throughout their lives will be key as well as ensuring changes to the Highway Code are well communicated.

Technology: we will research, implement and evaluate technologies for use within the Safe System and promote them as appropriate.

As technology is rolled out in vehicles, as part of the infrastructure, or directly to road users, it will be very important to monitor the delivery of Scotland's CAV roadmap. This will allow us to research and evaluate the impact that technology may have on road safety. Consideration of potential distraction that in car technology may have on road users.

Active & Sustainable Travel: we will ensure road safety remains a key focus of active & sustainable travel in Scotland.

The current push towards more active and sustainable travel needs to consider road safety issues and outcomes from the initial concept/design phase. In addition, active travel initiatives will have to support tackling the so-called 'safety in numbers' effect. Active & sustainable travel contributes to better place-making which, in turn, contributes to safer places, thereby improving the perception of road safety.

Knowledge & Data Analysis: we will ensure our actions are evidence-led to support the delivery of the Safe System.

Embedding the Safe system means any road safety initiatives under each of the five pillars are backed up by evidence and then fully evaluated, not only in terms of success in delivery, but also the longer-term success of their road safety outcomes. In addition to utilising revised STATS 19 data following the completion of the current review, we need to ensure we can access and harness data from a variety of sources, be it hospital data, academic research, the motor insurance industry, vehicle manufacturers (through telematics, pre-collision data for research on in-depth collision investigation), or technology companies (through mobile phone data, etc.). This will enhance road safety outcomes.

Enforcement: we will optimise enforcement to encourage good road user behaviour to support the Safe System.

Enforcement of the rules of the road spreads across most of the five pillars of the Safe System. Safe road use, such as: seatbelt and speed limit compliance; driving unimpaired by drugs and/or alcohol; and the maintenance of a safe fleet through the MOT regime and insurance checks should contribute to safer roads. Although the correlation between enforcement, improved compliance and safety does not imply a causal relationship – as it is difficult to isolate the impacts of enforcement from other factors, the presence, and/or threat, of enforcement, combined with suitable road user education is deemed essential to deter people from taking risks and endangering others. Vulnerable road users are more affected by non-compliant road discipline, than are users of any motorised vehicle. Enforcement methods should also embrace emerging technology which would make it more efficient. Tougher sanctions,[85] albeit reserved to the UK Government, may provide Police Scotland with opportunities to utilise more effective enforcement techniques.

Health: we will strengthen the relationship between health and road safety, reduce the likelihood, number and severity of collisions and improve the post-crash response.

Systematic cross-referencing of casualty data from STATS 19 and health (in terms of hospital admissions data) will provide a clearer overall picture of road collisions in Scotland, particularly suffered by Vulnerable Road Users. In addition, the sharing of road safety and health resources together at national and local level should realise more benefits than would have been achieved using the same resources separately. It should be better value for money to prevent casualties in the first instance, thus saving health resources which could be re-directed to caring for other patients, rather than treating road casualties. This was demonstrated through the COVID-19 pandemic when we as a nation adapted our approach to avoid overwhelming the NHS during lockdowns when everything was done to avoid overwhelming the NHS with other than COVID-19 related patients.

Education: we will provide opportunities for all road users to gain the knowledge, skills and experience required to become safe and responsible users.

Education is critical to position road safety as a lifelong-learning process. Given the importance of early years, it is vital that learning starts at an early age. We will ensure Curriculum for Excellence allows appropriate time for road safety education. At the same time, we will ensure road users will have access to learn and enhance their road safety knowledge. This will improve their road user experience, demonstrating positive road safety attitudes throughout their lives.

85 For example on 17 January 2021 the Department for Transport closed a public consultation expanding the offence of using a hand-held mobile phone while driving to include non-connected mobile application actions

Engineering: we will improve road infrastructure and maintenance.

The delivery of this Strategic Action which covers road design, new road infrastructure and maintenance of the existing road infrastructure is a fundamental element to meet the Strategic Outcome of Safe Roads and Roadsides. Following inclusion of increased funding for asset management in the draft Infrastructure Investment Plan, STPR2 Intervention 17 - Investment in the strategic road network asset - recommends to make the case for that investment in renewing and improving Trunk Road Carriageways, Structures and Ancillary Assets. The increased investment will bring a number of benefits: safety, economic benefits, jobs, connectivity, resilience, reliable journey times and customer satisfaction. A high quality, well maintained and efficient network also supports other Scottish government programmes for Active Travel, development of Connected and Autonomous Vehicle infrastructure and Bus Priority Investment, and thereby contributes to the low carbon economy. The programme would also include schemes being developed for the Removal of Accessibility Barriers (e.g. tactile paving, dropped kerbs, bus shelter and bus stop improvements, improved footway widths and crossfall) to assist pedestrian and wheeling access on the trunk road pedestrian network and for access to public transport, supporting equality. The Scottish Government will also publish 'Cycling by Design' guidance in early 2021 and develop a strategy to support the wider implementation of 20 mph speed limits. Recognising that 94% of the total Scottish road network are roads under responsibility of local authorities, the Scottish Government will consider the development and implementation of a Road Safety Framework Improvement Fund. This could include a proactive approach to road safety by undertaking a risk mapping exercise on all routes. In addition to more traditional road safety measures, this may identify where investment could be targeted to improve the maintenance and upgrading of roads, kerbsides and pavements.

