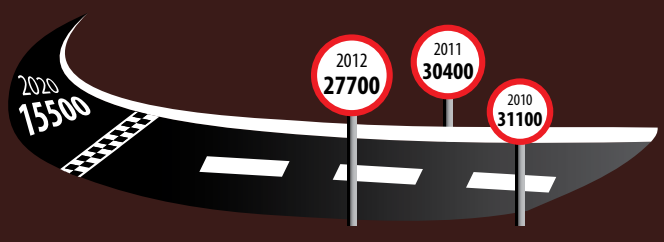
Back on track to reach the EU 2020 Road Safety Target?

7th Road Safety PIN Report



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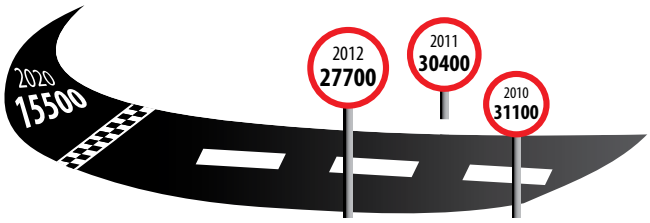

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17 June 2013

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This report is part of ETSC's Road Safety PIN Programme. The PIN Programme relies on the Panellists in the participating countries to provide the data for their countries and to confirm the quality of the data. This forms the basis for all PIN publications, which are circulated in draft to the PIN Steering Group and Panel for comment and are finalised after taking account of comments received from them.

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The European Transport Safety Council

The European Transport Safety Council (ETSC) is an international non-governmental organisation which was formed in 1993 in response to the persistent and unacceptably high European road casualty toll and public concern about individual transport tragedies. It brings together experts of international reputation and representatives of 47 national and international organisations concerned with transport safety from across Europe to exchange experience and knowledge and to identify and promote research-based contributions to transport safety. ETSC provides an impartial source of advice on transport safety matters to the European Commission, the European Parliament and to national governments and organisations concerned with safety throughout Europe.

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Regaining pace: road deaths down by 9% in 2012

A total of **27,700** people were killed in the EU27 as a consequence of road collisions. Around **313,000** were recorded as seriously injured and many more suffered slight injuries.

Following disappointing results from 2011, the year 2012 brings a welcome contrast as 27 out the 31 countries monitored by the PIN Programme registered a drop in the number of road deaths. Frontrunners are Malta and Cyprus followed by Israel and Denmark. But road deaths increased in Switzerland, Luxembourg, Lithuania and Romania.

There have been **2,661** fewer road deaths in 2012 than in 2011 in the EU as a whole. The monetary value of this reduction is estimated at **5 billion Euro**. For the EU to be reaching the 2020 target through constant annual progress, another **600** deaths would have had to be saved over the 2011-2012 period.

At the moment, the prospect for achieving the EU 2020 target is seen as achievable by all Member States, if they continue their sustained efforts and show political will to invest in road safety. Important safety measures are still to be implemented fully or are being developed.

The European Commission presented its **'First Milestone towards an injury strategy'** in March 2013 as the first step towards coming up with a strategy. ETSC welcomes the adoption by the European Commission of a common EU definition of seriously injured casualties as in-patients with an injury level of MAIS 3 or more. Each Member State should work towards adopting the MAIS3+ definition and adapting their data collection system.

Road deaths in collisions involving goods vehicles and buses

In the European Union **4,254** people lost their lives in collisions involving heavy goods vehicles (HGVs) in 2011, **3,999** in collisions involving light goods vehicles (LGVs) – goods vehicles with a maximum permitted weight below 3.5 tonnes – and **722** in collisions involving a bus, coach or trolleybus, these three groups totalling **29%** of the overall number of road deaths recorded in 2011.

Since 2001, for the EU as a whole, deaths in collisions involving an HGV and in collisions involving a bus or coach were reduced at a somewhat faster pace than the overall number of road deaths, with average annual reductions of **6%** and **6.4%** respectively compared with **5.7%** for the overall number of road deaths. However, the number of deaths per distance travelled for heavy goods vehicles, as well as buses and coaches, is larger than the average across the whole vehicle fleet. Because large proportions of those killed in such collisions are non-users of these verhicles, their deaths add an important dimension of externalities to the cost of transport of goods and passengers.

The chapter underlines that general as well as targeted road safety measures should be combined in order to reduce road deaths in collisions involving these types of vehicle sustainably. These include the enforcement of current legislation, particularly when aimed at HGVs and buses, the promotion and large-scale rollout of life-saving technologies and the training of road users, with a renewed focus on those who drive as part of their work or profession.

Risk on the roads: a male problem? - The role of gender in road safety

In 2011, out of the 30,300 people killed in the EU27 in road collisions, **7,200** were females and **23,200** males. At a closer look, females account for 51% of the total EU population but only **24%** of road deaths, a percentage that has changed only slightly since 2001. Males account for **76%** of people killed on the roads in the EU in 2011.

On average, in the EU, 90 men are killed on the roads each year per million male population, compared with 27 women per million female population. Across Europe, females have a road mortality rate less than one-third that of males. Hypothetically, if all EU road users used the roads like females in their respective countries do now, the road mortality rate across the EU would be about 20% lower than the average for the SUN countries, and even in the countries with the highest road mortality it would be no higher than it is in Germany now. Males are mainly killed as car drivers and motorcycle riders while females are mainly killed as pedestrians and car passengers.

There is extensive evidence to show that men have a higher rate of collision, as well as more frequently showing dangerous behaviours. Member States and the EU should address the myriad of differences between men and women, by recognising them and developing gender-differentiated policies in relevant areas.

Introduction

In April 2006, the European Transport Safety Council set up the Road Safety Performance Index as a response to the first target set by the European Union to halve road deaths between 2001 and 2010. By comparing Member States' performance, the PIN serves to identify and promote best practice and bring about the kind of political leadership that is needed to create what citizens deserve - a road transport system that offers all practicable safety.

The Index covers all relevant areas of road safety including road user behaviour, infrastructure and vehicles, as well as road safety policymaking more generally. Comparisons among countries are published in the series of **PIN Flashes**, gathered in seven **PIN Reports**.
http://www.etsc.eu/PIN-publications.php

In June each year at the **PIN Conference** ETSC publicises the results of the Annual Report and awards the **PIN Award** to a high level policymaker responsible for the selected country's outstanding progress in road safety. The findings from the country rankings have been discussed in 35 national **PIN Talks**. National decision-makers are confronted with both the successes and shortcomings of their road safety policies. http://www.etsc.eu/PIN-events.php

The **6th PIN Report** presented the results of the first year of progress towards the EU target of halving road deaths between 2011 and 2020. It provided a snapshot of the key elements of road safety management in the PIN countries, and looked at the countries' progress in reducing the number of road deaths among young people.

The current **7th PIN Report** gives an overview of the European countries' performance in three areas of road safety. Building on the previous Road Safety PIN Reports, it presents in Chapter 1 the developments in the numbers of road deaths and serious injuries during the second year of the EU 2020 road safety target and estimates the monetary value of the consequent benefit to society. Additionally, these developments are set in the context of reduction in road deaths since 2001, the baseline year of the first EU road safety target. Chapter 2 looks at the safety of transport of goods and passengers, showing that, when planning and introducing policies to improve road safety, Member States should maintain focus on vehicles with a large mass. Chapter 3 provides a gender perspective by comparing differences in road deaths between males and females and ranking countries' progress in reducing road deaths by gender.

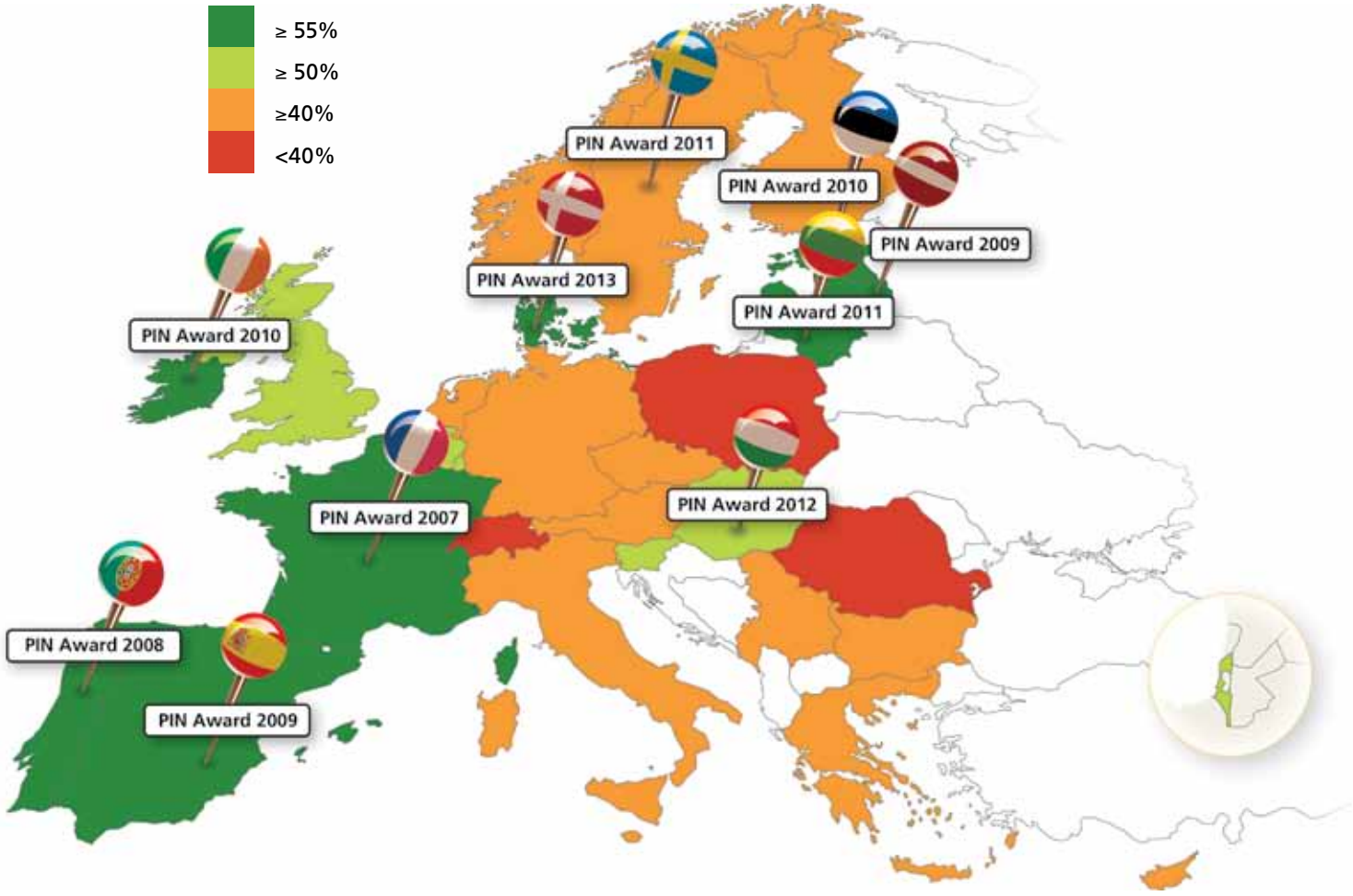
ETSC carried out these rankings during the seventh year of the Road Safety PIN programme between September 2012 and June 2013. The Report covers 31 countries: the 27 Member States of the European Union, together with Israel, Norway, the Republic of Serbia and Switzerland.

1| Regaining pace: road deaths down by 9% in 2012

The European Union has renewed its commitment to improving road safety by setting a target of reducing road deaths by another 50% by 2020, compared to 2010 levels. The rankings presented in this chapter show the latest developments in road safety in 2012, the second annual step toward the 2020 goal, since the base year 2010 of the 2020 target and since the base year 2001 of the 2010 target.

Malta and **Cyprus** top the ranking for reduction in road deaths between 2011 and 2012, followed by **Israel** and **Denmark**, all with reductions of more than 20% (Fig. 1). Reductions since 2010 have been highest in **Malta**, **Denmark**, **Norway**, **Spain** and **Israel** (Fig. 3).

Seven countries had reached the EU 2010 target in that year. In 2012, two years later, the number of countries where road deaths were fewer than half of those in 2001 rose to 15. **Latvia**, **Spain** and **Ireland** lead this ranking (Map, Fig. 4), followed by Denmark, Lithuania, Estonia, Portugal, France, Slovenia, Slovakia, Israel, Luxembourg, Hungary, the UK and Belgium.



Percentage reduction in road deaths between 2001 and 2012 and recipient countries of PIN Award.

Source: PIN Panellists (see Fig. 4, Table 2 in the Annexes)

Across the EU27, road deaths were cut by 9% in 2012, a welcome contrast to the 2% reduction in 2011. There were **2,661** fewer road deaths in the EU in 2012 than in 2011, a reduction valued at **5 billion euro** according to ETSC estimates.

Preventing deaths and serious injuries on EU roads is a sound investment in terms of resources devoted to safety measures and the saving potential is far from being exhausted. In 2012 a total of **27,700** people were killed in the EU27 as a consequence of road collisions. Around **313,000** were recorded as seriously injured and many more suffered slight injuries.

The European Commission presented its 'First Milestone towards an injury strategy' in March 2013 as the first step towards coming up with a strategy in this area. ETSC welcomes the adoption by the European Commission of a common EU definition of seriously injured casualties as in-patients with an injury level of MAIS 3 or more. Each Member State should work towards adopting the MAIS3+ definition and adapting their data collection system.

1.1 Reduction in road deaths picked up pace in 2012, following disappointing results in 2011

Out of the 31 countries monitored by the PIN Programme, 27 registered a drop in the number of road deaths in 2012 compared to 2011. **Malta** and **Cyprus** lead this ranking with reductions of 47% and 28% in road deaths (following increases of 13% and 18% respectively in 2011). **Israel** and **Denmark** follow with reductions of 23% and 20% respectively. **Portugal**, **Poland**, **Estonia**, **Ireland**, **Finland**, **Belgium**, **Norway**, **Spain**, **Sweden**, **Germany**, **Greece**, the **UK** and **Slovakia** achieved better than EU average reductions. But road deaths increased in **Switzerland** (+6%), **Luxembourg** (+3%), **Lithuania** (+1.3%) and **Romania** (+1.2%). Progress slowed down in **Austria** (-0.2%), **Latvia** (-1.1%), **The Netherlands** (-1.7%) and the **Czech Republic** (-4.5%).

The 2012 results are a welcome contrast to 2011 when 13 countries monitored by the PIN Programme registered an increase in road deaths. Road safety champions, Sweden, The Netherlands and the UK, had registered an increase in road deaths after years of sustained decrease. Research is ongoing in those countries to understand why this happened. Potential impact of the economic crisis on the number of road deaths should be investigated as part of such research.

We experienced an increase in both fatalities and serious injuries between 2010 and 2011. We believe this is mostly because the 2010 figures were lower than expected due to severe weather conditions and the 2011 figures put us back on trend.
Jennifer Scoons, TRL, UK

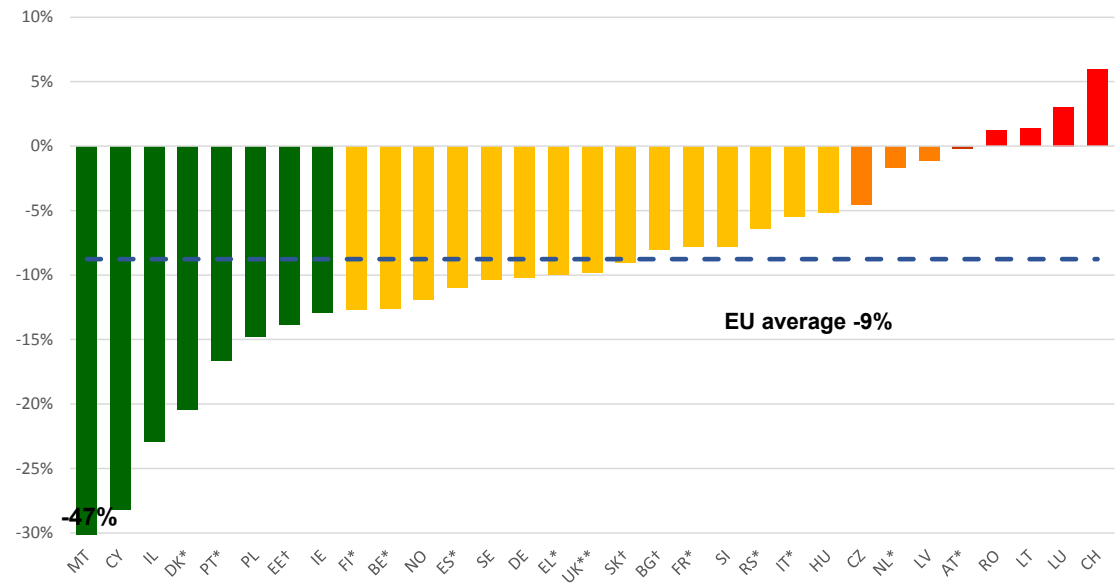


Fig. 1: Percentage change in road deaths between 2011 and 2012

** National provisional estimates used for 2012, as the final figures for 2012 are not yet available at the time of going to print. ** UK estimate based on 10% decrease in killed in 2012 Q1-3 compared with 2011 Q1-3. †ETSC estimates based on EC CARE Quick Indicator.*

Numbers of deaths in Luxembourg and Malta are small and are therefore subject to substantial annual fluctuation.

"Following the abnormal increase in road deaths seen in 2011, the results observed in 2012 put Cyprus back to the steady progress of the previous six years. While statistical fluctuations might also influence the year-to-year reductions, I believe that the progress in 2012 is primarily the result of concerted efforts from the relevant public authorities and the nearly 100 organisations who have signed up to the European Road Safety Charter. These stakeholders effectively acted as a 'Cyprus Road Safety Alliance' acting to bring the country onto a positive trend in impressive fashion."

George Morfakis, Road Safety Expert, Cyprus

> *"The reductions in road traffic deaths recently observed in Israel are due to safety-related activities promoted during the last decade. These refer, among others, to road infrastructure improvements – including a large programme of providing dual carriageways and motorways on interurban routes and the large-scale conversion of intersections to roundabouts; improved vehicle safety – including the market penetration of airbags and the compulsory fitting of ESC on new cars; raising public awareness, and systematic road safety monitoring. It is possible that the economic recession may have also had a positive effect on road safety and such a relation should be further investigated".*
>
> Shalom Hakkert, The Ran Naor Foundation for road safety research, Israel

"Poor weather for three of the months in 2012 complemented the joint efforts of the road safety stakeholders in Belgium to achieve a very positive result. February 2012 was very cold, while precipitations in April and June were above the seasonal averages. A particularly low number of deaths were recorded in those months, suggesting a relation between the weather, a lower level of exposure for unprotected road users and increased

attention from those who did travel. A good reduction in road deaths, albeit to a lesser extent, has also been observed in the months when the temperatures and precipitation levels were normal."
Heike Martensen, Belgian Road Safety Institute

> *"The Polish Parliament is currently in the process of adopting a draft National Road Safety Programme covering the period 2013-2020, which includes Vision Zero for the long term and specific reduction targets of 50% for road deaths and 40% for serious injuries compared with the 2010 levels. Besides annual monitoring of progress, once the strategy is adopted, wide-ranging evaluations of the Programme are foreseen for 2014 and 2017. Inappropriate and illegal speed, which is a contributing factor in approximately 30% of road deaths, is identified as a key area of action."*
> Ilona Buttler, Motor Transport Institute, Poland

The indicator

Following the adoption of the EU road safety target for 2020, this chapter uses as main indicators the **percentage changes** in the numbers of people killed on the road between 2011 and 2012 (Fig. 1) and between 2010 and 2012 (Fig. 3). A person killed in traffic is someone who was recorded as dying immediately or within 30 days from injuries sustained in a collision. We also show the percentage change in road deaths between 2001 and 2012 (Fig. 4) and use **road mortality**, the number of road deaths per million inhabitants, as an indicator of the current level of road safety in each country (Fig. 5). Additionally, the number of road deaths per billion vehicle-kilometres is presented where vehicle-kilometre data are available (Fig. 6).

The data collected to calculate the indicators are from the national statistics supplied by the PIN Panellist in each country. CARE and IRTAD databases were used for verification. Population figures were retrieved from the EUROSTAT database. The full dataset is available in the Annexes – Chapter 1.

The numbers of road deaths in 2012 in Belgium, Bulgaria, Denmark, Estonia, Finland, France, Greece, Italy, The Netherlands, Norway, Portugal, Serbia, Slovakia, Spain and the UK are provisional as final figures were not yet available at the time of going to print. Numbers of deaths in Luxembourg and Malta are small and are therefore subject to substantial annual fluctuation.

1.2 One good year is not enough…

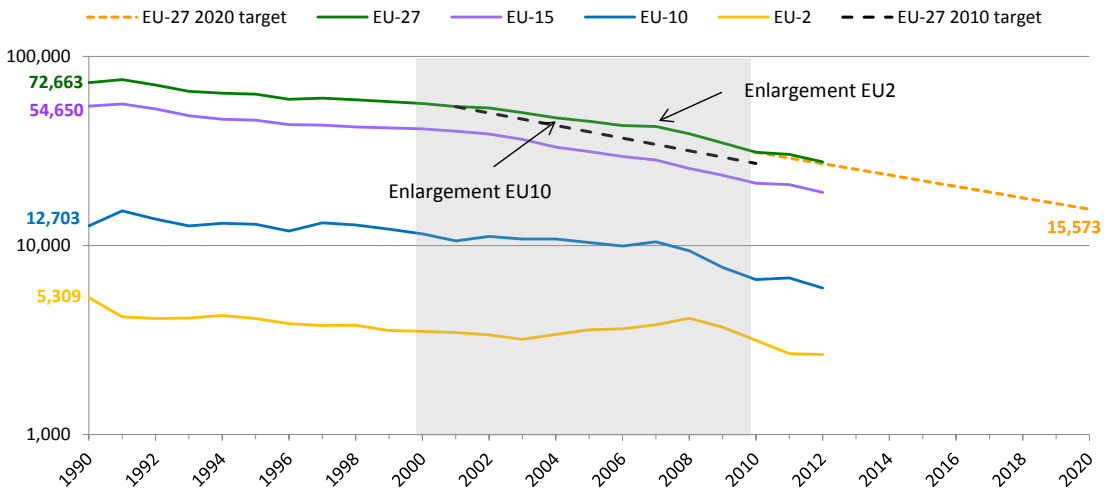


Fig. 2: Reduction in road deaths since 1990 in the EU27 (green line), the EU15 (purple line), the EU10 (blue line) and the EU2 (Bulgaria and Romania, yellow line). The logarithmic scale is used to enable the slopes of the various trendlines to be compared.
Source: CARE database 1990-2000 and PIN Panellists (2001-2012).

The reductions in the number of road deaths regained pace in 2012, a particularly good sign following the slowdown observed in the previous year. The 15 pre-2004 EU Member States collectively achieved a 9% reduction in the number of road deaths, while the countries that joined the Union in 2004 surpassed that achievement with an 11% collective reduction. Unfortunately, the good trend started in 2008 by the two latest EU Members slowed down in 2012. While in Bulgaria road deaths were reduced by 8% compared with 2011, the number recorded in Romania went up by 1%.

The 9% reduction in road deaths observed in the EU in 2012 brings the 27 Member States back towards being on track to reach the 2020 road safety target, following the early setback of 2011, but one good year is not enough. An average annual reduction of 6.7% would be needed over the 2010-2020 period to reach the target through constant progress. Combined efforts at both national and EU level must be stepped up in order to make the EU target for 2020 reachable.

There were **2,660** fewer road deaths in 2012 than in 2011 in the EU27, a reduction which is about 600 road deaths short of where we would have been in 2012 if the reduction needed to progress towards the 2020 road safety target by constant annual steps had been achieved.

"2012 was a landmark year for European road safety, with the lowest ever number of road deaths recorded. […] Still 75 people die on Europe's roads every day, so there is no room for complacency. We have ambitious goals to cut EU road deaths in half by 2020 and we need to keep up this momentum to get there."
Siim Kallas, European Commission Vice-President, responsible for transport.

...but still 2,660 fewer road deaths in 2012 than in 2011 is of considerable value to the EU

Putting a monetary value on prevention of loss of human life and limb can be debated on ethical grounds. However, doing so makes it possible to assess objectively the costs and the benefits of road safety measures and helps to make the most effective use of generally limited resources.

The Value of Preventing one road Fatality (VPF)[1] estimated for 2009 in the 5th PIN Report has been updated to take account of the economic situation in the intervening years. As a result, we have taken the monetary value of the human losses avoided by preventing one road fatality to be 1.88 million euro.[2]

The total value of the reductions in road deaths in the EU27 for 2012 compared to 2011 is thus estimated at approximately **5 billion Euro**. Given the financial difficulties that many EU countries face due to the economic slowdown, the value to society of improving road safety should be taken into account in the policy and budgetary planning processes, expressing in monetary terms the moral imperative of reducing road risk. The high figure of societal costs avoided during 2012 shows once more that the saving potential offered by sustained road safety improvements is considerable, making it clear to policy-makers that road safety policies provide a sound investment.[3]

Since the beginning of the 2010-2020 EU road safety target period, several countries have taken considerable steps which should put them in a good position to reach this objective domestically, if road safety efforts are maintained. Reductions since 2010 have been highest in **Malta** with 40%, **Denmark** with 31%, **Norway** with 30%, followed by **Spain** and **Israel** with 26% and 25% respectively (Fig. 3). The EU has collectively reduced the number of road deaths by 11% from 2010. Developments since the setting of the new EU road safety target have not yet followed the desired trend in **Estonia**, **Sweden**, **Luxembourg**, **Switzerland**, **Serbia**, **The Netherlands** and **Lithuania**. In each of these countries the number of road deaths recorded in 2012 was higher than the corresponding figure in 2010.

[1] In countries where the monetary value attributed to human losses avoided by Preventing one Fatality (VPF) is estimated on the basis known as Willingness-To-Pay (WTP). The use of WTP valuations in transport safety has been advocated by ETSC since 1997. ETSC (1997) Transport Accident Costs and the Value of Safety.

[2] See Methodological Notes, PIN Report 2013, www.etsc.eu/PIN-publications.php

[3] For more details, see ETSC (2011), 5th PIN Report and Methodological Notes on www.etsc.eu/PIN-publications.php

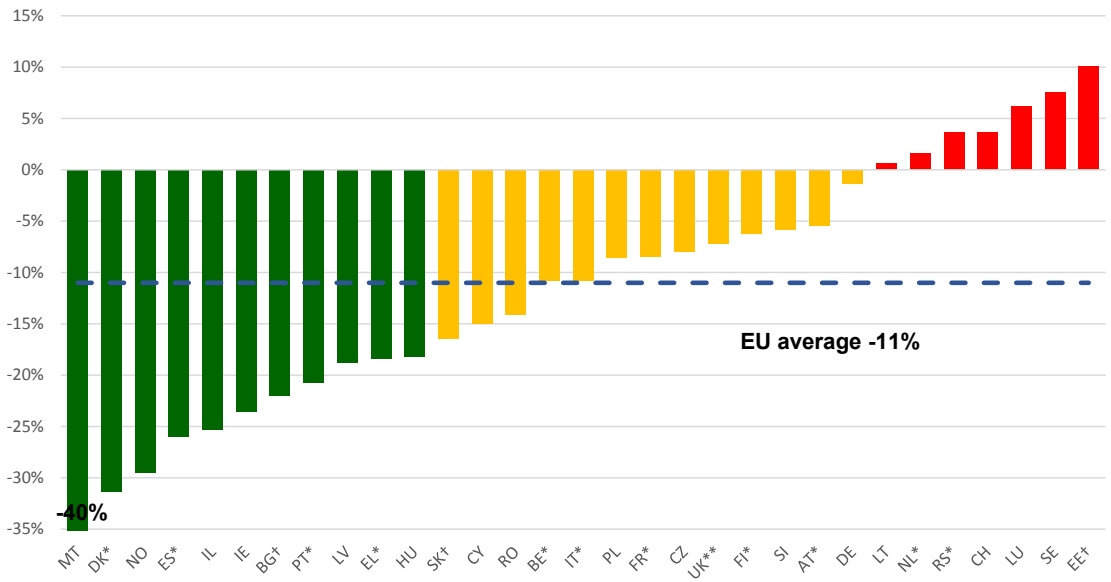


Fig. 3: Percentage change in road deaths between 2010 and 2012
** Provisional estimates used for 2012, as the final figures for 2012 are not yet available at the time of going to print. **UK estimate based on 10% decrease in killed in 2012 Q1-3 compared with 2011 Q1-3. † ETSC estimates based on EC CARE Quick Indicator. Numbers of deaths in Luxembourg and Malta are small and are therefore subject to substantial annual fluctuation.*

"According to a review conducted in 2011 in Norway, speed was found to be an important causal factor in 48% of the collisions that resulted in deaths between 2005 and 2010 and in 41% of them in 2011. Revised criteria for setting speed limits were adopted in 2011, resulting in speed limits reduced from 80km/h to 70km/h on 420 kilometres of roads, and from 90 km/h to 80km/h on 70 kilometres of roads. The revised speed limits criteria, together with automatic enforcement and speed awareness campaigns, have contributed to speed being an important causal factor in just 33% of fatal collisions in 2012."
Guro Ranes, Norwegian Public Roads Administration

1.3 A 49% reduction in the number of road deaths since 2001

Seven countries had reached the EU target in 2010: Latvia, Estonia, Lithuania, Luxembourg, Sweden, France and Slovenia. In 2012, two years later, the number of countries where road deaths were fewer than half of those in 2001 had risen to 15. **Latvia** with 68%, **Spain** with 67% and **Ireland** with 61% lead this ranking (Fig. 4), followed by **Denmark**, **Lithuania**, **Estonia**, **Portugal**, **France**, with 59%, 57%, 56%, 56% and 55% reductions respectively. **Slovenia**, **Slovakia**, **Israel**, **Luxembourg**, **Hungary**, the **United Kingdom** and **Belgium** complete the list.

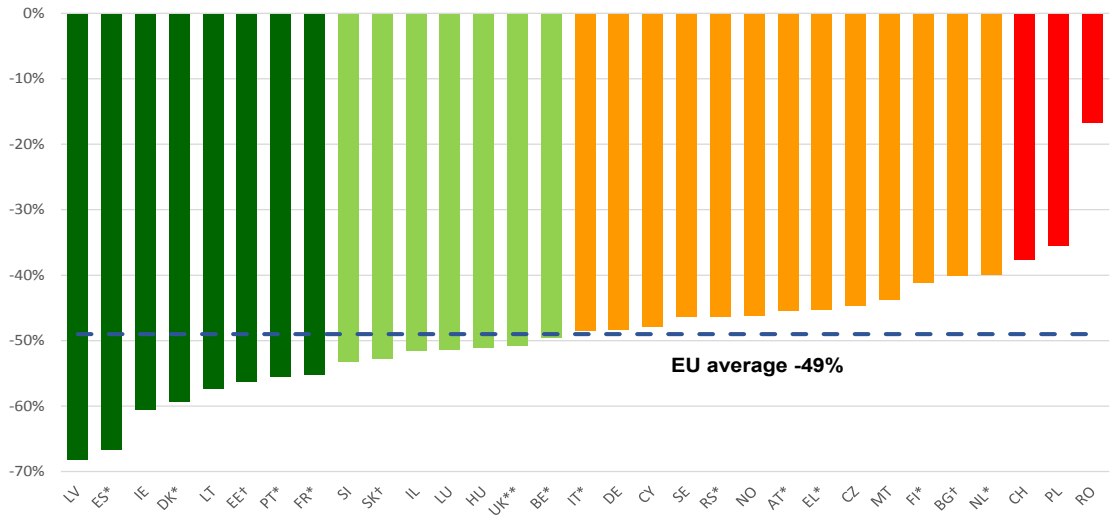


Fig. 4: Percentage change in road deaths between 2001 and 2012
** Provisional estimates used for 2012, as the final figures for 2012 are not yet available at the time of going to print. ** UK estimate based on 10% decrease in killed in 2012 Q1-3 compared with 2011 Q1-3. †ETSC estimates based on EC CARE Quick Indicator.*

1.4 Road safety league

In the EU27 the overall level of road mortality has been halved since 2001, falling to 55 deaths per million inhabitants in 2012 compared with 113 in 2001 (and 62 in 2010). **Malta**, the **UK**, **Norway** and **Sweden** are the four safest countries for road use in 2012, with 30 or less deaths per million inhabitants (Fig. 5). **Denmark**, **Israel**, **Ireland**, **The Netherlands** and **Spain** follow, having a road mortality not exceeding 40 deaths per million inhabitants.

