Traffic Safety Basic Facts 2012

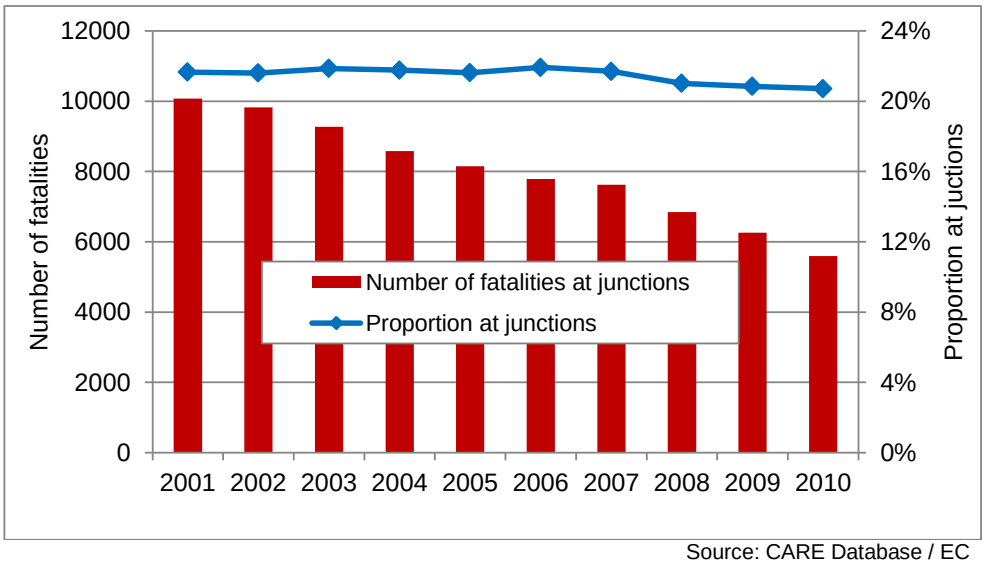
Junctions

It is estimated that about 6.500 people died in road traffic accidents at junctions in 2010 in the EU-22 countries listed in Table 1.

The fall in the number of fatalities at junctions over the past decade has broadly paralleled the fall for all fatalities.

Almost 6.300 people were killed in road traffic accidents at junctions in 18[1] EU member states in 2010, a reduction of around a third since 2001. Figure 1 shows that slightly more than 20% of fatalities occurred at junctions throughout the decade, so the trend in junction accident fatalities broadly followed the trend in all fatalities.

Figure 1: Number and proportion of fatalities in EU-18 in road accidents at junctions[1]



Source: CARE Database / EC
Date of query: September 2012

Statistics related to junction accidents need to be treated carefully due to the presence of a high proportion of "unknown" entries in certain countries. The following countries had high proportions of unknown entries between 2001 and 2010: IE (83%), SE (49%), DE (39%) and AT (22%).

Table 1 shows the annual data for individual countries. Note that for certain countries the actual numbers are somewhat higher than the reported numbers because for a significant number of accidents it is unknown whether or not they occurred at a junction. The number of fatalities reported for 2010 for the 22 countries in Table 1 is 5.846 (incorporating 2009 data where necessary), but it is estimated that when account is taken of “unknown” entries then the actual number is 6.486.

[1] The country abbreviations used and definition of EU-level are shown on Page 15. Where a value is missing for an EU-18 country in a particular year, its contribution to the EU-18 total is estimated as the next known value. NI data for 2009 are used to estimate UK data for 2010.

Table 1: Number of fatalities in junction accidents per country, 2001-2010 [1] [2]

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BE	357	315	272	221	210	207	195	167	164	158
CZ	241	289	303	327	267	222	218	238	177	177
DK	122	130	128	122	94	101	129	126	93	72
DE	1.643	1.577	1.578	1.359	1.293	1.249	1.153	1.073	1.031	878
EL	148	168	139	122	118	159	146	147	127	134
ES	856	805	806	764	750	754	721	577	484	458
FR	1.364	1.238	971	822	664	593	565	475	576	490
IT	2.013	2.000	1.837	1.761	1.674	1.654	1.550	1.369	1.218	1.130
LU	8	8	11	8	3	3	7	8	3	0
NL	327	321	324	247	249	276	253	227	221	0
AT	146	167	161	145	148	128	123	115	139	118
PL	934	934	983	1.014	898	768	840	834	699	585
PT	236	196	187	213	196	131	161	140	131	163
RO	71	94	64	61	236	238	272	269	255	208
SI	28	28	17	19	28	23	24	-	12	14
FI	104	93	83	65	73	65	62	72	51	58
SE	155	171	115	125	98	99	115	97	65	0
UK	1.325	1.287	1.289	1.189	1.152	1.115	1.089	907	816	662
EU-18	10.077	9.821	9.269	8.584	8.151	7.785	7.623	6.865	6.262	5.591
Yearly reduction		3%	6%	7%	5%	4%	2%	10%	9%	11%
EE	-	-	-	-	33	38	54	38	21	-
LV	-	-	-	-	-	45	53	20	17	28
HU	-	-	316	280	260	266	268	246	169	162
SK	-	-	-	-	72	75	61	70	35	44

