

Pedestrian crossings survey in Europe

Introduction

The issue of accidents on pedestrian crossings is highly emotional and raises a very strong interest within the public opinion and the media, mainly because the victims are often children and elderly people. Furthermore, everybody traveling is sooner or later a pedestrian himself before and after using any kind of vehicle. In our own country, we might know how to use a pedestrian crossing, but rules differ across the states, a fact that many tourists are not aware of. We imagine that the risk of being seriously injured or killed on pedestrian crossings is probably different around the world.

This Pan-European study co-financed by the Fia Foundation and led by the major automobile clubs in 10 European countries¹, within the scope of EuroTest and under the leadership of the Touring Club Suisse, has focused on pedestrian crossings risk analysis as well as existing regulations and directives governing the matter across Europe and on commonly found pedestrian crossings designs and equipment. This study has required the compilation of several types of information such as:

- Statistical data analysis (e.g. severe injuries and fatalities) on pedestrian crossings
- Rules and directives about the use of pedestrian crossings
- An inventory of legislation about pedestrian crossings facilities in each country (related to aspects such as design, equipments, criteria of implementation)

The goals of this project include:

- To highlight the risk potential of using pedestrian crossings in the different countries,
- To make the users (drivers and pedestrian) aware of their rights and obligations,
- To highlight, in each country, the best and the worst pedestrian crossing design

And last but not least,

- To draw the attention of national authorities to the measures urgently required to reduce fatalities and accidents occurring on pedestrian crossings

Comment on the statistical data investigation and quality

The study has focused on pedestrian victims occurring on and outside pedestrian crossings and, if possible, with the division in or outside built-up areas. The most relevant data are fatalities occurring on or outside pedestrian crossings while statistics of seriously injured pedestrians are not always appropriate (but may also give a good indication) for an international ranking. Thus, the record of the severe injuries may diverge depending the follow up of the accident and the definition within each country of a severe injury. At this level, please note that the data quality of accidents occurring on pedestrian crossings within the 10 countries must be subject to further discussions. With the exception of Belgium and in some measure Italy, each national statistic contains the place of the accident (e.g. on or outside pedestrian crossings) when fatalities happened but no information is available for built up and non-built up areas in Great Britain, Norway and Belgium. For serious injuries (but not for fatal accidents), Norway lacks the information whether the accident occurred on or outside

¹ ÖAMTC (Austria), TCB (Belgium), AL (Finland), ADAC (Germany), AA (Great Britain), ACI (Italy), ANWB (Netherlands), NAF (Norway), RACC and RACE (Spain), TCS (Switzerland)

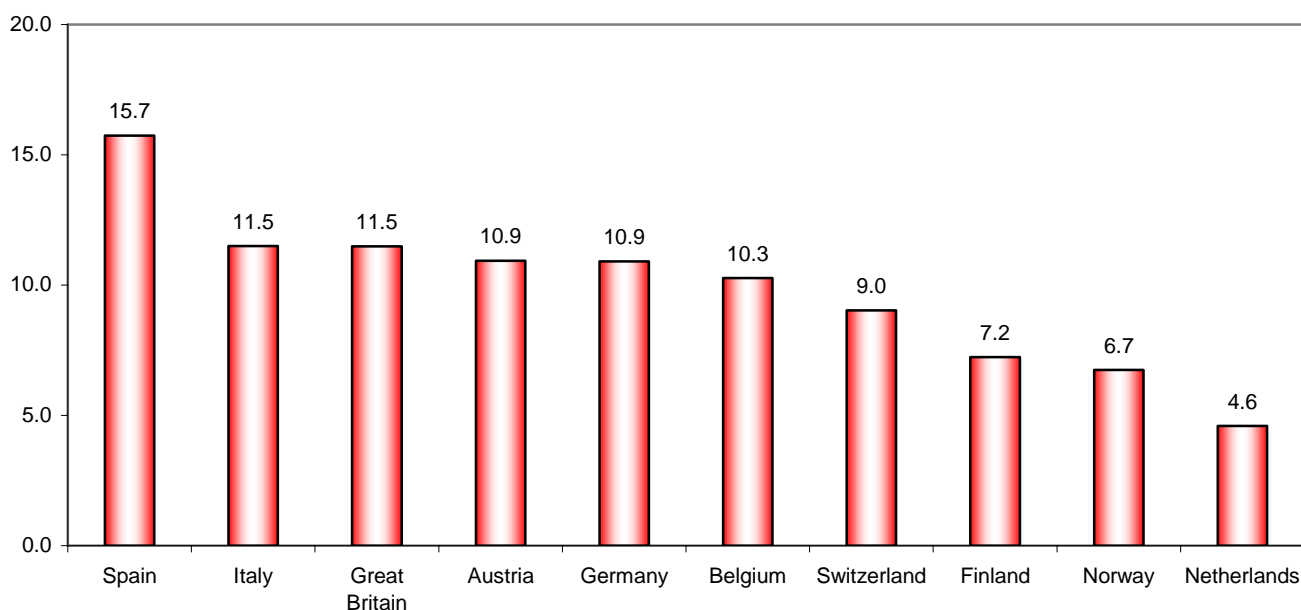
pedestrian crossings. Finland and Italy do not distinguish at all between slightly and seriously injured.

