EUROPEAN CONFERENCE OF MINISTERS OF TRANSPORT

Safety in Road Traffic for Vulnerable Users

Third Road Safety Week in the UN/ECE Region

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EUROPEAN CONFERENCE OF MINISTERS OF TRANSPORT (ECMT)

The European Conference of Ministers of Transport (ECMT) is an inter-governmental organisation established by a Protocol signed in Brussels on 17 October 1953. It is a forum in which Ministers responsible for transport, and more specifically the inland transport sector, can co-operate on policy. Within this forum, Ministers can openly discuss current problems and agree upon joint approaches aimed at improving the utilisation and at ensuring the rational development of European transport systems of international importance.

At present, the ECMT's role primarily consists of:

- helping to create an integrated transport system throughout the enlarged Europe that is economically and technically efficient, meets the highest possible safety and environmental standards and takes full account of the social dimension;
- helping also to build a bridge between the European Union and the rest of the continent at a political level.

The Council of the Conference comprises the Ministers of Transport of 39 full Member countries: Albania, Austria, Azerbaijan, Belarus, Belgium, Bosnia-Herzegovina, Bulgaria, Croatia, the Czech Republic, Denmark, Estonia, Finland, France, FYR Macedonia, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Moldova, Netherlands, Norway, Poland, Portugal, Romania, the Russian Federation, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine and the United Kingdom. There are five Associate member countries (Australia, Canada, Japan, New Zealand and the United States) and three Observer countries (Armenia, Liechtenstein and Morocco).

A Committee of Deputies, composed of senior civil servants representing Ministers, prepares proposals for consideration by the Council of Ministers. The Committee is assisted by working groups, each of which has a specific mandate.

The issues currently being studied – on which policy decisions by Ministers will be required – include the development and implementation of a pan-European transport policy; the integration of Central and Eastern European Countries into the European transport market; specific issues relating to transport by rail, road and waterway; combined transport; transport and the environment; the social costs of transport; trends in international transport and infrastructure needs; transport for people with mobility handicaps; road safety; traffic management; road traffic information and new communications technologies.

Statistical analyses of trends in traffic and investment are published regularly by the ECMT and provide a clear indication of the situation, on a trimestrial or annual basis, in the transport sector in different European countries.

As part of its research activities, the ECMT holds regular Symposia, Seminars and Round Tables on transport economics issues. Their conclusions are considered by the competent organs of the Conference under the authority of the Committee of Deputies and serve as a basis for formulating proposals for policy decisions to be submitted to Ministers.

The ECMT's Documentation Service has extensive information available concerning the transport sector. This information is accessible on the ECMT Internet site.

For administrative purposes the ECMT's Secretariat is attached to the Organisation for Economic Co-operation and Development (OECD).

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Further information about the ECMT *is available on Internet at the following address:*
http://www.oecd.org/cem/

FOREWORD

This publication which has come out in 2000 is the result of work carried out in 1996, 1997 and 1998 by the ECMT Group on Road Safety on safety problems concerning vulnerable road users. To preserve data coherence, 1995 has been retained as the study year. This choice may seem odd from the perspective of the year 2000; however, the derived trends without doubt reliable.

All users should benefit from an efficient and coherent transport system. Bearing this in mind the European Conference Transport Ministers have expressed the firm wish that the specific needs of the most vulnerable users be taken into account. These users include pedestrians and users of two-wheeled vehicles, whether motorised or not. Based on the latest data on the accidents in which they are involved, the survey drew updated and refined conclusions relating to the safety of these users.

On the occasion of the 3rd International Road Safety week of the ECE-UN, ECMT has gathered together reports and resolutions adopted over the last three years as a contribution to the principle : « Partnership on the road increases safety ».

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SUMMARY OF THE TRIPTYCH

The Ministers of Transport of the ECMT, meeting in Berlin in 1997, issued a declaration [ECMT/CM(97)8] stating:

- that the development of an efficient and coherent pan-European transport system should be of benefit to all users;

- that they consider it as their obligation in this connection to attach special attention to groups of transport users who risk being overlooked in transport policy.

These users include:

- pedestrians: all transport users are pedestrians as each trip starts and ends on foot. In built-up areas walking is a highly developed mode of transport. For elderly people and children, walking is, in many cases, the only option. Encouraging and supporting walking through safe and secure provisions is an important objective.

- users of two-wheeled vehicles whether motorised or not (bicycles, mopeds, motorcycles); they are exposed to special risks owing, among other factors, to the characteristic features of the vehicles (low stability, lower passive protection). In relation to their participation in traffic, cyclists and the riders of mopeds are more than proportionally involved in road accidents.

This is why the ECMT Road Safety Group decided to update and refine the knowledge relating to the safety of these users, drawing in particular on the latest data on the accidents in which they are involved. These users are particularly vulnerable due to their lack of external protection and their reduced visibility for other road users.

Consequently, in 1997, 1998 and 1999, the Group prepared a series of three reports and three resolutions forming a triptych dealing with cyclists, pedestrians and moped riders and motorcyclists respectively.

These studies form part of a wider area of study which, in addition to road safety itself, takes into account the demographic trend in ECMT Member countries -- ageing of the population -- and the emphasis now being given to mobility, land use planning, environmental and public health issues.

In general, these studies have been divided into two broad parts: the first presents the general trends in road accidents involving these categories of users, and the second defines possible initiatives in terms of the following three criteria: infrastructure, vehicles and users.

It should be noted that vulnerable users, whether cyclists, pedestrians, moped riders or motorcyclists, display certain common characteristics, both in terms of the problems encountered and the solutions proposed. In the light of the above, it is necessary, *inter alia*:

in general:

- to collect data needed to assess the safety of vulnerable users in road traffic more effectively and more regularly, in order to refine knowledge of the problem,

as regards general traffic management:

- to take all vulnerable users into account, giving them the same importance as other means of transport when travel and traffic plans are being drawn up,

as regards infrastructure:

- to ensure effective co-ordination of the units in charge of traffic design and management, incorporating the safety of these users into all planning and ensuring consistency from the outset in infrastructure, road signs and traffic rules,

as regards vehicles:

- to make all necessary improvements when vehicles, light or heavy, are being designed, so that the impact on more vulnerable road users is minimised in the event of an accident; in particular, to ban dangerous accessories on vehicles if vehicle use does not require them,

as regards users:

- continually to raise the public's awareness of safety and the need for mutual respect among road users,

- to pay special attention in this regard to training and educational aspects, beginning when children are very young;

- to develop strategies to improve the observance of traffic rules, including training, communication, user education, enforcement and penalties, with the use of methods, locations and media suitable for the particular audience,

- to involve all the partners concerned, such as parents, schools, the police, road user associations and insurance companies, in the implementation of these strategies,

- to encourage cyclists, pedestrians and drivers of two-wheeled motorised vehicles to be safer and be better seen through the use of appropriate clothing and the compulsory use of daytime running lights.

Furthermore, each category of users studied has its own ***specific characteristics*** for which separate proposals were made:

as regards infrastructure:

- each category of vulnerable users is entitled to use specific infrastructure to which designers should pay closer attention:

  - for *cyclists*, certain routes could be set aside for them with the use, for example, of appropriate surfacing, markings and signs; effective protection should be ensured, particularly at intersections, by providing specific equipment (staggered lights, advanced stop line, etc.);

  - as regards *pedestrians*, any footbridges and subways should be properly maintained and accessible to all users, including those with reduced mobility, and cost effectiveness should be assessed before considering any new infrastructure;

  - as regards *two-wheel motor vehicles*, the stability of two-wheeled motorised vehicles in general traffic should be ensured:
    - by maintaining the high quality of the pavement and providing clear road markings, and
    - by being particularly aware of the dangers which might occur from vertical structures on the sides of the road when mopeds and motorcycles are slowing down or changing direction, and

  - for *motorcyclists*, on fast roads,
    - on one hand, by eliminating ruts and repairing the carriageway with a view to preventing grooves, and
    - on the other hand, by setting up separators which will less endanger motorcyclists and their passengers;

as regards vehicles:

- each type of vehicle should have standards of quality adapted to its technical performance, beginning with bicycles;

- regarding *two-wheeled motorised vehicles*, two specific aspects should be taken into consideration:

  - to set up classification criteria clear and concise enough to easily identify each vehicle available on the market as belonging to one of the two categories under consideration -- moped or motorcycle,
  - to prevent any possibility of alteration, in line with the decisions taken within the European Union, so that, at the end of the decade, the fleet of two-wheeled motorised vehicles, for all ECMT Member countries, will be in conformity with the established classification,

as regards road users:

- cyclists and drivers of two-wheeled motorised vehicles should be encouraged to be safer through regular and correct maintenance of their vehicle,

– cyclists should be encouraged to wear a helmet that complies with safety standards and steps should be taken to ensure that two-wheeled motorised vehicle[1] drivers and passengers properly wear a standardised helmet,

– more particularly, regarding the minimum driving age, it is recommended:

  - that consideration be given to the advisability of introducing a minimum age for the use of *bicycles* on roads,
  - that driver training be made available for teenagers as early as possible, through official instruction in *moped* driving,
  - that the progressive access to *motorcycle* driving, depending on their power, be extended to all Member countries, with a view to encouraging safer behaviour by drivers,
  - that a practical examination be implemented, in addition to the theoretical one already existing, prior to issuing any *motorcycle* licence;

It is obvious from the above list of recommended measures, whether they are general or specific to each category of user concerned, that much remains to be done to ensure the safety of vulnerable users, both in terms of behaviour, infrastructure and vehicles. But the solution is not be to promote a single model, but to seek to develop a number of strategies that take into account the various differences existing across countries.

The detailed reports and corresponding resolutions adopted by the Ministers of Transport of the ECMT in Berlin in 1997, Copenhagen in 1998 and Warsaw in 1999 are provided below, and should enable all concerned to take stock of the different approaches developed in ECMT countries and to base their own future initiatives on specific examples of "good practice".

1. In Belgium and in the Netherlands, for those over 25 km/h speed limit only.

Chapter I

CYCLISTS

1. INTRODUCTION

The past decade has seen a marked increase in cycling mainly because it is an economical and environment-friendly means of transport, it meets the greater demand for mobility, resolves, to some extent, congestion problems in areas saturated by car traffic and, lastly, because regular use of the bicycle contributes to fitness.

For these reasons, a number of countries have defined policies to promote the use of the bicycle, while others have taken action to make cycling easier. While in some countries the bicycle is part of the daily scene and is traditionally used for home/place of work travel or for domestic needs, in others it is mainly used for recreational and sports activities; but the bicycle has an important place in the lives of children everywhere since it gives them a certain degree of independence and widens the scope of their activities.

Although the bicycle has its advantages, it must be admitted that its use still undoubtedly involves high risks. Because they have no outer protective shield, cyclists are particularly vulnerable, as shown by the number and seriousness of accidents. All the necessary steps must therefore be taken to improve cyclists' safety, and any policy to promote cycling must always be accompanied by a coherent and effective safety policy.

The Group on Road Safety -- whose task is to seek the best safety conditions for all road users -- has already addressed the issue of cyclists' safety [see CEMT/CM(83)7]. However, in the light of the recent trend referred to above and in response to the concern expressed by Ministers of Transport, the Group has decided to review all the measures concerning the vehicle, road facilities and road user behaviour, as these measures should make it possible to improve cyclists' safety. This study -- which takes into account the new knowledge acquired in this area, as well as experiments at international level and in each of the ECMT Member countries -- is intended as a general report which includes the findings of the work conducted by the Group on Road Traffic Signs and Signals on traffic rules and road design in connection with all light two-wheelers (bicycles and mopeds). However, in the case of accident statistics, the vehicle itself, training and behaviour, this report is limited to the bicycle. This choice is due to the fact that cyclists and moped do not necessarily form a uniform group of road users and, consequently, that the policies and instruments to improve their safety in traffic will not always be the same. However, although moped users are not taken into account in this report, they may benefit in countries where they are legally classified as cyclists from the efforts to promote the use and safety of non-motorised cycles. In any case, moped users will be the subject of a special report in the overall review of vulnerable road users' safety.

2. PRESENT SITUATION - STATISTICS

2.1 The number of bicycles

In most countries, a high proportion of people own a bicycle (in Norway, for instance, 70 per cent of adults own a bicycle, in Switzerland, 69 per cent of households own a bicycle). What differs considerably from one country to another is the way in which the bicycle is used. Some cyclists use it every day, as a means of transport, while others do so only occasionally. Some bicycles are even left unused in garages for years.

The number of bicycles per 1 000 inhabitants ranges from 52 (in the Czech Republic) to 1 000 (in the Netherlands). Even if all Member countries are not included in ECMT statistics, it can be considered that the range referred to above gives a good idea of the actual number of bicycles in relation to the population of ECMT countries.

It can also be considered that, if the present trend continues, particularly in countries where their use is not yet widespread or mainly recreational, the number of bicycles and their use will increase.

2.2 Use of the bicycle

Compared to the information available on other modes of transport, information on the use of the bicycle in ECMT countries is rather scanty, even in those countries where its use is frequent. A bicycle can be used as a daily means of transport or for recreational activities, and the breakdown between the two purposes differs greatly from one country to another. It is widely used for daily transport (work, school, shopping and social activities) in only a few ECMT countries, particularly in those where cycling is a long-standing tradition.

The information obtained does, however, provide some data on the use of the bicycle: in Denmark and Finland, home/place of work travel respectively accounts for 47.6 per cent and 37 per cent of daily bicycle trips and shopping for 14 and 28 per cent; in the United Kingdom the percentages are respectively 38 per cent and 9 per cent, while recreation takes a higher share; in the Netherlands, the bicycle is used for 30 per cent of all daily trips.

According to a micro-census in Switzerland in 1994 (16 500 households represented), the percentage of runs performed for each activity is the following: 27 per cent home/place of work, 19 per cent traineeship, 18 per cent shopping, 34 per cent for leisure and 2 per cent for commercial purposes. The distribution is somewhat different as far as distances covered are concerned (km/vehicle): 50 per cent home/place of work, 10 per cent traineeship, 8 per cent shopping, 5 per cent leisure and 27 per cent in commercial activities.

The conditions which can influence the possibilities of using the bicycle vary within the same country and from one country to another with the climate and the topography. These conditions, such as hilly or mountainous areas, may be an obstacle to greater use of the bicycle. They may also cause further problems with regard to the comfort and increased use of the bicycle since they reduce its speed and stability.

It may be considered, however, that use of the bicycle will increase rapidly, especially in countries where the conditions are suitable and where it is not yet widely used. In many countries there is now a craze for the bicycle, in response to a demand for greater mobility and environmental protection.

In a country with dense car traffic and a highly developed public transport system, particularly in major urban areas, use of the bicycle is still very limited but is tending to increase. It is used more frequently in rural districts. For example, urban areas have accounted for only 3 to 4 per cent of bicycle trips in recent years in France. On the contrary, in countries where bicycle use is more frequent, the share of its use in urban areas is more important than in rural districts.

The share of bicycle traffic thus differs greatly from one country to another and only approximate data on the subject are available. According to a survey conducted in France, the distance travelled by this means of transport is about 6 billion km, which represents only 1 to 2 per cent of the total distance travelled by all types of vehicles combined. The bicycle accounts for 45 billion km in the United Kingdom and 2.7 billion in Sweden, or 2.5 per cent of total traffic.

2.3 Number of accidents involving cyclists

Cyclists are vulnerable for, unlike motor vehicle drivers, they have no outer protection shield. In addition, their visibility (to other road users) is reduced. There is also the fact that as a permit is not needed for a bicycle, very often cyclists receive no training and are unfamiliar with the highway code.

The 1995 ECMT statistics show the degree of insecurity (cf. Tables 1 and 2 in Annex). In countries like Denmark, Finland and the Netherlands, where the bicycle is an important daily means of transport, the proportion of cyclist fatalities in all road accidents is respectively 13.2 per cent, 16.8 per cent and 20.0 per cent. In countries where the bicycle is used less widely, as in France or Greece, the proportion of cyclists represents respectively only 4.4 per cent and 1.5 per cent of all road fatalities.

As far as 1995 casualties are concerned: 22.7 per cent in Denmark, 15.0 per cent in Finland and 21.2 per cent in the Netherlands of casualties are cyclists, which is even more alarming.

It is obviously in countries where the bicycle takes the highest shares in travel that the proportion of the cyclist casualties in road accidents is the greatest. In addition, the number of bicycle accidents is underestimated for a number of less serious cycling accidents involving cyclists are not reported, particularly in the case of non-fatal accidents in which only the cyclist is involved.

In the Netherlands, it is estimated that the actual number of cyclist casualties is eleven times the number recorded. According to information obtained from hospitals, it has been estimated that injuries to cyclists reported to the police amount to about only 8 per cent of the real number of such injuries. The same estimates were made in Denmark.

It may be assumed that the Netherlands study findings also apply to the other ECMT countries, to a varying but still similar extent, where the use of the bicycle is comparable. For it seems that in the other countries, most accidents, especially among the least serious involving cyclists, are not always recorded either.

The personal injuries and economic losses due to these accidents are considerable.

2.4 Accident characteristics and causes

Accidents have more serious consequences for cyclists because of their vulnerability.

Relatively little is known about the characteristics and causes of accidents involving cyclists compared to the general accidents data available. A few specific studies, however, provide some precise information.

Like the departments of statistics in many countries, statistics in Denmark bring out a yearly study on all road accidents reported to the police, which makes it possible to obtain information on accident characteristics and causes (for example, the type of vehicle involved, place, circumstances, time, day, victim's sex and age, weather conditions, speed).

The decrease in the number of accidents involving a cyclist recorded in recent years is less than that for total road accidents. The trend is disappointing. Between 1980 and 1993 (in Denmark), the number of cyclist casualties decreased only slightly, from 2 628 to 2 457, or by 6.5 per cent, whereas the number of casualties involving car drivers was down from 6 575 to 4 619, or by almost 30 per cent.

Like their causes, the characteristics of bicycle accidents are similar in all countries, even if their classification by order of importance may differ.

According to Denmark's official statistics for 1993, 62 per cent of all cyclists killed were under 20 or over 65 years old. The accident risk to which cyclists are exposed is comparatively high considering cyclist traffic share of total traffic.

Of all accidents involving cyclists:

- 85 per cent occurred in built-up areas,
- almost 50 per cent also involved a motor vehicle and occurred at an intersection,
- 10 per cent concerned only the cyclist, and over 15 per cent occurred when the bicycle and another vehicle were moving in the same direction and the cyclist or the other road user turned left or right (19 cyclists killed in this kind of collision, or 20 per cent of total cyclist fatalities).

A recent in-depth study conducted in the Netherlands as part of the Netherlands programme to encourage cycling states that over 20 per cent of those killed in road accidents are cyclists (260 out of 1 300 fatalities), half of whom are over 65, and a quarter under 20. Built-up areas account for the highest percentage (75 per cent) of fatalities and serious injuries among cyclists; half the casualties are involved in accidents at intersections. Moreover, 25 per cent of all casualties are due to collisions with motor vehicles, in particular lorries and buses, as they turn left or right.