Inequality: we will reduce road safety inequality due to socio-economic disadvantage of people living in areas of deprivation.

Latest data from the MAST analysis platform on road safety indicates that the overall casualty rate in the most deprived 10% SIMD (Scottish Index of Multiple Deprivation) areas is 1.6, which is higher than the rate of 1.0 for the least deprived 10% SIMD areas, between 2015-19. This casualty rate has declined since the 2006-10 period where it was 1.4. The delivery of this strategic action is highly intertwined with the delivery of the strategic actions on Speed, Change in Attitudes & Behaviour, Active & Sustainable Travel, Enforcement and Education where road safety initiatives will ensure that areas in the most deprived 10% SIMD are covered in their geographical scope. For example the national speed indicator will have speed counters installed in such areas, and any national road side surveys on seat belt-wearing and mobile-phone use will cover these areas. This Strategic Action is supported by the following Intermediate Outcome Targets. The casualty rate for the most deprived 10% SIMD areas is reduced to equal the least deprived 10% SIMD areas. The delivery of this Strategic Action will be monitored through the tracking of this Intermediate Outcome Target. In addition areas of deprivation will become safer once a more cohesive and comprehensive national network of safe well-designed walking and cycling routes, including these areas is delivered through the delivery of the Active Travel Framework and Intervention 7 – Reallocation of roadspace for active travel of STPR2.

The table below provides a snapshot view of how each of the strategic actions have the potential to address a number of challenges, allowing for some kind of prioritisation of these actions to maximise their effect.

› Challenges ⌄ Strategic Actions												
Speed	✓	✓	✓		✓			✓	✓			✓
Climate	✓	✓	✓		✓	✓		✓		✓		
Funding				✓	✓	✓	✓	✓	✓	✓	✓	✓
Change in attitudes		✓	✓	✓	✓		✓	✓	✓		✓	✓
Technology				✓	✓			✓	✓	✓	✓	✓
Active & Sustainable Travel		✓	✓	✓		✓			✓			✓
Knowledge & Data Analysis				✓	✓	✓		✓	✓	✓	✓	✓
Enforcement		✓		✓	✓	✓	✓		✓			✓
Health			✓	✓							✓	✓
Education		✓		✓	✓	✓	✓	✓	✓			✓
Infrastructure	✓	✓	✓	✓	✓	✓		✓		✓		
Reduce Inequality		✓	✓		✓			✓	✓			✓

Climate Emergency
Active & Sustainable Travel
Health
Safe System
Speed Management
Road Safety Delivery
Driving/Riding for Work & Workplace Culture
Emerging Technologies
Enforcement/ Deterrence
Road Infrastructure & Maintenance
Post-Crash Response
Road Users

Road Safety Performance Management

All Safe System work is based on a performance framework, with a hierarchy of targets, and the Scottish model is depicted in the figure below.

Figure 5: Safe System results hierarchy for Scotland

The new Framework has the **Long-term Goal** of moving to zero fatalities , as set out in the NTS2 Delivery Plan. and serious injuries in road transport by 2050.

On this route to 2050 the **Interim Targets** to 2030 have been set out as follows, based on a 2014-18 baseline.

- 50% reduction in people killed
- 50% reduction in people seriously injured
- 60% reduction in children (aged <16) killed
- 60% reduction in children (aged <16) seriously injured

Measuring progress towards meeting the Interim Targets to 2030 requires the use of indicators, the most important one being the number of deaths and serious injuries. The Safe System approach relies on gaining a much clearer understanding of the different issues which influence overall safety performance. As such a number of other indicators have been developed which are categorised as either Intermediate Measures – tracking performance of casualty figures for specific user groups – or Key Performance Indicators – measuring observed road safety behaviours, vehicle safety and road infrastructure.

Wherever a specific % reduction number has been determined for individual Intermediate Measures, those indicators were promoted to **Intermediate Outcome Targets** status. An initial list of these is listed below with the 2014-2018 baseline.

- 40% reduction in pedestrians killed or seriously injured – this is complemented by an Intermediate Measure based on casualty rate
- 20% reduction in cyclists killed or seriously injured – this is complemented by an Intermediate Measure based on casualty rate
- 30% reduction in motorcyclists killed or seriously injured
- 20% reduction in road users aged 70 and over killed or seriously injured
- 70% reduction in road users aged between 17 to 25 killed or seriously injured
- Percentage of motorists driving/riding within the posted speed limit – More work is required on a speed national indicator or modal/type of road indicators
- The casualty rate for the most deprived 10% SIMD areas is reduced to equal the least deprived 10% SIMD areas.

