

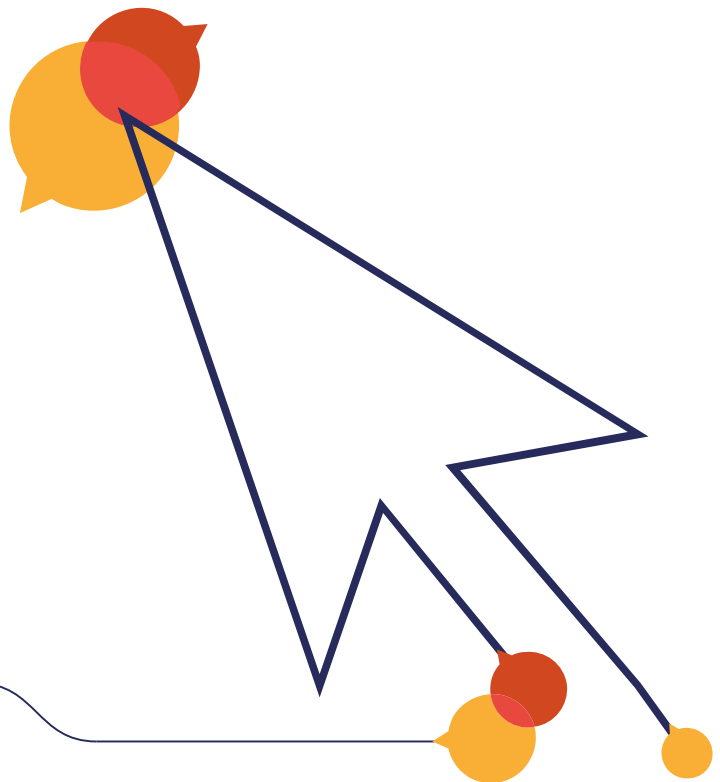


accidents don't have to happen

RoSPA Policy Paper: Cycling

Cycling

June 2023



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Summary statement

Cycling in Great Britain is increasing because it is an excellent way to get about and provides a wide range of health and environmental benefits. Unfortunately, it also carries a certain amount of risk, and so we need to ensure that more cycling does not lead to more cycling casualties. The key is to create a safe on and off-road cycling environment, improve driver and cyclist attitudes and behaviour towards each other, and to produce safer vehicles that reduce the risk to cyclists.



Executive summary

Cycling in Great Britain has been growing in popularity, although its growth is not consistent across the country. It is a form of active travel, offering a wide range of health and environmental benefits. However, as with all modes of transport, there is some level of risk. This is exacerbated by the inadequate infrastructure catering to cyclists' needs and the behaviour of some motorists and cyclists themselves.

The challenge we face is to create safer conditions for cycling, preventing an increase in cycling casualties whilst growing participation in cycling. By enhancing cycling safety, we can reduce the number of cycling collisions and encourage more people to cycle regularly. It will help those who want to cycle but are deterred from doing so because they think it is not safe enough and help to prevent an increase in cycling being accompanied by an increase in cyclist casualties. This, in turn, will increase the health and environmental benefits of cycling for individuals and society.

RoSPA strongly supports initiatives that encourage healthy and sustainable travel. The key to increasing cycling and gaining its associated benefits lies in establishing secure on and off-road cycling environments, improving the attitudes and behaviours of motorists and cyclists toward each other, and developing safer vehicles that minimise the risk to cyclists.

RoSPA strongly advocates the Safe System approach, which involves designing roads and vehicles to minimise the risk of crashes occurring, and ensures that when they do occur, they are unlikely to result in death or serious injury. 20mph schemes are a good example of the Safe System approach because lower speeds reduce the risk of crashes occurring and the severity of any that do occur.

The UK can draw valuable lessons from other countries like the Netherlands, Denmark, and Sweden, which boast higher levels of cycling participation alongside lower cyclist fatality rates. These countries demonstrate that it is possible to encourage cycling without experiencing an increase in cyclist crashes and casualties. By studying the successful approaches and strategies implemented in these countries, the UK can strive towards creating a safer cycling environment that promotes cycling while prioritising the well-being and safety of cyclists.

Introduction

Purpose of this policy paper

This policy paper has three main objectives:

1. To review and summarise information on the benefits and risks of cycling in Great Britain by:
 - a. Examining the health and environmental benefits of cycling
 - b. Exploring how driver and cyclist attitudes and behaviour can be improved to reduce the risk to cyclists, and so help more people to cycle safely
 - c. Exploring how roads can be designed to reduce the risk to cyclists, and so help more people to cycle safely.
2. To identify the best ways of meeting the challenge of increasing cycling without also increasing cyclist casualties, by:
 - a. Outlining the level and nature of cycling crashes and casualties in Great Britain
 - b. Exploring how the risk of HGV and cyclist collisions can be reduced
 - c. Examining the evidence of the relationship between traffic volume and cyclist casualties.
3. To produce evidence and recommendations that will assist RoSPA and other organisations to tackle this challenge. Recommendations will be based on;
 - a. Creating a safer cycling environment that will help to reduce the number of cyclist casualties
 - b. Preventing the increase in cycling resulting in an increase in cyclist casualties
 - c. How to help people who want to cycle but are deterred from doing so because they think it is not safe enough.

Although this policy paper focuses on cycling, many of the principles discussed also apply to walking. Both are important and valuable forms of physical activity and transport, which should be accorded equal priority in terms of public policy. Many of the health benefits gained from cycling can also be gained from walking, and many of the measures to improve cycling safety (for example, speed management) also improve walking safety. However, they are two very different modes, and mixing them together inappropriately can cause fear, anxiety, and even serious injury.

Policies and infrastructure to promote cycling, and improve cycling safety, should not be made in isolation. Both pedestrians and cyclists are highly vulnerable to, and restricted by, motor traffic. It is important to recognise that both are vulnerable road users, and aim to reduce the risk of collisions, and create an environment in which both pedestrians and cyclists feel safe using, as well as to improve driver behaviour.



The benefits of cycling

There is strong evidence^{1,2,3} that cycling provides a wide range of health benefits, mainly because it is a convenient and affordable form of physical activity, and increasing physical activity reduces the risk of many forms of ill-health and disease. Cycling offers numerous benefits for individuals and society. Here are some key benefits of cycling:

1. **Health and fitness:** Cycling is an excellent form of exercise that enhances overall physical health. Regular cycling can reduce the risk of chronic illnesses such as heart disease, obesity, and diabetes⁴
2. **Environmental sustainability:** Cycling is a sustainable mode of transportation that can help reduce air pollution
3. **Cost-effectiveness:** Ongoing and maintenance costs of a bike are relatively low compared to motorised modes of transport
4. **Improved mental health:** Regular cycling has positive effects on mental health. It can help reduce symptoms of anxiety and depression, boost self-esteem, and promotes mental well-being
5. **Efficiency and mobility:** Cycling can be a convenient way to navigate through urban areas, especially during peak traffic hours. It allows for quicker and more efficient commuting, as bicycles can often access areas where cars cannot, such as cycle lanes.

Cycling can easily be incorporated into daily life – by cycling to work, school, to see friends or to the shops. It is estimated that from 1961 to 2005, there was a 20 per cent reduction in physical activity within Britain, which is predicted to rise to 35 per cent by 2030. More than four in 10 people do not partake in enough physical activity to achieve good health, which has significant negative impacts upon their lives. The All-Party Commission on Physical Activity report estimates that physical inactivity leads to 37,000 premature deaths in England alone each year⁵.

Lack of physical activity is one of the most important risk factors for coronary heart disease, with a physically inactive lifestyle doubling the risk compared to an active lifestyle. Regular exercise is central to improving the nation's health, with cycling being an excellent method of building regular exercise into people's daily lives.