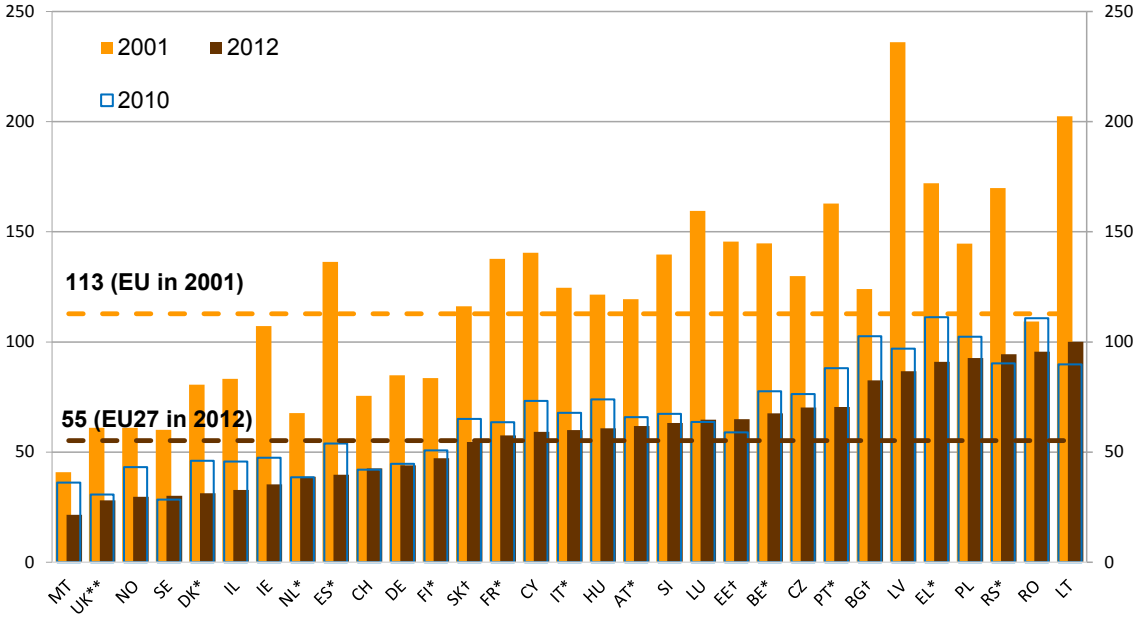


Fig. 5: Road deaths per million inhabitants in 2012 (with road deaths per million inhabitants in 2001 and 2010 for comparison)
** Provisional estimates used for 2012, as the final figures for 2012 are not yet available at the time of going to print. ** UK estimate based on 10% decrease in killed in 2012 Q1-3 compared with 2011 Q1-3. †ETSC estimates based on EC CARE Quick Indicator.*

"On the 5th of June 2013, the Government adopted new measures related to fixed penalties for motoring offences. The penalties currently in force for offences such as using a mobile phone while driving or failure to wear a seatbelt were increased. Moreover, on-the-spot fixed penalties can now be issued for careless driving offences as well. It is hoped these measures will improve the enforcement of road safety legislation by allowing the Police to focus more resources on the offences where a Court decision is needed while still addressing the offence of careless driving.
Louise Lloyd, TRL, UK

No country in the PIN had more than 100 road deaths per million inhabitants in 2012. Despite the positive developments in reducing the number of road deaths in Lithuania, road mortality in that country remains the highest in the EU. A sharp decrease in the Lithuanian and Latvian population numbers have prevented the reduction in the number of road deaths achieved there from being fully reflected in reduced road mortality.

"The Slovenian National Assembly has recently adopted the National Road Safety Programme for the 2013-2022 period, with maximum targets of 35 deaths per million inhabitants and 230 serious injuries per million inhabitants. The ambitious goals of the Programme are to be achieved through a series of measures focused on the main road risk factors – speed, alcohol, drugs and psychoactive substances, non-use of seatbelts and child restraint systems, railway level crossings, and the road user groups facing the highest risks – powered two-wheeler riders, cyclists, pedestrians, young and elderly drivers and tractor drivers.
Vesna Marinko, Slovenian Traffic Safety Agency

1.5 Road deaths per vehicle-distance travelled

Fig. 6 shows deaths per billion vehicle-kilometres travelled for the 19 countries where data on vehicle-km travelled are available. This indicator complements the well-established indicator of road mortality (Fig. 5).

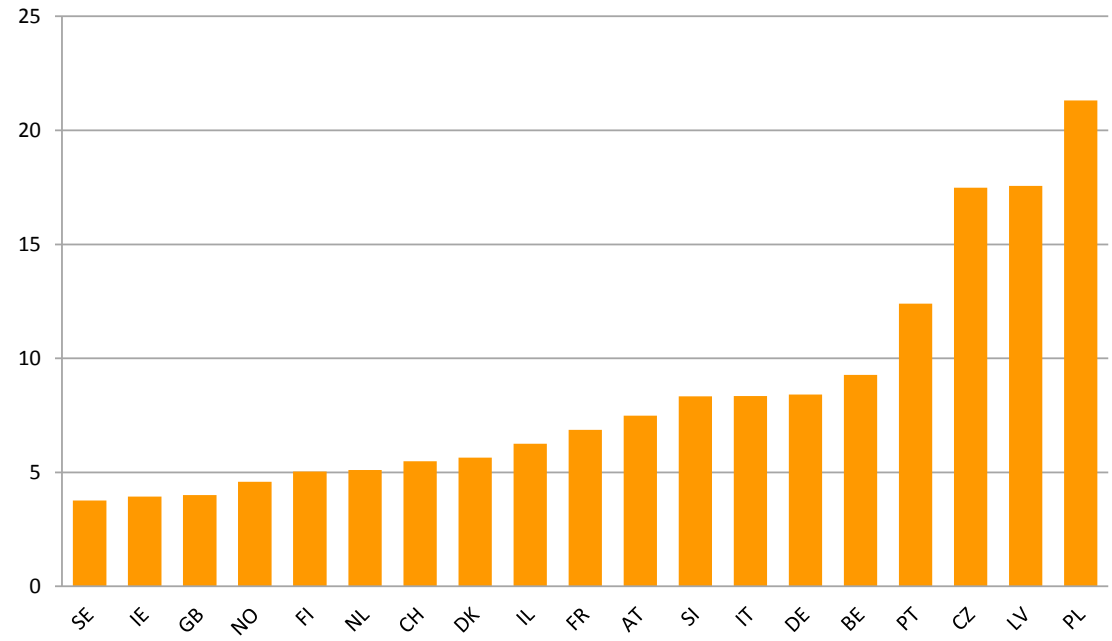


Fig. 6: Road deaths per billion vehicle kilometres. Average for the latest three years for which both the road deaths and the estimated number of vehicle-kilometres are available.
2010-2012 (FI, FR, IE, IL, IT, LV, PT, SE, CH); 2009-2011 (AT, DK, DE, NO, PL, SI, GB); 2010-2011 (NL); 2008-2010 (BE, CZ).

Sweden has the lowest number of road deaths per vehicle-km driven among the countries collecting up-to-date data, followed by **Ireland**, **Great Britain**, **Norway**, **Finland**, and **The Netherlands**. Road risk per kilometre travelled in **Poland** is more than five times as high as in **Sweden**. Differences between the relative positions of countries in Fig. 5 and Fig. 6 can arise from differences in aspects such as the usage of motorcycling, cycling or walking, the traffic density, the proportions of traffic on motorways or rural roads, and the method for estimating the number of vehicle-km travelled.

1.6 Reducing serious injuries on EU roads

"Road deaths are only the tip of the iceberg. For every death on Europe's roads there are 10 serious injuries such as damage to the brain or spinal cord. We need a strategy to bring down the number of serious road injuries everywhere in the EU."
Siim Kallas, European Commission Vice-President, responsible for transport.

There is strong political support for taking action on serious injury. In 2010 the European Commission dedicated an entire objective of its 'Road Safety Policy Orientations 2011-2020' to serious injury in road traffic[4]. In its 2011 White Paper on the future of transport, the European Commission committed to working towards a 'zero-vision' in road safety and it said it intended to *"develop a comprehensive strategy of action on road injuries and emergency services, including common definitions and standard classifications of injuries and fatalities, in view of adopting an injuries reduction target"*[5]. In 2010 the Council underlined the 'urgent need to address serious injuries, supporting the development of a common definition and agreeing to the principle of a specific quantitative target'[6]. In 2011 the European Parliament called on the European Commission to 'quickly' come up with a target of 40% reduction in the number of seriously injured on the roads[7].

The European Commission presented its 'First Milestone towards an injury strategy' on the 19th of March 2013[8] as the first step towards coming up with a strategy. ETSC welcomed the adoption by the European Commission of a common EU definition of seriously injured casualties as in-patients with an injury level of MAIS 3 or more[9]. The Abbreviated Injury Scale (AIS) is a globally accepted trauma classification of injuries used by medical professionals and ranging from 1 (minor injuries) to 6 (fatal injuries) to describe the severity of injury for each of the nine regions of the body (Head, Face, Neck, Thorax, Abdomen, Spine, Upper Extremity, Lower Extremity, External and other). As one person can have more than one injury, the Maximum Abbreviated Injury Score (MAIS) is the maximum AIS of all injury diagnoses for a person. The definition of seriously injured road casualties as in-patients with an injury level of MAIS 3+ was confirmed by the High Level Group on Road Safety representing all EU Member States in January 2013.

The High Level Group identified three main ways Member States can choose to collect the data: continue to use police data but apply a correction coefficient; report the number of injured based on data from hospitals; or create a link between police and hospital data. Member States should also continue collecting data based on their previous definitions so as to be able to monitor rate of continuation of progress prior to 2014.

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4 European Commission (2010), Towards a European road safety area: policy orientations on road safety 2011-2020.
5 European Commission (2011) Roadmap to a Single European Transport Area.
6 Council conclusions on road safety, 3052th Transport, Telecommunications and Energy Council meeting, Brussels, 2–3 December 2010.
7 European Parliament Resolution of 27 September 2011: European road safety 2011-2020, 2010/2235(INI).
8 European Commission (2013) 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.
9 ETSC Response the EC First Milestone Towards a Injury Strategy, http://www.etsc.eu/documents/ETSC_Response_to_EC_First_Milestone_Towards_an_Injury__Strategy_May_2013.pdf

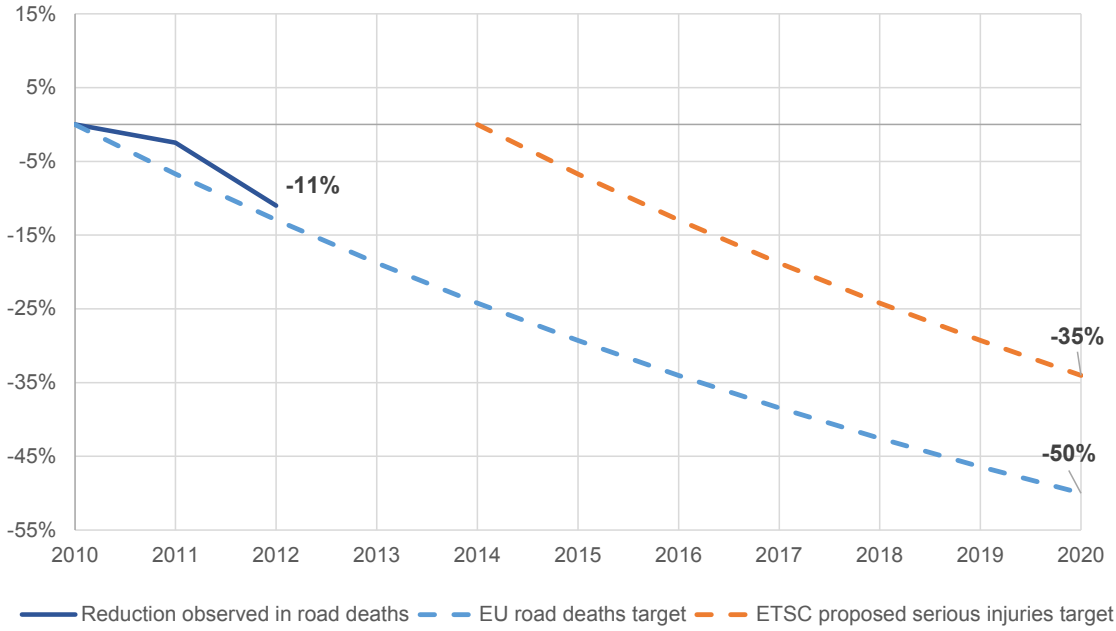


Fig. 7: Reduction in the number of road deaths (dark blue line) plotted against the EU target for 2020 (light blue line), with ETSC's recommended target for reduction in serious injuries (orange line).

The adoption of a common EU definition will help the EU to address the challenge of widely differing national definitions of serious injury. The European Commission sees it as important for this definition to be adopted as a prerequisite for effective intervention. The Commission has committed to setting in 2015 a common EU target for the reduction in the number of seriously injured people by 2020. However, the Commission's 2013 document did not pecify such a target or adopt fresh measures to tackle serious injury. As indicated in Fig. 7, a 35% reduction in the number of serious injuries over the period 2014 - 2020 would be similarly challenging and achievable for the Member States to the target for reducing road deaths between 2010 and 2020[10].

The Netherlands, Spain, Sweden, and the UK are taking the lead in collecting data on the total number of people seriously injured based on MAIS 3+ (see Table 7 in the Annexes). Other countries are discussing methods to adapt their data collection and reporting systems to the new EU-wide definition.

It is however too early to use data based on MAIS 3+ for country comparison. Fig. 8 therefore shows the annual average percentage change in reduction of the number of serious injuries using current national definition of serious injuries. National definitions supplied by PIN Panellists are available in the Annex as well as countries' progress in adapting their database to collect MAIS3+ data.

More than **313,000** people were recorded by the Police as seriously injured following traffic collisions in 2012. **Ireland**, **Spain**, **Portugal** and **Latvia** have all seen annual reductions of more than 8% on average during the period examined. **Slovenia**, **Lithuania**, **Denmark**, **Greece** and the **Czech Republic** follow with yearly reductions of over 6%.[11]

[10] Ibid.

[11] The reader should bear in mind that large differences in definition and reporting practices for seriously injured road users exist between countries and that changes in reporting practices might have affected the trend in some Member States.

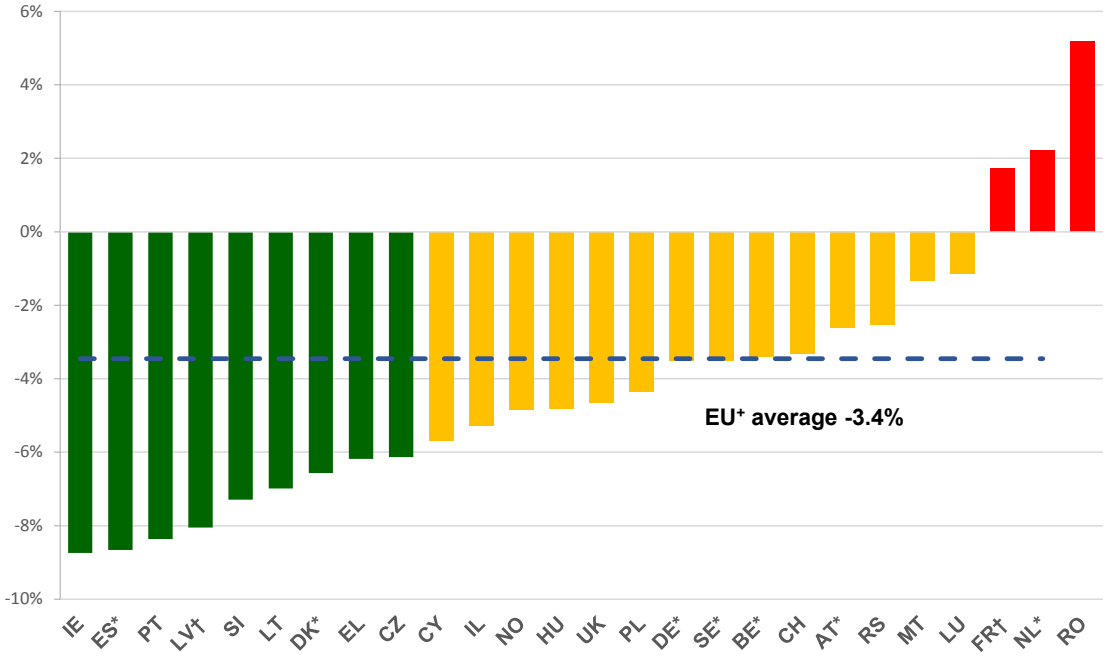


Fig. 8: Annual average percentage change in the number of serious injuries in road traffic, using current national definition of serious injuries (2001-2012).
*⁺EU countries using a definition of serious injuries similar to injuries requiring at least 24 hours as in-patient: BE, CY, CZ, DK, FR, DE, EL, IE, LU, PT, SK, ES, SE, UK. *Annual average percentage change calculated for 2001-2011 as 2012 data are not available. **UK estimate based on 1% decrease in seriously injured in 2011 Q1-3 compared with 2010 Q1-3. ‡ FR (2005-2011), LV (2004-2011)*

The numbers of serious injuries were supplied by the PIN panellist in each country, using the prevailing national definition. National definitions are provided in Table 6 of the Annexes. In Estonia, Finland and Italy there are no separate definitions of a slight injury and a serious injury.

1.7 Reduction in serious injuries lags behind reduction in road deaths

Fig. 9 looks at national progress in reducing the number of road deaths and the corresponding reported number of serious injuries, in order to indicate to what extent the two have moved in parallel. Average annual percentage change in road deaths has been plotted on the horizontal X-axis, and the average annual percentage change in serious injuries on the vertical Y-axis, with the EU averages shown by dotted lines. Green markers are used for countries having performed better than the EU average in both deaths and serious injuries, red markers for those below the EU averages in both deaths and serious injuries and amber markers for all the others - better than average in deaths but not in serious injuries or vice-versa.

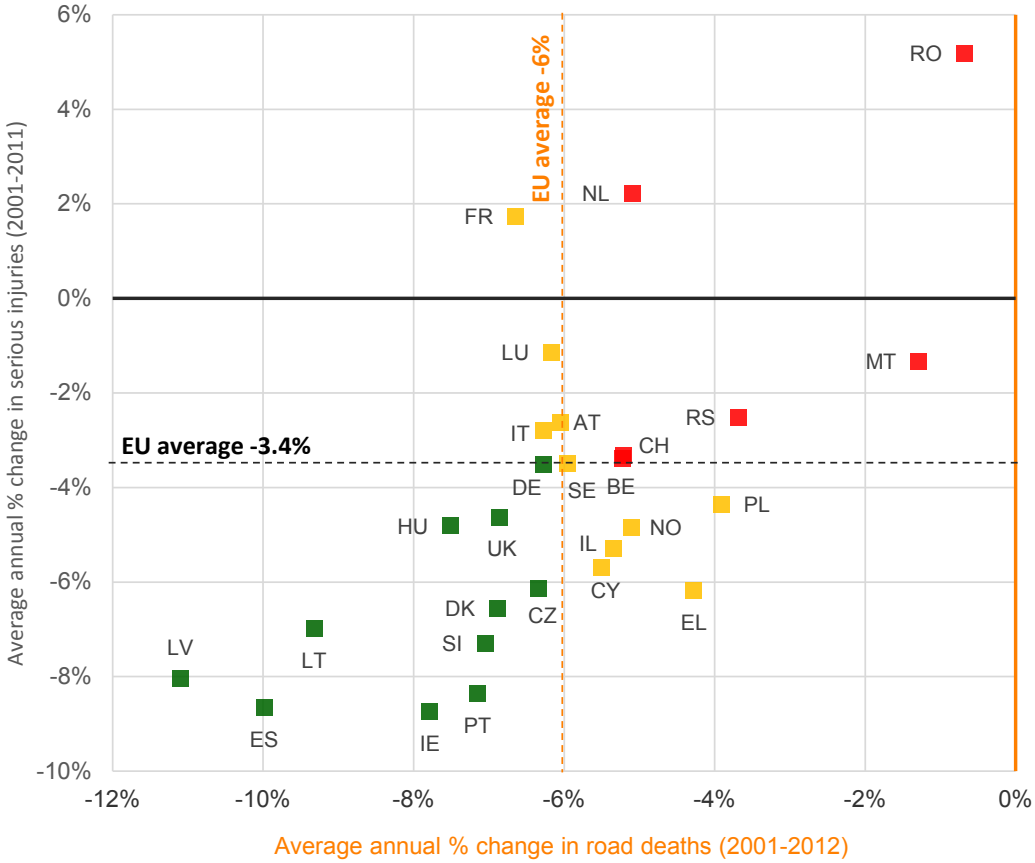


Fig. 9: Average annual change in serious injuries (2001-2012) plotted against the average annual change in road deaths (2001-2011).
** LV(2004-2011), FR(2005-2011)*

Latvia, Spain, Lithuania, Ireland, Portugal, Slovenia, Denmark, the Czech Republic, Hungary, the UK and Germany have performed better than the EU average both in serious injuries and in road deaths. The majority of countries – 20 out of 27 – have reduced road deaths at a faster pace than serious injuries, while in Cyprus, Greece, Ireland, Malta, Poland, Portugal and Slovenia the pace of reductions in the serious injuries recorded was higher than the corresponding one for deaths.

1.8 Denmark receives "2013 Road Safety PIN Award"

Denmark has achieved considerable progress in improving its road safety record, with a 60% reduction in road deaths since 2001 and a particularly steep reduction since 2009. Its ambitious target of less than 200 road deaths in a year has been duly achieved in 2012.

Moreover, the Danish progress brings it into the leading group of road safety champions in Europe: the mortality recorded in 2012 stood at 32 road deaths per million inhabitants, just behind the UK (28) and Sweden (31). 2013 is a cornerstone year in Danish road safety policy as a new road safety strategy will be adopted at the national level, to cover the period up to and including 2020, the final year of the EU road safety target.

ETSC interviewed Justice Minister Morten Bødskov to get an insight into the Danish success story and to find out about plans for keeping up the momentum.

ETSC: The current Danish Road Safety Strategy successfully catalysed stakeholders' efforts to reach the set road safety targets. Can you tell us which risk factors were targeted and briefly detail some of the measures and indicators used to tackle them?

Minister Bødskov: The previous Danish Road Safety Strategy was very ambitious, and I am more than pleased to note that we reached the target of less than 200 road deaths in 2012. Two of the major road traffic risk factors targeted in our previous Strategy are speeding and drink driving. As such, one of the factors contributing to our success was the way in which the public and private sectors have cooperated in their efforts to target these two risk factors.

Information campaigns have been and will continue to be used to draw the public's attention to the risks which are associated with speeding and drink driving. Such campaigns have been successfully linked with highly visible police enforcement operations. Additionally, we consider these information campaigns successful because we noticed a shift in the Danish population's attitudes towards drink driving. It has simply become socially unacceptable to drive under the influence of alcohol.

Moreover, the Danish National Police has updated the driver training curriculum so that aspiring drivers need to receive detailed training related to the ways in which alcohol and drugs affect one's ability to drive.

ETSC: Can you tell us how these risk factors are addressed in the new Road Safety Action Programme? Does it identify other risk factors which need to be addressed? If so how?

Unfortunately, we have yet to achieve full compliance with the speed limits and drink driving legislation, which is why our efforts are renewed in the new Danish Road Safety Strategy. Several surveys have shown a generally low level of acceptance of speeding. Moreover, when Danes speed they often do so because they underestimate the relation between speed and the risk of collisions. As the relation between speed and the risk and severity of consequences following collisions has been well-documented, we believe it is important to focus our future information campaigns on the consequences and risk of speed, even when the speeding is not excessive.

I personally believe that changing and influencing the attitudes of each of the road users can have a significant effect on road safety. Thus, our goal is to foster a culture of sound traffic behaviour, and achieving this requires constant effort in local communities, in schools, in companies, etc. To give just one example, at the beginning of 2013 the Danish Road Safety Council, in cooperation with a corporate partner, started a campaign addressing lack of attention in traffic.

ETSC: Are there any specific groups of road users which were targeted through specific measures? If so, how was this done?

Cyclists were one of the target groups of the previous Road Safety Strategy and will continue to be addressed in the new Strategy because they remain a group of road users facing high levels of risk. The number of collisions involving cyclists has dropped during the previous ten years and we will keep up our efforts to maintain this reduction trend.

Cars are most often involved in collisions with cyclists. As such, there is a strong relation between the speed of cars and the severity of collisions involving cyclists, which is why we believe it is very important to take steps to reduce speed.

Several other measures have an important effect on the safety of cyclists, such as the redesign of junctions through the use of advanced stop lines for cyclists. These allow cyclists to be in front of the

cars when traffic lights turn green and thus increase drivers' awareness of their presence. Moreover, the wearing of helmets has a well-documented positive effect on the number of head injuries cyclists suffer.

ETSC: A considerable proportion of the traffic on European roads, and presumably Danish ones too, is driven in the context of work, whether this refers to professional drivers and hauliers workers travelling for work or regular commuting. Can you tell us how you are engaging with employers in improving road safety within their organisations?

Enhancing road safety is a complex challenge. A wide range of stakeholders, both public and private, need to be involved. The recommendations of the new Danish Road Safety Strategy are aimed at all road users and hence they also target employers. Moreover, the Danish Road Safety Council has been and will continue to be a very important partner for the government in our work. The Council works with the police to engage with both employers and professional drivers in information and campaigns, for example to prevent collisions occurring when heavy goods vehicles perform right turns.

ETSC: Are Danish public authorities showing leadership in areas like their vehicle fleets, or establishing employee travel plans?

A good example is represented by the local authorities in Copenhagen. The public procurement procedure for waste collection companies states that all new collection trucks must have a camera on the right side, as well as a transparent door on the right side. These elements improve the driver's field of vision, both direct and indirect, and thus help prevent right hand turn collisions.

ETSC: Serious injuries on the roads are receiving increased levels of attention from policy-makers. In this respect, Denmark is among the frontrunners, with the current Road Safety Strategy including a target for reducing serious injuries. Will Denmark be ready to provide data according to the common EU definition – based on the MAIS scale – in 2015?

Our statistics show a correlation between road deaths and serious injuries. Moreover, the number of road deaths is relatively small and can be subject to fluctuations, especially when breakdowns by gender, age groups or types of road users are used. Hence we have looked at both deaths and serious injuries to identify and track progress towards achieving key priorities. Our road safety priorities have been and will continue to be based on data related to serious injuries.

One of the priorities in our new Road Safety Strategy is to minimise underreporting of serious injuries through the use of hospital data. We thus hope to have appropriate information on the collisions which are not reported to the police. This data must be collected and analysed in order to improve our efforts to reduce the number of road casualties.

I think it is very important that all countries have comparable data on those seriously injured on the roads. However, the implementation of the common EU definition will not be quick or without obstacles, and Denmark is no exception here. We are cooperating with other EU Member States on adapting our data collection and reporting procedure to be able to provide MAIS data. We will hopefully be able to provide such data from 2015.

ETSC: How do you see the role of in-vehicle technologies in reducing the number and severity of traffic collisions? Please tell us how the new Action Programme takes into account such new developments.

In-vehicle technologies can undoubtedly improve road safety, for all road users, by preventing serious errors that all drivers can make sometimes, and as such they are addressed in the new Danish Strategy. It is, however, very important to not overestimate their impact. In-vehicle technologies do not absolve drivers from their responsibilities in traffic, particularly paying full attention to other road users. To put it differently: paying attention in traffic is a personal responsibility of every driver. In a critical traffic situation the right behaviour is essential and new technologies will help support such correct behaviour.

ETSC: As Denmark is not covered by the provisions of the EU Cross-Border Enforcement Directive, can you tell us what your country is doing to follow up upon road safety offences committed by foreign drivers while driving through Denmark? Are you taking steps to cooperate with European countries to follow-up when Danish drivers commit traffic offences in other countries?

As a general rule in Denmark, fines resulting from traffic offences are collected on the spot. When an offence has been detected through automatic enforcement means, we have in place a series of existing conventions and international instruments related to mutual legal assistance. Through these we can request the other countries to assist in an investigation – including also the identification of the vehicle driver – and in the execution of the financial penalty resulting from the given offence. For instance, Denmark has implemented the EU Council Framework Decision on the application of the principle of mutual recognition to financial penalties.

We have a good level of cooperation with the other Nordic countries and furthermore, guidelines recently developed by the Danish National Police state the need for better investigation in the case of aggravated traffic offences committed by persons residing in a non-Nordic country. Offences that would lead to a suspension of the driving licence should always be investigated.

Moreover, in the framework of the international conventions mentioned above, the Danish authorities receive and carry out investigation requests, or requests for the execution of financial penalties, from foreign authorities.

Mr. Morten Bødskov has been Minister of Justice since October 2011.

Road safety is a shared responsibility in Denmark. The Ministry of Justice is primarily responsible for enforcing the Road Traffic Act, while the Ministry of Transport administers the Public Road Act.

The Danish Road Safety Action Plan 2013-2020 was adopted by the Danish Road Safety Commission in April 2013. The Danish Road Safety Commission is co-chaired by the Ministry of Justice and the Ministry of Transport, and includes representatives from the Road Authority, the Police, Research institutes, automobile clubs, cyclist associations, driving schools, trade unions, local authorities and municipalities. The Action Plan identifies for each of the measures the responsible authorities and a timetable for delivery.

Photo credit: Lars Svankjær

2| Towards safer transport of goods and passengers in Europe

In the European Union **4,254** people lost their lives in collisions involving heavy goods vehicles (HGVs) in 2011, **3,999** in collisions involving light goods vehicles (LGVs) – goods vehicles with a maximum permitted weight below 3.5 tonnes – and **722** in collisions involving a bus, coach or trolleybus, totalling **29%** of the overall number of road deaths recorded in 2011. Since 2001, for the EU as a whole, deaths in collisions involving an HGV and in collisions involving a bus or coach were reduced at a somewhat faster pace than the overall number of road deaths, with average annual reductions of 6% and 6.4% respectively, compared with 5.7% for the overall number of road deaths. In contrast, the numbers of deaths in collisions involving an LGV were reduced at 4.7% per year a somewhat slower rate than the total number of road deaths.

The number of road deaths in collisions with HGVs has dropped in all the PIN countries, **Latvia** leading the EU countries with an average annual reduction of 14.7% per year, a steeper reduction than the one in the total number of road deaths (Fig. 10). The number of road deaths in collisions involving LGVs has been reduced in all PIN countries except for France and Romania, with the best average annual reduction being observed in **Lithuania** with 19.9% (Fig. 20). Road deaths in collisions involving buses or coaches have been reduced in all countries but Israel and Romania, **Austria** having the best annual average reduction of 16.5% (Fig. 23).

The largest share of those killed in collisions with goods vehicles, buses or coaches are not the occupants of those vehicles (Figs. 11, 21 and 24). This is an important factor to note in the context of the free movement of goods and persons, which are among the fundamental freedoms in the European Union. These freedoms carry important externalities which should be minimised in the context of high levels of road traffic.

Member States should maintain focus on vehicles with a large weight – those looked at in this Chapter – when planning and introducing policies to improve road safety. Indeed HGVs and buses or coaches are involved in more fatal collisions per billion km travelled than the average vehicle (Figs. 13 and 25) and most of those killed are other road users rather than the occupants of the heavier vehicles. General, as well as targeted road safety measures, should be combined in order to reduce road deaths in collisions involving these types of vehicles sustainably. These include the enforcement of current legislation, particularly when aimed at HGVs and buses, the promotion and large-scale rollout of life-saving technologies and the training of road users, with a renewed focus on those who drive as part of their work or profession.

2.1 Collisions involving Heavy Goods Vehicles

2.1.1 Country comparison

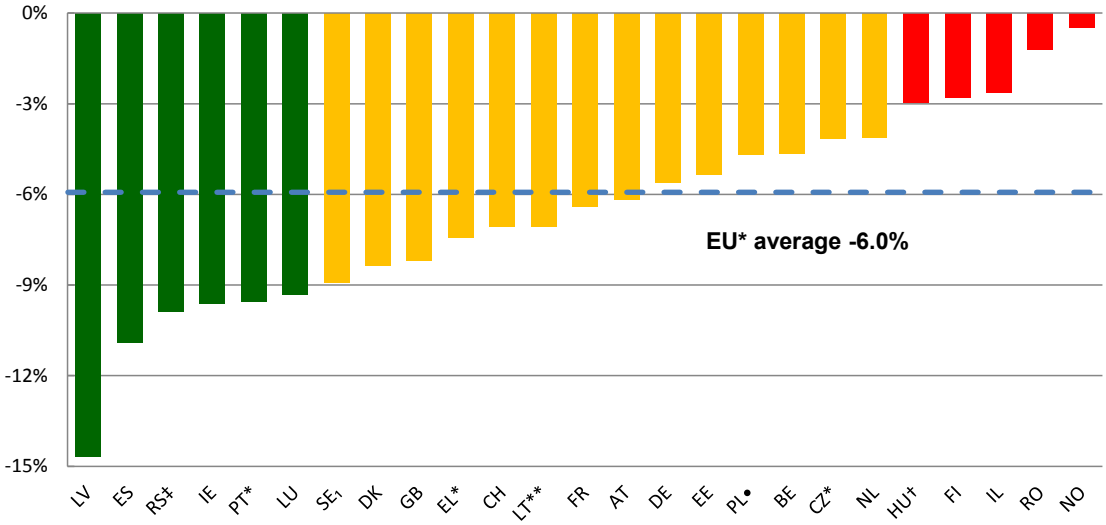


Fig. 10 Average annual percentage change between 2001 and 2011 in the number of road deaths in collisions involving a **heavy goods vehicle (over 3.5 t)**.
**CZ, EL, PT (2001-2010). **LT (2002-2011). †HU (2002-2010). ‡RS (2006-2011).*
•PL data refers to all goods vehicles.

Latvia achieved the fastest pace of reduction in the number of road deaths in collisions involving HGVs with an average year-to-year reduction of 14.7% per year between 2001 and 2011. It is followed by **Spain** with a corresponding reduction of 10.9% and **Serbia** with 9.9%, while **Ireland** and **Portugal** come close behind with reductions of 9.6%. **Luxembourg**, **Sweden**,[12] **Denmark**, **Great Britain**, **Greece**, **Switzerland**, **Lithuania**, **France** and **Austria** all had average annual reductions above the EU average[13] of 6%. A decrease in the number of road deaths in collisions involving HGVs was observed in all countries surveyed but in **Norway**, **Romania**, **Israel**, **Finland** and **Hungary** these road deaths decreased at an average annual rate of less than 3%.

Improvements in the safety of HGVs are associated with overall road safety in Latvia: since 2001 road deaths have gone down by 68%. During the last eleven years we have implemented many actions to reduce road deaths. The only measure targeted directly at HGVs is a lower speed limit for vehicles with a gross weight of 8t or more: 80km/h compared with 90km/h for all other vehicles. Our traffic safety work is showing good results as every year we see a reduction in the number of road deaths.
Aldis Lama, Ministry of Transport, Latvia.

> *In addition to general measures – such as the introduction of the penalty point system in July 2006 or the reform of the Criminal Code in December 2007 making drink driving, speeding and driving without licence criminal offences – a regulation*

[12] Suicides are excluded in the official statistics for 2010 and 2011. Vehicles with unknown weight are excluded. The STRADA official statistics in Sweden differentiate between vehicles with a maximum weight of over 3.5t, under 3.5t and unknown. National analysis has shown that a considerable proportion of the vehicles with unknown weight are HGVs.

