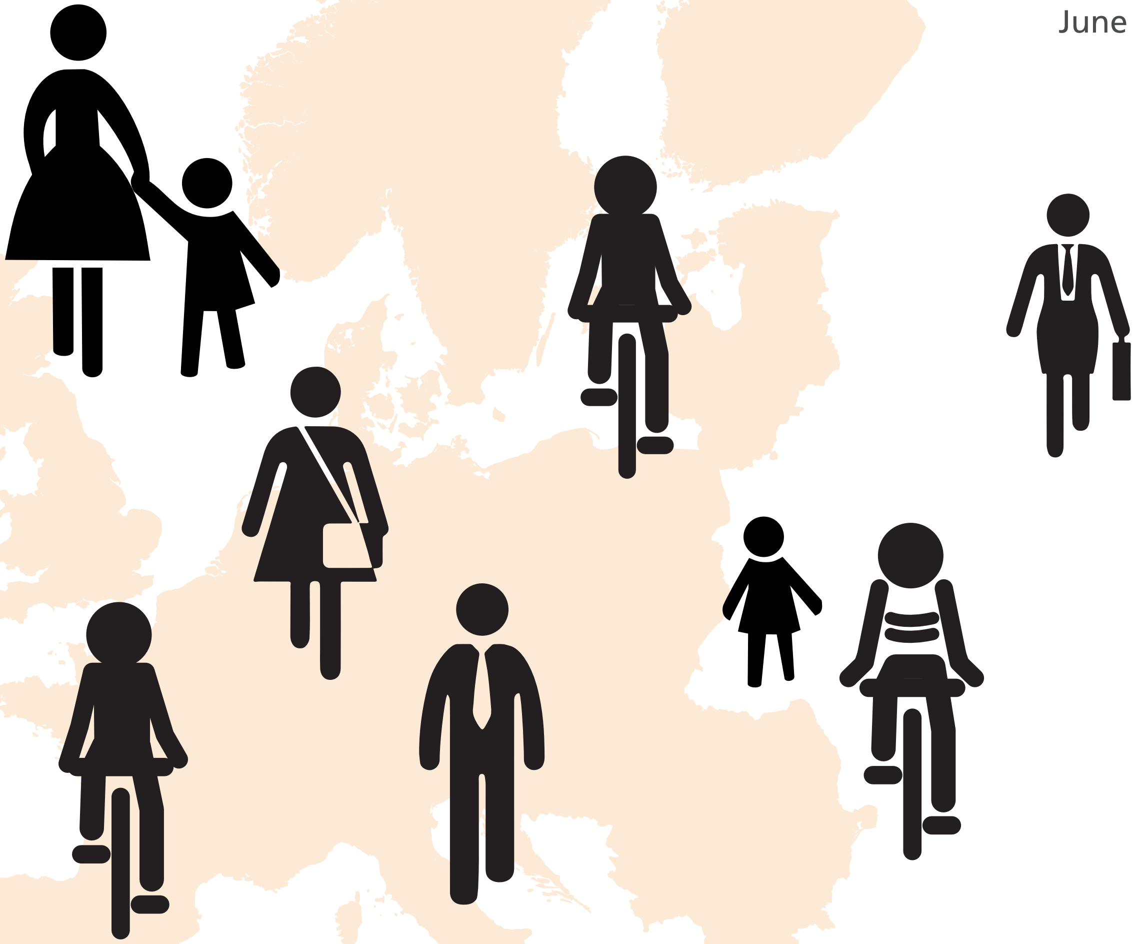
MAKING WALKING AND CYCLING ON EUROPE'S ROADS SAFER

PIN Flash Report 29

June 2015



European Transport Safety Council

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The PIN programme relies on panellists in the participating countries to provide data for their countries and to carry out quality assurance of the figures provided. This forms the basis for the PIN Flash report and other PIN publications. In addition, all PIN panellists are involved in the review process of the reports to ensure the accuracy and reliability of the findings.

ETSC is grateful for the financial support for the PIN programme provided by Volvo Group, Volvo Trucks, the Swedish Transport Administration, the German Road Safety Council, the Norwegian Public Roads Administration and Toyota Motor Europe.

ABOUT THE EUROPEAN TRANSPORT SAFETY COUNCIL (ETSC)

ETSC is a Brussels-based independent non-profit organisation dedicated to reducing the numbers of deaths and injuries in transport in Europe. Founded in 1993, ETSC provides an impartial source of expert advice on transport safety matters to the European Commission, the European Parliament, and Member States. It maintains its independence through funding from a variety of sources including membership subscriptions, the European Commission, and public and private sector support.

ABOUT THE ROAD SAFETY PERFORMANCE INDEX PROJECT

ETSC's Road Safety Performance Index (PIN) programme was set up in 2006 as a response to the first road safety target set by the European Union to halve road deaths between 2001 and 2010. In 2010, the European Union renewed its commitment to reduce road deaths by 50% by 2020, compared to 2010 levels.

By comparing Member State performance, the PIN serves to identify and promote best practice and inspire the kind of political leadership needed to deliver a road transport system that is as safe as possible.

The PIN covers all relevant areas of road safety including road user behaviour, infrastructure and vehicles, as well as road safety policymaking. Each year ETSC publishes PIN 'Flash' reports on specific areas of road safety. A list of topics covered by the PIN programme can be found on http://etsc.eu/projects/pin/.

Making walking and cycling on Europe's roads safer is the 29th PIN Flash report edition. The report covers 32 countries: the 28 Member States of the European Union together with Israel, Norway, the Republic of Serbia and Switzerland.

CONTENTS

OVERVIEW

Deaths of unprotected road users have been decreasing at a slower rate than those of vehicle occupants.

As active travel is being encouraged, the safety of walking and cycling in particular must be addressed urgently.

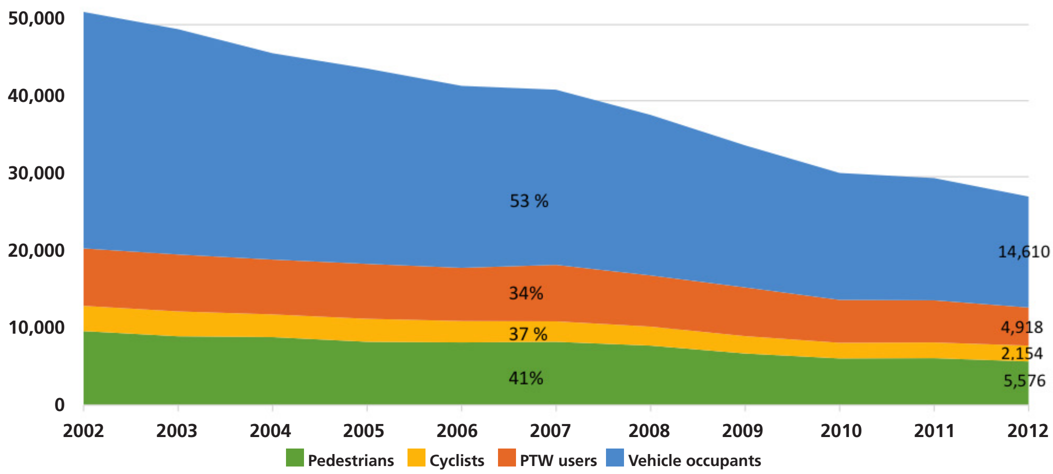
Around 138,400 pedestrians and cyclists lost their lives on EU roads between 2001 and 2013. 7,600 were killed in 2013 alone.

Deaths among pedestrians and cyclists, who are the most vulnerable road users and whose use of the roads is being encouraged for reasons of health and sustainability, account for 29% of all road deaths across the EU. Pedestrians killed represent 21% and cyclists 8% of all road deaths. But big disparities exist between countries. Moreover, there is a high level of underreporting of collisions involving pedestrians and cyclists.

Deaths of unprotected road users have been decreasing at a slower rate than those of vehicle occupants. In the last ten years deaths among pedestrians decreased by 41%, those among cyclists by 37% and those among power two wheeler (PTW) users by 34% compared to a 53% decrease for vehicle occupants (Fig. 1).

Since 2010 the reduction in the number of pedestrian and cyclist deaths has slowed down markedly. The safety of unprotected road users should therefore receive special attention from policymakers at the national and European levels. As active travel is being encouraged, the safety of walking and cycling in particular must be addressed urgently.

Fig. 1 Reduction of road deaths since 2002 for pedestrians, cyclists, PTW users and vehicle occupants. EU 25 (BG, MT and LT are excluded due to insufficient data).



Latvia, Lithuania and **Slovakia** top the rankings for the annual reductions of both pedestrian and cyclist deaths between 2003 and 2013 (Fig. 3 and Fig. 9). Pedestrians in **The Netherlands, Norway** and **Sweden** experience a lower level of risk than pedestrians in the rest of Europe (Fig. 4). The lowest cyclist mortality is in **Spain, Greece** and **Ireland** (Fig. 10).

Later this year the European Commission is going to revise the **Pedestrian Protection Regulation**[1] and the **General Safety Regulation**[2] which set technical requirements applied to all new motor vehicles sold in the EU market. These laws provide an opportunity to increase pedestrian and cyclist safety by setting new standards for vehicles' frontal protection systems, introducing active in-vehicle safety technologies and adopting new standards for safer goods vehicle cabin designs. ETSC is calling for a range of safety technologies including overridable assisting Intelligent Speed Assistance (ISA) and Autonomous Emergency Breaking (AEB) to be fitted as standard on new vehicles, and for improved pedestrian protection requirements.

[1] Regulation (EC) No 78/2009 of the European Parliament and of the Council of 14 January 2009 on the type-approval of motor vehicles with regard to the protection of pedestrians and other vulnerable road users, amending Directive 2007/46/EC and repealing Directives 2003/102/EC and 2005/66/EC.

[2] Regulation (EC) No 661/2009 of the European Parliament and of the Council of 13 July 2009 concerning type-approval requirements for the general safety of motor vehicles, their trailers and systems, components and separate technical units intended therefor.

Key recommendations to EU institutions

Within the context of the revision of Regulation 2009/78 on the Protection of Pedestrians and other Vulnerable Road Users:

- Upgrade type approval crash tests to be more closely aligned with the pedestrian safety requirements of Euro NCAP crash tests.
- Mandate the head form to windscreen test, adjusting the impact speed to a level appropriate to real life collision circumstances and introduce a head form impactor that would better reflect the fragility of the human skull.

Within the context of the revision of Regulation 2009/661 concerning Type-Approval Requirements for the General Safety of Motor Vehicles:

- Adopt legislation for the mandatory fitment of all new vehicles with an overridable assisting Intelligent Speed Assistance (ISA) system.
- Develop mandatory requirements for safer goods vehicles for improved cabin design, underrun protection and removing exemptions that exist so as to require use of side guards to protect other road users in collisions with trucks.
- Adopt legislation for the mandatory fitting of all new passenger cars and light trucks and vans under 3.5 tonnes with Autonomous Emergency Braking (AEB) systems.

Key recommendations to Member States

- Encourage local governments to adopt zones with a speed limit of 30km/h in residential areas and areas used by many pedestrians and cyclists.
- Further develop a policy of modal priority for road users, particularly in urban areas, the hierarchy being based on safety, vulnerability and sustainability. Walking should be at the top of the hierarchy, followed by cycling and use of public transport.
- Try to arrange for cycle traffic and motorised traffic to be physically separated where the speed of the latter is too big or where the traffic flow is too high to allow them to mix safely.
- Restrict heavy goods vehicle circulation in urban areas at certain peak times when there are high numbers of pedestrians and cyclists and develop recommended routes for heavy goods vehicles.[3]

NOTE

The average annual percentage change in the number of deaths among pedestrians and cyclists between 2003 and 2013 (Fig. 3 and Fig. 9) is used as the main indicator of progress. No information was received from Bulgaria. For Malta the numbers of pedestrians, cyclists and powered-two-wheeler users killed are available only from 2005. In Lithuania the numbers of powered-two-wheeler users killed are available only from 2010.

Countries are also compared according to the numbers of pedestrian and cyclist deaths per million inhabitants (Fig. 4 and Fig. 10). Population figures were retrieved from the Eurostat database. This indicator could not be calculated for Bulgaria due to the lack of data on the number of pedestrians and cyclists killed.

When available, the numbers of pedestrian, cyclist and PTW user deaths were retrieved from the European Commission's CARE database and confirmed or updated by the PIN Panellists (see inside cover). The full dataset is available in the Annexes.

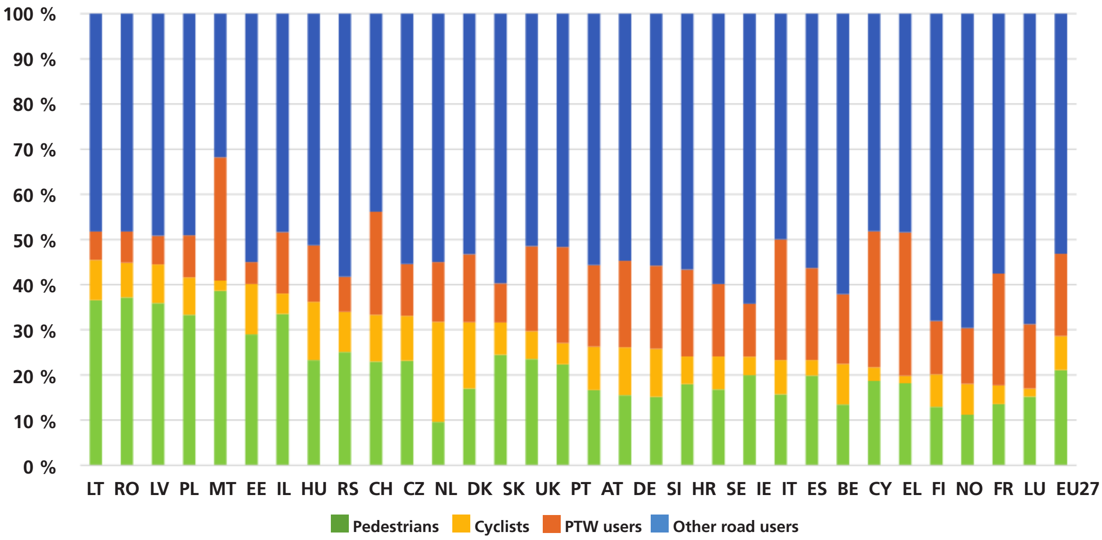
The analysis builds on previous rankings on numbers of unprotected road users killed to be found in ETSC's 5th Road Safety PIN report (2011). The publication can be downloaded from http://etsc.eu/projects/pin/.

[3] ETSC (2012), PRAISE Report, EU Social Rules and Heavy Goods Drivers.

PART I
COUNTRY COMPARISON

The share of pedestrian and cyclist deaths as a percentage of all road deaths differs between countries. Pedestrians and cyclists account for over 40% of all road deaths in Lithuania, Romania, Latvia and Poland, where the shares are highest, while in Finland, Norway, France and Luxembourg (Fig.2), where the shares are lowest, the share of pedestrian and cyclist deaths is about half as great, at around 20%.

Fig. 2: Pedestrian, cyclist and PTW user deaths as a percentage of all road deaths ranked by the share of deaths that were pedestrians and cyclists taken together (2011-2013 average). EU27 (BG is excluded due to insufficient data).