Statistical data analysis for the year 2005²

Pedestrian fatalities on and outside pedestrian crossings

In 2005, the pedestrian fatalities (in and outside pedestrian crossings) per 1 million population has obviously the worst rate in Spain with a ratio of 15.7 Italy and Great Britain follow both with a ratio of 11.5 At the opposite of the ranking, we can find the Netherlands with a ratio of 4.6, followed by Norway (6.7) and Finland (7.2).

Road fatalities in 2005
Pedestrian fatalities / 1'000'000 population

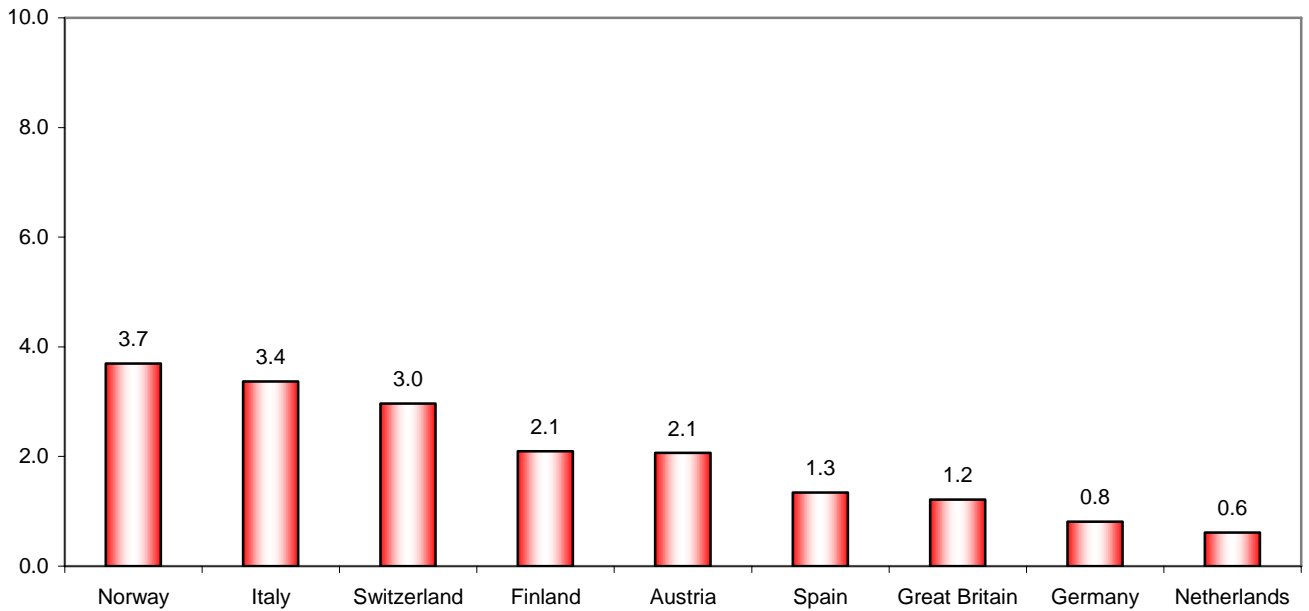


At this point, we have to make the difference between fatalities on and outside pedestrian crossings.

On pedestrian crossings, this international comparison shows a different result for Norway, which has the highest rate of fatalities with a ratio of 3.7, followed by Italy (3.4) and Switzerland (3.0). At the opposite, we can once again stress the excellent situation in the Netherlands (0.6), followed by Germany (0.8) and Great Britain (1.2). So, from a statistical point of view, the fatalities ratio on pedestrian crossings is 6 times higher in Norway than in the Netherlands.