¹ Hillman M (1992) Cycling: Towards health and safety, BMA

² Cavill N & Davies A (2007), Cycling and Health: What's the Evidence?" Cycling England

³ NICE (2012) Walking and cycling: local measures to promote walking and cycling as forms of travel or recreation, NICE public health guidance 41

⁴ Green, Saul's & Levitt (2021) Cycling for health, National Library of Medicine, Oct; 67(10): 739–742
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8516176/>. – accessed July 2023

⁵ All Party Commission on Physical Activity (2014) Tackling Physical Inactivity – A coordinated approach, www.sportsandplay.com/upload/public/APCOPA%20Final.pdf – accessed June 2023

Levels of cycling

Throughout much of the 20th century, cycling in Great Britain witnessed a significant decline alongside a substantial increase in motor vehicle traffic. However, recent years have seen a resurgence in cycling, albeit with varying levels across the country. This has been supported by increased investments in promoting cycling and providing safer cycling environments.

Over the past 15 to 20 years, the average distance travelled by bicycle has risen from 39 miles per person in 2020 to 55 miles per person in 2021⁶. However, there has been a decrease in the proportion of adults cycling regularly, with the percentage of adults cycling once a week dropping from 12 per cent in 2016 to 9 per cent in 2021. A similar trend is observed for adults cycling at least once a month, declining from 17 per cent in 2016 to 13 per cent in 2021. This has been primarily attributed to a decrease in leisure cycling⁷.

Cycling levels vary across the country, with higher participation in the East, London, and parts of the South East, while the North East exhibits lower levels. Cities such as Cambridge (50 per cent), Oxford (40 per cent), York (34 per cent), and London boroughs such as Islington (32 per cent), and Hackney (31 per cent) have the highest percentage of their population cycling at least once a month². Cycling levels in areas such as London have likely increased due to the investment in cycling infrastructure with London boroughs investing in high-quality infrastructure that encourages more people to walk and cycle⁸.

Areas with the lowest cycling rates, such as Medway and Sandwell, have less than 5 per cent of their population cycling at least once a month. Additionally, 88 local authorities have less than 10 per cent of their population cycling at least once a month. Many of these areas correlate with low ratings in the Active Travel England assessment, which evaluates the effectiveness of local authorities in developing schemes supporting the Cycling and Walking Investment Strategy⁹.

Currently, more people cycle for recreational purposes than for utility purposes (e.g., commuting or shopping). Around 10 per cent of people cycle recreationally at least once per month and 6.4 per cent cycle for utility purposes². Men are more likely to cycle than women, with men undertaking three times the number of cycling trips compared to women¹. The peak age range for adult male cycling is 50-59, while for women, it is 60-69. Overall, women participate in less cycling for all purposes than men across all age groups¹.

⁶ DfT (2022), Walking and cycling statistics, England: 2021, <https://www.gov.uk/government/statistics/walking-and-cycling-statistics-england-2021/walking-and-cycling-statistics-england-2021#trends-in-cycling> – accessed June 2023

⁷ DfT (2022), CW0302: [Proportion of adults that cycle, by frequency, purpose and local authority: England](https://www.gov.uk/government/statistical-data-sets/walking-and-cycling-statistics-cw#participation-in-walking-and-cycling), <https://www.gov.uk/government/statistical-data-sets/walking-and-cycling-statistics-cw#participation-in-walking-and-cycling> – accessed June 2023

⁸ TfL (2022), New TfL data shows continued boom in walking and cycling, <https://tfl.gov.uk/info-for/media/press-releases/2022/november/new-tfl-data-shows-continued-boom-in-walking-and-cycling-with-almost-twice-as-many-now-living-near-a-high-quality-cycle-route> – accessed June 2023

⁹ Active Travel England, (2023), Summary guidance on local authority active travel capability ratings, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1141355/local-authority-active-travel-capability-ratings.pdf – accessed June 2023



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Scotland¹⁰

In Scotland, cycling is the primary mode of transport for 1.5 per cent of the population, while 13 per cent of individuals cycle at least once a month. Cycling is most prevalent among individuals aged 16 to 24, accounting for 22 per cent of those who cycle.

The proportion of adults who cycle to work has consistently declined since 2012, currently standing at 4 per cent, compared to 5 per cent in 2012. The percentage of children cycling to school has remained stable, at 5.3 per cent in 2021.

Wales¹¹

In Wales, the 2022 Travel Survey revealed that 6 per cent of people aged 16 years and over travelled by bike at least once a week. Men were more than twice as likely to travel by bike than females. Notably, there was no significant difference in cycling rates between urban and rural areas in Wales.

¹⁰ Cycling Scotland (2022), Annual Cycling Monitoring Report, 2022, https://www.cycling.scot/mediaLibrary/other/english/Annual_Cycling_Monitoring_Report_2022.pdf – accessed June 2023

¹¹ Welsh Government (2022), Active travel (walking and cycling):April 2021 to March 2022, <https://www.gov.wales/sites/default/files/pdf-versions/2022/10/3/1665563419/active-travel-walking-and-cycling-april-2021-march-2022.pdf#page5> – accessed June 2023

The risks of cycling

Every year in Britain around 16,500 cyclists are killed or injured in police reported road accidents, including around 4,300 who are killed or seriously injured.

Table 1: Reported pedal cyclist casualties by severity, Great Britain, 2017 – 2021¹²

	Killed	KSI	All
2017	101	4,412	18,321
2018	99	4,400	17,550
2019	100	4,221	16,884
2020	141	4,356	16,249
2021	111	4,353	16,458

These are casualties that have been reported to the police. However, reporting rates for pedal cyclist casualties tend to be lower than for other road user groups, and cyclist non-fatal casualties are amongst the most likely to be under reported in data collected by the police, especially when the cycle was the only vehicle involved. Based on hospital data (Hospital Episode Statistics) the number of cyclist admissions is more than three times the number of seriously injured cyclists recorded by the police¹³.

Traffic counts and the National Travel Survey suggest that cycling levels are around 13 per cent to 20 per cent higher than the 2005-9 average depending on the data collection method employed. Over the last few years, the number of cyclist deaths and casualties, and the cyclist fatality rate, has fluctuated, which suggests that more cycling is not automatically resulting in more cyclist casualties.

Cyclist casualties

Of the 111 cyclists killed on our roads in 2021, 108 were adults and 3 were children. Accidents are more likely to involve collisions with motor vehicles, but about 8 per cent of their fatal or serious accidents that are reported to the police do not involve a collision with another vehicle.

Table 2: Cyclist casualties by age, Great Britain, 2021¹⁴

	Child (0-15)	Adults (16-59)	Adults (60+)
Killed	3	73	35
Serious	395	3,367	658
Slight	1,259	9,422	930
Total	1,654	12,789	1,588

¹² DfT (2022), Reported road casualties in Great Britain: pedal cycle factsheet, 2021

<https://www.gov.uk/government/statistics/reported-road-casualties-great-britain-pedal-cyclist-factsheet-2021/reported-road-casualties-in-great-britain-pedal-cycle-factsheet-2021> – accessed June 2023

¹³ DfT (2014) Focus on Cycling in “Reported Road Casualties Great Britain 2013”

¹⁴ DfT (2022), RAS0102: Casualties and casualty rates, by road user type and age group, since 1979,

<https://www.gov.uk/government/statistical-data-sets/reported-road-accidents-vehicles-and-casualties-tables-for-great-britain>



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Most cyclist casualties are male. 94 of the 111 cyclists killed in 2021 were male, as were 13,100 of the 16,458 overall casualties¹⁵.

Among males and females in 2021, those aged 50-59 had the highest number of killed or serious injuries (KSI) among cyclists, representing a total of 19 per cent of such casualties. For males, this marks a change from 2013 when teenagers and young adults accounted for approximately 30 per cent of male cyclist fatalities or serious injuries. However, it is important to note that young male cyclists still face a higher risk than older male cyclists, as they tend to engage in cycling for shorter periods and account for only 25 per cent of the total miles cycled.

Between 2016 and 2021, in collisions involving a bicycle and another vehicle, the most common key contributory factor recorded by the police was “failed to look properly” by either the driver or rider, accounting for 45 per cent of total collisions. “Failed to look properly” was attributed to the car driver in 67 per cent of collisions and to the cyclist in 33 per cent of collisions. The second most common contributory factor assigned to both pedal cyclists and drivers was ‘failed to judge other person’s path or speed’. Other common contributory factors attributed to drivers are “poor turn/manoeuvre” (in 9 per cent of serious accidents involving a cyclist) and “careless, reckless, in a hurry (13 per cent)¹⁶.