[13] EU average calculated for the 27 EU Member States excluding Italy for which data was available only for 2008-2010; no reply was received from Bulgaria, Malta or Slovakia.

mandating that HGVs and trailers use special conspicuity markings came into force in July 2011. This is a reflective sticky tape which marks the boundary of the rear and side of the goods transport vehicles. Thus, in conditions of poor visibility, at night or in adverse weather, this device improves visibility from all angles. These markings are mandatory for vehicles with a maximum weight exceeding 7.5 t, length over 6m and width over 2.1m, as well as trailers and semitrailers weighing more than 3.5 t which have been registered after the 10th July 2011.
Pilar Zori, Dirección General de Tráfico, Spain.

As in the EU, buses – categories M2 and M3 – and HGVs – categories N2 and N3 – with a maximum authorised weight exceeding 7.5 t registered after the 1st of July 2011 must be equipped with a speed limiter as well as a digital tachograph, except for trolley buses for urban transport. Speed limiters for HGVs, including those used for the transport of dangerous goods are set at 90km/h.
Jovica Vasiljevic, Traffic Safety Agency, Republic of Serbia.

2011 was an exceptional year in which there was an increase in the number of deaths in collisions involving HGVs. We hope that in the coming years we will see a return to the positive trend seen between 2001 and 2010.
Shalom Hakkert, Ran Naor Foundation for Road Safety Research, Israel.

The Indicator

This chapter covers road deaths in collisions involving three categories of vehicles: **goods vehicles with maximum permitted weight over 3.5 t (section 2.1), goods vehicles with a maximum permitted weight below 3.5 t (section 2.2) and buses, trolleybuses and coaches** taken together **(section 2.3)**.

Countries are compared according to the progress in reducing deaths in collisions involving each of these three categories, using as indicator the **average annual percentage change between 2001 and 2011**. Figs. 10, 20 and 23 show the progress in reducing the numbers of road deaths in collisions involving a goods vehicle over 3.5 t., a goods vehicle with a maximum permitted weight below 3.5 t, or a bus respectively. The numbers of deaths were retrieved from CARE when available and completed or updated by the PIN Panellists. Data corresponding to Fig. 10, 20 and 23 are available in the **Annexes – Chapter 2**. Data corresponding to other figures are available in the Background Tables – Flash 24 on www.etsc.eu/PIN-publications.php.

Figs. 11, 21 and 24 show the percentage breakdowns by type of road user of those killed in collisions involving a heavy goods vehicle, a light goods vehicle or a bus respectively.

Countries are also compared according to **the numbers of deaths in collisions** involving a heavy goods vehicle **per billion vehicle km travelled** by those vehicles with corresponding rates for all vehicles to take into account exposure to risk (Fig. 13). Similar indicators are used for light goods vehicles (Fig. 22) and buses (Fig. 25). Estimations of vehicle km travelled were supplied by the PIN Panellists.

Figs. 16 to 19 show speed measurements in free flow traffic of goods vehicles over 3.5t as supplied by PIN Panellists for countries where data are available.

2.1.2 By type of road user killed

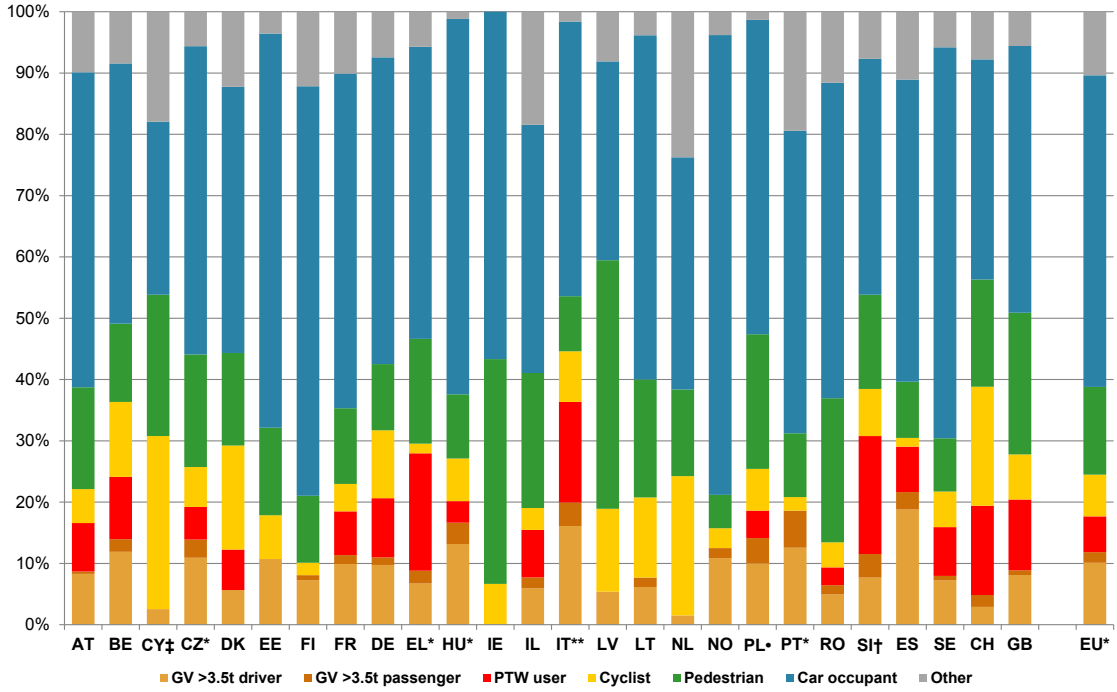


Fig. 11 Percentages by type of road user of deaths in collisions involving a goods vehicle over 3.5 t in the last two or three years for which numbers are available (2009-2011 unless otherwise indicated). **CZ, EL, HU, PT values for 2009-2010. **IT 2008-2010, †SI 2010-2011, ‡CY values for 2009 and 2011. •PL data refers to all goods vehicles.*

Across the EU the occupants of the HGVs involved in the collision make up only 12% of the deaths. The highest number of road deaths following collisions with HGVs is observed among the occupants of passenger cars, either drivers or passengers. They amount to 50% of such road deaths during the last three years observed. Unprotected road users amount to 28% of the road deaths recorded following collisions involving HGVs: 6% were riders of powered two-wheeled vehicles (PTW), 7% were cyclists and 15% were pedestrians. Other types of road user accounted for 10% of the road deaths.

The percentage breakdown by type of road user of those killed in HGV collisions has changed only slightly between the beginning and the end of the period 2001-2011.

In **Romania** and **Israel**, the percentage of deaths among car occupants in collisions with HGVs has increased during this period. Increases in the levels of car ownership can to some extent explain this development, but attention should be paid to reversing a possible trend. In these two countries, despite a downward trend in the total number of road deaths, the number of deaths among car occupants in collisions with HGVs has increased.

The exact reasons for this trend are not fully known, but we believe that a period of economic expansion between 2001 and 2005, high traffic density on the Israeli road network and limited speed enforcement might have contributed to the increase in the share of car occupants among those killed in collisions involving HGVs.
Shalom Hakkert, The Ran Naor Foundation for Road Safety Research, Israel.

In **Spain**, **Italy**, **Portugal** and **Hungary** the percentage of deaths that are HGV occupants is above the EU average, with rates of 22%, 20%, 19% and 17% respectively. The lowest proportions of

HGV occupants among deaths in HGV collisions were recorded in **Ireland**, where no HGV driver or passenger died between 2009 and 2011, and **The Netherlands**, where two HGV drivers died in 2010 and one died in 2009.

The Italian goods vehicle fleet is quite old, with an average age close to 20 years, so most of the vehicles currently on the roads lack safety systems such as ABS or ESP. The renewal of the vehicle fleet could generate important safety benefits through on-board safety and efficiency technologies, such as brakes, tyres, lighting, ITS in the form of cruise control and lane departure warning.
Lucia Pennisi, Automobile Club Italia.

> *In Spain, 54% of the road deaths among HGV occupants occur in single-vehicle collisions. In these cases, the main contributing factors were distraction in 55% of the cases, infractions in 25%, speeding in 17% and fatigue in 16%.*
> Pilar Zori, Dirección General de Tráfico, Spain.

It is typical that most (more than 60%) fatal crashes occur outside built-up areas, a consequence of the higher speeds. Rural roads are especially dangerous where the most serious head-on and single-vehicle crashes occur. Hungary is a typical transit country and some road sections (single carriageway) are very dangerous from the point of view of serious head-on collisions. The real causes of these crashes have to do with speeding, dangerous overtaking and fatigued drivers.
Péter Holló, KTI Hungary.

> *In the Netherlands, since 1980 the average number of truck drivers killed is approximately 10 annually. This is a low number (ca 1% of the total), which is explained by the fact that truck speeds in The Netherlands are limited and roads are sustainably safe, in combination with the fact that it needs a very severe single vehicle or truck-truck crash to kill a truck driver. In 2009 and 2010 we must have had accidentally low numbers, as there were no specific safety measures taken in these years.*
> Henk Stipdonk, SWOV, The Netherlands.

Unprotected road users make up 51% of the road users killed in collisions involving HGVs in **Switzerland** with 15% PTW riders, 19% cyclists and 17% pedestrians, while in **Latvia** pedestrians account for 41% of the road deaths in HGV collisions.

Given Switzerland's high population density, urban areas account for a relatively larger proportion of the total distance travelled. Higher traffic exposure in urban areas leads to a higher casualty rate and in fact approximately 60% of serious injuries recorded on Swiss roads occur on this type of road.
Stefan Siegrist, Swiss Council for Accident Prevention, Switzerland.

> *On average, pedestrians account for 33% of the total number of road deaths in Latvia. The main reason is a lack of physical separation from other road users, especially on rural roads. Approximately 70% of all pedestrian deaths occurred during the dark.*
> Aldis Lama, Ministry of Transport, Latvia.

The large differences between the percentage of people losing their life as an occupant of an HGV and as other types of road user in these collisions provide an interesting insight into the externalities associated with the transport of goods by road, and further developments, both in policies and vehicle technologies, should take these into account.

The relatively large masses of the HGVs translate into higher momentum when the vehicle enters a traffic collision with another road vehicle or user, which in turn increases the severity for the occupants of the other vehicle involved in the collision. The redistribution of momentum during a traffic collision partly explains the relatively small proportion of road deaths for HGV occupants. As such, while HGVs are relatively safe for their occupants, they make for formidable collisions for other types of road users. Moreover, the generally raised cabs of HGVs afford their occupants a relatively higher level of protection than for other vehicle occupants.

Improvements in the requirements of the **Regulation 2009/661/EC** for underrun protection systems in HGVs would be beneficial in reducing the severity of the collisions between HGVs and other vehicles. Rigid front underrun protection is mandated for all HGVs in the EU. However, as frontal car-to-truck collisions normally occur at high relative speeds, an energy-absorbing front underrun protection system would improve the survivability of frontal collisions, even up to relative speeds of 75km/h.[14] Other pieces of EU legislation could also be used to make HGV fronts safer (see box). Side underrun protection systems fill the empty space between the wheels of the HGVs thus preventing unprotected road users from being caught under the HGV, especially in cases when the latter is making a turning manoeuvre (see also Figs. 14 and 15). However, the legislation currently in force permits the use of an 'open' frame, i.e. two side planks with a maximum distance between them of 30cm. In some circumstances road users can be caught between these two planks and research has shown that deaths in such situations among pedestrians and cyclists could be reduced by approximately 45%.[15] Rear underrun protection systems for HGVs and trailers are designed primarily to protect in the case of collisions with passenger cars. Council Directive 70/221/EEC requires a ground clearance of 550mm and test forces of 100kN. Conservative estimates by studies that reviewed these requirements showed that lowering the ground clearance to 400mm and doubling the test forces for the rear underrun protection systems would yield a **one third** reduction in the number of car occupants killed or seriously injured in such collisions.[16]

[14] ETSC (2012) ETSC Contribution to the CARS 21 WP1 on Road Safety http://www.etsc.eu/documents/CARS%2021_WP%201_ETSC%20Contribution%2015%20Feb%202012.pdf

[15] ETSC (2001) Priorities for EU Motor Vehicle Design http://etsc.eu/documents/mvdesign.pdf

[16] ETSC (2012) ETSC Contribution to the CARS 21 WP1 on Road Safety http://www.etsc.eu/documents/CARS%2021_WP%201_ETSC%20Contribution%2015%20Feb%202012.pdf

Directive 96/53/EC on maximum permitted weights and dimensions in road transport

In 2013 the EU Institutions are due to debate a revision of Directive 96/53/EC which prescribes the maximum permitted weights and dimensions for vehicles using the road networks in the European Union. A proposal published by the European Commission offers an opportunity to improve road safety by improving the streamlining of the cab, allowing a reduction of the driver's blind spots. A new cab profile could also incorporate energy absorption structures in the event of a collision and could potentially save lives of vulnerable road users who the driver does not necessarily see when making manoeuvres.

The proposal also adds provisions to Directive 96/53/EC to enable national inspection authorities to better detect infringements and harmonise administrative penalties that apply to them. The European Commission will also publish guidelines on inspection procedures to ensure harmonisation of inspection methods between all Member States.

However, any increase of either vehicle weight or length should be weighed carefully so that potential benefits are not outweighed by negative consequences in terms of road safety, or the costs that may arise from the need to modify road infrastructure, including rest and loading/ unloading areas, to accommodate changes in the HGV size or weight.

http://ec.europa.eu/transport/modes/road/weights-and-dimensions_en.htm

2.1.3 By type of road

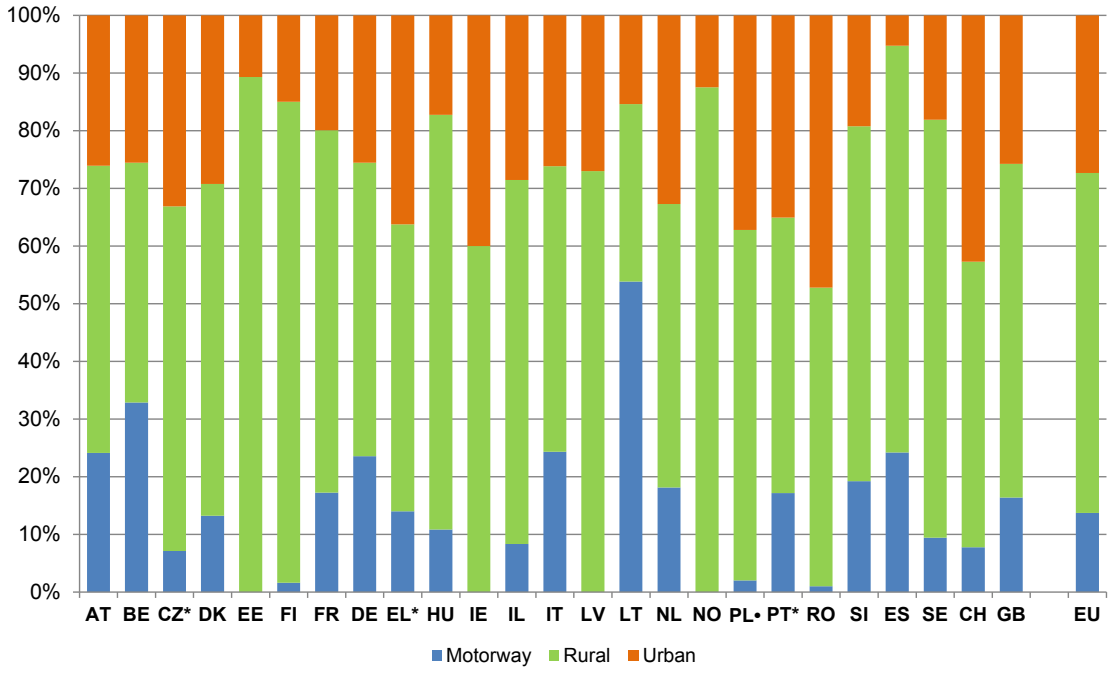


Fig. 12 Percentages by type of road of deaths in collisions involving a heavy goods vehicle in the last two or three years for which numbers are available (2009-2011 unless otherwise indicated).
**CZ, EL, PT values for 2009, 2010. •PL data refers to all goods vehicles.*

For the EU as a whole, 28% of the road deaths in collisions involving HGVs occur within urban areas, 59% on rural roads other than motorways and 13% on motorways. The lowest percentages of these road deaths occurring on urban roads are observed in **Spain** with 5%, **Estonia** with 11%, **Norway** with 13%, **Luxembourg** with 14% and **Lithuania** and **Finland** with 15%. In contrast, in **Romania**, 47% of the deaths in collisions involving HGVs occur on urban roads, while the figures for **Switzerland** and **Ireland** stand at 43% and 40% respectively.

In Ireland, a total of 12 people lost their lives on urban roads in collisions involving HGVs during the period 2009-2011. In 2007, the Dublin City Council approved a city-wide ban on HGVs in the inner city, which is reported to have improved the safety of pedestrians, PTW users and cyclists in the city.[17]

If deaths in collisions involving HGVs are to be further reduced on urban roads, a series of challenges have to be met and the function of providing goods to urban businesses and residents, which is performed in part by HGVs, has to be integrated with initiatives aimed at improving general road safety in urban areas. Measures to reduce the risks of death and injury for road users in urban areas generally include:

- Matching the use of each road to the functions that the road serves in terms of living space, access and through movement;
- Separating faster vehicles from slower ones and lighter vehicles from heavier ones, and separating vehicles that are making conflicting movements;
- Making the road system self-explaining to its users;
- Achieving high levels of use of protective devices and understanding of how to drive to reduce risk.

While 55% of the overall number of road deaths in the EU occur on rural roads[18], a slightly higher percentage, 59%, of the deaths in collisions involving HGVs take place on this type of road. In **Estonia**, 89% of the road deaths in collisions with HGVs occur on rural roads, followed by **Finland** with 83%. The corresponding rates are 73% in **Latvia**, 72% in both **Hungary** and **Sweden** and 71% in **Spain**.

Measures aimed at the general reduction of deaths on rural roads will also have an effect on the number of road deaths in collisions involving HGVs. However, there is no single measure to improve safety on rural roads and experience from fast progressing and best performing countries shows the need for a combination of well-known and cost-effective measures. These include safe road design, safe infrastructure management and increased enforcement of applicable traffic laws, particularly with regard to speeding (more details below) and drink driving.

One of the main infrastructural measures introduced in **Sweden** was the upgrade of rural roads to a 2+1 design with the traffic in the two directions separated by a middle barrier. An evaluation of these roads, published in 2009, analyses the safety benefits of the investments made in the upgrade of the infrastructure.[19] In the framework of the EU-funded SUPREME project, rumble strips – milled into the asphalt surface of either the shoulder of the road or the line separating opposite directions of traffic when there is no middle barrier – have been identified as one of the best practice infrastructural measures to reduce road deaths on rural roads. Research has shown that reductions of over 30% in the number of injury collisions could be achieved through the use of shoulder-mounted rumble strips.[20] As fatigue is a contributing factor in a considerable share of collisions involving HGVs, an

[17] ETSC (2009) 3rd Road Safety PIN Report Chapter 4 *En route to safer mobility in EU capitals*. http://www.etsc.eu/documents/ETSC%20PIN%20Annual%20Report%202009.pdf

[18] ETSC (2011) 5th Road Safety PIN Report Chapter 3 *Reducing deaths on rural roads – A priority for the UN Decade of Action*, http://www.etsc.eu/documents/ETSC_2011_PIN_Report.PDF

[19] VTI (2009) Evaluation of 2+1 roads with cable barriers. http://www.vti.se/en/publications/pdf/evaluation-of-21-roads-with-cable-barrier.pdf

[20] Further information available at http://ec.europa.eu/transport/road_safety/pdf/projects/supreme.pdf

infrastructural element required, but which is sometimes overlooked on the road network, is the provision of adequate and secure parking spaces for these vehicles.[21] Studies from 2002 identified a considerable shortfall of parking spaces in Europe.[22]

2.1.4 By distance travelled

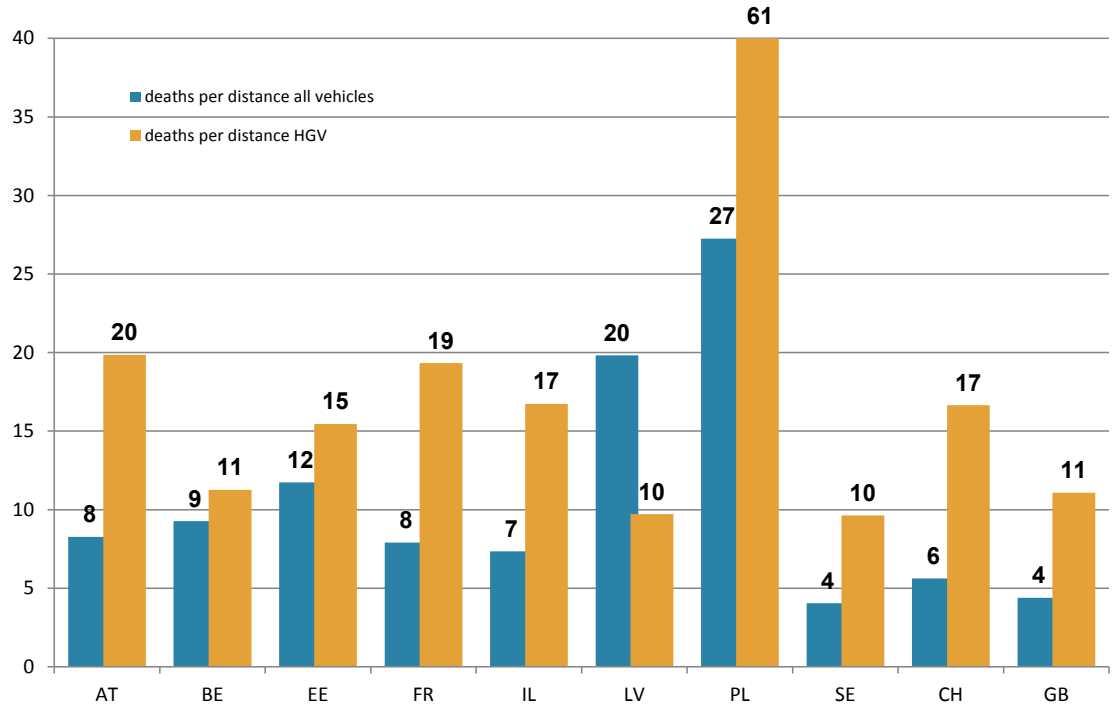


Fig. 13 Road deaths in collisions involving a goods vehicle over 3.5t per billion vehicle kilometres travelled by those vehicles (orange bars) with corresponding rates for all vehicles (blue bars).
Average for the period 2008-2010 except for LV and SE 2009-2011 and PL 2008-2009.

In terms of the number of deaths per distance travelled by HGVs, the data from the countries that collect it shows that HGVs are generally less safe than the country average for the entire vehicle fleet, with **Latvia** being the only exception. In **Austria**, **Israel**, **Sweden**, **Switzerland** and **Great Britain** HGVs are involved in more than twice as many fatal collisions per billion km travelled as the average vehicle. While the demand for transport of goods is likely to either remain constant or increase in the future, the data in Fig. 13 should serve as a reminder that road safety policies should not lose focus on HGVs.

2.1.5 Nearside turn collisions

The larger size of the HGVs results in a comparatively smaller area of direct vision for their drivers than for drivers of passenger cars or LGVs, so this deficiency has to be corrected through the use of indirect vision devices, particularly mirror elements. A re-design of the cabs may also help as foreseen as the current proposal for a revision of the Directive 96/53/EC. EU-level legislation has been adopted to provide minimum requirements for reducing blind spot areas around large vehicles.[23] A study on the implementation of Directives 2007/38/EC shows the areas around the HGV which are covered by

[21] ETSC (2011) Tackling Fatigue: EU Social Rules and Heavy Goods Vehicle Drivers. Preventing Road Accidents and Injuries for the Safety of Employees (PRAISE) http://www.etsc.eu/documents/Report7_final.pdf

[22] 'SETPOS Workshop, Brussels 29.04.2009 Alexia Journé' http://www.setpos.eu/docs/ppt-journe.pdf. For further information http://setpos.eu/handbook/SETPOS-project-handbook.pdf

[23] EC Directive 2003/97/EC on the fitting of blind-spot mirrors on new vehicles and Directive 2007/38/EC on retro-fitting mirrors to heavy goods vehicles.

the indirect vision devices mandated by the Directive, but it also notes that even, if the requirements are fully implemented, the potential for blind spots around HGVs still remains.[24]

This conclusion is consistent with the data related to deaths in collisions with near-side turning HGVs provided by the PIN panellists, as shown in Fig. 14.

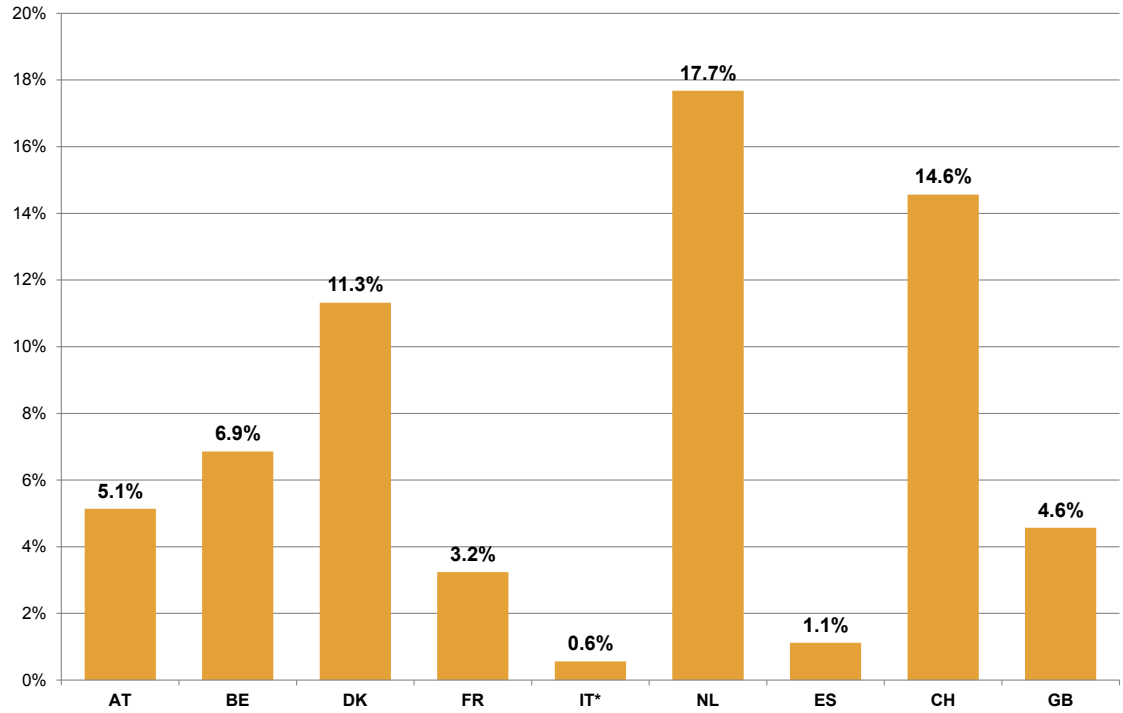


Fig. 14 Percentage of road deaths in collisions involving a goods vehicle over 3.5 t for which the HGV was performing a near-side turn (left turn in the UK, Malta and Ireland, right turn in the rest of Europe). Average for the last three years available.
**IT average for 2009 and 2010.*

In **The Netherlands**, close to 18% of the total number of deaths following collisions with HGVs occur while the vehicle is performing a nearside (right) turn. The corresponding percentages are 14.6% in **Switzerland**, 11.3% in **Denmark**, 6.9% in **Belgium** and 5% in **Austria**.

Further research would be needed to provide a full explanation of the higher share of deadly nearside collisions in The Netherlands. A possible explanation might be found in the large proportion of Dutch roads that have separate bicycle infrastructure and the fact that cyclists, as well as moped riders, must stay on the right of motorised traffic. These rules increase the safety on road sections but might increase the risk of collisions at intersections when HGVs are performing a right turn.
Henk Stipdonk, SWOV, The Netherlands

[24] TRL (2011) A study of the implementation of Directive 2007/38/EC on the retrofitting of blind spot mirrors to HGVs http://ec.europa.eu/transport/road_safety/pdf/retrofitting_mirrors.pdf

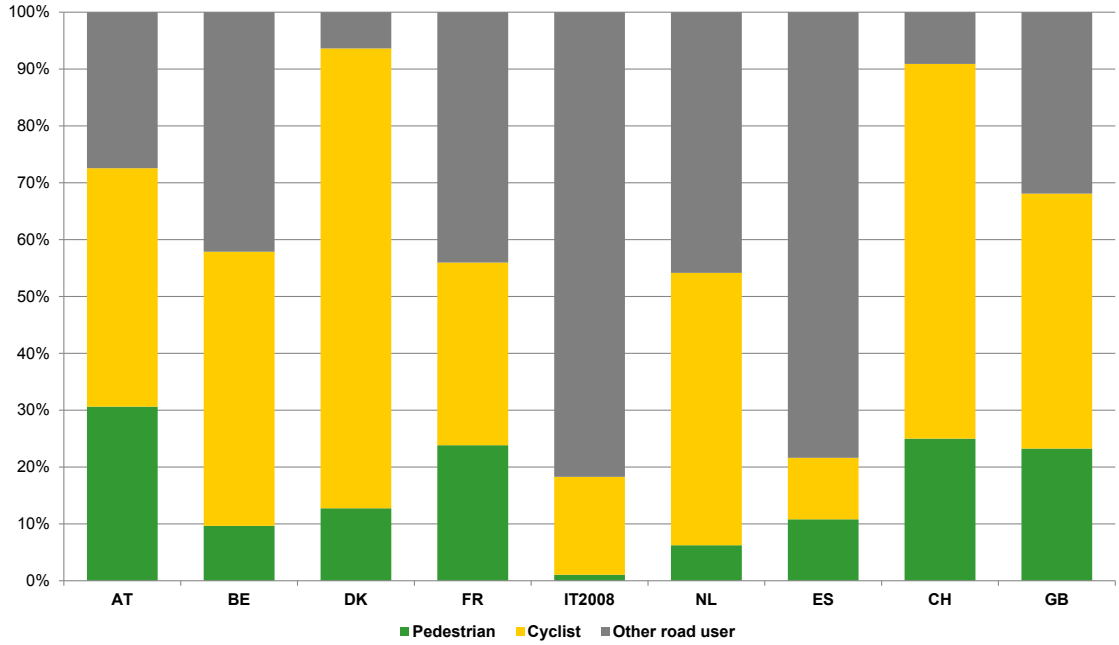


Fig. 15 Percentage by type of road user of those killed or seriously injured in a collision with a goods vehicle over 3.5 t performing a near-side turn (left turn in the UK, Malta and Ireland, right turn in the rest of Europe). *Average for the last three years available*.

The problem of blind spots around nearside turning HGVs is particularly acute for vulnerable road users, not just because of their small weight in relation with the HGVs, but also because of the limited amount of space they occupy on the road, which reduces the chance of the drivers detecting them through the rear-view mirrors. Fig. 15 shows the percentages of pedestrians and cyclists among those who are killed or seriously injured in collisions with nearside turning HGVs.

As a measure to improve the safety of cyclists, Transport for London started promoting the use of Fresnel lenses, distributing 20,000 of them in 2008, of which 5,000 were given to vehicles working on the Olympic site in London.[25] Moreover, the use of Fresnel lenses is required for all HGVs operating on or delivering materials and goods to work sites contracted by Transport for London.

Transport for London also asks that all drivers working on or delivering goods to its sites across the city have undertaken specialised training on interacting with cyclists and other vulnerable road users within an urban environment. Public procurement rules are also used to ensure that these requirements are met.

View from driver's seat (right-hand side) of cyclist on the nearside of the lorry. Fresnel lens and side mirror. Source: TfL

[25] Transport for London http://www.tfl.gov.uk/microsites/freight/hgvs_and_road_safety.aspx

2.1.6 Speed measurements in countries where they are available

a) Rural roads

Unfortunately, only six of the PIN countries were able to provide measurements related to the speed of heavy goods vehicles, measured in free-flowing traffic. With few exceptions, data from these countries paints an encouraging picture, as the mean speed of heavy goods vehicles has decreased slightly over the observed period (Fig. 16).

A marked drop in the mean speed of HGVs was observed in France, up to 2008; this mean speed subsequently increased in 2009 and 2010, but reverted to the 2008 level in 2011. In **Great Britain** the reported mean speed of HGVs on rural single carriageways remains consistently above the speed limit of 64km/h that is specific to HGVs on these roads, but this speed limit, much lower than the limit of 97km/h that applies to smaller vehicles on those roads, is under review, partly because of the risk that it encourages dangerous overtaking by cars and other lighter vehicles. The same applies to the limit of 81km/h on rural dual carriageways.

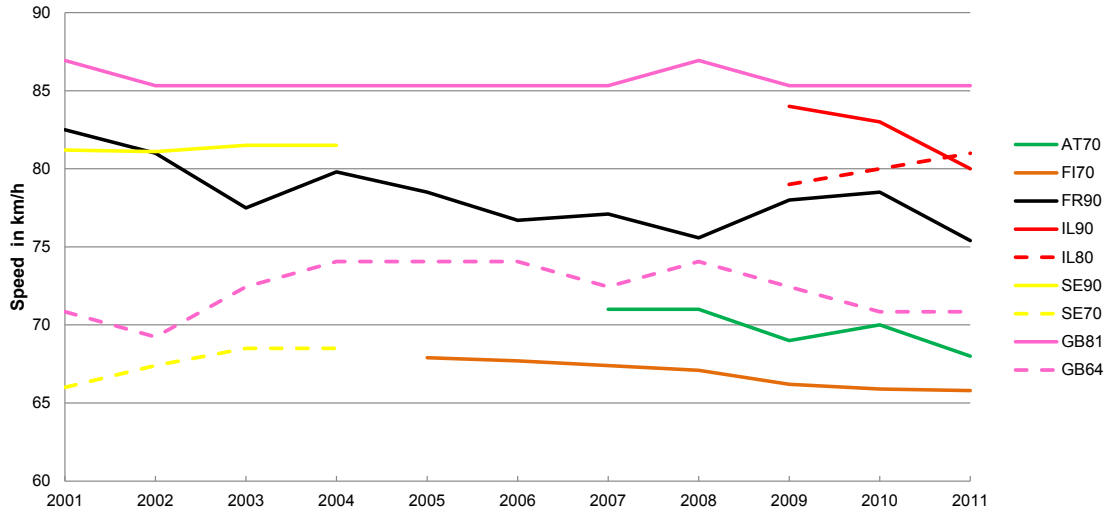


Fig. 16 Mean speed (in km/h) of goods vehicles over 3.5 t, measured in free flowing traffic, on rural roads other than motorways in some European countries.
In GB the speed limits of 64 and 81km/h refer to HGVs exceeding 7.5t only. HGVs with a maximum weight between 3.5t and 7.5t are limited to 81km/h (50mph) on single carriageways and 97km/h (60mph) on dual carriageways. Cars are limited to 97km/h and 113km/h respectively.