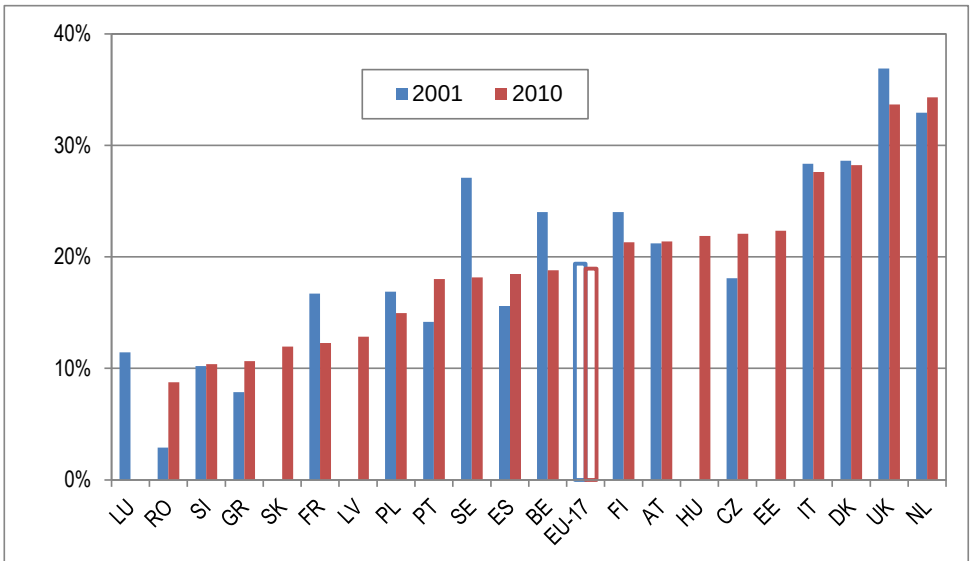
IE excluded as the proportion of "junction unknown" entries was high throughout the period

Source: CARE Database / EC
Date of query: September 2012

The number of fatalities at junctions has fallen every year since 2002.

Figure 2 shows the proportion of fatalities in junction accidents per country in 2001 and 2010. Ireland and Germany have been excluded as they had a high proportion of "junction unknown" entries in 2010. The proportions have all been calculated on the basis of known entries. The proportions from 2010 are illustrated in Map 1.

Figure 2: Proportion of fatalities in junction accidents per country, 2001 and 2010 [1]



DE and IE excluded because of the high proportion of "junction unknown" entries in these years. 2009 data for EE, NL and SE; NI data for 2009 used to estimate UK data for 2010.

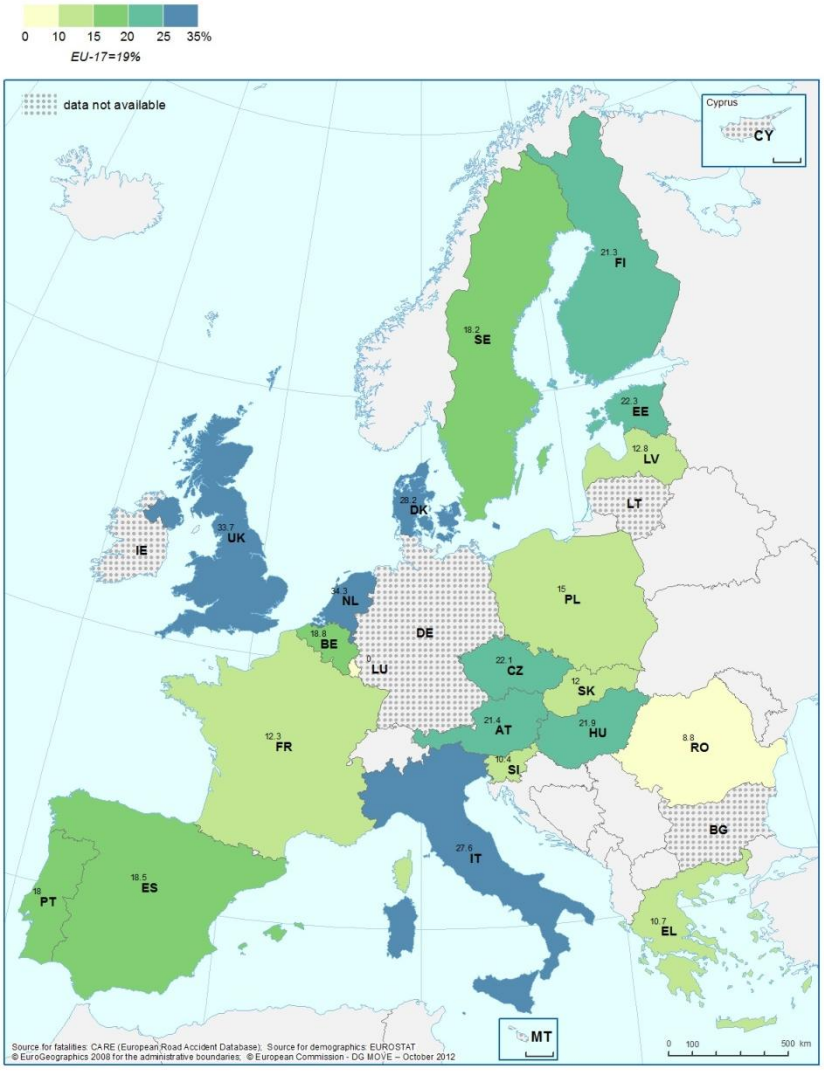
Source: CARE Database / EC
Date of query: September 2012

The proportion of fatalities occurring in road accidents at junctions has tended to fall in some countries, but to rise in others.

[2] The country abbreviations are shown on Page 15

The proportion of fatalities occurring at junctions varies widely across the EU.

Map 1 Proportion of fatalities in junction accidents per country, 2010



Type of Junction

Several types of junction are recorded in the CARE data, and Table 2 shows the data for 2010. Junction type is not available for several countries, and there are wide variations among the others.

When people die in road traffic accidents at junctions, crossroad is the most common type of junction.