1.1 Pedestrian safety

1.1.1 Progress in reducing deaths among pedestrians

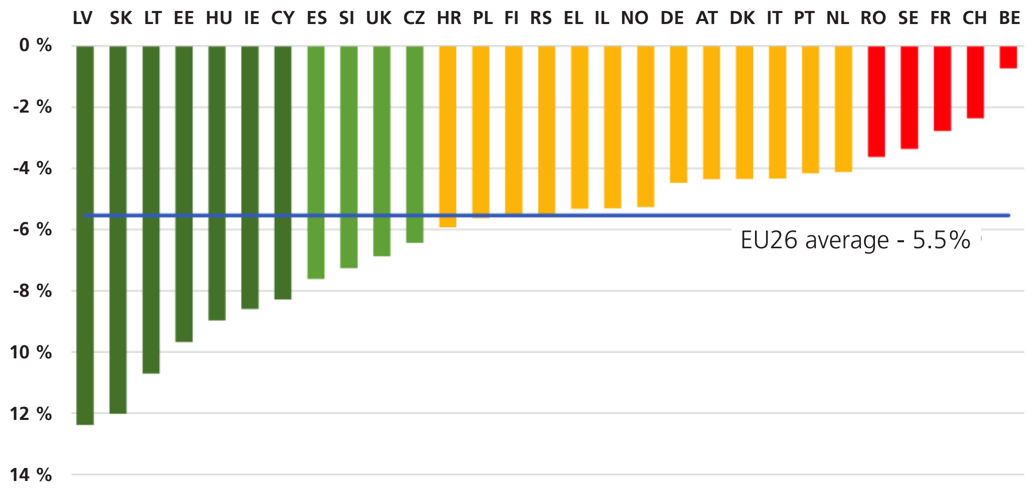
Pedestrian safety has improved in all EU countries over the last ten years. Yet over 5,500 pedestrians were killed in the EU in 2013 alone, representing 21% of all road deaths. Almost 73,300 have been killed since 2004.

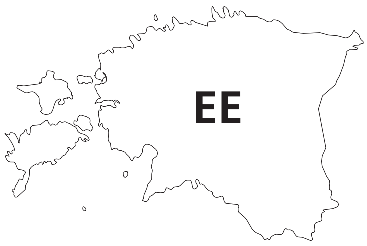
Latvia has achieved a rapid reduction in the number of pedestrian deaths by more than 12% per year on average, Slovakia follows closely with 12%, Lithuania with 11% and Estonia with almost 10% annual reductions (Fig. 3). Hungary, Ireland, Cyprus, Spain, Slovenia, the United Kingdom, the Czech Republic and Croatia have better than average reductions. However, the progress is very slow in Romania, France, Switzerland and Belgium. The Netherlands and Sweden are already leaders in pedestrian safety (Fig. 4), therefore it may be difficult to reduce pedestrian deaths substantially further, and reductions in these countries are far below the EU average.

For the EU as a whole, the number of pedestrian deaths has decreased by 5.5% on average each year over the period 2003 to 2013. However, in recent years the reduction in pedestrian deaths has slowed down markedly. Over the three years since the beginning of the decade the annual progress was only around 4%; in 2013 it was 2%.

In some countries improvements in pedestrian safety are to a large extent a function of the overall developments in road safety. Countries that have made the biggest improvements in road safety since 2001, namely Latvia, Slovakia, Lithuania, Estonia and Spain, are also rapidly reducing the numbers of pedestrian deaths.

Fig. 3: Average annual percentage change in pedestrian deaths over the period 2003 - 2013.
LU is excluded due to fluctuation in small numbers of deaths but its numbers are included in the EU26 average. BG and MT are excluded due to insufficient data.





Estonia: effective awareness raising campaigns

In Estonia, pedestrian deaths decreased by 46% from 43 in 2003 to 23 in 2013. This might be partly related to a number of national campaigns targeted at improving pedestrian and driver traffic education which brought positive results in changing pedestrian and driver attitudes.

„Over the last fifteen years Estonia has successfully introduced road safety campaigns aimed at informing drivers and pedestrians on the dangers when crossing the street at unregulated pedestrian crosswalks. Efforts have also been made in raising awareness of the safety benefits of reflectors when walking in the dark. Studies evaluating the campaigns' efficiency revealed that driver behaviour has improved significantly – in 2003 only 35% of drivers gave priority to pedestrians at unregulated crossings, while in 2012 this share was 74%. The wearing of luminous items among children remained stable over the years reaching 90% - 95% while the number of adults using reflectors regularly has almost doubled, from 38% in 2002 to 79% in 2013. Even though progress has been made, the numbers of collisions at unregulated pedestrian crossings in Estonia are too high. Some pedestrian crossings are on wide busy streets, where driver attention is divided among several different traffic situations, usually these roads do not have traffic islands and therefore create dangerous conditions for pedestrians and drivers."
Erik Ernits, Estonian Road Administration.

Poland: pedestrian safety initiatives

In Poland pedestrian deaths were 39% fewer in 2013 compared with 2003, going down from 1,879 to 1,140. However, the number of pedestrians killed in Poland is still one of the highest in the EU with more than 32 deaths per million population per year.

"Obviously, we are not satisfied with Poland's performance. Nevertheless, pedestrian safety is improving and it is related to a set of different measures, for example, tougher policy towards speeding. Since last year pedestrians must wear luminous items when walking outside built-up areas at night. The first pedestrian manual has also been published giving guidance for safe behaviour and suggesting effective safety solutions. Some positive developments are taking place with regard to pedestrian safety. However, this area of road safety policy still lacks consistency".
Ilona Buttler, Motor Transport Institute

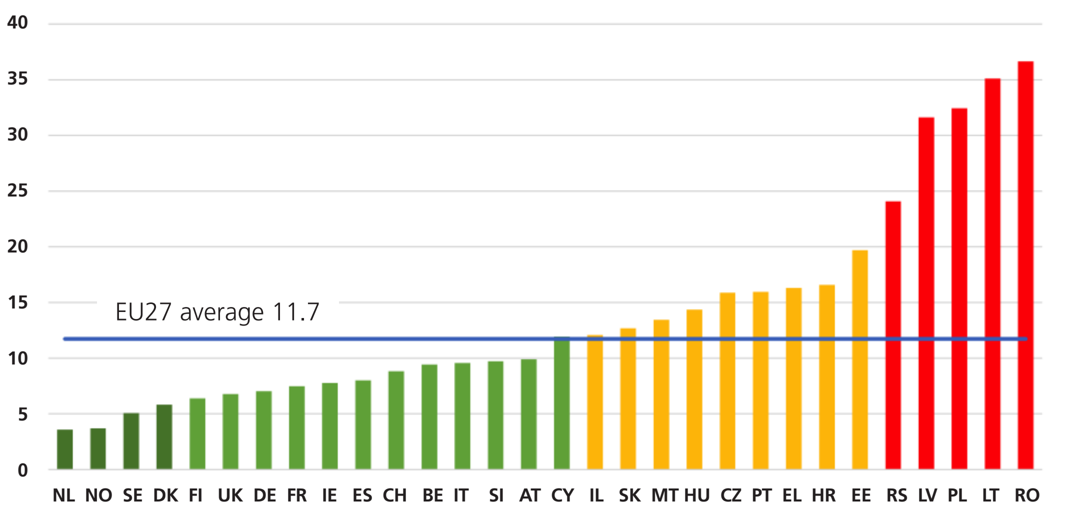
1.1.2 The risk of death as a pedestrian in the best and worst performing groups of countries differs by a factor of six

The Netherlands, Norway, Sweden and Denmark are the safest countries for pedestrians (Fig. 4). In The Netherlands and Norway, pedestrian mortality is less than four deaths per year per million inhabitants. In Sweden and Denmark less than six pedestrians are killed per year per million inhabitants.

Big disparities in pedestrian safety exist in Europe.

But big disparities in pedestrian safety exist in Europe. The risk of being killed as a pedestrian is six times higher in the worst performing countries compared to the leaders. People have the highest risks of being killed as pedestrians in Poland, Lithuania and Romania where 32, 35 and 37 pedestrians are being killed per million inhabitants respectively. Despite the positive developments in reducing the number of pedestrian deaths, pedestrian mortality in Latvia is still 32 per million inhabitants which is among the highest in the EU.

Fig. 4: Average annual pedestrian deaths in 2011-2013 per million inhabitants in 2013. LU and MT are excluded due to fluctuation in small numbers of deaths but their numbers are included in the EU27 average. BG is excluded due to insufficient data.



1.1.3 How the risk of death as a pedestrian differs by age

The indicator of annual pedestrian deaths per million inhabitants for each agegroup reveals big differences in mortality rates between people of different ages (Fig. 5). In the EU, the risk of being killed as a pedestrian is consistently lowest for children, with 3.4 deaths per million child population, about double that for adults under 50 with 7.5 deaths per million adult population. The greatest risks of being killed as a pedestrian are for people aged 50-64 and especially for those over 65 with 13 and 28 deaths per million population in the agegroup respectively.

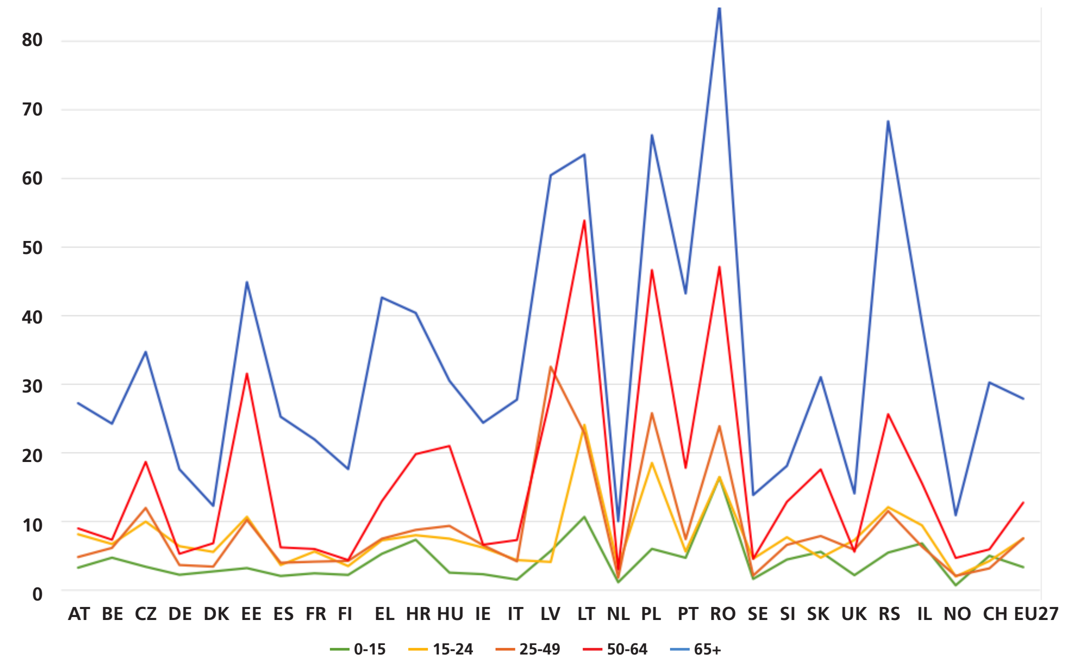
Children are safest as pedestrians in Norway with less than one pedestrian death per million child population.

The highest mortality of children under 15 as pedestrians is in Romania and Lithuania. In Romania 16 children are killed as pedestrians per million population under 15. In Lithuania this number is 11 which is much higher than the EU average of 3.4 children killed as pedestrians per million population under 15. Children are safest as pedestrians in Norway with less than one pedestrian death per million child population.

People over 65 have a greater risk of being killed as pedestrians than the rest of the population in the EU. The risk is disproportionally high in Romania with 85 elderly pedestrian deaths per million population in this agegroup, in Serbia and Poland the mortality rate of the same group is 68 and 66 respectively whereas the EU average is 28. Elderly people are safest as pedestrians in The Netherlands and Norway with 10 and 11 pedestrian deaths per million elderly population.

However, the data used for this indicator do not allow estimation of the extent to which the differences in mortality rates between the agegroups are down to amount of walking, amount of involvement in collisions and ability to survive a collision, each of which is likely to vary systematically with age.

Fig. 5: Average annual pedestrian deaths in 2011-2013 per million inhabitants in 2013 for each of the agegroups under 15, 15-24, 25-49, 50-64 and 65 and over. CY, LU and MT are excluded due to fluctuation in small numbers of deaths but their numbers are included in the EU27 average. BG is excluded due to insufficient data.



1.1.4 Difference in the environment surrounding pedestrian deaths

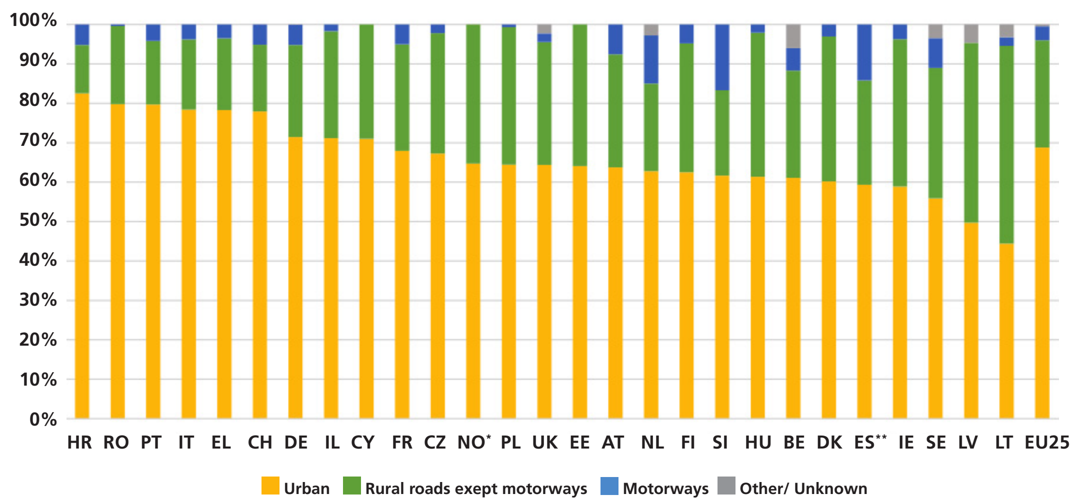
69% of all pedestrian deaths occur on urban roads.

For the EU as a whole, over the period 2011 to 2013, 69% of all pedestrian deaths occurred on urban roads (Fig. 6). Given the high level of urbanisation in Europe and frequent interaction between pedestrians and motorised transport in cities and towns, such a figure is not unexpected.

The largest percentage of pedestrian deaths on urban roads is observed in Croatia with 83%, followed by Romania and Portugal with 80% and Italy, Greece and Switzerland with 78%. The lowest proportion of pedestrian deaths in urban areas is in Lithuania with 44%, Latvia with 50% and Sweden with 56% of all pedestrian deaths.

In the EU, another 27% of pedestrian deaths occur on rural roads and 4% on motorways. Pedestrians are legally not allowed to use motorways, so the ones killed might be vehicle users who have left their vehicles for some reason or workers in work zones, along with some individuals who entered the motorway on foot illegally.

Fig. 6: Percentage share of pedestrian deaths by road type in the last 3 years (2011-2013). *2011 and 2013 average. **Motorways and autovias. LU is excluded due to fluctuation in small numbers of deaths but its numbers are included in the EU25 percentages. BG, MT, SK and RS are excluded due to insufficient data.