The evolution in the percentage of HGVs that exceed the speed limit on rural roads rather closely mirrors the evolution of mean speeds (Fig. 17). The best record of compliance with the posted speed limits was observed in **Finland**, where 26% of drivers exceeded the 70km/h limit. **France** and **Israel** (on roads with 90km/h speed limit) follow with non-compliance levels of 38% and 39% respectively.

In Sweden, speed monitoring on a yearly basis is done through the use of a 'speed index' which regularly monitors speed developments at 83 points across the rural road network. During 2012, an extensive speed survey – over 1,500 measurement points – was conducted in a manner similar to surveys done up to 2004. The results show small decreases in mean speed for HGVs (- 2.2%) and larger decreases for passenger cars (-4.5%) compared with the data from 2004.
Anna Vadeby, VTI Sweden.

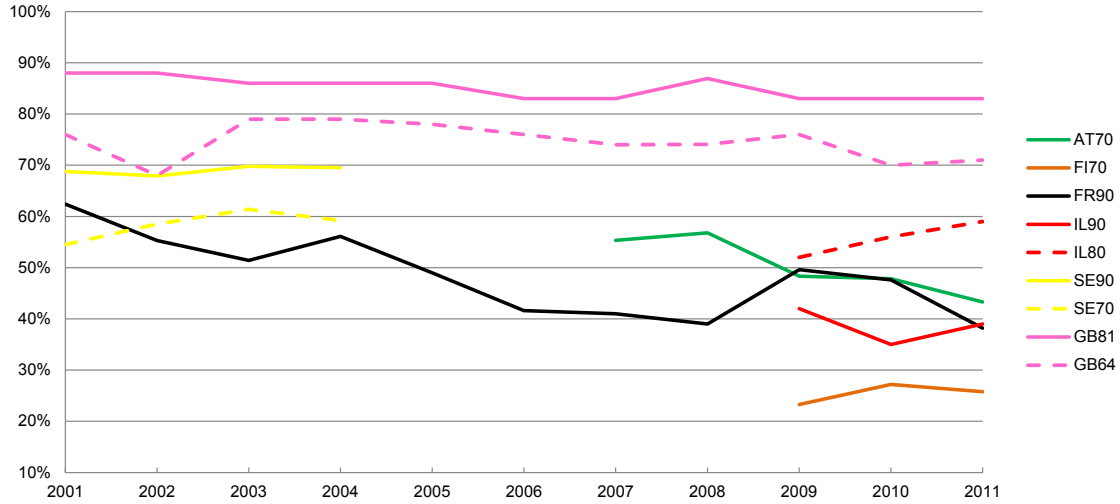


Fig. 17 Percentage of goods vehicles over 3.5 t exceeding the speed limit on rural roads other than motorways.
In GB the speed limits of 64 and 81km/h and the observed percentages refer to HGVs exceeding 7.5t only, which have a lower speed limit than the rest of the vehicles. HGVs with a maximum weight between 3.5t and 7.5t are limited to 81km/h (50 mph) on single carriageways and 97km/h (60mph) on dual carriageways. Speed limits for cars are 97km/h and 113km/h respectively.

b) Urban roads

With exceptions, the mean speed, measured in free flowing traffic, of HGVs on urban roads, shows a relatively static picture for the countries that provided data (Fig. 18). The biggest nominal reduction in the mean speed of free flowing HGV traffic on urban roads was observed in **France**, from 56km/h in 2001 to 49km/h in 2011. The lowest mean speed for HGVs on French urban roads was recorded in 2006 and the mean speed has fluctuated slightly since then. Mean speed was also reduced substantially on 30km/h limited **Austrian** urban roads, from 30km/h in 2007 to 25km/h in 2011.

In Austria, area-wide engineering speed management measures on 30km/h roads have been introduced as part of a new policy, thus ensuring that compliance with the posted speed limits minimises the need for additional resources dedicated to enforcement. We now appear to see the first positive results of these comprehensive investments.
Klaus Machata, Austrian Road Safety Board.

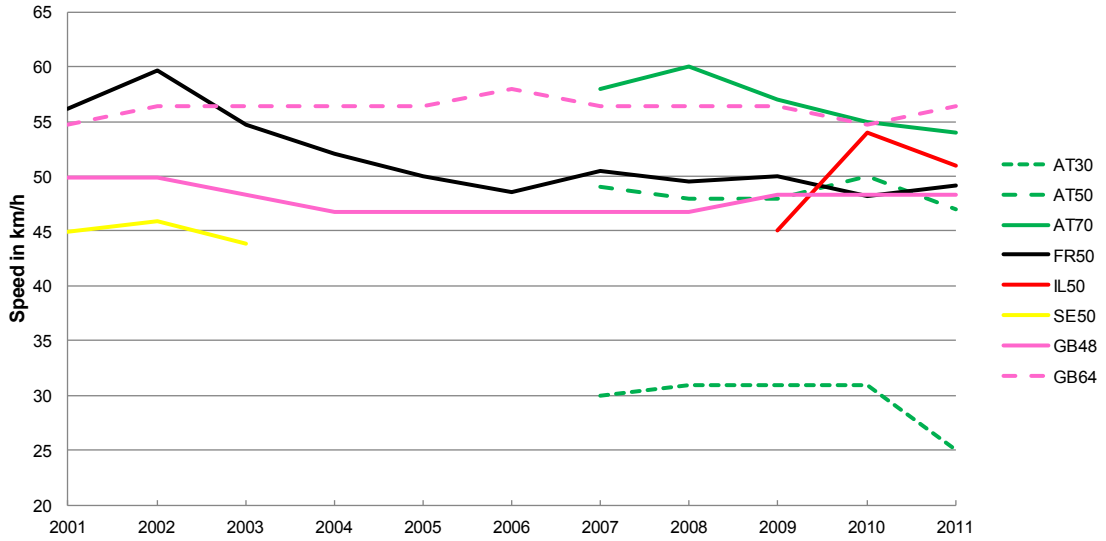


Fig. 18 Mean speed (in km/h) of goods vehicles over 3.5t, measured in free flowing traffic, on urban roads in some European countries.
The GB data refers to 2-axle rigid HGVs only.

The proportion of HGVs travelling above the speed limit in urban areas was the lowest on 70km/h roads in **Austria** at 3% (Fig. 19). In **Great Britain**, 21% of HGV drivers went above the speed limit on 64km/h urban roads. In **Austria**, 28% exceeded the limit on 30km/h roads and 39% on 50km/h roads.

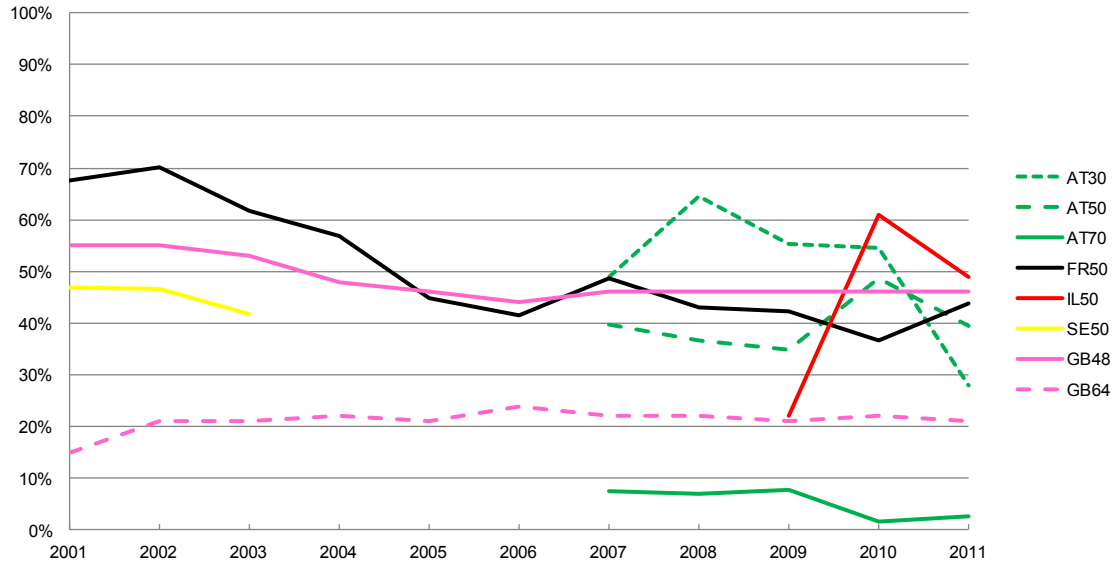


Fig. 19 Percentage of goods vehicles over 3.5 t exceeding the speed limit on urban roads.
The GB data refers to 2-axle rigid HGVs only.

ETSC project STARS 'Students Take Action to Reduce Speed'

STARS is a project which aims at mobilising transport research into speed management to demonstrate how excessive and inappropriate speed can be reduced through measures that are available now. The main objective of STARS is to take concrete actions that can reduce speed through the work of students. Groups of two students from across the continent devise their projects to manage and reduce speed at a selected site and participate in an EU-wide competition.

The winning group in the 2010-2011 round of STARS implemented a speed management project on the AS-19 road linking Avilés and Gijón in Spain. The selected site had the highest concentration of collisions within the region and it was located in an area with high HGV traffic due to its proximity to an industrial site, as well as having two bus stops in locations with low visibility.

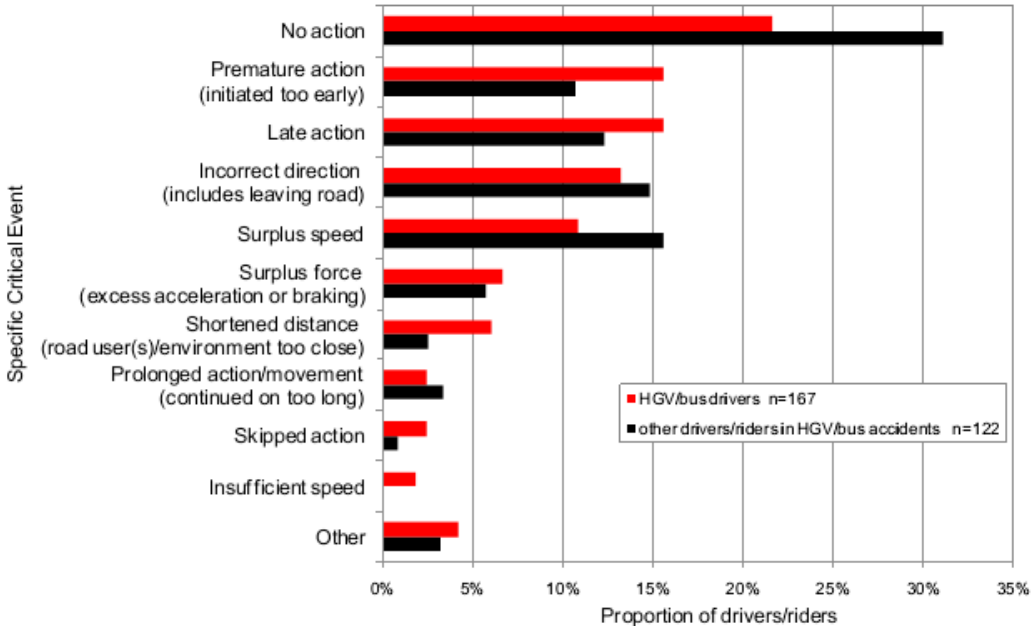
The students installed high visibility elements to make drivers pay more attention at the site. They placed two fluorescent reflective high visibility panels at the beginning of the treated road section, painted transversal lines to alert drivers of a reduced speed limit and installed reflective road studs on the road surface and on the crash barriers (see below). Moreover, the speed limit for the treated site was reduced from 90km/h – the general limit on rural roads – to 60km/h.

http://www.etsc.eu/stars.php

[26] Dutch Safety Board (2012) Truck Accidents on Motorways, The Hague, November 2012. http://www.onderzoeksraad.nl/docs/rapporten/Summary_Vrachtwagenongevallen_EN_web.pdf. The full report (in Dutch) is available at http://www.onderzoeksraad.nl/docs/rapporten/Vrachtwagenongevallen_NL_web.pdf.

In-depth collision studies

Many studies used in-depth accident investigation in order to reveal the dynamics of collisions and draw conclusions to prevent similar ones in the future. In the framework of the EC-funded SafetyNet project, a sample of collisions that occurred in Germany, Italy, The Netherlands, Finland, Sweden and the UK was identified and in-depth data for these collisions was collected. The SafetyNet Accident Causation Database contains 1,006 accidents, 158 involving an HGV or bus driver and, through the SafetyNet Accident Causation System, one specific critical event is attributed to each driver/rider/pedestrian involved in a collision.[26] The figure below shows the distribution of critical events for HGV or bus drivers (red bars) and other drivers/riders involved in collisions with HGVs/buses within the database.



Eleven collisions, occurring on Dutch motorways between October 2011 and January 2012, investigated by the Dutch Safety Board form the basis of a report published in November 2012.[27] On this basis, the Safety Board selected several focus areas that need to be looked at more closely to gain an insight into the underlying causes of collisions involving HGVs: the general area of alertness and the more specific areas of tyre blowouts and collisions at the end of traffic jams – i.e. vehicles encountering a traffic jam and unable to brake in time to avoid collision with the vehicles in front, who are either travelling at reduced speed or are stationary. The report says that new technologies, such as Advanced Emergency Braking System (AEBS) and Lane Departure Warning System (LDWS), can help in limiting serious HGV collisions if used correctly, and notes that HGV drivers' behaviour is key to road safety. The report also draws attention to the role of infrastructure in inducing correct behaviour: a shortage of 1,800 truck parking spaces, as

calculated in 2011, could be a contributory factor in non-compliance with legislation on driving and rest times.

In a 2010 report analysing 130 fatal collisions involving HGVs that occurred in Norway between 2005 and 2008, the Institute of Transport Economics identified several risk factors and tested 14 hypotheses related to the influence of these risk factors on collisions.[28] In 39 of the cases studied the HGV was the vehicle triggering the collision, while in 76 cases another vehicle involved in the collision triggered it. The Norwegian data identified speed (either inappropriate or illegal) as a triggering factor in all types of collisions except for those between a HGV and a vulnerable road user. The report also showed that, while vehicle conditions (such as brakes or tyres) may contribute to road collision, they are rarely its main cause.

A 2009 study by the Swedish Road Administration looked at collisions in the period 2000-2007 and quantified the life saving potential of various road safety measures as it related to collisions involving HGVs.[29] The measures were divided into:

- Measures related to safe roads: median barriers, central and side rumble strips, safe intersections in urban areas, safe intersections on main (rural) roads and speed controlled pedestrian and bicycle crossings;
- Measures for safe use: sober drivers of passenger cars, sober drivers of heavy goods vehicles, seat-belted drivers of passenger cars, seat-belted drivers of heavy goods vehicles, well secured loads, speed limit compliance by drivers of passenger cars and speed limit compliance by drivers of heavy goods vehicles;
- Measures for safe vehicles: crashworthiness in new vehicles, safe reversing by heavy goods vehicles, heavy goods vehicles without technical faults, Electronic Stability Control systems for passenger cars, Electronic Stability Control systems for heavy goods vehicles, LDWS for passenger cars and HGVs, AEBS for passenger cars and heavy goods vehicles in rear-end collisions, detecting unprotected road users, automatic emergency brake for heavy goods vehicles and automatic emergency brake + deformation zone + safe cars.

According to the report, the greatest individual effects are yielded by median barriers, rumble strips, sober passenger car drivers, LDWS and AEBS. It was also noted that a combination of AEBS and a deformation zone on heavy goods vehicles would reduce the number of deaths in frontal collisions with HGVs by slightly over 50%.

A recently-published report by Volvo Trucks uses the investigations of their Accident Research Team to analyse collisions involving the Group's heavy goods vehicles in Europe. The report looks at the factors contributing to collisions and reveals that in 90% of the collisions involving an HGV one of the contributory factors was related to the driver, in 30% one was related to the road/traffic environment and in 10% one was related to the vehicle, with a combination of factors contributing to a large proportion of the collisions analysed.[30]

[27] TOI (2010) In-depth-study of 130 fatal accidents involving heavy goods vehicles in Norway 2005-2008 https://www.toi.no/getfile.php/Publikasjoner/T%D8I%20rapporter/2010/1061-2010/1061-2010-Sum.pdf

[28] Swedish Road Administration (2009) In-depth analysis of accidents with heavy goods vehicles – Effects of measures promoting safe heavy goods traffic. http://publikationswebbutik.vv.se/upload/4598/2009_2_in_depth_analysis_of_accidents_with_heavy_goods_vehicles.pdf

[29] Volvo Trucks (2013) http://pnt.volvo.com/e/GetAttachment.ashx?id=26704

EU legislation for the use of tachographs in professional road transport

A tachograph is a recording device, fitted to commercial vehicles, which stores details of the movement of vehicles and of certain work periods of their drivers. The recording of the driver's individual duty periods is mandatory in commercial vehicles in European countries for enforcement of driving-time regulations.

The digital tachograph records drivers' activities, speed, distances, identification data of the vehicle, of the tachograph fitted, calibration data as well as faults and attempts to manipulate the system and when data has been accessed (for example by the enforcement authority). It stores digital records of the driver activities and vehicle activities on its internal memory and separately on a driver's smart card. A truck operator must periodically download this data from the digital tachograph and the driver cards. They also need to analyse the data, to ensure that the rules have been complied with. The system of the digital tachograph is controlled by four different Smart Cards: Driver, Company (operators), Workshop (Tachograph manufacturers, Vehicle manufacturers or Tachograph Calibration Centres) and Control Card for enforcement authorities. Each Smart Card is issued according to the specific needs. All Member States have to ensure the availability and provide all necessary infrastructure and equipment for application, personalisation and issuing of digital tachograph Smart Cards.

http://www.europarl.europa.eu/oeil/popups/ficheprocedure.do?id=593078

2.2 Light Goods Vehicles

2.2.1 Country comparison

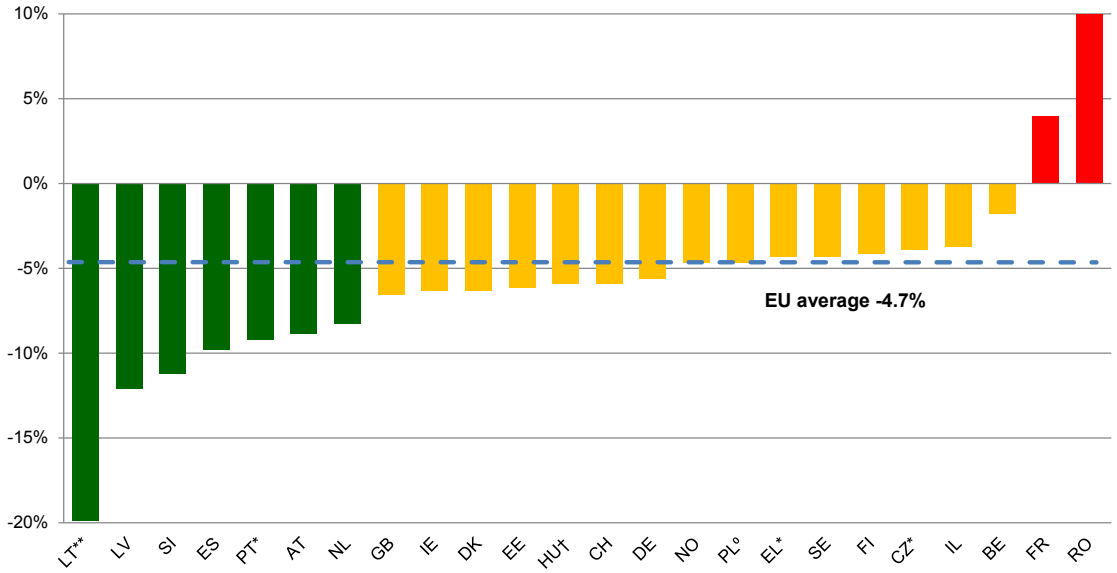


Fig. 20 Average annual percentage change between 2001 and 2011 in the number of road deaths in collisions involving a goods vehicle with a maximum permitted weight below 3.5 t.
**CZ, EL, PT, 2001-2010, **LT 2002-2011, †HU 2002-2010. °PL data refers to all goods vehicles.*

Lithuania achieved the best average annual percentage change in the number of road deaths in collisions involving light goods vehicles (vehicles with a maximum permitted weight of less than 3.5 t). It is followed by **Latvia** and **Slovenia**, which achieved average annual reductions of 12.1% and 11.2% respectively. **Spain**, **Portugal**, **Austria** and **The Netherlands** also achieved reductions of more than 8.0% per year. At the other end of the table, the number of road deaths in collisions with LGVs has increased in **Romania** and **France**, at an annual average rate of 10% and 4% respectively. It should be noted that the number of road deaths reached a peak in 2008 for Romania and 2009 for France, followed by a slight decrease in the number of recorded deaths.

2.2.2 By type of road user killed

Occupants of LGVs make up approximately 30% of the total number of road deaths recorded in collisions involving this type of vehicle, 23% being the drivers of the LGV and the other 7% LGV passengers. Car occupants form the largest other percentage of road deaths in collisions involving LGVs, also accounting for 30% of the number of such deaths between 2009 and 2011. Among unprotected road users the largest percentage is that for pedestrians, at 19%. Riders of PTW vehicles account for 8% and cyclists for 6%, while 8% are other road users.

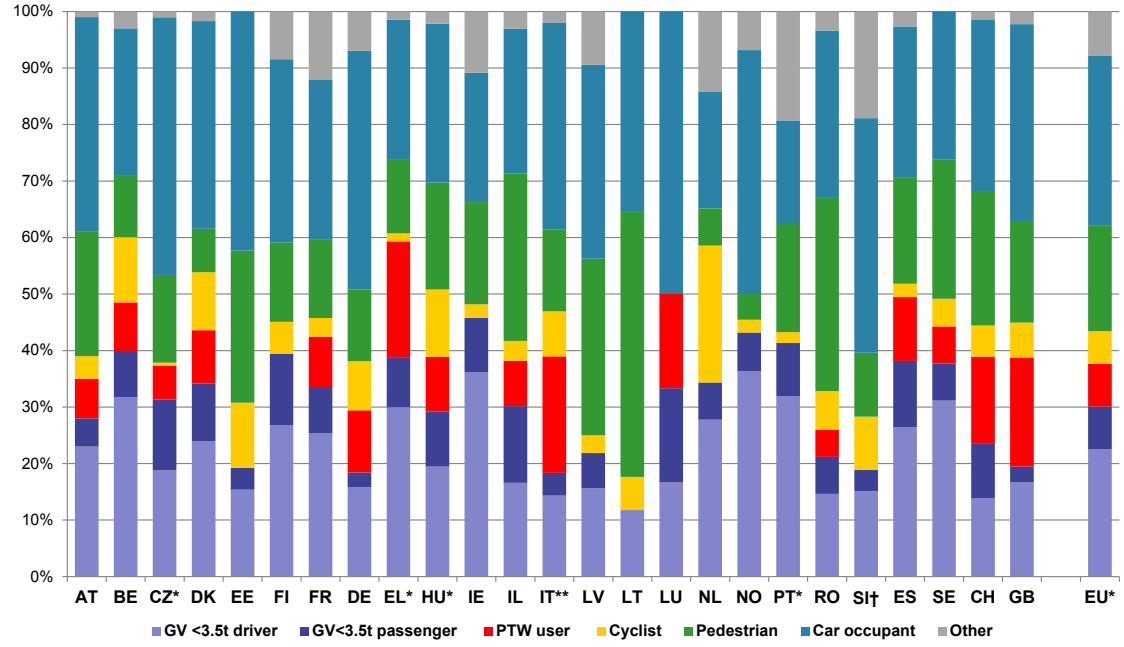


Fig. 21 Percentages by type of road user of deaths in collisions involving a goods vehicle under 3.5 t in the last two or three years for which numbers are available (2009-2011 unless otherwise indicated). **CZ, EL, HU, PT values for 2009-2010. **IT 2008-2010.*

Compared with the corresponding road user group breakdown for HGVs (Fig. 11), the larger proportion of those killed who are LGV occupants – 30% for LGVs compared with 12% for HGVs – reflects in part the lower weight of the LGVs, which makes their occupants more vulnerable. It is also worth noting the larger share of unprotected road users killed in collisions involving LGVs than the corresponding share in collisions involving HGVs, particularly when looking at the share of pedestrians killed – 19% of deaths in LGV collisions compared with 14% of deaths in HGV collisions. With heavy traffic being subjected to entry restrictions in several urban centres in Europe,[30] smaller vehicles are being used more and more for 'last mile' deliveries, leading to an increase in the share of LGVs in urban traffic,

[30] For further information, please consult ETSC (2009) 3rd Road Safety PIN Report, Chapter 4 *En route to safer mobility in EU capitals*.

reinforcing the tendency for much of the activity of LGVs being in areas where many pedestrians are using the roads and thus possibly offering a partial explanation for the observed figures. Road safety in urban areas should thus focus on the purpose, or function, of the vehicles entering urban areas, rather than exclusively on their weight.

The percentage of those killed in LGV collisions who are LGV occupants is the highest in **Ireland**, where they account for 46% of these deaths, compared with the 30% EU average (Fig. 21). In **Norway** and **Portugal**, LGV occupants account for 41% of the road deaths, followed by **Belgium** with 40%. For LGV passengers killed in these collisions, **Israel** has the largest share with 14%, compared with the EU average of 8%, the **Czech Republic** and **Finland** each have 13% respectively and **Spain** 12%.

2.2.3 By distance travelled

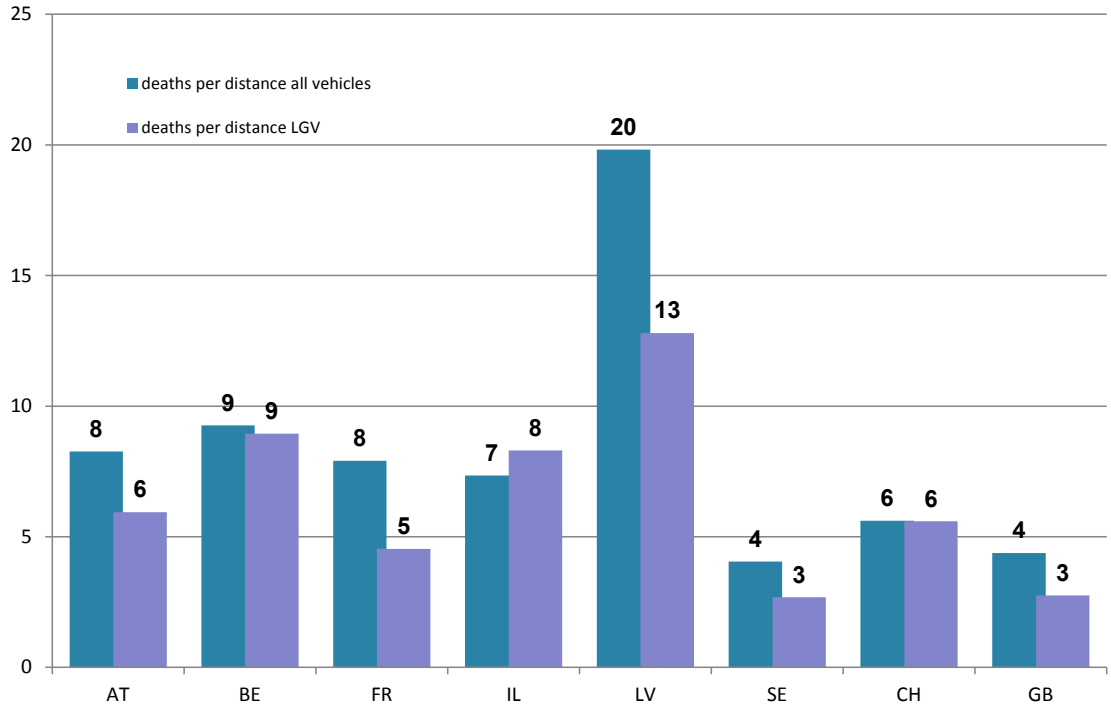


Fig. 22 Road deaths in collisions with a goods vehicle under 3.5 t per billion vehicle kilometres travelled by those vehicles (purple bars) with corresponding rate for all vehicles (blue bars). Average for the last three years for which the data is available.

The data from the countries that record the distance travelled by goods vehicles under 3.5 t shows that, per kilometre travelled, the safety of LGVs is generally better than that of the entire vehicle fleet (Fig. 22). Moreover, with the exception of Latvia, all the countries that record the data used for figures 13 and 22 reported more traffic for LGVs than for HGVs. However, the two figures should not be used as an argument for general replacement of HGVs by LGVs. Even where smaller vehicles could carry goods now carried by HGVs, each HGV-km would be replaced typically by several LGV-km. And HGVs are covered by several pieces of EU legislation, particularly related to the drivers' driving and rest times. When LGVs are used for long trips – whether a single long-distance trip or combined multiple short-distance trips – it should be ensured that LGV drivers benefit from the same social provisions as their HGV counterparts.

An ETSC report published in 2010 noted an increase in the use of LGVs in Europe, particularly following a rise of the home delivery sector.[31] For example, the number of LGVs in the UK has increased by approximately one third during the 2001-2010 period, while LGV traffic increased by 40%.[32] The SafetyNet project noted however a lower rate of seatbelt wearing in LGV drivers and passengers compared with occupants of passenger cars. Moreover, an examination of the severity of collisions in Great Britain shows that LGVs are more likely to be involved in fatal and serious collisions than other vehicle groups. In approximately one quarter of the road deaths where the driver of an LGV caused the collision, they were travelling above the speed limit – either the applicable speed limit for the vehicle class or the posted speed limit.[33] The ETSC report also presents examples of good practices related to the training of LGV drivers.[34]

2.3 Buses and Coaches

2.3.1 Country comparison

Road deaths in collisions involving buses, coaches or trolley buses make up a relatively small percentage of the total number of road deaths recorded yearly in the EU, 2.4% in 2011. However, this type of collisions is likely to receive a relatively high level of attention from the public. This could be in part because of the relatively large number of passengers on buses or coaches. Particularly in the case of coaches, it can happen that a relatively large number of casualties occur in a single collision, thus drawing a higher level of attention from the media, policy-makers and the general public.

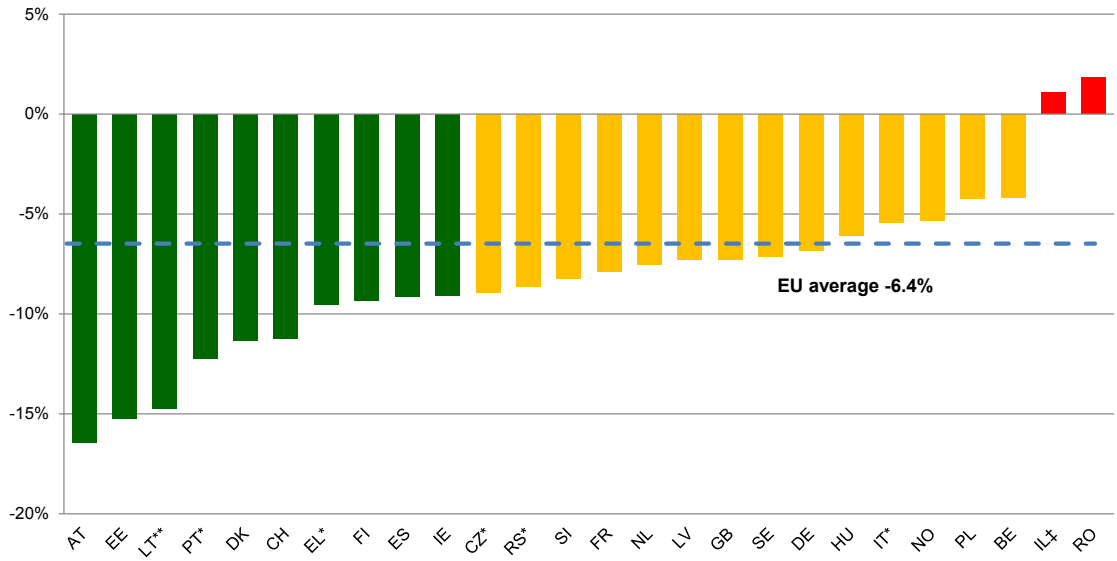


Fig. 23 Average annual percentage change between 2001 and 2011 in the number of road deaths in collisions involving a bus, coach or trolley bus.
**CZ, EL, IT, PT, RS 2011 2001-2010. **LT 2001 2002-2011. ‡IL 2001-2002 2003-2011.*

Between 2001 and 2011 **Austria** achieved the largest reduction in the number of road deaths in collisions involving buses, coaches or trolley buses, with an average reduction of 16.5% per annum. **Estonia** and **Lithuania** follow with corresponding annual average reductions of 15.2% and 14.7%

[31] ETSC (2010) Fit for Road Safety: From Risk Assessment to Training. Preventing Road Accidents and Injuries for the Safety of Employees (PRAISE) http://www.etsc.eu/documents/PRAISE%20Report%202.pdf
[32] DfT, THINK! http://www.thinkroadsafety.gov.uk/campaigns/drivingforwork/index.htm
[33] PACTS (2003), Speed Cameras: 10 criticisms and why they are flawed, PACTS & SSI, London, p4.
[34] ETSC (2010) Fit for Road Safety: From Risk Assessment to Training. Preventing Road Accidents and Injuries for the Safety of Employees (PRAISE) http://www.etsc.eu/documents/PRAISE%20Report%202.pdf

respectively, while Portugal, Denmark and Switzerland have also achieved average percentage reductions of more than 10% per annum. In **Romania** and **Israel** there was an average annual increase between 2001 and 2011 in the number of road deaths in collisions involving a bus or a coach.