The number of accidents in which no road user other than the cyclist is involved is relatively high.

Collisions with cyclists are particularly serious outside built-up areas owing to the higher car speeds.

Of all cyclist fatalities in road accidents, the proportion of elderly people is very high in many countries, to a large extent because the elderly are more vulnerable to the effects of an accident.

It seems that drinking is an important factor in road accidents involving adult cyclists, although there are no international statistics to prove the point. In practice, as a cyclist who is under the influence of alcohol is more of a danger to himself than to others. Such a case is usually not comparable with drunk driving, but it should be taken into greater account. A study based on REAGIR surveys in France has shown that in 7 per cent of accidents where measurement could be done, the cyclists' blood alcohol content exceeds the limit of 0.8 °/oo l. This result is far below the actual figure since the alcohol level test is not carried out on all cyclists involved in accidents.

These few data show that it is possible to define the main characteristics of cycling accidents but that further studies are required. A fair number of factors in such accidents are unknown, for in most cases no detailed analysis is conducted following them, particularly if there are no serious injuries.

A European accident study which was based on information collected from hospitals showed that, out of a total of 6 785 bicycle accidents in France, 41.6 per cent resulted in minor injuries, 17.6 per cent required on average five days in hospital and only four were fatal.

Two-thirds of the casualties were children of under 15, and 71 per cent were males. In this country where the bicycle is used less as a means of transport than in others, 86 per cent of the accidents occurred during recreational or sports activities, and

- 50.8 per cent of accidents occurred on roads;
- 24.8 per cent near the home;
- 11.7 per cent on areas set aside for sport and recreation;
- 38 per cent of the casualties had head injuries (55 per cent when the casualty was between 1 and 5 years old and 48 per cent when they were between five and ten).

The most frequent injuries were bruises, wounds (27 per cent) and fractures (18.4 per cent).

In May 1995, Denmark published a special report on bicycle safety which suggests ways of improving safety in the light of the most frequent types of accident. The following causes account for two-thirds of all accidents in which cyclists are killed or injured:

- The cyclist does not stop at an intersection. He does not see the other vehicle, or he misjudges the speed of the other road user or the distance between them.

- The other road user, who is usually a car driver, does not stop at an intersection. Such accidents often occur at night. The driver cannot see the cyclist properly or does not think of looking behind before turning.

- The other road user (usually a car driver) overtakes the cyclist and/or collides with him from behind. Again these accidents often occur at night and often because the driver is going too fast and the bicycle perhaps does not have the proper lighting.

- The cyclist and the other road user (usually a car driver) have a head-on collision. These accidents often occur at night outside built-up areas where there are no cycle tracks.

- Accidents in which only the cyclist is involved. He is often going too fast and/or cycling under the influence of alcohol. Sometimes he hits something on the road that may be difficult to see in the dark.

According to Netherlands studies, it can be considered that technical causes are an important factor in accidents where only the cyclist is involved. The cyclist's feet, his luggage or his clothing are caught up in the bicycle wheels. Accidents at intersections can be partly explained by the fact that the other road users cannot see the cyclist clearly. Accidents outside built-up areas can be explained to some extent by the fact that cars travelling at high speed are too close to cyclists when overtaking and by the lack of separate cycle tracks.

One of the main causes of accidents involving a bicycle is due to the blind spot which often prevents a car driver from seeing the cyclist coming up on his near-side. This primarily relates to situations where car drivers want to change their direction and the cyclists going straight ahead. It has also often been noted that, in the absence of cycle tracks or lanes, the cyclist does not stay on the left or right and may catch the other road users by surprise.

Little is known either about how far the rules are respected by cyclists and the other road users. A brief study recently conducted in the Netherlands shows that many cyclists do not keep to the rules. In many countries, cyclists seem to disregard signs and signals and traffic lights as they consider the rules do not concern them, even if some of them pay special attention to collision risks when they are breaking the rules. The study also shows that many car drivers do not give way to cyclists when they should. Generally speaking, car drivers do not seem to pay much attention to cyclists. It is worth noting that the behaviour of many car-drivers also causes problems and accidents involving cyclists. This can be the case for instance when car-drivers exceed speed limits sometimes causing accidents which could otherwise be avoided.

Young and elderly cyclists are less familiar with the rules. It is not known exactly how far this is a problem. In fact, it might be said that the cyclist who knows his rights is more of a danger than others who make up for their lack of knowledge by being more careful, but this has still to be proved. In this respect, it should be stressed that the highway code is designed more for motor traffic than for cyclists, and that specific facilities should be developed in order to take greater account of cyclists and their particular problems.

Besides identifying the causes for accidents, it is of great interest to clarify what causes fatalities and injuries. According to studies carried out in Sweden, head-injuries cause 50-75 per cent of all fatalities among cyclists. As far as all casualties are concerned, approximately 40 per cent of the fatalities and 20 of all injuries can be avoided if a helmet is used. It is for this reason that Sweden has created a lot of cycle tracks and lanes in many cities, as compared with many other European countries.

Owing to this situation, precise rules should be defined and proper facilities developed and all parties briefed on them.

3. THE VEHICLE

According to the Vienna Convention on Road Traffic of 8 November 1968, as amended on 3 September 1993, a precise definition of the cycle which is commonly known as the "bicycle" is

given: it means any vehicle which has at least two wheels and is propelled solely by the muscular energy of the persons on that vehicle, in particular by means of pedals or hand-cranks.

Although the Vienna Convention and national regulations define the minimum characteristics for cycles if they are to be allowed onto a public highway as a means of transport or for recreational purposes, perhaps all due attention has not been given to the standardisation of this type of vehicle -- standardisation which contributes also to safety improvement.

The technical condition of the bicycle makes an important contribution to safety, even if it is difficult to assess the effects of any improvements that could be made. It is possible, however, to improve standards.

3.1 Rules for bicycle construction

Some countries have introduced construction rules so that the bicycle will be strong and safe enough for the purpose for which it is intended. More precisely:

- With the exception of the drive and free wheel mechanisms, bicycles must not have any sharp edges which might cause injuries.

- The edges, protruding parts, cables, saddles and unenclosed fixtures on bicycles must be designed and made in such a way that they reduce as far as possible the risks of injury in the event of contact with them or a fall.

- The level beyond which the saddle and the handlebars support cannot be fixed must be shown by a permanent marker.

- Bicycles must be equipped with at least two independent braking systems each of which acts on a different wheel.

- The braking systems must make it possible to stop in circumstances which can be reasonably expected in order to avoid any surprise obstacle, even in wet weather. These systems must be designed in such a way that the front wheel is not blocked if a brake cable snaps.

- The quick-locking devices on the front wheel should be equipped with a safety system which prevents the wheel from being released from the fork.

- The wheels should be equipped with tyres or other bandages with constant elasticity; the cloth must not show.

- The frame, the handlebars, the fork and the wheels should be sufficiently strong.

- It must be possible to tighten easily the parts to be removed or adjusted by users, taking into account the physical capacities that can be reasonably expected of them.

- Bicycle assembly, adjustment and maintenance instructions must be clear and complete, and explain by any appropriate means the technical terms used, for example by a precise diagram for each component which has to be properly mounted for routine use of the bicycle.

To be admitted onto a public highway, bicycles should be equipped with active or passive lighting systems as well as a warning device, in compliance with the provisions laid down in national regulations.

Article 44 of the Vienna Convention stipulate that cycles without engines in international traffic must:

- have efficient brakes;
- be equipped with a bell capable of being heard at a sufficient distance and carry no other audible warning device;
- be equipped with a red reflecting device at the rear and with devices such that the cycle can show a white or selective-yellow light to the front and a red light to the rear.

Article 44 is a minimum basis which can easily be completed by national supplementary regulations which, for instance, can improve visibility conditions.

3.2 Visibility

The relevant provisions mainly concern the vehicle's visibility and the means of drawing attention to its presence in order to ensure a minimum of safety for the cyclist. They usually state the obligation to have a white light at the front and a red light at the rear (permanent or not, depending on the country) of the vehicle, as well as to be equipped with red reflecting devices visible from the rear and sometimes white reflecting devices on the front and orange reflectors on the pedals. Reflecting devices visible from the side, are optional or compulsory depending on national legislation.

The use of additional safety equipment on a bicycle, for example tyre reflectors and reflex reflectors should be encouraged by Member countries provided that they comply with minimum quality standards and meet the official requirements for vehicle lighting, particularly with regard to colours. Some countries, such as Germany, have a strict regulation on mandatory equipment to ensure cyclists' visibility:

- 1 white reflecting device visible from the front,
- orange pedal reflectors visible from the front and rear,
- 2 wheel-mounted orange spoke reflectors on each wheel, arranged at an angle of 180° and visible from the side, or continuous white circular retro-reflector strips on the tyres or on the spokes of the front and rear wheels,
- 1 additional red large-surface reflector on the rear.

In order to draw the attention of other users to their presence, some cyclists equip their bicycle with a pennant on a staff long enough for the flag to be seen from a sufficiently long distance. Evaluation studies on the effectiveness of these systems should be conducted before any promotional action is taken and especially before any plans to regulate the use of this type of device.

Different items and systems are available on the market to improve cyclists visibility/perception by night or under poor weather conditions. In this respect, it would be advisable to encourage a good

quality of these products, given they fulfil the objective to improve cyclists' safety. Gadgets should in any case be prohibited.

Standardisation in this field may seem premature but should be kept in mind when efficient criteria for cycle manufacturing are defined.

As regards visibility, which is one of the main factors in safety, it must be pointed out that bicycle maintenance, meaning in particular keeping all the parts adding to the bicycle's visibility clean, is a simple and effective means by which the cyclist can contribute directly to his own safety. Similarly, in some countries a bicycle must have mudguards to prevent mud from reducing the visibility of lights and reflectors. Like brake maintenance, these points should be stressed when action is taken to train cyclists and brief them on safety.

3.3 Improvement of standards

The technical condition of the bicycle is in itself important for safety, although it is difficult to foresee the effects of any improvements which could be made to it. However, it is quite obviously possible to improve bicycle standards considerably, as well as the condition of those now in service.

In the light of technical progress, it is now possible to raise standards for the most important bicycle components, such as the frame, handlebars, brakes and lighting devices in order to improve the efficiency and facilitate the maintenance of bicycles. Longer service lives for parts can be expected and the use of parts that do not require maintenance encouraged.

In defining stricter standards, priority must be given to lighting and reflecting devices as they have a direct impact on safety.

It should be pointed out, however, that, for children, the bicycle is both a plaything and a means of transport. With regard to the basic parts, different standards may have to be defined in order to take the different objectives into account; however, in the case of the components essential for access to public traffic, the standards will have to be identical for all types of bicycle and, as has been said above, among the most stringent.

3.4 Checking the quality and implementation of standards

Bicycles and each of their components should comply with manufacturing standards. To check on compliance, some countries have introduced in their national legislation a provision prohibiting the manufacture, import, sale or provision of bicycles that do not meet basic safety requirements, in particular those not equipped with the necessary lighting and signalling devices.

The statement "conformity with safety requirements guaranteed" appearing on the bicycle and in the instructions for use, and possibly on the packaging should confirm that the standards have been respected.

In addition, in order to prevent assembly mistakes which might be detrimental to safety, some countries have prohibited kit sales in favour of assembly by the seller who guarantees that the operation has been properly carried out.

A fine is imposed for non-compliance with these rules.

In all cases the aim is to ensure somehow or other that only reliable, correctly mounted systems can be sold and to enable users to check product quality by means of labels.

The technical aspects should be examined by the appropriate international bodies in the light of experience acquired at national level by certain Member countries.

The introduction of a type approval or quality label system should help to stimulate the sale and use of quality products. Such regulations should be worked out at international level even if their implementation might prove difficult in some countries, for economic reasons among others.

3.5 Accessories

Seats for children

Like those provided in cars, children's bicycle seats should be subject to special safety standards. In addition to seat attachments and stability, special attention should be given to systems preventing the child's feet from coming into contact with the spokes, depending on where the seat can be placed in compliance with the national regulations in force.

In some countries (the Netherlands, for example), standards for accessories such as children's seats have already been drawn up by consumer organisations.

Trailers and luggage carriers

Standards should also be set for bicycle luggage carriers, trailers and tow hooks to ensure safe transport. Here again children are concerned since the children's trailer towed by a bicycle is authorised in some countries, such as the Netherlands and Switzerland.

3.6 Protection of the cyclist

In addition to equipment or measures concerning bicycles to improve their users' safety, particularly by ensuring visibility in all kinds of weather, other measures such as light-coloured clothing with retroflecting patterns should for example be recommended.

Although bicycle speed is rather limited, it is acknowledged that a properly designed helmet provides very good protection for the most vulnerable part of the body, the head, from being seriously injured in an accident. According to studies carried out in Sweden, if 80 per cent of cyclists used helmets this would reduce fatalities in Sweden to approximately 30 per cent.

Although the helmet is more or less compulsory in all countries for participants in sporting events, it is still optional for cycle touring or bicycle rides in general. Some cyclists are against the helmet as it imposes a requirement conflicting with the feeling of freedom given by the bicycle or because it is unsightly, uncomfortable or unnecessary over short distances, which could be contrary to a development objective. Others are firmly in favour of it as it provides good head protection.

The definition of precise standards without which the effectiveness of helmets cannot be guaranteed, particularly as regards children for whom head size is the main criterion, is a prerequisite for any regulations on the wearing of helmets. Some countries have already set up such norms.

The European Directive No. 89/686/EC on personal protective equipment lays down the standards which could be adopted for cyclists' helmets. The provisions for children's helmets would, however, still have to be settled.

At present, helmets are worn on a voluntary basis by 15 per cent of cyclists in Finland, 16 per cent in the United Kingdom, 17 per cent in Sweden, 7 per cent in Switzerland and 6 per cent in Norway. In Denmark, 68 per cent of children, who are passengers on bicycles (children between 0 and 5 years old), are using helmets. 34 per cent of the children between 6 and 9 years old use helmets on their bicycles. Only 5 per cent of cyclists aged between 10 and 25 year old use a helmet, and among cyclists aged 25 years and older only 3 per cent use a helmet. The proportion is insignificant in most other countries.

4. TRAFFIC AND INFRASTRUCTURE

Whereas in some countries, notably in Northern Europe, there is a long tradition of using bicycles for transport, in others bicycles have in the past been viewed more as a problem than as a means of transport to be encouraged.

The provision of dedicated infrastructure to meet demand for cycling facilities has often been made on a case-by-case basis, resulting in a profusion of different types of facility as well as gaps in the cycle route network.

The interest shown in new forms of road-sharing and concern that roads should be easier to use have prompted the development of strategies aimed specifically at cyclists and focusing largely on increasing their safety and mobility. Examples of such policies include the "*Fahrrad-freundliche Stadt*" (the bicycle-friendly city) in Germany, cities of Copenhagen, Odense and Nakskov in Denmark, and the Delft project in the Netherlands, where the aim is to create a comprehensive network of cycle routes.

4.1 Cycle routes in the open country

Dedicated infrastructure for cyclists require space availability and financial investments. Such facilities should however be promoted. In the open country, cycling facilities should be implemented more easily.

However, to ensure that they are effective they must be developed in accordance with certain principles:

- The road must be well marked and road users must acquire certain reflexes which will allow them to focus their attention on potentially dangerous situations and on the behaviour of other road users.

- The road must be properly planned. This is particularly important in the case of developments aimed at providing for two-wheeled users. Potential conflicts with other road users, as a result of a lack of co-ordination between planners from two neighbouring communes for example, must be avoided at the design stage.

- The cycle route network, made up of cycle tracks and lanes, must meet clearly defined standards or rules.

- The number of special facilities must be kept to a minimum and should be confined to clearly identified and recurring situations.

- The same type of facility should be provided for the same type of situation, regardless of location.

Facilities must be standardised at national level, since this will encourage both cyclists and other road users to behave in the same way, i.e. they will be better able to recognise such facilities, identify traffic conditions and thus appreciate the potential risks they may face.

In addition to special facilities, improvements to the carriageway may make it easier for cyclists to use the road network. Account should also be taken of this with regard to recreational cycle routes.

In areas where it is simply not possible to provide cycle paths or lanes, due to the lack of space, levelling or even surfacing the verges along certain roads may be the next best solution and one that will also increase road safety for all users. A highway network in good condition is not only a prerequisite for encouraging people to make greater use of bicycles, it also increases safety by reducing the number of movements cyclists need to make to avoid obstacles and by ensuring that cyclists are not knocked off their bicycles by defects in the carriageway surface.

4.2 Cycle routes in urban areas

The need for cities to accommodate bicycles

All aspects of town planning and urban highway development projects must take account of the needs of cyclists not only by setting up bicycle routes or by providing specific facilities, but also by introducing measures of a general nature such as traffic calming and by devoting a greater share of public land resources to cyclists, pedestrians and public transport services.

To increase the mobility of cyclists and ensure their safety, provision must be made for the peaceful co-existence of different modes of transport, preferably and wherever possible by separating road users according to the vehicle used, and to do this by providing special facilities or by maintaining mixed traffic flows under the safest possible conditions.

On open stretches of road, there are a number of relatively inexpensive facilities or provisions for cyclists, according to experiments achieved in some countries, which can meet this objective of peaceful co-existence. For example:

- contraflow arrangements in lightly-travelled (by local traffic) one-way streets;

- use of existing service roads (used for local activities or for providing access for local residents or frontages);

- creation of cycle tracks or lanes, and introduction of 30 km/h areas;

- creation of cycling areas modelled on those reserved for pedestrians;

- provision of a central lane on roads carrying two-way traffic, which in addition to reducing visibility across the carriageway and thus causing traffic to slow down would also make it easier for vehicles emerging from side streets to enter the traffic flow and for vehicles already on the road to move into position to turn left (turn right in countries driving on the left) at intersections;

- possible use of footpaths or bus lanes, which may be widened if the road is heavily-travelled;

- use of tunnels, lifts, foot-bridges or other works reserved, in principle, for pedestrians, in order to avoid breaks in cyclists routes;

- footpath sharing or mixed traffic on footpaths that are sufficiently wide;

- signing of recommended routes.

This list is by no means exhaustive and each facility must be tailored to local circumstances and possibilities, must be studied in detail, and must be governed by traffic rules that are both stringent and adapted to the behaviour of each type of user. Where necessary, road users may be reminded of traffic rules through road signs or markings.

When repairing or resurfacing roads, it is also advisable not to leave manhole covers, gratings or utility access plates protruding above the surface of the carriageway, which would force cyclists to swerve to avoid them, or to produce too convex a carriageway profile as a result of successive resurfacing operations.

Since other provisions can be made to ensure that there are no breaks in the network of roads and paths on which cyclists can travel safely, the examples given above are by no means exhaustive.