A list of **Intermediate Measures** have been identified to support our intermediate outcome targets, these are as follows:

- Casualty rate per 100 million vehicle kilometers for cyclists killed and seriously injured
- Casualty rate per thousand population for pedestrians killed and seriously injured
- Number of people killed and seriously injured in collisions where at least one driver/rider was driving for work, not commuting

The Key Performance Indicators for the framework are currently being developed to enable the monitoring of road safety behaviours, vehicle safety and road infrastructure. We are continuing to work with stakeholders on the number of KPI's and their associated performance level that are required to be monitored as part of our intermediate outcome targets. A rationale, definition and methodology, will be developed for each KPI alongside the organisation responsible for collection of the appropriate data.

The publication of our Key Performance Indicators will be contained in the first Road Safety Framework Annual delivery plan. All targets, intermediate outcome targets and measures as well our KPI's will be monitored in the Road Safety Framework Annual Report. There will also be a number of other indicators that will be monitored at Operational Partnership Group level. The performance management framework will be a live document with KPI's that are added, modified or removed as appropriate through the lifetime of the framework.

The Monitoring and Evaluation framework for the National Transport Strategy (NTS2) will also include a number of road safety indicators that contribute to the achieving the NTS2's vision and delivering against its priorities. These indicators and measures will align with those contained within the Road Safety Framework Annual Report.

GOVERNANCE STRUCTURE

The 2020 Framework saw the establishment of a Strategic Partnership Board (SPB), chaired by Transport Scotland's CEO, with senior Police and Fire Officers, members from NHS Scotland, and the Society of Local Authority Chief Executives (and with regular ministerial attendance) to govern the Framework, and the SPB will continue until 2030. The SPB works in partnership with Ministers and senior partner organisations to ensure a strategic and joined-up partnership buy-in to the framework.

It guides Scottish road safety delivery partners in best practice, and constructively challenges their policies and/or actions.

In addition, a supporting Operational Partnership Group (OPG) at senior official level was set up. It has representation from a variety of organisations with a remit for, or vested interest in, road safety, such as Police Scotland, Scottish Ambulance Service, Crown Office and Procurator Fiscal Service, Society of Chief Officers of Transportation in Scotland, RoSPA, IAM Roadsmart and Cycling Scotland. The OPG will remain and have responsibility for the monitoring, analysis and distillation of evidence and information on activities being undertaken by partners towards the delivery of the framework.

The SPB and OPG will each continue to meet twice a year.

In order to improve communications between national and local level, the new framework introduces a third tier – Local Partnership Forums (LPFs).

The SPB and OPG will establish the number of LPFs that are required and what road safety partners will be represented.

Representatives from the following have been suggested and will be confirmed following engagement at SPB and OPG level these may include:

- Local authorities within the LPF boundary
- Chair of relevant road safety forums, groups, or partnerships such as the A9 Road Safety Group, Highland & Islands Road Casualty Reduction Group, Western Isles Road Safety Group, Road Safety North East Scotland and Dumfries and Galloway Road Safety Partnership
- Community safety partnership groups
- Active Travel groups
- Scottish Fire and Rescue
- Scottish Ambulance or a Public Healthcare service in the area
- Education – possibly from Schools or a rep from the local authority who leads on road safety education
- Police Scotland
- Groups which reflect specific areas such as British horse society, farmers/tractor associations
- Motorcycle groups
- Haulage organisations
- Trunk Road Operating companies

The remit of the LPFs will include:

- Review, analyse and distil information and evidence which supports delivery of the strategic actions of the framework;
- Sharing information and best practice between members;
- Monitor progress against the strategic actions of the Framework and the sub-actions of the relevant Delivery Plan;
- Align respective relevant organisational activity in accordance with direction provided by the OPG;
- Provide updates to the OPG on activity undertaken and highlight issues to the OPG along with recommendations for action;
- Identify potential barriers to delivery of the strategic actions (including policy and legal barriers) and formulate innovative solutions for consideration by OPG;
- Make recommendations to the OPG for areas where Framework budget might be spent to support Framework strategic actions;
- Highlight key issues and risks to the OPG for their consideration;
- Contribute to the production of a Framework Annual Report, focusing on performance against the sub-actions, set out in the relevant Framework Delivery Plan;
- Monitor risk through an operational Risk Register, raising high-level risks for consideration by the OPG and propose mitigating action;
- Invite road safety delivery partners or other persons to attend meetings, where their expertise is required.

Each LPF will meet twice a year with Transport Scotland providing their secretariat.

The Framework governance can be depicted as follows:

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