Table 2: Proportion of fatalities in junction accidents, by type of junction per country, 2010

	Accidents at junctions					Accidents not at junctions	Not known	Total (100%)
	Cross-road	T or Y Junction	Round-about	Level Crossing	Other/ Unknown			
BE	0%	0%	1%	0%	18%	81%	0%	840
CZ	8%	4%	0%	9%	0%	78%	0%	802
DK	13%	1%	0%	0%	14%	72%	0%	255
EE	6%	4%	2%	7%	2%	74%	4%	98
EL	0%	0%	0%	0%	11%	89%	0%	1.258
ES	7%	0%	2%	7%	2%	82%	0%	2.479
FR	5%	0%	1%	4%	2%	88%	0%	3.992
IT	11%	0%	2%	0%	14%	72%	0%	4.090
LV	0%	0%	0%	0%	13%	87%	0%	218
LU	0%	0%	0%	0%	0%	100%	0%	32
HU	17%	4%	1%	0%	0%	78%	0%	740
NL	31%	2%	2%	0%	0%	66%	0%	644
AT	13%	3%	0%	5%	0%	79%	0%	552
PL	15%	0%	0%	0%	0%	85%	0%	3.908
PT	6%	0%	1%	8%	2%	79%	3%	937
RO	8%	1%	0%	0%	0%	91%	0%	2.377
SI	7%	3%	0%	0%	0%	88%	2%	138
SK	5%	0%	1%	7%	0%	87%	1%	371
FI	0%	0%	0%	0%	21%	79%	0%	272
SE	0%	0%	1%	0%	17%	82%	0%	358
UK	6%	0%	2%	19%	7%	66%	0%	1.965
EU-21	9%	1%	1%	3%	5%	81%	0%	26.326

2009 data for EE, NL and SE; NI data for 2009 used to estimate UK data for 2010. DE and IE excluded as the proportion of "junction unknown" entries was high in this year.

Source: CARE Database / EC
Date of query: September 2012

Type of Road

The CARE data show whether or not each accident occurs on a motorway, and, if not, whether it occurs on an urban or rural road. Table 3 shows the number of fatalities on each road type per country, together with the proportion of fatalities occurring at junctions. The seventeen countries are those for which the reporting of junction accidents and road type was relatively good in 2010.

The proportion of fatalities occurring at junctions is higher on urban roads than on rural roads or motorways.

Table 3: Distribution of fatalities at junctions per country by road type, 2010

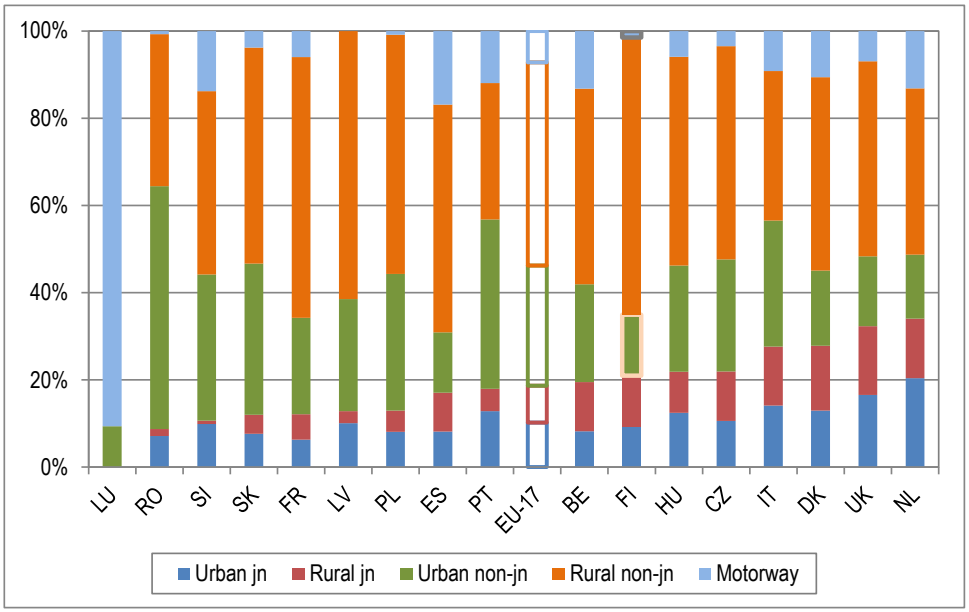
	Motorway		Non-motorway				All roads	
	Fatalities	% at junction	Rural Fatalities	% at junction	Urban Fatal-ities	% at junction	Fatalities	% at junction
BE	106	2%	449	20%	246	27%	840	19%
CZ	28	4%	483	19%	291	29%	802	22%
DK	27	4%	151	25%	77	43%	255	28%
ES	418	8%	1.516	15%	545	37%	2.479	18%
FR	238	2%	2.618	9%	1.132	22%	3.992	12%
IT	376	0%	1.955	28%	1.759	33%	4.090	28%
LV	0		140	4%	78	28%	218	13%
LU	7	0%	22	0%	3	0%	32	0%
HU	44	0%	424	17%	272	34%	740	22%
NL	83	2%	327	26%	222	58%	644	34%
PL	28	0%	1.913	8%	1.262	21%	3.908	15%
PT	111	3%	339	14%	482	25%	937	18%
RO	18	0%	866	4%	1.493	11%	2.377	9%
SI	19	0%	59	2%	60	23%	138	10%
SK	14	0%	200	8%	157	18%	371	12%
FI	4		205	16%	63	40%	272	21%
UK	118	9%	1.023	26%	553	51%	1.965	34%
EU-17	1.661	4%	12.668	15%	8.695	27%	24.060	19%

Percentages only for cells with at least 10 fatalities.
DE and IE excluded as the proportion of "junction unknown" entries was high in these years. 2009 data for NL; NI data for 2009 used to estimate UK data for 2010.