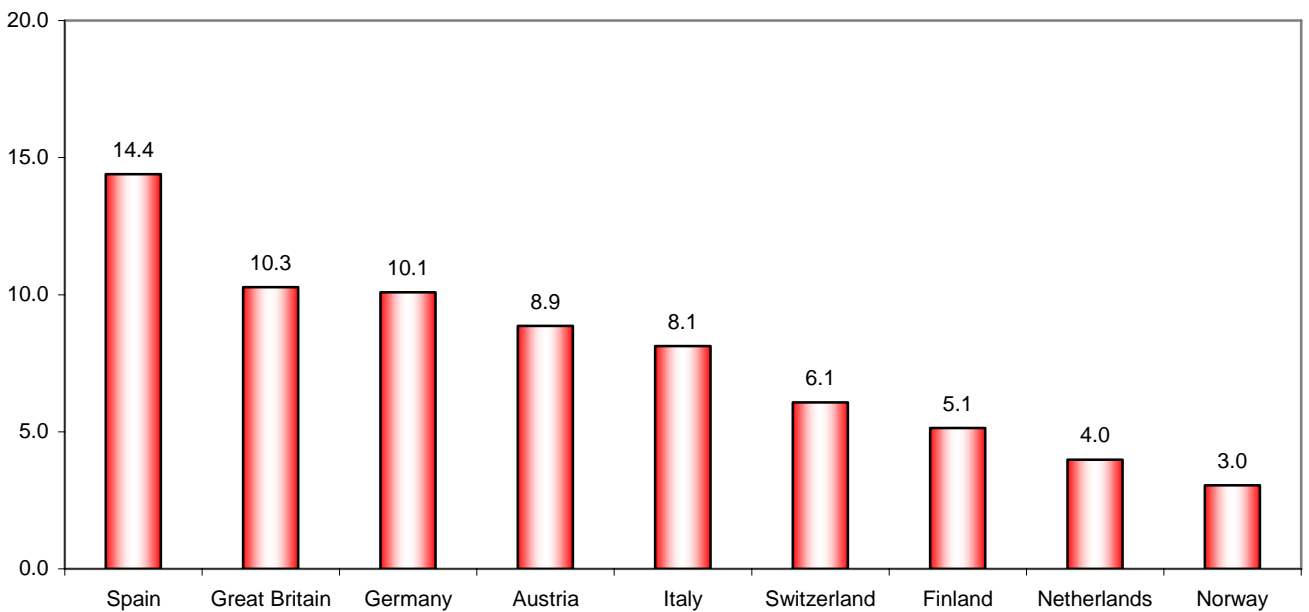
² Reference year where data were available at the time the study has started

Road fatalities in 2005
Pedestrian fatalities on p.crossings / 1'000'000 population



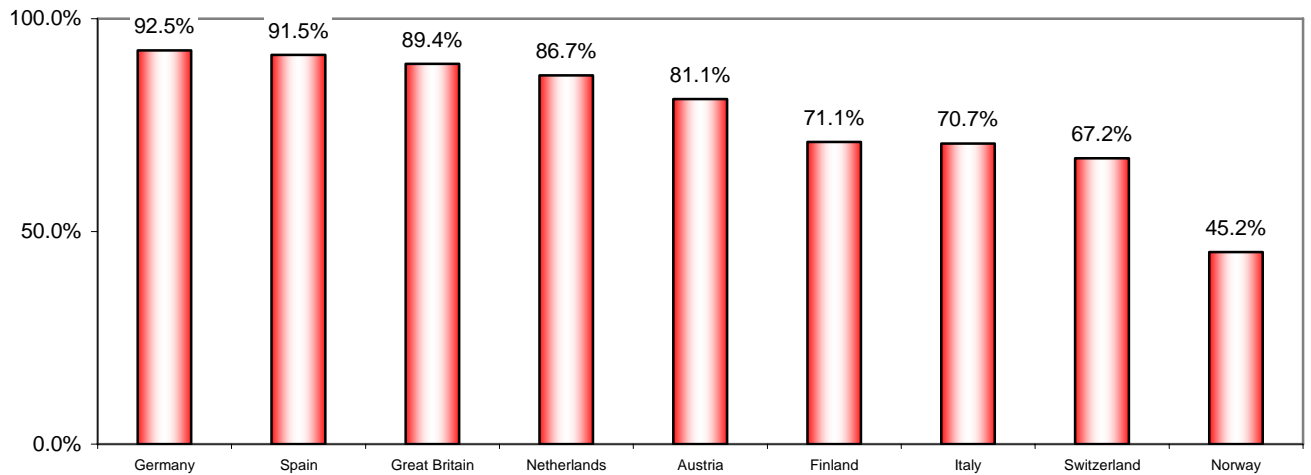
Outside pedestrian crossings, this international comparison confirms the situation previously observed in Spain, which has the higher rate of fatalities with a ratio of 14.4, followed by Great Britain (10.3) and Germany (10.1). At the opposite, Norway has the smallest ratio with 3.0, followed by the Netherlands (4.0) and Finland (5.1).

Road fatalities in 2005
Pedestrian fatalities outside p.crossings / 1'000'000 population



From these last figures, it appears that especially Germany, Spain and Great Britain should be concerned about pedestrian fatalities outside pedestrian crossings, because roughly 90% (or even higher) of pedestrian fatalities occurred outside pedestrian crossings. At the same time, Norway has the lowest rate with 45.2%, followed by Switzerland (67.2%) and Italy (70.7%).