Table 3 provides an overview of the primary locations where cyclists were killed or injured. The data reveals that most cyclists (59 per cent) were not killed at or within 20 metres of a junction. T, Y, or staggered junctions accounted for 21 per cent of fatalities, but they also represented many collisions resulting in serious or slight injury. This highlights the significance of junctions as areas of potential risk for cyclists.

Table 3: Percentage of pedal cycle KSI casualties by severity and junction detail where the collision occurred, GB: 2016 to 2021¹⁶

Junction	Fatalities	Serious	Slight	All casualties
Crossroads	10.1%	9.7%	10.6%	10.3%
T, Y, or staggered junction	21.1%	35.8%	37.7%	37.1%
Roundabout	4.3%	10.9%	11.6%	11.4%
Not a junction or within 20 metres	58.7%	32.2%	26.5%	28.1%

The most common vehicle involved in collisions with cyclists are cars. Between 2016 and 2021, pedal cyclist collisions involving cars accounted for 46 per cent of total fatalities and 78 per cent of all cyclist casualties. Other common collision types in fatal cycle crashes are:

- no other vehicle (16 per cent)
- heavy goods vehicle (14 per cent).

¹⁵ DfT (2022), RAS0102: Casualties and casualty rates, by road user type and age group, since 1979, <https://www.gov.uk/government/statistical-data-sets/reported-road-accidents-vehicles-and-casualties-tables-for-great-britain> – accessed June 2023

¹⁶ DfT (2022), Reported road casualties in Great Britain: pedal cycle factsheet, 2021 <https://www.gov.uk/government/statistics/reported-road-casualties-great-britain-pedal-cyclist-factsheet-2021/reported-road-casualties-in-great-britain-pedal-cycle-factsheet-2021> – accessed June 2023



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For all casualty severities:

- No other vehicles (5 per cent)
- Light goods vehicles (7 per cent)¹⁶

Summary of other key statistics cycling casualties and crashes between 2016 and 2021¹⁶

- 81 per cent of all casualties happen on urban roads where most cycling takes place, but 56 per cent of cyclist deaths occur on rural roads
- Weekday collisions involving cyclists have two peaks: from 7am to 10am and 4pm to 7pm. The weekend has a single peak from mid-morning until 12 noon
- Head injuries, ranging from fatal skull fractures and brain damage to minor concussion and cuts, are very common injuries to cyclists. Hospital data shows that over 40 per cent of cyclists, and 45 per cent of child cyclists, suffer head injuries.



Comparisons with other countries

Comparing cycling data between countries can be difficult due to variations in data collection methods. It is also difficult to accurately determine the amount of cycling taking place in a country, making it hard to draw precise conclusions regarding the distance travelled or time spent cycling by individuals. The European Transport Safety Council (ETSC) has been compiling data on the progress made by EU countries in reducing cycling-related fatalities. On average, cyclists accounted for 8 per cent of all road deaths in the EU in 2018. However, this percentage varied significantly among different EU states¹⁷.

Focusing solely on the number and percentage of cycling deaths does not provide a comprehensive assessment of cycling risk in each country, as it fails to consider the number of cycling trips or the mode share of cycling. Table 4 offers a method to measure risk by examining cyclist deaths per billion kilometres cycled. Unfortunately, only a few countries collect data on distance cycled, and these countries employ different methodologies, making meaningful comparisons difficult.

Table 4: Distance cycled per person and cyclist fatality rate by country¹⁷

Country	Distance cycled per year per inhabitant (km)	Cyclist deaths per million inhabitants	Cyclist deaths per billion km cycled
Austria	217	5	24
Belgium	578	7	13
Denmark	508	5	10
Germany	400	4	12
Finland	300	5	16
Netherlands	865	12	13
Sweden	194	2	13
UK	80	2	19

Broadly speaking, the comparison found that some European countries have much higher levels of cycling than the UK, but lower cyclist fatality rates per billion km cycled.

Other key comparisons from across Europe include¹⁸:

- 82 per cent (in 2019) of cyclists killed were male, this is the same amount as in the UK. However, in countries with higher rates of cycling, the proportion of male fatalities is lower
- The EU the mortality rate is the highest for those people aged 65 or over, with their mortality rate being three times higher than 25–64-year-olds and six times higher than for under 25-year-olds.

¹⁷ ETSC (2020), How safe is walking and cycling in Europe? PIN Flash Report 38, https://etsc.eu/wp-content/uploads/PIN-Flash-38_FINAL.pdf – accessed June 2023

¹⁸ European Road Safety Observatory (2021), Facts and Figures – Cyclists 2021, https://road-safety.transport.ec.europa.eu/system/files/2022-03/FF_cyclists_20220209.pdf – accessed June 2023



Current public cycling policy in the UK

The Governments of the United Kingdom all have similar aspirations to increase the number of people cycling, and the safety of cyclists. Key policy documents include the Cycling and Walking Investment Strategy, Active Travel Act Wales 2013 and the Cycling Framework for Scotland.

All UK Governments have expressed their aspirations for walking and cycling to become the natural choice for shorter journeys, as well as integral parts of longer journeys, without limitations based on age, gender, fitness level, or income. RoSPA fully endorses any vision that promotes active travel. However, it is worth noting that interventions and initiatives are often fragmented, with localised successes instead of nationwide implementation. This fragmented approach can be attributed, in part, to the absence of systematic delivery of policy interventions and a lack of a clear long-term vision¹⁹.

Cycling delivery plan²⁰

Within England, the Department for Transport's Cycling Delivery Plan is a 10-year plan for incremental changes to take place until cycling becomes the norm for everyone. Key elements include:

- Local authorities developing local walking and cycling delivery plans
- Appointing an influential cycling and walking champion, who would be an elected member
- Cycle proofing new transport infrastructure.

DfT cycling and walking investment strategy²¹

In 2017, the Department for Transport published the Cycling and Walking Investment Strategy (CWIS), with the aim of making cycling and walking the natural choice for shorter journeys, or as part of a longer journey, regardless of age, gender, fitness level or income. Individuals are encouraged to consider walking or cycling for several purposes, including travelling to a place of work or education, travelling to the bus or train station or for pleasure.

The strategy sought to build upon previous strategies and partnerships such as Cycling Ambition Cities and Bikeability. The overall ambition in the strategy looks towards 2040, with objectives looking at key target year dates. These include reducing the rate of cyclists killed or seriously injured (KSI) on England's roads and doubling the number of cycling stages, from 0.8 billion in 2013 to 1.6 billion by 2025.

The Department for Transport aimed to meet these objectives by providing over £1 billion of government funding to local bodies to invest in cycling and walking over five years. Delivery will include cycling and walking programmes,

¹⁹ Golbuff L & Allred R (2021) Cycling Policy in the UK. A historical and thematic overview, <http://rachelaldred.org/wp-content/uploads/2012/10/cycling-review1.pdf> – accessed June 2023

²⁰ DfT (2014) Cycling Delivery Plan, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/364791/141015_Cycling_Delivery_Plan.pdf – accessed June 2023

²¹ DfT 'Cycling and Walking Investment Strategy', Department for Transport, 2017 <https://www.gov.uk/government/publications/cycling-and-walking-investment-strategy> – accessed June 2023



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local transport programmes, Government programmes, local body programmes and initiatives led by business and the third sector.

The Government also announced a second CWIS strategy²² that set out the objective and financial resources for the period April 2021–March 2025, with the ambition to make walking and cycling the natural choice for shorter, or part of longer journeys by 2040. Some of the objectives to achieve this vision were also revised, such as a new objective to increase the percentage of short journeys in towns and cities that are walked or cycled from 41 per cent in 2018 to 2019 to 46 per cent by 2025.

Gear Change²³

In 2020, the Government announced a vision to make England a cycling and walking nation. It set out the Government's vision in four themes:

- Better streets for cycling and people
- Cycling and walking at the heart of decision making
- Empowering and encouraging local authorities
- Enabling people to cycle and protecting them when they do.