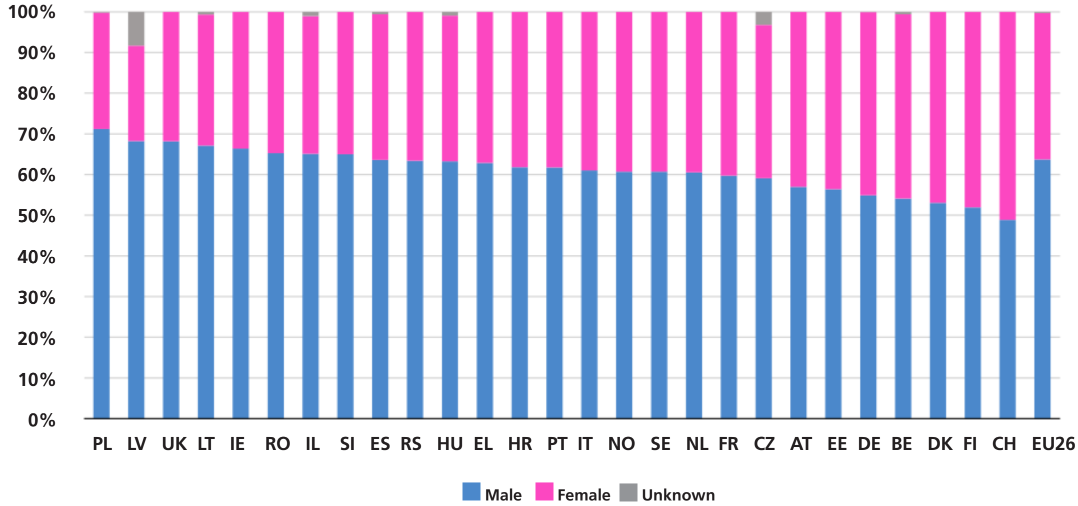


1.1.5 Gender differences in pedestrian deaths

There is extensive evidence to show that more males than females are being killed in road collisions in Europe[4] which is also the case for pedestrians, but to a lesser degree than for all road users. 6,200 females and 11,000 males were killed as pedestrians in the last three years in the EU representing 36% and 64% of all pedestrian deaths respectively (Fig. 7), compared with about one quarter and three quarters of all road deaths. The proportion of females and males killed as pedestrians has changed very little over time – ten years ago 34% of those killed as pedestrians in the EU were females and 66% were males.

The highest proportion of males among pedestrians killed is in Poland (71%), Latvia, the United Kingdom (68%) and Lithuania (67%). The proportion of females and males killed is more balanced in Germany, Belgium, Denmark and Finland. Only in Switzerland are more females than males killed as pedestrians; they account for 51% of all pedestrian deaths.

Fig. 7: Percentage share of pedestrian deaths by gender in the last three years (2011 - 2013). CY, LU and MT are excluded due to fluctuation in small numbers of deaths but their numbers are included in the EU26 percentage. BG and SK are excluded due to insufficient data.



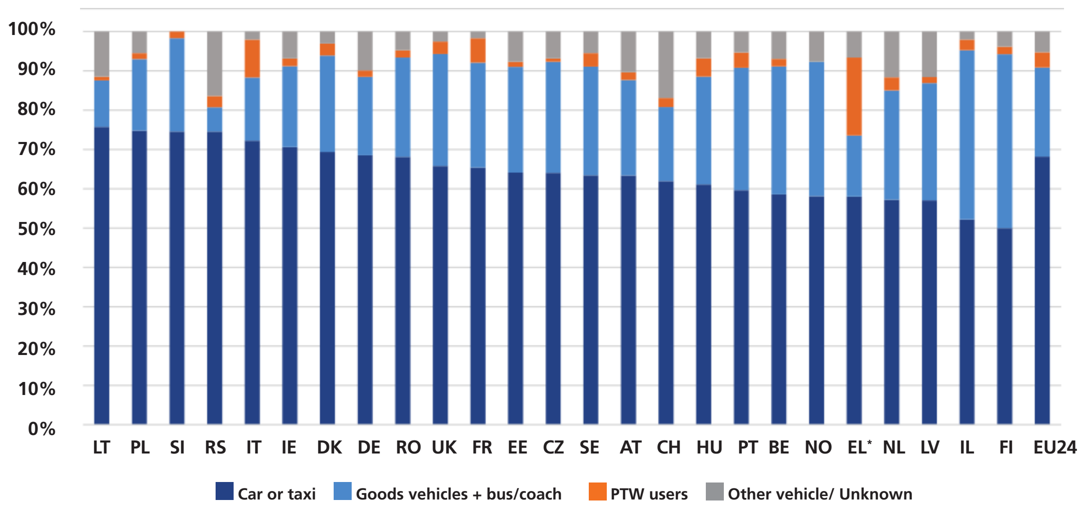
1.1.6 Pedestrian interaction with traffic

68% of pedestrian deaths are a consequence of an impact with a car.

In the EU 68% of pedestrian deaths are a consequence of an impact with a car, 22% due to impact with goods vehicles or buses and around 4% in collisions with PTWs (Fig. 8).

The proportion of killed pedestrians struck by cars is 76% in Lithuania, 75% in Poland, Slovenia and Serbia, 72% in Italy, 71% in Ireland and 69% in Denmark. The largest share of pedestrian deaths as a consequence of an impact with a goods vehicle or bus occurred in Finland (44%) and Israel (43%), followed by Norway (34%) and Belgium (33%). The highest share of pedestrian deaths due to collisions with PTWs is in Greece, where they represent 20% of all pedestrian deaths in the country.

Fig. 8: Percentage share of pedestrian deaths occurring in collisions with different types of vehicles in the last 3 years (2011 - 2013). *2011-2012. CY, LU and MT are excluded due to fluctuation in small numbers of deaths but their numbers are included in the EU24 percentages. BG, ES, HR and SK are excluded due to insufficient data.



[4] ETSC (2013), Back on Track to reach the EU 2020 Road Safety Target? 7th Road Safety PIN Report.

1.2 Cyclist safety

1.2.1 Progress in reducing deaths among cyclists has been slow since 2010

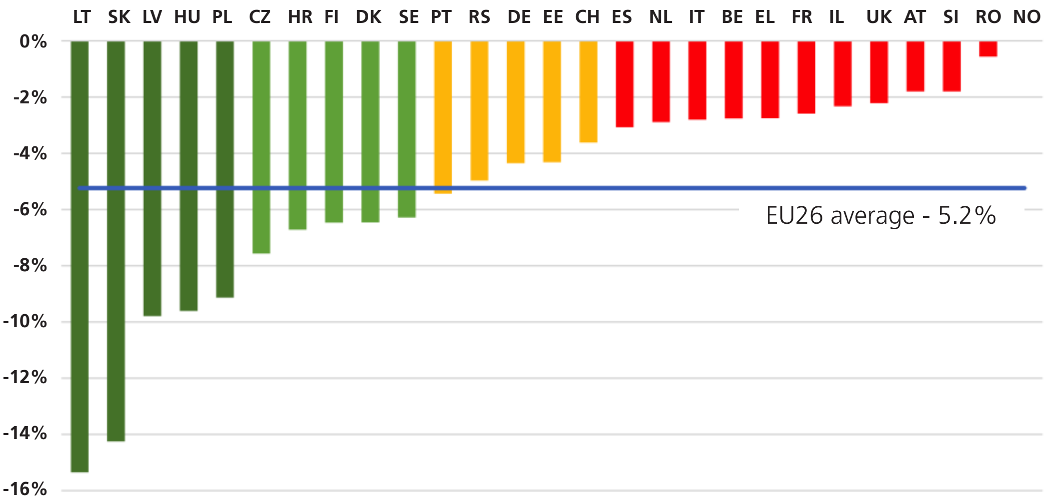
More than 2,000 cyclist deaths were recorded in traffic collisions in the EU in 2013 representing 8% of the total number of road deaths in those countries. Around 25,000 have been killed since 2004.

In the last ten years all EU countries have seen a reduction in the number of cyclist deaths. Lithuania holds the lead with a 15% average year-to-year drop, Slovakia follows with an average annual reduction of 14% (Fig. 9). Latvia, Hungary, Poland, the Czech Republic, Croatia, Finland, Denmark, Sweden and Portugal reached better annual reductions than the 5.2% EU average. The progress was slowest in the United Kingdom, Slovenia, Austria, Romania and Norway.

Since 2010 the reduction in the number of cyclist deaths has stagnated with less than a 1% year-to-year reduction in the EU. 2,078 cyclists were killed in the EU in 2010, in 2013 this number dropped only to 2,009. This slowdown in the fall in cyclist deaths may well be partly related to a growing use of bicycles as a form of active travel among EU citizens. An increasing number of EU countries are adopting national strategies to promote cycling[5], so it is possible that in recent years more people are choosing cycling as a means of transport. However, national cycling strategies should not only encourage cycling, but also promote high safety standards for bicycle users.

A high level of underreporting in the number of collisions involving cyclists exists. This is noticed when police reporting is compared to hospital records.[6] Moreover, the rate of reporting is much higher for bicycle collisions with motor vehicles involved than for bicycle only collisions.[7]

Fig. 9: Average annual percentage change in cyclist deaths over the period 2003 - 2013. CY, IE and LU are excluded due to fluctuation in small numbers of deaths but their numbers are included in the EU26 average. BG and MT are excluded due to insufficient data.



Poland: improving cycling infrastructure

Cyclist deaths in Poland were cut by 52% from 647 in 2003 to 306 in 2013 while at the same time the number of cyclists was growing.

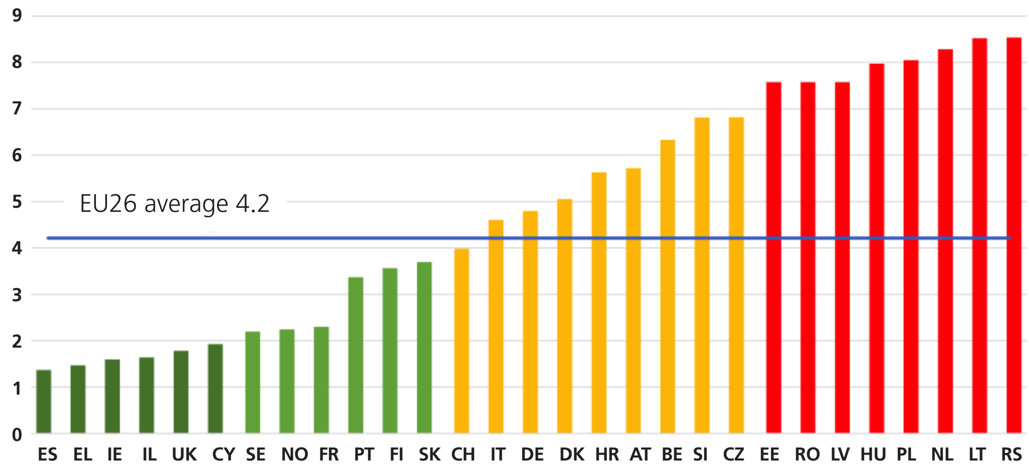
"In recent years the number of cyclists in Poland has increased considerably. Many cities have launched city bike systems and they are gradually improving cycling infrastructure. However, it will take some time to introduce all the necessary cycling regulations in Poland; it is important that the process has already started. An area which clearly needs to be addressed is interaction between cyclists and other road users. Another challenge will be to build cycling infrastructure in such a way that it can be integrated into the existing road system".
Ilona Buttler, Motor Transport Institute.

[5] European Cyclists' Federation, Cycling in All Policies.
[6] SafetyNet (2009), Pedestrians and Cyclists.
[7] P. Schepers. SWOV (2013), A Safer Road Environment for Cyclists.

1.2.2 Cyclist mortality

Less than two cyclists per million inhabitants are killed each year in Spain, Greece, Ireland, Israel, the United Kingdom and Cyprus (Fig. 10). The highest cyclist mortality is in Hungary, Poland, The Netherlands, Lithuania and Serbia with eight or more cyclist deaths per million inhabitants. So risk per million inhabitants differs by a factor of more than four between the groups of countries with the highest and lowest risks.

Fig. 10: Average annual cyclist deaths in 2011-2013 per million inhabitants in 2013.
LU is excluded due to fluctuation in small numbers of deaths but their numbers are included in the EU26 average. BG and MT are excluded due to insufficient data.



The level of cycling risk could be better evaluated as a function of the number of trips taken by bicycle or the bicycle distance travelled in order to provide a better picture of the areas where policies to increase cycle safety should be targeted. However, only The Netherlands, Sweden and Great Britain have reported such data for the last three years, so comparison between countries on the basis of the risk of cycling by distance travelled is not possible in this report.

Another grey zone in cyclist safety is that most European countries do not collect data on collisions related to drink and drug cycling, so that the scope of the problem remains unknown. Several EU countries have introduced Blood Alcohol Content limits for cyclists, including Poland with 0.2g/l, The Netherlands with 0.5g/l and Austria with 0.8g/l. There is an ongoing discussion in Germany on whether to introduce BAC limits for cyclists.

Germany: debate on BAC limits for cyclists

"In Germany, many organisations, including the German Road Safety Council, the German Cycling Association, the Volunteers for Road Safety Organisation and others are asking for the introduction of a BAC limit for cyclists. Recent research has shown that the amount of cyclist collisions increases enormously when the BAC is higher than 1g/l. The introduction of a fine based on administrative law would help to avoid alcohol-related collisions caused by drunk cyclists."
Jacqueline Lacroix, German Road Safety Council.

Pedelec cycles

Pedelecs are a type of bicycle where the cyclist's pedalling power is supported by a battery-powered electric motor, primarily designed to aid the rider when starting off or when cycling uphill. The EU legislation currently in force sets limits on the power and speed provided by the electrical assistance in order for the vehicle to still be considered a bicycle. The maximum electrical assistance power of 0.2kW is cut when the cycle reaches a speed of 25 km/h.[8] There is another category of electrically assisted bicycles that have a more powerful motor and can develop a speed of up to 45 km/h. Under EU legislation these ebikes are not considered as bicycles.

In the last few years the use of pedelecs in Europe has been increasing and is expected to continue growing. However, the road safety consequences of the potentially higher speed that pedelecs can achieve are not clear. A study by GDV suggests that the use of pedelecs does not result in a higher risk of collision.[9] A Dutch study revealed that pedelec users are more likely to be involved in a collision that requires treatment at an emergency department. However, collisions involving pedelecs are about equally severe as collisions with classic bicycles.[10]

Germany is collecting separate data on cyclists killed on pedelecs. In 2014 they represented around 10% of all cyclist deaths.

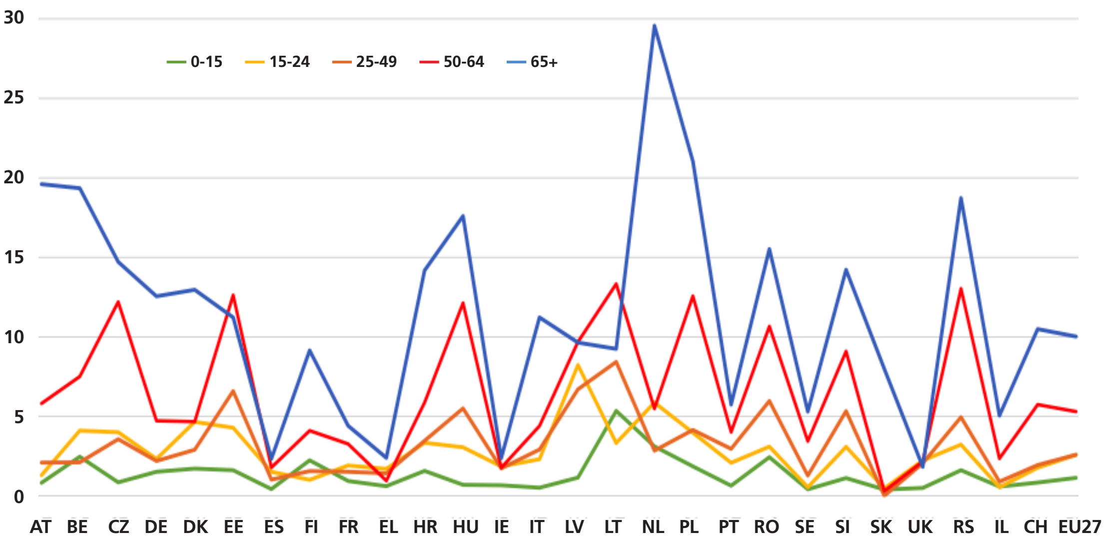
1.2.3 How the risk of death as a cyclist differs by age

Differences among agegroups in cyclist mortality are similar to those in pedestrian deaths per million population. Mortality of cyclists in the EU is least for children under 15 with around 1.1 deaths annually per million child population, more than twice as big for the adult population under 50 with 2.6 deaths per million adult population, and twice as great again for citizens aged 50-64 with 5.3 deaths per million population of this agegroup (Fig. 11). The greatest risk of being killed as a cyclist is for people older than 65, with 10 deaths per million elderly population.