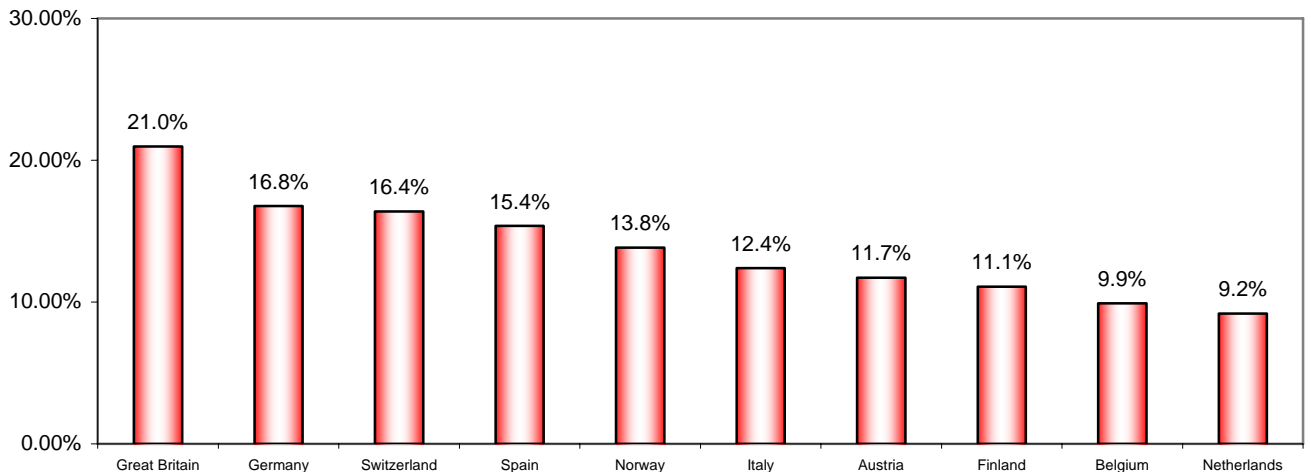
Road fatalities in 2005
Pedestrian fatalities outside p.crossings / pedestrian fatalities in total



Pedestrian fatalities related to road fatalities in 2005

In 2005, pedestrian fatalities (on and outside pedestrian crossings) related to road fatalities in general clearly give the worst rate for Great Britain with a share of 21%. Germany and Switzerland follow behind respectively with a share of 16.8% and 16.4%. On the other side of the ranking we can find once again the Netherlands with a share of 9.2%, followed by Belgium (9.9%) and Finland (11.1%).

Road fatalities in 2005
Pedestrian fatalities / Road fatalities in total

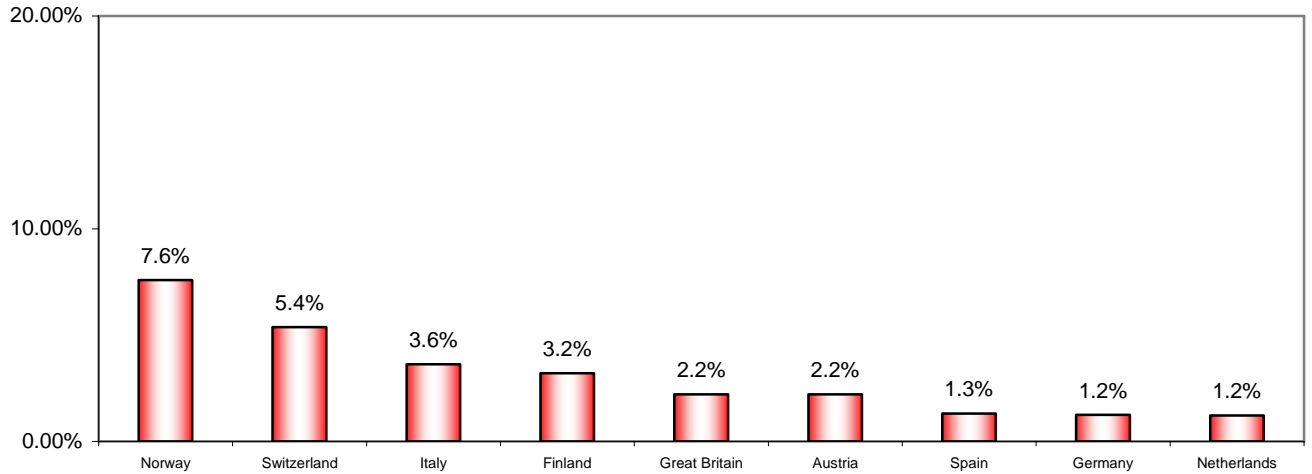


What is the difference between fatalities on and outside pedestrian crossings correlated to road fatalities in general?