2.3.2 By type of road user killed

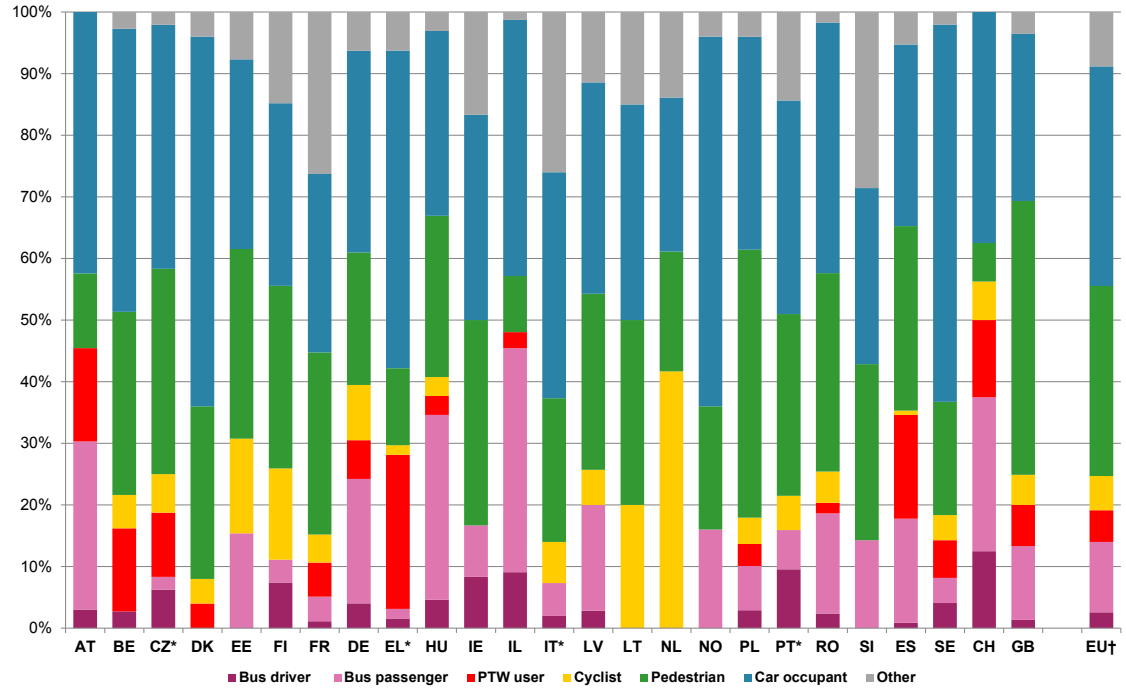


Fig. 24 Percentages by type of road users of deaths in collisions involving a bus or coach in the last two or three years for which numbers are available (2009-2011 unless otherwise indicated).
**CZ, EL, IT, PT values for 2009-2010.*

Occupants of buses or coaches account for 14% of the total number of road deaths in collisions involving such vehicles. As expected – because of a high passenger to driver ratio – most of these are the passengers of the vehicle: 11% of the total compared to 3% drivers. This data appears consistent with an ETSC assessment of the relative safety of transport modes in the EU, which presented buses and coaches as the safest road transport option.[35] However, figure 24 shows that, when buses and coaches are involved in collisions, it is mostly road users outside the said vehicle who lose their lives. The collision mechanics discussed in the case of HGVs in section 2.1 are also applicable in this case due to the large weight of buses and coaches: 36% of those losing their lives in collisions involving buses or coaches are car occupants, while the heterogeneous group of unprotected road users account for 41% of the deaths. The latter group is composed of pedestrians accounting for 31% of these deaths, cyclists accounting for 6% and PTW users accounting for 5%. The large percentage of pedestrians may well be accounted for partly by the large amounts of pedestrian activity in many urban streets used by buses, especially around bus stops.

[35] ETSC (2003) Transport safety performance in the EU. A statistical overview http://www.etsc.eu/oldsite/statoverv.pdf

As explained at the beginning of this section, a large number of casualties may occur in the context of a single collision involving a bus or coach, thus drawing the attention of the media and the public on a particular incident. The coach transporting Belgian school children that hit the wall of a tunnel in Switzerland in March 2012 is such an example.[37] Several of the PIN Panellists provided examples of single crashes involving a large number of passengers. A 2008 collision in Israel where the bus was the only vehicle involved led to the death of 25 passengers, while in 2010 a bus-truck collision led to 5 deaths and a railway level crossing collision involving a coach killed 7 people. In Portugal a bus rolled over in 2007 killing 17 and seriously injuring 23 people. A 2005 collision in Romania resulted in 16 deaths, 6 serious injuries and 5 slight injuries. In Sweden single collisions recorded in 2007 and 2006 resulted in 6 deaths and 6 serious injuries and 9 deaths and 24 serious injuries respectively. Such relatively high-profile events can be seen as an opportunity, albeit a highly unfortunate one, to introduce policies that improve the safety of buses and coaches on the road network. When such policies are designed and debated, figure 24 should serve as a reminder that most often it is road users outside the bus or coach who die following such collisions.

In **Great Britain** pedestrian deaths form the largest share of the road deaths in collisions involving a bus or coach at 44%. The share of pedestrian deaths in such collisions is also higher than the EU average in **Poland**, the **Czech Republic**, **Romania** and **Spain**, with 34%, 33%, 32% and 30% respectively.[37] The percentage of cyclists among those killed in collisions involving buses or coaches is highest in **The Netherlands**, probably as a consequence of the considerable bicycle traffic in that country. **Greece** has the highest percentage of those killed in collisions involving buses or coaches who are PTW users, at 25%.

Alcohol interlocks for school buses

On the 1st of August 2011, the installation of alcohol interlock devices became mandatory on all vehicles dedicated to school and day-care transport in **Finland**. These include school buses as well as any chartered transport requested by the municipalities, cities, schools or institutes, a fleet estimated at approximately 7,000 vehicles. Failure to install the alcohol interlock devices would result in punitive fines. Finland is the second EU country introducing alcohol interlocks for school buses, after France mandated their use from the beginning of the 2009-2010 school year. Moreover, alcohol interlock devices are being used in several EU countries, in the context of driver rehabilitation or of commercial transport. Several EU countries have also adopted legislation mandating the use of such devices. ETSC has been regularly monitoring the gradual introduction of alcohol interlock devices in the EU and an 'Alcohol Interlock Barometer' is published three times per year in the Drink Driving Monitor newsletter.

http://www.etsc.eu/documents.php?did=2

[36] Media reports are abundant across the EU and global media outlets. One report by The Guardian is available here: http://www.guardian.co.uk/world/2012/mar/14/swiss-coach-crash-belgium-mourns-22-children?INTCMP=SRCH

[37] See also http://www.swov.nl/rapport/Factsheets/UK/FS_Public_transport.pdf

2.3.3 By distance travelled

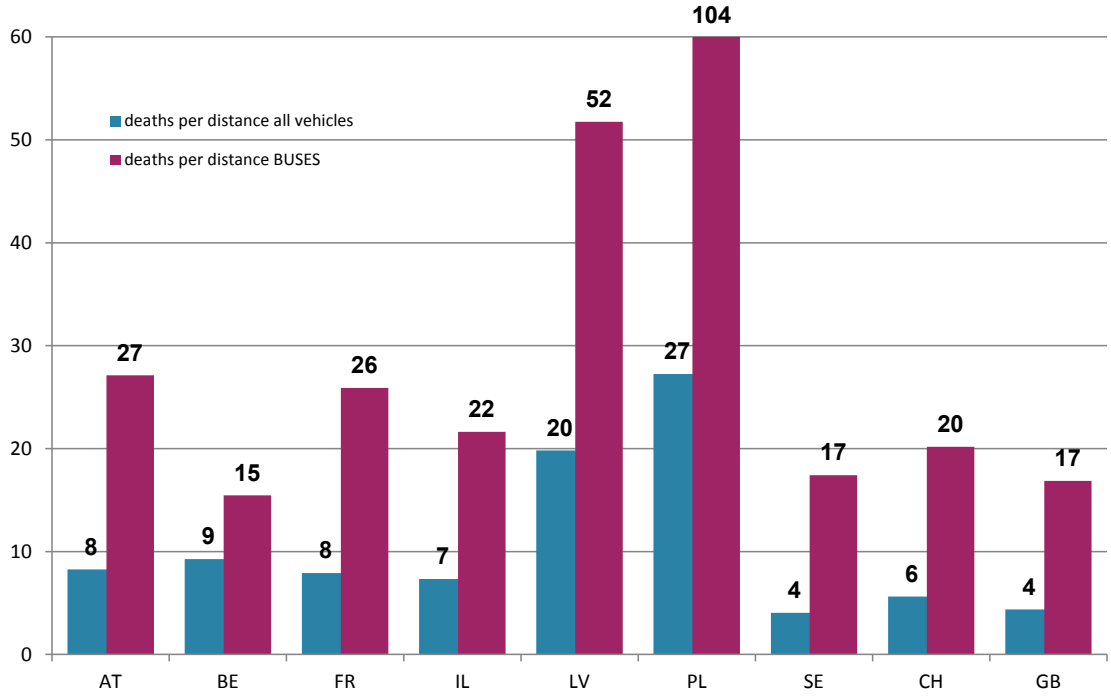


Fig. 25 Road deaths in collisions with a bus, coach, or trolley per billion vehicle kilometres travelled by those vehicles (purple bars) with corresponding rate for all vehicles (blue bars). Average for the last three years for which the data is available.
PL average for 2008-2009 period.

While buses and coaches remain the safest mode of road transport for their occupants (see box above), the data in figure 25 shows that, in the countries recording the data, buses and coaches are less safe in terms of deaths per distance travelled than the average for the entire vehicle fleet.

2.4 Driving for work

As HGVs, LGVs, buses and coaches are driven largely in a work setting, employers have a role to play in reducing the number of collisions involving these vehicles. Particularly in the case of employers which operate in the field of transport, safety must be taken into account. Journey management and planning, which generally improve the efficiency of an employer's operations, are likely to have a positive road safety effect through a reduction in traffic. Moreover, companies and transport operators managing vehicle fleets should pay particular attention to the maintenance of the vehicles and schedule regular inspections to make sure they can safely travel on the roads. In the framework of the ETSC PRAISE project, a thematic report has been published which looks at the steps employers can take to implement work-related road safety management programmes.[38] While human error plays a role in many of the collisions involving HGVs – see box on in-depth collision studies – ETSC advocates that fitness to drive is tackled also in the framework of workplace health promotion.[39] This same report also presents a wealth of good practice examples from the national authorities as well as companies taking up this challenge. Separate reports published by ETSC look at the issues of

[38] ETSC (2012) Work Related Road Safety Management Programmes. Preventing Road Accidents and Injuries for the Safety of Employees (PRAISE) http://www.etsc.eu/documents/PRAISE_ROAD_SAFETY_MANAGEMENT.pdf

[39] ETSC (2010) Fitness to Drive. Preventing Road Accidents and Injuries for the Safety of Employees (PRAISE) http://www.etsc.eu/documents/PRAISE%20Report%203.pdf

fatigue[40] and minimising in-vehicle distraction,[41] providing the state of the art in terms of regulatory practices at EU and national levels, as well as company-level good practice examples. These matters are addressed by the recent international standard ISO 39001:2012.[42]

The following sections will focus on in-vehicle technologies which can be used in goods vehicles and buses, coaches or trolleys to improve their safety.

2.4.1 Speed and speed management technologies

As seen in figures 16-19 above, speeding is still a problem for HGVs, with a considerable percentage of the drivers driving above the speed limit. According to EU legislation, both HGVs and coaches registered in the EU must be fitted with speed limiters which prevent the vehicle from travelling faster than 90km/h in the case of HGVs and 100km/h in the case of buses and coaches. While speed limiters provide road safety benefits, as they prevent the vehicle from going above a certain speed, these are limited to the roads where the highest speeds are permitted, normally on highways or motorways. When the speed limit is below that of the limiter they are unlikely to have an impact.

In addition to speed limiters, in-vehicle speed management technologies exist which aim to adapt the vehicle travelling speed to the prevailing conditions and speed limits. Intelligent Speed Assistance (ISA) systems range from informative to intervening ones. The life-saving potential of ISA in cars has been demonstrated[43] and ETSC has been calling for the large-scale deployment of the technology. Moreover, a trial of using ISA in a truck was performed in the UK in the framework of a project conducted by the University of Leeds. The report notes a reduction in travelling at speeds over the limit, in particular in the 'very high exceeding the limit' category.[44] While the driver of the truck involved in the trial reported his personal dissatisfaction with the ISA system, the study shows better compliance with the prevalent speed limits and an overall reduction in the average travelling speed. The ISA study also reports that in the case of the ISA trial for cars, where more vehicles and drivers were involved, a 'fleet effect' has been observed whereby the participating drivers became more acceptant of the system knowing that others were using it.[45] The ETSC PRAISE report "Driving for work: Managing Speed" provides further examples of speed management solutions implemented in vehicle fleets, as well as providing successful examples and the business case for operators and fleet managers to manage speed of the vehicles being driven for work.[46]

2.4.2 Alcohol and alcohol interlock devices

While driving under the influence is less common in commercial transport (i.e. the types of vehicles within the scope of this publication), alcohol-related collisions in commercial transport tend to

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[40] ETSC (2011) EU Social Rules and Heavy Goods Vehicle Drivers. Preventing Road Accidents and Injuries for the Safety of Employees (PRAISE) http://www.etsc.eu/documents/Report7_final.pdf

[41] ETSC (2010) Minimising In Vehicle Distraction. Preventing Road Accidents and Injuries for the Safety of Employees (PRAISE) http://www.etsc.eu/documents/PRAISE_Thematic_Report_Moving%20In%20Vehicle%20Distraction_21_December%202010.pdf

[42] More information about the ISO 39001:2012 standard, and the full text of its requirements, can be found here: http://www.iso.org/iso/home/store/catalogue_tc/catalogue_detail.htm?csnumber=44958

[43] Among others, see Carsten (2012) Is intelligent speed adaptation ready for deployment? Editorial. Accident Analysis and Prevention 48 (2012)1-3, ETSC (2009) How can In-Vehicle Safety Equipment improve road safety at work? Preventing Road Accidents and Injuries for the Safety of Employees (PRAISE) http://www.etsc.eu/documents/PRAISE%20Report%201.pdf and ETSC (2011) Driving for Work Managing Speed http://www.etsc.eu/documents/PRAISE%20Thematic%20Report%208%20Driving%20for%20Work%20Managing%20Speed.pdf

[44] Carsten et. al. (2008) ISA-UK Intelligent Speed Adaptation Final Report http://www.righttoride.eu/virtuallibrary/warningcontrolsystems/isareportjune2008.pdf

[45] Ibid.

[46] ETSC (2011) Driving for Work Managing Speed http://www.etsc.eu/documents/PRAISE%20Thematic%20Report%208%20Driving%20for%20Work%20Managing%20Speed.pdf

result in relatively more serious consequences.[47] The 2009 ETSC PRAISE report on in-vehicle safety technologies looks at the use of alcohol interlock devices in commercial fleets and highlights implementation examples. Moreover, a dedicated ETSC newsletter regularly monitors legislative developments related to the use of alcohol interlocks.[48]

2.4.3 Seatbelts and seatbelt reminders

In the case of collisions, seatbelts, when properly worn, ensure that occupants remain inside the vehicle. Due to the protective structure of the vehicle cab – whether a car, HGV or LGV – this is likely to reduce the seriousness of injuries sustained. As such, increased seatbelt wearing rates would result not only in improvements in road safety overall, but also in reduced mortality rates, particularly in collisions between passenger cars and HGVs, LGVs, or buses and coaches, which make up the majority of deaths in collisions involving these types of vehicle. Seatbelt reminders detect vehicle occupants – and passengers in coaches – and send a visual and audible warning if the seatbelt has not been fastened.

2.4.4 Emergency Braking and following distance warning

Such systems are based on a system being installed in the large vehicle (HGVs or coaches) in order to detect oncoming vehicles and whether a collision with the front of the vehicle is imminent. Based on the relative speed between the vehicles, the system would be able to detect rear-end collisions (HGV or coach crashing into the back of another vehicle) as well as frontal head-on collisions. The system would warn the driver both visually and audibly that it is too close to the vehicle ahead, and in the case of an imminent collision apply the brakes in order to reduce the speed of the HGV or coach.[49] A study conducted by the Swedish Road Administration in 2009 reports that just over 50% of the road deaths in head-on collisions with HGVs could be reduced through a combination of emergency brakes and a deformation zone on HGVs (see also box on maximum weights and dimensions of HGVs in European transport).[50]

The "Driver Assistance System. Safer. For you. For me" project tested the combined effectiveness of several Driver Assistance Systems in Germany.[51] 767 HGVs were equipped with Electronic Stability Control, following distance warning and Lane Departure Warning Systems, while a control group of 565 HGVs did not have such advanced driver assistance systems (ADAS) installed. Over the two years of the trial the collision involvement rate per distance travelled was approximately 34% lower for the ADAS-equipped HGVs than for the control group, with the safety gains appearing to be independent of the location – urban or rural roads – the time of day and light conditions or weather conditions.

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47 ETSC (2009) How can In-Vehicle Safety Equipment improve road safety at work? Preventing Road Accidents and Injuries for the Safety of Employees (PRAISE) http://www.etsc.eu/documents/PRAISE%20Report%201.pdf

48 ETSC Drink Driving Monitor, published 3 times per year. For more information check http://etsc.eu/documents.php?did=2

49 ETSC (2009) How can In-Vehicle Safety Equipment improve road safety at work? Preventing Road Accidents and Injuries for the Safety of Employees (PRAISE) http://www.etsc.eu/documents/PRAISE%20Report%201.pdf

50 Swedish Road Administration (2009) In-depth analysis of accidents with heavy goods vehicles – Effects of measures promoting safe heavy goods traffic. http://publikationswebbutik.vv.se/upload/4598/2009_2_in_depth_analysis_of_accidents_with_heavy_goods_vehicles.pdf

51 Hochschule Heilbronn (2011), H. Hautzinger u.a.: Schlussbericht der wissenschaftlichen Begleitung der Aktion "FAS. Sicher. Für Dich. Für Mich." von BG Verkehr, BGL und KRAVAG. More information (in German) is also available at http://www.fahrer-assistenz-systeme.de

2.5 Interview with Dr. Will Murray

Goods vehicles and buses are predominantly driven by professional drivers. ETSC has spoken to Dr. Will Murray, to get an insight into what companies, public authorities, regional, national and EU policy makers can do to reduce collisions involving professional drivers driving a truck, a van or a bus.

ETSC: What are the specific challenges faced by professional drivers carrying goods?

There are a range of specific challenges faced by professional and other drivers carrying goods, people and equipment. These include: the size, weight and shape of the vehicles; distance travelled; time on the road; time pressures and deadlines; long and often unsocial hours; responsibility for a highly expensive piece of equipment and hundreds of thousands of euros of stock, often many kilometres from home; and other road users not understanding how to share the road with large commercial vehicles. De-regulation and the moves towards contracted labour and self-employed drivers; uncertainty and varying levels of enforcement with regard to legal requirements such as tachographs and drivers hours; trends toward contracting and sub-contracting of work; and, in some cases limited enforcement allowing 'cowboy' operators to flout the rules, regulations and general good practice. Linked to all of this, there are often high divorce rates in the transport sector, and a range of health issues faced by commercial vehicle drivers – many of whom do not live long enough to enjoy their pension.

Fatigue, wellbeing and stress are also specific challenges. There is a general consensus that workloads are increasing and professional drivers face escalating pressures. Pressures from clients to deliver more quickly and cheaply, with issues such as 'just-in-time management', increased traffic, remote monitoring and working irregular and long hours. Drivers can be over-stressed by the demands placed on them to deliver goods to meet the schedules of modern transport systems and the impact of elaborate subcontracting chains. If they fail to meet such schedules the transport operator may have to compensate the client for delays incurred. This situation encourages drivers to flout the rules in relation to rest times so that they can deliver on time and remain competitive. Similar pressures also exist in the passenger transport sector as public funding is squeezed, and in other areas such as retail, home shopping and express parcel deliveries.

ETSC: The EU Directive on driving and resting time offers some protection to the drivers. What are the limits of this regulation and how can this be improved?

The EU Directive on driving and resting time is a good starting point: as a common minimum standard across the EU-27 it offers some protection to organisations, drivers, other road users and along the corridors where commercial vehicles operate. As with any minimum standard, there are limits to the regulation. As a starting point it is a minimum standard, not a target. We should think about moving beyond compliance and promoting the benefits of good practice. At a more basic level, increasing level of effective enforcement would allow the regulation to be improved and linked to EU and national road safety strategies and occupational health and safety programmes. Targets for enforcement of tachographs, including installation of and correct use and effective utilisation of the outcomes data for effective driver management, monitoring and motivation should still be promoted. Effective management, supervision and leadership, allowing appropriate and realistic times for jobs, including loading and unloading, are important. Road safety is a shared responsibility, between drivers and management. The ETSC PRAISE report 'Tackling Fatigue: EU Social Rules and Heavy Goods Vehicle Drivers' is an excellent resource for researchers, policy makers and practitioners, which is strongly recommended reading.

ETSC: Some transport companies have understood the benefit they will get from implementing road safety policies. Can you give us recent examples of success stories of companies that managed to improve their safety performance? What was their business case?

An increasing number of organisations, both public and private have understood the potential benefits from implementing road safety policies and there are many success stories showing improved safety performance, based on sound moral, legal, commercial and financial business cases.

The ETSC PRAISE project (see Publications at http://www.etsc.eu/PRAISE.php) has a number of excellent case studies including all its annual award winners such as British Telecommunications (BT), and a range of others including DB Schenker, Suckling Transport, Fredso Vognmandsforretning, TNT and Deutsche Post.

The UK Driving for Better Business project (www.drivingforbetterbusiness.com) is another example of a project with many excellent good practice case studies, including BT which operates approximately 34,000 vans and company cars, Suckling Transport which operates just under 100 tanker vehicles and TNT which operates a mixed fleet of 26,600+ vehicles globally (including sub-contractor vehicles). All presented sound business cases, based on understanding the risks faced and developing appropriate data-led, systems-based, programs - applying sound health and safety systems based principles to manage their drivers, vehicles and journeys. BT has been particularly active with regards to managing its own fleet, supporting research, engaging family members and working with governments in the UK, Europe and USA to provide good practice guidance. There costs and claims rate are less than half of what they were 10 years ago. Details of several of the research papers can be found at www.virtualriskmanager.net/research

In our experience at Interactive Driving Systems, proactive leadership by influencing groups to achieve common goals is key to creating a crash free culture, driving the management of behavior change and ensuring people travel safely. This is reflected in the sustained success of our clients and partners. As an example, the fleets in our UK 'Fleet Safety Benchmarking' program, representing approximately 170,000 drivers and 80,000 vehicles, have saved more than £11 million in direct collision costs over the last three years through claim rate and cost per vehicle reductions. The business case is clear for organisations that can open their minds to the opportunities.

Our guidance would be to start with a gap analysis, framed by a systems based approach such as the Haddon Matrix. Several are available. One example is shown at www.fleetsafetybenchmarking.net which provides a very quick and freely available gap analysis tool for organisations to review and benchmark their performance against 1,000+ other participant organisations.

ETSC: What is your advice to a country as to where to start to tackle work-related road risks, in particular those involving professional drivers?

At the country level, the starting point is for the agencies responsible for transport, and occupational health and safety should *collaborate* to fully quantify, understand and begin to tackle work-related road risks. The PIN report gives a good entry point, by identifying the extent of the risks involving professional passenger and goods vehicle drivers? With regards to the extent of the work-related road safety risk, in the Police and Transport data on road collisions what does the 'Purpose of journey' data (if any exists) tell is? What proportion of collisions are directly work-related? What proportion of collisions occur during commuting? Similarly in the health and safety data, what proportion of worker injuries and fatalities involve vehicles and driving, again both at work and commuting. Such data gives a beginning point for understanding the extent of the work-related road safety risk, and hints at opportunities for improvement.

Also at the country level, in many jurisdictions around the EU, government is the biggest user and buyer of vehicles and transport services, both passenger and freight. This means that an important starting point is government's own procurement, road and worker health and safety policies, processes and procedures.

Several countries in the EU have addressed work-related road safety, including:
The Danish Road Safety Council, which has launched a project on work-related road safety. It will focus on what companies can do to improve road safety for their employees both at work and at home. More details are available at http://www.sikkertrafik.dk

In Ireland in order to assist employers, the Health and Safety Authority (http://www.hsa.ie) and the Road Safety Authority (http://www.rsa.ie) have collaborated to produce 'Driving for Work: A Guide for Employers', along with a range of other good practice materials.

The Driving for work guidance from the Swedish Work Environment Authority provides a range of guidance for organisations operating vehicle fleets in Sweden. The document is available at: http://www.av.se/dokument/inenglish/broschures/adi_578eng.pdf

In the UK the, for example, the joint Health and Safety Executive/ Department for Transport (HSE/ DfT) guidance on 'Work-related Road Safety', issued in September 2003 set out how this should be achieved by competent people in organisations taking a risk-assessment-led approach to managing drivers, vehicles and the journeys they undertake (www.hse.gov.uk/roadsafety).

At the EU level, as well as the ETSC PRAISE project, EU-OSHA provides some excellent resources, including its recent E-facts 47 'Health Promotion in the Transport Sector', which has been translated into all official EU languages, and is available for download from the EU-OSHA website (http://osha.europa.eu). Also at the EU level, DG Employment is in the early stages of developing a non-binding guide to help improve the effectiveness and efficiency of the protection of workers from Work Related Vehicle Risks. This will help to improve the understanding of both employers and workers of the risks associated with the use of a vehicle at work, by providing practical advice on how to comply with the requirements of Directive 89/391/EEC and in particular the use of risk assessments.

ETSC: What are the three most urgent actions you would like the EU to take to tackle road risks posed by professional drivers?

The three most urgent actions I would like the EU to take to tackle road risks posed by at-work and commuting drivers include understanding the extent of the risks through both transport and OHS data, managing its own travel and procurement as effectively as possible and supporting all the above projects and others like them. As a start point, how many journeys does the EU generate each year that could be avoided? What are its own policies, processes and procedures? Such an approach and leadership will give it more legitimacy, credibility and experience with regards to understanding and setting policy in the area of work-related road safety. It may also be worth considering the trade-offs for road safety of more coordinated investment in safer modes of transport, particularly the potential for further utilization of rail, and similar alternatives, for longer distance bulk movements, and for passenger transportation. As a part of a keen family of cyclists, I would also personally like to see even more investment in safe and effective infrastructure, facilities, road safety, research, modal-integration and coaching for the humble bicycle.

Will Murray has led on research, policy and practice in work-related road safety for 20+ years. He is Research Director at Interactive Driving Systems, whose Virtual Risk Manager has over 1,000,000 registered drivers from all types of organisations in 30+ languages globally. Will is also a Visiting Fellow at Loughborough University and the Centre for Accident Research and Road Safety – Queensland. He works with researchers, policy makers and businesses in a range of regions around the globe including the UK, the wider EU, the USA, Canada, Australia and New Zealand. He can be contacted via www.virtualriskmanager.net

2.6 ETSC Recommendations

To the EU

The Three Main Killers on the roads

- Encourage Member States to implement best practice for speed, alcohol and seat belt enforcement as indicated in the EC Recommendation on enforcement with particular reference to goods vehicles and buses;
- Extend the mandatory use of speed limiters, which already exists for HGVs, to LGVs up to 3.5 t gross vehicle weight, as a first step to introducing ISA to these vehicle types;
- Contribute to the development of harmonised standards for Intelligent Speed Assistance (ISA) systems towards eventual universal fitment, including to goods vehicles and buses;
- In the medium term adopt legislation for the mandatory fitting of all fleet vehicles with speed management technologies including Intelligent Speed Assistance systems;
- Monitor implementation of the professional driver training Directive and provide support to Member States to train drivers on road safety elements and speed management in particular;
- Adopt legislation mandating alcohol interlocks for professional drivers;
- Adopt legislation to ensure that all new goods vehicles and buses, have as standard equipment an enhanced seat belt reminder system for all occupants. This is of particular relevance to increasing seat belt wearing rates of drivers of commercial vehicles who tend to have lower average seat belt wearing rates than other drivers.

Fatigue and the implementation of driving and resting hours

- Make Lane Departure Warning Systems and Advanced Emergency Braking Systems mandatory for all new goods vehicles and buses;
- Work towards achieving a more harmonised approach to checks of the EU tachographs and driving times rules;
- Strengthen the enforcement of the liability clause (Article 10) of Regulation EC 561/2006 in order to prevent the pressures of just-in-time management contributing to fatigue and stress;
- Ensure that the Member States respect the amount of checks to be organised as referred to in Article 2 (3) of Directive 2006/22/EC on driving and resting hours in road transport;
- Support the implementation of the European Risk Rating System and deal with any existing barriers to data sharing among authorities;
- Work with Member States to lay down minimum and maximum penalties for each breach of the rules on working time;
- Develop an easily understandable brochure in all official languages of the European Union for undertakings and for lorry drivers; this brochure should give the drivers and undertakings concerned more information about the relevant social rules and the penalties applicable to infringements in the various Member States;
- Make safe and secure roadside rest facilities a long term commitment, featuring a set of annual objectives as well as providing EU funding.

Additional recommendations

- Carefully consider safety when revising Directive 96/53/EC on maximum permitted weights and dimensions in road transport;
- Tackle Heavy Goods Vehicle collisions including those caused by blind spots e.g. by improving the design and equipment of HGVs including retrofitting with front-view mirrors, improved cabin design, installation of cameras and active warning systems and front, underrun and side protection;

- Encourage Member States to include aspects specific to goods vehicle and bus safety issues in collision investigation and databases and the envisaged EU common in-depth accident investigation database.

To Member States

The Three Main Killers on the roads

- Enforce compliance with speed limits through inter-alia installing safety cameras;
- Adopt Zero Tolerance for drink driving for professional drivers and raise enforcement levels;
- Adopt legislation mandating alcohol interlocks for professional drivers;
- Increase enforcement of seat belt wearing.

Fatigue and the implementation of driving and resting hours

- Increase enforcement of specific requirements of relevant categories of road users relating to tachographs and driving times, vehicle inspection and driving licences;
- Provide safe parking and resting spaces on routes with goods vehicle and bus traffic;
- Prioritise the enforcement of ensuring that contractually agreed transport time schedules complying with the provisions on drivers' hours (rest and driving time) are respected by consignors, freight forwarders, tour operators, principal contractors, sub-contractors and driver employment agencies as per Article 10 Regulation (EC) n° 561/2006;
- Provide adequate resources to facilitate enforcement of tachograph and driving time rules;
- Ensure that comprehensive information flows exist between national enforcement authorities and also between the latter and domestic and foreign road transport operators;
- Develop targeted enforcement programmes focusing resources on the most serious / repeat offenders among the professional drivers;
- Equip enforcement officers with knowledge and equipment to be able to spot fraud and prevent it from occurring in commercial road freight;
- Establish "hotlines" so that drivers and operators can report suspected fraudulent, illegal and non-compliant behaviour;
- Establish a risk monitoring system to include not only tachographs and driver's hours non-compliance but also other areas which present a risk to other road users such as overloaded vehicles and defective vehicles;
- Implement and execute severe, dissuasive and deterrent sanctions for tachograph fraud infringements;
- Target professional drivers through information, education and training about the dangers of driving when tired. Efforts should be made to target transport subgroups such as small firms and self-employed workers.

Safe road infrastructure

- Consider road use by goods vehicles and buses in matching the use of each road to the functions that the road serves in terms of living space, access and through movement;
- Separate faster vehicles from slower ones and lighter vehicles from heavier ones where this is practicable;
- Provide adequate road markings that Lane Departure Warning Systems can read, which is crucial to managing fatigue and of particular relevance to professional drivers.

Procurement

- Include safety as a criterion for public procurement contracts involving the use of goods vehicles or buses and apply this throughout the supply chain;
- Purchase goods vehicles and buses with in-vehicle technologies which have high life saving potential;
- Promote vehicle safety information, such as EuroNCAP results (especially the safety equipment rating) more widely and effectively so that they play a more prominent role in new vehicle choices and fleet purchasing policies;
- Give incentives (such as tax breaks) to employers investing in effective and proven vehicle safety technologies.

Additional recommendation

- Run and organise campaigns about interaction of goods vehicles and buses with other road users.