Children under 15 have the greatest risk of being killed as cyclists in Lithuania with over five deaths per million child population. The Netherlands follows with about three deaths, Belgium, Romania and Finland with more than two deaths whereas the EU average is 1.1.

People over 65 years have the greatest risk of being killed as cyclists in The Netherlands with 30 deaths per million elderly population, compared with 21 in Poland and about 19 in Austria, Belgium and Serbia, while the EU average is 10.

Fig. 11: Average annual cyclist deaths in 2011-2013 per million inhabitants in 2013 for each of the agegroups under 15, 15-24, 25-49, 50-64 and 65 and over.
CY, LU and MT are excluded due to fluctuation in small numbers of deaths but their numbers are included in the EU26 average. BG and NO are excluded due to insufficient data.



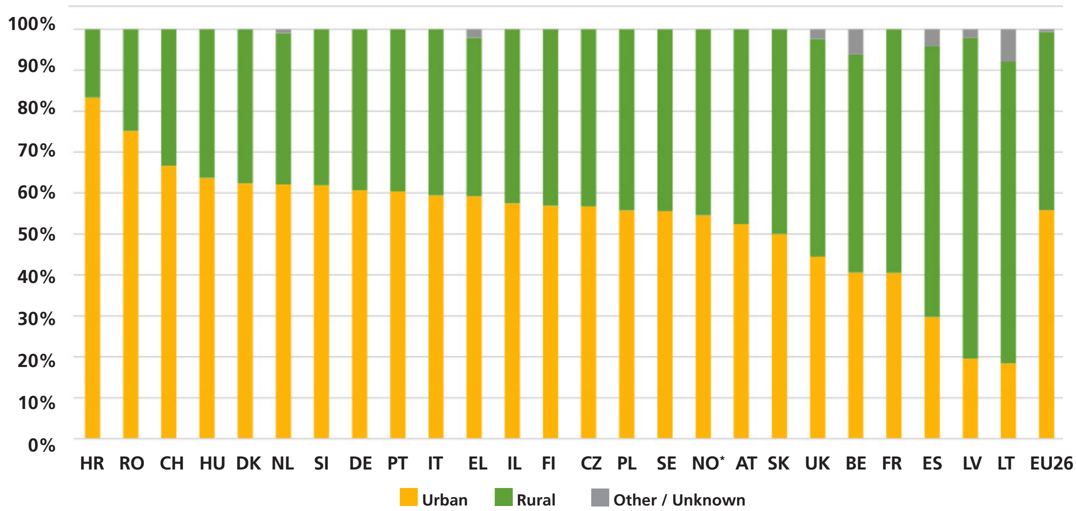
[8] ETSC (2012), Raising the bar, Review of Cycling Safety Policies in the European Union.
[9] GDV (2014), Pedelec-Naturalistic Cycling Study.
[10] J. P. Schepers et al. (2014), The Safety of Electrically Assisted Bicycles Compared to Classic Bicycles.

However, the indicator of average annual cyclist deaths per million inhabitants in each agegroup takes no account of the extent to which people of different agegroups are cycling and how cycling volumes by these groups vary across the EU. For example, the high children and elderly cycling mortality rate in The Netherlands is a result of an extensively developed cycling culture in the country.

1.2.4 Difference in the environmen surrounding cyclist deaths

For the EU as a whole, just over half of cyclist deaths occur in urban areas (Fig. 12). The highest proportion of cycling deaths that are urban is in Croatia, where 83% of cycling deaths occur inside urban areas, followed by Romania with 75%, Switzerland with 67% and Hungary with 64%. In the United Kingdom, Belgium, France, Spain, Latvia and Lithuania more than half of cycling deaths occur in non-urban areas.

Fig. 12: Percentage share of cyclist deaths by road type in the last 3 years (2011-2013).
*2011 and 2013. CY, EE, IE and LU are excluded due to fluctuation in small numbers of deaths but their numbers are included in the EU26 percentage. BG, MT and RS are excluded due to insufficient data.

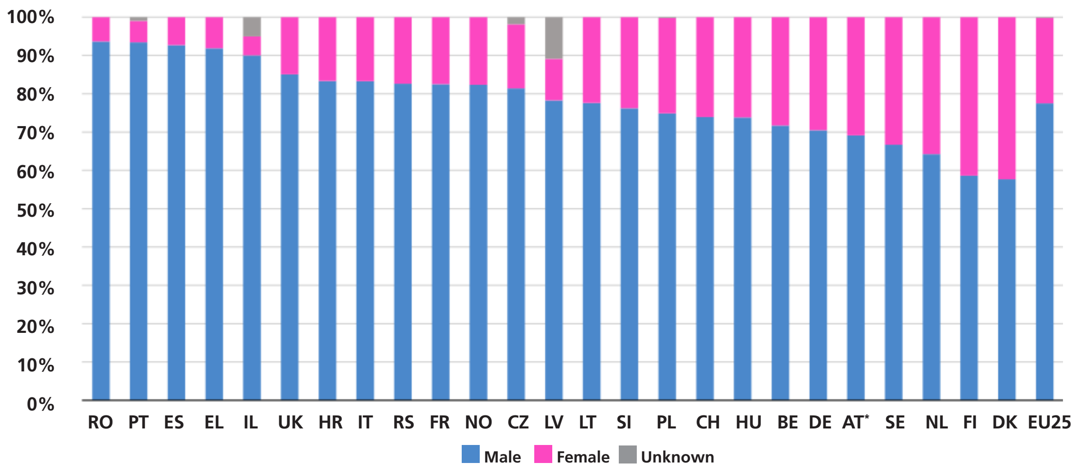


1.2.5 Gender differences in cyclist deaths

In the last three years, almost four out of every five cyclists killed in the EU were male (Fig. 13). Around 1,400 female and 4,800 male cyclists were killed in the EU representing 22% and 78% of all cyclist deaths respectively.

In Denmark the proportions of males and females among killed cyclists are 58% and 42%, in Finland 59% and 41%, in The Netherlands 64% and 36%. At the other extreme are Romania with 94% male and Portugal and Spain with 93% male cyclist deaths.

Fig. 13: Percentage share of cyclist deaths by gender in the last three years (2011 - 2013).
*2011-2012. CY, EE, IE and LU are excluded due to fluctuation in small numbers of deaths but their numbers are included in the EU25 percentage. BG, MT and SK are excluded due to insufficient data.



The substantially larger number of males killed could be due partly to the fact that males cycle more than females and are thus exposed to more risk. Countries with more advanced cycling culture like Denmark and The Netherlands have a higher proportion of females among the cyclists killed. A more even division between road deaths for males and females would thus be a marker, albeit a very sad one, that cycling is viewed as a transport mode appropriate for all the people of a country.[11]

1.2.6 Cyclist interaction with traffic

More than half of the total number of cyclist deaths is a consequence of a collision with a car.

Collisions with passenger cars make up slightly more than half of the total number of cyclist deaths in the EU (52%). Collisions with goods vehicles and buses account for 24% of cyclist deaths (Fig. 14).

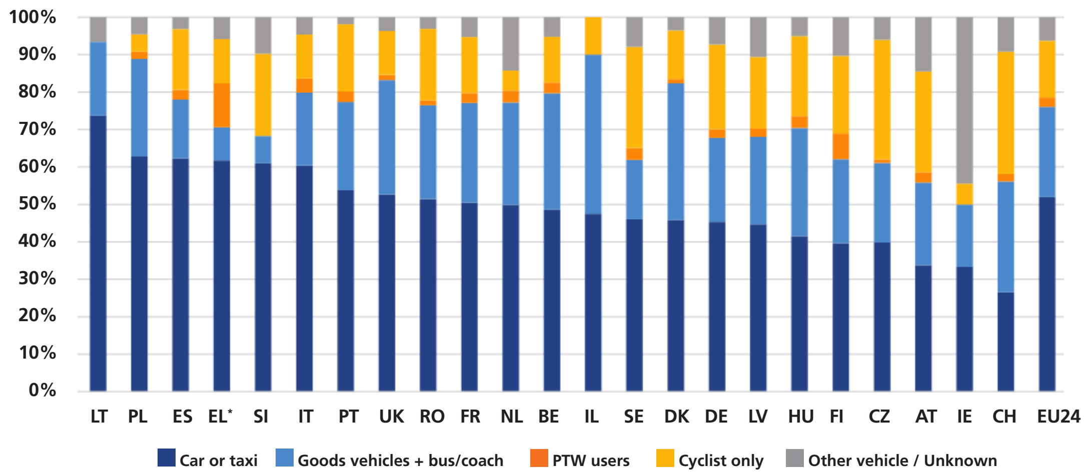
Single bicycle or bicycle with bicycle collisions account on average for 15% of all cyclist deaths in the EU, but there are several countries where this percentage is much larger - in Switzerland 33% and in the Czech Republic 32%, one third of all cyclist deaths, in Sweden and Austria 27% and in Germany 23%.

The proportion of cyclist deaths caused by collisions with cars is markedly higher than the EU average in Lithuania with 74%, Poland with 63%, Spain and Greece with 62%, Slovenia with 61% and Italy with 60%.

The largest shares of cyclist deaths as a consequence of an impact with goods vehicles or buses are in Israel with 43%, Denmark with 36%, Belgium with 31% and the United Kingdom with 30%.

Bicycle collisions with PTWs are rather rare and in most of the EU countries do not account for more than 3% of all cyclist deaths.

Fig. 14: Percentage share of cyclist deaths occurring in collisions with different types of vehicles in the last 3 years (2011 - 2013).
*2011-2012. CY, EE and LU are excluded due to fluctuation in small numbers of deaths but their numbers are included in the EU24 percentages. BG, HR, MT, SK and NO are excluded due to insufficient data.



[11] ETSC (2012), Pedalling Towards Safety.

PART II
TOWARDS SAFER ENVIRONMENTS FOR PEDESTRIANS AND CYCLISTS – MEASURES THAT WORK

Walking and cycling are encouraged at EU level and also at a national level by a number of Member States. Some of them have adopted national strategies for promoting cycling and have established an urban street user hierarchy that gives the highest priority to walking, cycling and public transport. This concept introduces a "principle of prudence" governing the relationship between drivers and the most vulnerable road users, as well as new approaches to urban road planning and design and the growing implementation of 30 km/h zones (20 miles/h in the UK).

Increasing pedestrian and cyclist safety requires a combination of measures. Improved infrastructure in conjunction with developments in other areas related to the traffic system, like in-vehicle technologies and road user behaviour, can deliver high safety standards for all road users, especially the most vulnerable ones.

There are a whole range of measures that can be taken to improve vulnerable road user safety and these are covered in more detail in ETSC's Position on 'Integrating Safety into the EU's Urban Transport Policy'[12], in ETSC's Review on Vulnerable Road Users[13] and in ETSC's recent Review of Cycling Safety Policy[14].

2.1 Pedestrian and cyclist safety in urban areas

2.1.1 Urban road safety characteristics

Almost half of all car trips in urban areas in the EU are over distances shorter than 5 kilometres and many of these can be made by walking or cycling.

Almost half of all car trips in urban areas in the EU are over distances shorter than 5 kilometres and many of these can be made by walking or cycling.[15] Making active travel an attractive alternative to motorised transport will result in decreases in traffic noise, pollution and congestion in urban areas and at the same time contribute to the EU agenda[16] aiming for more sustainable mobility and improved health.

An important feature of urban road use is frequent and close interaction between unprotected road users and motor vehicles that move at higher speed, have bigger mass and whose occupants are enclosed. As a result, the majority of pedestrian and cyclist deaths occur on urban roads.

[12] ETSC (2013), Integrating Safety into the EU's Urban Transport Policy.
[13] ETSC (2005), The Safety of Vulnerable Road Users in the Southern, Eastern and Central European Countries (The "SEC Belt").
[14] ETSC (2012), Raising the Bar – Review of Cycling Safety Policies in the European Union.
[15] European Commission, Mobility and Transport, Clean transport, Urban transport.
[16] European Commission, Mobility and Transport, Transport White Paper 2011 and Urban Mobility Package 2013. See also ETSC Position Paper on the Mid Term Review of the Transport White Paper.and the ETSC Position Paper on the Urban Mobility Package.

www.30kmh.eu

2.1.2 Safety potential of 30km/h speed limits

The risk of an unprotected road user being killed or seriously injured in a collision with a motorised vehicle grows substantially when the speed of the vehicle increases. The probability of a pedestrian being killed in a collision with a passenger car going at 50km/h is more than five times the risk with the same vehicle going at 30km/h (Fig. 15). If there were 100 fatal pedestrian collisions that occurred at 50km/h, then if the speed had been 30km/h instead of 50km/h, at least 80 lives would have been saved.

As well as reducing impact severity in the case of collision, a maximum speed of 30km/h creates opportunities for positive interaction among road users through visual communication, and gives drivers more time both to make use of their visual field to see potential hazards and to react to these.[17] Lower speed also reduces feelings of danger for pedestrians and cyclists and might encourage more people to walk and cycle. Therefore, reducing the speed of motor vehicles in urban areas has much to contribute to pedestrian and cyclist safety.

30km/h zones should be considered for all roads frequently used by cyclists and pedestrians, including residential and downtown areas. A combination of traffic calming measures, such as roundabouts, road narrowing, chicanes, road humps and techniques of space-sharing is helpful in 30km/h zones to make it difficult for vehicle drivers to exceed the legal speed limit.

Enforcement on roads limited to 30km/h also has a contribution to make. Enforcement is a means to prevent collisions from happening by way of persuading drivers to comply with the safety rules where information and engineering measures by themselves are insufficient to do so. Deterrence is based on giving drivers the feeling that they run too high a risk of being caught when breaking the rules.

There is a growing public support and increasing acceptance in the EU of lower urban speed limits.

There is a growing public support and increasing acceptance in the EU of lower urban speed limits; 38% of the Swiss population live in 30km/h zones.[18] Among other European countries that have to various extents introduced 30 km/h speed limits in urban areas are Austria, Belgium, Germany, Hungary, Italy, Portugal, Slovenia, Sweden, The Netherlands, the Czech Republic and the United Kingdom.[19]

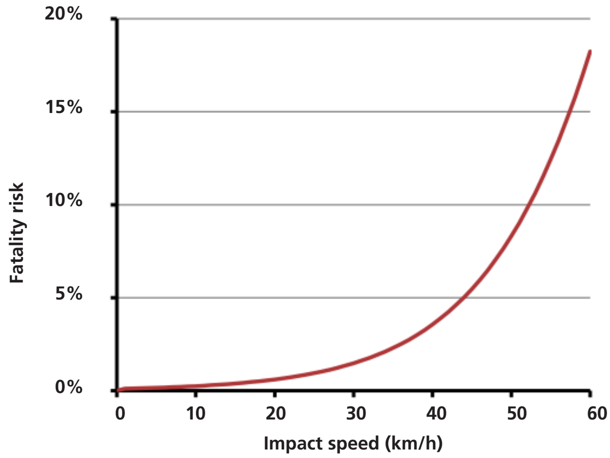
According to a TRL study in 1996, introduction of early 30km/h zones in residential areas in the United Kingdom resulted in an overall vehicle speed reduction of 15km/h and a decrease in road collisions of 60%, and cut vehicle collisions with cyclists by 29%. A reduction of 67% was reached in vehicle collisions with child pedestrians and cyclists.[20] A new comprehensive three year study of both 30km/h zones and limits in the United Kingdom began in 2014.