Gear change has been funded with £2 billion of new money. Funding was provided to local authorities through a new Active Travel Fund and Transport for London. The National Audit Office²⁴ produced a value for money report in 2023. It suggested that although the investment is having an impact the rate of change was not happening fast enough to achieve its objectives. Although it is recognised that active travel can deliver important benefits, local delivery is patchy and too little is known about what has been achieved. Active Travel England will become an increasingly important body to monitor the benefits of active travel outcomes.

Active Travel England²⁵

Active Travel England was established to enable the achievement of the objectives set out in the CWIS. It is an executive agency of the DfT with the overall objective to achieve a step-change in walking and cycling in England. It supports, promotes and funds dedicated walking and cycling initiatives.

Active Travel (Wales) Act 2013

In 2013, Wales introduced an Active Travel Act, which requires local authorities to continuously improve facilities and routes for pedestrians and cyclists. The Act requires Welsh ministers to publish annual reports on the number

²² DfT (2023), The second cycling and walking investment strategy (CWIS2), <https://www.gov.uk/government/publications/the-second-cycling-and-walking-investment-strategy/the-second-cycling-and-walking-investment-strategy-cwis2#table1> - accessed June 2023

²³ DfT (2020), Gear Change. A bold vision for cycling and walking, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/904146/gear-change-a-bold-vision-for-cycling-and-walking.pdf - accessed June 2023

²⁴ National Audit Office (2023), Active Travel in England, <https://www.nao.org.uk/wp-content/uploads/2023/06/active-travel-in-england-summary.pdf> - accessed June 2023

²⁵ Active Travel England (2022) Framework Document, Active Travel England, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1099662/framework-document-active-travel-england.pdf - accessed June 2023

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of active travel journeys made in Wales. The Act also encourages securing new and improved active travel routes and facilities and to promote active travel such as walking and cycling. Further information can be found on the Welsh Government [website](#).

Scotland

The Scottish Government had a vision for 10 per cent of all journeys to be made by bicycle by 2020²⁵. The aim was to achieve this through focussed leadership, funding, infrastructure, and safety. Scotland is now in the process of writing a new Cycling Framework for Scotland, that will set out strategic priorities for everyday cycling to 2030.



A safer cycling environment

The WHO safe system approach to road safety

The safe systems approach is advocated by the World Health Organisation and Vision Zero philosophy²⁶ and is based on the understanding that injury is caused by an exchange of energy in quantities higher than human tolerance to it. Preventing or minimising the exchange of energy, therefore, prevents injuries.

The safe system approach has been adopted in some countries, such as The Netherlands, Sweden, Scotland and New Zealand, and components of the approach are beginning to be adopted across local authorities in England such as in the Safe streets for London Action Plan²⁷ and National Highways strategy²⁸.

The safe system approach recognises that people make mistakes, and designs roads and vehicles so that these mistakes are not likely to result in death or serious injury. This places human vulnerability to injury at the centre of the road system, and proposes that roads, vehicles, and traffic speeds are modified to prevent exchanges of energy which are likely to cause fatal and serious injuries. This approach can be applied to all types of roads and for all road users.

In general, the safe system philosophy identifies ways of separating traffic, and especially separating vulnerable road users from motor vehicle traffic on high-speed roads, and where this cannot be achieved, designing roads to reduce traffic speed.

There have been several estimates of how many lives (all road users not just cyclists) could be saved by the safe system.

One study²⁹ examined the circumstances of 215 fatal crashes, in which 248 people were killed, in Sweden in 2004. In 63 per cent of these crashes, it was judged that the road or vehicle did not meet the safety standards that would have existed if the safe system approach had been fully implemented. These fatalities could, therefore, have been prevented by the safe system, even without addressing road user behaviour.

An Australian study used a similar method, based on coroner's reports for every fatal crash in Southern Australia in 2008³⁰. After some exclusions to remove intentional crashes, and crashes due to natural causes (for example, heart attack or stroke whilst driving) there were 83 crashes and 93 deaths in the sample. In this study³¹, 57 per cent of the crashes were categorised as a failure of the safe system.

²⁶ OECD International Transport Forum (2008) Towards Zero: Ambitious Road safety Targets and the Safe System Approach

²⁷ Transport for London (2013) Safe Streets for London. The Road Safety Action Plan for London 2020, <https://www.tfl.gov.uk/cdn/static/cms/documents/safe-streets-for-london.pdf> - accessed June 2023

²⁸ <https://nationalhighways.co.uk/media/npvmcrjg/putting-safety-first.pdf> - accessed June 2023

²⁹ Stigson H, Krafft M, Tingvall C (2008) Use of fatal real-life crashes to analyze a safe road transport system model, including the road user, the vehicle, and the road, *Traffic Injury Prev.* 2008;9

³⁰ Wundersitz L and Baldock (2012) The relative contribution of system failures and extreme behaviour in South Australian crashes: Preliminary findings, M, Australasian Road Safety Research, Policing and Education Conference 2012, 4 - 6 October 2012

³¹ WHO (2013) Pedestrian safety: a road safety manual for decision-makers and practitioners.



Reducing casualties through safer road infrastructure

The safe system model includes many measures to prevent fatal and serious injury collisions from occurring. The two main approaches are:

- Separating different road user groups using physical infrastructure
- Where separation cannot be achieved, reducing vehicle speeds to reduce the likelihood of crashes occurring and the severity of any that do occur, so they are unlikely to cause fatal injuries

20mph schemes

The purpose of 20mph limits is to create conditions in which drivers naturally choose to drive at around 20mph because of the nature of the area. When motorists drive at lower speeds, they are able to react and identify what is happening around them and if they are involved in a collision, it is less likely to cause serious injury to the occupants of the vehicle and any other road user involved.

Table 5: Risk of pedestrian or cyclist death according to impact speed

Country and years of data analysed	Most likely estimated risk of death at 20mph	Most likely estimated risk of death at 30mph
GB 1975–1979 ³²	5%	45%
Germany 1991–2003 ³³	4%	14%
GB 2000–2007 ³⁴	~2%	~12%
Germany 2003–2007 ³⁵	~1%	~8%

There are two distinct types of 20mph areas:

20mph limits are areas where the speed limit has been reduced to 20mph but there are no physical measures to reduce vehicle speeds within the area. Drivers are alerted to the speed limit by 20mph speed limit repeater signs.

20mph zones use traffic calming measures to reduce the adverse impact of motor vehicles on built up areas. The principle is that traffic calming slows vehicles down to speeds below the limit, and in this way the zone becomes 'self-enforcing'. Speed humps, chicanes, road narrowing, planting and other measures can be introduced to both physically and visually reinforce the nature of the road.

Many local authorities are adopting 20mph limits to reduce road risk, promote active travel, and improve air quality. To be effective, drivers must be aware of and comply with these limits, and this may require a change in behaviour and speed choice. It is essential to have a coordinated strategy to inform road users about 20mph limits and involve relevant stakeholders in the development of 20mph roads.

³² Ashton S (1980) A Preliminary Assessment of the Potential for Pedestrian Injury Reduction through Vehicle Design, SAE Technical Paper 801315

³³ Hannawald L & Kauer F (2004), Equal Effectiveness Study on Pedestrian Protection, Technische Universität Dresden

³⁴ Oh C et al (2008) Assessing the safety benefits of an advanced vehicular technology for protecting pedestrians, Accident Analysis & Prevention, 2008:40

³⁵ Rosén E and Sander U. (2009) Pedestrian fatality risk as a function of car impact speed. Accident Analysis & Prevention, 2009:41; 536–542.



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There has been substantial expansion in the number of 20mph schemes throughout England, Scotland and Wales. Wales is introducing a default 20mph speed limit on restricted roads from September 2023. 20mph speed limits can be an important part of a [Safe System approach](#)³⁶.

For more information on 20mph schemes, we have an in-depth guide that can be accessed [here](#).

Cycling infrastructure

An American study³⁷ of why and how cyclists chose their routes analysed 1,500 cycling trips and found that the two most important factors influencing cyclists' road choice were avoiding streets with higher levels of vehicle traffic and minimising total distance. Being able to ride in a cycle lane was ranked third.