To Employers

In the framework of the PRAISE project, ETSC has formulated and published several recommendations to employees whose staff use road vehicles in the course of their work.[52]

- Set up a register to enter any incidents;
- Assess the risk to help determine the best actions to take;
- Establish a written safety policy and instructions for drivers and self-employed drivers, considering in particular:
  - specific training for staff, especially drivers;
  - maintenance of vehicles and equipment;
  - alignment with road traffic legislation and highway codes including requirements relating to tachographs and driving times, vehicle inspection and driving licences;
- Encourage "ownership" of vehicle and driver as much as possible (1 vehicle = 1 driver) as experience has shown greater care in looking after the vehicle and included technological equipment benefits from such use;
- Consider employees' ill-health as part of their risk assessment under Directive 89/391, and promote Work Place Health Promotion as the most efficient tool to combat ill-health;
- Purchase vehicles that are equipped with the best safety features including seat belts for all passengers and airbags, safety screen behind the driver's seat, anti-lock brakes, load safety devices, blind spot elimination equipment;
- Establish schedules that allow drivers enough time to obey speed limits and avoid peak-hour driving;
- Assess employee requirements in terms of vehicle type and most appropriate speed adaption and limiting technologies;
- Adopt a clear policy against speeding-this should focus on driving at speeds that are appropriate to the prevailing conditions rather than complying (as a minimum) with the legal speed limits;
- Set speed limiters in HGV fleets at a level which is lower than the legally required compliance limit, which can benefit fuel utilization as well as safety;
- Take account of weather and adverse conditions when setting schedules;
- Specify safe routes, preferably motorways;

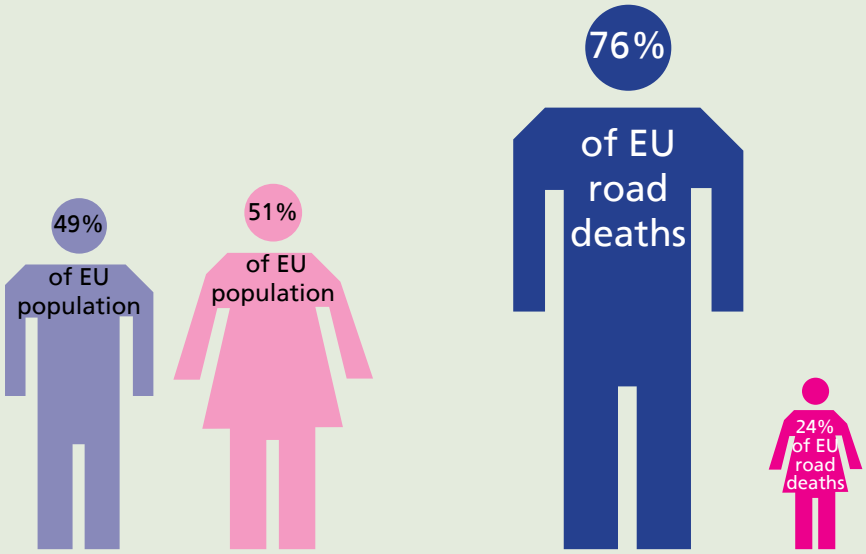
[52] Preventing Road Accidents for the Safety of Employees http://www.etsc.eu/PRAISE-publications.php. Several guidelines for setting a safety policy include Road Safety Authority, Ireland, http://www.rsa.ie/Documents/Driving%20for%20work/Driving%20for%20Work%20Checklist.pdf. European Agency for Safety and Health at Work, Facts, Preventing Road Accidents involving Heavy Goods Vehicles, 2001

- Monitor and control driving hours within recommended safe limits and legal requirements;
- Report suspected fraudulent or non-compliant behaviour to the relevant agency;
- Promote education/train drivers on work, drive and rest time regulations and on the proper use of the tachographs thus minimising inadvertent breaches of the rules;
- Work with enforcement officers and member associations to identify and eliminate the causes of tachograph fraud;
- Include written guidelines on eliminating driver fatigue in the health and safety management policy and driver handbook;
- Provide advice and training in personal sleep and fatigue management and provide a mechanism, including consultation, for the continuous improvement of the roster system to fulfil and reconcile technical, operational and individual needs;
- Manage working time in order to ameliorate fatigue; this should be an essential part of mandatory qualification standards for transport operators;
- Consider the location of safe, secure and appropriate parking areas in journey planning and scheduling;
- Use trained personnel other than drivers to do the unloading. Plan rest periods for drivers who are required to load and drive, as loading can cause fatigue;
- Employ suitable drivers. Check their driving licence background. Check they are fit to drive;
- Ensure drivers are trained in safe driving practices, checking vehicle safety, proper use of vehicle safety features, safe loading of vehicles. Plan refresher training and regular briefings;
- Develop clear policies on control of alcohol and other substance abuse;
- Ensure that mobile phones are used appropriately;
- Reward compliance.

3| Risk on the roads: a male problem? The role of gender in road safety

Just under **30,400 people were killed in 2011 in the EU27** in road collisions, approximately **7,200** females and **23,200** males. Females account for 51% of the total EU population but only **24%** of road deaths. This percentage has changed by only one percentage point since 2001, but the reduction in female deaths since then has been four percentage points greater than the reduction in male deaths. Males account for **76%** of people killed on the roads in the EU in 2011.

In the EU on average **95** men are killed on the roads each year per million male population, compared with **28** women per million female population. **Males have more than three times the death rate of females on the roads in the EU.** Hypothetically, if all EU road users used the roads like females in their respective countries do now, the road mortality rate across the EU would be about 20% lower than the average for the SUN countries, and even in the countries with the highest road mortality it would be no higher than it is in Germany now. Males are killed on the roads mainly as car drivers and motorcycle riders while females are killed mainly as pedestrians and car passengers.



There is extensive evidence to show that men have a higher rate of collisions than women. In addition to having a higher number of collisions, men incur their first collision earlier in their driving career and are more likely than women to be held to blame for the incident. Female drivers are less prone to risky driving behaviour, in particular speeding, and have more positive attitudes towards traffic regulations and safety.

These differences between men and women should be recognised and gender-differentiated policies developed in relevant areas.

3.1 The scale of the problem

3.1.1 Female road deaths have fallen faster than male since 2001 in more than two thirds of the EU countries

Spain and **Hungary** scored the highest average annual percentage reductions in both male and female road deaths since 2001, **Estonia** the second best reduction in male. Only in Romania have the numbers of males and females killed on the roads increased since 2001 (by 0.1% and 0.3% respectively). A

group of 14 countries follow with reductions in male deaths above the EU average of 5.8%. These are **Portugal**, **Luxembourg**, **France**, **Ireland**, the **UK**, **The Netherlands**, **Slovenia**, **Germany**, the **Czech Republic**, **Denmark**, **Sweden**, **Italy**, **Austria** and **Switzerland**.

Fifteen countries – **Austria**, **Cyprus**, the **Czech Republic**, **Estonia**, **France**, **Germany**, **Hungary**, **Ireland**, **Italy**, **Slovenia**, **Portugal**, **Spain**, **Sweden**, **Switzerland** and the **UK** – achieved reductions in female deaths above the EU average of 6.1%. Across the EU, female deaths have fallen on average slightly faster than male between 2001 and 2011 (-6.1% and -5.8% respectively).

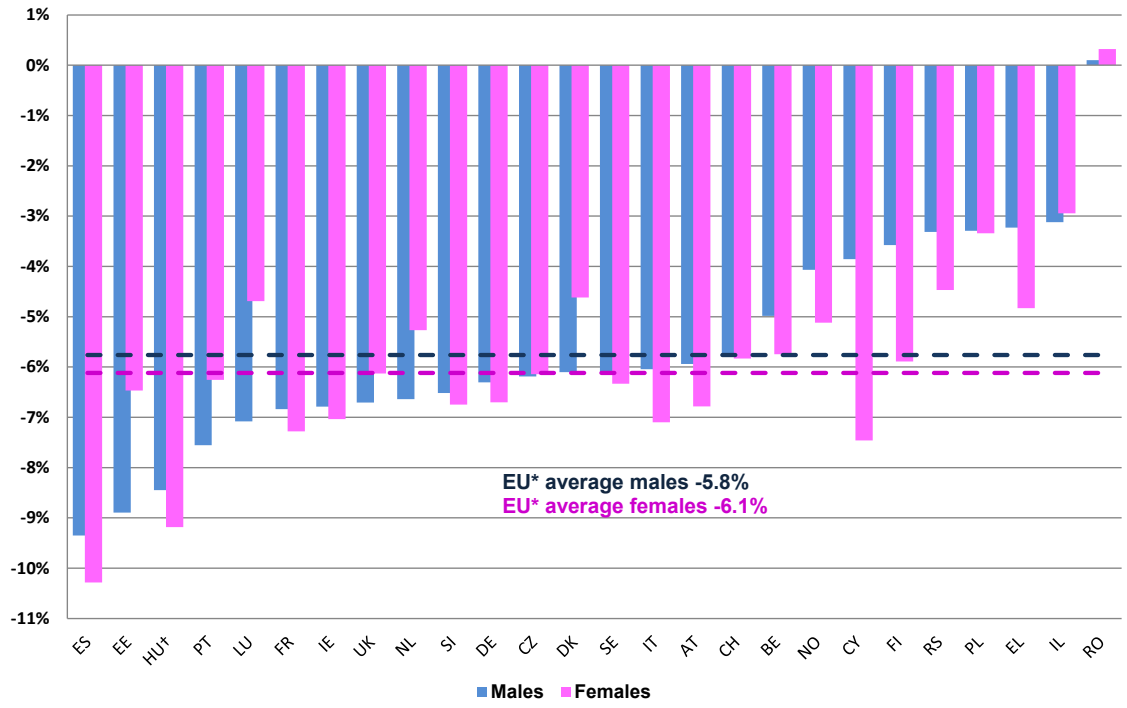


Fig. 26a: Average annual percentage change in female and male **road deaths** between 2001 and 2011 ranked by the reduction in male deaths.
†HU (2003-2010). Note: Limitations of data have prevented the inclusion of Bulgaria, Latvia, Lithuania, Malta and Slovakia in Fig. 26a and Fig. 26b (see indicator box).
EU = EU27 except BG, LV, LT, MT, SK.*

The corresponding ranking by average percentage change in road mortality is shown in Fig.26b and is broadly similar to that in Fig.26a, indicating that differences between countries in the changes in the female and male populations have affected the ranking only slightly. The principal exception is Ireland, where the increase in population for both males and females (+19%) has brought Ireland into the 3rd and 4th position for reduction in female and male mortality respectively.

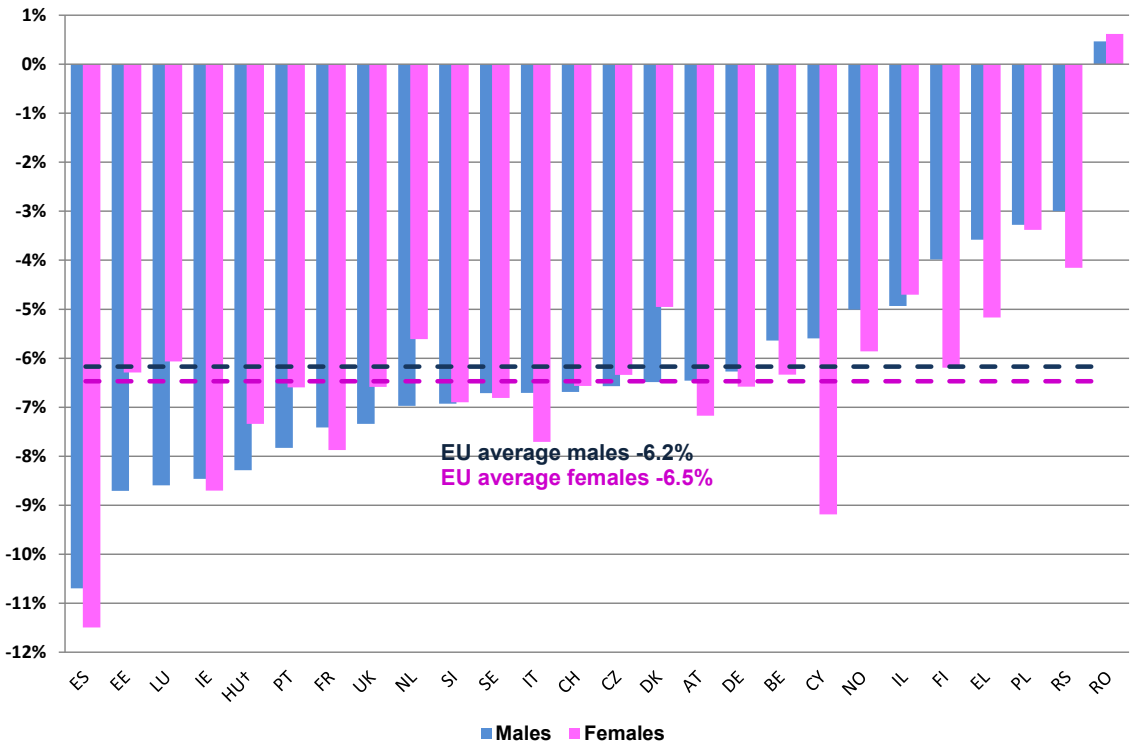


Fig. 26b: Average annual percentage change in female and male **road mortality** between 2001 and 2011. *†HU (2003-2010)*

The indicator

The annual average percentage reductions in the numbers of **road deaths** among females and males between 2001 and 2011 are used as the main indicator in this PIN ranking (Fig.26a). To allow for the effect of changes in the population, the corresponding annual average percentage reductions in road mortality are shown in Fig.26b.

When available, the data were retrieved from CARE and completed or updated by the PIN Panellists. **The full dataset is available in the Annexes – Chapter 3.** The numbers of females and males killed in traffic are available only in 2009 in Bulgaria, from 2005 to 2010 in Slovakia and from 2007 to 2011 in Lithuania. Limitations of data between 2009 and 2011 have prevented the inclusion of Latvia. Malta is excluded from Fig. 26a, 26b and 27 because the number of males killed is below 20. Population figures were retrieved from the Eurostat database.

The safety of females and males on the road is expressed in terms of **mortality**, i.e. the number of females killed in road collisions divided by the female population in millions and similarly for males (Fig. 29). Unfortunately an estimation of time spent in traffic or the amount of travel by males and females is available in only a few countries. Exposure in traffic is therefore not taken into consideration here when comparing countries. Yet data available in Sweden, The Netherlands and the UK have shown that large differences in male and female mortality rates remain even after taking into consideration the fact that men use the roads more than women.

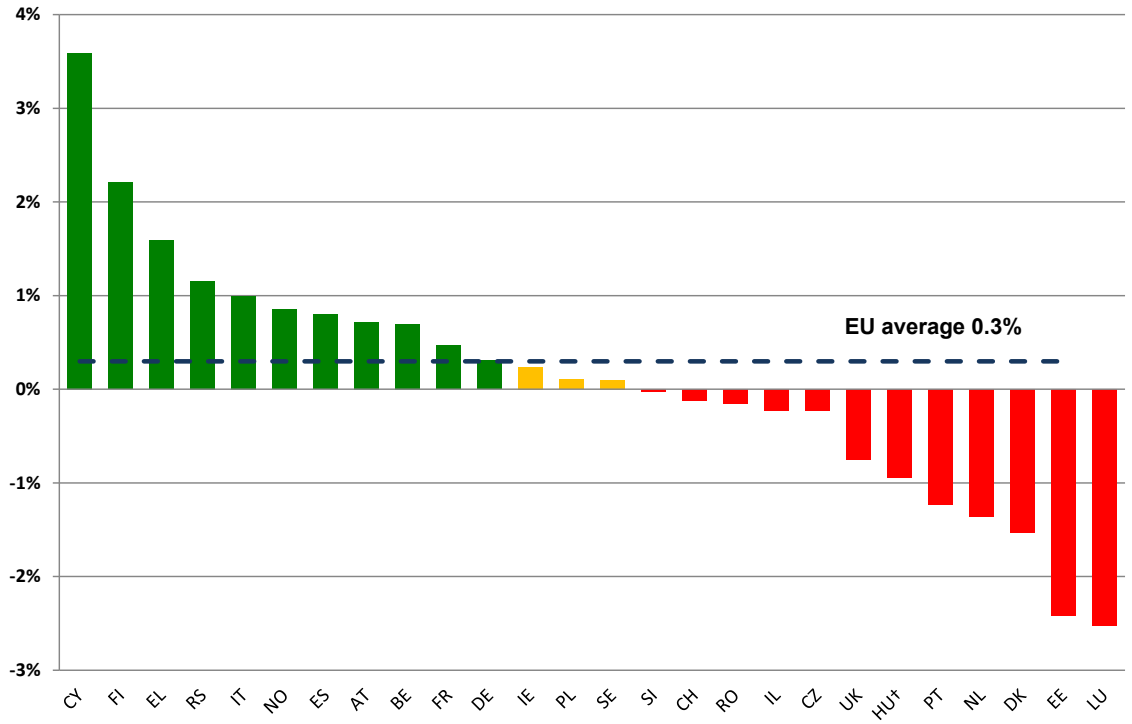


Fig.27. Amount by which the average annual percentage reduction in mortality of females exceeds the average annual percentage reduction in mortality of males over the period 2001–2011. *†HU 2003-2010*

On average in the EU27, road safety of females has, if anything, improved slightly faster than road safety of males since 2001. In **Cyprus**, the annual average reduction in road deaths among females is more than 3 percentage points higher than the corresponding reduction for males, and in **Finland** and **Greece** it is more than 2 and 1.5 percentage points higher respectively. In **Luxembourg**, **Estonia**, **Denmark**, **The Netherlands** and **Portugal**, the opposite is true and road safety of males has improved more than one percentage point faster than road safety of females. For all other countries, the two rates are within about 1 percentage point of each other.

"Road safety education has been significantly upgraded in Cyprus in the decade 2001-2011 and I believe that the messages were better absorbed by the girls in the schools. I also believe that messages successfully reached the mothers, through their children. Similarly, road safety campaigns were better received by the female population. Additionally, there were specific road safety awareness activities targeted towards pregnant women and new mothers, which, I believe, contributed to the progress."
George Morfakis, road safety expert, Cyprus.

3.1.2 358,000 males and 113,000 females have been killed on EU roads since 2001

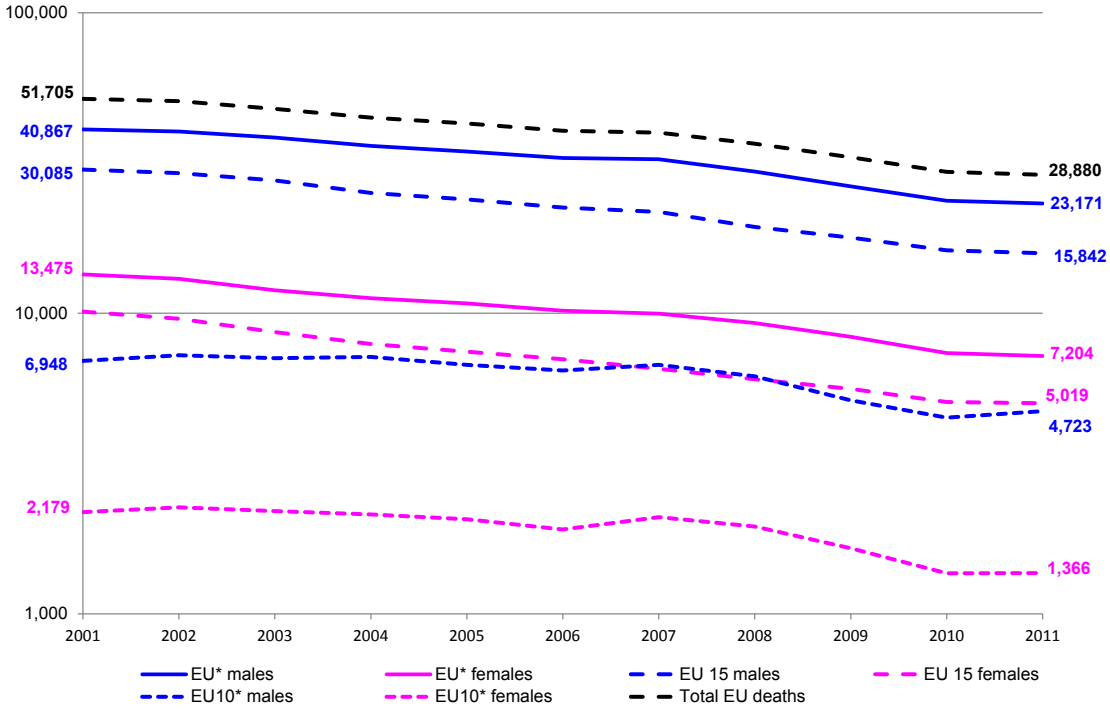


Fig. 28: Reduction in road deaths since 2001 in the EU 27, EU 15 and EU 10 for males and females separately. The logarithmic scale is used to enable the slopes of the various trendlines to be compared. ** Note: EU minus Bulgaria, Lithuania and Slovakia.*

Approximately **358,000** males and **113,000** females were killed in the EU27 as a consequence of road collisions over the years 2001-2011. In 2011 alone, 23,200 males were killed in 2011 alone (compared with 41,000 in 2001) and 7,200 females (13,500 in 2001). Female deaths have declined faster than male deaths in both the group of pre-2004 EU Member States (EU15) and the 10 countries that joined in 2004 (EU10) (see Table below).

	People killed in 2001		People killed in 2011		Reduction 2001-2011	
	Females	Males	Females	Males	Females	Males
EU27	13,475	40,867	7,204	23,171	47%	43%
EU15	10,121	30,085	5,019	15,842	50%	47%
EU10	2,179	6,948	1,366	4,723	37%	32%

Reduction in female and male road deaths between 2001 and 2011

3.1.3 Males have three times the death rate of females on the roads in the EU

The indicator for all people hides big differences in road mortality rates between males and females (Fig. 29). In the EU on average **95** males are killed on the roads each year per million male population, compared with **28** females per million female population. Across Europe, females have a road mortality rate less than one-third that of males. Fig.29 shows that there is less variation in female road mortality between countries than in male so most of the variations in road mortality in the total population come from the variation in male mortality.

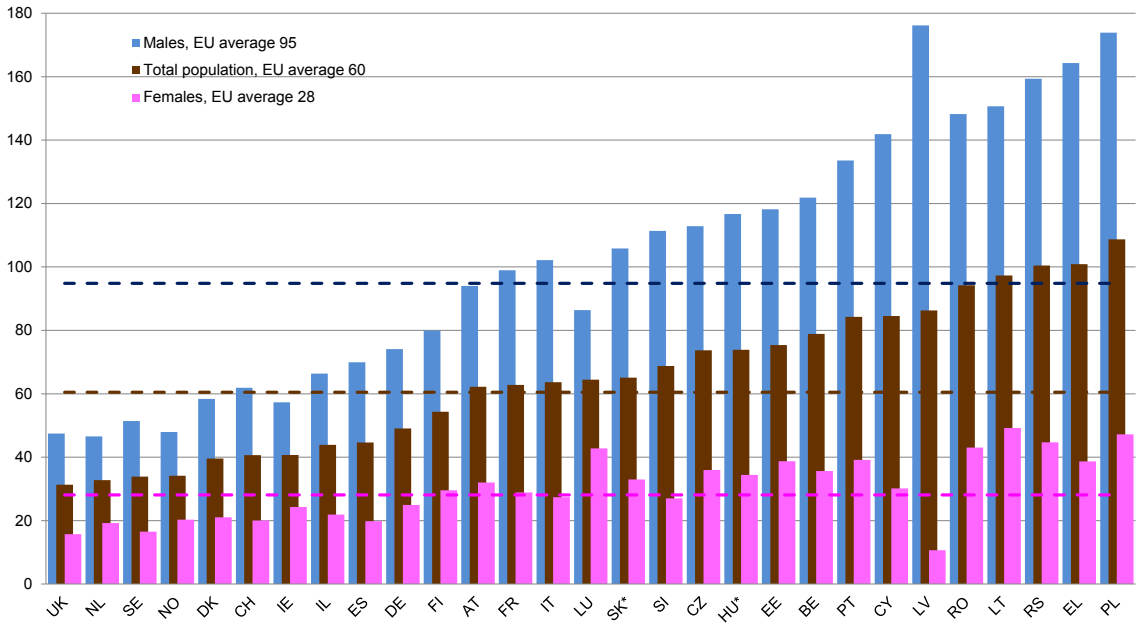


Fig. 29: Road deaths per million inhabitants in **2011** in total and by gender, ranked by the road mortality of the whole population. **HU, SK: 2010.*
For Malta the small numbers of deaths and the number with unrecorded gender prevent calculation of comparable mortality rates.

Hypothetically, if all EU road users used the roads like females in their respective countries do now, the road mortality rate across the EU would be about 20% lower than the average for the SUN countries, and even in the countries with the highest road mortality it would be no higher than it is in Germany now.

Women Manifesto for Safer Roads

To mark the 2013 International Women's day on the 8th of March, the Road Safety Interministerial Delegation in France launched the *"As long as there will be men"* campaign inviting people to sign a Women Manifesto for Safer Roads. *"75% of road deaths are men. Men we know, men we love. A husband, a companion, a son, a father, a friend. Speed does not scare them. Nor does fatigue. And they do not let a few drinks during the meal prevent them from taking the car. They drive well. They are in control. So they say. They have never had an accident. And it's true. Until one day. In the entourage of a man who takes the wheel or the keys of a motorbike, there is often a woman. You, me, a woman who can say no. I do not ride in this car. I get out at the next traffic light. Drive more slowly. Really slower. You are dangerous. Hand me the keys. But this woman is silent. She lets them. By tenderness, fatigue. Habit. We have the power to break the habit, we did, and in so many areas. We can all abandon the old role playing that sees men as conquerors and women as accommodating. Let's refuse to be accommodating. We will make the road safer for us, for them, the men we love. Our names are a promise. Let's engage them".*

Men represent 83% of the people sentenced for manslaughter on the roads in France.[54]

[53] http://securite-routiere.gouv.fr/medias-outils/les-chiffres-de-la-route/les-hommes-et-les-femmes-sur-la-route

3.1.4 Males are mainly killed as car drivers and motorcycle riders while females are mainly killed as pedestrians and car passengers

Fig. 30a and 30b show the percentages of different types of road user among males and females respectively who were killed on the roads in the last three years. Across the EU the principal differences between the percentages for females and males are, perhaps not unexpectedly, that larger percentages of female than male deaths occur as pedestrians or car passengers, while larger percentages of male than female deaths occur as PTW users, car drivers and users of goods or public transport vehicles (the last probably mainly as goods vehicle users).

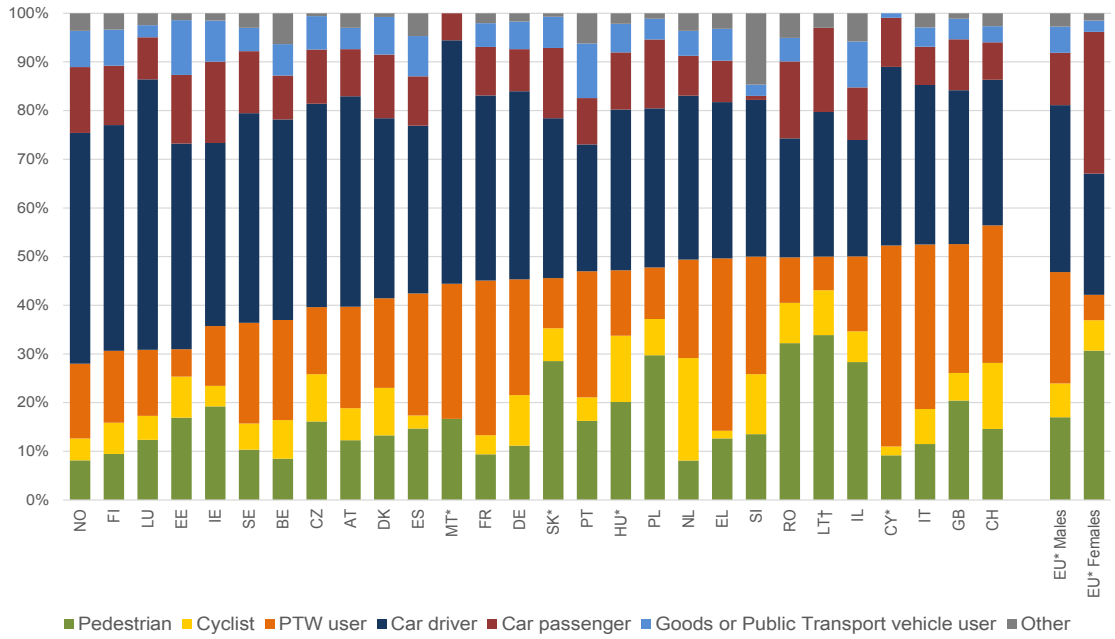


Fig. 30a: Percentage share of different types of road user, among **male road deaths**. Average of the last three years available, with countries ranked by percentage of those killed who were vulnerable road users (pedestrians, cyclists or PTW users).
**CY, HU, MT, SK, average of the last two years available 2009, 2010. †LT average of the last two years available 2010-2011. EU* = EU27 except BG, EE, LV*

Unfortunately an estimation of time spent in traffic or the amount of travel by females and males is available in only a few countries. Exposure in traffic is therefore not taken into consideration here in comparing countries. Yet data available in Sweden, The Netherlands and the UK have shown that large differences in female and male mortality rates remain even after taking into consideration the fact that men use the roads more than women.

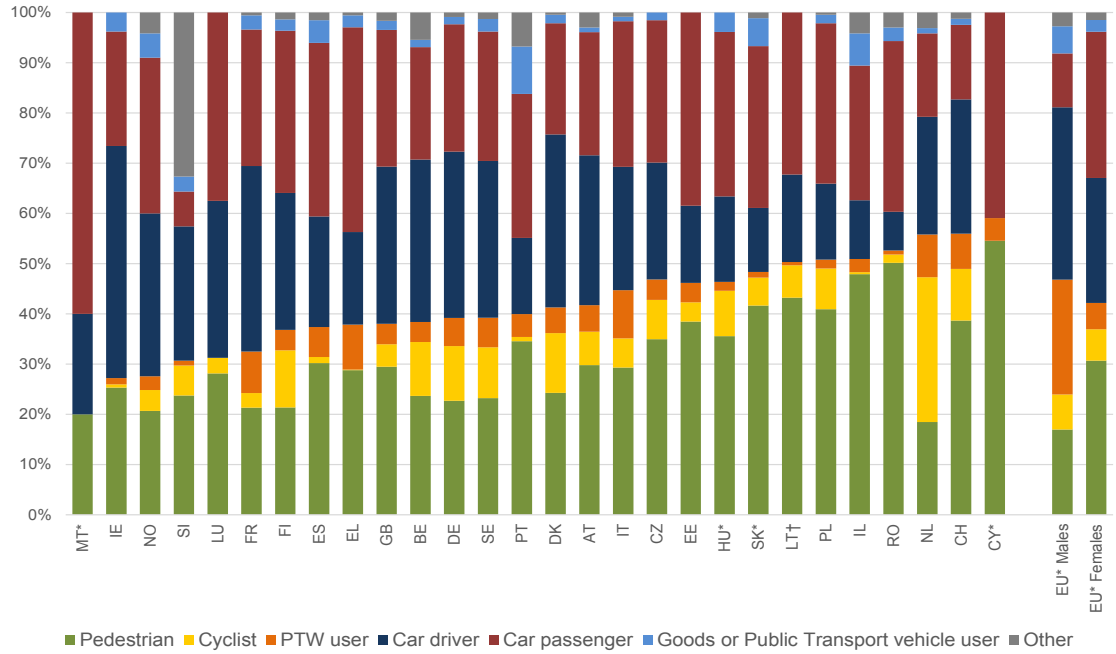


Fig. 30b: Percentage share of different types of road user, among **female road deaths**. Average of the last three years available, with countries ranked by percentage of those killed who were vulnerable road users (pedestrians, cyclists or PTW users).
**CY, HU, MT, SK, average of the last two years available 2009, 2010. †LT average of the last two years available 2010-2011. EU* = EU27 except BG, EE, LV*

3.1.5 Male share of road deaths far outweighs their percentage of population

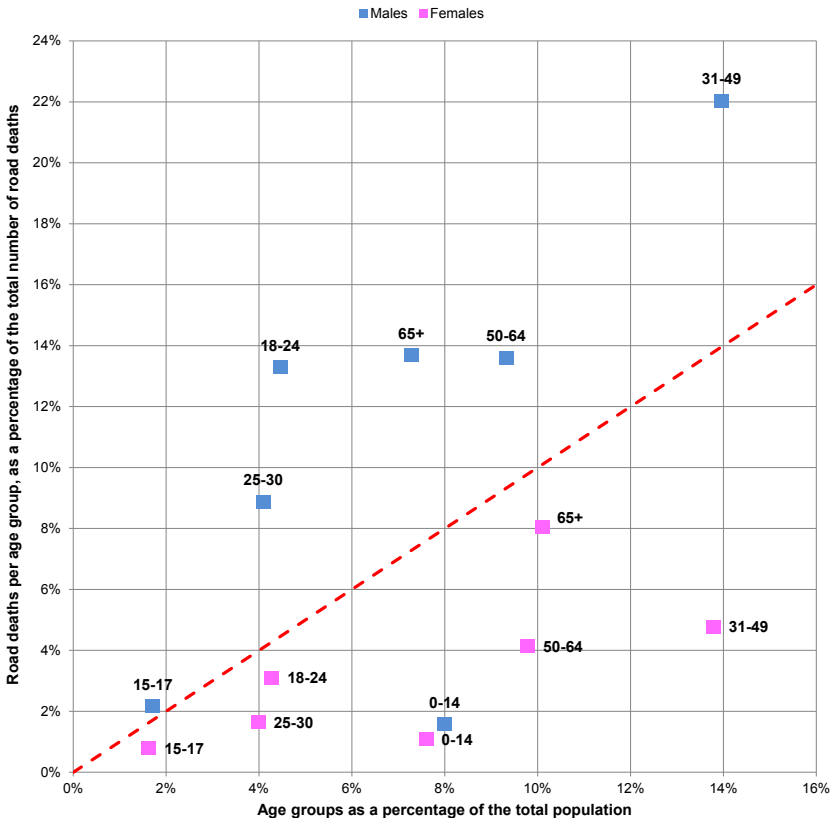


Fig 31. Road deaths in EU27, by gender and age group as a percentage of all road deaths for that particular age group and gender, plotted against the corresponding percentage of the population in the last three years available.

Males represent 49% of the EU population but 76% of road deaths. Fig. 31 illustrates how the overrepresentation of males differs between the age groups 0-14, 15-17, 18-24, 25-30, 31-49, 50-64 and 65+. It is appreciable first in the 15-17 age group and is at its greatest in the 31-49 age group, and successively lower in the 50-64 and 65+ age groups. These differences may well be related to access to motor vehicles and in the 65+ age group to the longevity of women and the frailty of the oldest women.

3.2 Research shows males to be more prone to risky road behaviours

There is extensive evidence to show that men have a higher rate of collisions than women. The difference between the sexes in terms of the number of deaths resulting from road collisions is similarly marked. Chipman *et al* (1992), for example, show that men have double the number of collisions (per 1,000 drivers) than women. Waller *et al* (2001) also note that in addition to having a higher number of collisions, men incur their first collision earlier in their driving career and are more likely than women to be held to blame for the incident. Norris *et al* (2000) and others attribute this greater level of collision-proneness to higher driving speeds among men and less regard for traffic laws[54]. Male drivers seem to be more prone to risky driving behaviour than female drivers. In the UK, for example, Home Office statistics show that in 2002 88% of all recorded driving offences, and 83% of speeding offences, were committed by men.[55]

Waylen and McKenna (2002) note that the pattern of road collision involvement also differs between the sexes. Men are more likely than women to be involved in collisions that occur on bends, in the dark or those that involve overtaking. Women, on the other hand, have a greater frequency of collisions occurring at junctions than men. This supports the suggestion by Storie (1977) that men are more at risk from collisions involving high speed while women are at more likely to be involved in collisions resulting from perceptual judgment errors.

