

Scotland's Road Safety Framework to 2030 consultation

Cycling Scotland submission

December 2020

Summary

Thank you for the opportunity to respond to the consultation. Significant progress has been made on reducing road casualties during the term of the current road safety framework. The exception is reducing serious injuries amongst people cycling: cycling casualties are increasing, in line with the continuing rise in people cycling.

It's also important to note the long-term trend that there are now almost as many people being killed while walking/cycling/motorcycling as are killed in cars. In order to maintain and increase progress towards Vision Zero, including amongst vulnerable road users, and in particular to tackle fatalities and serious injuries amongst people cycling, we would highlight the following **three key priorities** for the new Road Safety Framework

1. Intermediate Outcome Targets:

Currently proposed: "Percentage reduction in cyclists killed or seriously injured"

We strongly support having an intermediate outcome target on cycling if it has a measure of risk included (either by km cycled or hours cycled). The data most readily available at present is number of km cycled so we'd suggest a change to:

Percentage reduction in cyclists killed or seriously injured *per km cycled*

2. Key Performance Indicators:

Currently proposed: "Percentage of riders of powered two wheelers and bicycles wearing a protective helmet"

We do not believe helmet wearing is the top priority to monitor for four reasons.

- Firstly, it is not compulsory/required by law to wear a helmet when cycling whereas other proposed KPIs (including helmet wearing while motorbiking) reflect legal requirements or the risk that one road user may pose to another.
- Secondly, we note the Transport Scotland review document didn't recommend helmet wearing as a KPI ¹.
- Thirdly, there is no system for collecting data on helmet wearing and to set one up would require scarce resources and it is unclear which organisation would take responsibility for collecting this data.
- Finally, while wearing a correctly fitted helmet can protect you from a head injury in the event of a low-speed crash, there is no evidence that helmets provide protection at higher speeds ². Efforts on cycle helmets would be more effectively spent on educating and enforcing road laws for all road users, with priority given to tackling behaviours creating the greatest risk of harm.

¹ Development of Scotland's 2030 road safety casualty targets and key performance indicators
Transport Scotland

² <https://www.cyclinguk.org/campaigning/views-and-briefings/cycle-helmets>

As an alternative, we recommend the inclusion of a KPI on infrastructure from the Active Travel Framework (Km of traffic-free walking and cycling facilities).

3. Priority activities:

We believe the Road Safety Framework should clearly pursue two key priority activities for cycling safety:

- Support the expansion of the network of cycling infrastructure, separated from vehicle traffic
- Introduce Third Party Reporting system using helmet and dash cam footage to detect and enforce dangerous driving

Linked to wider objectives on climate change in particular, the key aspirations should also include:

- Reduce speed limits and tackle speeding, especially on 30-60mph roads
- Reduce traffic levels, pursuing the principle that HGVs and bikes shouldn't have to share the same space

Question 1 – Is the vision set out for the next 10 years the right one?

1.1 Please explain your answer

The vision to have the best road safety performance by 2030, and the long-term aspiration for Vision Zero, is welcome. We would suggest that adding 'for all road users' at the end of the vision would enable progress towards this vision to be measured and explained more effectively.

Question 2 – Are the outcomes Safe Road Use, Safe Speeds, Safe Vehicles, Safe Roads & Roadsides and Post-Crash Response to deliver the vision the right ones?

2.1 Please explain your answer

With some additional detail, we agree these outcomes could help deliver the vision – please see our feedback below:

Safe Road Use

We welcome that reducing car-based traffic is included within this outcome – we recommend that the document explicitly includes reducing vehicle traffic on residential and shopping streets and that it be broadened to include all vehicles (HGVs, vans) with the principle that HGVs and bicycles should generally not be expected to share the same road space. This means managing HGVs on roads that people are cycling on (and people are walking on), during times they are likely to be cycling and ensuring there is separate, appropriate space for cycling.

In this section, we suggest acknowledging the introduction of information on safe passing distances for drivers when passing people cycling on the roads. This aligns to the proposals outlined in the ongoing review of the Highway Code, which proposes introducing a passing distance of a minimum of 1.5 metres at speeds of under 30mph, and a 2-metre minimum passing distance at over 30mph³.