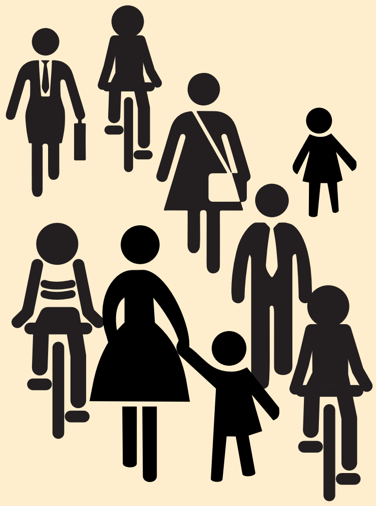
Between 1987 and 2006 overall road deaths and injuries in London decreased by 29% while at the same period within 30km/h zones they dropped by 42%. The largest road safety effects of 30km/h zones were for children, their deaths and injuries went down by 50%. The study suggests that the benefits of 30km/h zones in high casualty areas are greater than the costs of implementation when a road has over 0.7 fatalities or injuries per kilometre.[21]

A study conducted by SWOV indicates that conversion from 50km/h zones to 30km/h in The Netherlands had a positive effect in reducing the number of pedestrian and cyclist deaths. Even though it is difficult to accurately calculate the size of the reductions, this value might be more than 70%.[22]

[17] OECD and ECMT (2006), Speed Management.
[18] ETSC (2015), 30km/h limits gaining rapid acceptance across Europe.
[19] European Cyclists' Federation, 30 km/h Speed Limits and Cyclist Safety.
[20] TRL (1996), D. C. Webster, A. M. Mackie, Review of Traffic Calming Schemes in 20 mph zones.
[21] London School of Hygiene and Tropical Medicine, (2008), C. Grundy et al., 20 mph Zones and Road Safety in London.
[22] SWOV (2009), E. Berends, H. Stipdonk, De veiligheid van voetgangers en fietsers op 30km/uur-erftoegangswegen.

Fig. 15: Pedestrian fatality risk as a function of impact speed for adult pedestrian in a frontal collision with a passenger car.





Safety impact of more cycling and walking: Safety in numbers

Evidence shows that the more pedestrians or cyclists there are using the road, the lower the risk to each individual from motor traffic, car drivers and other motorised vehicle users being more used to sharing the road with pedestrians and cyclists when more people walk and cycle[23].

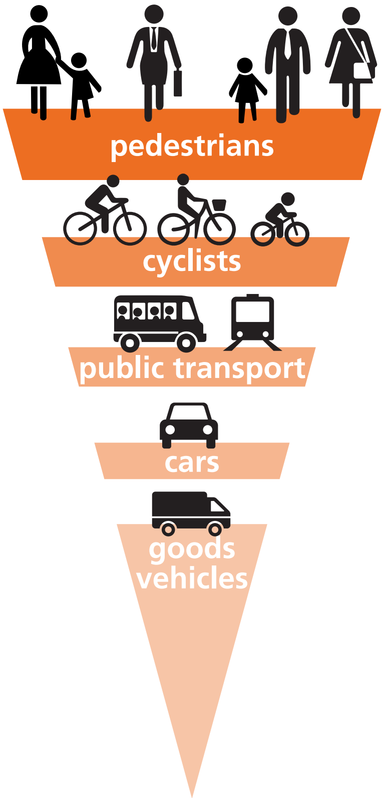
Although an increase in cycling might, at least at first, lead to an increase in the number of cyclists killed and seriously injured[24], the advantages of walking and cycling (a healthy life through regular exercise, benefit to the environment and higher quality of life) outweigh their disadvantages (in terms of the risk of death or injury). Moreover, cyclists and pedestrians do not endanger other road users as much as car drivers do because of their lower speed and mass. So shifting a substantial proportion of short-distance car trips to walking, cycling and public transport can, if accompanied by measures to reduce the risks of walking and cycling, increase overall road safety.

Recommendations to EU Institutions

- Encourage Member States to adopt zones with a speed limit of 30km/h in residential areas and areas used by many pedestrians and cyclists, and a maximum speed of 50km/h elsewhere in urban areas.
- Draft guidelines for promoting best practice in traffic calming measures, based upon physical measures such as roundabouts, road narrowing, chicanes, road humps and techniques of space-sharing.
- Legislate to introduce Intelligent Speed Assistance (ISA) which, in managing speed, has the potential to reduce risks to pedestrians and cyclists.
- In line with the recommendation of the EC's Serious Injury document[25] apply the instruments of the Infrastructure Safety Directive to urban roads.
- Support Member States in preparing national enforcement plans with annual targets for compliance in the areas of speeding, especially in urban areas where there are high numbers of pedestrians and cyclists.

[23] P. Jacobsen (2003), Safety in numbers: more walkers and bicyclists, safer walking and bicycling. Injury Prevention.
[24] SWOV (2010), H. Stipdonk, M. Reurings, The safety effect of exchanging car mobility for bicycle mobility.
[25] Commission Staff Working Document: On the Implementation of Objective 6 of the European Commission's Policy Orientations on Road Safety 2011-2020 – First Milestone Towards an Injury Strategy.

- Strengthen the Cross Border Enforcement Directive within the context of the revision in 2016 by ensuring greater convergence in enforcement of road safety related road traffic rules (including speeding) and developing common minimum standards for enforcement.
- Consider extending the CARE database to enable Member States to submit records of numbers of deaths and serious injuries while using the roads to pedestrians in falls and seek to improve the recording of deaths and serious injuries to cyclists, including those in incidents not involving motor vehicles.



Recommendations to Member States

- Encourage local authorities to adopt zones with a speed limit of 30km/h in residential areas and areas used by many pedestrians and cyclists.
- Prepare national enforcement plans with yearly targets for compliance in the areas of speeding, especially in urban areas, where there are high numbers of pedestrians and cyclists.
- Introduce lower speed limits for junctions and intersections.
- Further develop a policy of modal priority for road users, particularly in urban areas, the hierarchy being based on safety, vulnerability and sustainability. Walking should be at the top of the hierarchy, followed by cycling and use of public transport.
- Give priority in road maintenance to the quality of surfaces on footways, cycle paths and the parts of carriageways most used by crossing pedestrians and by cyclists.
- By providing safe and attractive infrastructure and in other ways encourage more walking and cycling as "safety in numbers" will increase individual safety.
- Provide shorter and safer routes for pedestrians and cyclists by ensuring that routes are direct and that the quickest routes are also the safest. Travel time should be increased on unsafe routes and decreased on safe routes.
- Create conditions so that cyclists can mix freely with motorised traffic where the travel speed, volume and mass of motorised traffic does not pose a significant risk to the unprotected road users.
- Try to arrange for cycle traffic and motorised traffic to be physically separated where the speed of the latter is too big or where the traffic flow is too high to allow them to mix safely.
- Prioritise the safety of cyclists and pedestrians when developing sustainable urban mobility plans.
- Strengthen enforcement against illegal parking when pedestrian and cyclist facilities are abused by parking on footpaths and cyclists' paths.
- Keep records as road casualties of the numbers of deaths and serious injuries while using the roads to pedestrians in falls and to cyclists in incidents not involving motor vehicles.
- Tackle high levels of underreporting in pedestrian and cyclist deaths and injuries.

2.2 Pedestrian and cyclist interaction with motorised vehicles

Collisions with motorised vehicles account for an overwhelming percentage of pedestrian and cyclist deaths. Different factors influence impact severity between motor vehicles and cyclists or pedestrians, the most important being speed of travel, vehicle mass and the level of protection provided by the vehicle.

Later this year the European Commission is going to revise the Pedestrian Protection Regulation[26] and the General Safety Regulation[27] which set technical requirements applied to all new motor vehicles sold in the EU market. Pedestrian Protection legislation prescribes requirements for the construction and functioning of vehicles and frontal protection systems in order to reduce the number and severity of injuries to pedestrians and other vulnerable road users who are hit by the fronts of vehicles. An update of motor vehicles testing procedures, including technical features setting requirements for more forgiving car fronts, could incorporate improvements in the crush depth available in the event of a collision with an unprotected road user and therefore reduce the number and severity of injuries. The General Safety Regulation will reconsider current technical requirements applied to all new motor vehicles sold in the EU market. The revision offers an opportunity to maximise vehicle safety potential by improved heavy good vehicles cabin design and in-vehicle technologies that will bring safety benefits for both car occupants and for those outside the vehicles. ETSC is calling for a range of safety technologies, including overridable Intelligent Speed Assistance (ISA) and Autonomous Emergency Breaking (AEB), to be fitted as standard on new vehicles, and for improved pedestrian protection requirements.[28]

2.2.1 Passenger cars – passive and active safety

Passive and active in-vehicle safety have an important role in reducing the number of pedestrian and cyclist collisions.

Collisions with cars and taxis account for 68% of pedestrian and 52% of cyclist deaths in the EU. Therefore, passive and active in-vehicle safety have an important role in reducing the number of pedestrian and cyclist collisions. In the cases when collisions cannot be avoided, active in-vehicle technologies can reduce the severity of the impact.

Safer car fronts

In most of the collisions involving pedestrians or cyclists and a passenger car, the impact occurs between these vulnerable users and the front of the vehicle, making the frontal area of the car of particular importance. Requirements for pedestrian-friendly car fronts take into account various features including shock absorbing areas where the pedestrian's head would hit the car bonnet in the event of a collision.[29]

A study evaluating the correlation between EuroNCAP pedestrian protection test result scores and injury outcomes in car-to-pedestrian and car-to-cyclist injury collisions found that large reductions both of injury severity and the risk of permanent medical impairment can be achieved. The study also showed that pedestrian friendly car fronts can yield benefits for cyclists too although the injury reduction is slightly lower.[30]

Autonomous Emergency Braking (AEB)

Collisions between motorised vehicles and pedestrians or cyclists occur due to failure to brake, late braking or braking with insufficient force. A driver may brake too late for several reasons: being distracted or inattentive; visibility being poor or there not being sufficient time to react in a situation when, for example, a pedestrian

[26] Regulation (EC) No 78/2009 of the European Parliament and of the Council of 14 January 2009 on the type-approval of motor vehicles with regard to the protection of pedestrians and other vulnerable road users, amending Directive 2007/46/EC and repealing Directives 2003/102/EC and 2005/66/EC.
[27] Regulation (EC) No 661/2009 of the European Parliament and of the Council of 13 July 2009 concerning type-approval requirements for the general safety of motor vehicles, their trailers and systems, components and separate technical units intended therefor.
[28] ETSC (2015), Position Paper: Revision of the General Safety Regulation.
[29] ETSC (2012), Raising the bar, Review of Cycling Safety Policies in the European Union.
[30] J. Strandroth et al. (2014), Correlation between Euro NCAP Pedestrian Test Results and Injury Severity in Injury Crashes with Pedestrians and Bicyclists in Sweden.

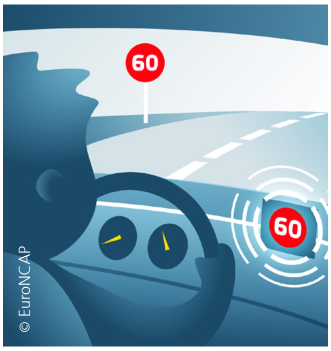
crosses the street unexpectedly.[31] In order to avoid or mitigate this kind of an imminent collision, AEB systems, which variously use lasers, radar or video cameras, activate the brakes and automatically apply them when an imminent collision is detected. The most advanced systems can detect moving pedestrians and cyclists in the path or periphery of the vehicle. These systems can either warn the driver or apply AEB or do both.[32] With sensors used to detect pedestrians, AEB can reduce impact speeds by as much as 15km/h so reducing the severity of injury. AEB also maximises the benefit of softer and 'forgiving' car fronts. So the combined effect of improved pedestrian crashworthiness and crash avoidance promises further gains in safety for pedestrians.[33]

Analysis based on in-depth data from Great Britain and Germany found that current AEB pedestrian systems could reduce fatal pedestrian casualties by 2.9 – 6.2%, seriously injured by 4.2 – 4.4% and slight injured by 2.2 – 4.4%.[34] Analysis by Hummel predicted reductions of 21% for fatal, 15% for serious, and 44.5% for slight casualties in accidents involving cars and pedestrians.[35]

Another system that can be linked to AEB is an intelligent night vision system which detects critical objects such as pedestrians or cyclists at night, in low light or low visibility conditions. The systems use data sources to either display the data to the driver, for them to decide what action to take, or intelligently analyse the data and warn the driver of a potential collision. If linked to an AEB system, braking or manoeuvres could be activated automatically even in low light conditions.[36]

Regular AEB systems are compulsory for all new lorries and buses in the EU, but their fitment in new passenger cars and lorries under 3.5 tonnes is still voluntary.

Intelligent Speed Assistance (ISA)



While road infrastructure measures are necessary in managing the speed of motorised traffic, there is an important case to be made for complementing these with Intelligent Speed Assistance (ISA)[37]. ISA can improve the safety of pedestrians and cyclists by increasing speed compliance, particularly in urban areas. In countries where data are available, in free-flowing traffic up to 80% of drivers exceed speed limits on urban roads.[38] In 2011 the European Commission completed a study[39] to assess the application areas and services of Intelligent Transport Systems (ITS) which demonstrate maximum benefits for vulnerable road users. ISA was identified as a high-priority application to benefit vulnerable road users, scoring well on criteria such as life-saving potential, technical maturity, cost-benefit analysis and potential to stimulate deployment in the short or medium term in the EU.

Recommendations to EU institutions

Within the context of the revision of Regulation 2009/78 on the Protection of Pedestrians and other Vulnerable Road Users:

- Upgrade type approval crash tests to be more closely aligned with the pedestrian safety requirements of Euro NCAP crash tests.
- Mandate the head form to windscreen test, adjusting the impact speed to a level appropriate to real life collision circumstances.
- Introduce a head form impactor that would better reflect the fragility of the human skull.
- Encourage research on Autonomous Emergency Braking (AEB) systems which can detect pedestrians and cyclists.

[31] Euro NCAP, Autonomous Emergency Braking.
[32] TRL (2015), Benefit and Feasibility of a Range of New Technologies and Unregulated Measures in the Fields of Vehicle Occupant Safety and Protection of Vulnerable Road Users.
[33] Global NCAP (2013), Democratising Car Safety: Road Map for Safer Cars 2020.
[34] TRL (2015), Benefit and Feasibility of a Range of New Technologies and Unregulated Measures in the fields of Vehicle Occupant Safety and Protection of Vulnerable Road Users.
[35] Ibid.
[36] Ibid.
[37] ETSC (2015), Position Paper: Revision of the General Safety Regulation.
[38] ETSC (2010), Road Safety Target in Sight: Making up for lost time. 4th Road Safety PIN Report.
[39] ITS Action Plan (2011), Safety and Comfort of the Vulnerable Road User.

Within the context of the revision of Regulation 2009/661 concerning Type-Approval Requirements for the General Safety of Motor Vehicles:

- Adopt legislation for the mandatory fitting all new passenger cars and light trucks and vans under 3.5 tonnes with Autonomous Emergency Braking (AEB) systems.
- Adopt legislation for the mandatory fitting of all new vehicles with an overridable assisting Intelligent Speed Assistance (ISA) system.

EuroNCAP has changed the market for vehicle safety, but regulatory measures are needed to maximise safety benefits for all.

With the inclusion of the pedestrian score into the overall rating, EuroNCAP has encouraged improvement in pedestrian protection. Over the last years it has toughened pedestrian protection criteria challenging car manufacturers to deliver pedestrian friendly designs. EuroNCAP uses standardised simulations of the most common pedestrian and vehicle collisions to assess the level of pedestrian safety that the vehicle provides. The pedestrian protection score is determined from tests to the most important vehicle front-end structures such as the bonnet and windshield, the bonnet leading edge and the bumper. In these tests, the potential risk of injuries to the pedestrian's head, pelvis and upper and lower leg are assessed.[40]

However, not all car models sold in Europe are tested, and not all models of the same type are sold with the same standards of safety equipment. Regulation is needed to ensure that these safety benefits are spread more widely.