Cycle tracks and lanes

The review³⁷ encompassed fifteen evaluations primarily conducted in the USA, focusing on cyclist infrastructure, including lanes, paths, and tracks. Notably, there were significant variations in the study methods, such as the use of different injury measures and diverse definitions of cyclist infrastructure. Nonetheless, the reviewers reached a conclusion that on-road marked bike lanes decreased injuries compared to unmodified roads.

In contrast, the evidence regarding off-road riding was less uniform, mainly due to the diverse nature of the infrastructure, including variations in surfaces, as well as the inclusion of falls from bicycles and collisions with other vehicles in certain studies. While two studies indicated that off-road cycle paths reduced risks, studies examining unpaved off-road trails found higher rates of injuries.

Studies³⁸ have also highlighted that measures such as edge markings and improving the conspicuity of bollards can prevent cycle injuries from falls or single vehicle collisions. Evidence for the effectiveness of segregated cycle lanes comes from a study by the SWOV Institute for Road Safety Research in the Netherlands. The study aimed to investigate the effects of cycling infrastructure provision in the form of segregated cycle lanes, as well as other road characteristics such as kerbside parking on cycle collision risk on 50kmh roads³⁹.

9,840 collisions on 622 roads were analysed by splitting roads into 25 metre segments and using crash prediction models (negative binomial regression). It was identified that standard cycle lanes resulted in a 1.9x increase to bicycle collision risk when compared to segregated cycle lanes (this translates to a 50-60 per cent decrease in cycle collisions when these lanes are used). Other key types of road infrastructure that increased collision risk were kerbside parking and tramways, with an increase of 1.7x and 2.0x respectively. The authors state that the results of the study illustrate the success of the Dutch Sustainable Safety approach, which advises the introduction of segregated cycle lanes, and that cyclists should be separated from motor vehicles to decrease health risks to cyclists and to promote cycling.

³⁶ Towards Zero, OECD (2008), <https://www.itf-oecd.org/sites/default/files/docs/08targetsummary.pdf> - accessed June 2023

³⁷ Dill, J (2008) Where do people bicycle? The role of the infrastructure in determining bicycling behaviour https://pdxscholar.library.pdx.edu/cgi/viewcontent.cgi?referer=&httpsredir=1&article=1032&context=usp_fac - accessed June 2023

³⁸ Schepers P and den Brinker B (2011) What do cyclists need to see to avoid single-bicycle crashes?, Ergonomics

³⁹ van Petegem JWH, Schepers P, Wijlhuizen GJ (2021) The safety of physically separated cycle tracks compared to marked cycle lanes and mixed traffic conditions in Amsterdam. *EJTIR*. 2021;21(3):19-37. <https://journals.open.tudelft.nl/ejir/article/view/5283> - accessed July 2023



Shared routes

Shared use routes are set away from the road and designed for use by both cyclists and pedestrians. They can have a white line segregating cyclists and pedestrians, or they may be left open for the two to mix. One study⁴⁰ found that cyclists were willing to travel longer distances to make use of a shared route rather than ride on the road so they could avoid streets with high levels of traffic.

Whilst shared routes can reduce conflict between motor vehicles and cyclists, they increase the number of interactions between pedestrians and cyclists, which can sometimes (but not always) cause problems. When a canal side towpath was opened to cyclists, no change in attitudes was seen in walkers or anglers at the site, even with an increase in cyclist use⁴¹. However, on another shared route, concern was expressed by some users about cyclists behaving inconsiderately⁴².

Shared space

In 2018, the [DfT](#) announced a pause in shared space schemes so they could carry out more research. This pause does not include shared space areas in new residential developments. In shared space areas, the distinction between the space allocated to motor vehicles and the space allocated to pedestrians is removed, so that motor vehicles become less dominant⁴³. In a shared space, cyclists do not experience the same restrictions as in other pedestrian areas.

Research⁴⁴ commissioned by the DfT to inform guidance on shared spaces, concluded that:

- Drivers travelled at lower speeds and were more likely to give way to pedestrians
- The full benefits of a shared space were more likely to be seen if multiple characteristics of a shared space were put in place
- Shared space design needs to be inclusive and understood by all, including making provision for vulnerable users of the space.

Junctions and intersections

Studies tend to show that introducing intersections on roads tends to increase the injury risk for cyclists. Roundabouts, both mini and standard tend to have a higher injury risk than other intersections, with intersections with traffic signals having no impact on injury risk^{45, 46}.

⁴⁰ Dill J (2009) Bicycling for transportation and health: the role of infrastructure, J Dill, Journal of Public Health Policy

⁴¹ Banister, Groome, & Pawson (1992) The shared use debate: a discussion on the joint use of canal towing paths by walkers, anglers and cyclists, Journal of Environmental Management

⁴² U.S. Department of Transportation (1994) Conflicts on multiple-use trails: Synthesis of the literature and state of the practice

⁴³ DfT (2020), Policy Paper, Inclusive Transport Strategy,

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/3873/ltn-1-11.pdf - accessed June 2023

⁴⁴ MVA Consultancy, (2010) Designing the Future: Shared Space: Operational Research

⁴⁵ Aldred R et al (2021) Factors with Cycling Injury Risk at Intersection and Non-Intersection Locations: A Case-Crossover Study of Britain, Int. J. Environ. Res. Public Health 2021, 18(6), 3060 <https://www.mdpi.com/1660-4601/18/6/3060> - accessed July 2023

⁴⁶ Harris A et al (2012) Comparing the effects of infrastructure on bicycling injury at intersections and non-intersections using a case-crossover design, <https://injuryprevention.bmj.com/content/injuryprev/19/5/303.full.pdf> - accessed July 2023



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Studies have examined the effectiveness of raising the cycle lane above road level by 4-12cm. A study of 540 unsignalled junctions in the Netherlands between 2005 and 2008⁴⁷ found that for crashes that occurred where cyclists had the right of way, raised bicycle crossings (and other speed reducing measures for vehicles entering or leaving the side road) halved the number of crashes if there was a 2m to 5m distance between the cycle track and junction. The number of crashes increased when bicycle crossings were marked in red.

Street lighting

Whilst most cycling collisions occur in the daytime, there is still a significant risk to cyclists who ride in the dark. Road lighting can improve visibility of cyclists and it has been suggested in studies that road lighting can reduce the risk of a cyclist being hit by 58 per cent⁴⁸. It has been evidenced that on rural roads, the most common cause of being killed or seriously injured at night is being 'rear-ended' by a motor vehicle⁴⁹.

Reducing cyclist casualties through spatial planning

The main aspects of land use that influence road safety are⁵⁰:

- the spatial distribution of origins and destinations of road journeys
- urban population density and patterns of urban growth
- the configuration of the road network
- the size of residential areas
- alternatives to private motorised transport.

The National Planning Policy Framework⁵¹ sets 12 core planning principles to promote mixed use developments. Many specific paragraphs also support approaches to planning that make cycling and walking a feasible choice and reduce car dependence for many journeys, and therefore, reduce traffic volume:

The transport system needs to be balanced in favour of sustainable transport modes, giving people a real choice about how they travel.

Plans and decisions should ensure developments that generate significant movement are located where the need to travel will be minimised and the use of sustainable transport modes can be maximised.

⁴⁷ Schepers J et al. (2011) Road factors and bicycle–motor vehicle crashes at unsignalized priority intersections, *Accident Analysis & Prevention* 2011;43:853–861

⁴⁸ University of Sheffield, RSA0134, Evidence on Road Safety,

<https://committees.parliament.uk/writtenevidence/102429/pdf/#:~:text=Cyclists%20are%20also%20more%20likely,is%20because%20of%20reduced%20visibility> – accessed July 2023

⁴⁹ Fotios S et al (2015) Lighting for cycling in the UK – A review, <https://journals.sagepub.com/doi/10.1177/1477153515609391#bibr11-1477153515609391> – accessed July 2023

⁵⁰ Margie Peden, M et al, WHO (2004) World report on road traffic injury prevention

⁵¹ Ministry of Housing, Communities & Local Government (2021) National Planning Policy Framework, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf - accessed July 2023



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The planning system can play an important role in facilitating social interaction and creating healthy, inclusive communities.