As previously observed in the figures related to the home population, the situation on pedestrian crossings related to road fatalities confirms the worst situation in Norway with a share of 7.6%, followed by Switzerland (5.4%) and Italy (3.6%). At the opposite, we can one more time highlight the excellent situation in the Netherlands as well as in Germany, both with a share of 1.2% followed very close by Spain (1.3%).

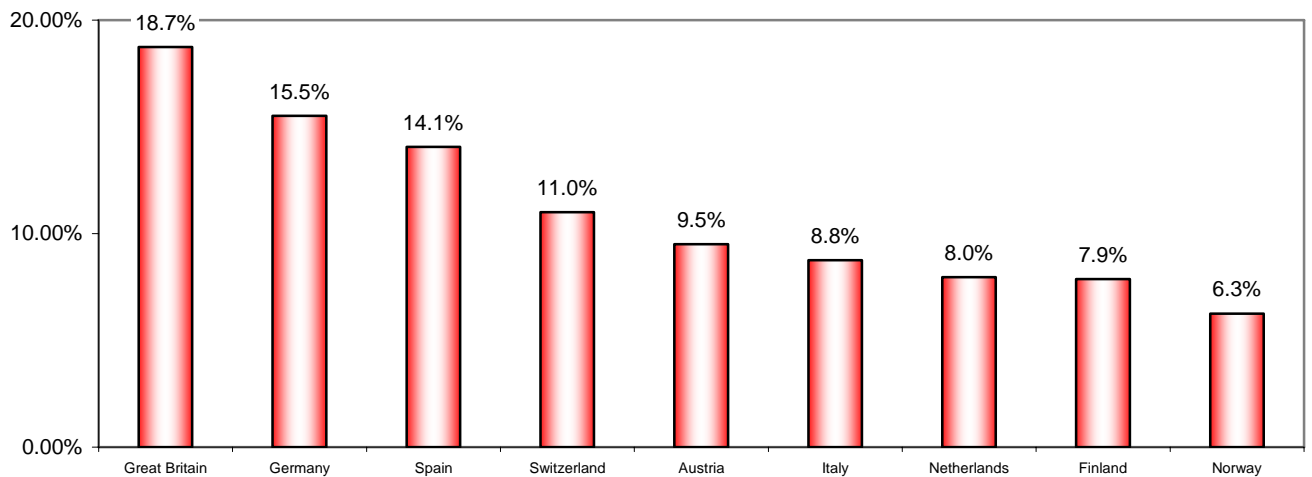
From 2000 to 2005, in each country (with the exception of Italy) the share between fatalities on pedestrian crossings related to the road fatalities tends to decrease in favor of the pedestrians. This means that fatalities on pedestrian crossings decrease faster than road fatalities in general.

Road fatalities in 2005
Pedestrian fatalities on pedestrian crossings / Road fatalities in total



Outside pedestrian crossings, the trend previously observed is confirmed. Thus, Great Britain has the higher share with 18.7%, followed by Germany (15.5%) and Spain (14.1%). At the opposite, Norway has the smallest share with 6.3%, followed by Finland (7.9%) and the Netherlands (8%).

Road fatalities in 2005
Pedestrian fatalities outside pedestrian crossings / Road fatalities in total



Comments on the statistical data analysis

This statistical data analysis has been established for the year 2005 and thus offers only a punctual image of the situation. Nevertheless, considering that these rates/shares remain relatively constant over the years, the following statements can be given:

- **On pedestrian crossings**, Norway, Switzerland and Italy find themselves in the worst part of this international comparison of pedestrian fatalities related to home population and to road fatalities in general. Many parameters may explain this ranking, such as the density of pedestrian crossings, the road design and pedestrian crossings facilities, the drivers' and pedestrian's behaviour and knowledge of the rules on pedestrian crossings. This inventory is not complete but it must help to understand the diversity observed in this ranking.
- **Outside pedestrian crossings**, Spain, Great Britain and Germany systematically present the worst rate/share of pedestrian fatalities related to home population and to road fatalities in general. In Spain, the fatalities occur more frequently outside built-up areas than within built-up areas; the ratio is 6/5, while in Germany, this ratio is around 1/2. In a first step and without any further investigations, it is very difficult to give any explanation from this statistical analysis. Each country will have to deepen the subject individually in order to draw some valuable explanations.
- Austria presents an average ranking on and outside pedestrian crossings related to home population and to road fatalities in general.
- **A special award has to be given to the Netherlands, almost always scoring the best result.**

Rules and directives about the use of pedestrian crossings

The purpose of this chapter is to summarize the domestic legislation, which concerns the entire body of national laws and guiding principles for drivers and for pedestrians on pedestrian crossings. In general, the rules are given either by the national laws or by the guiding principles.