2.2.2 Goods vehicles – a need for safer trucks design

In most countries that have data on people killed or seriously injured in a collision with heavy goods vehicles, the majority of the victims are pedestrians and cyclists.

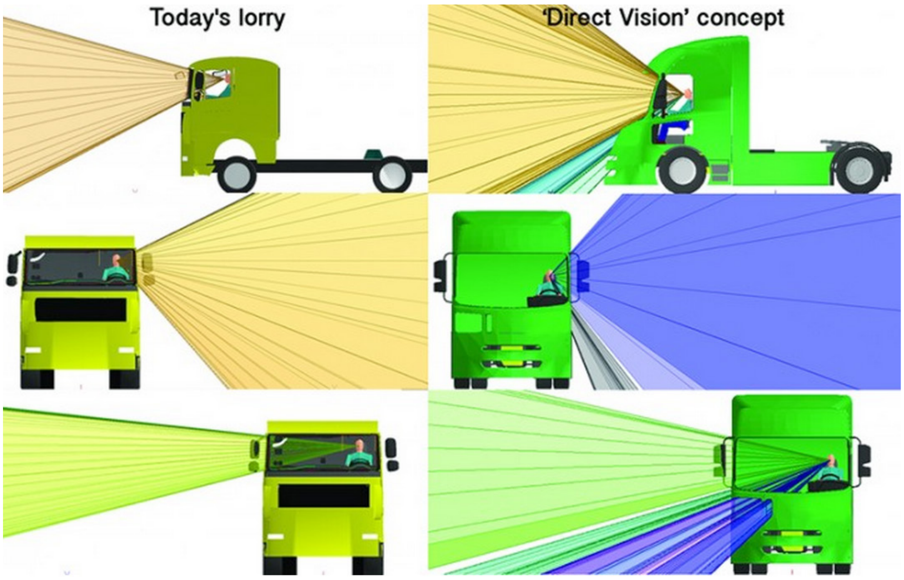
Cyclist and pedestrian collisions with goods vehicles and buses in the EU account for 22% of pedestrian deaths and for 24% of cyclist deaths. Even though they are less frequent than collisions with light motorised vehicles, collisions involving goods vehicles or buses and pedestrians or cyclists tend to be more severe because of the vehicles' size and mass.

As pedestrians and cyclists are among the road users which occupy the smallest amounts of road space, sometimes in drivers' blind spots, they are particularly liable to be involved in collisions where other road users simply do not see them. Goods vehicles and buses have large size and mass which can result in vehicles designed for the carriage of goods and passengers having a reduced field of direct vision for their drivers. As a result, the driver cannot see certain angles properly from their seat and must depend on the mirrors and their visual field through front and side windows.[41] The dimensions of the windows at the front and sides lead to large blind areas in the driver's field of view. Those blind areas change when the vehicle is turning, particularly because the trailer unit always turns along a shorter radius than the cabin unit. That results in the driver being unable to see pedestrians and cyclists who are close to the vehicle, particularly when turning.[42] In most of the countries which have data on people killed or seriously injured in a collision with heavy goods vehicles, the majority of the victims are pedestrians and cyclists.[43]

[40] Euro NCAP, Pedestrian Protection.
[41] Havarikommissionen for Vejtrafikulykker (2006), Ulykker mellem højresvingende lastbiler og ligeudkørende cyklister.
[42] ETSC (2014), Weights and dimensions of heavy goods vehicles – maximising safety.
[43] ETSC (2013), Back on track to reach the EU 2020 Road Safety Target? 7th Road Safety PIN Report.

A study conducted by the Danish Road Directorate has found that one of the most common collision situations among heavy goods vehicles and cyclists in Denmark occurs when a lorry is turning right and a cyclist is going forward. The study revealed that all 25 collisions with killed or injured bicycle riders were related to a wrong mirror setting or/and reduced driver's visibility because of objects in the front screen or side window or/and inadequate orientation.[44] For the last several years heavy goods vehicle drivers in Denmark have been informed and trained on how to position the mirrors correctly.

To counter part of this problem, the EU has adopted changes to the legislation which prescribes the maximum permitted weights and dimension for vehicles using the road network in the EU. The new legislation enables truck manufacturers to increase vehicle length somewhat in order to make changes in lorry cabin design that improve visibility and reduce the impact of collisions on pedestrians, cyclists and other vehicles[45]. However, these changes are yet to be made mandatory and redesigned cabins may only be allowed on EU roads from 2022[46]. Making these changes mandatory is under consideration in the context of the revision of the General Safety Regulation[47].



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Some European cities have undertaken initiatives to reduce goods vehicle and vulnerable road user collisions. Copenhagen, with a population of 500,000, is an example of a city where 60% of citizens use their bikes every day for many of their local trips. To maintain these high levels of cycling and improve safety, a number of policy interventions have been applied, leading to a 24% reduction in the number of cyclists killed or seriously injured over the period 2000 to 2013. These include, for example, restrictions for HGVs over 18 tonnes and recommended routes for HGVs through the city. To further minimise HGV and cyclists collisions, LED technology informs HGV drivers if a cyclist is approaching at junctions. Large stickers have been placed on the ground, in the cycle track at junctions as a very visible reminder to alert cyclists to the dangers.[48] The number of cyclists killed as a result of a collision with right turning heavy goods vehicles in Denmark has decreased by two-thirds since 2004. A new national campaign will be launched to further reduce the number of collisions of these kinds.

Heavy goods vehicles were involved in 55% of all cyclist fatal collisions in London between 2008 and 2013. Two campaigns called CLOCS and FORS were launched to address this issues. CLOCS focuses on construction vehicles which account for a disproportionate number of cyclist deaths or serious injuries in London. The project encourages a wider adoption of best safety practices across the construction sector and aims at developing a national construction vehicles safety standard which would

[44] HVU (2006), Ulykker mellem højresvingende lastbiler og ligeudkørende cyklister.
[45] ETSC (2013) Position Paper: Proposal to Amend Maximum Weights and Dimensions of Vehicles.
[46] ETSC (2015), Position Paper: Revision of the General Safety Regulation.
[47] Ibid.
[48] ETSC (2010), Safer Commuting to Work, 4th PRAISE Report.

help to reduce the risk of collision between construction vehicles and vulnerable road users.[49] The FORS project aims at raising the level of quality within fleet operators which also includes better protection for vulnerable road users. The project has developed standard safety equipment to vehicles over 3.5 tonnes to increase vulnerable road users protection. Standard equipment includes side underrun protections, class VI mirrors, giving the driver a better view of cyclists and pedestrians around the vehicle, and warning signage on the rear of the vehicle to warn vulnerable road users not to get too close to the vehicle.[50]

ETSC runs a project on work related road safety with a specific report on HGV safety which includes a range of recommendations on route planning and avoiding areas and times when vulnerable road users are most present[51]

Recommendations to EU Institutions

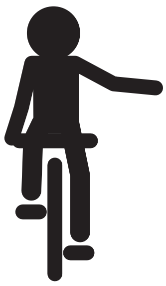
- Within the context of the revision of Regulation 2009/661 on Type-Approval Requirements for the General Safety of Motor Vehicles, develop mandatory requirements for safer goods vehicles to improve cabin design and underrun protection, and remove exemptions that exist so as to oblige use of side guards to protect other road users in collisions with trucks.

Recommendations to Member States

- Restrict heavy goods vehicle circulation in urban areas at certain peak times when there are high numbers of pedestrians and cyclists and develop recommended routes for heavy goods vehicles.
- Introduce LED technology to inform HGV drivers if a cyclist is approaching at junctions on roads frequently used by cyclists.
- Within the upcoming revision of Directive 2003/59 concerning initial and periodic training of professional drivers[52] improve HGV and bus driver awareness of what it is like to be a cyclist interacting with large vehicles.

2.3 Pedestrian and cyclist behaviour

The infrastructure and vehicle developments presented in the sections above can only be fully effective if they are also supplemented by correct user behaviour on the roads. Integrating cycling into the traffic system thus requires that motorised road users act in a way which cyclists can predict and react to safely, and vice versa. Such behaviour can be achieved through an optimal combination of education on safe road use, as well as enforcement of traffic rules.[53]



While pedestrians and cyclists do not need a licence to travel on the roads, it is important that they have at least a minimum of road safety education. The knowledge of road signs and signals is necessary if pedestrians and cyclists are to correctly assess and predict traffic situations and asses other users' behaviour.[54] Cyclists should also indicate their intentions to other traffic by hand signals.

Training courses are provided by local, as well as central authorities, throughout the EU, with abundant examples of education and awareness raising campaigns from several Member States. Most often such campaigns have a dual objective of improving the road skills of existing cyclists and promoting cycling to people who do not cycle often. Such campaigns are often based on the premise that most people know how to ride a bicycle but do not view cycling as a transport mode and attach only recreational value to it.[55]

[49] CLOCS, Looking out for vulnerable road users.
[50] FORS (2015), Fleet Operator Recognition Scheme Standards.
[51] ETSC (2012), PRAISE Report, EU Social Rules and Heavy Goods Vehicle Drivers.
[52] Directive 2003/59/EC of the European Parliament and of the Council of 15 July 2003 on the initial qualification and periodic training of drivers of certain road vehicles for the carriage of goods or passengers.
[53] ETSC (2012), Raising the Bar – Review of Cycling Safety Policies in the European Union.
[54] Ibid.
[55] Ibid.

Recommendations to Member States

- Support and promote research into effective and innovative methods of enforcing traffic rules for pedestrians and cyclists.
- Ensure that cyclists and pedestrians have a minimum level of traffic education and awareness of the risks imposed by the current traffic system through training and education.
- Introduce and enforce sanctions for pedestrians and cyclists for exposing themselves or other road users to unnecessary risks.
- Encourage a Zero Tolerance approach to use of drugs and alcohol to cover all road users, including cyclists.
- Encourage research on road safety implications of electrically assisted cycles.
- Maintain the current definition of pedelecs – with a designed speed of 25km/h and a maximum power of the electric assist of 0.20kW is cut when the vehicle reaches its designed speed.

2.4 Passive safety for cyclists

While neither helmets nor reflective luminous clothing are part of the bicycle, they are a part of the way in which cyclists are noticed by other traffic participants. Cycle helmets are designed to protect the cyclist's head and skull in the event of collision. Helmets sold in the EU have to conform with international standards which prescribe the protection they need to offer. Current EU helmet standards requires impacts of up to around 15-20km/h to be absorbed.

Head and brain injuries sustained by cyclists could be reduced by bringing cycle helmets into general use. According to German Road In-Depth Accident Study (GIDAS), use of helmets might result in 33% reductions of cyclists head injuries of severity AIS3+, isolated soft tissue injuries by 15% and skull and base of skull fractures by 46%.[56]

Recently conducted research in Ireland was based on 37 fatal cyclist collision scenarios. In primary impacts between cyclists and cars the main areas of injury are to the torso or lower limbs and a helmet offers little extra protection except when a car runs into the back of a cyclist thus causing the head to strike the windscreen or bonnet. The helmet then provides protection by reducing forces on the head. Most head injuries were found to occur at secondary impact, usually with the ground and as long as the impact occurs against an area of the head that is above a line near to the rim of the helmet, the helmet provided significant protection. In 26 out of 32 secondary impact cases, helmets would have reduced the Head Injury Criterion scores (HIC-scores) on the cyclist's head by approximately 75%.[57]

Not all the countries collect data on cyclists' helmet wearing rates. However, among those who could provide the figures the largest proportions of cyclists wearing helmets are in Ireland (46%), Switzerland (43%), Finland (41%), Sweden (37%), Estonia (31%), Austria (30%) and Denmark (28%). In Germany 15% of cyclists are wearing helmets, and in Poland and Latvia 12%.

Some European countries are regulating obligatory use of cycle helmets but the extent of legislations vary from country to country (Table 1).

[56] O. Dietmar, W. Birgitt, (2012), Comparison of Injury Situation of Pedestrians and Cyclists in Car Frontal Impacts and Assessment of Influence Parameter on Throw Distance and Injury Severity.
[57] K. Fingleton, M. Gilchrist (2013), UCA Dublin, A study of the protective capabilities of cycle-helmets in collisions involving motor-vehicles based on computer simulated reconstructions.

Table 1: Cycle helmet wearing regulations.[58]

Country	Cycle helmet wearing policies
Austria	Mandatory for children only.
Croatia	Mandatory for cyclists under 16 years.
Czech Republic	Mandatory for cyclists under 18 years.
Estonia	Mandatory for cyclists under 16 years cycling when riding on the road.
Finland	Mandatory (without sanctions).[59]
France	Recommended for children.
Hungary	Mandatory outside built-up areas riding on roads where speeds are higher than 50km/h.
Ireland	Recommended.
Latvia	Mandatory for children.
Lithuania	Mandatory for cyclists under 18 years.
Malta	Mandatory for power assisted pedal cycles and for children under 10 travelling pillion in a safety seat.
Slovenia	Mandatory for children.
Slovakia	Mandatory for cyclists under 15 years and all cyclists outside built-up areas.
Spain	Mandatory for cyclists under 16 years. For cyclists over 16 helmets are recommended in urban areas and mandatory outside urban areas.
Sweden	Mandatory for cyclists under 15 years.
United Kingdom	Recommended.

Recommendations to the EU

- Introduce minimum requirements for cycle lighting and reflective elements.
- Revise standards for testing bicycle helmets to offer high levels of protection.

Recommendations to Member States

- Encourage helmet wearing among cyclists.
- Encourage cyclists to have adequate lighting when cycling in the dark.

[58] European Commission, Mobility and Transport, Road Safety, http://goo.gl/KXtYUg.
[59] Finnish Road traffic act (267/1981).

ANNEXES

Country	ISO Code
Belgium	BE
Bulgaria	BG
Czech Republic	CZ
Denmark	DK
Germany	DE
Estonia	EE
Ireland	IE
Greece	EL
Spain	ES
France	FR
Croatia	HR
Italy	IT
Cyprus	CY
Latvia	LV
Lithuania	LT
Luxembourg	LU
Hungary	HU
Malta	MT
The Netherlands	NL
Austria	AT
Poland	PL
Portugal	PT
Romania	RO
Slovenia	SI
Slovakia	SK
Finland	FI
Sweden	SE
The UK	UK
Serbia	RS
Israel	IL
Norway	NO
Switzerland	CH

Table 1 (Fig.2) Pedestrian, cyclist and PTW user' deaths as a percentage of all road deaths ranked by the share of deaths that were pedestrians and cyclists taken together (2011-2013 average)

	Pedestrians	Cyclists	PTW users	Other road users
LT	37%	9%	6%	48%
RO	37%	8%	7%	48%
LV	36%	9%	6%	49%
PL	33%	8%	9%	49%
MT	39%	2%	27%	32%
EE	29%	11%	5%	55%
IL	33%	5%	14%	48%
HU	23%	13%	12%	51%
RS	25%	9%	8%	58%
CH	23%	10%	23%	44%
CZ	23%	10%	12%	55%
NL	10%	22%	13%	55%
DK	17%	15%	15%	53%
SK	24%	7%	9%	60%
UK	23%	6%	19%	51%
PT	22%	5%	21%	52%
AT	17%	10%	18%	56%
DE	16%	11%	19%	55%
SI	15%	11%	18%	56%
HR	18%	6%	19%	57%
SE	17%	7%	16%	60%
IE	20%	4%	12%	64%
IT	16%	8%	27%	50%
ES	20%	3%	20%	56%
BE	13%	9%	15%	62%
CY	19%	3%	30%	48%
EL	18%	2%	32%	48%
FI	13%	7%	12%	68%
NO	11%	7%	12%	70%
FR	14%	4%	25%	58%
LU	15%	2%	14%	69%
BG	n/a	n/a	n/a	n/a
EU 27	**21%**	**8%**	**18%**	**53%**

Source: Data were retrieved from the EU's CARE road safety database when available and completed or updated by national statistics provided by the PIN Panellists.