Planning policies and decisions, in turn, should aim to achieve places which promote:

- *opportunities for meetings between members of the community who might not otherwise come into contact with each other, including through mixed-use developments, strong neighbourhood centres and active street frontages which bring together those who work, live, and play in the vicinity;*
- *safe and accessible environments where crime and disorder, and the fear of crime, do not undermine quality of life or community cohesion; and*
- *safe and accessible developments, containing clear and legible pedestrian routes, and high-quality public space, which encourage the active and continual use of public areas. [paragraph 69]*



Improving cyclist behaviour

Most road crashes are at least partly, and sometimes mainly, caused by human error, which can range from simple mistakes and misjudgements to deliberately dangerous and illegal behaviour.

Creating a safer cycling environment will help to improve the behaviour of all road users, by making it easier for them to behave responsibly and safely. Education (including training and publicity) and enforcement are also key approaches to improving road user behaviour, and to helping everyone share the road safely together. All road users, including cyclists and drivers, must also take responsibility for their own choices and behaviour.

Cyclists

In collisions in which cyclist behaviour was judged to have been a contributory factor, the most common reasons recorded by the police are “failed to look properly”, especially at junctions, and ‘failed to judge other persons path or speed’. These are also common errors by drivers. Another common contributory factor attributed to cyclists is “cyclist entering the road from the pavement” (including when a cyclist crosses the road at a pedestrian crossing)⁵².

Compliance with road traffic law

Research has shown that some road users who do not cycle hold a negative stereotype of cyclists, viewing them as a group who have a tendency to break road laws⁵³. The public often perceive cyclists as frequently jumping red lights and cycling on the pavement. However, studies have shown that only a minority of cyclists behave in this way. For example, the proportion of cyclists violating red lights varies depending on the site but can be anywhere between 3 per cent and 36 per cent^{54, 55}.

Pavement cycling is illegal unless it is on a shared cycle/pedestrian path or shared space. More should be done to make cyclists feel safer on the road, so they don't feel the need to use the pavements. When asked, many cyclists say they ride on pavements because of the danger posed by traffic on the road⁵⁶, although, actual numbers of cyclists cycling on the pavements is unknown.

Training

Schemes that adhere to National standards for Cyclist Training⁵⁷ are an important way of enabling cyclists to stay safe and of encouraging more cycling.

⁵² DfT (2022) Reported road casualties in GB: pedal cycle factsheet, 2021, <https://www.gov.uk/government/statistics/reported-road-casualties-great-britain-pedal-cyclist-factsheet-2021/reported-road-casualties-in-great-britain-pedal-cycle-factsheet-2021#contributory-factors-in-collisions> – accessed July 2023

⁵³ Christmas S et al, DfT (2010) Cycling, Safety and Sharing the Road: Qualitative Research with Cyclists and Other Road Users, www.cyclist.ie/wp-content/uploads/2010/11/Dept-of-Trans-London-RS-Cycling-ORU-Report-1110-2.pdf - accessed July 2023

⁵⁴ Allen, Bygrave and Harper (2006) Behaviour at Cycle Advanced Stop Lines

⁵⁵ Transport for London: Road Network Performance & Research Team (2007) Proportion of Cyclists Who Violate Red Lights in London, RNPR Traffic Note 8 www.tfl.gov.uk/cdn/static/cms/documents/traffic-note-8-cycling-red-lights.pdf - accessed July 2023

⁵⁶ Living Streets (undated) Walking and cycling policy, <https://www.livingstreets.org.uk/policy-and-resources/our-policy/walking-and-cycling> - accessed July 2023

⁵⁷ DfT & DVSA (2019) National Standard for Cycle Training, <https://www.gov.uk/government/publications/national-standard-for-cycle-training#:~:text=The%20national%20standard%20for%20cycle,of%20adult%20cycle%20training%20programmes> – accessed July 2023



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A 2015 study⁵⁸ assessed whether Level 2 Bikeability cyclist training* improves the ability of children to perceive and respond appropriately to hazards when cycling on the road. Both Bikeability-trained and untrained pupils took a quiz to test their knowledge and skills relating to hazard perception and responding to hazards. The Bikeability-trained children also took a practical on-road assessment.

Children who participated in Bikeability Level 2 training scored significantly higher on the hazard perception and appropriate response quiz, than children who had not received training. This effect was undiminished when children re-took the quiz more than two months later, suggesting that the effect of the training was sustained.

However, the improved hazard perception scores in the practical assessment had declined significantly by the second assessment, two months after the training, suggesting that the ability to put the knowledge gained from Bikeability into practice can decline over time if the skills are not practised. Children who participated in training reported a statistically significant increase in confidence when cycling on the road after the training. However, they did not report that they cycled more often as a result of receiving Bikeability training.

Another study into Bikeability found that benefits can persist into adolescence. However, there is further potential for interventions to encourage safe cycling behaviours, as even after training there is low use of cycle helmets and high-visibility clothing⁵⁹. However, evidence into the impact of training on accidents and injuries is particularly sparse.

Cycle helmets

There continues to be much debate regarding the effectiveness of cycle helmets and whether the wearing of them should be made compulsory. RoSPA's position regarding this is that we strongly recommend that cyclists wear a cycle helmet, as it reduces the risk of suffering a serious head or brain injury in an accident. Cycle helmets do not prevent crashes from happening in the first place, nor guarantee survival, but they do provide a last line of defence for the cyclist's head.

RoSPA does not support calls for compulsory cycle helmet laws because it is not clear whether such a law would discourage some people from cycling, which, if it did, would mean losing the health and environmental benefits from cycling. By deterring people from cycling, this may also reduce the benefits that cyclists gain from 'safety in numbers'⁶⁰. For more information on the safety in numbers, read our [factsheet](#).

If we are to make cycling safer, it is vital that drivers and cyclists share the road space and that drivers have a greater appreciation of their vulnerability. Cyclists are most likely to be injured at junctions, roundabouts,

⁵⁸ Hodgson & Worth, National Foundation for Educational Research (2015) Research into the impact of Bikeability training on children's ability to perceive and appropriately respond to hazards when cycling on the road

* Level 2 training is generally provided to children in Years 5 or 6 before they leave primary school to give them the skills and confidence needed to cycle on road.

⁵⁹ Teyhan, et al. BMC Public Health (2016), The impact of cycle proficiency training on cycle-related behaviours and accidents in adolescence: findings from ALSPAC, a UK longitudinal cohort, https://research-information.bris.ac.uk/ws/portalfiles/portal/75189741/art_3A10.1186_2Fs12889_016_3138_2.pdf - accessed July 2023

⁶⁰ Jacobson, PL, 2004, Safety in numbers: more walkers and bicyclists, safer walking and bicycling, Injury Prevention, 2004, V9 Issue 3; <https://injuryprevention.bmj.com/content/9/3/205> - accessed May 2023



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where the road narrows (pinch points) and near left turning HGVs.

Helmets do have a role to play, however they must be regarded as a secondary safety feature. Preventing the collision happening in the first place should be paramount.

Lights and high visibility clothing

Research into the effectiveness of cyclists using lights during daylight as additional safety features, as is the case with motorcycles, should be considered.

Although most cycling accidents happen in daylight, those that happen in the dark are more likely to be fatal. Between 2016-2021, “Not displaying lights at night or in poor visibility” was recorded as a contributory factor in 367 pedal cyclist accidents and “Rider wearing dark clothing” in 573 reported pedal cyclist accidents⁶¹.

The law about the use of lights and reflectors is very clear; the [Highway Code](#) (rule 60) says:

*‘At night your cycle **must** have white front and red rear lights lit. It **must** also be fitted with a red rear reflector (and amber pedal reflectors, if manufactured after 1/10/85). White front reflectors and spoke reflectors will also help you to be seen. Flashing lights are permitted but it is recommended that cyclists who are riding in areas without street lighting use a steady front lamp’.*

However, there is no legal requirement for pedal cyclists (or any other road user) to wear high visibility garments.