Source: CARE Database / EC
Date of query: September 2012

Figure 3 illustrates this information. Countries are ordered by the overall proportion of fatalities at junctions.

Figure 3: Distribution of fatalities by road type and junction, 2010



2009 data for NL; NI data for 2009 used to estimate UK data for 2010. DE and IE excluded as the proportion of "junction unknown" entries was high.

Source: CARE Database / EC
Date of query: September 2012

Mode of Transport

Table 4 shows, of the fatalities recorded in CARE data as occurring at junctions, the distribution of fatalities by mode of transport. Table 5 then shows, of the fatalities recorded for each mode of transport the proportion that occurred at junctions. For example, 20 pedestrians were killed in Belgium at junctions, 13% of the 158 fatalities at junctions. 106 pedestrians were killed in total, so this represents 19% of pedestrian fatalities (Table 5).

Over one third of fatalities at junctions were travelling by car or taxi.

Table 4: Distribution of junction fatalities per country by mode of transport, 2010

	Car or Taxi	Pedestrian	Motor Cycle	Pedal Cycle	Moped	Lorry	Other	Total (=100%)
BE	42%	13%	17%	20%	5%	1%	2%	158
CZ	50%	21%	12%	12%	0%	6%	0%	177
DK	39%	18%	10%	22%	8%	3%	0%	72
EE	48%	38%	5%	0%	5%	5%	0%	21
EL	34%	20%	32%	1%	2%	7%	3%	134
ES	33%	27%	21%	3%	9%	5%	1%	447
FR	35%	17%	29%	6%	10%	2%	1%	488
IT	38%	10%	31%	10%	7%	2%	2%	1.129
LV	50%	29%	11%	4%	4%	0%	4%	28
LU	0%	0%	0%	0%	0%	0%	0%	0
HU	30%	27%	12%	21%	5%	2%	2%	162
NL	23%	14%	10%	40%	11%	1%	1%	216
AT	34%	29%	16%	12%	7%	1%	2%	118
PL	37%	34%	9%	11%	4%	4%	1%	582
PT	31%	16%	20%	3%	18%	9%	2%	163
RO	38%	31%	4%	11%	6%	4%	5%	208
SI	18%	36%	0%	18%	27%	0%	0%	11
SK	27%	32%	18%	20%	0%	2%	0%	44
FI	48%	12%	9%	19%	9%	2%	2%	58
SE	42%	9%	29%	11%	5%	3%	2%	65
UK	37%	26%	25%	7%	0%	2%	2%	662
EU-21	36%	21%	21%	11%	6%	3%	2%	4.943

2009 data for EE, NL and SE; NI data for 2009 used to estimate UK data for 2010. DE and IE excluded because of the high proportion of "junction unknown" entries.

Source: CARE Database / EC
Date of query: September 2012

Table 5: Proportion of fatalities at junctions per country, by mode of transport, 2010

	Car or Taxi	Pedestrian	Motor Cycle	Pedal Cycle	Moped	Lorry	Other	Total
BE	15%	19%	26%	44%	36%	4%		20%
CZ	22%	22%	23%	26%		22%		22%
DK	21%	30%	32%	62%	55%	13%		28%
EE	19%	38%						23%
EL	8%	15%	12%	4%	8%	13%	13%	11%
ES	13%	25%	25%	23%	39%	12%	13%	18%
FR	8%	17%	19%	19%	19%	5%	15%	12%
IT	24%	19%	37%	42%	38%	15%	26%	28%
LV	15%	10%	18%	8%			7%	13%
LU	0%							0%
HU	15%	22%	41%	37%	42%	11%	17%	22%
NL	17%	48%	31%	63%	49%	7%		34%
AT	14%	35%	28%	44%	44%	6%	8%	21%
PL	12%	16%	20%	23%	31%	15%	13%	15%
PT	14%	14%	26%	15%	40%	15%	11%	18%
RO	8%	7%	15%	12%	11%	10%	11%	9%
SI	5%	17%	0%	12%				10%
SK	7%	11%	30%	35%		5%		12%
FI	18%	20%	28%	42%		6%		21%
SE	12%	14%	40%	35%	27%	20%		18%
UK	27%	41%	40%	43%		19%	34%	34%
EU-21	15%	19%	27%	32%	30%	12%	17%	19%

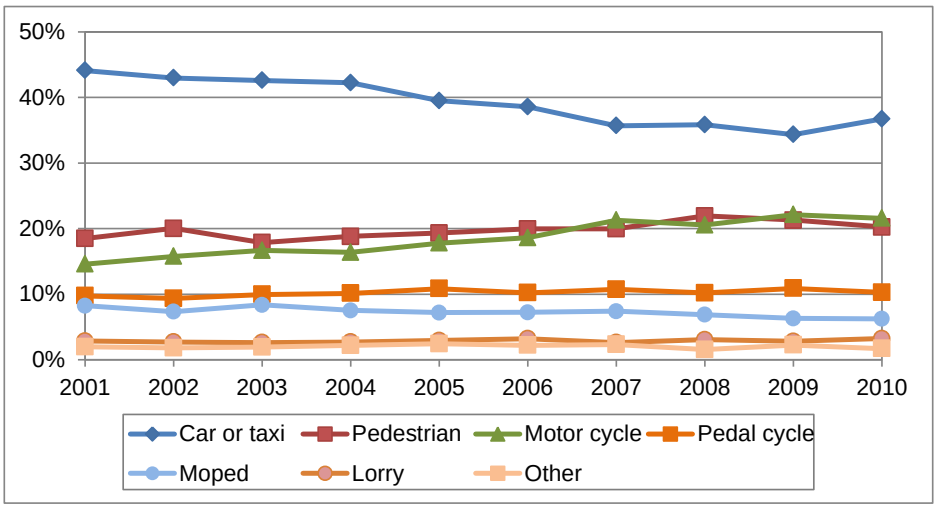
Percentages only for cells with at least 10 fatalities. 2009 data for EE, NL and SE; NI data for 2009 used to estimate UK data for 2010. DE and IE excluded because of the high proportion of "junction unknown" entries.