³ <https://www.gov.uk/government/consultations/review-of-the-highway-code-to-improve-road-safety-for-cyclists-pedestrians-and-horse-riders>

Safe Speeds

Speed of traffic is another significant contributory factor to road safety for people cycling. We support the expansion of 20mph speed limits on urban, residential roads, many of which are currently likely to have speed limits of 30mph. Evidence shows that the risk of serious injury or death for people cycling and pedestrians increases disproportionately as speed increases⁴. There should also be support for local roads authorities to review and lower speed limits from 60 and 50mph, improving the safety for road users and reducing climate change emissions.

Safe Vehicles

We welcome the stated aim that “*Vehicles are designed and regulated to minimise the occurrence and consequences of collisions to road users, including the occupants themselves, **but also to pedestrians, cyclists, horse-riders and motorcyclists.***” [emphasis added]

We acknowledge that vehicles are able to act increasingly autonomously in limited situations and believe that for the 10 year period of this Road Safety Framework, it should be clearly assumed and stated that autonomous vehicles will always have a user-in-charge.

We welcome the reference to Intelligent Speed Adaptation and believe this technology should receive greater emphasis as a method of managing vehicle speed to improve safety for all.

Safe Roads & Roadsides

We welcome the commitment to “*segregate different kinds of road users*” - segregated cycle lanes being a key example. Building and maintaining coherent networks of separated safe, easy to access cycling infrastructure is essential to improve safety of people cycling, and to increase rates of cycling, a key action to improve people’s health and help tackle climate change.

Designing safer roads is crucial to achieving Vision Zero, particularly in places where evidence shows collisions with vulnerable road users are more likely to occur (e.g. at junctions) – for example by raising road height to pavement level at junctions as a speed reduction measure.

We would also welcome support for street design that helps prevent drivers using “rat runs” as shortcuts – based on evidence showing that a driver driving a mile on an urban residential street is twice as likely to kill or seriously injure a child walking and three times more likely to seriously injure a child on a bike, than if they stuck to the main road.

There is also a need to improve road markings and signage, to better inform all road users, particularly as dedicated cycling infrastructure increases and new design is being used, supported by effective use of the forthcoming new Cycling by Design publication.

⁴ Cycling UK 20 mph: lower speeds, better streets <http://www.cyclinguk.org/campaign/20-mph-lower-speeds-better-streets>

Question 3 – Do you agree that the Safe System Approach is fundamental to the success of the Framework?

Yes

3.1 Please explain your answer

The Safe System Approach is evidence-based and internationally recognised, and we welcome adopting this approach, particularly in terms of segregating different road users and developing and improving safer routes for vulnerable users.

Question 4 – Are the 12 key challenges for road safety, from the Climate Emergency, health to emerging technologies and post-crash response, the correct ones?

4.1 Please explain your answer

Enforcement/deterrence:

With regards to enforcement activity, we welcome that the use of dashcam footage is mentioned as “*key to achieving success.*” Where dashcam footage is accepted, helmet and body camera footage from people cycling should also be accepted. This can be important for providing and supporting evidence in a collision between a vehicle and person cycling as well as collecting evidence of other dangerous road use. This approach is now used in Wales, is widespread in English police forces and is a key step, using technology increasingly widely available. While the police can’t be everywhere, the public can be.

Increased, tactical enforcement in London has been a key contributing factor in achieving the lowest ever year on record in 2019 for the combined measure of killed and serious injury collisions. The Met Police advocate for stronger sentencing for speeding and other dangerous driving behaviour, as a preventative measure and, while Scotland’s roads are very different, there is an opportunity to learn from the evidence of the Met approach.

Our research with Glasgow Centre of Population Health⁵ showed that there are significant data gaps in the reporting of cycling collisions, and we believe more data on crashes will help in preventing deaths and serious injuries.

Climate emergency:

We welcome recognition of the importance of the Sustainable Transport Hierarchy in the Framework and that the hierarchy will be applied to road safety, ensuring that all road users understand their responsibilities and improve attitudes and behaviours to ensure the safety of all road users.

Promoting modal shift to sustainable modes of travel as part of the Framework will make an important contribution to reducing transport’s contribution to greenhouse gas emissions and for delivering on commitments to tackle the climate emergency. Our [tracker research with more than 1,000 people across Scotland](#) shows that safety is the biggest barrier to more people cycling – and in order to tackle the climate emergency, we need more people to choose to travel by bike.