There is very little research to show the effectiveness of cycle lighting and high visibility clothing. One study⁶² conducted at Bath and Brunel universities involved 269 participants riding bikes with ultrasonic devices fitted to measure the distance at which motorists overtook them while they wore a variety of cycling kit (typical sport rider’s Lycra, casual clothing, or hi-visibility vests).

The research found that the only clothing which made a difference to the average passing distance was a high visibility vest with the words police and a notice advising drivers that the rider was filming their ride. This increased the average passing distance from 117cm to 122cm. The report did not evaluate the relationship between wearing high visibility clothing and the time it took a driver to see the cyclist in various lighting conditions. Further scientific investigation is required to answer this question.

Despite the lack of research, RoSPA fully supports the advice in the Highway Code (rule 59) which advises that riders should wear light coloured or fluorescent clothing in daylight and poor light and reflective clothing in the dark. Riders should be encouraged to make themselves as visible as possible; however, drivers failing to look properly is a common contributory factor in collisions between drivers and cyclists, so drivers equally have a responsibility to look out for cyclists, irrespective of the clothing worn by riders.

⁶¹ DfT (2022) Reported road casualties in GB: pedal cycle factsheet, 2021, <https://www.gov.uk/government/statistics/reported-road-casualties-great-britain-pedal-cyclist-factsheet-2021/reported-road-casualties-in-great-britain-pedal-cycle-factsheet-2021#contributory-factors-in-collisions> – accessed July 2023

⁶² Walker, Garrard and Jowitt (2014) The influence of a bicycle commuter’s appearance on a drivers overtaking proximity



Improving driver behaviour

Awareness of cyclists

Drivers can have negative perceptions of cyclists. Some drivers feel cyclists break the rules of the road and are irritated when they feel cyclists inconvenience them⁶³. Drivers believe they should give consideration to cyclists, but sometimes feel pressure from other drivers not to do so. For example, when roads are narrow, drivers may feel pressurised to overtake cyclists even if there is insufficient space to do so safely, rather than wait until there is more space to overtake. Drivers have commented that they feel more confident when there is infrastructure to define the road space for cyclists⁶⁴.

It is often suggested that drivers who are also cyclists, are better at sharing the roads with cyclists because they understand cyclists' needs and vulnerabilities. Unfortunately, little research exists to show whether this is true, although it is a reasonable assumption to make.

Training

Once they have gained their full driving licence, few drivers choose to take any form of further driver training. In addition to normal driver development training, specific cycle awareness training for drivers is also [available](#), although these courses are largely aimed at professional large vehicle drivers. Training schemes can include drivers and cyclists trading places, with drivers receiving cycle training and cyclists getting into the HGV cab, to help both parties understand the road from the other's perspective. No formal evaluations have been conducted on these schemes to determine their effectiveness.

Space

Recent changes to the [Highway Code](#) state that drivers should give cyclists "at least 1.5m when overtaking them" at speeds of up to 30mph and giving even more space when overtaking at higher speeds. Sometimes drivers may find it difficult to give cyclists sufficient space when roads are narrow, as they can feel pressurised by other drivers to overtake a slow-moving road user. One study⁶⁵ concluded that drivers tend to slow down more when overtaking cyclists where there are narrow lanes, lower speed limits and the absence of centre line markings.

There is evidence to suggest that drivers modify the amount of space they give a cyclist based on their appearance⁶⁶. Drivers in one study gave less space when overtaking cyclists who were further away from the kerb, wearing a helmet or who were male. However, another study found that the way cyclists dressed did little to encourage drivers to leave them more space when overtaking⁶⁷.

⁶³ Basford, Reid, Lester, Thomson and Tolmie, TRL (2002) TRL549 report; Drivers' perceptions of cyclists

⁶⁴ Walker (2007) Accident Analysis & Prevention, Volume 39, Issue 2, 2007, Drivers overtaking bicyclists: Objective data on the effects of riding position, helmet use, vehicle type and apparent gender"

⁶⁵ Shackeland Parkin (2014) Influence of road markings, lane widths and driver behaviour on proximity and speed of vehicles overtaking cyclists

⁶⁶ Walker (2007) Accident Analysis & Prevention, Volume 39, Issue 2, 2007, Drivers overtaking bicyclists: Objective data on the effects of riding position, helmet use, vehicle type and apparent gender

⁶⁷ Walker, Garrard, Jowitt (2014) The influence of a bicycle commuter's appearance on drivers' overtaking proximities: an on-road test of bicyclist stereotypes, high visibility clothing and safety aids in the United Kingdom.



Cyclists and lorries

Lorries present a particular danger to cyclists. Cyclists are less likely to be involved in a collision with a HGV than a car but when they are, they are more likely to be killed or seriously injured. Between 2016 and 2021, lorries were involved in 14 per cent of collisions resulting in the death of a cyclist despite comprising only 6 per cent of traffic. Cars, in comparison, accounted for 74 per cent of traffic, but 46 per cent of cyclist fatalities^{68, 69}.

Table 6: Cyclist casualties by vehicle type, Great Britain 2016-21^{68,69}

	HGV	LGV	Bus or Coach	Cars	Motorcycles
% of GB traffic	6	18	1	74	1
% of cycle deaths	14	8	2	46	1
% of serious cycle injuries	2	7	4	73	5
% of cycle slight injuries	1	7	1	80	2
% of cycle casualties	1	7	1	79	2

A disproportionate number of female cyclists are involved in collisions with HGVs. One study found that female cyclists accounted for double the number of HGV collision fatalities than men, despite only accounting for 30 per cent of time spent cycling. However, when collisions did not involve a HGV, the fatality rate for male cyclists was double that of females⁷⁰. A key contributor could be that females are less likely to differentiate between the risks posed by nearside or offside overtaking⁷¹.

The left-turn issue

HGVs can present a particular danger to cyclists when turning left, as when a cyclist is on the left of an HGV, the driver may not be aware of their presence, due to a blind spot in their mirrors.

A number of infrastructure designs used in other countries could be tested in the UK, including cycle bypass lanes at junctions, specific traffic lights for cyclists which allow them to enter a junction first, stop them from entering when left turning motorists are instructed to enter or allow them to turn left when there is a red light for motorists⁷². Designs, however, would need to consider the local conditions at each junction. For example, a cycle bypass may not be practical if there is a limited amount of pedestrian space.

⁶⁸ DfT (2022) Reported road casualties in GB: pedal cycle factsheet, 2021, <https://www.gov.uk/government/statistics/reported-road-casualties-great-britain-pedal-cyclist-factsheet-2021/reported-road-casualties-in-great-britain-pedal-cycle-factsheet-2021#contributory-factors-in-collisions> – accessed July 2023

⁶⁹ DfT (2022) Road traffic statistics, TRA0101: Road traffic (vehicle miles) by vehicle type in GB, <https://www.gov.uk/government/statistical-data-sets/road-traffic-statistics-tra> - accessed 2023

⁷⁰ Woodcock, Tainio, Cheshire, O'Brien and Goodman (2014) British Medical Journal, Health effects of the London bicycle sharing system: health impact modelling study

⁷¹ Frings, Rose & Ridley (2012) Traffic Injury Prevention Bicyclist fatalities involving heavy goods vehicles: gender differences in risk perception, behavioural choices, and training.

⁷² Knight, Bedingfeld & Gould 2011 Transport for London, Traffic Management Techniques for Cyclists: Final Report.



Lorry design and technological aids

One of the key approaches is to improve lorry design and technology. Some changes have already been made; for example, legislation requires most HGVs to be fitted with side guards. In addition, HGVs sold in the EU must be fitted with extra mirrors (European Directive 2003/97/EC) to reduce blind spots. Mirrors must also be retrofitted on HGVs sold before 2007, although again some are exempt (European Directive 2007/38/EC).