While every cycle facility must be tailored to local conditions and planned in great detail, given that one of the objectives is to maximise its effectiveness, it is also important to ensure that approaches to the design of facilities are standardised to the greatest extent possible at national level so that other road users will readily recognise the presence of cyclists on the road.

Showing that "cyclists are road users too" by putting in place a comprehensive and coherent network of cycle routes does not mean to say that it is any less important to make it easier for cyclists to use all highway infrastructure under the safest possible conditions.

Cycling facilities must also meet stringent quality objectives.

4.3 Intersections

Specific measures such as minor changes in road layout, new road markings and various other provisions must ensure both the continuity of cycle routes and the comfort and safety of cyclists.

Other ways in which cyclists can be accommodated under acceptable conditions of safety include:

- turning lanes on the approach arms to junctions controlled by traffic signals;
- marking-out of cycle lanes at junctions to make the cycle route more readily visible to other road users;
- on open stretches of road between junctions, maintenance of cycle tracks and lanes and their verges to avoid projections of water and dirt; and
- ensuring that road surfaces are level.

However, particular attention must be paid to the layout of junctions at points where cycle tracks or lanes intersect with lanes open to all vehicles.

In most countries, as shown in Chapter 2, almost 50 per cent of the accidents involving cyclists in towns with over 20 000 inhabitants take place at intersections.

Crossing over an intersection poses the greatest problem for cyclists. Most accidents between bicycles and cars consist of sideways-on collisions between cars turning either right or left across the path of cyclists going straight ahead.

Turning left (right in countries driving on the left) is considered by cyclists to be a particularly hazardous manoeuvre. Accidents during this manoeuvre at junctions without traffic signals or at complex junctions with heavy traffic are often very serious.

Cyclists are more at risk of an accident at intersections because of visibility problems and the difficulty of anticipating traffic movements. This risk is exacerbated by the inherent instability of bicycles and cyclists' lack of protection, and also by the speed of motor vehicles.

Small, relatively noiseless, easily hidden in a blind spot or by another vehicle, inconspicuous (particularly at night), bicycles are in many cases simply not seen by other road users. The movements of cyclists are also fairly unpredictable given that there are no stop or indicator lights on bicycles; this unpredictability is also due to the fact that many cyclists do not use arm signals to indicate their intention to turn left or right.

Furthermore, motor vehicles on the approach arms of intersections are sometimes masked by other vehicles and are often seen too late by cyclists.

The geometric design of intersections is often too extensive and too complex; cyclists have difficulty in seeing and appreciating traffic movements and thus find it hard to position themselves correctly. They also have problems in optimising their travel path and stopping point.

To ensure that it is safe for cyclists to use the cycle route network, and more generally the road network as a whole, the design and improvement of intersections must aim to:

- reduce the number and severity of conflicts between cyclists and other road users by improving visibility and by slowing the speeds at which motor vehicles travel;
- protect cyclists turning left, and from other vehicles turning right;
- take account of cycle traffic in the design of roundabouts and junctions controlled by traffic signals;
- provide special turning phases for cyclists in the form of advanced stop lines.

4.4 Criteria governing the choice of facility

The decision regarding the type of facility to be provided requires a prior assessment of needs based primarily on the following:

- analysis of accidents resulting in death or injury, and also of any incidents or conflicts between cyclists and other road users;
- determination of the levels of road usage by different modes;
- visibility and appreciation of traffic flows at location;
- geometrical design of location;
- practices and behaviour of road users;
- knowledge of local activities.

This decision is generally taken by local government officials and by the highway authorities at all levels. All those concerned must therefore be aware of the problem and must be familiar with the technical options available.

This awareness may be fostered in many different and non-mutually exclusive ways:

- drafting of technical guides on specific subjects;
- organisation of seminars to raise awareness of certain issues;
- vocational training courses for highway engineers and technicians;
- publication of studies in specialist revues; etc.

The choice of facility must be made in collaboration with all the parties concerned, notably cyclists' associations but also other categories of users too, to ensure that proper account is taken of the needs of all road users and that their approval of the measures decided is secured.

5. ROAD USERS

5.1 Traffic rules

In addition to the rules which normally apply to all public highway users and in accordance with the Vienna Convention, cyclists are subject to specific rules defined in their national legislation in

order to ensure that they can travel safely and easily. Similarly, the other road users must behave in a way that will not compromise the safety of these more vulnerable users.

In addition to the rules on bicycle equipment discussed in Section 3, the following main provisions can be quoted.

Use of roads

Cyclists must not ride without holding the handlebars with at least one hand, must not allow themselves to be towed by another vehicle, and must not carry, tow or push objects which hamper their cycling or endanger other road users.

They must keep to the right of the carriageway (to the left in the United Kingdom) and give an appropriate arm signal when they wish to turn.

In principle, cyclists may not ride more than one abreast. Some countries however introduced exceptions to this rule; for instance, cyclists may ride two abreast where the carriageway is wide enough, where cycle traffic is heavy, on cycle tracks, etc.

They are required to use cycle lanes and tracks. They may not, however, use motorways and similar roads.

When walking and pushing their bicycles on foot, cyclists are classified as pedestrians and may therefore use the pavement.

Passenger transport

The Vienna Convention prohibits the transport of passengers on bicycles, but enables the Contracting Parties to authorise exceptions.

In some countries, the transport of a passenger is allowed only if he is under a statutory age limit (for instance 14 years in France) and if the cyclist himself has a minimum age. More than one passenger may not be carried.

Age for access to traffic

Some national legislations provide that cyclists can only ride on a road after a certain age. In Switzerland, a cyclist must have at least the legal age to go to school before he can ride on a road. In Denmark, children under the age of 6 are not allowed to go by bicycle unless they are escorted by a person, who is 15 years old or older. In Germany, children must be at least 8 years old with the same provisions as in Denmark. In Poland, children over 10 years must have passed a test to be allowed on a road. These provisions are still not widely used (even if some countries are considering the possibility to introduce them). They should however be encouraged since to ride a bicycle safely requires some maturity young children certainly do not have.

Penalties

Cyclists must obviously respect the Highway Code like any other user and in particular obey traffic lights. In the event of an offence, they are therefore liable to various penalties which, depending on the country and the seriousness of the offence and its consequences, range from a fine to a prison sentence, particularly for cycling under the influence of alcohol.

Rules to be observed by other users with regard to cyclists

According to the Vienna Convention and legislation in all countries, road users are subject to the general rule which states that, when overtaking, they must give the user or other users being overtaken a sufficiently wide safety berth. This is particularly important when the user being overtaken is a cyclist.

Some countries state the minimum distance to be maintained in this case and encourage the use of a distance-marker pennant.

Road users should be reminded of these rules, for behaviour in traffic tends to show that they are not well known or at least disregarded.

Other rules

As we have seen, alcohol consumption, particularly in the case of cyclists, has been quoted as an important factor in accidents. No country has actually included cyclists among the road users who must keep to a legal alcohol limit. Few checks are carried out. In countries where this is a serious problem, this shortcoming should be remedied mainly because of the increase in cycling. Cyclists should also be reminded they cannot ride when drunk.

Conclusion

These general provisions show that the cyclist is a road user as such.

In order to make cycling easier and avoid excessive deviations, the use by cyclists of lanes reserved for public transport and contraflow lanes or other facilities, as mentioned in Section 4, is sometime recommended. If such proposals were adopted, these facilities would have to be indicated by specific signs for both the cyclists and other users. Practical proposals on this subject by the Group on Road Traffic, Signs and Signals have been transmitted to the competent body responsible for the follow-up of Conventions on Road Traffic and Road Signs and Signals in UN/ECE.

Although they have no real effect on traffic rules, other measures concerning for instance signs and signals are also proposed, so as to provide a safety area near traffic lights for cyclists and other light two-wheeler users by advancing the stop line for them.

It is recommended that Member countries include the rules given in the Annex in their national legislation and that they encourage the relevant international organisations, such as the United Nations Economic Commission for Europe, to include them in international legal instruments like the Vienna Convention or European Agreements.

5.2 Improving user behaviour

According to the majority of studies conducted throughout the world, cyclists' behaviour is one of the main factors in accidents in which they are involved, even if the behaviour of other categories of users, in particular that of car drivers towards cyclists, is also a cause of accidents.

It is, however, difficult to take action in this area as cyclists are not a homogenous group: some use bicycles as a means of transport, others use them for excursions, and yet others as something they play with. All age groups are represented, which results in widely varying experience of road traffic and in very different kinds of behaviour.

Cyclists' safety can be improved only if all road users respect one another and have a good knowledge of the rules applicable to each of them.

As a permit is not required to ride a bicycle on the public highway, it must be admitted that, to an extent varying with the country or the particular region of a country, the Highway Code provisions for cyclists are not observed by cyclists themselves or by car drivers, because, for some of them, they often are unfamiliar with the rules, particularly those concerning the cyclists' vital space. Conflicts also arise between cyclists and pedestrians, and although the consequences are less dramatic, they can still be serious.

The respect of the rules must therefore be improved by bringing home to all users the need to share road space. In order to do so and modify behaviour for the better, a real social marketing strategy must be used, one which is not based entirely or mainly on enforcement and penalties, but on preventive measures including training. This strategy should comprise communication campaigns and the briefing and education of road users using methods, locations and media suitable for the particular audience.

Children and young people

The problems mainly concern the child's development stage and the way in which the child uses a bicycle in traffic. Children of the same age sometimes represent quite different categories of road users. Their experience, motor skills, knowledge and their ability to perceive traffic correctly and take the right decisions are not identical.

Children have, however, some characteristics in common. Since they are small, it is more difficult to see them and distinguish them from their surroundings.

All children play and are always on the go; their behaviour is also impulsive in traffic, and car drivers are often surprised by their unexpected movements.

A child learns to behave in traffic through experience. For a more effective learning process, it is therefore essential for an adult to accompany the child and place him gradually in practical situations of increasing complexity. In this respect the parents' role is obvious and extremely important.

In the case of children, learning to use a bike means acquiring motor skills and independence, as well as an insight into basic traffic rules and the need to take others into account when in traffic.

As a supplement to action by parents, school is one of the best places for driving home in the youngest minds the notions of risk and the conduct to be observed in the light of the rules so that a responsible attitude to safety and the environment will be acquired.

In most countries, the educational system includes special programmes, at national or local level, on bicycle safety. Such a programme is being prepared in Slovenia. The teaching of road safety rules, particularly for cyclists, is compulsory in some countries, but optional in others. This trend in the educational field shows that the authorities in most countries attach great importance to the educational aspect so that children will become good road users in general and good cyclists in particular.

This education is sometimes supplemented by the voluntary work of associations and also by television broadcasts which, by teaching children in an entertaining way, show the difficulties and how they can be tackled by continually keeping to the proper line of conduct and to the rules.

Later on, secondary school and sports or recreational clubs for young cyclists are among the facilities enabling adolescents themselves -- with the participation of adults, parents, teachers and other partners -- to work out on a practical basis conditioning and training exercises for themselves and for their friends. The activities which have been tested in some countries and have proved that they can heighten the awareness of road users and make them contribute actively to their own safety are as follows:

- identifying potential risks with other road users, and analysing the reactions of all parties to these risks in order to improve these reactions;
- getting to know one's bicycle and the purpose of the various parts;
- learning to repair it and maintain it;
- organising outings, choosing the routes and identifying their difficulties;
- studying together ways of protecting oneself more effectively.

In Germany, the road safety organisations DVR (German Road Safety Council) and DVW (German Accident Prevention Organisation) conduct programmes aimed at specific target groups. In the case of children, the activities are directed at parents and other adults entrusted with the care of children, as well as the children themselves.

Adult cyclists

Adult cyclists can be informed and influenced by educational programmes at their place of work, within cycle touring or safety associations, as well as by advice and information on the road environment provided by the media.

Although cyclists are often aware of their vulnerability, they should be reminded by various means of the need to be careful and respect traffic rules for their own safety.

But careful behaviour in traffic does not depend only on education as the cyclist must also be aware of his own responsibility. The cyclist must firstly know the rules applicable to his own conduct and be intent on respecting them, like those which the other users must observe with regard to him.

Motor vehicle drivers

From the viewpoint of cyclists' safety, the main factor is the readiness and capacity of car drivers to pay special attention to cyclists, as well as to all other road users, in deference to the concept of sharing road space.

The future driver's training and his driving test are extremely important in this respect. Training programmes must include the idea that the driver has a responsibility to cyclists and pedestrians and stress simple rules to improve safety, such as keeping a sufficient safety gap away from a cyclist when overtaking him.

The role of associations and the insurance sector

In most Member countries, cycling is actively promoted by incentive campaigns in which cyclist associations and other bodies whose aim is to promote cycling as a physical exercise and means of transport often take part.

Communication campaigns are used for this promotion exercise, which is often included in a country's general transport policy.

These incentive campaigns must not ignore road safety or the other users. For this reason, bicycle safety campaigns must be based on extensive co-operation between all the different bodies concerned.

Insurance companies also have an important role to play.

In many countries, a cyclist's personal injuries are covered by the other party's car insurance on the basis of the strict liability principle, no matter who causes the accident.

The insurance sector could develop its preventive action by distributing leaflets to its customers, stating the rules to be respected or any other safety message, offering reductions for the purchase of safety devices (helmet, pennants, etc.) as is already done in some countries, and taking part in communication operations of various kinds.

Chapter II

PEDESTRIANS

1. INTRODUCTION - SYNTHESIS

ECMT has long been concerned with the safety of pedestrians, who are among the most vulnerable road users because they have no physical protection to reduce the consequences of accidents. In 1975, the Council of Ministers adopted a report on this subject and recommended the adoption of a set of measures and rules in favour of pedestrian safety. These recommendations have been complemented by other proposals presented in specific reports adopted in recent years by the ECMT and prepared by the Road Safety Group. Here we would cite the resolutions on measures to be taken to improve road safety at night (1979), on road safety for children (1987), on improving the safety of old people (1991) and most recently on speed moderation (1995), all of which already took account of the problem of the safety of pedestrians. Moreover, in 1996 the OECD published the results of a study on the safety of vulnerable road users in connection with its Research Programme on Road Safety. This study has also been used to draw up this publication.

Although the number of pedestrians involved in road accidents has fallen over the past twenty years, often by a greater proportion than the number of victims among other categories of road user, the fact remains that in many European countries, the pedestrian share of road accident victims still remains high.

2. PRESENT SITUATION

2.1 General situation

Drawing up what is commonly known as an inventory on the basis of the road accident statistics requires certain preliminary precautions. Pedestrians are no exception to this rule.

Firstly, by taking only the general trends recorded for the years 1980, 1985, 1990 and 1995, some countries may be fully or partly only excluded from these trends even if they cover the vast majority of countries.

In the field of road accidents, comparisons are particularly difficult because of the heterogeneity of the situations (vehicle stock, traffic conditions, etc.).

In the following analysis, “peak” situations (i.e. the most representative age groups) or “abnormal” situations (i.e. situations or conditions in which pedestrians are most often accident

victims) have been examined. These peak or abnormal situations -- while they "benefit" from the general observation, that is a reduction in the number of accidents in which pedestrians are victims -- nevertheless remain constant over time, or even increase.

The first observation is in fact an over-proportional reduction in the number of pedestrian victims of road accidents.

While in 1980 pedestrians represented on average 15 to 30 per cent or even more of the total number of road deaths, in 1995 this proportion was generally around 10 to 20 per cent (cf. Table 2 in the Annex).

This first encouraging observation is also confirmed as regards the number of people killed (i.e. victims dying within 30 days of the accident)[1] or seriously injured.[2]

The fall in the number of pedestrians slightly injured is proportionally less significant. It should be noted that "slightly injured"[2] means that the victim does not need long-term hospitalisation.

Despite this positive trend, the fact remains that, in ECMT Member countries as a whole, the number of pedestrians involved in road accidents is unacceptable and illustrates the relevance of this report and the need to make even greater efforts with regard to pedestrian safety.

This is all the more important in that the peak or abnormal situations remain practically unchanged for the reference years. There has thus not been a more homogenous distribution of victims according to age, spatial situation or traffic conditions, and this despite the already very precise recommendations and the many measures introduced in Member countries.

In addition, although these data have not emerged from a systematic survey in the context of this report, we would point out that on the basis of the complementary information furnished by certain delegations, male victims are more numerous than female below the age of 60 to 70. This phenomenon is then inversed due to the fact that women are considerably more numerous in this age group (over 60/70).

This observation obviously has to be considerably qualified according to the situations specific to each country, and in particular in the case of old people. But the first observation for its part remains more generally relevant.

Lastly, certain data which would give a more detailed picture are often lacking or are collected in very different ways from one country to another, which requires the utmost caution when analysing available information and should be an incentive to improve knowledge of the problems.

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1. Where these data are available.

2. The following is the definition used by the UN/ECE:
"Serious injuries: Fractures, concussion, internal lesions, crushing, severe cuts and laceration, severe general shock requiring medical treatment and any other serious lesions entailing detention in hospital. **Slight injuries**: Secondary injuries such as sprains or bruises. Persons complaining of shock, but who have not sustained other injuries, should not be considered in the statistics as having been injured unless they show very clear symptoms of shock and have received medical treatment or appeared to require medical attention."

2.2 Trends by age group - cause for concern

As regards the distribution of the victims by age group, it has to be said that there has been no significant change regarding the age groups most at risk (cf. Tables 3 and 4 in Annex), i.e.:

- children;
- old people.

In other words, and but for rare exceptions, children and old people are for the reference years and in a constant fashion always over-represented in the statistics of accidents involving pedestrians. This is all the more worrying as these groups of population are supposed to increase in number over the years to come (cf. Table 7 in Annex).

It should be noted that as far as children are concerned, the injuries suffered may be more serious than in the case of adults, because of their size.

In the case of old people, there are problems of rehabilitation and of irreversible handicap which are made more acute by their more limited capacity to recover mobility.

Lastly it should be pointed out that in line with the comment in the outline of the general situation, the sex distribution of the victims in these two age groups is sometimes different for children and old people.