We agree with the statement that electric vehicles, while contributing positively to tackling pollution, can still have a negative impact on safety for cyclists and pedestrians due to the

⁵ <https://www.cycling.scot/news-article/cycling-and-serious-cycling-injuries-rise-in-the-last-15-years>

lack of noise. We would again highlight that traffic growth increases risks to vulnerable road users.

We welcome the note in changes in weather due to climate change and would note that extreme weather events already affect the safety of vulnerable road users. Part of a safe system will involve preparing the road environment for extreme weather events, including effective drainage and maintenance of the surface and ironwork.

Emerging technologies:

We note reference to Connected and Autonomous Vehicles (CAVs) in this section. With regards to cycling, and vulnerable road users, there are number of safety concerns from these vehicles that are yet to be resolved. In our submission to the Law Commission Scotland's call for evidence on automated vehicles, we expressed concern about premature widespread adoption of these vehicles⁶.

For the foreseeable future, such vehicles should not be allowed on the road without a user in charge. A user in charge is always necessary to ensure the safety of all road users, and especially for vulnerable road users like people cycling and pedestrians. Further, such vehicles still create issues for congestion and use up road space that could be reallocated to people cycling and using other active and sustainable modes. The Framework should take into account proven safety concerns with regards to vulnerable road users, and ensure strategic steps are in place to prevent premature roll out of autonomous vehicle technology before the safety (and also the congestion and climate change) concerns are addressed.

The impact of Real-time smartphone routing apps, increasing traffic levels on residential roads, needs to be acknowledged and regulation should be introduced. Given there are now 3 million vehicles registered in Scotland in 2018 compared to 2.66 million in 2008 and the increasing traffic growth, it is a key part of making roads safer for vulnerable road users that emerging technologies are properly regulated.

Active and sustainable travel:

We welcome recognition of road safety considerations in active and sustainable modes from the outset of the process, at initial conception and design stages. Creating continuous networks of dedicated cycling infrastructure is required to improve safety and address safety concerns, to increase modal shift to active modes.

We note and are surprised at the statement of a "*different approach towards mandating cycle helmet wearing*" between active travel and road safety. We do not believe this statement needs to be included in a final Government Road Safety Framework - the evidence is very clear that mandating helmet wearing would not achieve either desired road safety or active travel outcomes.

We note that with "*significant increases in walking and cycling, the safety rate improves, but the actual number of pedestrian and cyclist casualties may increase*". Rather than us accepting that, as more people cycle in Scotland, the rise in deaths and serious injuries is inevitable, we need to prioritise safety interventions in order to prevent them.

In Copenhagen, the level of cycling increased from 0.93 million km in 1996 to 1.34 million km in 2014 and the average number of km cycled between serious injury crashes increased

⁶ <https://www.cycling.scot/mediaLibrary/other/english/6463.pdf>

from 1.2 million in 1996 to 4.9 million in 2014. During that time period, cycling infrastructure was vastly expanded:

- The length of cycle tracks increased from 29 to 368 km;
- the length of cycle lanes increased from 0 to 28 km;
- the length of green cycle routes increased from 29km to 58 km;
- the length of cycling superhighways increased from 0km to 38.5km

Data for Germany suggest that serious injuries and fatalities declined between 2000 and 2011 at a time when cycling levels were increasing.⁷

We note the Transport Scotland casualty target document states:

“There is a predicted increase in pedal cycle casualties which reflects both the recent trend in bicycle trips and casualty number, plus projected growth. The model does not take into account the potential benefit of ‘safety in numbers’ which explains that as cyclist densities increase, collision rates fall i.e. cycling becomes safer per mile travelled. It also does not take into account any plans for increased segregation of motorised traffic and cyclists.”⁸

We believe casualty assumptions should be reviewed to take into account both ‘safety in numbers’ and the significant increase in segregation that there will be.

Road infrastructure and maintenance:

We note in this section reference to the design of a road and road infrastructure may be a contributing factor in more than 30% of crashes. It should be acknowledged as a factor and it should be noted that road maintenance defects affect people walking, cycling, and wheeling disproportionately.