Table 7: Potential Changes to HGV design to reduce the risk of collisions with cyclists

	Advantages	Disadvantages
More mirrors than currently required	<ul style="list-style-type: none"> • Reduces blind spots 	<ul style="list-style-type: none"> • Driver needs to be looking in the mirror at the correct time • Hazards can be difficult to identify in distorted images (e.g., convex mirrors)
Cameras	<ul style="list-style-type: none"> • Can have greater field of view than a mirror • Images not distorted as they might be with mirrors 	
Windows in doors or increase the field of view from the windscreen	<ul style="list-style-type: none"> • Provides an accurate view, not distorted • Intuitive as encourages the driver to look where the cyclist could be 	<ul style="list-style-type: none"> • Changing design of cab could impact on other regulatory requirements
Roadside mirrors e.g., at junctions	<ul style="list-style-type: none"> • Evidence from Germany suggested a reduction in HGV turning collisions 	<ul style="list-style-type: none"> • Left turn collisions can be localised, cost may outweigh the benefit in areas where they are not as common
Improved side guards	<ul style="list-style-type: none"> • Lower ground clearance could help with left turn collisions rather than just overtaking manoeuvres 	<ul style="list-style-type: none"> • Little evidence to suggest whether this would work in practice
Sensors and warnings	<ul style="list-style-type: none"> • Sensors detect movement, even where the driver may not 	<ul style="list-style-type: none"> • Doesn't identify <i>what</i> is in range. If the sensor alerts too often, the driver could become less responsive to it
Introduction of rear steering control	<ul style="list-style-type: none"> • When turning it would allow the driver better control of the rear end, so the vehicle doesn't cut in as much • If cyclist is knocked over by front end, they could be less likely to get run over by back wheels 	<ul style="list-style-type: none"> • Reducing cut in would increase the swing out, increasing the risk to those overtaking on the outside. • EU regulations could be a barrier – needs to be at least as safe as without the new steering and regulations may need to be amended



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Suggestions which go further than the current regulations have also been made⁷³. A four-week trial where HGVs used camera and sensor equipment showed encouraging results⁷⁴. Another example of a potential technological solution is a new collision avoidance system that includes sensors to detect the presence of a cyclist on the HGV's nearside and software that predicts the path and speed of the cyclist and the HGV. If it predicts the HGV is going to hit the cyclist when it turns, it automatically applies the HGV's brakes to bring it to a stop. An analysis of 19 fatal crashes involving a cyclist and a left-turning HGV concluded that 15 of these would have been completely avoided and three would have been less severe with the new system. Further development work and trials to test the effectiveness of the system in different scenarios are underway⁷⁵.

Management of HGVs

Some researchers have gone so far as to say that large freight vehicles (over 3.5 tonnes) should be removed from the roads⁷⁶. They suggest replacing large vehicles with river and rail transport and using light goods vehicles to distribute locally. It is unclear, however, whether this would be feasible in practice.

Companies using large vehicles are also encouraged to meet certain optional standards to improve the safety of their drivers and reduce the risk posed to vulnerable road users. Examples of these schemes in London are the [Construction Logistics and Community Safety](#) and the [Fleet Operator Recognition Scheme](#). The incentives for companies to participate in these schemes include making it being a requirement to win business contracts, improving their safety records or reducing costs, such as fines and charges.

Road justice system

Cycling UK has set up the [Road Justice campaign](#), an online tool through which vulnerable road users can report dangerous driving. The report makes the following recommendations to improve how the police deal with road crime:

- Thorough investigation of all road traffic collisions, including collecting information on near misses and reports of bad or aggressive driving.
- Ensuring that there is sufficient resourcing and training for police to respond appropriately to road crime.
- That the support offered to victims of road crime should be similar to that of other types of crime and that the victim should not be blamed.

⁷³ Knight (2012) A study of the implementation of Directive 2007/38/EC on the retrofitting of blind spot mirrors to HGVs. A study of the implementation of Directive 2007/38/EC on the retrofitting of blind spot mirrors to HGVs.

⁷⁴ DfT (2011) Barclays Cycle Superhighways: HGV technology trial".

⁷⁵ Presentation by Professor David Cebon, Cambridge University, to RoSPA National Road Safety Committee, 7 October 2014, HGV- Cyclist Collision Avoidance Systems: Cyclists and HGVs

⁷⁶ A S Morgan et al, (2010) BMC Public Health 2010, 10:699 Deaths of cyclists in London: trends from 1992 to 2006,



Conclusion

Cycling has positive and tangible health and societal benefits, and there are very strong reasons for enabling more people to cycle more often and more safely.

In Great Britain, the level of cycling is increasing, but cyclist casualties have fluctuated, rising in some years, and reducing in others, with no clear trend apparent. Therefore, we all face a crucial challenge, which is to create safer cycling conditions so that more cycling does not lead to more cycling casualties.

Improving the safety of cycling will reduce the number of cyclists injured on our roads and encourage and enable more people to cycle more often. It will help people who want to cycle but are deterred from doing so because they think it is not safe enough and help to prevent the increase in cycling resulting in an increase in cyclist casualties. This, in turn, will increase the health and environmental benefits of cycling for those people who cycle and for society.

Other countries, such as the Netherlands, Denmark, and Sweden, have much higher levels of cycling than the UK, but lower cyclist death rates, which shows that it is possible to increase cycling without increasing cyclist crash and casualty rates.

RoSPA strongly supports measures which encourage healthy and sustainable travel and believes that the key to increasing cycling (and so gaining all the health and environmental benefits that result from cycling) is to create a safe on and off-road cycling environment, improve driver and cyclist attitudes and behaviour towards each other, and to produce safer vehicles that reduce the risk to cyclists. Cycle safety measures should also include training, education and enforcement programmes that work together with the engineering measures to provide an environment which maximises protection for all vulnerable road users.

RoSPA strongly advocates the Safe System Approach, which involves designing roads and vehicles to minimise the risk of crashes occurring, and ensure that when they do occur, they are unlikely to result in death or serious injury. Such an approach will help motorists and cyclists to interact and share the highway in a safe and responsible manner.



Recommendations

The safety of cycling should be improved to:

- reduce the number of cyclist casualties
- encourage and enable more people to cycle more often
- help people who want to cycle, but are deterred from doing so because they think it is not safe enough
- help to prevent the increase in cycling resulting in an increase in cyclist casualties
- increase the health and environmental benefits of cycling for those people who cycle and for society.

Cycling should be promoted as it provides a range of health and environmental benefits.

Government, Local Authority and other cycling strategies and action plans should be supported.

To minimise the risk that the growth in cycling will result in increased cyclist casualties, a comprehensive range of measures should be introduced, including:

Engineering

- New cycle infrastructure to be designed in accordance with the principles of the Safe System approach.
- 20mph schemes should be introduced where there is substantial cycling activity, or the potential for substantial cycling activity
- The design and construction of cycle facilities should follow best practice as fully as possible
- Wherever practical, new cycle lanes should be planned to be continuous and of sufficient length to provide meaningful separation from traffic
- Further research should be conducted to identify how best to provide for cyclists at junctions
- The transport system should be balanced in favour of sustainable transport modes
- The provision of cycling policies and facilities must be integrated with those for pedestrians
- Highway Authorities should consider the safety of cyclists as an integral part of their cyclical maintenance programmes (winter maintenance, vegetation cutting, surfacing etc.)
- Highway authorities should consider the safety implications, especially for cyclists and pedestrians, as well as the environmental and financial benefits when deciding whether to switch off or reduce the level of street lighting.

Education and Training

- Practical theory and on road training for both drivers and cyclists must highlight the danger of:
 - LGV collisions, especially resulting from left turn manoeuvres
 - Collisions resulting from failure to look properly, frontal collision crashes, failure to judge other persons path or speed and overtaking too close
 - Cyclists entering the road from the pavement, including when a cyclist crosses the road at a pedestrian crossing



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- How to interact and share space with cyclists safely should be included in learner driver training, refresher professional driver training and driver diversionary training courses
- The use of cycle helmets, lights, reflectors, and high visibility garments should be encouraged as secondary safety features but should not be compulsory (other than the mandatory use of cycle lights and reflectors as currently required by law)
- Research into the effectiveness of cycle lights, reflectors and high-visibility garments should be conducted
- Practical cycle training for adults should be provided and promoted.

Enforcement

- Locally targeted traffic enforcement should be undertaken where motorists have been identified to be putting cyclists and other vulnerable road users in danger due to their actions
- Locally targeted and proportionate traffic enforcement should be undertaken where cyclists are seen putting themselves or other road users in danger.