Source: CARE Database / EC
Date of query: September 2012

The proportion of fatalities occurring at junctions is highest for pedal cyclists and moped riders, and lowest for lorry occupants.

CARE data are not available for several of the 21 countries in these two tables throughout the period 2001-2010. To analyse trends consistently over this period, trends have been calculated for these EU-14 countries, and Figure 4 presents the trends that correspond to Table 4. The proportion of fatalities in junction accidents who were travelling by car or taxi fell from 2001, but rose in 2010. The proportion who were walking or motorcycling rose until 2008.

Figure 4: Distribution of junction fatalities by mode of transport, EU-14



2009 data for NI, NL and SE used to estimate 2010 data

Source: CARE Database / EC
Date of query: September 2012

Age and Gender

Table 6 examines CARE data from the EU-21 countries in 2010 to see whether the incidence of fatalities in junction accidents varies with age and gender. It begins with the numbers of fatalities in junction and non-junction accidents. The distributions of junction and non-junction fatalities are then presented; for example, 26% of fatalities in junction accidents were female, compared with 23% in non-junction accidents. Finally, the table presents the proportion of each group of fatalities that was killed at a junction.

The proportion of fatalities occurring at junctions is highest for the elderly.

Table 6: Distribution of junction fatalities by age and gender, EU-21, 2010

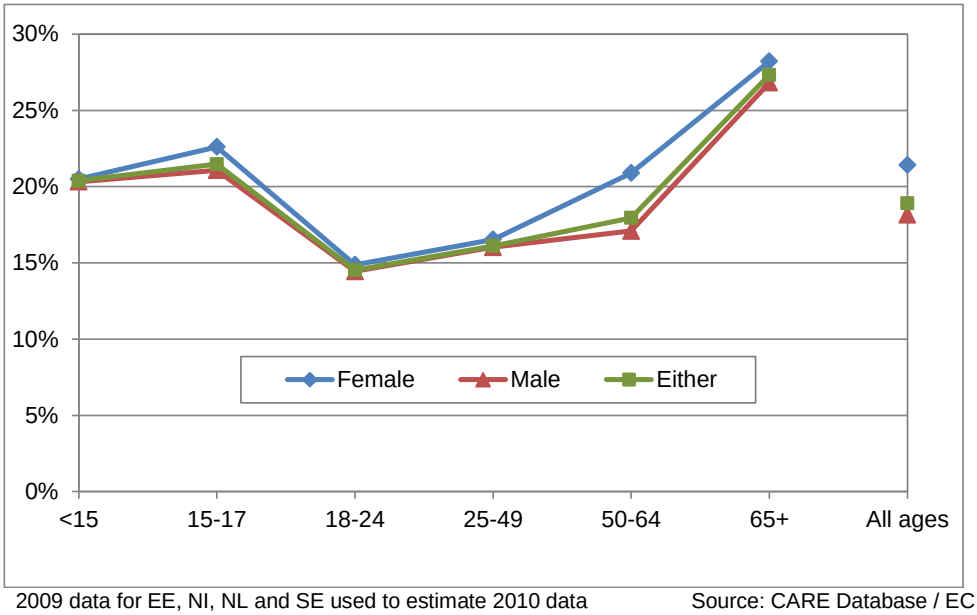
			<15	15-17	18-24	25-49	50-64	65+	not known	Total
Number of fatalities in:										
	junction accidents	female	56	46	116	280	222	573	15	1.308
		male	85	125	492	1.327	630	949	34	3.641
	non-junction accidents	female	219	160	668	1.413	837	1.454	40	4.789
		male	334	467	2.928	6.928	3.045	2.597	121	16.419
Distribution of fatalities in:										
	junction accidents	female	1%	1%	2%	6%	4%	12%	0%	26%
		male	2%	3%	10%	27%	13%	19%	1%	74%
	non-junction accidents	female	1%	1%	3%	7%	4%	7%	0%	23%
		male	2%	2%	14%	33%	14%	12%	1%	77%
Proportion of fatalities occurring at junctions		female	20%	23%	15%	17%	21%	28%	25%	21%
		male	20%	21%	14%	16%	17%	27%	22%	18%

2009 data for EE, NI, NL and SE used to estimate 2010 data

Source: CARE Database / EC
Date of query: September 2012

Overall, the table shows that the elderly (at least 65 years) are more likely than others to be killed at a junction. The variation of this proportion is illustrated in Figure 5.

Figure 5: The proportion of fatalities killed at a junction, by age and gender, EU-21, 2010



2009 data for EE, NI, NL and SE used to estimate 2010 data

Source: CARE Database / EC
Date of query: September 2012

Lighting and Weather conditions

Table 7 examines CARE data from the EU-21 countries in 2010 to see whether the incidence of fatalities in junction accidents varies with weather condition. The numbers of fatalities in junction and non-junction accidents are shown first, followed by the distributions of junction and non-junction fatalities. The table also presents for each weather condition, the proportion of fatalities that were killed at a junction. This was highest for dry conditions (20%) and lowest in adverse conditions such as snow (12%).