With regards to road infrastructure, we support the recommendation of the Scottish Infrastructure Commission for there to be “a presumption in favour of investment to future proof existing road infrastructure and to make it safer, resilient and more reliable rather than increase road capacity”. Limiting investment in expanding road capacity is crucial for improving road safety, as well as for addressing climate change, air pollution and delivering social inclusion objectives, and is required if desired levels of modal shift to active travel and public transport are to be achieved. This should be considered within the Framework.

In light of this recommendation to future proof and upgrade existing road capacity, road works will become increasingly important. Where road works are undertaken, they should properly account for people cycling and other vulnerable road users who may be adversely impacted by them. It is important that cycling routes (particularly cycle paths and segregated infrastructure) due to undergo works are treated in the same fashion as on-carriageway roadworks, complete with a process ensuring proper notification, diversion and reinstatement is in place and subject to the same requirements for contributions, inspections, guarantees, charges, etc. In particular, opportunities to implement filtered permeability to allow people to continue to safely cycle or walk on the most direct route should always be sought.

⁷ International Comparator Study, 2016, Urban Movement for Cycling Scotland:

<https://www.cycling.scot/mediaLibrary/other/english/1237.pdf>

⁸ Development of Scotland’s 2030 road safety casualty targets and key performance indicators Transport Scotland; Published 8 September 2020.

<https://www.transport.gov.scot/publication/development-of-scotlands-2030-road-safety-casualty-targets-and-key-performance-indicators/>

Speed management:

The results of the Edinburgh 20mph speed limit reduction should be acknowledged, including the evidence that:

“There was a reduction post speed limit introduction in the number of drivers exceeding 20mph at speeds over 20mph (10%), 24mph (25%) and 30mph (41%)”.⁹

Driving /Riding for Work and Workplace culture:

We would propose adding to this the time pressure being placed on drivers by employers to reach places in set time frames (e.g. delivery drivers) which could encourage speeding and another dangerous driving on our roads.

Enforcement:

We agree that dash cam /helmet cam footage is a key part of reducing road danger and it relies on the police having the resource to review it – and acting on it in a consistent way.

Lifelong road use learning:

We would welcome the inclusion of communication about the revised Highway Code to drivers.

It should also be noted that the evidence shows that the majority of KSI crashes, between a vehicle and an adult cycling, are caused by the driver behaviour¹⁰.

Question 5 – Do you think the strategic actions will deliver the outcomes and identified challenges?

No

5.1 Please explain your answer

The strategic actions need to include and emphasise effective infrastructure, including dedicated cycling lanes, as a stand-alone action. It's the single most important action to reduce cycling deaths and serious injuries, which is the only casualty reduction target that has not improved in the last ten years

We think the other strategic actions will help to deliver the outcomes – and we would add the following:

Speed:

The Safe Road Use outcome outlined reducing car-based traffic and it would be helpful to see this as a specific action.

We believe that a focus on reducing vehicle traffic on residential and shopping streets, and broadening it to include all vehicles (HGVs, vans), would help deliver road safety benefits.

We welcome a National Speed Management Review and would support a speed reduction in both 60mph and 30mph zones across Scotland. With more than half of all fatalities

⁹ <https://www.edinburgh.gov.uk/downloads/file/26614/report-on-key-outcomes-following-the-implementation-of-20mph-limits-in-edinburgh-nihr-sept-2019>

¹⁰ https://trl.co.uk/uploads/trl/documents/PPR445_new.pdf

See also for London: <http://content.tfl.gov.uk/analysis-of-police-collision-files-for-pedal-cyclist-fatalities-in-london.pdf>

occurring on 60mph roads, tackling inappropriate speed could significantly improve road safety.

In terms of enforcement of speeding and other dangerous driving behaviour, we agree processing dash cam footage will be key to success. Additionally, in line with many other groups representing road users and victims of road crashes, we believe stricter sentencing is required.

Climate:

As referenced previously, we would note that extreme weather events already affect the safety of vulnerable road users

Funding:

We would welcome a commitment to increased funding for effective road safety interventions and road policing in particular to help deliver the vision. This is an example of 'spend-to-save', given that estimated costs of road crashes in Scotland are over £1 billion¹¹.

Change in attitudes and behaviours:

We believe there is a need to help people associate speeding and other dangerous driving behaviour with criminality, as has been done effectively with drink driving in Scotland. Increased sentencing for dangerous driving behaviour would help to achieve this.