Figure 1. **Number of killed by category of age**
(for countries which furnished data in this breakdown)

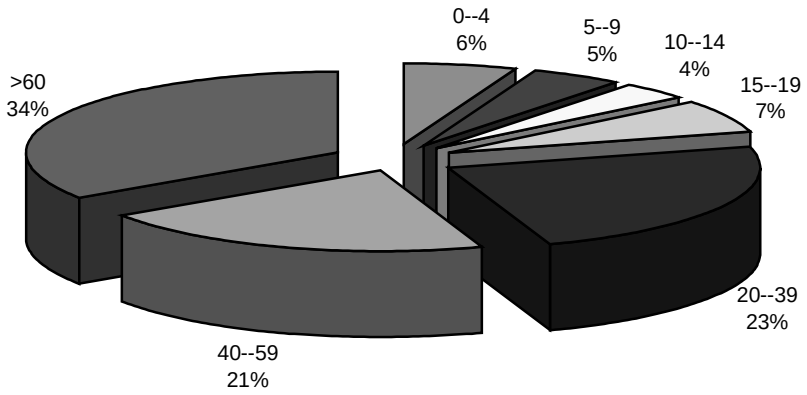
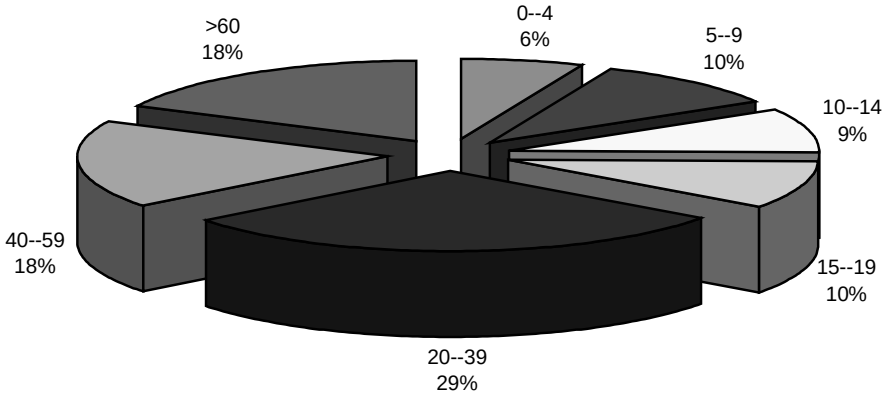


Figure 2. **Number of seriously injured by category of age (for countries which furnished data in this breakdown)**



2.3 Distribution in and outside built-up areas

The vast majority of accidents in which pedestrians are involved occur *in built-up areas*. They account for up to nine-tenths of casualties.

The consequences of these accidents are not so serious however. The number of pedestrians killed represents six to seven tenths of the total number of pedestrians killed and in certain countries has tended to decline for the reference years.

Outside built-up areas however, accidents are more serious although the number of pedestrian victims is lower, since a tenth of victims are pedestrians, and the risk of a pedestrian being killed is three to four times higher. This proportion is tending to rise over time (cf. Table 5 in Annex).

One explanation might be the higher vehicle speeds, but other concomitant factors must not be forgotten: the absence of infrastructures reserved to pedestrians, a more acute visibility problem, the even more negative effects of drink driving, etc.

Figure 3. **Breakdown of pedestrian victims of accidents in and outside built-up areas**

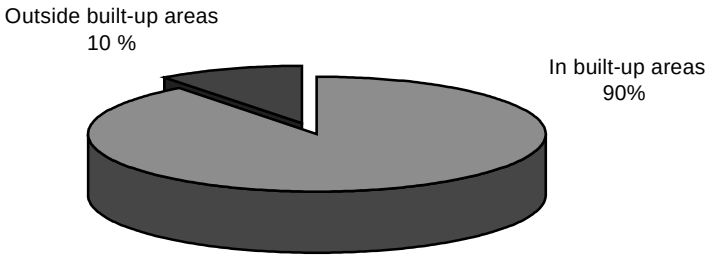
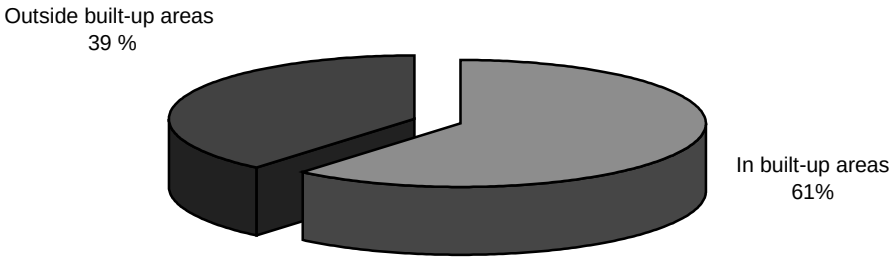


Figure 4. **Breakdown of pedestrian killed in and outside built-up areas**



2.4 Accidents at pedestrian crossings

The number of pedestrians suffering accidents at pedestrian crossings, protected or otherwise, varies greatly from one country to another. What is more, the data received are often very rudimentary or even non-existent in some cases.

Analysis of this situation is thus particularly difficult, all the more so because the marking of pedestrian crossings is a practice used to a very different extent from one country to another, and is based on rules or directives which, where they exist, also vary greatly.

Aid for pedestrians and particular measures (police, school patrols, provision of traffic lights, street lighting, etc.) also varies greatly.

In view of the available information, the insecurity at pedestrian crossings calls for attention, and thinking here should be in terms of a global approach to the problem, including the greatest possible coherence between regulations, signs and signals and infrastructures.

2.5 Accidents at night and in bad weather conditions

The picture is disquieting as regards the number of victims, the seriousness of the accidents and the constancy of this situation for the reference years, with even an aggravation of this phenomenon in some cases.

Where data are available, it can be seen that in many countries almost half of the pedestrian deaths occur at night or in bad weather conditions.

Many factors may contribute to this situation: visibility (obviously causing poor perception of the pedestrian), speed, drink, tiredness, etc.

This is without a doubt a field that needs further investigation. We also need to evaluate and assess the relevance of the recommendations and measures already implemented (cf. Table 6 in Annex).

Figure 5. **Breakdown of pedestrian accidents by day and by night**

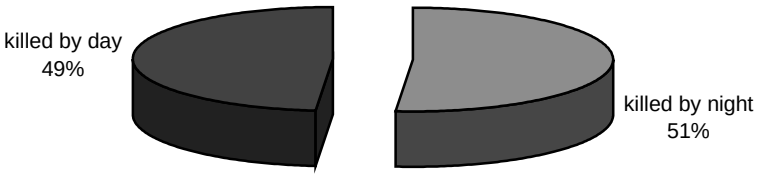
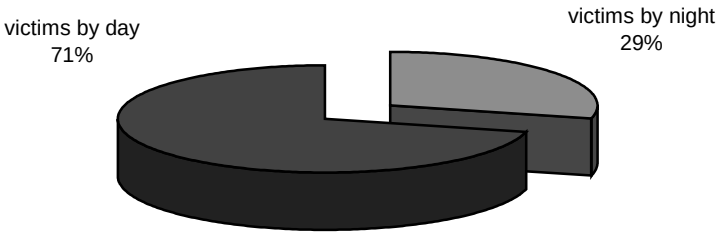


Figure 6. **Breakdown of pedestrian accidents by day and by night**



2.6 Exposure to risks

Seeking the causes of accidents suffered by pedestrians means that we first of all need to know their mobility, since this is the variable which determines the pedestrian's exposure to the risk of accident.

The majority of the mobility studies carried out in certain European countries have been carried out from the urban standpoint however, and have focused mainly on understanding the behaviour of motorised traffic, forgetting somewhat the importance of walking in the overall mobility of the population.

Studies concerning the mobility of pedestrians with respect to the population as a whole are, for this reason, few and incomplete. Nevertheless, certain studies do highlight the important share of pedestrian activity in a number of towns, where 50 per cent of the trips are made on foot, i.e. twice as many as public transport or car trips.

In addition, most European countries deal only in a marginal and generalised way with accidents to pedestrians, which just shows the secondary role assigned to the pedestrian in road traffic considerations.

There is a whole series of external circumstances which influence accidents to pedestrians: weather conditions, the number of vehicles, the population or activity. Thus:

- as the level of precipitation and the number of cloudy days increase, so the number of pedestrian accidents increases too;

- the number of children or elderly people and their proportion within the population influences the number of pedestrian accidents;

- exposure to risks usually rises with the level of socio-economic activities; in areas with the highest activity rates, pedestrians tend to be more exposed to accident risks;

- the relation between the presence of vehicles in the zone and the number and consequences of the road accidents is also positive. The bigger the car stock, the greater the number of vehicle/pedestrian conflict situations.

2.7 Causes of accidents involving pedestrians

Role of pedestrians

To find the causes of pedestrian accidents, it is necessary to know how and why they occur and the external factors contributing to them.

For instance, a study carried out in Spain in 1995 revealed that in almost 50 per cent of cases, the accident happens when the pedestrian is *"crossing the road away from the intersection"*, as against 25 per cent when he is *"crossing the road at the intersection"*. Other circumstances have less influence on pedestrian accidents.

As for the human causes of these accidents, the same study shows that carelessness on the part of the pedestrian himself is an important contributory factor as most of the pedestrians run over commit an offence at the time of the accident.

The kinds of behaviour by pedestrians resulting in the greatest accident risks are:

- overdrinking,
- not using retro-reflective devices,
- crossing the road in breach of the rules,
- not using pedestrian crossings,
- not respecting pedestrian signals,
- not keeping to the rules when walking on the roadway or the verge.

The most serious risks arise:

- on pedestrian crossings with traffic lights, when pedestrians ignore the red lights;
- when pedestrians do not use the crossing provided;
- when there is no pedestrian crossing and vehicles do not have their lights on despite the lack of visibility;
- in this same case, when the pedestrian crosses at some distance from the intersection;

– when pedestrians wait on the roadway before crossing although there is a pavement or verge;
– when they walk on the roadway.

Lastly, it should be stressed:

– that pedestrians make little or no use of footbridges and subways, for a number of reasons (too much trouble, insecurity, etc.);

– that the places where from time to time there are large numbers of pedestrians for various reasons (schools, discotheques, sports centres, etc.) are also exposed to risk, particularly at night or in bad weather.

Role of drivers

Although the fact that pedestrians may be at fault in the event of accidents must be highlighted, the considerable role and responsibility of drivers in accidents cannot be ignored, for any mistakes by drivers have immediate detrimental effects on pedestrians.

Logically, and this is very clear from the statistics on pedestrian accidents, most of these accidents occur when there is an interaction in the same physical space (the roadway) between pedestrians and vehicles. Owing to their behaviour, drivers also have a great deal to answer for with regard to the risks for pedestrians, because of their carelessness, absent-mindedness or their failure to respect pedestrian crossings and red lights.

Speed or the presence of alcohol in the driver of a vehicle may also cause accidents and aggravate their consequences.

By way of example, according to 1995 data:

– In Switzerland, the inappropriate speed of the drivers was responsible for 18.2 per cent of the pedestrian deaths and 8.3 per cent of the victims. In the Netherlands, excessive speed also seems to be acknowledged as one of the most frequent causes of road accidents suffered by pedestrians. In Hungary, excessive speed accounts for 38.6 per cent of pedestrian fatalities and 15 per cent of casualties.

– The influence of alcohol, both in the case of the driver of the vehicle and in that of the pedestrian, plays an important role in the number of victims. In Bulgaria and Lithuania, alcohol is present in over 12 per cent of the accidents involving pedestrians, either in the driver or pedestrian.

Driver behaviour varies according to the type of regulation at intersections. If the intersection is regulated by traffic lights, the usual driver actions constituting a risk are: going through an orange or red light, and starting off while pedestrians are still crossing the road. If there is a pedestrian crossing at the intersection, the risk taken by drivers is greater, because they tend to swerve rather than brake.

Lastly, the driver may be involved indirectly. Although drivers by and large respect the traffic rules rather well when they are playing an active role, i.e. when they are driving, their passive road behaviour (the way they park, for example) may condition the behaviour of pedestrians, forcing them to take unnecessary risks due to the position of parked vehicles. Vehicles parked on pedestrian crossings or on corners are a common sight. This prevents passage of pedestrians or obliges them to

walk on the roadway, to cross outside the pedestrian crossings, or take some other action involving risk.

Taking the foregoing into account, human behaviour plays a decisive role in accidents involving pedestrians. Drivers must therefore take into account the possibility of mistakes by pedestrians, since the pedestrian is also a road user in his own right, and the approach should be not only to target the pedestrian but also and perhaps especially the driver. This approach is all the more necessary as any road user is, at one time or another, a pedestrian.

3. PEDESTRIAN SAFETY

3.1 A topical problem...

Two observations can be made on the basis of what has been said so far:

- on both national and international levels, pedestrian safety has been paid the greatest attention by the authorities;

- the number of pedestrian accident victims as a proportion of total road accident victims has tended to fall over the past fifteen years.

There is no doubt that the policies pursued by Member countries have brought some encouraging results. However, the number of pedestrian accident victims remains high and, what is more, the reduction in number of victims has done nothing to eliminate or attenuate the peak phenomenon or the abnormal situations, quite the contrary.

which requires a global and coherent approach

Tackling the pedestrian safety problem requires a global approach, embracing:

- users: training, information and raising their awareness of road safety problem, traffic rules and their control;

- infrastructures: if the aim is to encourage alternative means of locomotion, it is up to those responsible for land use planning to take pedestrians into account and not focus only on traffic;

- vehicles too, even though this aspect is complex to deal with.

The approach must result on the ground in an optimal coherence between the traffic rules, signs and signals and the infrastructures, which takes into account the specificity of the pedestrian as a road user and in particular the fact of his great vulnerability.

Mainly with regard to urban areas, road safety also depends on appropriate land use planning and a coherent locomotion system, as stressed in the introduction. Until recently, a town was no longer designed around its central figure, the citizen, and he must now recover his rightful position. A town must be on a human scale and, if this is to be possible, the citizen must be able to move within it as a pedestrian.

with a multiple user: the pedestrian

Understanding the problem of the pedestrian in relation to traffic means taking account not only of his specificity, but also the multiple categories of pedestrian according to age (children, adults, old people), their experience of the traffic phenomenon (road sense in children), their mobility in traffic (children, persons with reduced mobility), and the type of trips they make.

The responses required will thus vary greatly within the global approach that we propose.

An improvement designed to help blind people (barrier, for example) will be perceived by other pedestrians as an obstacle in their path.

Paradoxically, we often address one and the same person differently according to his current status in road traffic: on the one hand as a pedestrian, on the other hand as a driver. It is depressing to see that once he has become a driver, the ex-pedestrian fails to take account of the difficulties encountered by pedestrians. The same person thus has to be addressed in different ways, but they must be complementary.

which requires a radical change in behaviour to ensure real harmony

The road, and even more so the street, is intended to be a link between people, a place of exchange. For the pedestrian, the road, and too often still the street, are perceived as obstacles in his path.

Changing this state of affairs means not only determined action on the conventional three fronts -- user, road, vehicle -- but, more fundamentally a societal choice based on harmony.

We raised the paradox of having to address the same person in different ways according to whether he is currently a pedestrian or a driver: here it is often the opposition -- and hence the balance of forces -- between two road users that is taken into account. Their complementarities are generally ignored. Responsible behaviour -- even though it underlies all our highway codes -- is still too rarely mentioned. Each user is entitled to his full place in traffic.

When we speak of vulnerable users, this can only be with reference to the specific characteristics of the user, and must not imply his relegation to a second class role in traffic, a role in which our action would consist of overprotecting him. This observation of vulnerability should make us take measures to alleviate this by ensuring an equal and real place for each and every one.

through the right to mobility

In our societies, life expectancy has increased enormously (see Table 7 in Annex).

For elderly people, especially if they have mobility problems, finding themselves in traffic frequently means having to fight it. The difficulties are amplified to such an extent that many elderly people limit their trips or even give them up altogether. However, as pointed out in the general approach, everybody should be entitled to go wherever he wishes in the utmost safety.

Accordingly, thought should be given in every situation to the alternative between the development of infrastructure to enable everybody to move around, or land use planning to encourage the siting of activities at a reasonable distance from the citizens/pedestrians. The advantages of the latter approach are that the duration of exposure to traffic risks is reduced and that excessive numbers of people at a particular spot are avoided.

which takes into account handicaps in traffic

In evoking the right to mobility for elderly people we would be incomplete if we did not raise the question of taking into account the handicaps that certain categories of pedestrians may encounter in traffic without their necessarily being elderly people. One immediately thinks of people with disabilities, and given the different forms that these disabilities can take, the responses to them need to be specific.

Certain types of provision should be systematic (for example: taking account of people with reduced mobility in the design of footpaths), others more selective (for example: devices to help blind people at traffic lights).

In our approach, the term "handicap" is used in the broadest of senses and is intended to include the problems encountered by children, who experience very specific difficulties in traffic, which amount to so many handicaps: small size, limited road sense, etc.

and meets a need that is too often ignored: health

The use of non-polluting alternative means of locomotion -- cycling, walking -- is beneficial not only for the environment but also for people's health.

This double qualitative aspect should be seen not simply as having a positive effect on health, but also as an effort to keep fit.

3.2 An infrastructure problem

As the improvement of pedestrian safety requires a comprehensive strategy -- which therefore includes infrastructure -- a new approach should be taken to land use planning, the design of public highways and their equipment, the ranking of networks, the general organisation of travel and movements and town planning, in order to reduce the problems with which pedestrians are still too often confronted, encourage walking, bring about a change for the better in driver behaviour, and even influence the choice of transport mode. Quite obviously the action to be taken will differ depending on whether it is intended for a rural municipality, a medium-sized or large urban centre, or an old or a new city. Other factors also have to be taken into account, such as the financial aspects, the type of urban development, social and economic activities, etc. It also seems that arrangements should be made, enabling the public to put forth its viewpoint and participate in planning.

Ten or so years ago, an OECD study mentioned in an ECMT report on the safety of elderly persons in traffic [CEMT/CM(91)15] stressed that any future traffic planning had to take into account the population groups who had most difficulty in coping with the increasingly complex road traffic situation. These ideas are still topical and are relevant to the more general issue of pedestrian safety.

To identify locally the weak points of the road network from the safety standpoint, and reduce their number in order to remedy the road safety problems that we find in urban areas in particular -- whether they are connected with inadequacy of the infrastructure or equipment or to shortcomings in the organisation of trips -- it is essential to have the most accurate picture possible of the accident record. This picture is provided by the road safety indicators (statistics, accident parameters) described in Section 2 of this chapter.

The studies carried out in this field are divided into two phases. The first consists of examining the situation and calling into question certain existing infrastructures and equipment, on the basis of concrete case studies, to then be able to make general recommendations. The second, concerned with the longer term, should make it possible to define a set of principles on the subject, based on studies in greater depth.

To sum up, the measures which improve road safety obey the following four broad principles:

- Reduce vehicle speeds.
- Ensure “driver/pedestrian” visibility.
- Reduce the length of the path the pedestrian has to take to cross the road.
- Do not create exaggerated constraints that the pedestrian may not respect.

These considerations were also taken into account in the Report on consistency between infrastructure, road traffic and road signs and in the respective Recommendations [document CEMT/CM(94)5].

This amounts to seeing the street through the pedestrian’s eyes, enabling the various means of locomotion to co-exist and taking into account the users’ needs in terms of transport, safety and the living environment.

Development of infrastructure for pedestrians

Pedestrian crossings should allow users to cross the roadway in safety. They cannot therefore be considered simply as a road marking, but as a traffic guidance component forming part of a whole. In other words their location and layout must always be integrated with the planning, design and construction of the road as a whole. The basic principles of traffic engineering should therefore be respected, i.e. those already stated in the report on the technical possibilities of improving safety on pedestrian crossings [CEMT/CM(85)6]: quality and maintenance must have precedence over the number of crossings, the choice of their location will be determined by the path that pedestrians prefer to take, and their design must depend on the type of road and the volume of vehicles and pedestrians.