Table 2 (Fig.3) Number of pedestrian deaths and average annual percentage change estimated over the period 2003-2013 in pedestrian deaths

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Annual average % change between 2003 and 2013
LV	181	197	174	153	158	105	82	79	60	62	70	71	-12.4%
SK	195	196	174	214	217	204	113	126	75	66	65	58	-12.0%
LT	218	262	256	241	235	174	121	108	110	105	98	109	-10.7%
EE	43	60	47	61	37	40	24	14	26	29	23	26	-9.7%
HU	299	326	289	296	288	251	186	192	124	156	147	n/a	-9.0%
IE	64	66	72	72	81	49	40	44	47	29	31	42	-8.6%
CY	18	18	23	19	17	16	9	13	13	10	8	10	-8.3%
ES	786	683	680	614	591	502	470	471	380	370	371	n/a	-7.6%
SI	38	35	37	36	32	39	24	26	21	19	20	14	-7.3%
UK	802	694	699	697	663	591	524	415	466	429	405	n/a	-6.9%
CZ	290	281	298	202	232	238	176	168	176	163	162	n/a	-6.4%
HR	132	115	101	126	124	136	103	105	71	72	69	73	-5.9%
PL	1,879	1,987	1,756	1,802	1,951	1,882	1,467	1,235	1,408	1,157	1,140	1,107	-5.6%
FI	59	49	45	49	48	53	30	35	41	29	34	34	-5.5%
RS	274	289	225	236	253	225	176	172	187	157	175	127	-5.5%
EL	257	293	234	267	255	248	202	179	223	170	151	n/a	-5.3%
IL	159	166	130	136	114	134	105	119	115	89	91	117	-5.3%
NO	34	22	32	36	23	31	26	24	16	22	18	n/a	-5.3%
DE	812	838	686	711	695	653	591	476	614	527	557	n/a	-4.5%
AT	132	132	97	110	108	102	101	98	87	81	83	n/a	-4.4%
DK	49	43	44	60	68	58	52	44	33	31	34	n/a	-4.3%
IT	871	810	786	758	627	646	667	621	589	576	549	n/a	-4.3%
PT[‡]	280	233	214	156	156	155	148	195	199	159	144	106[p]	-4.2%
NL	97	68	83	66	86	56	63	62	65	64	51	n/a	-4.1%
RO	944	1,059	978	1,034	1,113	1,067	1,015	868	747	728	726	n/a	-3.6%
SE	55	67	50	55	58	45	44	31	53	50	42	53	-3.4%
FR	626	581	635	535	561	548	496	485	519	489	465	n/a	-2.8%
CH	91	95	69	76	79	59	60	75	69	75	69	n/a	-2.4%
BE	114	102	108	125	104	99	105	106	113	104	99	n/a	-0.7%
BG	n/a	n/a	n/a	n/a	n/a	n/a	198	n/a	n/a	n/a	n/a	n/a	
LU	7	12	2	10	7	6	12	1	6	6	5	n/a	-4.6%
MT	n/a	n/a	6	3	5	3	4	3	9	3	5	6	
EU26 [1]	9,248	9,207	8,568	8,469	8,512	7,963	6,865	6,197	6,266	5,681	5,549		-5.5%

The baseline year for calculating average yearly percentage change in the number of pedestrian deaths is 2003.

[1] EU26; BG and MT data are n/a.
[‡] Increases in 2010 and 2011 are partly due to change in reporting methods. Prior to 2010 the number of people killed were people killed on the spot multiplied by a coefficient of 1.15. Since 2010 Portugal is able to collect deaths according to the EU common definition of any person killed immediately or dying within 30 days as a result of an injury collision. Provisional data for 2014.
[p] provisional
LU is excluded from Fig. 3 as the numbers of deaths are small and are therefore subject to substantial annual fluctuation.

Source: Data were retrieved from the EU's CARE road safety database when available and completed or updated by national statistics provided by the PIN Panellists.

Table 3 (Fig.4) Pedestrian deaths (2011-2013 average) per million inhabitants in 2013

	Average number of pedestrian deaths in 2011-2013	Inhabitants in 2013	Pedestrian deaths per million inhabitants
NL	60	16,779,575	**3.6**
NO	19	5,051,275	**3.7**
SE	48	9,555,893	**5.1**
DK	33	5,602,628	**5.8**
FI	35	5,423,679	**6.4**
UK	433	63,905,297	**6.8**
DE	566	80,523,746	**7.0**
FR	491	65,560,721	**7.5**
IE	36	4,591,087	**7.8**
ES	374	46,727,890	**8.0**
CH	71	8,039,060	**8.8**
BE	105	11,161,642	**9.4**
IT	571	59,685,227	**9.6**
SI	20	2,055,496	**9.7**
AT	84	8,451,860	**9.9**
CY	10	865,878	**11.9**
IL	98	8,134,800	**12.1**
SK	69	5,410,836	**12.7**
HU	142	9,908,798	**14.4**
CZ	167	10,516,125	**15.9**
PT	167	10,487,289	**16.0**
EL	181	11,123,034	**16.3**
HR	71	4,262,140	**16.6**
EE	26	1,320,174	**19.7**
RS	173	7,181,505	**24.1**
LV	64	2,023,825	**31.6**
PL	1235	38,062,535	**32.4**
LT	104	2,971,905	**35.1**
RO	734	20,020,074	**36.6**
LU	6	537,039	**10.6**
MT	6	421,364	**13.4**
BG	n/a	7,284,552	**n/a**
EU27[1]	**5,838**	**497,955,757**	**11.7**

[1] EU27; BG data are n/a.
LU and MT are excluded from Fig. 3 as the numbers of deaths are small and are therefore subject to substantial annual fluctuation.

Source: National statistics provided by the PIN panellists for each country, completed with Eurostat for population figures.

Table 4 (Fig.5) Average annual pedestrian deaths per million inhabitants in 2011-2013 for each of the agegroups in 2013 under 15, 15-24, 25-49, 50-64 and 65 and over

	Share of population by age group 2013				
	<15	15-24	25 - 49	50 - 64	65 +
AT	14.4%	12.1%	35.8%	19.7%	18.1%
BE	17.0%	12.0%	33.9%	19.5%	17.6%
CZ	14.8%	11.1%	37.3%	20.0%	16.8%
DE	13.1%	10.9%	34.1%	21.1%	20.7%
DK	17.4%	12.8%	32.8%	19.1%	17.9%
EE	15.7%	11.8%	34.5%	20.0%	18.0%
ES	15.2%	9.9%	38.9%	18.4%	17.7%
FI	16.4%	12.2%	31.6%	21.0%	18.8%
FR	18.6%	12.0%	32.5%	19.3%	17.5%
EL	14.7%	10.6%	35.9%	18.8%	19.8%
HR	14.9%	11.7%	33.8%	21.3%	18.2%
HU	14.4%	12.1%	35.5%	20.8%	17.2%
IE	21.9%	11.7%	37.7%	16.4%	12.2%
IT	14.0%	9.9%	35.3%	19.7%	21.2%
LV	14.4%	12.0%	34.4%	20.4%	18.8%
LT	14.7%	13.5%	33.3%	20.2%	18.2%
NL	17.2%	12.2%	33.5%	20.3%	16.8%
PL	15.1%	12.8%	36.3%	21.4%	14.4%
PT	14.8%	10.7%	35.4%	19.8%	19.4%
RO	15.7%	11.8%	36.3%	20.0%	16.3%
SE	16.9%	12.9%	32.8%	18.3%	19.1%
SI	14.5%	10.5%	36.6%	21.4%	17.0%
SK	15.4%	13.0%	38.2%	20.3%	13.1%
UK	17.6%	12.9%	34.2%	18.1%	17.2%
RS	14.4%	11.5%	33.8%	22.8%	17.6%
IL	28.2%	15.2%	32.2%	13.9%	10.5%
NO	18.4%	13.2%	34.6%	18.2%	15.7%
CH	14.9%	11.7%	36.4%	19.5%	17.4%
CY	16.4%	15.0%	37.6%	17.9%	13.2%
LU	17.0%	12.2%	38.5%	18.4%	14.0%
MT	14.6%	13.2%	33.8%	21.3%	17.1%
BG	13.60%	10.9%	35.1%	21.2%	19.2%
EU28	**15.6%**	**11.5%**	**35.0%**	**19.7%**	**18.2%**

	Average number of pedestrian deaths by agegroup in 2011 - 2013 per million inhabitants for each of the agegroups				
	<15	15-24	25 - 49	50 - 64	65 +
AT	3.3	8.1	4.8	9.0	27.2
BE	4.7	6.7	6.2	7.4	24.3
CZ	3.4	10.0	12.0	18.7	34.7
DE	2.2	6.4	3.7	5.3	17.6
DK	2.7	5.6	3.4	6.9	12.3
EE	3.2	10.7	10.2	31.6	44.9
ES	2.1	3.7	4.0	6.2	25.3
FI	2.2	3.5	4.3	4.4	17.7
FR	2.5	5.6	4.2	6.0	22.0
EL	5.3	7.3	7.5	13.0	43.3
HR	7.3	8,0	8.8	19.8	40.4
HU	2.6	7.5	9.4	21.0	30.5
IE	2.3	6.2	6.5	6.6	24.4
IT	1.6	4.4	4.2	7.3	27.8
LV	5.7	4.1	32.6	28.3	60.5
LT	10.7	24.1	22.9	53.9	63.5
NL	1.2	3.4	1.8	3,0	10.1
PL	6.0	18.5	25.8	46.7	66.3
PT	4.7	5.6	7.5	17.8	43.3
RO	16.4	16.5	23.9	47.1	85.2
SE	1.7	4.6	2.1	4.6	13.9
SI	4.5	7.7	6.6	12.9	18.1
SK	5.6	4.7	7.9	17.6	31.0
UK	2.2	7.3	5.9	5.6	14.1
RS	5.5	12.1	11.5	25.7	68.3
IL	6.8	9.5	6.4	15.6	38.9
NO	0.7	2.0	2.1	4.7	10.9
CH	5.0	4.3	3.2	6.0	30.3
EU27[1]	**3.4**	**7.5**	**7.6**	**12.8**	**27.9**

CY, MT and LU are excluded from the Fig. 5 as the numbers of deaths are small and are therefore subject to substantial annual fluctuation.
[1] EU27; BG data are n/a.

Source: Population data were retrieved from Eurostat database. IL population data provided by PIN panellists.

Table 5 (Fig.6) Percentage share of pedestrian deaths by road type in 2011-2013

	Urban	Rural roads except motorways	Motorways	Other/ Unknown
HR	83%	12%	5%	0%
RO	80%	20%	0%	0%
PT	80%	16%	4%	0%
IT	78%	18%	4%	0%
EL	78%	18%	3%	0%
CH	78%	17%	5%	0%
DE	71%	23%	5%	0%
IL	71%	27%	2%	0%
CY	71%	29%	0%	0%
FR	68%	27%	5%	0%
CZ	67%	31%	2%	0%
NO*	65%	35%	0%	0%
PL	64%	35%	1%	0%
UK	64%	31%	2%	2%
EE	64%	36%	-	0%
AT	64%	29%	8%	0%
NL	63%	22%	12%	3%
FI	63%	33%	5%	0%
SI	62%	22%	17%	0%
HU	61%	37%	2%	0%
BE	61%	27%	6%	6%
DK	60%	37%	3%	0%
ES	59%	26%	14%	0%
IE	59%	37%	4%	0%
SE	56%	33%	8%	3%
LV	50%	46%	-	5%
LT	44%	50%	2%	3%
LU	76%	12%	12%	0%
BG	n/a			
MT	n/a			
SK	n/a			
RS	n/a			
EU25	**69%**	**27%**	**4%**	**0%**

* Average number of pedestrian deaths 2011 and 2013.
** Motorways and autovias.
(1) EU 25; BG, MT and SK data are n/a.

LU is excluded from Fig. 6 as the numbers of deaths are small and are therefore subject to substantial annual fluctuation.

Table 6 (Fig. 7) Percentage share of pedestrian deaths by gender in the last three years (2011 - 2013)

	Male	Female	Unknown
PL	71%	29%	0%
LV	68%	23%	8%
UK	68%	32%	0%
LT	67%	32%	1%
IE	66%	34%	0%
RO	65%	35%	0%
IL	65%	34%	1%
SI	65%	35%	0%
ES	64%	36%	1%
RS	63%	37%	0%
HU	63%	36%	1%
EL	63%	37%	0%
HR	62%	38%	0%
PT	62%	38%	0%
IT	61%	39%	0%
NO	61%	39%	0%
SE	61%	39%	0%
NL	61%	39%	0%
FR	60%	40%	0%
CZ	59%	38%	3%
AT	57%	43%	0%
EE	56%	44%	0%
DE	55%	45%	0%
BE	54%	45%	1%
DK	53%	47%	0%
FI	52%	48%	0%
CH	49%	51%	0%
CY	48%	52%	0%
LU	53%	47%	0%
MT	76%	24%	0%
BG	n/a		
SK	n/a		
EU26 (1)	**64%**	**36%**	**0%**

* Average number of pedestrian deaths 2011-2012.
(1) EU26; BG and SK data are n/a.

CY, LU and MT are excluded from the Fig. 7 as the numbers of deaths are small and are therefore subject to substantial annual fluctuation.

Table 7 (Fig. 8) Percentage share of pedestrian deaths occurring in collisions with different types of vehicles in the last 3 years (2011 - 2013)

	Car or taxi	PTW	Goods vehicles + bus/ coach	Other vehicle/ Unknown
LT	76%	1%	12%	12%
PL	75%	2%	18%	5%
SI	75%	2%	24%	0%
RS	75%	3%	6%	16%
IT	72%	10%	16%	2%
IE	71%	2%	21%	7%
DK	69%	3%	24%	3%
DE	68%	2%	20%	10%
RO	68%	2%	25%	5%
UK	66%	3%	28%	3%
FR	65%	6%	27%	2%
EE	64%	1%	27%	8%
CZ	64%	1%	28%	7%
SE	63%	3%	28%	6%
AT	63%	2%	24%	10%
CH	62%	2%	19%	17%
HU	61%	5%	27%	7%
PT	60%	4%	31%	5%
BE	59%	2%	33%	7%
NO	58%	0%	34%	8%
EL*	58%	20%	16%	7%
NL	57%	3%	28%	12%
LV	57%	2%	30%	12%
IL	52%	3%	43%	2%
FI	50%	2%	44%	4%
CY	90%	3%	0%	6%
LU	88%	0%	12%	0%
MT	73%	27%	0%	0%
BG	n/a			
ES	n/a			
HR	n/a			
SK	n/a			
EU24 (1)	**68%**	**4%**	**22%**	**5%**

* Average number of pedestrian deaths 2011-2012.
(1) EU 24; BG, ES, HR, LT, MT and SK data are n/a.
CY, LU and MT are excluded from the Fig. 8 as the numbers of deaths are small and are therefore subject to substantial annual fluctuation.