Table 7: Distribution of junction fatalities by weather condition, EU-21, 2010

	Dry	Rain	Fog or mist	Snow	Other	not known	Total
Number of fatalities in:							
junction accidents	4.154	432	47	69	182	83	4.968
non-junction accidents	16.791	2.568	298	531	711	418	21.317
Distribution of fatalities in:							
junction accidents	84%	9%	1%	1%	4%	2%	100%
non-junction accidents	79%	12%	1%	2%	3%	2%	100%
Proportion of fatalities occurring at junctions	20%	14%	14%	12%	20%	17%	19%

2009 data for EE, NI, NL and SE used to estimate 2010 data

Source: CARE Database / EC
Date of query: September 2012

Table 8 repeats the analysis for lighting condition. This is poorly recorded for Italy and Slovenia so these are excluded, leaving the EU-17 countries. The proportion of fatalities occurring at junctions was highest for accidents in the dark with lighting, and lowest in the dark with no lighting. This probably reflects the tendency for street lighting to be installed at junctions.

Proportionately more fatalities occur in daylight or twilight at junctions than away from junctions.

Table 8: Distribution of junction fatalities by lighting condition, EU-19, 2010

	Darkness. no lights	Darkness. with lights	Daylight or twilight	not known	Total
Number of fatalities in:					
junction accidents	298	769	2.713	44	3.824
non-junction accidents	4.087	2.622	11.022	504	18.236
Distribution of fatalities in:					
junction accidents	8%	20%	71%	1%	100%
non-junction accidents	22%	14%	60%	3%	100%
Proportion of fatalities occurring at junctions	7%	23%	20%	8%	17%

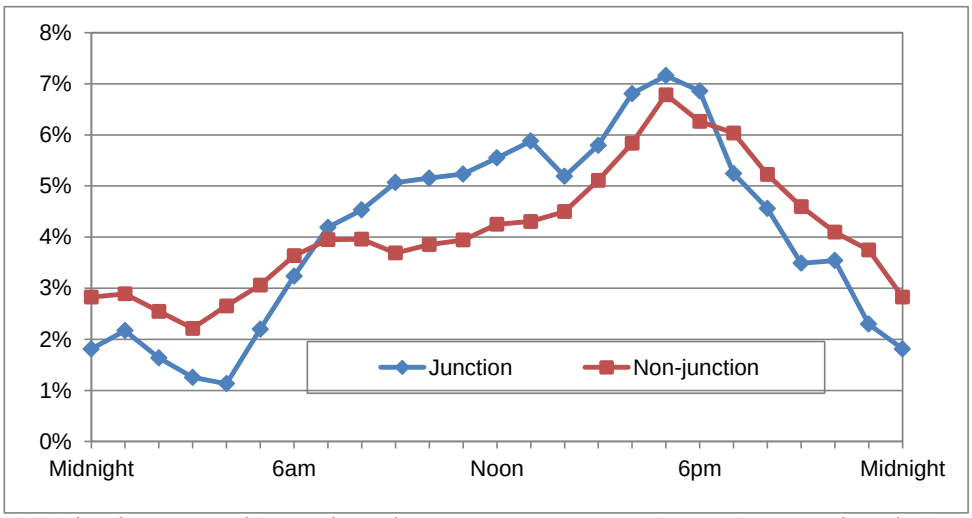
2009 data for EE, NI, NL and SE used to estimate 2010 data. IT and SI excluded.

Source: CARE Database / EC
Date of query: September 2012

Day of week and time of day

Figure 6 shows the distribution of fatalities in junction accidents in 2008 by hour of day in the EU-19 countries, and compares this with the distribution of fatalities in non-junction accidents. This comparison shows that proportionately fewer people died at junctions during the night (8pm-6am) and proportionately more during the day (8am-5pm).

Figure 6: Distribution of fatalities by hour, EU-21, 2010



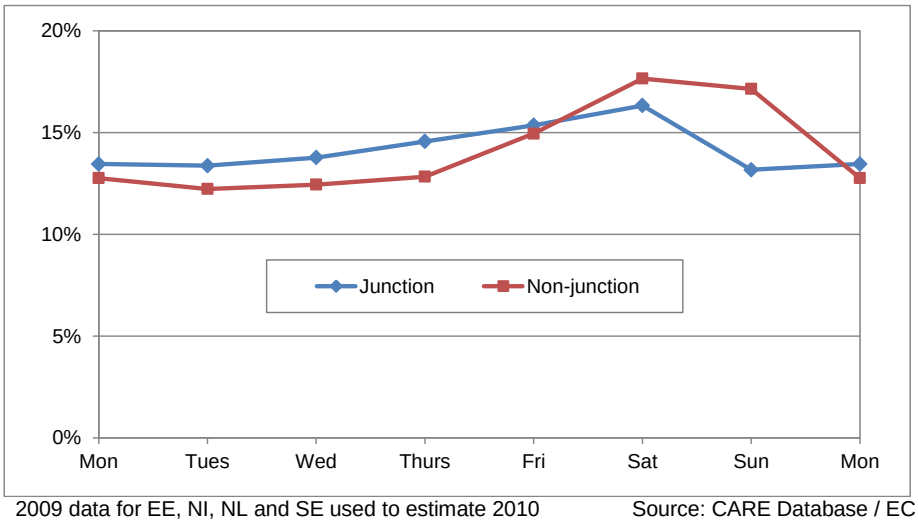
2009 data for NI, NL and SE used to estimate 2010 data

Source: CARE Database / EC
Date of query: September 2012

Proportionately more fatalities occur between 8am and 5pm at junctions than away from junctions, and proportionately fewer between 8pm and 6am.