Moreover, the utmost importance should be attached to visibility, since drivers have to be able to see at the same time the zebra crossing itself and any pedestrians waiting to cross or already on the crossing, so that they can give them priority and stop if necessary. As for pedestrians, they must be able to see oncoming vehicles at a sufficient distance if they are to cross safely. For this reason, the position of the crossing should be carefully planned and, in the area leading to the crossing, there should be nothing to interfere with visibility, such as cars parked in non-parking areas, containers,

flower tubs, shrubs on the pavement near the roadway, hoardings, etc. Lastly, at night, the lighting system should show up the crossing, or where necessary be improved for this purpose. "See and be seen" is the motto.

As noted in the preceding section:

Pedestrian subways and footbridges are costly solutions which involve considerable construction work, and are sometimes ignored by the public because of the unattractive access, inadequate lighting, the risk of being attacked or the lack of cleanliness. But they must not be rejected out of hand, for a subway or footbridge is justified where a large number of pedestrians have to cross a road with dense, fast-moving traffic. In such cases, people with reduced mobility should be taken into account by providing ramps for wheelchairs and pushchairs.

Although the number of accidents involving pedestrians **outside built-up areas** is lower than in an urban environment, they are of a more serious kind, so that it is extremely important to ensure that appropriate infrastructure is also provided in this case too. Basically the aim is to provide near the roads used by pedestrians paths that are separated from the roadway, build verges, remove obstacles to visibility, and eliminate accident black spots, which usually occur when the infrastructure design is not adapted to a specific danger point.

Speed moderation in built-up areas

Although at one time planning principles were based mainly on the separation of user groups and traffic flows, a different approach is taken today; where it is possible and appropriate, the objective in most countries is to review road sharing techniques and integrate the different traffic flows. This can be done in particular by moderating vehicle speeds, which simultaneously reduces the number and seriousness of accidents, improves the living environment and may attenuate disturbance.

To implement the integration principle, urban areas must be replanned, and speeds must be adapted to the areas in which some road users protected by their vehicle structure and other more vulnerable users co-exist, so that a safer mix of traffic is achieved [see Recommendations on speed moderation adopted by the Council of Ministers in Budapest on 29 and 30 May 1996; CEMT/CM(96)11/Final]. The aim is also to define a policy for the organisation of traffic depending on whether roads are to be used, for example, as transit roads, roads on which a balance has to be achieved between the traffic flow and local life, and roads on which the latter aspect has precedence.

Very often the sections located between the road into a town and the dense built-up area have to be redesigned in order to accentuate the visual break between the open countryside and the town (gate effect) and obtain the desired effect on driver behaviour. This can be done by means of various specific modifications, by narrowing the roadway or using surface markings, as well as by introducing a system which has been increasingly successful in many European countries for some years now:

Roundabouts: The use of these roundabout intersections and their design rules differ, however, from one country to another and are modified as experience is acquired. Greater importance must be attached to their planning, design and construction in order to improve road safety and make the most of the accident prevention potential provided by this type of facility. Although this kind of infrastructure is not specifically designed to improve pedestrian safety, it still contributes to speed moderation by encouraging drivers to slow down within built-up areas, which is quite obviously to the benefit of pedestrians.

In many countries the authorities are banking on:

The "30 zones", a system in which the main objective is to improve road safety and improve the residential environment by moderating speed. For this purpose, it is usually not sufficient to place traffic signs at the start of a zone, as experience has shown that "30 zones" set up without any support in terms of infrastructure or traffic management (roadway narrowing, heightened sections, priority to the right) are not satisfactory, since there was no consistency between infrastructure and the speed restriction which was then difficult for drivers to take seriously.

In addition, the roads within a future "30 zone" should be homogeneous with regard to their function, their use and their importance within the network and the image they present. The perimeter of the "30 zone" should be clearly defined from the standpoint of the residential structure so that the road user can identify the layout of the zone and perceive it as an area forming a unit. Provided that the "30 zones" are well designed, they undoubtedly contribute to increased pedestrian safety.

The **residential streets or zones**, where the breakdown of space is different. It is a specially designed mixed traffic area which is mainly intended for pedestrians and in which special traffic rules apply, such as priority for pedestrians and a speed limit of 20 km/h. It should be designed in such a way that it suggests restraint and distinctiveness, so that drivers are bound to be careful and keep to the authorised speed limit.

The **pedestrian areas** which, as their name suggests, are restricted to pedestrians, although a limited amount of vehicle traffic is sometimes tolerated, due to specific provisions. In these areas vehicles must be driven at walking speed and give pedestrians priority. The creation of pedestrian areas is an innovation which is tending to spread, particularly in the historical centres of our cities, whose image is thereby enhanced. But a reduction in traffic in one area may result in a transfer of traffic to adjacent districts; the necessary organisational, management and safety measures should therefore be taken in these districts.

In some countries, a 40 km per hour speed limit is applied where pedestrian traffic is high, therefore risky, and where the surroundings favour such a measure, for instance in shopping centres within the city.

Safety action and improvements

... in school zones

Contrary to popular belief, the great majority of accidents involving school children do not occur as children come out of school, but on the trip between home and school. The aim is therefore to make the school zone (a radius of 300m around the school) safer, and to pay special attention to the routes taken by school children when new schools are planned and existing schools are to be modified. The object of planning school children's routes is to increase road safety by identifying the movement pattern and making special technical improvements to infrastructure and traffic signs, and should be carried out with the participation of the children themselves and/or their parents.

The roadway modifications recommended for school zones are based on three principles: reducing vehicle speeds, guaranteeing good pedestrian/driver visibility and reducing the width of the lanes to be crossed in one go.

Moreover, special attention should be given to the layout of school bus stops. The principles defined in an ECMT Resolution on school transport are still relevant today. In short, the aim is to provide boarding and alighting areas that are protected and indicated, safe and clearly marked pedestrian paths, and parking space for the private cars of people accompanying children to and from school, and to ensure that the area around the school is designed in such way that the children need not cross a road.

... for the benefit of the elderly and people with reduced mobility

As the proportion of the elderly is constantly increasing in our industrialised societies, the aim is more than ever to take into account this category of the population. In the road and urban environment planning phase, it is in particular necessary to consider the trips they have to make, the kind of difficulties they encounter in traffic and the decline in their physical fitness, so that their problems with road traffic can be reduced and their mobility enhanced.

The principles adopted in most countries are thus to reduce speeds in residential and shopping areas that attract many elderly pedestrians and people with reduced mobility, to plan sufficiently long crossing times for pedestrian crossings with traffic lights, to provide for safe and easy access to bus stops, etc. [Cf. ECMT Resolution on improving road safety for the elderly in CEMT/CM(91)15].

3.3 A vehicle problem

Discussing the relationship between the pedestrian and the vehicle leads to the following two issues:

- Firstly, active or passive perception of the other party or the ability to see and be seen on the part of both pedestrians and vehicles is becoming the main factor in the prevention of accidents involving pedestrians.

- Secondly, as a complementary measure, the use of design features to produce vehicles that will inflict less bodily damage on pedestrians in the event of an accident.

Accident prevention: perceiving the other party

The pedestrian must be seen by the driver and the vehicle by the pedestrian.

Pedestrians must use luminous or retro-reflective devices between dusk and dawn when visibility is reduced. Similarly, wearing coloured clothing or carrying objects contrasting with the surrounding colours must be encouraged since their effectiveness in accident prevention has been proved.

Action has been taken and campaigns have been conducted in many Member countries to make vulnerable users realise that it is in their interest to use luminous or retro-reflecting devices. Some countries have even made them mandatory. An example of the action taken to bring home to vulnerable users the risks to which they are exposed is also given by the Commission of the European Union, which has proposed a code of conduct for the wearing of light-coloured or retro-reflective clothing, as part of its Programme for the Promotion of Road Safety in the European Union 1997-2001 [COM(97)131 Final]. The message is particularly intended for the elderly for whom the probability of being involved in a road accident as a pedestrian is very high.

It would also be desirable if these devices were integrated from the outset in the design and manufacture of such clothing and equipment, especially if it is to be worn or used by children.

Such devices should also be standardised.

However, the pedestrian must also be able to see the vehicle. On this subject, certain measures should be pointed out, such as the use of dipped headlights by day. The countries which have adopted this measure are satisfied with it. Poland, Hungary and some Scandinavian countries have assessed its positive effects.

In other countries, there is some opposition to the measure. It has, however, been taken for certain categories of vehicles. In France, since 1975, motorcycles must use dipped headlights by day. In Spain, for example, the measure was introduced for motorbikes and two-wheelers in 1981. Since 1992 it has been in force for all vehicles travelling on two-way roads or lanes.

Studying the possibility of making the use of dipped headlights compulsory for all vehicles seems, at the very least, desirable.

Moreover, when certain types of vehicles are manoeuvring, particularly in reverse, and the driver has only a limited field of vision to the rear of his vehicle, the use of a specific and standardised type of horn can make it easier for the pedestrian to understand what the vehicle is doing.

Rear mirrors that are designed and positioned so that the sides of the vehicle can be seen as well as the traffic coming from behind are also an additional safety factor.

In addition, car windows should be designed with a view to ensure that the pedestrian can, on any occasion, see the driver.

Although such systems exist and are coming into general use on heavy, long vehicles, it should be considered how useful they might also be for lighter vehicles.

Vehicle shapes that are less damaging to pedestrians and thus reduce the seriousness of accidents

The authorities and vehicle manufacturers are making a determined effort in the research field to reduce the seriousness of injuries to pedestrians by modifying vehicle shapes.

Since 75 per cent of pedestrian accidents involve head-on collisions, the front parts of the vehicle are targeted by most of the measures aimed at reducing the seriousness of injuries. These measures apply simultaneously to the vehicle's shape and size as well as to its structure and the materials used.

The research method involves the reconstitution of accidents in a laboratory, often with the use of sophisticated anthropomorphic dummies making it possible to record accurately various parameters such as accelerations, deformations, forces, etc.

This research work has shown that, statistically speaking, the most frequent injuries are to the vital parts of the pedestrian's body (in particular the head) which are struck by certain very specific parts of the vehicle. By modifying them, if only very slightly, the consequences of an accident can be greatly reduced. The aim is therefore to eliminate sharp edges and frontal profiles that are too prominent. Moreover, this same research has highlighted the necessity of having a certain distance

between the bonnet on the one hand and mechanical components and parts of the chassis on the other, which permits free deformation of the bonnet in the event of impact.

For instance, the presence of bull-bars on vehicles involved in general traffic and not in forest or agricultural work can be very dangerous for pedestrians and cause very serious lesions.

The elasticity and deformation of the materials used in the manufacture of vehicles is also of great importance. A more deformable material absorbs more energy than another more rigid material, but a material that is too deformable absorbs little energy.

Such work requires the use of advanced technology, and the economic costs are very high for both the research phase and the production launch of new models. The active participation of all the parties concerned, including the authorities and manufacturers, is therefore required.

In its Programme for the Promotion of Road Safety in the European Union 1997-2001, the Commission of the European Union bases itself on the very high cost of accidents, which is estimated at ECU 1 million per accident with a fatality (Conclusions of COST 313, 1993), and proposes a wider appraisal than the mere cost/benefit ratio, which undoubtedly justifies a substantial increase in investment in this field. The Programme includes the submission in 1998 of a draft Directive on the approval of the vehicle frontal profiles which are the least dangerous for pedestrians.

3.4 A problem of user behaviour

As we pointed out at the start of this paper, the aspects briefly enumerated below take into account not only pedestrians in all their diversity but also the behaviour of drivers vis-à-vis pedestrians.

Education and training

The teaching of road safety in schools is undeniably given considerable attention by Member countries. The importance of this teaching has also been stressed in international conferences[1].

The latest recommendations on the subject [cf. CEMT/CM(94)6] stress:

- the integration of road safety education into the general ethical concepts underlying a responsible and positive attitude in everyday life;
- the importance of the actors in this training, in particular teachers and parents, but also the public sector, enterprises and the media;
- the active involvement of young people in the running of the educational programme.

The orientations stressed in these latest recommendations go in the direction of this report, especially the aspects connected with harmony (positive attitude) and responsibility.

The integrated approach to road safety education, involving not only the immediate actors but other public and private partners in this task is likely to increase the resources employed and to lead to raised awareness of the role of all concerned.

1. Cf. in particular the joint Council of Europe - ECMT conferences on awareness raising and education of children and adolescents on road safety problems.

In addition, it is essential that the young people concerned should participate actively in this action, which will enable them to better understand the difficulties encountered and also, on the basis of their own experience and their own understanding, to optimise road safety education. This aspect of the matter is also essential in the field of infrastructure improvement (in the vicinity of the school and on the way to school), as previously considered.

Lastly, the young person as a road user is sometimes a pedestrian, sometimes a driver. Instilling a positive convivial and responsible attitude is essential, and fits into the general philosophy of this report.

In the case of adults, road safety training and education -- in the strict sense -- is generally abandoned in favour of awareness raising. However, at the place of work there are opportunities for continuing the training and education aspects. This possibility is still very little exploited and needs to be examined in a more dynamic and systematic way. This same applies for old people, who could be reached through group activity, for example. We would also stress here, in the context of the family, the very positive role older people could play vis-à-vis the children.

Awareness raising

While all Member countries endeavour to make the public more aware of road safety, the resources committed and the intensity of the effort vary greatly from one country to another. It is in fact sometimes very difficult to obtain appropriate and sufficient resources for this awareness raising effort.

While the citizen admits the importance of the subject of road safety -- at least this is what the surveys seem to show -- it does not yet mobilise him sufficiently as compared with other societal issues. In the case of pedestrians, pedestrian/driver duality should not be overlooked and the message should therefore be correctly targeted.

This awareness raising take many forms: traditional, via the media, in particular via the schools, but it is still too embryonic in the enterprise or retirement homes, for example.

As in the case of the approach encouraged in training, it is necessary to have a very broad view of awareness raising. Certain experiments developed along these lines -- in the form of a safety "contract" -- indicate that there can be a real interest, and they have the advantage of making the intermediary participate in the awareness raising action. One not very positive aspect of general awareness raising is its passive nature, as the target is simply the recipient of the message. However, with regard to awareness raising for pedestrians or the problems encountered by pedestrians, actions at local level or targeted actions make it easier for the people concerned to take an active part in this awareness raising.

It is not only important to raise the awareness among car users of road safety problems and the needs of vulnerable road users, especially pedestrians. It is also of the greatest importance to raise the awareness of those responsible for road transports, business and work travels, such as public authorities, agencies, companies, trade and industry. It ought to be of interest and to be the responsibility of the leadership in each authority and company to ensure the safety of their transports by integrating safety demands into the planning of transports that are carried out by the company itself and into the contracts when purchasing commercial road transports. Such safety demands can be that the speed limits should not be exceeded and that the safety for pedestrians is given the first priority when passing a pedestrian crossing.

The methods used in this awareness raising are nowadays many and varied. The message may even be diffused in the form of a device that can be used by the pedestrian in traffic (see above: See and be seen). Experience also shows that identification with a character having a positive and attractive attitude also works very well. This was highlighted particularly at the ECMT seminar on communication in road safety held in Warsaw in October 1997.

Lastly, this awareness raising should not simply project an image of the pedestrian as a vulnerable road user, but first and foremost an image of the pedestrian as an actor in his own right.

Traffic rules and road signs and signals

The work already carried out on improving pedestrian safety leads us to reconsider the status of the pedestrian in road traffic and the harmony which must prevail between road users.

The reflections of this Group have in fact led it to propose an important modification of the rules governing the behaviour of drivers vis-à-vis pedestrians, obliging drivers not only to permit pedestrians to cross once they are engaged upon a pedestrian crossing which is not protected (by traffic lights or a police officer) but also to act similarly once the pedestrian clearly intends to cross at such a crossing.

Moreover, thought should be given to the arsenal of signs available to suit new practices in the field of traffic management. For example, ad hoc positive signals to indicate pedestrian streets and the recognition of a status for the said streets as has been done for residential zones. One of the roles of these instruments is to provide the managers of the road network with appropriate regulatory tools to define the status of the different infrastructures.

On-board medical equipment

Although the survey for the preparation of this report did not include this issue, it would appear that in several countries the number of accident survivors who die within 30 days of the accident has tended to fall significantly. This observation also applies to pedestrians.

One of the factors which may explain this trend would seem to be the increasingly sophisticated medical equipment on board emergency service vehicles and the continually increasing practical experience of the personnel.

Objective liability or liability without fault

Compensation for injury to pedestrians and cyclists is in various countries the subject of specific provisions regarding compulsory civil liability insurance.

The principle is that the damages resulting from the injury or death of pedestrians or cyclists should be paid “automatically” except in certain circumstances, such as wilful negligence by adults.

The justification for this concept is due to the obvious inequality in a practical situation between pedestrians and cyclists on the one hand and car drivers on the other. In the event of an accident, the pedestrian or cyclist will be systematically compensated, subject to certain conditions, without the driver necessarily being at fault.

Monitoring observance of the traffic rules

It is very difficult to obtain a relatively precise and above all objective view of the extent to which traffic rules are respected by pedestrians. Behaviour varies from one country and even from one situation to another. For example, a pedestrian will be more attentive to traffic lights when traffic is dense. Generally speaking, it must be admitted that, in many Member countries, the pedestrian is still too negligent about traffic rules.

It should be pointed out that the monitoring of the observance by pedestrians of traffic rules various greatly in its strictness and is often of marginal concern to the police. But such monitoring should have a direct impact on behaviour and road safety and not be seen simply in its coercive light. In any case, how is it possible to assess the effect of new rules without a monitoring process?

Although the pedestrian is perfectly entitled to his place in traffic, he must take into account the place of the car driver.

Surveillance of the respect of traffic rules by pedestrians and of the behaviour of drivers vis-à-vis pedestrians constitutes one of the components of a road safety policy and, in the present case, a not unimportant aspect of a new policy in favour of pedestrians.

We must therefore not forget the efforts that need to be made in this field.

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Promoting an integrated policy for the benefit of pedestrians also requires wider action, particularly with regard to the means of locomotion. Without going into detail on the measures which could be considered since the focus of this report is on pedestrian safety, the need for a change in attitudes must, however, be stressed.

Supporting measures must be taken in this context by the authorities, enterprises and citizen groups.

Chapter III

MOPED RIDERS AND MOTORCYCLISTS

I. INTRODUCTION

Like cyclists, moped riders and motorcyclists are particularly vulnerable road users for they have no outer protective shield and their visibility to other road users is reduced. In addition, the drivers of other vehicles do not make enough allowance for them. But although the two categories of vehicles concerned -- mopeds and motorcycles -- are similar as regards their design (motorised two-wheelers) and their greater exposure to traffic hazards, their engine powers are quite different, as is their use. The differences in the numbers of these two types of vehicle, in the possibilities of access to their use and, in the causes of accidents are such that it seemed preferable to discuss these two types of users separately in this chapter.