The growing proportion of women drivers is usually attributed to the changing role of women in society. There is much to suggest that, with more women driving, road traffic may become safer. Women have been shown to commit fewer traffic offences and to be involved in collisions less often than men (even after exposure is controlled for). Similar differences are evident regarding male and female involvement in accidents in the home and workplace. The differences have persisted over the years. This does not seem to confirm the concerns of some specialists claiming that, as more and more women drive, they may adopt a male style of driving leading to an increase in collisions involving women as drivers.

Studies have shown women drivers to have more positive attitudes than their male counterparts towards traffic regulations and safety. Additionally, in the framework of the SARTRE 4 survey, respondents were asked about their attitude towards the use of speed limitation devices, event data recording devices, alcohol interlocks and fatigue detection devices. For each of these ITS technologies the women respondents showed a more positive attitude than the men.[56]

In terms of the three main risk factors on the roads (speeding, drink driving and failure to wear a seatbelt), a higher incidence of these behaviours was observed among males than among females in a number of research papers.

[54] The Social Issues Research Centre (2004), Sex differences in driving and insurance risk.
[55] Ibid.
[56] SARTRE (2012) European road users' risk perception and mobility

3.2.1 Compliance with posted speed limits

According to the SafetyNet Collision Causation Database, men are more often involved in collisions caused by high speed and incorrect direction (including running off the road)[57].

Men also showed a more positive attitude towards speeding in the SARTRE study of driver attitudes, with 29% of men survey respondents saying that driving 20km/h over the speed limit in a residential area would make driving a more pleasant experience, compared with 23% of women, and 6% of men compared with 3% of women admitting that they 'very often' or 'always' speed in residential areas. A corresponding difference was apparent in levels of risk perception: 19% of men said the risk of being involved in a collision when driving 20km/h over the speed limit in a residential area would not increase, compared with 15% of women[58].

In terms of attitude towards speeding and speed enforcement, a UK study from 2006 showed that women had a more positive attitude towards safety cameras than men, including a better awareness of their road safety benefits, and their life-saving and collision-reduction potential.[59] This positive attitude towards safety cameras was also reflected in a higher preference for increasing the number of cameras in the area close to the respondents' homes.

It is interesting to note that both of these attitudinal studies also observed an effect of the respondents' age on their attitude towards speeding and speed enforcement, with older drivers of both sexes revealing more rule-accepting/abiding attitudes than their younger counterparts.

Speed Dating: driving too fast is not sexy

A new campaign under the *Go For Zero* Road Safety Initiative in Belgium aims to debunk a positive image of speed. In July 2012, a 'speed dating' campaign was launched, together with a popular women's magazine called "Flair", to see whether women passengers find speeding men attractive. The winners went on a 'speed date' with their chosen date on an off-road drive at high speeds. The women did not know their date was in fact an actor and it was part of a road safety experience. Upon exiting the vehicle, all respondents disapproved of the behaviour of their speeding date. The reactions of the women's participating were recorded and subsequently used in radio spots or displayed on posters along the highways. A snapshot: *"I cannot date a man who plays with other people's lives"* or *"Driving too fast turns me off completely."*
http://www.goforzero.be/fr/rouler-trop-vite-a-me-refroidit-compltement/home/speeddating/speeddate

eCall for women

In 2008, Fondazione ANIA, together with the Italian Ministry of Equal Opportunities launched a project aimed at women entitled "Pink Box" (Scatola Rosa): an in-vehicle system which can send an emergency call in case of a collision or the need of assistance. The "Pink Box" can contact a central emergency unit at any time, while satellite-determined vehicle location can be sent to the Police or emergency services or roadside assistance services. Approximately 2,500 devices have been fitted so far.
http://www.fondazioneania.it/Fondazione_Ania/La_sicurezza_Personale_1.html

[57] ERSO (2012) Traffic Safety Basic Facts 2012 - Gender
[58] SARTRE (2012) European road users' risk perception and mobility
[59] Corbett, C. and Caramlau, I. (2006) 'Gender differences in responses to speed cameras: typology findings and implications for road safety'. in Criminology and Criminal Justice: An International Journal 6(4), 411-433.

3.2.2 Driving under the influence of alcohol, drugs or both

The European research project DRUID investigated the prevalence of alcohol and other psychoactive substances – such as illegal drugs and some prescription medicines – among drivers. Alcohol had the highest incidence of all psychoactive substances, with men in the 35-49 and 50+ age groups showing the highest prevalence of drinking and driving. Among women, a relatively higher prevalence of alcohol was found in the same two age groups: 35-49 and 50+. However, men in the 25-35 age group showed the highest incidence of consuming alcohol among drivers killed or seriously injured in collisions. The DRUID report also notes that it was mainly among older female drivers that psychoactive medicinal drugs were detected, particularly during daytime hours.[60]

Men represent 92% of drivers involved in a fatal drink and drive collision in France.[62]

In terms of the attitudes towards drinking and driving, the SARTRE study reports that 11% of the men surveyed said they could drink and drive provided they were careful, compared with 6% for women. SARTRE respondents in the 17-24 age group seemed most likely to agree with the above statement. Unsurprisingly, the study also reports an association between drivers admitting to drinking and driving and the belief that they can do so provided they are careful. Moreover, the self-reported responses provided in the SARTRE survey are consistent with women being less likely than men to drink and drive when over the legal BAC limit.[62]

A study of alcohol consumption and its effects on driving in the UK found the groups of men and women most likely to be at risk of harm from their drinking are older adults and those with higher incomes, although young people are often perceived as a greater problem because they drink more in one session, often just at the weekends[63]. Although men are still the majority, over the years 2003-2010 women's convictions for drink driving are increasing as a proportion of all convictions whilst male rates are falling.

"Whilst binge drinking among young people is an issue in the UK they usually do not then get in their cars after drinking alcohol, whilst the older drivers often do – especially the women – and we suggest that they do not know how much alcohol there is in a glass of wine (their preferred drink) especially as wine is getting stronger in terms of alcohol content and glass sizes are getting bigger".
Heather Ward, University College London, UK.

3.2.3 Seatbelt wearing

In Switzerland, the Council for Accident Prevention (bfu/bpa) found a significant gender gap in terms of seatbelt wearing rates. Seat belt roadside counts showed that in 2012 96% of women use their seatbelts, whether travelling as a driver or as a passenger, whereas only 89% of men do so when driving and only 84% when they are passengers.[64]

A similar difference was previously found in Belgium, but has recently been found to have narrowed encouragingly while belt-wearing by both males and females has increased.[65]

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60 DRUID (2012) Final Report: Work performed, main results and recommendations.
61 http://securite-routiere.gouv.fr/medias-outils/les-chiffres-de-la-route/les-chiffres-de-la-vitesse
62 SARTRE (2012) European road users' risk perception and mobility.
63 Beuret, K., Corbett C. And Ward, H. (2012), Drinking among British women and its impact on their pedestrian and driving activities: A review of the literature.
64 http://www.bpa.ch/French/medien/Pages/2012_07_10.aspx
65 Riguelle, F (2013), National behavioural study, .seat belt wearing rates 2012 (in French: *Mesure nationale de comportement, port de la ceinture de sécurité 2012*), Belgium Road Safety Institute.

"Since we have started estimating seatbelt wearing rates through roadside counts, we have noticed that the gap is decreasing. In 2005, 70% of female drivers and 72% of female passengers wore their seatbelts, while only 65% of male drivers and 57% of male passengers were doing so. In 2012, 89% of female drivers and 86% of female passengers were belted, compared with 86% of male drivers and 82% of male passengers. We believe that awareness campaigns, coupled with increased market penetration of seat belt reminders have contributed to increased compliance levels for males."
Yvan Casteels, Belgian Road Safety Institute

3.2.4 Use of hand-held mobile phones

In Germany, more men than women are breaking the law when it comes to using the mobile phone while driving.

"The German traffic law prohibits the use of a hand-held mobile phone while driving a motor vehicle or riding a bicycle, with fines for motorists of 40 EUR and one demerit point. "In 2011 there were 450,000 vehicle users who violated this law, 73% of whom were male."
Jacqueline Lacroix, German Road Safety Council

3.2.5 Gender and pedestrian behaviour

A study published in 2007 investigates the relationship between gender, age and driver status and pedestrian intentions to cross the road in risky situations. The results suggest that in the age group 25-59 women are less likely to cross in risky situations than men. In the under-25 and 60+ age groups, gender was not found to have a significant effect.[66]

3.3 Improved protection for women in cars

The crashworthiness of cars has until recently mainly been developed based on an average male, as the most frequently used crash test dummy is based on an 'average' male human body. A very small female-based dummy is used in some crash tests. But as yet no dummy representing an average female has been used. The 'EvaRid', a smaller 'female' dummy is under development to improve the occupant protection of women in rear-end crashes.

Seat and seatbelt design should also be improved to take account of gender differences. Women are more subject to whiplash injuries than men. The explanation is not yet fully known. But apart from weight and stature, several differences exist related to muscle strength and vertebras in the neck. Belted elderly females are more likely to suffer from chest injuries in cases of frontal or side impact, as they are more subject to osteoporosis.

"Manufacturers are starting to accommodate these anthropometric characteristics in various ways, such as seat and seatbelt design and airbag design, but more research is needed. Progress has been too slow in this area."
Anders Kullgren, Folksam, Sweden.

[66] Holland, C., Hill R. (2007) The effect of age, gender and driver status on pedestrians' intentions to cross the road in risky situations. Collision Analysis and Prevention vol. 39

3.4 Recommendations to Member States and EU institutions

Females account for 51% of the total EU population but only 24% of road deaths. Gender differences should be recognised when developing road safety policies.

- Fully integrate gender perspectives into all policy-making, implementation and research related to road safety to maximise safety benefits to both males and females;
- Achieve effective legislation and enforcement in particular against speeding, drink driving and the non-use of protective equipment (seat belts and helmets) where male drivers are over-represented;
- Improve training systems to take account of the different trajectories of learning and gaining experience among young male and female drivers;
- Consider gender differentiated levels of risk to users in the design of footways, pedestrian crossing facilities and road junctions;
- Improve data collection systems and provide statistics on gender differentiated mobility, thus providing measures of exposure to risk for males and females as pedestrians, especially among children and older people, as public transport passengers, and as users of vehicles of all other kinds;
- Continue to research the main determinants of gender differences in road risk with a view to designing more effective countermeasures;
- Support research on the adaptability of occupant protection devices to the biomechanical characteristics of the occupant;
- Assess the appropriateness of pedestrian protection devices to biomechanical characteristics of struck pedestrians;
- Support research on the gender-specific needs in rehabilitation following a road collision;
- Promote, encourage and widely disseminate the results of research into the effects of prescription drugs, especially among older women, on driving.

4| ETSC recommendations

4.1 General recommendations

To Member States

- Seek to reach targets by all available means, including applying proven enforcement strategies according to the EC Recommendation on enforcement;
- Work towards adopting the MAIS3+ definition by the end of 2013 and set national reduction targets for seriously injured based on MAIS3+ alongside the reduction of deaths;
- Adapt or supplement data collection system to be able to report the 2014 total number of serious injuries as MAIS3+ in 2015;
- Establish a system of linking police and hospital databases to report seriously injured road casualties;
- Continue collecting data based on the previous definition of serious injury after implementing the new definition;
- Include serious injuries in the impact assessment of countermeasures, where this does not take place already;
- Streamline the emergency response chain and increase quality of trauma management in order to effectively mitigate crash consequences;
- Use the evidence gathered under the Road Safety PIN to devise and update relevant policies. Make the choice of measures based on sound evaluation studies and - where applicable - cost effectiveness consideration.

To EU Institutions

- Work together with Member States in making progress towards the target of having no more than 15,500 road deaths in 2020, as set in the EC Road Safety Policy Orientations;
- Show leadership and actively work towards the fulfilment of the EU ambition stated in the 2011 Transport White Paper to become a world leader in road safety;
- Support Member States in preparing national enforcement plans with yearly targets for compliance in the areas of speeding, drink and drug driving and seat belt use;
- Allocate the necessary resources with a view to developing coherent and cost-effective action plans for each of the seven objectives in order to implement the road safety policy orientations 2011-2020;
- Adopt a fully fledged strategy to tackle serious injuries including measures against which delivery can be made accountable;
- Adopt a target to reduce by 35% serious injuries based on MAIS3+from 2014 to 2020;
- Continue to review the procedures used by Member States to estimate the number of people seriously injured to ensure comparability since a variety of methods will be used in practice;
- Regularly monitor developments in passive and active safety technologies for the protection of both car occupants and unprotected road users and ensure that robust in-vehicle safety technologies are mandated into new legislation;
- Support the implementation of in-car enforcement technologies such as seat belt reminders on all seats, alcohol interlocks and Intelligent Speed Assistance.

4.2 Recommendations to improve the safety of goods and passengers in Europe

To Member States

- Enforce compliance with speed limits through inter-alia installing safety cameras;
- Adopt Zero Tolerance for drink driving for professional drivers and raise enforcement levels;
- Adopt legislation mandating alcohol interlocks for professional drivers;
- Increase enforcement of specific requirements of relevant categories of road users relating to tachographs and driving times, vehicle inspection and driving licences;
- Provide safe parking and resting spaces on routes with goods vehicle and bus traffic;
- Implement and execute severe, dissuasive and deterrent sanctions for tachograph fraud infringements;
- Target professional drivers through information, education and training about the dangers of driving when tired. Efforts should be made to target transport subgroups such as small firms and self-employed workers;
- Run and organise campaigns about interaction of goods vehicles and buses with other road users;
- Consider road use by goods vehicles and buses in matching the use of each road to the functions that the road serves in terms of living space, access and through movement;
- Separate faster vehicles from slower ones and lighter vehicles from heavier ones where this is practicable;
- Provide adequate road markings that Lane Departure Warning Systems can read, which is crucial to managing fatigue and of particular relevance to professional drivers;
- Include safety as a criterion for public procurement contracts involving the use of goods vehicles or buses and apply this throughout the supply chain;
- Purchase goods vehicles and buses with in-vehicle technologies which have high life saving potential.

To EU Institutions

- Extend the mandatory use of speed limiters, which already exists for heavy goods vehicles, to goods vehicles below 3.5 t, as a first step to introducing Intelligent Speed Assistance to these vehicle types;
- Contribute to the development of harmonised standards for Intelligent Speed Assistance systems towards eventual universal fitment, including to goods vehicles and buses;
- Monitor implementation of the professional driver training Directive and provide support to Member States to train drivers on road safety elements and speed management in particular;
- Adopt legislation mandating alcohol interlocks for professional drivers;
- Make Lane Departure Warning Systems and Advanced Emergency Braking Systems mandatory for all new goods vehicles and buses;
- Strengthen the enforcement of the liability clause (Article 10) of Regulation EC 561/2006 in order to prevent the pressures of just-in-time management contributing to fatigue and stress;
- Ensure that the Member States respect the amount of checks to be organised as referred to in Article 2 (3) of Directive 2006/22/EC on driving and resting hours in road transport;
- Support the implementation of the European Risk Rating System and deal with any existing barriers to data sharing among authorities;
- Carefully consider safety when revising Directive 96/53/EC on maximum permitted weights and dimensions in road transport;

- Tackle Heavy Goods Vehicle collisions including those caused by blind spots e.g. by improving the design and equipment of HGVs including retrofitting with front-view mirrors, improved cabin design, installation of cameras and active warning systems and front, underrun and side protection.

4.3 Addressing the gender bias in road safety

Recommendations to Member States and EU institutions

- Fully integrate gender perspectives into all policy-making, implementation and research related to road safety to maximise safety benefits to both males and females;
- Achieve effective legislation and enforcement in particular against speeding, drink driving and the non-use of protective equipment (seat belts and helmets) where male drivers are over-represented;
- Improve training systems to take account of the different trajectories of learning and gaining experience among young male and female drivers;
- Consider gender differentiated levels of risk to users in the design of footways, pedestrian crossing facilities and road junctions;
- Improve data collection systems and provide statistics on gender differentiated mobility, thus providing measures of exposure to risk for males and females as pedestrians, especially among children and older people, as public transport passengers, and as users of vehicles of all other kinds;
- Continue to research the main determinants of gender differences in road risk with a view to designing more effective countermeasures;
- Support research on the adaptability of occupant protection devices to the biomechanical characteristics of the occupant;
- Assess the appropriateness of pedestrian protection devices to biomechanical characteristics of struck pedestrians;
- Support research on the gender-specific needs in rehabilitation following a road collision.

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Annex 1 - Chapter 1

Country	Code	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2011-2012	2010-2012
Malta	MT	16	16	16	13	16	10	14	15	21	15	17	9	-47%	-40%
Cyprus	CY	98	94	97	117	102	86	89	82	71	60	71	51	-28%	-15%
Israel	IL	542	525	445	467	437	405	382	412	314	352	341	263	-23%	-25%
Denmark*	DK*	431	463	432	369	331	306	406	406	303	255	220	*175**	-20%	-31%
Portugal*[2]	PT*	1,670	1,668	1,542	1,294	1,247	969	974	885	840	937	891	*743**	-17%	-21%
Poland	PL	5,534	5,827	5,640	5,712	5,444	5,243	5,583	5,437	4,572	3,907	4,189	3,571	-15%	-9%
Estonia†	EE†	199	223	164	170	169	204	196	132	100	79	101	*87†*	-14%	10%
Ireland	IE	411	376	335	374	396	365	338	279	238	212	186	162	-13%	-24%
Finland*	FI*	433	415	379	375	379	336	380	344	279	272	292	*255**	-13%	-6%
Belgium*	BE*	1,486	1,306	1,214	1,162	1,089	1,069	1,067	944	943	841	858	*750**	-13%	-11%
Norway	NO	275	310	280	258	224	242	233	255	212	210	168	148	-12%	-30%
Spain*[3]	ES*	5,517	5,347	5,399	4,741	4,442	4,104	3,823	3,100	2,714	2,478	2,060	*1,834**	-11%	-26%
Sweden[4]	SE	534	515	512	463	423	428	454	380	341	266	319	286	-10%	8%
Germany	DE	6,977	6,842	6,613	5,842	5,361	5,091	4,949	4,477	4,152	3,651	4,009	3,601	-10%	-1%
Greece*	EL*	1,880	1,634	1,605	1,670	1,658	1,657	1,612	1,553	1,456	1,258	1,141	*1,027**	-10%	-18%
UK**	UK**	3,598	3,581	3,658	3,368	3,337	3,300	3,056	2,718	2,337	1,905	1,960	*1,768***	-10%	-7%
Slovakia†	SK†	625	626	653	608	600	608	661	606	385	353	324	*295†*	-9%	-16%
Bulgaria†	BG†	1,011	959	960	943	957	1,043	1,006	1,061	901	776	658	*605†*	-8%	-22%
France*	FR*	8,162	7,655	6,058	5,530	5,318	4,703	4,620	4,275	4,273	3,992	3,963	*3,653**	-8%	-8%
Slovenia	SI	278	269	242	274	257	262	293	214	171	138	141	130	-8%	-6%
Serbia*	RS*	1,275	854	868	960	843	910	968	905	810	660	731	*684**	-6%	4%
Italy*	IT*	7,096	6,980	6,563	6,122	5,818	5,669	5,131	4,725	4,237	4,090	3,860	*3,650**	-5%	-11%
Hungary	HU	1,239	1,429	1,326	1,296	1,278	1,303	1,232	996	822	740	638	605	-5%	-18%
Czech Republic	CZ	1,334	1,431	1,447	1,382	1,286	1,063	1,222	1,076	901	802	773	738	-5%	-8%
The Netherlands*[1]	NL*	1,083	1,069	1,088	881	817	811	791	750	720	640	661	*650**	-2%	2%
Latvia	LV	558	559	532	516	442	407	419	316	254	218	179	177	-1%	-19%
Austria*	AT*	958	956	931	878	768	730	691	679	633	552	523	*522**	-0%	-5%
Romania	RO	2,451	2,410	2,229	2,444	2,629	2,587	2,800	3,065	2,797	2,377	2,018	2,042	1%	-14%
Lithuania	LT	706	697	709	752	773	760	740	499	370	299	297	301	1%	1%
Luxembourg	LU	70	62	53	50	47	43	45	35	48	32	33	34	3%	6%
Switzerland	CH	544	513	546	510	409	370	384	357	349	327	320	339	6%	4%
EU27		54,355	53,409	50,397	47,346	45,384	43,157	42,592	39,049	34,879	31,145	30,382	27,721	-9%	-11%
EU15		40,306	38,869	36,382	33,119	31,431	29,581	28,337	25,550	23,514	21,381	20,976	19,110	-9%	-16%
EU10		10,587	11,171	10,826	10,840	10,367	9,946	10,449	9,373	7,667	6,611	6,730	5,964	-11%	-11%
EU2		3,462	3,369	3,189	3,387	3,586	3,630	3,806	4,126	3,698	3,153	2,676	2,647	-1%	-11%

Table 1 (Figs. 1, 3). Road deaths and percentage change in road deaths between 2011 and 2012 (and between 2010 and 2012)

Source: National statistics provided by the PIN Panellists in each country.

** Provisional estimates as supplied by the PIN Panellists used for 2012, as the final figures for 2012 are not yet available at the time of going to print.*

***UK estimate based on a GB estimate of 9.5% decrease in killed in 2012 Q1-3 compared with 2011 Q1-3. In 2012, 48 people were killed on Northern Ireland's roads. The final count for GB will be available on www.dft.gov.uk/pgr/statistics*

† ETSC estimates based on EC CARE Quick Indicator. http://europa.eu/rapid/press-release_IP-13-236_en.htm

[1] Figures have been corrected for police underreporting. In the Netherlands, the reported number of deaths is checked by Statistics Netherlands (CBS) and compared individually to the Death certificates and Court files of unnatural death.

[2] Increases in 2010 and 2011 are partly due to change in reporting methods. Prior to 2010 the number of people killed are people killed on the spot multiplied by a coefficient of 1.14. 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 accident. The number of people killed in 2010 would have been 845 in 2010, 785 in 2011 and 653 in 2012 using the old methodology.

[3] Decrease in 2011 is partly due to change in reporting methods. Like Portugal, prior to 2010 the number of people killed are people killed on the spot multiplied by a coefficient. Since 2011 Spain is able to report data according to the EU common definition of any person killed immediately or dying within 30 days as a result of an injury accident by matching police and national deaths register.

[4]The definition of road deaths changed in 2010 to exclude suicides. The time series was adjusted so figures for previous years exclude suicides as well.

Country	Code	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2001-2012
Latvia	LV	558	559	532	516	442	407	419	316	254	218	179	177	-68%
Spain*[3]	ES*	5,517	5,347	5,399	4,741	4,442	4,104	3,823	3,100	2,714	2,478	2,060	*1,834**	-67%
Ireland	IE	411	376	335	374	396	365	338	279	238	212	186	162	-61%
Denmark*	DK*	431	463	432	369	331	306	406	406	303	255	220	*175**	-59%
Lithuania	LT	706	697	709	752	773	760	740	499	370	299	297	301	-57%
Estonia†	EE†	199	223	164	170	169	204	196	132	100	79	101	*87†*	-56%
Portugal*[2]	PT*	1,670	1,668	1,542	1,294	1,247	969	974	885	840	937	891	*743**	-56%
France*	FR*	8,162	7,655	6,058	5,530	5,318	4,703	4,620	4,275	4,273	3,992	3,963	*3,653**	-55%
Slovenia	SI	278	269	242	274	257	262	293	214	171	138	141	130	-53%
Slovakia†	SK†	625	626	653	608	600	608	661	606	385	353	324	*295†*	-53%
Israel	IL	542	525	445	467	437	405	382	412	314	352	341	263	-51%
Luxembourg	LU	70	62	53	50	47	43	45	35	48	32	33	34	-51%
Hungary	HU	1,239	1,429	1,326	1,296	1,278	1,303	1,232	996	822	740	638	605	-51%
UK**	UK**	3,598	3,581	3,658	3,368	3,337	3,300	3,056	2,718	2,337	1,905	1,960	*1768***	-51%
Belgium*	BE*	1,486	1,306	1,214	1,162	1,089	1,069	1,067	944	943	841	858	*750**	-50%
Italy*	IT*	7,096	6,980	6,563	6,122	5,818	5,669	5,131	4,725	4,237	4,090	3,860	*3,650**	-49%
Germany	DE	6,977	6,842	6,613	5,842	5,361	5,091	4,949	4,477	4,152	3,651	4,009	3,601	-48%
Cyprus	CY	98	94	97	117	102	86	89	82	71	60	71	51	-48%
Sweden[4]	SE	534	515	512	463	423	428	454	380	341	266	319	286	-46%
Serbia*	RS*	1,275	854	868	960	843	910	968	905	810	660	731	*684**	-46%
Norway	NO	275	310	280	258	224	242	233	255	212	210	168	148	-46%
Austria*	AT*	958	956	931	878	768	730	691	679	633	552	523	*522**	-46%
Greece*	EL*	1,880	1,634	1,605	1,670	1,658	1,657	1,612	1,553	1,456	1,258	1,141	*1,027**	-45%
Czech Republic	CZ	1,334	1,431	1,447	1,382	1,286	1,063	1,222	1,076	901	802	773	738	-45%
Malta	MT	16	16	16	13	16	10	14	15	21	15	17	9	-44%
Finland*	FI*	433	415	379	375	379	336	380	344	279	272	292	*255**	-41%
Bulgaria†	BG†	1,011	959	960	943	957	1,043	1,006	1,061	901	776	658	*605†*	-40%
The Netherlands*[1]	NL*	1,083	1,069	1,088	881	817	811	791	750	720	640	661	*650**	-40%
Switzerland	CH	544	513	546	510	409	370	384	357	349	327	320	339	-38%
Poland	PL	5,534	5,827	5,640	5,712	5,444	5,243	5,583	5,437	4,572	3,907	4,189	3,571	-35%
Romania	RO	2,451	2,410	2,229	2,444	2,629	2,587	2,800	3,065	2,797	2,377	2,018	2,042	-17%
EU27		54,355	53,409	50,397	47,346	45,384	43,157	42,592	39,049	34,879	31,145	30,382	27,721	-49%
EU15		40,306	38,869	36,382	33,119	31,431	29,581	28,337	25,550	23,514	21,381	20,976	19,110	-53%
EU10		10,587	11,171	10,826	10,840	10,367	9,946	10,449	9,373	7,667	6,611	6,730	5,964	-44%
EU2		3,462	3,369	3,189	3,387	3,586	3,630	3,806	4,126	3,698	3,153	2,676	2,647	-24%

Table 2 (Fig. 4). Road deaths and percentage change in road deaths between 2001 and 2012

Source: National statistics provided by the PIN Panellists in each country.

** Provisional estimates as supplied by the PIN Panellists used for 2012, as the final figures for 2012 are not yet available at the time of going to print.*

***UK estimate based on a GB estimate of 9.5% decrease in killed in 2012 Q1-3 compared with 2011 Q1-3. In 2012, 48 people were killed on Northern Ireland's roads. The final count for GB will be available on www.dft.gov.uk/pgr/statistics*

† ETSC estimates based on EC CARE Quick Indicator. http://europa.eu/rapid/press-release_IP-13-236_en.htm

[1] Figures have been corrected for police underreporting. In the Netherlands, the reported number of deaths is checked by Statistics Netherlands (CBS) and compared individually to the Death certificates and Court files of unnatural death.

[2] Increases in 2010 and 2011 are partly due to change in reporting methods. Prior to 2010 the number of people killed are people killed on the spot multiplied by a coefficient of 1.14. 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 accident. The number of people killed in 2010 would have been 845 in 2010, 785 in 2011 and 653 in 2012 using the old methodology.

[3] Decrease in 2011 is partly due to change in reporting methods. Like Portugal, prior to 2010 the number of people killed are people killed on the spot multiplied by a coefficient. Since 2011 Spain is able to report data according to the EU common definition of any person killed immediately or dying within 30 days as a result of an injury accident by matching police and national deaths register.

[4]The definition of road deaths changed in 2010 to exclude suicides. The time series was adjusted so figures for previous years exclude suicides as well.

	2012			2001		
Country	Road Deaths	Population	Road Deaths per million Population	Road Deaths	Population	Road Deaths per million Population
Malta	9	417,520	22	16	391,415	41
UK	*1768***	62,989,551	***28****	3,598	58,999,781	61
Norway	148	4,985,870	30	275	4,503,436	61
Sweden	286	9,482,855	30	531	8,882,792	60
Denmark	*175**	5,580,516	***31****	431	5,349,212	81
Israel	263	8,012,400[1]	33	542	6,508,800[1]	83
Ireland	162	4,582,769	35	411	3,832,783	107
The Netherlands	*650**	16,730,348	***39****	1,083	15,987,075	68
Spain	*1,834**	46,196,276	***40****	5,517	40,476,723	136
Switzerland	339	7,954,662	43	544	7,204,055	76
Germany	3,601	81,843,743	44	6,977	82,259,540	85
Finland	*255**	5,401,267	***47****	433	5,181,115	84
Slovakia	*295†*	5,404,322	***55†***	625	5,378,783	116
France	*3,653**	63,409,191	***58****	8,162	59,266,572	138
Cyprus	51	862,011	59	98	697,549	140
Italy	*3,650**	60,820,696	***60****	7,096	56,960,692	125
Hungary	605	9,957,731	61	1,239	10,200,298	121
Austria	*522**	8,443,018	***62****	958	8,020,946	119
Slovenia	130	2,055,496	63	278	1,990,094	140
Luxembourg	34	524,853	65	70	439,000	159
Estonia	*87†*	1,339,662	***65†***	199	1,366,959	146
Belgium	*750**	11,094,850	***68****	1,486	10,263,414	145
Czech Republic	734	10,505,445	70	1,334	10,266,546	130
Portugal	*743**	10,541,840	***70****	1,670	10,256,658	163
Bulgaria	*605†*	7,327,224	***83†***	1,011	8,149,468	124
Latvia	177	2,041,763	87	558	2,364,254	236
Greece	*1,027**	11,290,067	***91****	1,880	10,931,206	172
Poland	3,571	38,538,447	93	5,534	38,253,955	145
Serbia	*684**	7,241,295	***94****	1,275	7,504,739	170
Romania	2,042	21,355,849	96	2,451	22,430,457	109
Lithuania	301	3,007,758	100	706	3,486,998	202
EU27	27,721	503,663,601	55	54,352	482,084,285	113
EU15	19,110	398,931,840	48	40,303	377,107,509	107
EU10	5,964	76,048,688	78	10,587	74,396,851	142
EU2	2,647	28,683,073	92	3,462	30,579,925	113

Table 3 (Fig. 5). Road deaths per million inhabitants in 2012 (with road deaths per million inhabitants in 2001 for comparison)

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

** Provisional estimates as supplied by the PIN Panellists used for 2012, as the final figures for 2012 are not yet available at the time of going to print.*

***UK estimate based on a GB estimate of 9.5% decrease in killed in 2012 Q1-3 compared with 2011 Q1-3. In 2012, 48 people were killed on Northern Ireland's roads.*

[1] National population data.

Country	Average number of road deaths	Average number of vehicle-km (in millions)[1]	Deaths per billion vehicle-km	Time period covered
Sweden	290	77,196	4	*2010-2012*
Ireland	187	47,354	4	*2010-2012*
Great Britain	1,991	497,033	4	*2009-2011*
Norway	197	42,928	5	*2009-2011*
Finland	273	54,170	5	*2010-2012*
The Netherlands	651	127,585	5	*2010-2011*
Switzerland	332	62,174	5	*2009-2011*
Denmark	259	45,983	6	*2009-2011*
Israel	319	50,954	6	*2010-2012*
France	3,869	563,567	7	*2010-2012*
Austria	569	75,994	7	*2009-2011*
Slovenia	150	17,992	8	*2009-2011*
Italy	3,867	463,548	8	*2010-2012*
Germany	3,937	467,967	8	*2009-2011*
Belgium	909	98,104	9	*2008-2010*
Portugal	857	69,121	12	*2010-2012*
Czech Republic	926	53,968	17	*2008-2010*
Latvia	191	10,892	18	*2010-2012*
Poland	4,223	198,195	21	*2009-2011*

Table 4 (Fig. 6). Road deaths per billion vehicle kilometres driven

[1] Data provided by the PIN panellists. Member States are using different methods for estimating the numbers of vehicle-km travelled. See Background Tables of 7th PIN Report at www.etsc.eu/PIN-publications.php.