Knowledge and data analysis:

We agree more data would help us to understand more about causes of road collisions and help to inform preventative action – our evidence with Glasgow Centre of Population Health¹² analysing reported cycling casualties in Scotland over a 23-year period from 1995-2018, revealed significant gaps in reporting.

Education:

Bikeability Scotland, which Cycling Scotland co-ordinates, delivers cycle training to tens of thousands of school pupils every year, providing essential road safety learning outcomes about on-road cycling.

5.2 Are some of these actions more important than others?

Yes

5.3 Please explain your answer

We believe all of the actions outlined are important and intrinsically linked but that infrastructure separating road users is the highest priority action to reduce cycling KSIs (not currently specified).

Question 6 – What are your views on the proposed 2030 Interim Targets?

It is important to recognise that interim targets to 2030 need to be achievable in the short to medium-term, as the timeframe for achieving the targets is now less than 10 years.

¹¹ Road Casualties Scotland, 2019.

¹² <https://www.cycling.scot/mediaLibrary/other/english/7529.pdf>

Question 7 – Do you think the Intermediate Outcome Targets and Key Performance Indicators are appropriate to monitor the progress towards the 2030 Interim Targets?

No

7.1 Please explain your answer

Outcome

We welcome that achieving a percentage reduction in people cycling and pedestrians killed and seriously injured are listed as intermediate outcome targets.

We strongly support having an intermediate outcome target on cycling if it has a measure of risk included (either by km cycled or hours cycled). The data most readily available at present is number of km cycled so we'd suggest a change to:

Percentage reduction in cyclists killed or seriously injured *per km cycled*

KPI

The proposed KPI to monitor the proportion of people cycling wearing helmets is not appropriate for four main reasons:

Firstly, it is not compulsory/required by law to wear a helmet when cycling whereas other proposed KPIs (including helmet wearing while motorbiking) reflect legal requirements or the risk that one road user may pose to another.

Secondly, we note the Transport Scotland review document didn't recommend this as a KPI: *Protective equipment*

Motorcycle helmet wearing rates are almost 100% in the UK, although there is no evidence collected on non-wearing rates. It is not therefore considered to be a road safety priority worthy of measuring through a KPI.

Other protective equipment for motorcycle riders or cyclists could be measured through random surveys similar in nature to those for seatbelt or mobile phone use. There is no legislation in place however to mandate the use of such equipment which would make the establishment and improvement of KPI performance difficult. There is significant debate as to whether the use of cycle helmets should be made mandatory, although the evidence for effectiveness is less controversial. We do not therefore consider a KPI for protective equipment to be established at this moment. ¹³

Thirdly, there is no system for collecting data on helmet wearing and to set one up would require scarce resources and it is unclear which organisation would take responsibility for collecting this data.

Finally, while wearing a correctly fitted helmet can protect you from a head injury in the event of a low-speed crash, it is important to note there is no evidence that helmets provide protection at higher speeds ¹⁴. Efforts on cycle helmets would be more effectively spent on educating and enforcing road laws for all road users, with priority given to tackling behaviours creating the greatest risk of harm.

¹³ Development of Scotland's 2030 road safety casualty targets and key performance indicators
Transport Scotland

¹⁴ <https://www.cyclinguk.org/campaigning/views-and-briefings/cycle-helmets>

As an alternative, we recommend the inclusion of a KPI on infrastructure from the Active Travel Framework (Km of traffic-free walking and cycling facilities). This tracks the key road safety priority of infrastructure and aligns with other Government policy frameworks.

We would also highlight that behaviours in RITS survey should be tracked as it reflects a culture of reducing road danger to vulnerable road users (people walking, cycling, or motorbiking), including:

- I always check for pedestrians at junctions
- I always check for people on pedal bikes at junctions
- I always check for people on pedal bikes before turning a corner
- I always leave a gap of a car's width when passing people on bikes.

Question 8 – Do you think the proposed governance structure is appropriate?

8.1 Please explain your answer

Question 8.2 - Would road safety performance be improved across Scotland as a result of systematically sharing information and best practice between local authorities and/or local/regional partnerships through the Local Partnership Forums?

Yes

8.3 Please explain your answer

It's important that action to improve road safety is evaluated and results shared across all local authorities in Scotland. A network to share information and best practice would be helpful to facilitate this. It should be borne in mind that each local authority area is different and faces different challenges, so each local authority, participating in a coordinated national approach, should also respond in an evidence-based fashion to the specific causes of road casualties and road danger in their area.