Moreover, this chapter refers only to two-wheeled mopeds and motorcycles.

For the sake of consistency with the structure that has become the norm over the years, this chapter is divided into the following sections: present situation (legal and statistical framework), vehicles, infrastructure and road users.

In order to obtain a more accurate picture of the statistics and of the regulations on the instruction and testing of moped riders and motorcyclists and the traffic rules applicable to them, a questionnaire was circulated to ECMT Member countries [CEMT/CS/SR(97)7] and forms the basis of this report. Other sources used include the International Driving Test Committee (IDTC) list and, for vehicle and population censuses, the publications of the United Nations.

2. PRESENT SITUATION

Tables 1 and 2 in the Annex give an overview of accident statistics for the two categories of road users studied hereafter compared with total road users. Although the severity of the problem varies from one country to another, principally depending on the numbers of these vehicles, an alarming percentage of all road accident casualties are nevertheless motorcyclists or moped riders (13 per cent for ECMT Member countries overall). Indeed, of all the users covered in this series, these two categories of road users have the highest number of accident casualties.

2.1 General framework

Mopeds

The statistics for the use and safety of mopeds are quite poor. In many countries, data are not always available or series are often incomplete. Sometimes the statistics refer to motorised two-wheelers as a whole, irrespective of the type (cf. Table 9 and following tables in the Annex).

A problem of definitions

According to the Vienna Convention "moped" means any two-wheeled or three-wheeled vehicle which is fitted with an internal combustion engine having a cylinder capacity not exceeding 50 cc and a maximum design speed not exceeding 50 km (30 miles) an hour.

According to European Directive 92/61 of 30/06/92, mopeds are two or three-wheeled vehicles fitted with an engine having a cylinder capacity not exceeding 50 cc if of the internal combustion type and a maximum design speed of not more than 45 km/h.

Some countries have only one type of moped with a maximum speed of between 45 km/h and 50 km/h. Other countries have two types of mopeds: slow mopeds with a maximum speed of 25 km/h (Belgium, Germany, Netherlands) or 30 km/h (Denmark, Sweden) and fast mopeds with a maximum design speed of between 40 and 50 km/h. In Switzerland, where some mopeds are classed as light motorcycles under the terms of the European Directive there is only one category: slow mopeds with a maximum design speed of 30 km/h.

The term *moped* in fact covers different types of vehicles which have various kinds of equipment and are not used subject to the same regulations in all countries. A consistent definition of this category of vehicles at international level would be extremely useful for the purposes of establishing more uniform manufacturing standards.

Moped numbers

The moped is the first step in private motorised transport.

In Western Europe, Italy has the highest number of mopeds per thousand inhabitants, with over 60. Then comes Spain with over 50. In Switzerland and Austria, the figure is slightly under 50, while in France, the Netherlands and Belgium, it is close on 30. In Germany, the United Kingdom, Denmark, Norway and Finland, the proportion is around 20 per thousand. Sweden has the lowest figure, with slightly over 10 mopeds per thousand inhabitants (see Table 8).

Of the countries with a category of slow mopeds, Switzerland and Denmark are those which have many more slow mopeds than fast mopeds. In Germany and the Netherlands, the opposite is true. Belgium does not distinguish between slow and fast mopeds. In Sweden, there are only slow mopeds.

In the central and eastern European countries, only the census data for Bulgaria and the Slovak Republic are known: over 30 mopeds per thousand inhabitants in the first case, and 15 per thousand in the second.

The figures given above are the latest available. The data may vary considerably from one year to another. It is also to be noted that, over a long period, the number of mopeds has fallen in almost every country. This is the case in the United Kingdom, where a decrease of 75 per cent can be seen. In Germany, there has been scarcely any change in fleet size, but the proportions have been reversed now that there is a far higher number of fast than slow mopeds.

With the exception of Germany and Sweden, mopeds always outnumber motorcycles in western countries. When the number of mopeds in a particular country is low or high compared with other countries, the same generally applies to the number of motorcycles.

From the above figures two conclusions can be drawn: first, the size of the moped fleet varies widely; second, there is general evidence of a substantial decline in every country of Western Europe in the last twenty years. The variation in the number of mopeds can be attributed to several factors: weather, geography, but also the economic development of individual countries and the regulations on the minimum age limit for driving mopeds, motorcycles and cars.

Use of mopeds

Although in many countries this means of transport is mainly used by youngsters from age 16 or even 14 (13 in Poland and 12 in Lithuania), it is also used extensively by adults in others. However, it is most widespread in urban areas, whether for private or professional purposes. In some countries, it is also the mode of transport most used by delivery staff and messengers in town and has grown enormously as a result of changes in lifestyle. Scooter-type mopeds are the vehicles used most often for these purposes.

Roads unsafe for moped riders

This category of vulnerable users has been somewhat neglected in research at international level and has benefited but little from recent safety gains. The country breakdown for the number of studies conducted in this field shows that the Netherlands is in the lead, followed by France, Germany, the United Kingdom, Switzerland and Belgium.

On the basis of total casualties in 1995, the proportion of moped riders involved is 19.5 per cent in the Netherlands, 16 per cent in Greece, 12.5 per cent in Spain and 10.8 per cent in France as shown in Table 12.

Studies conducted in different countries in Europe, whose synthesis was produced in an INRETS report published in 1996, all showed that age was a strong contributing factor. In France, for instance, the risk of being injured in a moped accident is seven times higher than in the case of private cars; a moped rider is five times as likely to be killed than a car driver; lastly, the risk of injury to a moped rider is slightly lower than for a motorcyclist but ten times greater than for a car driver. Adolescents (aged 14 to 19) are the main casualties in terms of both fatalities and injuries and run the greatest risk of a serious accident on the basis of mileage. Tables 10 and 11 show that up to 50 per cent of fatalities and 60 per cent of the injured are in this age bracket. The number of fatalities is also higher among the elderly, who are more vulnerable to traumas. The risk factor varies also substantially with the country and age group concerned.

In the case of accidents where the rider is at fault, the studies clearly show that the causes are a frequent tendency to take risks, insufficient control of the vehicle, non-observance of signs and

signals and manoeuvres carried out without warning. The carelessness of other users, in particular car drivers, is also highlighted.

In situations involving risks, moped riders are over-represented:

- in accidents at intersections where the rider is going straight ahead or turning left. Those mainly concerned are youngsters or elderly people in the kind of scenario with which they are most often confronted (left turn in an urban area). Table 13 shows the high percentage of accidents in an urban environment compared with that on open country roads;

- in accidents involving another vehicle on an uninterrupted stretch of secondary road, which are associated with lack of experience and point to a certain tendency among moped riders to take risks, as well as the failure by other drivers, in particular car drivers, to keep their eyes open.

Lastly, in addition to the rider's age as a risk factor in moped accidents, there are also technical alterations to the vehicle after purchase. Studies carried out in the Netherlands show that, in the 16-17 age group, the risk of a serious accident per 1 million kilometres travelled is five times higher with a moped which has been "souped up" or tampered with than with a standard moped.

Motorcycles

A problem of definitions

According to the Vienna Convention, *"a motorcycle means any two-wheeled vehicle, with or without sidecar, which is equipped with a propelling engine... Three-wheeled vehicles whose unladen mass does not exceed 400 kg can be classified as motorcycles."*

According to Directive 92/61 of 30.6.1992, "*motorcycles are two-wheeled vehicles with or without sidecar, fitted with an engine having a cylinder capacity of more than 50 cc if of the internal combustion type and/or having a maximum design speed of more than 45 km/h."*

Apart from the legal problems that arise from having two definitions, the resulting regulations on the minimum age for driving – which is generally lower for "light" motorcycles without a special licence being necessarily a requirement – prompt manufacturers to design vehicles that can artificially be included in either motorcycle category: "light" motorcycles with an engine capacity of up to 125 cc, as opposed to "heavy" motorcycles machines with a higher engine capacity.

Motorcycle fleet

In this category, it is Switzerland that, with almost 50 vehicles per thousand inhabitants, has the largest fleet in Western Europe. This can be explained by the definition of motorcycle used in this country. Then comes Italy with more than 40 motorcycles per thousand inhabitants, followed by Spain with more than 30 and Austria, Germany, the Netherlands, Belgium and Luxembourg with over 20 per thousand. In the United Kingdom, Denmark, Norway, Sweden and Finland, the figure is around 10 per thousand.

In the central and eastern European countries the number of motorcycles per thousand inhabitants is generally high, at between 40 and 60 per thousand. Only Hungary is an exception, with 15 per thousand.

Where the number of light motorcycles has been specified, it is almost invariably lower than that for standard motorcycles. The Slovak Republic is the only country where the proportion of light motorcycles is substantially higher.

Over the long term, there has been an undoubted increase in the motorcycle fleet. This does not apply however to the United Kingdom, or to light motorcycles, except in Germany and France where there has been a sharp increase in their number. In Central and Eastern Europe, the motorcycle fleet has declined in four countries -- Poland, the Slovak Republic, Moldova and Hungary -- and increased in two countries, Bulgaria and Belarus.

Lastly, with the exception of Germany and Sweden, the number of mopeds still exceeds the number of motorcycles. When the number of mopeds in a given country is low or high compared with other countries, the same generally applies to the number of motorcycles.

Use of motorcycles

Motorcycles vary greatly in terms of type and use: some riders use only this means of transport which has become a passion or even a way of life, as these users ride in all weathers over the entire road network. Others see it as a "second" vehicle enabling them to move around town more easily or cover short distances between their home and place of work, weather permitting. The number of motorcycles in use therefore rises in this second category in summer.

Lastly, in some countries, both user categories – average age, social status – and types of motorcycle – powerful or very powerful – have changed in recent years. This is due to several factors, chiefly a higher standard of living and a choice of less powerful motorised transport for the "young".

Roads unsafe for motorcycles

Although motorcycle safety has improved in recent years in most countries, the toll for this category of users is still too heavy (see Tables 1 and 2). As shown in Table 2, the proportion of motorcycle casualties compared with total casualties ranged from 1.1 per cent (Romania) to 18.9 per cent (Greece). On average, it is 7 per cent in most Member countries.

The 20-34 age bracket is the most seriously affected, as shown by Tables 17 and 18. Men are over-represented, especially as drivers (cf. Table 19).

The factors that most influence the accident rate are: the difficulty in maintaining balance on two-wheelers; the age and experience of the driver; the small numbers of road users of this type (other users do not pay as much attention to them); the lack of protective shielding; the flexibility of use (weaving in and out through traffic). These factors relate to the motorcyclist, the circumstances of the accident or exposure to risk.

Also, although powerful motorcycles are involved more often in accidents, the fact should be taken into account that their annual mileage rises with cylinder capacity.

2.2 International overview of regulations governing instruction and examination

The distinction between "slow" and "fast" is based on different criteria in different countries; moreover not all countries make a distinction (see Tables 14, 15 and 21 and 22).

Moped

"Slow" mopeds

The regulations governing the riding of slow mopeds vary a great deal from one country to another (cf. Table 14). For instance in Belgium the minimum age is 16 while in Sweden the minimum age is 15. Germany applies a minimum age limit of 15, but makes only the theoretical and practical examinations compulsory. In Denmark, instruction and examination only applies for 16 and 17 old riders. The Netherlands and Switzerland apply minimum ages of 16 and 14 and an obligatory theoretical examination. Moreover, in general, people with car or motorcycle driving licences may, ipso facto, also ride slow mopeds.

"Fast" mopeds

In 12 countries, the minimum age for riding a fast moped is 16. Only Denmark has a higher minimum age of 18. Lithuania applies the lowest minimum age of 12 -- without compulsory instruction or examination. Six countries have compulsory instruction and theoretical and practical examinations. Six countries have just compulsory theoretical and practical examinations. In United Kingdom and Belgium, learners may practise for the examination if they have a learner's licence. In Belgium, they may choose between a learner's licence and a compulsory course of instruction, and the learner's licence is valid for ten months only. In United Kingdom, a learner's licence may be obtained after a basic instruction course; the licence is valid for three years, after which the whole process may be repeated.

The compulsory examination is limited to theory in five countries: Austria, the Netherlands, Spain, Latvia and Luxembourg.

In some countries the requirements of instruction and/or examination do not apply to holders of a car or motorcycle licence (United Kingdom, Netherlands, Slovak Republic). Other countries only require instruction and/or examination for young moped riders. France, Spain and Portugal have a minimum age of 14 with compulsory instruction and/or examination, but no restriction from age 16.

Apart from a minimum age, Finland, Lithuania, and Belarus apply no further restrictions to the riding of mopeds.

Motorcycles

Historically, most ECMT Member countries opted for a distinction based on motorcycle engine capacity for the purposes of establishing minimum age limits. Recently, European Union member states have adopted new age limit regulations, which are based on engine power, 25kW, and the vehicle weight/power ratio, 0.16 kW per kg, rather than on engine capacity. Between the ages of 18 and 21, the rider must already have at least two years driving experience to drive a motorcycle of over

25 kW. From the age of 21, anyone with a motorcycle driving licence may ride more powerful motorcycles with a higher cc. However, the European regulations allow for exceptions.

Some countries outside the European Union have opted for one of the above distinctions, others do not apply either in determining the minimum driving age (see Tables 14 and 22).

Whatever the option selected, the objective of the countries that have adopted an incremental system is to promote safer driver behaviour by delivering licences for progressively more powerful vehicles in stages.

Consequently, it is necessary to ensure that the different ages and the vehicles that are actually accessible to riders at different stages of instruction are really appropriate.

Clearly instruction needs to be properly geared to the type of driving expected and the vehicles concerned, whatever the distinctions used. Evaluation of the system of instruction implemented should continue to establish whether it is valid and to improve it. Owing to the high rate of serious accidents involving new drivers, a recommendation aimed at monitoring their progress once they are on the roads would be particularly useful.

3. THE VEHICLES

3.1 A necessary clarification enabling more effective design rules to be defined

In view of the problems with definitions discussed in Chapter II, the Convention on Road Traffic should be closely adapted to certain realities.

The purpose is not purely formal since the aim is, on the basis of this classification, to define design standards prior to vehicle approval that meet safety imperatives in compliance with the highest common denominator with regard to both active and passive safety (vehicle structure, brake lights, etc.).

The heterogeneity of these categories of vehicles is also to be taken into account with regard to approval standards[1].

For example, what is known as a scooter and can also be classified as a moped or motorcycle depending on its cylinder capacity and maximum speed will, because of its shape, behave quite differently in an accident from the conventional moped or motorcycle. Many examples of this kind can be given.

1. Cf. Council Directive 92/61 relating to the type-approval of two or three-wheel motor vehicles and Directive 97/24 on certain components and characteristics of two or three-wheel motor vehicles.

3.2 A recurrent problem: vehicles that are tampered with and souped up

The practice of tampering with mopeds is particularly widespread. In this area some countries have drawn up a specific array of regulations opposing this practice, without always obtaining the expected results.

It is undoubtedly in the vehicle design phase that the most effective solution is to be found. Moreover, a European Union Directive aimed at preventing tampering that will be applicable from 2000 is expected to produce some results and thus to reinforce the measures that some EU member states have already introduced on their own initiative, although it will not resolve problems with the existing vehicle stock.

Tampering obviously has serious effects, for there is no point in drawing up rules of behaviour, particularly with regard to road positioning (see Section 5.1) if in reality the vehicles' speed characteristics are not what they should be. In such a case no credibility can be attached to the rules.

Tampering to increase speed has an effect on the vehicle itself, in particular on the brakes which are designed to cater for a certain maximum speed. Also, the behaviour of the driver is affected, once he finds himself in charge of a vehicle that is too fast and powerful and difficult to control.

The problem of souped-up motorcycles is not one of vehicle classification but of how suitable they are in terms of the on-the-road behaviour of the rider (lack of experience) with consequences that can easily be imagined.

3.3 Roadworthiness tests

The advisability of setting up roadworthiness tests for motorcycles has been frequently discussed.

For any vehicle, a roadworthiness test is a way of providing the driver with very useful information on the general condition of the vehicle and particularly on safety-related components. Consequently, the tests should in no way be regarded as a constraint. They are also a way of controlling not only the safety but also the pollution and noise caused by vehicles and, incidentally, of making the vehicle fleet more homogeneous (regular maintenance).

The same benefits can be expected with regard to motorcycles and, by a logical extension, to mopeds, although it would be advisable to phase in any such approach.

However, the technical aspects would have to be managed so as to ensure that the costs of testing are realistic for the testing bodies as well as the users. Testing at regular intervals is, moreover, essential if the objective is to be met.

3.4 Perspectives in technical development

The technical characteristics of vehicles are an extremely important field of investigation when safety measures for mopeds and motorcycles are under review. Research in this field should be stepped up and extended.

Studies have therefore been carried out to increase safety, especially as far as methods to reinforce leg protection are concerned. This research, up to now has not led to satisfactory solutions.

Tyres, which have a very strong effect on the behaviour of motorcycles, have been and continue to be an important topic of research and practical testing.

Although progress has been unquestionably made with regard to vehicle safety and particularly in the event of collisions between cars, more importance should however be attached, as far as car and lorry manufacturers are concerned, to collisions with "vulnerable users", including moped riders and motorcyclists.

4. INFRASTRUCTURE

In some countries mopeds are classified -- wholly or partly -- as bicycles with regard to road positioning. If this is not the case, they use the carriageway in the same way as motorcycles.

In both cases and particularly if these vehicles use the carriageway, it must be acknowledged that infrastructure is most often designed either for the drivers of "heavy" vehicles (cars, lorries, etc.) or for cyclists. Therefore, the problem of infrastructure should be reviewed with the specific characteristics of mopeds and motorcycles being taken into account.

4.1 Mopeds

A moped rider behaves in a quite special way in traffic. His maximum speed is relatively low in theory (25 to 50 km/h at most), but the facts are quite different. This is in particular due to the possibilities of tampering and souping. Moreover, his vehicle is compact as it takes up the same room as a bicycle, which enables the rider to weave in and out of car traffic.

Although the moped rider never or very seldom has certain difficulties encountered by cyclists (need to take a longer path, efforts to be made on slopes, etc.) since his vehicle is motorised, he still has to cope with problems of balance and the moped is very sensitive to the quality of the road surface.

Like any user of a two-wheeler, the moped rider is also at a disadvantage in bad weather (rain, cold…).

Lastly, since he can move around in traffic, he will tend to take risks and use parts of the road that are not suitable for a moped (by travelling close to a kerb, a gutter, etc.).

The co-existence of cyclists and moped riders on the same path -- the cycle track -- is frequently called into question in countries where such tracks exist. It is in fact made difficult by moped speeds combined with the fact that the riders are not subject to the same constraints as cyclists. However, a properly designed cycle track may prove more reassuring to users who are in a highly exposed position in general traffic.