The following table summarizes the laws related to the drivers' and pedestrian's obligations. It also presents the fines, which are attributed in case of non-compliance with these laws. Please note that this survey concerns only pedestrian crossings, which are not regulated by traffic lights or equivalent.

Road traffic rules on pedestrian crossings	Countries									
	A	B	D	E	FIN	GB	I	N	NL	CH
Rules related to driver obligations on p. crossings:										
Are the driver's requirements towards the pedestrians on p. crossings specified?	√	√	√	√	√	√	√	√	√	√
Is the driver asked to pay a special attention when approaching a p. crossing?	√	√	√	√	√	√	√	√	√	√
Is the driver asked to give right of way to pedestrians?	√	√	√	√	√	√	√	√	√	√
Is it specified to slow down in order to give way to pedestrians?	√	√	√	X	√	√	√	√	X	√
In which conditions has the pedestrian the priority (multiple choices):										
When he is crossing the road?	√	√	√	√	√	√	√	√	√	√
When he obviously wants to cross the road?	√	√*	√	√	√	√*	X	√*	√	√
Is the disrespect of this right of way liable to penalty?	√	√	√	√	√	√	√	√	√	√
Current fine (EUR) Remark: In addition, points can be taken from the driving licence	up to 2180	150 to 2750	50	91 to 300	50	77	143 to 570	650	130	24 to 84
Is it specified to give way for some specific pedestrian categories such:										
Others various means of transportation (skaters, wheelchairs...)?	√	√	√	X	X	X	X	√	X	√
Disabled or visually impaired people?	X	√	X	√	√	X	√	√	√	√
Young children and/or elderly people?	√	√	X	√	√	X	√	√	X	X
Rules related to pedestrian obligations on p. crossings:										
Are the pedestrian's requirements on p. crossings specified?	√	X	√	√	√	√	√	√	√	√
Is the pedestrian asked to pay special attention before walking on a p. crossing?	√	X	√	√	√	√	√	√	X	√
Is it specified that the pedestrian has the right of way?	√	X	√	√	X	√	√	√	√	√
Is it specified how the pedestrian must behave on p. crossings?	√	X	√	√	√	√	X	√	X	√
Exemption										
Is there any exception (Bus lines, tramways, military vehicles, police and fire vehicles, or special situations) to the pedestrian's right of way?	√	√	√	√	√	√	√	√	√	√

* Additional sign give the priority

The following statements can be given:

For drivers:

- All countries have requirements for drivers when approaching a pedestrian crossing.
- All countries have the principle that the driver is asked to pay special attention when approaching a pedestrian crossing and he is asked to give right of way to pedestrians. Except in Spain and the Netherlands, the driver is moreover asked to slow down in order to give way if necessary.

- The driver is always asked to give right of way when the pedestrian is crossing (which is fortunately obvious), but in some countries even when the pedestrian obviously wants to cross. This last requirement is explicitly expressed in all countries except Italy. In Great Britain and Norway, a sign (e.g. with the hand) from the pedestrian gives him right of way. In almost all the other countries, the sign is not mandatory but can be used to insist on his intention to cross.
- Some legislations mention special pedestrian categories to be particularly aware of, such as skaters, wheelchairs, disabled or visually impaired people, young children and elderly people. There are a lot of differences in the treatment of these categories in each country. Sometimes, sensitive users such as the visually impaired people are not even mentioned. Moreover, pedestrians are using more and more often other means of transportation such as skates, kickboards, etc... For such situations, they are explicitly considered as pedestrian in Austria, Belgium, Germany, Norway and Switzerland. Other countries do not mention them in their laws or guiding principles.
- The fine for disrespect of the right of way of pedestrians varies in all countries. It goes from 24 EURO in Switzerland for a motorcyclist up to 2750 EURO in Belgium. In some countries points can be withdrawn from (or added to, depending on the system) the driving license. In Great Britain, if the driver is found dangerous and someone is killed, 14 years in prison could theoretically be imposed.

For pedestrians:

- All countries except Belgium have requirements for pedestrians that have to be explicitly applied on pedestrian crossings. Belgium has the same rules whichever the type of crossing used by the pedestrian (e.g. on or outside pedestrian crossings).
- We can observe differences in some countries. In the Netherlands, for instance, the pedestrian is not specifically asked to pay attention before using a pedestrian crossing. In Finland, the right of way of pedestrians is not mentioned in the regulation for pedestrians but only in the regulation for drivers. And last but not least, Italy and the Netherlands give no indications related to the pedestrian's behaviour when he intends to cross the road.