Figure 7 shows the distribution of fatalities in junction accidents in 2010 by day of week in the EU-19 countries, and compares this with the distribution of fatalities in non-junction accidents. The number of fatalities per day is less variable at junctions than away from junctions. By comparison with non-junction accidents, relatively few people died at junctions at weekends and relatively many on weekdays (Monday -Thursday).

Figure 7: Distribution of fatalities by day of week, EU-21, 2010



2009 data for EE, NI, NL and SE used to estimate 2010 data

Source: CARE Database / EC
Date of query: September 2012

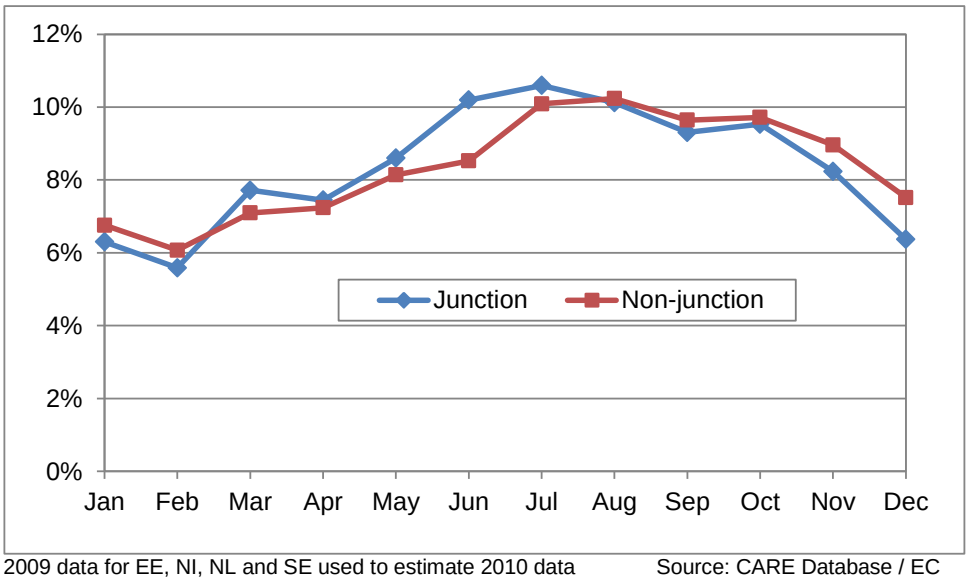
Proportionately more fatalities occur between Monday and Thursday at junctions than away from junctions, and proportionately fewer on Saturday and Sunday.

Seasonality

Figure 8 shows the distribution of fatalities in junction accidents in 2010 through the year in the EU-19 countries, and compares this with the distribution of fatalities in accidents that occurred elsewhere (non-junction). The two distributions are similar, but there were relatively many fatalities in junction accidents between March and July, and relatively few between September and January.

Proportionately more fatalities occur between March and July at junctions than away from junctions, and proportionately fewer between September and January.

Figure 8: Distribution of fatalities by month in junction and non-junction accidents, EU-21, 2010



2009 data for EE, NI, NL and SE used to estimate 2010 data

Source: CARE Database / EC
Date of query: September 2012

Accident Causation

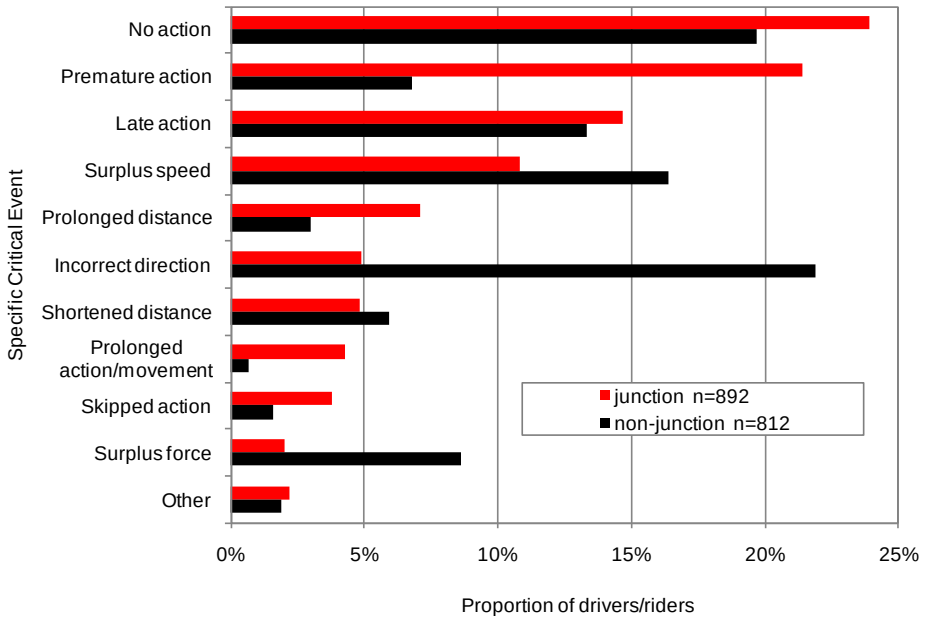
During the EC SafetyNet project, in-depth data were collected using a common methodology for samples of accidents that occurred in Germany, Italy, The Netherlands, Finland, Sweden and the UK[3] [4]. The SafetyNet Accident Causation Database was formed between 2005 and 2008, and contains details of 1.006 accidents covering all injury severities. A detailed process for recording causation (SafetyNet Accident Causation System – SNACS) attributes one specific critical event to each driver, rider or pedestrian. Links then form chains between the critical event and the causes that led to it. For example, the critical event of late action could be linked to the cause observation missed, which was a consequence of fatigue, itself a consequence of an extensive driving spell.