An alternative is to vary the number of moped riders on cycle tracks depending on the quality of the track and/or by distinguishing between slow (25 or 30 km/h) and fast mopeds.[1]

A quality track for cyclists is also seen as such for moped riders. The following will be taken into account in particular:

- the track surface;
- the track width;
- junctions with the carriageway;
- the layout at intersections;
- signs and signals;
- lighting where appropriate;
- obstacles on the path;
- maintenance, including track practicability in winter.

Owing to the presence of mopeds on the carriageway, some aspects mainly concerning the moped rider's balance, should be stressed i.e.:

- pavement quality: ruts, potholes, grooves and surface dressing chipping are particularly dangerous;
- protruding transverse joints can also upset the rider's balance;
- road markings can be a real hazard for moped riders; the thickness of the paint and some thermoplastic markings may in time be so slippery that braking becomes hazardous. The same applies to areas where vehicles frequently stop (traffic lights) and where deposits form on the road surface.

4.2 Motorcycles

The motorcyclist finds it easier to adapt to general traffic owing to the vehicle's characteristics (power, braking system, usually more sophisticated technology), however he encounters the same difficulties as moped riders, which are at the same time magnified due to the speed of the vehicles concerned.

Some road surfaces are dangerous for motorcycles, in particular when they are wet. Especially significant are paving stones, rail tracks, manhole covers and road markings. In the absence of technical solutions to these problems (for example through non slip road markings) it is necessary to insist during driver training on the behaviour to be adopted (see Section 5.2).

Moreover, these difficulties can be even greater on high speed roads (motorways and expressways) to which motorcyclists but not moped riders have access.

The ruts, grooves and sharp protrusions on this network can be extremely dangerous, especially when wet, leaving little chance for drivers to escape unharmed. In the absence of direct countermeasures, at the minimum their presence should be indicated. Chipping may induce a reduction in grip and risks of falling.

1 . This issue was raised in the report on Cyclists (Chapter I, Section 4).

The particular problem of safety rails should also be mentioned; in the vast majority of cases of a problem with these rails, the consequences are very severe. The rail does not work as a mechanism to hold bad vehicles. Either it increases the risk of the driver and passenger being thrown off, or the driver and passenger are literally crushed into the rail.

Some road structures to reduce speed or moderate traffic may sometimes be dangerous, either for motorcyclists or moped riders, in particular when they are badly placed, badly or not signalled, not visible.

Therefore one should insist on the necessity for these structures to comply with construction standards taking into account the safety of all motorised users. It is also essential that these structures (reducing or raising the carriageway, flower pots, small posts…) can really be seen at night. The principle according to which road design should allow for certain kinds of mistakes is extremely relevant.

5. ROAD USERS

This Section is divided into two quite separate parts. The first part deals with the traffic rules applicable to road users. The second part deals with educating road users and making them more aware of the safety concerns of moped riders and motorcyclists.

5.1 Traffic rules

Moped riders: road positioning

The Convention on Road Signs and Signals gives Member States the possibility of also requiring moped riders to use the tracks reserved for cyclists.[1]

Some countries have used or still use this possibility. Others have adjusted this requirement[2]:

- by accepting slow mopeds (20 to 30 km/h) on cycle tracks;
- either by accepting riders of fast mopeds (45 km/h) on cycle tracks provided that the infrastructure allows them to co-exist on a reasonable basis with the cyclists, and/or that this solution provides greater safety;
- or by prohibiting the use of cycle tracks by fast mopeds (45 km/h);
- by adjusting the last two provisions depending on whether the location is in a built-up area or not.

1. See definition of signal D4 in the Convention.

2. See Table 15.

These median solutions between the strict requirement for moped riders to use or not to use cycle tracks are explained by the question of whether it is possible or not for moped riders and cyclists to co-exist.

The maximum speed of "slow mopeds" should permit this co-existence with cyclists owing to the speeds that are possible in both cases, which is not necessarily the case of "fast" mopeds that can move into traffic on the carriageway more easily owing to their maximum speed and the general speed limit in force in built-up areas for example (50 km/h or 60 km/h).

The debate on this subject is not, however, closed. The choice of road positioning for moped drivers should remain for the time being the responsibility of Member countries, for the facts concerning this type of locomotion and the extent of its use differ greatly from one country to another. The strategy to be adopted will be aimed at reconciling the optimal co-existence of cyclists and moped riders with the highest level of safety, particularly in order to prevent the major risks to which both are exposed at intersections.

A visibility and perception problem

Each of the categories discussed in the three-part report on vulnerable road users behaves in specific ways in traffic. Moped riders and motorcyclists are no exception to this rule.

Although efforts have been made with regard to safety and particularly on standardising safety equipment in line with the highest common denominator (see Section 4), car and lorry drivers seem to have the greatest difficulty in seeing moped riders, even motorcyclists, in time. Sometimes, they do not take any notice of their presence in traffic.

By day, it is proposed that the same rule on the use of lights by motorcycle drivers should be adopted for moped riders.[1] This requirement which is in force in some countries is quite well accepted and is well observed in practice. The technical characteristics of the present moped fleet are consistent with this requirement. Moreover, it has been proven that people react quicker to lights, and this would improve the visibility of motorised two-wheelers to other road users.

Passengers

The presence of passengers on mopeds and motorcycles is quite a problem as such (changes in balance, lengthened braking distances, vulnerability to wind…)

Some countries prohibit the carrying of a passenger or authorise it depending on the driver's age. The regulations are extremely heterogeneous. In the case of a very young passenger, it would probably be useful in many cases to supplement domestic legislation in order to guarantee greater safety through the compulsory use of approved seats.

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1. Article 32 of the Convention on Road Traffic:

   "*During the day, a motorcycle moving on the road shall display at least one passing lamp to the front and a red lamp to the rear. Domestic legislation may permit the use of daytime running lamps instead of passing lamps.*"

   Cf. document E/Conf.56/16Rev.1/Amend.1 of the Economic Commission for Europe.

Protection of the driver and the passenger

Although motorcycle drivers and passengers are in most cases required to wear a helmet, this requirement has apparently not yet been extended to all moped users. If a helmet is correctly worn, it is, however, is an essential safety device. Injuries to the head are among the most dangerous and their frequency is potentially high. It is therefore most desirable that all moped users and their passengers should be required to wear a helmet.

Apart from wearing a helmet, it is important to underline the importance of appropriate clothing (outfits, gloves, shoes) with stronger protection for the most vulnerable parts, of bright colours and of resistant material.

Overtaking and passing -- reminder

Drivers wrongly think that moped riders and motorcyclists do not need much room in traffic.

Apart from the fact that the driver of a motorised two-wheeler will tend to follow an optimal path, he will also try to avoid any defects on the carriageway surface by sudden manoeuvres.

He is also affected by the weather which is more or less of a handicap (wind, rain, etc.). Motorcycle power can partly offset these difficulties, but moped riders are more affected by them.

Therefore:

- the driver should leave a sufficient safety gap between his vehicle and the cycle or two-wheeled moped which it is overtaking or passing;
- when passing an oncoming two-wheeler, the motor vehicle driver should slow down if he cannot leave a sufficient safety gap and, if necessary, stop.

This was already mentioned when reporting on cyclists.[1]

A problem common to moped riders and motorcyclists: behaviour in a line of vehicles

In many regulations it is accepted that the moped rider or motorcyclist can overtake a stationary line of vehicles either on the left or the right, depending on the traffic direction. In some cases, domestic legislation even permits this practice when traffic has slowed down greatly.

The question of whether slow moped riders should be allowed to overtake a queue of moving vehicles on the right (on left, depending on the traffic direction) has been and remains controversial.

Some countries allow this and others forbid it. In any case, it should be forbidden, for driving safety reasons, for motorcycles and faster mopeds. In the same way, no motorised two-wheelers should be allowed to zigzag between cars.

1. Cf. Chapter I: Cyclists.

Checks on the observance of traffic rules

Although it is sometimes difficult to obtain an accurate picture of how intensive the checks by the police are in the case of "vulnerable road users", it is obvious that the checks on moped riders and motorcyclists are much more frequent than for cyclists and pedestrians.

In addition, these checks concern all the applicable rules, and in particular high-risk types of behaviour (excessive speeds, drink driving, etc.).

The impact of these checks on moped riders' and motorcyclists' behaviour does not seem, however, to be so effective as for other categories of drivers, in particular due to the extreme mobility of these vehicles combined with the excessive risks taken practically as a kind of game, by a small number of riders.

These circumstances show the extent to which it is necessary to implicate these road users into the drawing up and implementation of the different rules that concern them.

Moreover, in some Member countries, mopeds are not registered. Checks on these vehicles in traffic are therefore problematic. Their registration should in addition discourage theft.

5.2 Heightening the awareness of road users

Mopeds

The moped safety problem leads to the issue of the moped rider's behaviour and particularly that of the adolescent, who is the main user of this means of transport. It is therefore this impulsive youngster who is in a hurry and takes risks by riding dangerously without giving any warning about his intentions who, owing to his lack of experience, should be made to realise and control his behaviour.

Most accidents involving moped riders aged 14 to 18 are due to the risks taken, non-observance of traffic rules and, in general, to inattention. This negligence with regard to the rules is typical of adolescents who want to ride their mopeds with a minimum effort -- by not stopping, not getting off, taking the shortest and most direct path and leaving very small safety margins.

The safety of these young moped riders can be increased only by giving them proper training and making them more aware of their vulnerability so that they will be more careful and respect the rules when they are on the road.

Briefings on the dangers of riding two-wheelers should be integrated to a greater extent in school teaching programmes, which is also a means of introducing the young and future car driver to driving in traffic, respect of the highway code and road safety. For instance, the road safety certificate enabling a youngster in France to ride a moped as from age 14 is obtained after a theoretical exam, the first part of which is taken at 12 and the second at 14, at the time of the practical test. The two theoretical exams are held at school.

In the campaigns to heighten the awareness of this age group, youngsters must also be taught how important it is for both rider and passenger to wear a properly fitted and fastened helmet, irrespective of weather conditions.

As regards this category of young impressionable users, it is also important that manufacturers base their sales strategy on criteria that do not affect road safety.

Another special user category consists of messengers whose main concern is to arrive at their destination as quickly as possible. Firms are aware of this problem and are taking preventive action aimed at this group of employees. This kind of action should be publicised and must be stepped up.

Motorcycles

As in the case of moped riders and road users as a whole, motorcyclists must be made aware of the serious consequences of dangerous driving, and other road users, especially car drivers, of how vulnerable motorcyclists are.

Motorcyclists can be influenced by ad hoc campaigns, by insurance companies and at their place of work. They can also be informed by automobile clubs and associations and at major sports events for motorcyclists. In any preventive policy involving checks, the bodies representing these users must act in partnership with the authorities.

For instance, "staging posts for cool and calm motorcyclists" have existed in France since 1993. Under an agreement signed by the authorities and the French Motorcyclists' Protest Movement, staging posts are set up during major motorcycling sporting events on rest areas distributed throughout the road and motorway network, the aim being to combat fatigue and reduce the number of accidents during these migrations involving thousands of motorcyclists. These staging posts are an incentive for motorcyclists to be careful, and they provide the kind of services and setting which mean that the break is no longer seen simply as a necessity but also as a pleasure.

A national steering committee is responsible for ensuring that the original spirit of the staging posts is maintained and that the various kinds of action are consistent, as well as for promoting the operation at national and international level via a special national press report.

The risk factors specific to motorcyclists will have to be highlighted in communication campaigns: the fact that they are more vulnerable than car drivers owing to the lack of a protective structure, the bad practice of weaving in and out of traffic and often the passion for speed.

In addition to road users, infrastructure managers must also be made more aware of the problems specific to motorcycles. In France, for instance, a "Mr. or Mrs. Motorbike" network was set up in 1994. A "Mr. or Mrs. Motorbike" is appointed within the Ministry of Transport's Safety and Road Traffic Directorate and in each of this Ministry's Departmental Directorates.

These officials, who are aware of motorcyclists' problems and have preferably been motorcyclists or obtained their motorbike licence, are expected to serve as the motorcyclists' opposite numbers, to make the technical departments aware of their problems, and to propose and monitor the operation of specific safety programmes for motorcyclists. Motorcyclists can inform these officials about certain maintenance or minor construction problems (potholes, manholes, dips at the edge of carriageways, etc.) which have a greater effect on them than on car drivers.

This reporting method has, for example, made it possible to take practical action in some areas of great concern to motorcyclists: the improvement of metallic guard rails and speed-reducing devices and the replacement of carriageway markings that do not respect the adhesion characteristics required

for the approval of marking products. Motorcyclists' associations and the trade press can serve as intermediaries to develop this method of problem reporting.

Riding a moped or a motorcycle requires particular awareness of traffic problems and the greater risks involving these vehicles. If their users are to be seen as vulnerable, a special effort must also be made to impress the fact on other drivers.

For this reason, when anybody is learning to drive any type of vehicle, the best kinds of behaviour must be impressed on the beginner:

- the rider of a two-wheeler must, for example:
  - use clothing giving sufficient protection in the event of an accident (especially a motorcycle accident) and never be without a helmet;
  - not weave in and out of lines of cars;
  - not ignore intersections;
  - maintain regularly and properly his vehicle;

- a driver of another vehicle must, for example:
  - not change lanes without checking that there is no two-wheeler in the way;
  - carefully estimate the speed of a motorcycle coming up to an intersection;
  - anticipate a two-wheeler rider's reactions in traffic.

It is up to the driving schools to drive all these points home. But the riders of two-wheeler must also be encouraged to take more training than is strictly required by drawing on the experience of specialised instructors.

RECOMMENDATION ON CYCLISTS

The Council of Ministers of Transport, meeting in Berlin on 21 and 22 April 1997,

CONSIDERING the report on cyclists' safety [document CEMT/CM(97)12];

NOTING,

- that, although there is already a high level of bicycle use in some European countries, cycling is now increasing in many ECMT countries,
- that many countries are defining policies to promote the use of the bicycle, mainly because this means of locomotion is unobtrusive and environment-friendly and is an alternative to other transport modes, particularly in urban areas,
- that cyclists are far more at risk of injury in road accidents than other categories of road user, particularly owing to their vulnerability;

CONVINCED that any policy to promote the use of the bicycle must necessarily be accompanied by a consistent and effective safety policy;

DETERMINED to take the necessary measures to increase the safety of those using bicycles and encourage courteous behaviour among all road users;

BELIEVING that these measures must simultaneously cover:

- regulatory aspects,
- traffic management,
- infrastructure and the necessary coherence between infrastructure, traffic rules and signs and signals,
- technical aspects of vehicles,
- training and behaviour of cyclists and other road users;

RECOMMENDS that further knowledge be obtained of cyclists' needs and the risks to which they are exposed so that the necessary safety measures can be defined, and in particular:

- as regards ***traffic management***:
  - that the same importance be attached to cyclists as other transport modes when travel and traffic plans are being drawn up;

- as regards ***road infrastructure***:
  - that, wherever necessary, continuous unbroken cycle lanes or tracks are provided to ensure cyclists' safety,

- that special attention be given to the construction or improvement of infrastructure for cyclists; for this purpose certain routes could be set aside for them with the use, for example, of appropriate surfacing, markings and signs; effective protection should be ensured, particularly at intersections, by providing specific equipment (staggered lights, advanced stop line, etc.);

– as regards the ***technical aspects of vehicles and safety systems:***
  - that quality standards applicable to bicycles be adopted so that only reliable vehicles and systems can be used or marketed; these standards can, for instance, apply to the frame, lighting and brake systems, children's seats or retro-reflectors,
  - that the necessary steps be taken so that cyclists are required to use at night and whenever atmospheric conditions require it, a reliable and effective lighting system and to equip their cycles with reflex reflectors,
  - that cyclists be encouraged to wear a helmet that complies with safety standards;

– as regards ***behaviour***:
  - that consideration be given to the advisability of introducing a minimum age for the use of a bicycle on a road,
  - that children be given training enabling them to understand that cycling can be dangerous, particularly by ensuring that they have a minimum knowledge of the rules,
  - that strategies to improve the observance of traffic rules be developed, and that such strategies include training, communication, user education, enforcement and penalties, with the use of methods, locations and media suitable for the particular audience,
  - that all the partners concerned, such as parents, schools, the police, road user associations and insurance companies, be involved in the implementation of these strategies,
  - that cyclists be encouraged to be visible in traffic, for instance, by the use of light-coloured or retro-reflecting clothing,
  - that awareness of the specific problems encountered by cyclists be stressed in the training of other road users, particularly when they are being prepared for a driving test;

APPROVES the proposals for Amendments to the United Nations Conventions on Road Traffic and Road Signs and Signals, in accordance with the guidelines set out in Annex 2 of the report CEMT/CM(97)12 and decides to forward them to the competent bodies of the UN/ECE for further action:

INSTRUCTS the Committee of Deputies to circulate the report and the recommendations which have just been adopted among those responsible for their implementation, to forward to the competent bodies of the UN/ECE the draft Amendments to the Conventions on Road Traffic and Road Signs and Signals for further action and to ensure that this Resolution is applied.

RECOMMENDATION ON PEDESTRIANS

The Council of Ministers of the ECMT, meeting in Copenhagen on 26 and 27 May 1998,

HAVING REGARD to the report on pedestrian safety, reproduced in document CEMT/CM(98)17;

TAKING ACCOUNT of the work in this area carried out by other international organisations, and in particular by the OECD, which in 1996 published the results of a study on the safety of vulnerable road users by its Programme of Co-operation in the field of Road Transport Research;

AWARE:

- that pedestrian safety is a serious problem that requires a comprehensive and coherent approach and a radical change in behaviour to ensure real conviviality between the various road users;
- that such safety requires assurance of a right to mobility that takes handicaps in traffic into account and touches upon a little discussed aspect of transport—health;
- of the importance of incorporating pedestrian safety into all decisions concerning locomotion-related policies at national and local levels;

REFERS to previous Resolutions adopted by the ECMT in this area, primarily:

- Resolution No. 34, of December 1975, on pedestrian safety;
- Resolution No. 40, of May 1979, on measures required for the improvement of road traffic at night;
- Resolution No. 50, of May 1987, on road safety of children; and
- Resolution No. 91/3, of May 1991, on the improvement of road safety for the elderly;
- Recommendation CEMT/CM(96)11/Final, of May 1996, on speed moderation with regard to speed limits in urban areas,

NOTES certain provisions of these Resolutions that are still relevant, including recommendations that the Member countries should:

- "give pedestrian safety an important role in their national road safety policies; ensure, to this end, that measures concerning pedestrian safety are given due weight in their legislation, regulations and national programmes of action, and that adequate resources are made available to carry out such action";
- always encourage "the installation of facilities that would make urban roads appreciably safer for pedestrians";
- "when constructing new roads and improving existing ones, [give] careful attention ... to other aspects of the road network at night, such as the choice of road surfacing materials, provision

of public lighting, particularly in urban areas, at pedestrian crossings, heavily trafficked urban roads, rural intersections and other hazardous (high-risk) locations";

- "[encourage] pedestrians ... to make themselves plainly visible, notably by wearing light-coloured clothing or, better still, reflective devices";
- "in accordance with the Vienna Convention on Road Traffic, [instruct pedestrians] to use the side of the road facing on-coming traffic and if this is already prescribed, [enforce] compliance ...";
- include "as part of the [instruction given to pedestrian] road users", especially at school, "references to accidents at night";
- "pay special attention, outside residential areas, to the design and location of crossing facilities used by children, especially near the schools and in places where children move a lot in the traffic";
- "inform all road users of the difficulties experienced by the elderly in traffic and to remind them of their obligations towards such persons";
- "encourage information campaigns aimed at drawing the attention of the elderly to traffic problems and risks by means of straightforward, factual and unambiguous messages";
- "give special consideration to the elderly when designing or improving road infrastructure...";
- "with regard to road networks, [strive for that] speed limits in urban areas where protected road users and vulnerable ones coexist, be adapted to a level that promote a safe interplay between them,"...