Comments on the rules and directives

We can observe some diversity in laws and guiding principles. However, one principle remains and is clearly specified in all countries: the driver is asked to pay special attention when approaching a pedestrian crossing and he has to give right of way to pedestrians. It's not only the action of using a pedestrian crossing which gives right of way, but also the evident intention from the pedestrian to cross the road. However, this last point is not mentioned at all in the Italian legislation. Furthermore, in Belgium, we can underline that the way of using of a pedestrian crossing is not specifically mentioned to the pedestrian.

In addition, this review shows different treatments for different pedestrian categories (e.g. skaters, wheelchairs users, disabled or visually impaired people, young children and elderly people) and them being taken into account or not in the legislation body.

Pedestrian crossings design

The purpose of this chapter is to collect information on the national standards concerning planning and design of common pedestrian crossings. The goal is to underline possible gaps and future needs of improvement. We have to keep in mind that pedestrian crossings often have different designs and facilities in Europe. Nevertheless, "zebra" stripes remain a constant parameter (white or yellow) to identify a pedestrian crossing often coupled with a vertical sign. Around Europe, we may encounter other crossing systems for pedestrians, such as platforms without any markings on the pavement, where the speed limit is 20 km/h and where

pedestrians can cross the road anywhere with an absolute right of way. These facilities are not the topic of this chapter.

The table on the next page summarizes some significant criteria and whether they are taken into account (or not) in each country. These criteria are not the state of the art in this field but they should, at least, offer a common basis of reflection.

The following statements can be given:

- All countries have standards related to planning and design of pedestrian crossings. In some countries, these national standards may be supplanted by regional standards.
- The criteria to implement pedestrian crossings in built-up or outside built-up areas may also differ. In Austria and Spain for instance, the speed of the traffic stream will impose traffic lights to complete pedestrian crossings outside built-up areas. In Norway, some crossings for pedestrians located outside built-up areas do not have any stripes or vertical sign, but are "pedestrians friendly" equipped. In Germany, pedestrian crossings with stripes do not exist outside built-up areas; the common situation is a crossing section delimited with a white and transversal line and equipped with traffic lights.
- The vertical sign, which indicates the presence of a pedestrian crossing, is mandatory in Austria, Belgium, Germany, Spain, Finland and recommended in Great Britain, Norway and Switzerland (no indication available for the Netherlands).
- Visibility is a very important issue (e.g. visibility distance, security lines prohibiting the stopping of vehicles and location of bus stops nearby a pedestrian crossing) and here we are facing much diversity. Thus, the visibility distance when approaching a pedestrian crossing should correspond to the average traffic speed; this is the case in all countries except Spain, Finland and Italy. In Spain and Finland the distance is invariable (respectively 30 and 40 m) and in Italy this distance is not at all imposed. Security lines prohibiting the stopping of vehicles are not at all mentioned in Germany, Norway and Finland. The location of the bus stops nearby pedestrian crossings is not mentioned in Austria, Italy, Norway and only partially in Spain.
- Regarding the material that can be used on pedestrian crossings, the use of light-reflective material for stripes is mandatory in Austria, Germany, Norway and Switzerland, recommended in Finland, Great Britain and Italy and not at all specified in Spain. The use of highly skid resistant material is mandatory in Germany and Norway, recommended in Belgium, Great Britain and Switzerland and not specified at all in Austria, Spain, Finland and Italy (no indication available for the Netherlands).