48% (483) of accidents in the database occur at junctions. Figure 9 compares the distribution of specific critical events for drivers and riders in junction accidents to those in non-junction accidents.

[3] SafetyNet D5.5, Glossary of Data Variables for Fatal and Accident Causation Databases
[4] SafetyNet D5.8, In-Depth Accident Causation Database and Analysis Report

Specific critical events relating to 'timing' are recorded for 60% of drivers and riders in junction accidents in the sample.

Figure 9: Distribution of specific critical events - drivers or riders by junction presence



Source: SafetyNet Accident Causation Database 2005 to 2008 / EC
N=1704
Date of query: 2010

The distributions are quite different for the most often recorded specific critical events. The specific critical events under the general category of 'timing', no action, premature action and late action, are recorded more frequently in junction accidents, especially acting prematurely. A premature action is one undertaken before a signal has been given or the required conditions are established, for example entering a junction before it is clear of other traffic.

On the other hand, incorrect direction, surplus speed and surplus force are recorded more frequently in non-junction accidents. Surplus speed describes speed that is too high for the conditions or manoeuvre being carried out, travelling above the speed limit and also if the driver is travelling at a speed unexpected by other road users. Similarly, surplus force describes excess acceleration or braking for conditions or actions. Incorrect direction refers to a manoeuvre being carried out in the wrong direction (for example, turning left instead of right) or leaving the road (not following the intended direction of the road). Here it is likely that the wrong direction element will appear in junction accidents and the leaving road element in non-junction accidents.

Table 9 shows the most frequent links recorded between causes for drivers and riders in junction accidents. There are 1.001 such links in total for this group

16% of the links between causes are observed to be between 'faulty diagnosis' and 'information failure'.

Table 9: Ten most frequent links between causes - drivers/riders, junction accidents

Links between causes	Frequency
Faulty diagnosis - Information failure (between driver and traffic environment or driver and vehicle)	158
Observation missed - Temporary obstruction to view	92
Observation missed - Permanent obstruction to view	76
Observation missed - Faulty diagnosis	73
Observation missed - Distraction	62
Observation missed - Inadequate plan	55
Faulty diagnosis - Communication failure	55
Inadequate plan - Insufficient knowledge	53
Observation missed - Inattention	44
Observation missed -	24
Others	309
Total	1.001

Source: SafetyNet Accident Causation Database 2005 to 2008 / EC
Date of query: 2010

Observation missed is recorded most frequently and the causes leading to can be seen to fall into two groups, physical 'obstruction to view' type causes (for example, parked cars at a junction) and human factors (for example, not observing a red light due to distraction or inattention). Following observation missed, faulty diagnosis is an incorrect or incomplete understanding of road conditions or another road user's actions. It is linked to both information failure (for example, a driver/rider thinking another vehicle was moving when it was in fact stopped and colliding with it) and communication failure (for example, pulling out in the continuing path of a driver who has indicated for a turn too early).

Inadequate plan (a lack of all the required details or that the road user's ideas do not correspond to reality) is seen to lead to observation missed and be a result of insufficient knowledge.

Disclaimer

The information in this document is provided as it is and no guarantee or warranty is given that the information is fit for any particular purpose. Therefore, the reader uses the information at their own risk and liability.

For more information

Further statistical information about fatalities is available from the CARE database at the Directorate General for Mobility and Transport of the European Commission, 28 Rue de Mot, B -1040 Brussels.

Traffic Safety Basic Fact Sheets available from the European Commission concern:

- Main Figures
- Children (Aged <15)
- Youngsters (Aged 15-17)
- Young People (Aged 18-24)
- The Elderly (Aged >64)
- Pedestrians
- Cyclists
- Motorcycles and Mopeds
- Car occupants
- Heavy Goods Vehicles and Buses
- Motorways
- Junctions
- Urban areas
- Roads outside urban areas
- Seasonality
- Single vehicle accidents
- Gender
- Accident causation

Country abbreviations used and definition of EU-level

EU - 14	
BE	Belgium
CZ	Czech Republic
DK	Denmark
EL	Greece
ES	Spain
FR	France
IT	Italy
LU	Luxembourg
NL	Netherlands
PL	Poland
PT	Portugal
RO	Romania
FI	Finland
UK	United Kingdom (GB+NI)

EU-21= EU-14 +	
EE	Estonia
LV	Latvia
HU	Hungary
AT	Austria
SE	Sweden
SI	Slovenia
SK	Slovakia

Detailed data on traffic accidents are published annually by the European Commission in the Annual Statistical Report. This includes a glossary of definitions on all variables used.

More information on the DaCoTA Project, co-financed by the European Commission, Directorate-General for Mobility and Transport is available at the DaCoTA website: http://www.dacota-project.eu/index.html.

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Authors

Jeremy Broughton	TRL, UK
Pete Thomas, Alan Kirk, Laurie Brown	Loughborough University, UK
George Yannis, Petros Evgenikos, Panagiotis Papantoniou	NTUA, Greece
Nimmi Candappa, Michiel Christoph, Kirsten van Duijvenvoorde, Martijn Vis	SWOV, The Netherlands
Jean-François Pace, María Teresa Tormo, Jaime Sanmartín	INTRAS-UVEG, Spain
Mouloud Haddak, Léa Pascal, Marie Lefèvre, Emmanuelle Amoros	IFSTTAR, France
Christian Brandstatter	KfV, Austria