Country	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Average annual % change
Austria*	8,207	8,043	7,984	7,591	6,922	6,774	7,147	6,783	6,652	6,370	6,397	n/a	-3%
Belgium*[1]	8,949	8,223	8,083	6,913	7,272	6,999	6,997	6,782	6,647	5,982	6,164	*n/a*	-3%
Cyprus[1]	1,015	945	900	960	741	730	717	661	647	586	561	551	-6%
Czech Republic[1]	5,378	5,375	5,125	4,711	4,237	3,883	3,861	3,725	3,467	2,774	3,026	2,925	-6%
Denmark*[1]	3,946	4,088	3,868	3,561	3,072	2,911	3,138	2,831	2,498	2,063	2,172	*n/a*	-7%
France†[1][3]	26,192	24,091	19,207	17,435	39,811	40,662	38,615	34,965	33,323	30,393	29,679	*n/a*	2%
Germany*[1]	95,040	88,382	85,577	80,801	76,952	74,502	75,443	70,644	68,567	62,620	68,985	*n/a*	-4%
Greece[1]	3,238	2,608	2,348	2,395	2,270	2,021	1,821	1,872	1,676	1,709	1,626	*1389†*	-6%
Hungary	7,920	8,360	8,299	8,523	8,320	8,431	8,155	7,227	6,442	5,671	5,152	4,921	-5%
Ireland[1]	1,417	1,150	1,009	877	1,021	907	860	835	640	561	472	*485†*	-9%
Israel	2,644	2,419	2,416	2,455	2,363	2,305	2,095	2,063	1,741	1,683	1,340	1,611	-5%
Latvia† [1]	n/a	n/a	n/a	1,222	810	630	638	791	681	569	531	493	-8%
Lithuania*	7,103	7,427	7,263	7,877	8,466	8,334	8,042	5,818	4,426	4,230	3,919	3,712	-7%
Luxembourg[1]	352	351	331	297	307	319	286	290	288	266	317	339	-1%
Malta	262	314	247	264	257	277	246	248	199	211	235	300	-1%
The Netherlands*[5]	16,000	16,100	16,500	16,200	16,000	15,400	16,600	17,600	18,800	19,100[6]	20,100[6]	*n/a*	2%
The NL - MAIS3+										5,700	6,100		
Norway*	1,043	1,151	994	980	977	940	879	867	751	714	679	*639†*	-5%
Poland	19,311	18,831	17,251	17,403	15,790	14,659	16,053	16,042	13,689	11,491	12,585	12,049	-4%
Portugal[1]	5,797	4,770	4,659	4,190	3,762	3,483	3,116	2,606	2,624	2,475	2,265	*1,948†*	-9%
Romania	6,072	5,973	5,585	5,774	5,885	5,780	7,091	9,403	9,097	8,509	8,768	8,860	5%
Serbia	5,777	4,314	4,551	4,864	4,401	4,778	5,318	5,197	4,638	3,893	3,777	*3,545†*	-3%
Slovakia*[1]	2,367	2,213	2,163	2,157	1,974	2,032	2,036	1,806	1,408	1,207	1,168	*n/a*	-7%
Slovenia	2,481	1,561	1,399	1,398	1,292	1,259	1,295	1,100	1,061	880	919	848	-7%
Spain*[1]	26,566	26,156	26,305	21,805	21,859	21,382	19,295	16,488	13,923	11,995	11,347	*n/a*	-9%
Spain MAIS3+										6,412			
Sweden*[1]	10,636	11,022	11,166	10,614	10,768	9,891	9,710	9,452	8,933	7,749	7,869	n/a	-4%
Sweden MAIS3+							1,642	1,775	1,588	1,300	1,229	1,099	
Switzerland[1]	6,194	5,931	5,862	5,528	5,059	5,066	5,235	4,780	4,708	4,458	4,437	4,202	-3%
UK**[1]	38,792	37,502	34,995	32,313	30,027	28,673	28,871	27,024	25,725	23,552	23,947	*23,875***	-5%
GB MAIS3+										34,810			
EU 27	439,395	427,826	407,079	388,109	398,459	390,003	387,146	365,057	348,052	327,888	324,324	313,497	
EU same def.[1]	229,685	216,879	205,736	189,029	204,073	198,395	194,766	178,991	170,997	155,770	152,904	140,128	-3.4%

Estonia	Separate statistics for serious and slight injuries are n/a.
Finland	Separate statistics for serious and slight injuries are n/a.
Italy[4]	Separate statistics for serious and slight injuries are n/a.

Table 5 (Fig. 8 and 9). Serious injuries according to national definition (see Table 6 for definition)

Source: National statistics provided by the PIN Panellists in each country

† 2012 provisional

**Annual average percentage change calculated for 2001-2011. ‡ LV annual average percentage change calculated for 2004-2011.*

***UK 2012 estimate based on estimate for GB based on 0.2% decrease in seriously injured in 2012 Q1-3 compared with 2011 Q1-3. In 2012, 795 people were seriously injured in a road collision in Northern Ireland.*

[1] Countries using a comparable definition of serious injuries: BE, CY, CZ, DK, FR, DE, EL, IE, LU, LV, PT, SK, ES, SE, CH, UK.

[3] Change of definition from in-patient for 6 days to in-patient for 24 hours. Average annual percentage change 2005-2011 in Fig. 7 and 8.

[4] Separate statistics on serious and slight injuries are n/a in Italy. It was estimated from a sample study at regional level that serious injuries represent around 14% of the total recorded injuries

[5] Data for the Netherlands rounded off to nearest hundred.

[6] Due to changes in the registration software and internal police procedures, the numbers of injuries have dropped in 2010 and 2011. This does not reflect an actual improvement in road safety.

Country	Current definition of a seriously injured person in a road collision.
Austria	Whether an injury is severe or slight is determined by §84 of the Austrian criminal code. A severe injury is one that causes a health problem or occupational disability longer than 24 days, or one that "causes personal difficulty". Police records.
Belgium*	Hospitalised more than 24 hours. But in practice no communication between police and hospitals so in most cases allocation is made by the police. Police records.
Bulgaria	n/a. Police records.
Cyprus*	Hospitalised for at least 24 hours. Police records.
Czech Republic*	No official definition, but common approach is hospitalised for at least 24 hours. Police records.
Denmark*	All injuries except "slight". Police records.
Estonia	Separate statistics of serious and slight injuries are n/a.
Finland	Separate statistics of serious and slight injuries are n/a.
France*	Until 2004: hospitalised for at least 6 days. From 2005: hospitalised for at least 24 hours. Police records. People injured are asked to go to the police to fill in information about the collision, in particular if they spent at least 24 hours as in-patient.
Germany*	Hospitalised for at least 24 hours. Police records.
Greece*	Injury and injury severity are estimated by police officers. It is presumed that all persons who spent at least one night at the hospital are recorded as seriously injured persons. Police records.
Hungary	Serious injury which necessitates hospitalisation for more than 48 hours within seven days after occurrence or caused fracture, except for finger, toe, nose fractures; or caused cut wounds, which resulted in serious bleeding or nerve, muscle or tendon injuries; or caused injury of inner organs; or caused burn of second or third degree or burn affecting more than 5% of body surface.
Ireland*	Hospitalised for at least 24 hours as an in-patient, or any of the following injuries whether or not detained in hospital: fractures, concussion, internal injuries, crushing, severe cuts and lacerations, several general shock requiring medical treatment. Police records.
Israel*	Hospitalised more than 24 hours as in-patient. Police records.
Italy	Separate statistics on seriously and slightly injuries are n/a.
Latvia*	From 2004: hospitalised more than 24 hours as in-patient. Police records.
Lithuania	Separate statistics on seriously and slightly injuries are n/a.
Luxembourg*	Hospitalised for at least 24 hours as in-patient. Police records.
Malta	An injury accident is classified as 'Serious' injury (referred to in Malta accident statistics as 'Grievous' injury) if the person does not recover his/her previous health condition with 30 days. Police records.
The Netherlands	MAIS=2 or higher. Police records.
Norway	Very serious injury: Any injury that is life-threatening or results in permanent impairment. Serious injury: Any injury from a list of specific injuries; these would normally require admission to hospital as an in-patient. Police records.
Poland	A person who sustained a serious disability, a serious incurable disease or a chronic life threatening disease, permanent mental disease, complete or substantial permanent incapacity to work in their current occupation or a permanent or substantial scarring or disfiguration of the body; the definition also includes persons who have suffered other injuries incapacitating their bodies or causing ill health for longer than 7 days". Police records.
Portugal*	Hospitalised for at least 24 hours. Police records.
Romania	Injuries requiring hospitalisation or any of the following injuries: Organ injuries, permanent physical or psychological disability, body disfiguration, abortion, fractures, concussions, internal wounds, serious shock, or any other injury which leads to death more than 30 days after the collision. Police records.
Serbia	Using of the ICD-International Classification of Diseases. Categorization of an injury as a "serious injury" is made on the basis of expert assessment given by doctors during admission to hospital, during hospitalization or after the hospitalization. The Republic of Serbia has not yet adopted a definition for serious injury. Police records.
Slovakia*	Hospitalised for at least 24 hours. Police records.
Slovenia	Any injured persons who were involved in a road traffic accident and sustained injuries due to which their lives were in danger or due to which their health was temporarily or permanently damaged or due to which they were temporarily unable to perform any work or their ability to work was permanently reduced (Penal Code of the Republic of Slovenia). Police records.
Spain*	Hospitalised for at least 24 hours. Police records.
Sweden	Up to 2011, hospitalised for at least 24 hours. Discharge data. Data in Table 5 from 2001-2011 are from Hospital records. The definition has been updated in 2012. A serious injury is now defined as a health loss following a traffic injury reflecting that a person does not recover the previous health condition within a reasonable amount of time.
Switzerland*	Hospitalised for at least 24 hours or if the injury prevented the person from doing its daily activity for 24 hours. Police records.
UK*	Hospitalised for at least 24 hours or any of the following injuries whether or not they are detained in hospital: fractures, concussion, internal injuries, crushing, burns (excluding friction burns), severe cuts and lacerations, severe general shock

Table 6 (Fig. 8 and 9). Definition of a seriously injured person in a road collision.

National definition provided by the PIN Panellists in each country.

** Group of countries considered as using similar definitions of serious injuries, spending at least one night in hospital as an in-patient or a close variant of this. The definition may include also a quite wide list of injuries and the allocation of "serious" is made by the police officer at the scene. Errors in the categorisation cannot be excluded.*

Austria	Under consideration. It is not possible to link police and hospital data directly on the basis of the current data architecture. There are, however, plans to estimate MAIS 3+ on the basis of data sources such as the hospital discharge register and the EU Injury Database (IDB).
Belgium	Belgian inpatient hospital data does not contain MAIS and AIS. Belgium is working on a process to convert ICD diagnose codes into AIS and MAIS.
Bulgaria	n/a
Cyprus	n/a
Czech Republic	Under discussion.
Denmark	No systematic linkage between police and hospital data. Denmark is working on a process to convert ICD diagnose codes into AIS and MAIS
Estonia	n/a
Finland	Actively working on the implementation of tools to collect MAIS data
France	Linking between police and health data is done in the Rhone Alpes region.
Germany	It is planned to introduce a new category of critically injured persons which will probably be defined as MAIS3+.
Greece	Hospitals do not systematically collect data on the injury severity of road casualties.
Hungary	Hungary will participate in the international IDB project for the development of an international injury database as a first step in the nationwide collection of MAIS3+ data.
Ireland	The Road Safety Authority has commissioned a study examining the feasibility of adopting MAIS+3 definition of serious injury and linking Irish Hospital data with the police data
Israel	Israel currently uses ISS data, and is considering collecting data based on MAIS 3+ in the future.
Italy	The current data architecture does not provide direct linkage between police and hospital data. MAIS3+ will be adopted for coding the level of injury and calculated on the basis of data sources such as the hospital discharge register. A first estimate of the number of seriously injured is expected for 2014.
Latvia	MAIS3+ under discussion but it will be difficult to start collecting data from 01.01.2014. Medical staff will have to be trained to describe the severity of injuries using the AIS scale.
Lithuania	Under discussion.
Luxembourg	MAIS3+ will be used in the near future
Malta	n/a
The Netherlands	Data already available for 2010 and 2011 (see Table 5)
Norway	Under consideration.
Poland	Poland is working to update its data collect system to be able to report serious injuries based on MAIS 3+. The work is coordinated by the National Road Safety Council.
Portugal	Under consideration
Romania	n/a
Serbia	n/a
Slovakia	n/a
Slovenia	In the short term it is not planned to collect serious injuries data based on MAIS3+.
Spain	Data already available for 2011 (see Table 5). Since 2011 MAIS3+ is published in official reports. In a near future Spain will add MAIS3+ to the current definition of seriously injured.
Sweden	Data already available since 2007 (see Table 5)
Switzerland	Linking of health and police data will start in 2013. This will allow to code the recommended maximum AIS score based on ICD-10.
UK	Data already available (see Table 5). MAIS 1 and 2 are considerate minor or moderate injuries, MAIS 3+ serious injuries.

Table 7. Countries' progress in collecting data on serious injuries based on MAIS.

Annex 2 - Chapter 2

Country	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Annual average % change between 2001 and 2011
LV	46	40	73	47	52	62	62	28	10	15	12	-14.7%
ES	803	860	834	766	714	659	528	452	353	333	298	-10.9%
RS*	n/a	n/a	n/a	n/a	n/a	195	179	178	136	133	n/a	-9.9%
IE	36	15	21	29	24	29	20	22	11	9	10	-9.6%
PT*	197	214	213	166	145	120	131	101	113	86	n/a	-9.6%
LU	6	12	9	6	4	7	7	2	2	9	3	-9.3%
SE[1]	118	135	92	59	61	83	92	72	45	47	46	-8.9%
DK	77	81	69	65	79	48	65	61	36	36	34	-8.4%
GB	575	532	528	449	486	419	435	368	268	263	257	-8.2%
EL*	174	175	188	154	134	133	116	114	91	102	n/a	-7.4%
CH	76	49	50	52	45	40	32	38	44	28	31	-7.1%
LT*	61	61	78	79	97	87	96	54	42	49	39	-7.1%
FR	1,073	1,004	766	741	723	685	660	596	505	553	578	-6.4%
AT	124	147	144	149	129	127	90	111	82	101	70	-6.2%
DE	1,472	1,408	1,379	1,284	1,158	1,197	1,095	1,004	890	859	889	-5.6%
EE	29	27	30	33	32	28	22	22	14	20	22	-5.4%
PL[2]	1,443	1,474	1,462	1,487	1,425	1,408	1,275	1,181	961	959	1,023	-4.7%
BE	193	178	136	143	162	132	156	122	117	111	116	-4.7%
CZ*	222	234	241	257	240	215	220	169	163	175	n/a	-4.2%
NL	99	86	108	81	66	90	90	61	54	72	72	-4.1%
HU*	n/a	166	125	257	244	233	214	171	115	143	n/a	-2.9%
FI	118	105	97	107	92	82	97	106	70	92	85	-2.8%
IL	64	72	75	85	70	66	65	70	55	51	62	-2.6%
RO	217	216	242	227	287	273	283	304	245	188	164	-1.2%
NO	66	63	62	59	50	76	61	55	57	71	56	-0.5%
SI	5	8	1	8	7	0	7	0	0	1	25	
IT	n/a	n/a	n/a	n/a	n/a	n/a	n/a	352	335	380	380	
CY	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	34	n/a	5	
BG	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
MT	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
SK	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
PIN	7,394	7,299	6,962	6,731	6,476	6,189	5,829	5,203	4,311	4,290	4,266	-6.1%
EU[3]	7,254	7,178	6,837	6,594	6,361	6,083	5,732	5,095	4,212	4,211	4,173	-6.0%

Table 8 (Fig. 10). Road deaths in collisions involving a heavy goods vehicle (over 3.5t) and average annual percentage change between 2001 and 2011

Source: CARE when available, completed or updated by the PIN Panellists. No data was received from Bulgaria, Malta and Slovakia.

** Annual average % change calculated for the available years.*

[1] SE Suicides are excluded for 2010 and 2011. Vehicles with unknown weight are excluded. The STRADA official statistics differentiate between vehicles with a max. weight of over 3.5t, under 3.5t and unknown. National analysis has shown that a considerable proportion of the vehicles with unknown weight are HGVs.

[2] PL data refers to all goods vehicles.

[3] EU27 excluding IT, CY, BG, MT, SK.

Code	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Annual average % change between 2001 and 2011
LT*	36	36	22	25	20	26	7	11	8	4	5	-19.9%
LV	36	27	35	18	18	19	27	13	11	13	8	-12.1%
SI	30	40	28	43	52	44	39	40	28	21	4	-11.2%
ES	796	783	746	706	644	647	585	485	385	346	279	-9.8%
PT*	407	365	357	275	286	252	184	197	198	180	180	-9.2%
AT	67	69	68	56	52	39	30	45	43	29	28	-8.8%
NL	136	121	169	100	95	88	87	95	80	59	59	-8.3%
GB	319	311	327	283	272	280	303	203	174	169	191	-6.6%
IE	55	48	43	43	47	41	57	35	29	24	30	-6.3%
DK	68	69	77	43	53	42	62	63	54	33	30	-6.3%
EE	16	12	12	19	13	11	14	9	6	12	8	-6.1%
HU	167	167	127	140	145	139	150	123	102	83	83	-5.9%
CH	47	30	33	35	24	28	21	16	19	25	28	-5.9%
DE	1,472	1,408	1,379	1,284	1,158	1,197	1,095	1,004	890	859	889	-5.6%
NO	20	28	19	19	15	23	22	12	10	17	17	-4.7%
PL[1]	1,443	1,474	1,462	1,487	1,425	1,408	1,275	1,181	961	959	1,023	-4.7%
EL*	261	245	223	220	219	198	182	204	203	151	151	-4.4%
SE[2]	38	32	25	19	25	32	20	28	19	19	23	-4.3%
FI	29	36	45	33	33	14	33	32	20	28	23	-4.1%
CZ*	115	108	80	124	110	92	114	117	80	59	59	-3.9%
IL	106	58	120	109	104	103	91	86	61	74	64	-3.7%
BE	116	113	78	83	97	95	99	96	110	77	81	-1.8%
FR	369	345	304	227	197	393	416	398	443	413	415	4.0%
RO	226	211	210	223	417	459	493	574	461	459	411	10.0%
BG	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
CY	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	15	
IT	n/a	n/a	n/a	n/a	n/a	n/a	n/a	588	335	380	n/a	
LU	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2	1	4	
MT	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
NO	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
RS	n/a	n/a	n/a	n/a	n/a	195	179	178	136	133	n/a	
SK	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
PIN	6,355	6,108	5,970	5,595	5,506	5,613	5,354	5,030	4,378	4,085	4,011	-4.5%
EU[3]	6,202	6,020	5,817	5,451	5,378	5,287	5,063	4,750	4,162	3,853	3,919	-4.8%

Table 9 (Fig. 20). Road deaths in collisions involving a Light Goods Vehicle (max. permitted weight below 3.5t).

Source: CARE when available, completed or updated by the PIN Panellists. No data was received from Bulgaria, Malta and Slovakia.

** Annual average % change calculated for the available years.*

[1] SE Suicides are excluded for 2010 and 2011. Vehicles with unknown weight are excluded. The STRADA official statistics differentiate between vehicles with a max. weight of over 3.5t, under 3.5t and unknown. National analysis has shown that a considerable proportion of the vehicles with unknown weight are HGVs.

[2] PL data refers to all goods vehicles.

[3] EU27 excluding IT, CY, BG, MT, SK.

Code	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Annual average % change between 2001 and 2011
AT	33	17	20	24	10	19	17	9	15	17	1	-16.5%
EE	16	13	16	15	6	9	6	3	4	3	6	-15.2%
LT*	n/a	17	13	23	15	14	19	8	11	6	3	-14.7%
PT*	66	51	26	41	23	13	33	21	15	21	n/a	-12.2%
DK	14	22	26	15	11	14	20	10	9	13	3	-11.3%
CH	23	10	15	10	20	19	8	13	4	6	6	-11.2%
EL*	59	60	94	48	53	36	35	33	33	31	n/a	-9.5%
FI	28	17	13	29	13	19	13	13	8	9	10	-9.3%
ES	135	109	126	80	108	102	73	81	69	51	47	-9.2%
IE	7	6	2	15	12	3	6	5	7	4	1	-9.1%
CZ*	44	42	68	49	31	34	35	27	28	20	n/a	-8.9%
RS*	81	63	64	68	69	52	55	60	23	39	39	-8.6%
SI	6	4	12	12	8	2	2	4	8	3	3	-8.2%
FR	119	110	128	98	86	74	107	78	67	60	49	-7.9%
NL	27	21	21	15	18	14	15	14	14	11	11	-7.5%
LV	24	11	23	33	29	16	16	10	9	14	12	-7.3%
GB	170	135	118	127	110	122	128	103	86	64	75	-7.3%
SE[1]	32	29	33	16	13	36	15	13	17	16	16	-7.1%
DE	149	122	114	111	116	92	101	78	68	91	64	-6.8%
HU	58	83	75	60	63	64	49	34	39	41	50	-6.1%
IT*	122	107	131	136	108	116	91	102	71	79	n/a	-5.4%
NO	17	13	10	20	4	5	17	8	6	8	11	-5.3%
PL	16	18	19	24	16	21	21	15	12	11	14	-4.2%
BE	220	197	192	212	226	204	181	185	172	149	125	-4.2%
IL	10	14	28	20	24	35	12	53	25	31	21	1.1%
RO	54	116	88	107	125	120	134	101	124	90	81	1.8%
LU	6	4	1	2	2	0	0	1	2	1	0	
MT	0	0	0	0	1	0	1	3	0	1	0	
BG	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
CY	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
NO	0	0	0	0	0	0	0	0	0	7	11	
SK	n/a	n/a	n/a	n/a	35	35	39	15	35	18	n/a	
PIN	1,535	1,399	1,467	1,390	1,351	1,285	1,232	1,091	974	907	799	-6.0%
EU†	1,421	1,312	1,360	1,292	1,203	1,144	1,118	950	887	806	722	-6.4%

Table 10 (Fig. 23). Deaths in collisions involving a bus, coach or a trolley bus

Source: CARE when available, completed or updated by the PIN Panellists. No data was received from Panellists from Bulgaria, Malta and Slovakia.

** Annual average % change calculated for the available years.*

[1] SE Suicides are excluded for 2010 and 2011.

EU†: EU27 excluding BG.

Annex 3 - Chapter 3

Code	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Annual average % change in DEATHS between 2001 and 2011	Annual average % change in MORTALITY between 2001 and 2011
AT	707	680	680	663	573	540	530	509	478	409	385	-6%	-7%
BE[1]	1,102	1,003	913	911	828	824	855	722	710	635	666	-5%	-6%
CH	409	383	408	395	321	280	302	267	269	244	240	-6%	-7%
CY	77	73	70	96	83	71	75	65	59	50	58	-4%	-9%
CZ	995	1,078	1,122	1,056	988	838	946	817	669	618	581	-6%	-6%
DE	5,052	4,952	4,854	4,264	3,913	3,717	3,638	3,247	3,050	2,651	2,971	-6%	-7%
DK	314	344	310	271	251	219	300	299	212	170	161	-6%	-5%
EE	314	344	310	271	251	219	300	299	212	170	161	-9%	-9%
ES[1]	4,174	4,066	4,131	3,601	3,476	3,201	2,997	2,421	2,092	1,922	1,594	-9%	-11%
FI	296	301	272	257	283	241	279	265	208	204	211	-4%	-6%
FR	6,103	5,786	4,622	4,181	4,004	3,554	3,502	3,262	3,232	3,039	3,024	-7%	-8%
EL	1,458	1,277	1,313	1,303	1,296	1,361	1,268	1,244	1,201	1,013	920	-3%	-5%
HU†	*n/a*	*n/a*	1,008	993	963	1,008	916	757	612	555	*n/a*	-8%	-7%
IE	304	260	246	259	286	262	250	199	182	161	130	-7%	-9%
IL	292	388	325	322	312	289	288	323[1]	230	254	255	-3%	-5%
IT	5,342	5,402	5,154	4,877	4,575	4,392	4,126	3,765	3,311	3,249	3,005	-6%	-8%
LU	52	50	43	34	30	33	38	27	35	24	22	-7%	-6%
NL[2]	743	734	758	568	540	518	517	498	469	392	384	-7%	-6%
NO	191	236	209	188	156	169	163	195	167	158	118	-4%	-6%
PL[1]	4,210	4,459	4,314	4,415	4,195	4,007	4,248	4,112	3,461	2,991	3,249	-3%	-3%
PT	1,306	1,326	1,244	1,028	1,005	779	779	674	666	734	675	-8%	-7%
RO	1,871	1,815	1,725	1,841	1,941	1,926	2,060	2,298	2,102	1,802	1,545	0%	1%
RS	973	663	667	744	644	682	753	714	647	521	564	-3%	-4%
SE	404	396	391	364	326	333	344	286	266	199	241	-6%	-7%
SI	227	202	188	220	187	220	232	178	132	104	113	-7%	-7%
UK	2,728	2,662	2,738	2,539	2,520	2,492	2,307	1,962	1,740	1,366	1,423	-7%	-7%
EU*	40,867	40,237	38,405	36,026	34,512	32,871	32,524	29,616	26,446	23,674	23,171	-5.8%	-6.2%
BG	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	700	*n/a*	*n/a*		
LV	431	424	388	375	324	309	317	*n/a*	*n/a*	*n/a*	167		
LT	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	559	352	281	222	212		
MT	*n/a*	*n/a*	*n/a*	*n/a*	13	11	11	6	10	8	*n/a*		
SK	*n/a*	*n/a*	*n/a*	*n/a*	462	480	505	495	296	279	*n/a*		

Table 11 (Fig. 26a, 26b): MALE road deaths and average annual percentage change in deaths and in mortality between 2001 and 2011.

Source: CARE when available, completed or updated by the PIN Panellists.

[1] The small numbers with unrecorded gender were allocated to the male and female totals according to the male/female ratio of numbers with recorded gender.

HU† Annual average % change between 2003 and 2010.

[2] Data used in Chapter 3 are Police reported numbers, therefore not corrected for underreporting as in Chapter 1 and 2.

** EU27. Where the gender information was not available, the numbers were estimated on the basis of the female/male ratio from the most recent known year.*

Code	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Annual average % change in DEATHS between 2001 and 2011	Annual average % change in MORTALITY between 2001 and 2011
AT	251	276	251	215	195	190	161	170	155	143	138	-7%	-7%
BE(1)	384	2,278	2,254	2,219	2,200	2,196	2,168	2,178	2,164	2,153	2,149	-6%	-6%
CH	135	130	138	115	88	90	82	90	80	83	80	-6%	-7%
CY	21	21	27	21	19	15	14	17	12	10	13	-7%	-9%
CZ	338	352	325	326	298	225	275	259	232	184	192	-6%	-6%
DE	1,923	1,889	1,757	1,571	1,445	1,371	1,309	1,229	1,102	997	1,038	-7%	-7%
DK	117	119	122	98	80	87	105	107	91	85	59	-5%	-5%
EE	1,923	1,889	1,757	1,571	1,445	1,371	1,309	1,229	1,102	997	1,038	-6%	-6%
ES(1)	1,342	1,281	1,267	1,140	966	902	826	678	623	558	466	-10%	-11%
FI	137	114	107	118	96	95	101	79	71	68	81	-6%	-6%
FR	2,057	1,869	1,435	1,349	1,314	1,155	1,118	1,013	1,041	953	939	-7%	-8%
EL	416	351	289	364	355	290	338	304	250	245	221	-5%	-5%
HU†	*n/a*	*n/a*	318	302	308	293	314	237	207	181	*n/a*	-9%	-7%
IE	103	101	79	102	102	97	85	75	56	46	56	-7%	-9%
IL	78	137	120	145	125	116	94	89(1)	81	98	86	-3%	-5%
IT	1,754	1,578	1,409	1,245	1,243	1,277	1,005	960	926	841	855	-7%	-8%
LU	17	12	10	16	17	10	7	8	13	8	11	-5%	-6%
NL(2)	246	246	262	224	210	212	192	179	175	145	162	-5%	-6%
NO	84	74	71	69	68	73	70	60	45	50	50	-5%	-6%
PL(1)	1,324	1,367	1,328	1,297	1,249	1,236	1,335	1,325	1,111	917	940	-3%	-3%
PT	363	348	302	264	233	182	188	209	173	203	216	-6%	-7%
RO	579	596	504	601	688	661	740	763	694	575	473	0%	1%
RS	302	191	201	216	199	228	215	191	163	139	167	-4%	-4%
SE	147	136	138	116	114	112	127	111	92	67	78	-6%	-7%
SI	51	67	54	54	71	42	59	36	39	34	28	-7%	-7%
UK	864	915	920	829	816	806	752	682	597	497	499	-6%	-7%
EU*	13,478	13,034	11,934	11,226	10,788	10,202	9,973	9,275	8,350	7,369	7,202	-6.1%	-6.5%
BG	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	201	*n/a*	*n/a*		
LV	127	135	144	141	118	97	100	*n/a*	*n/a*	*n/a*	12		
LT	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	176	146	84	74	81		
MT	*n/a*	*n/a*	*n/a*	*n/a*	4	0	1	3	5	5	*n/a*		
SK	*n/a*	*n/a*	*n/a*	*n/a*	144	134	156	111	88	92	*n/a*		

Table 12 (Fig. 26a, 26b): FEMALE road deaths and average annual percentage change in deaths and in mortality between 2001 and 2011.

Source: CARE when available, completed or updated by the PIN Panellists.

(1) The small numbers with unrecorded gender were allocated to the male and female totals according to the male/female ratio of numbers with recorded gender.

HU† Annual average % change between 2003 and 2010.

(2) Data used in Chapter 3 are Police reported numbers, therefore not corrected for underreporting as in Chapter 1 and 2.

** EU27. Where the gender information was not available, the numbers were estimated on the basis of the female/male ratio from the most recent known year.*

Code	Average annual % change in mortality of FEMALES	Average annual % change in mortality of MALES	Difference
CY	-9.2%	-5.6%	3.6%
FI	-6.2%	-4.0%	2.2%
EL	-5.2%	-3.6%	1.6%
RS	-4.2%	-3.0%	1.2%
IT	-7.7%	-6.7%	1.0%
NO	-5.9%	-5.0%	0.9%
ES	-11.5%	-10.7%	0.8%
AT	-7.2%	-6.5%	0.7%
BE	-6.3%	-5.6%	0.7%
FR	-7.9%	-7.4%	0.5%
DE	-6.6%	-6.3%	0.3%
IE	-8.7%	-8.5%	0.2%
PL	-3.4%	-3.3%	0.1%
SE	-6.9%	-7.2%	0.1%
SI	-6.9%	-6.9%	-0.0%
CH	-6.6%	-6.7%	-0.1%
RO	0.6%	0.5%	-0.2%
IL	-4.7%	-4.9%	-0.2%
CZ	-6.3%	-6.6%	-0.2%
UK	-6.6%	-7.3%	-0.8%
HU†	-7.3%	-8.3%	-0.9%
PT	-6.6%	-7.8%	-1.2%
NL	-5.6%	-7.0%	-1.4%
DK	-5.0%	-6.5%	-1.5%
EE	-6.3%	-8.7%	-2.4%
LU	-6.1%	-8.6%	-2.5%
EU	-6.5%	-6.2%	0.3%

Table 13 (Fig. 27): Amount by which the average annual percentage reduction in mortality of females exceeds the average annual percentage reduction in mortality of males over the period 2001-2011.

HU† Annual average % change between 2003 and 2010.

Code	Road deaths per million inhabitants	Male road deaths per million male inhabitants	Female road deaths per million female inhabitants
UK	31	47	16
NL[1]	33	47	19
SE	34	51	17
NO	34	48	20
DK	40	58	21
CH	41	62	20
IE	41	57	24
IL	44	66	22
ES	45	70	20
DE	49	74	25
FI	54	80	30
AT	62	94	32
FR	63	99	29
IT	64	102	27
LU	64	86	43
SK*	65	106	33
SI	69	111	27
CZ	74	113	36
HU*	74	117	34
EE	75	118	39
BE	79	122	36
PT	84	134	39
CY	85	142	30
LV	86	176	11
RO	94	148	43
LT	97	151	49
RS	100	159	45
EL	101	164	39
PL	109	174	47
EU	60	95	28

Table 14 (Fig. 29): Road deaths per million inhabitants in 2011 in total and by gender, ranked by the mortality of both sexes.

Source: CARE when available, completed or updated by the PIN Panellists, and Eurostat for population figures.

HU, SK: last year available (2010).

[1] Data used in Chapter 3 are Police reported numbers, therefore not corrected for underreporting as in Chapter 1 and 2.

For Malta the small numbers of deaths and the number with unrecorded gender prevent calculation of comparable mortality rates.

Annex 4: Topics covered by the PIN Programme since 2006

Dates refer to the year of publication of the PIN report in which the topics mentioned are covered.

Yearly	Progress in reduction in deaths in each country since 2001
	– and from 2012 also since 2010 with valuation of reduction
	– and from 2011 in total since 1990 in EU15, EU10, EU2 and EU27
	Deaths per million inhabitants and deaths per billion vehicle-km
	Progress in reduction in serious injuries since 2001
2012	Young people deaths aged 15-30 and young people mortality
	Young people deaths by gender and type of road users
	Road deaths among young people as a percentage of deaths from all causes in the same age group
	Deaths in collisions involving young drivers or riders
	Road safety management
2011	Valuation of reduction in deaths since 2001 and possible future reduction from 2010
	Pedestrian deaths
	Cyclist deaths and helmet wearing rates
	PTW rider deaths and helmet wearing rates
	Moped rider deaths as share of PTW rider deaths
	PTW rider deaths relative to car driver deaths
	Deaths on rural roads other than motorways
	Deaths on urban roads
2010	Numbers of seriously injured as defined by each country
	Speeds of car and van drivers on urban roads, rural roads and motorways and percentages exceeding the limit
	Numbers of speeding tickets issued
	Deaths attributed to alcohol relative to other deaths
	Numbers of roadside breath tests
	Seatbelt wearing rates for front and rear seats

2009	Occupant protection in new cars
	Pedestrian protection in new cars
	Child protection in new cars
	Seatbelt reminders in new cars
	Percentages of vehicles in various EuroNCAP categories
	Renewal rate of cars
	Child deaths aged up to 14
	Road mortality by agegroup below age 18
	Road mortality in capital cities
2008	PTW rider deaths
	Moped rider deaths as share of PTW rider deaths
	PTW rider deaths relative to car driver deaths
	Deaths on motorways
	Speeds on motorways
	Older people deaths aged 65 and over
2007	Numbers of roadside breath tests
	Deaths attributed to drink driving relative to other deaths
	Speeds on urban roads, rural roads and motorways
	Seat belt wearing rates
	Lives saved by seatbelts
	Further lives that could be saved by seatbelts
	Provision of seat belt reminders

PIN Events July 2012 to June 2013

Date	Event	Location	Co-organiser
17 June 2013	7th Road Safety PIN Conference	Brussels	
29 May 2013	PIN Talk Hungary *"One year after the PIN Award"*	Budapest	KTI Institute for Transport Sciences
15 April 2013	PIN Talk Romania *"Road safety in the European background"*	Bucharest	General Inspectorate of the Romanian Police
14 February 2013	PIN Talk Poland *"Towards sustainable road safety progress"*	Warsaw	Motor Transport Institute (ITS)
6 February 2013	PIN Talk UK	London	Parliamentary Advisory Council for Transport Safety Institute for Transport Studies, University of Leeds Transport Safety Research Centre, University of Loughborough
20 November 2012	PIN Talk Republic of Serbia *"Delivering sustainable road safety progress"*	Belgrade	Road Traffic Safety Agency

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