Question 9.1 – In your opinion, what aspects of road safety work well at the moment?

Based on evidence, the following are road safety measures working well:

- Permanent, segregated cycle lanes
- Operation Close Pass
- Speed reductions (in some local authority areas)
- Temporary active travel infrastructure for people walking, wheeling, and cycling, during the pandemic
- Closing roads to vehicular traffic

Question 9.2 – What practical actions would you like to see taken to encourage and promote these aspects?

An increase in permanent cycle lanes, segregated from traffic.

Question 10.1 – In your opinion, what aspects of road safety do not work well in general and as a result of Covid-19?

An effective road safety approach is based on the 4 'E's of enforcement, engineering, education and evaluation. Action is required in each of these areas, as highlighted throughout this response. There are also a number of points not mentioned elsewhere:

Data: There is currently a significant issue of under-reporting of cycling road casualties, as well as of close pass/near miss incidents. STATS19 is designed to capture road traffic collisions and incidents which result in an injury and so close passes/near misses are not captured. The new Collision Reporting and Sharing System (CRASH) being introduced to Police Scotland will help but underreporting is likely to remain a consideration. Close pass incidents remain a significant road safety issue and have a significant role to play in negative perceptions of cycling as unsafe.

Data: STATS19 also does not record the type of bike involved in an incident so there is no evidence of the proportion of incidents/collisions that involved an e-bike or standard pedal cycle, and does not record the ethnicity of cycling casualties. Both of these are improvements that can be made through the review of STATS19.

Investigation: There is also always a need for greater police enforcement activity, given the impact of enforcement on improving behaviour and also investigation into road crash causes.

Sentencing: We welcome the current review of sentencing in order to improve attitudes towards safer driving. This should be referenced in the final Road Safety Framework as another key element towards a Safe System approach. Current sentencing can create a perception that road safety in general, and cycling safety in particular, is not seen as a priority.

Infrastructure: Some existing infrastructure is unsafe, for example narrow painted cycle lanes.

Covid-19: During the lockdown period for Covid-19, there was emerging evidence of vehicles significantly exceeding the speed limits on roads, as a result of roads being much quieter. Many police divisions experienced an increase in dangerous driving, with Police Scotland seeing a rise of 17.6% (141 offences) during the initial lockdown period¹⁵. This is significantly problematic for road safety and is especially concerning for vulnerable road users, like people cycling. Evidence suggests that reducing speed of traffic on the roads, particularly in built-up areas, will help to reduce cycling and pedestrian casualty rates¹⁶.

Question 10.2 – What practical actions would you like to see taken to encourage and promote these aspects?

Action to improve data gathering and recording of cycling casualties is required. A recently published report ¹⁷, which Cycling Scotland commissioned, made a recommendation for the type of bike to be recorded in STATS19. This would enable determination of the proportion of cycling casualties which involve an e-bike and standard pedal cycle, for example. Further,

¹⁵ Scottish Police Authority <https://www.spa.police.uk/spa-media/as5paqup/rep-b-20200918-item-7-policing-performance-report-q1.pdf>

¹⁶ <http://www.cyclinguk.org/campaign/20-mph-lower-speeds-better-streets>

¹⁷ <https://www.cycling.scot/mediaLibrary/other/english/7529.pdf>

information on ethnicity should be added to STATS19, as this would enable analysis of road casualties for all types of road user.

Improvements to police investigation of cycling casualties should be introduced to strengthen cycling safety as a priority and help to create safer road conditions for people cycling by understanding the cause of collisions and the socio-demographics of people involved.

Substantial and sustained investment is required to help improve road safety for people cycling, with a focus on policies that generate a shift away from car use towards active travel. Investment should be focused on creating networks of separated high quality cycling infrastructure. This is vital to both increase rates of cycling and improve safety. Such investment should also avoid further embedding existing inequalities in the transport system. Investment in protected/separated cycle lanes is the highest priority action for improving road safety for people cycling.

Reducing the amount of car parking available in city centres would help to reduce vehicle traffic. Similarly, ongoing action is required to tackle the risk posed by HGVs to vulnerable road users in crowded town and city centre streets, reducing the mixing of the heaviest vehicles with the most vulnerable road users.