Table 8 (Fig.9) Number of cyclist deaths and average annual percentage change in cyclist deaths over the period 2003 - 2013

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Annual average % change between 2003 and 2013
LT	85	87	84	68	73	38	30	23	26	32	18	19	**-15.4%**
SK	71	66	56	52	61	46	22	27	18	26	16	24	**-14.3%**
LV	40	30	31	33	18	15	26	13	15	18	13	16	**-9.8%**
HU	178	183	152	153	158	109	103	92	85	84	68	n/a	**-9.6%**
PL	647	691	603	509	498	433	371	280	313	300	306	285	**-9.1%**
CZ	159	131	115	110	116	93	84	80	63	78	74	68	**-7.6%**
HR	48	36	34	50	28	47	28	27	28	21	23	19	**-6.7%**
FI	39	26	43	29	22	18	20	26	19	19	20	24	**-6.5%**
DK	47	53	41	31	54	54	25	26	30	22	33	n/a	**-6.5%**
SE	35	27	38	26	33	30	20	21	21	28	14	34	**-6.3%**
PT[‡]	63	47	48	40	34	42	29	33	45	32	29	n/a	**-5.4%**
RS	86	100	92	85	96	85	77	65	56	69	59	50	**-5.0%**
DE	616	475	575	486	425	456	462	381	399	406	354	n/a	**-4.4%**
EE	15	9	12	18	14	10	7	9	13	8	9	2	**-4.3%**
CH	48	42	37	35	30	27	54	34	39	36	21	n/a	**-3.6%**
ES	78	88	82	72	90	59	57	67	48	74	70	n/a	**-3.1%**
NL	187	157	151	179	147	145	138	119	144	145	128	n/a	**-2.9%**
IT	355	322	335	311	352	288	295	265	282	292	251	n/a	**-2.8%**
BE	109	78	71	91	90	86	88	70	70	69	73	n/a	**-2.8%**
EL	21	24	18	21	16	22	15	23	13	21	15	n/a	**-2.8%**
FR	201	177	180	181	142	148	162	147	141	164	147	n/a	**-2.6%**
IL	23	12	21	14	6	13	15	18	16	11	13	10	**-2.3%**
UK	116	136	152	147	138	117	104	111	109	120	113	n/a	**-2.2%**
SI	14	21	18	14	17	16	18	16	14	12	16	13	**-1.8%**
AT	56	58	47	48	37	62	39	32	42	52	51	n/a	**-1.8%**
RO	156	130	206	198	179	179	157	182	140	154	161	n/a	**-0.6%**
NO	14	10	7	8	7	10	9	5	12	12	10	n/a	**0.0%**
IE	11	11	10	9	15	13	7	5	9	8	5	13	**-6.6%**
CY	2	2	1	2	3	6	2	2	2	1	2	1	**-1.0%**
LU	0	0	1	0	0	0	2	1	2	0	0	n/a	**n/a**
MT	n/a					0	1	0	1	0	0	0	**n/a**
BG	n/a												**n/a**
EU27[(1)]	3,349	3,065	3,104	2,878	2,760	2,532	2,311	2,078	2,091	2,186	2,009		**-5.2%**

[(1)] EU 26; BG and MT n/a or not sufficient.

[(‡)] Increases in 2010 and 2011 are partly due to change in reporting methods. Prior to 2010 the number of people killed were people killed on the spot multiplied by a coefficient of 1.15. Since 2010 Portugal is able to collect deaths according to the EU common definition of any person killed immediately or dying within 30 days as a result of an injury collision.

CY, IE and LU are excluded from Fig. 9 as the numbers of deaths are small and are therefore subject to substantial annual fluctuation.MT cyclist numbers are gathered according to press.

Source: Data were retrieved from the EU's CARE road safety database when available and completed or updated by national statistics provided by the PIN Panellists.

Table 9 (Fig.10) Average annual cyclist deaths in 2011-2013 per million inhabitants in 2013

	Average number of cyclist deaths in 2011-2013	Inhabitants in 2013	Cyclist deaths per million inhabitants
ES	64	46,727,890	**1.4**
EL	16	11,123,034	**1.5**
IE	7	4,591,087	**1.6**
IL	13	8,134,800	**1.6**
UK	114	63,905,297	**1.8**
CY	2	865,878	**1.9**
SE	21	9,555,893	**2.2**
NO	11	5,051,275	**2.2**
FR	151	65,560,721	**2.3**
PT	35	10,487,289	**3.4**
FI	19	5,423,679	**3.6**
SK	20	5,410,836	**3.7**
CH	32	8,039,060	**4.0**
IT	275	59,685,227	**4.6**
DE	386	80,523,746	**4.8**
DK	28	5,602,628	**5.1**
HR	24	4,262,140	**5.6**
AT	48	8,451,860	**5.7**
BE	71	11,161,642	**6.3**
SI	14	2,055,496	**6.8**
CZ	72	10,516,125	**6.8**
EE	10	1,320,174	**7.6**
RO	152	20,020,074	**7.6**
LV	15	2,023,825	**7.6**
HU	79	9,908,798	**8.0**
PL	306	38,062,535	**8.0**
NL	139	16,779,575	**8.3**
LT	25	2,971,905	**8.5**
RS	61	7,181,505	**8.5**
MT	0	421,364	**0.8**
LU	1	537,039	**1.2**
BG	n/a	7,284,552	**n/a**
EU27(1)	2,096	467,553,070	**4.2**

* Average number of cyclist deaths 2011-2012.
(1) EU 27; BG data are n/a.
Source: Population data were retrieved from Eurostat database.

Table 10 (Fig. 11) Average annual cyclist deaths per million inhabitants in 2011-2013 for each of the agegroups under 15, 15-24, 25-49, 50-64 and 65 and over

	0-15	15-24	25 - 49	50 - 64	65+
AT	0.8	1.3	2.1	5.8	19.6
BE	2.5	4.1	2.1	7.5	19.3
CZ	0.9	4.0	3.6	12.2	14.7
DE	1.5	2.3	2.2	4.7	12.6
DK	1.7	4.6	2.9	4.7	13.0
EE	1.6	4.3	6.6	12.6	11.2
ES	0.4	1.5	1.0	1.8	2.3
FI	2.2	1.0	1.6	4.1	9.2
FR	0.9	1.9	1.5	3.3	4.4
EL	0.6	1.7	1.4	1.0	2.4
HR	1.6	3.3	3.5	5.9	14.2
HU	0.7	3.1	5.5	12.1	17.6
IE	0.7	1.9	1.7	1.8	2.4
IT	0.5	2.3	2.9	4.4	11.2
LV	1.1	8.2	6.7	9.7	9.6
LT	5.3	3.3	8.4	13.3	9.2
NL	3.1	5.9	2.8	5.5	29.6
PL	1.9	4.0	4.1	12.6	21.0
PT	0.6	2.1	3.0	4.0	5.7
RO	2.4	3.1	6.0	10.7	15.5
SE	0.4	0.5	1.3	3.4	5.3
SI	1.1	3.1	5.3	9.1	14.2
SK	0.4	0.5	0.0	0.3	8.0
UK	0.5	2.2	2.1	2.2	1.8
RS	1.6	3.2	4.9	13.0	18.7
IL	0.6	0.5	0.9	2.4	5.1
CH	0.8	1.8	1.9	5.7	10.5
BG	n/a				
EU27 (1)	**1.1**	**2.6**	**2.6**	**5.3**	**10.0**

CY, MT and LU are excluded from the Fig. 11 as the numbers of deaths are small and are therefore subject to substantial annual fluctuation.

(1) EU 27; BG data are n/a.

Table 11 (Fig.12) Cyclist deaths by road type in 2011-2013

	Urban	Rural	Unknown
HR	83%	17%	0%
RO	75%	25%	0%
CH	67%	33%	0%
HU	64%	36%	0%
DK	62%	38%	0%
NL	62%	37%	1%
SI	62%	38%	0%
DE	61%	39%	0%
PT	60%	40%	0%
IT	59%	41%	0%
EL	59%	39%	2%
IL	58%	43%	0%
FI	57%	43%	0%
CZ	57%	43%	0%
PL	56%	44%	0%
SE	56%	44%	0%
NO**	55%	45%	0%
AT	52%	48%	0%
SK	50%	50%	0%
UK	44%	53%	2%
BE	41%	53%	6%
FR	40%	60%	0%
ES	30%	66%	4%
LV	20%	78%	2%
LT	18%	74%	8%
LU	100%	0%	0%
CY	20%	80%	0%
IE	36%	64%	0%
EE	33%	67%	0%
BG	n/a		
MT	n/a		
RS	n/a		
EU (1)	**56%**	**44%**	**1%**

* Average number of cyclist deaths 2011 and 2013
(1) EU 28 except BG, MT and SK

CY, EE, IE and LU are excluded from the Fig. 12 as the numbers of deaths are small and are therefore subject to substantial annual fluctuation.

Table 12 (Fig.13) Percentage share of cyclist deaths by gender in the last three years (2011 - 2013)

	Male	Female	Unknown
RO	94%	6%	0%
PT	93%	6%	1%
ES	93%	7%	0%
EL	92%	8%	0%
IL	90%	5%	5%
UK	85%	15%	0%
HR	83%	17%	0%
IT	83%	17%	0%
RS	83%	17%	0%
FR	83%	17%	0%
NO	82%	18%	0%
CZ	81%	17%	2%
LV	78%	11%	11%
LT	78%	22%	0%
IE	77%	23%	0%
SI	76%	24%	0%
PL	75%	25%	0%
CH	74%	26%	0%
HU	74%	26%	0%
BE	72%	28%	0%
DE	70%	30%	0%
AT*	69%	31%	0%
SE	67%	33%	0%
NL	64%	36%	0%
FI	59%	41%	0%
DK	58%	42%	0%
CY	60%	40%	0%
EE	73%	27%	0%
LU	50%	50%	0%
BG	n/a		
MT	n/a		
SK	n/a		
EU25 (1)	**78%**	**22%**	**0%**

(1) EU 25; BG, MT and SK are excluded due to insufficient data.
* Average number of cyclist deaths 2011-2012.
CY, EE, IE and LU are excluded from the Fig. 13 as the numbers of deaths are small and are therefore subject to substantial annual fluctuation.

Table 13 (Fig.14) Percentage share of cyclist deaths occurring in collisions with different types of vehicles in the last 3 years (2011 - 2013)

	Car or taxi	Goods vehicles + bus/coach	PTW users	Cyclist only	Other vehicle/ Unknown
LT	74%	20%	0%	0%	7%
PL	63%	26%	2%	5%	5%
ES	62%	16%	3%	16%	3%
EL*	62%	9%	12%	12%	6%
SI	61%	7%	0%	22%	10%
IT	60%	20%	4%	12%	5%
PT	54%	24%	3%	18%	2%
UK	53%	30%	1%	12%	4%
RO	51%	25%	1%	19%	3%
FR	50%	27%	3%	15%	5%
NL	49%	28%	3%	5%	14%
BE	49%	31%	3%	12%	5%
IL	48%	43%	0%	10%	0%
SE	46%	16%	3%	27%	8%
DK	46%	36%	1%	13%	4%
DE	45%	22%	2%	23%	7%
LV	45%	23%	2%	19%	11%
HU	42%	29%	3%	21%	5%
CZ	40%	21%	1%	32%	6%
FI	40%	22%	7%	21%	10%
AT	34%	22%	3%	27%	14%
IE	33%	17%	0%	6%	44%
CH	27%	30%	2%	33%	9%
CY	100%	0%	0%	0%	0%
EE	60%	27%	0%	3%	10%
LU	0%	50%	0%	50%	0%
BG	n/a				
HR	n/a				
MT	n/a				
SK	n/a				
RS	n/a				
NO	n/a				
EU24[(1)]	**52%**	**24%**	**2%**	**15%**	**6%**

* Average number of cyclist deaths 2011 and 2013.
[(1)] EU 24; BG, HR, MT, SK, RS and NO data are n/a.
In some countries double counting might occur when more than two vehicles are involved in a collision with a cyclist. However, these numbers are small and do not have a big effect on the overall totals.

CY, EE and LU are excluded from Fig. 14 as the numbers of deaths are small and are therefore subject to substantial annual fluctuation.

Table 14. Total number of powered-two-wheelers killed on the roads

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
AT	144	135	156	142	139	134	120	116	117	86	85	86	102	
BE	210	224	169	153	155	166	165	140	164	124	147	101	115	
CY	24	22	21	35	24	25	25	24	25	21	18	17	15	14
CZ	95	134	112	102	124	116	139	123	94	99	84	93	72	
DE	1,102	1,044	1,080	980	982	900	907	766	749	709	778	679	641	
DK	55	62	68	69	45	45	84	70	42	33	37	24	26	
EE	7	5	5	3	7	7	14	7	5	7	5	3	5	7
ES	831	784	758	760	784	791	872	665	593	486	421	371	358	
FI	23	29	35	34	34	37	41	46	38	25	38	28	29	18
FR	1,542	1,450	1,276	1,205	1,248	1,106	1,177	1,108	1,207	982	1,006	871	817	
EL	503	396	363	434	457	497	463	435	433	403	339	317	317	
HR	55	78	81	77	95	81	116	127	96	66	86	78	63	56
HU	114	93	102	94	140	131	143	117	96	68	83	64	82	
IE	50	44	55	49	56	29	33	29	25	17	18	19	26	24
IT	1,426	1,359	1,555	1,595	1,505	1,473	1,540	1,377	1,249	1,156	1,088	974	849	
LU	6	0	13	11	6	8	6	9	7	1	3	5	8	
LV	19	30	21	25	16	16	14	18	11	21	11	10	13	16
LT										18	16	21	17	10
MT					2	2	4	4	5	4	5	2	5	1
NL	154	191	189	141	133	120	124	118	115	92	86	93	70	
PL	232	226	199	232	210	221	274	349	358	342	379	343	315	308
PT[‡]	413	369	371	302	294	234	215	187	173	203	187	161	129	
RO	13	19	18	20	43	80	154	240	196	173	156	161	91	
SE	47	49	56	74	54	70	74	62	58	45	57	39	43	38
SI	50	23	32	29	39	54	53	46	31	23	30	22	21	17
SK	36	36	32	33	45	37	54	39	34	27	27	27	19	21
UK	594	628	715	607	584	612	614	509	488	413	369	332	341	
RS	28	25	22	30	33	40	56	79	71	48	62	62	37	40
IL	37	41	40	31	39	36	36	46	33	43	45	36	39	37
NO	33	43	37	41	35	37	40	37	29	26	17	21	24	
CH	116	96	117	123	92	80	89	92	86	72	72	77	63	
BG	n/a								53	n/a				
EU25[1]	7,745	7,430	7,482	7,206	7,219	6,990	7,421	6,727	6,404	5,622	5,538	4,918	4,567	

[‡] Increases in 2010 and 2011 are partly due to change in reporting methods. Prior to 2010 the number of people killed were people killed on the spot multiplied by a coefficient of 1.15. Since 2010 Portugal is able to collect deaths according to the EU common definition of any person killed immediately or dying within 30 days as a result of an injury collision.

[1] EU25; BG, LT and MT data are not sufficient.

Table 15. Helmet wearing rates for cyclists

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
AT	11%			15%		22%			27%	34%	32%	29%	35%	30%
DK				6%		11%		15%	20%	25%	26%	28%	27%	28%
EE						13%	25%	30%			24%	27%	34%	31%
FI	21%	22%	27%	25%	29%	29%	33%	31%	32%	33%	37%	37%	44%	41%
DE	5%	5%	6%	6%	6%	7%	9%	10%	11%	9%	11%	13%	15%	
IE									17%	18%	49%	53%	52%	46%
LV											9%	11%	13%	12%
PL													9%	12%
SE	15%	17%	18%	21%	24%	25%	27%	28%	27%	27%	32%	33%	36%	37%
UK		25%		28%		31%		34%						
RS													1%	
IL									17%-28%	13%-32%		14%-27%		
NO	33%	30%	31%	33%		35%	41%	35%	44%	49%				
CH	20%	23%	27%	33%	34%	39%	38%	38%	38%	37%	40%	43%	46%	43%

Source: PIN Panellists

Table 16. Bicycle kilometre ridden (mln.)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BE									3,033					
FI										1,310				
DK	2,860	3,020	2,970	2,820	3,010	2,970	2,880	3,040	2,950	2,620				
NL	13,000	12,900	13,800	13,700	14,200	14,000	14,100	13,700	15,000	13,700	14,900	14,700	14,500	
NO	524				691				821					
SE											1,998	1,654	1,705	
CH					2,087									
GB	4,199	4,356	4,434	4,117	4,314	4,502	4,105	4,570	4,774	4,834	4,941	5,003	5,036	

Source: National statistics provided by PIN Panellists.

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