Pedestrian crossing design	Countries									
	A	B	D	E	FIN	GB	I	N	NL	CH
National or regional standards:										
Is there a national standard related to the planning process (evaluation and implementation) for new pedestrian crossings?	Yes	Yes	Yes	N/A	Yes	Yes	Yes	Yes	Yes	Yes
Is there a national standard related to the design of new pedestrian crossings?	Yes	Yes	Yes	Yes	N/A	Yes	Yes	Yes	Yes	Yes
Are there regional standards (planning and/or design), which may supplant the national standards?	No	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Planning process:										
For new p. crossings, is there a comprehensible procedure, which clearly establishes how to analyse a preliminary situation and which will define what type of p. crossings can be set up?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Does this procedure take into account the following elements:										
The place of the demand of crossing?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
The kind of demand which depends on the desired move of the pedestrians?	Yes	No	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Importance of the demand in crossing?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Visibility distance for all users (drivers and pedestrians)?	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes
Average speed of the traffic stream to be crossed?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
In built-up areas or outside built-up areas?	Yes °°	Yes	No	Yes °°	Yes	Yes	No	No	Yes	Yes
Distances to other pedestrian crossings?	Yes	Yes °	Yes	No	Yes	Yes	Yes	Yes	N/A	Yes
Position in the intersection or along the road section?	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Others?	N/A	Yes	Yes	N/A	No	Yes	Yes	Yes	Yes	Yes
Design of pedestrian crossings:										
For new p. crossings, is there a standard clearly establishing the design of p. crossings?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Does this standard take into account the following elements:										
Minimum length, width and colour of the stripes?	N/A	3-4 m 0.5 m white	3 m 0.5 m white	2.5-4 m 0.5 m white	2.5-4 m 0.5 m white	6 types of crossing, only 1 has stripes	2.5-4 m 0.5 m white	3 m 0.5 m white	4 m 0.4-0.6 m white	3 m 0.5 m yellow
Is there any mention to use special light-reflective material for the stripes?	Yes *	Yes	Yes *	No	Yes	Yes	Yes	Yes *	N/A	Yes *
Is there any mention to use material with higher skid resistance?	No	Yes	Yes *	No	No	Yes	No	Yes *	N/A	Yes
Is there any mention to use a vertical p. crossings sign?	Yes *	Yes *	Yes *	Yes *	Yes *	Yes	No	Yes	N/A	Yes
Is there any mention concerning the visibility distance?	Yes fn(speed)	Yes fn(speed)	Yes fn(speed)	Yes (30 m)	Yes (40 m)	Yes fn(speed)	No	Yes fn(speed)	N/A	Yes fn(speed)
Is there any mention concerning the security lines forbidding the stopping of vehicles nearby p.crossings?	Yes	Yes	No	Yes	No	Yes	Yes	No	N/A	Yes
Is there any mention regarding the location of bus stops nearby p. crossings?	No	Yes	Yes	No (yes in some cities)	Yes	Yes	No	No	Yes	Yes
Is there any mention regarding the lighting of p. crossings, which should reach a minimum value?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	Yes
Is there any mention regarding the need to lower the level of the side walk of p. crossings?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	Yes
Is there any mention regarding the minimum width of the side-walk on both sides of p. crossings?	No	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Is there any mention regarding the security islands to be installed in the middle of p. crossings?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	Yes
Is there any mention regarding the use of traffic lights to secure p. crossings outside intersection?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	Yes

* mandatory

°° ° °°
 Depends on the speed Only for p. crossings regulated with traffic lights Depends on the speed

Comments on the pedestrian crossings design

As observed in the chapter "rules and directives", this international comparison shows many different standards for the different countries. All these standards are implemented on national level, but can in some countries be supplanted by regional standards. On one hand, this has the advantage to offer more flexibility depending on the local conditions, but on the other, this can create confusion to motorists who thus encounter many different pedestrian crossings when travelling. Furthermore, this fact will add numerous alternatives to pedestrian crossings design and may lead to some pedestrian crossings that are not in compliance with the national guidelines (e.g. in Switzerland, this can happen in small towns).

Some basic treatments can be applied to secure existing pedestrian crossings and they should at least be taken into account at the beginning of the planning process for new pedestrian crossings: visibility for drivers and pedestrians, light-reflective material for the stripes, verification of the lighting by night, position of the bus stops nearby pedestrian crossings, relevance (or not) regarding the location of the pedestrian crossing in the urban and rural area, etc... This can only be applied with a premium design procedure and through this study we can underline that there is a good chance to make safer pedestrian crossings in all countries.

Closing comments

This international study has investigated statistical data, rules, directives and basic facilities on pedestrian crossings. This report compiles a benchmark of relevant statistical investigations and underlines strengths and weaknesses of each country.

The following general observations are particularly highlighted:

- The rate/share of pedestrian fatalities on and outside pedestrian crossings shows a significant diversity of results for the different countries.
- Rules and directives governing the right of way on pedestrian crossings have a common basis in all countries: the driver has to give right of way to pedestrians. However, we encounter many differences in the description and definition related to this mandatory requirement.
- Pedestrian crossings planning and design may significantly differ among the countries.

There is no significant correlation between these 3 categories, in the sense that the explanation of a high level of fatalities on pedestrian crossings can not be explained directly within the filter "rules and regulation" or "planning and design". The explanation must be deepened taking into account the history of urban development, the knowledge and correct use of traffic rules, the sociology aspects and the mobility in general within each country.

Nevertheless, future needs of improvement can be stressed to increase the safety potential on pedestrian crossings, in particular:

- **To enforce the quality of data acquisition related to accidents on pedestrians crossings.** This can be accomplished with the help of each national statistics office.
- **To harmonize on European level the road traffic rules for drivers and pedestrians on pedestrian crossings.** On one hand, the main goal is that all new drivers are forced to learn the same rules in the driving license theory test. On the other hand, all drivers and pedestrians should have the same behaviour whenever approaching or using pedestrian crossings in Europe. Special attention has to be given to children, elderly people and disabled or visually impaired people.

- **To force national and regional authorities in Europe to establish relevant guidelines and tools for road designers** aiming to secure and build safe pedestrian crossings. Simple measures can be applied and should be considered on a short-term basis.

Pedestrian crossings must be safe places for pedestrians and they must be fully integrated in the urban and rural mobility network.