NOTES that the formulation of principles of pedestrian safety is not only an objective of transport policy, but also a societal problem insofar as road users are all pedestrians at one point or another, and overcoming their insecurity entails a comprehensive approach with regard both to infrastructure and to vehicles and users;

RECOMMENDS that the Member countries:

- ***as a general measure:***
  - collect data needed to assess the safety of pedestrians in road traffic more effectively and more regularly, in order to refine knowledge of the problem;

- ***regarding the organisation of traffic:***
  - take pedestrians into account, giving them the same importance as other means of transport when travel and traffic plans are being drawn up, similarly to what was recommended in the 1997 Resolution on cyclists [CEMT/CM(97)11];

- ***regarding infrastructure :***
  - endeavour above all to create a safe environment for pedestrians whenever infrastructure is created or improved, that this concern underlie any land-use planning and, in particular, that urban speed limits be lowered in areas in which some better protected road users and other more vulnerable ones coexist, so that a safer mix of traffic is achieved; the Recommendations on speed moderation adopted in 1996 in Budapest are particularly relevant in this regard;

- ensure effective co-ordination of the units in charge of traffic design and management, incorporating pedestrian safety into all planning and ensuring consistency from the outset in infrastructure, road signs and traffic rules;
- enlist the participation of residents of the neighbourhoods involved, so that they may contribute via their suggestions, from the town planning stage, to the improvement of pedestrian safety;
- ensure that any footbridges and subways be properly maintained and accessible to all users, including those with reduced mobility, and assess cost effectiveness before considering any new infrastructure;
- pay special attention to pedestrian safety in the most highly exposed areas, and particularly in the vicinity of schools and on the way to schools, and in places where there are likely to be large numbers of pedestrians;

– ***regarding motor vehicles:***
  - make all necessary improvements when vehicles, light or heavy, are being designed, so that the impact on pedestrians is minimised in the event of an accident; in particular, ban dangerous accessories on vehicles if vehicle use does not require them;
  - systematically ensure optimal traffic visibility in all vehicles involved, for both drivers and pedestrians;
  - encourage organisations that set and enforce industrial standards to apply them so as to enhance pedestrian safety;

– ***regarding users:***
  - continuously raise the public's awareness of safety and the need for conviviality among road users and particularly pedestrians, who are most vulnerable;
  - pay special attention in this regard to training and educational aspects, beginning when children are very young;
  - raise awareness among those responsible for transport at businesses and workplaces of the importance of ensuring the safety of their transport with an impact on vulnerable road users, especially pedestrians;
  - encourage people to walk as much as possible, given that it is economical, environmentally beneficial and healthy;

INSTRUCTS the Committee of Deputies:

– to forward the report to the relevant units of the United Nations' Economic Commission for Europe (UN/ECE), inasmuch as the report contains proposed amendments to the Convention of 1968 on Road Traffic, concerning behaviour at pedestrian crossings and work on vehicle design;

– to keep developments concerning pedestrian safety under review and report back to the Council in due course.

RECOMMENDATION ON MOPED RIDERS AND MOTORCYCLISTS

The ECMT Council of Ministers, meeting in Warsaw on 19 and 20 May 1999,

HAVING REGARD TO the report on the safety of moped riders and motorcyclists [CEMT/CM(99)19];

AWARE of the vulnerability of moped riders and motorcyclists, particularly due to their lack of external protection and their reduced visibility for other road users;

AWARE also of a potential deterioration in the safety of two-wheeled motorised vehicle users due to the general increase of traffic, in particular in urban areas;

RECALLING the previous Resolutions adopted by ECMT on Road Safety Problems concerning two wheeled vehicles (Resolution N°31 of 1974) and on the Safety of Users of two-wheeled motor vehicles (Resolution No. 42 of 1980);

NOTING:

- the diverse types of two-wheeled motorised vehicles,
- the wide range in types of use,
- the improvement in their technical capacities, concerning safety as well as performance;

TAKING INTO ACCOUNT work undertaken within other international organisations dealing with this subject, whether they represent users, manufacturers or institutions;

DETERMINED to take all the necessary measures to increase the safety of moped riders and motorcyclists, and to favour a convivial behaviour of all road users, as stated in Berlin, when adopting the draft Resolution on cyclists [CEMT/CM(97)11];

RECOMMENDS:

- *in a general framework* with a view to getting a better picture of the problem on a statistical basis,
  - to introduce a more homogeneous classification of the vehicles concerned,
  - to then improve the collection of data relating to the number of vehicles and types of accidents concerned;

- *as far as vehicles are concerned*,
  - to set up classification criteria clear and concise enough to easily identify each vehicle available on the market as belonging to one of the two categories under consideration – moped or motorcycle,

- to prevent any possibility of alteration, in line with the decisions taken within the European Union, so that, at the end of the decade, the fleet of two-wheeled motorised vehicles, for all ECMT Member countries, will be in conformity with the established classification,
- to take better account, as far as construction of cars and heavy vehicles is concerned, of problems of collisions with two-wheeled motorised vehicles,
- to support research aimed at ensuring a safer use of these vehicles,
- to study whether it would be useful to create, as exists for other motor vehicles, a compulsory technical check of the vehicles concerned;

– *as far as infrastructure is concerned*,
- to draw particular attention to mixed traffic involving moped riders and cyclists on cycle tracks and to moderate moped riders presence depending on the quality of the infrastructure and the speed of the mopeds concerned,
- to ensure, in general traffic, the stability of motorised two-wheeled vehicles,
  - by a good quality of the pavement and the road markings, and
  - by being particularly aware of dangers which might occur from vertical structures on the sides of the road when mopeds and motorcycles are slowing down or changing direction, and
  - for motorcyclists, on fast roads,
  - on one hand, to forbid ruts and repair the carriageway with a view to avoid grooves, and
  - on the other hand, to set up separators which will less endanger motorcyclists and their passengers;

– *as far as training is concerned*,
- to improve the quality of existing training in Member countries through an exchange of information on best practices,
- to make this driving training available for teenagers as early as possible, through a regulated instruction on moped driving,
- to extend to all Member countries the progressive access to motorcycle driving, depending on their power, with a view of a safer behaviour of their driver,
- to implement a practical examination, in addition to the theoretical one already existing, prior to any motorcycle licence;

– *as far as road users are concerned*,
- to make them permanently aware of the difficulties two-wheeled vehicles have to be seen by other users,
- to encourage them to be safer and better seen through the use of appropriate clothing and the compulsory use of daytime running lights,
- to encourage them to be safer also through regular and correct maintenance of their vehicle,
- to ensure that motorised two-wheeled vehicles[1] drivers and passengers, properly wear a standardised helmet,

1. In Belgium and in the Netherlands, for those over 25 km/h speed limit only.

- to ensure also that other road users are not endangered by motorised two-wheeled vehicle users by making them respect traffic rules and in particular their place on the road;

INSTRUCTS the Committee of Deputies

- to diffuse these recommendations to all those able to implement them,
- to follow a development of the situation of those road users categories and report back to the Council in due time.

ANNEXES

Table 1. **Percentage breakdown of number of killed by road-user category**

1995	Pedestrians	On bicycles	On mopeds	On motor-cycles	In Cars		Others + Unrecorded	TOTAL	Killed
					Drivers	Passengers			
A	16.5	6.4	5.5	7.0	42.6	16.0	6.0	100 %	1 210
B	10.3	8.8	4.9	8.0	47.5	16.6	3.9	100 %	1 449
BG	32.8	3.8	0.9	4.6	24.7	20.3	12.9	100 %	1 264
BLR	0.0	0.0	0.0	0.0	0.0	0.0	0.0		1 781
CH	18.2	7.7	4.2	15.3	32.9	15.5	6.2	100 %	692
CZ	26.8	11.0	2.1	4.0	30.7	22.2	3.3	100 %	1 588
D	14.1	7.9	1.9	9.6	43.3	19.4	3.6	100 %	9 454
DK	20.3	13.2	4.6	6.2	33.7	17.4	4.6	100 %	582
E	17.4	2.1	6.7	8.3	32.6	23.1	9.8	100 %	5 751
EST	31.6	6.3	1.8	3.3	26.8	21.4	8.7	100 %	332
F	12.2	4.4	5.6	9.3	43.0	21.0	4.4	100 %	8 891*
FIN	16.3	16.8	4.5	2.9	35.1	17.2	7.0	100 %	441
GR	23.7	1.5	10.1	16.3	26.0	17.8	4.7	100 %	2 076
H	30.6	14.2	3.8	2.9	23.9	20.0	4.6	100 %	1 589
HR	29.3	6.3	2.0	4.1	28.9	19.9	9.6	100 %	800
I	13.5	5.6	9.8	8.2	37.7	19.6	5.7	100 %	6 968*
IRL	30.0	6.4	=>	13.6	44.1	=>	5.9	100 %	404
L	13.2	2.9	1.5	5.9	58.8	17.6	0.0		68
LT	39.9	10.9	1.3	4.0	18.5	19.5	6.0	100 %	672
LV	30.3	6.1	2.3	4.9	31.6	24.9	0.0	100 %	660*
MD	40.6	0.0	0.0	0.0	10.7	0.0	48.7	100 %	544
N	15.1	5.9	1.6	6.2	39.3	28.5	3.3	100 %	305
NL	10.6	20.0	8.8	6.7	34.9	14.4	4.5	100 %	1 334
P	22.1	3.5	19.6	9.7	18.6	16.5	10.0	100 %	2 710*
PL	38.2	9.1	1.9	4.6	20.7	19.3	6.2	100 %	6 900
RO	47.5	6.6	0.9	0.9	15.4	18.0	10.8	100 %	2 863
S	12.4	10.0	1.6	5.6	46.0	18.9	5.6	100 %	572
SK	11.9	6.2	0.5	3.4	=>	63.7	14.3	100 %	595A
SLO	20.0	8.4	4.1	3.6	36.1	24.3	3.4	100 %	415
TR	23.5	ND	3.1	1.7	33.5	38.0	0.2	100 %	8 217*
UK	28.7	5.9	0.5	11.8	30.0	18.3	4.9	100 %	3 621
ECMT	22.0	6.1	4.6	7.2	33.0	21.4	5.8	100 %	74 748
AUS	19.8	2.4	ND	10.0	39.3	23.2	5.2	100 %	2 013
CDN	12.4	1.9	0.2	4.8	35.9	20.6	24.2	100 %	3 347
JAP	27.7	12.4	9.3	10.7	28.7	10.8	0.3	100 %	16 598A
NZL	12.2	2.6	ND	13.4	40.9	26.6	4.3	100 %	582
RUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0		32 791
USA	13.5	2.0	0.1	5.6	35.9	17.9	25.1	100 %	40 676A
Associated	16.7	4.2	2.1	6.9	34.5	16.8	18.8	100 %	96 007
MA	31.5	5.4	11.2	=>	14.1	17.2	20.7	100 %	3 623
Observer	31.5	5.4	11.2		14.1	17.2	20.7	100 %	3 623

A: Previous year.
ND: Not available.
*: Figures adjusted to the standard definition : death within 30 days = number of killed x correction factor.

Table 2. **Percentage breakdown of casualties by road-user category**

1995	Pedestrians	On bicycles	On mopeds	On motor-cycles	In Cars		Others + Unrecorded	TOTAL	Casualties
					Drivers	Passengers			
A	9.0	10.1	7.6	5.5	41.6	21.3	4.9	100 %	51 974
B	5.9	10.5	9.5	5.0	42.3	22.1	4.8	100 %	71 754
BG	30.4	3.0	1.7	4.9	20.6	23.3	16.1	100 %	9 981
BLR	0.0	0.0	0.0	0.0	0.0	0.0	0.0		9 238
CH	10.4	11.6	6.0	13.2	36.1	19.0	3.7	100 %	29 451
CZ	17.6	12.1	3.1	5.1	29.2	28.5	4.5	100 %	38 555
D	8.4	13.9	3.0	7.3	41.0	22.0	4.4	100 %	521 595
DK	10.9	22.7	8.4	4.8	30.1	18.2	4.9	100 %	10 573
E	10.9	2.3	13.5	10.0	28.8	25.9	8.4	100 %	127 183
EST	27.5	4.5	1.4	3.5	26.4	28.8	7.8	100 %	2 229
F	11.7	4.2	11.6	9.5	36.2	22.6	4.1	100 %	189 815
FIN	10.4	15.0	4.5	4.3	33.9	24.4	7.5	100 %	10 632
GR	14.1	1.2	16.0	18.9	26.8	22.2	0.9	100 %	34 135
H	17.5	12.2	6.0	4.5	26.2	27.8	6.0	100 %	27 476
HR	15.8	5.7	3.1	4.3	33.0	29.0	9.1	100 %	18 465
I	6.3	3.4	16.0	7.1	39.3	23.7	4.2	100 %	266 083
IRL	14.0	6.5	=>	9.4	60.6	=>	9.4	100 %	10 633
L	0.0	0.0	0.0	0.0	0.0	0.0	0.0		1 480
LT	35.8	7.7	2.3	4.9	18.2	26.9	4.2	100 %	5 180
LV	29.4	3.6	2.2	5.3	26.0	32.3	1.2	100 %	5 514
MD	37.1	0.0	0.0	0.0	11.2	0.0	51.8	100 %	3 613
N	9.6	7.9	4.5	4.9	44.8	27.6	0.7	100 %	12 061
NL	8.2	21.2	17.3	7.5	28.2	13.5	4.1	100 %	13 022
P	15.0	2.4	26.3	7.0	19.2	21.4	8.7	100 %	67 912
PL	30.2	7.8	2.2	4.9	20.4	27.4	7.1	100 %	77 126
RO	49.5	5.2	0.5	1.1	13.6	19.0	11.1	100 %	10 561
S	6.8	14.1	3.8	4.0	43.6	21.6	6.1	100 %	21 745
SK	ND	ND	ND	ND	=>	ND	ND		ND
SLO	11.0	7.4	7.3	4.2	40.5	27.7	2.0	100 %	8 416
TR	17.5	ND	3.7	2.9	32.0	43.7	0.2	100 %	129 734
UK	15.1	8.0	0.8	6.8	38.8	23.6	6.8	100 %	310 506
CEMT	12.1	7.9	7.2	7.1	35.9	24.6	5.2	100 %	2 096 642
AUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100 %	23 426A
CDN	6.2	4.1	0.2	2.4	43.6	25.0	18.4	100 %	245 147
JAP	ND	ND	ND	ND	ND	ND	ND		ND
NZL	6.4	4.7	ND	9.3	48.7	25.7	5.2	100 %	17 452
RUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0		183 926
USA	ND	ND	ND	ND	ND	ND	ND		ND
Associated	4.4	4.6	2.4	2.8	46.4	22.6	16.6	100 %	469 951
MA	29.5	5.3	18.1	=>	14.2	21.1	11.8	100 %	64 245
Observers	29.5	5.3	18.1	=>	14.2	21.1	11.8	100 %	64 245

A: Previous year.
ND: Not available.
*: Figures adjusted to the standard definition : death within 30 days = number of killed x correction factor.

Table 3. **Number of pedestrians killed by category of age**

Year 1995								
Country	**0--4**	**5--9**	**10--14**	**15--19**	**20--39**	**40--59**	**≥60**	**Total**
A	7	7	5	6	31	48	96	200
B (!)	7	2	6	11	24	31	65	149
BG (!)	6		14	11	26	343	14	414
CH	5	7	1	5	14	13	81	126
CZ	11	10	7	15	41	170	171	425
D	39	66	33	58	239	270	627	1332
DK (!)	4	7	8	13	11	22	53	118
E	11	33	33	46	178	191	446	938
F	15	41	35	37	205	215	474	1022
FIN	1	4	3	3	12	20	29	72
H	11	8	8	28	93	158	181	487
LT	4	15	5	11	59	108	69	271
LV	3	7	6	7	3	96	26	148
MA (!)	89		226	128	242	164	264	1 113
NL	10	4	10	3	18	29	68	142
P	26	27	14	19	68	139	295	598
PL (!)		68	112	268	492	866	830	2 636
S	1	3	2	3	9	18	35	71
TR	434	210	116	45	198	203	281	1 487
UK	29	40	51	56	193	149	511	1 029
Total (*)	**607**	**482**	**329**	**342**	**1361**	**1 827**	**3 390**	**8 348**
						Countries (*)		15

(!) Different break-down

(*) For countries which furnished data in this break-down

Table 4. **Number of pedestrians seriously injured by category of age**

Year 1995								
Country	**0--4**	**5--9**	**10--14**	**15--19**	**20--39**	**40--59**	**≥60**	**Total**
A	34	114	82	56	216	220	421	1 143
B (!)	93	103	91	82	163	160	282	1 025
CH	71	162	83	51	137	198	451	1 153
CZ	371	784	663	721	836	1 792	1 184	6 351
D	1 096	2 839	1 658	933	2 467	2 410	3 855	15 258
DK (!)	37	73	53	140	126	135	152	716
E	104	290	270	308	804	804	1 826	4 406
F	152	605	505	389	1 000	1 047	1 806	5 504
LT	80	237	135	104	356	367	307	1 586
LV	38	122	88	90	43	488	182	1 051
MA (!)	195		675	454	731	323	411	2 789
NL	77	196	84	48	170	113	225	913
P	86	208	156	125	473	504	808	8 360
PL (!)		1 569	4 014	3 719	3 714	5 553	4 690	23 259
S	20	33	36	30	90	75	150	434
TR	3 554	2 899	2 426	1 150	4 789	3 113	2 671	20 602
UK	626	1 460	1 893	1 053	2 335	1 414	2 302	11 083
Total (*)	**6 309**	**9 949**	**8 079**	**5 058**	**13 716**	**12 545**	**16 188**	**77 844**
						Countries (*)		13

(!) Different break-down

(*) For countries which furnished data in this break-down

Table 5. **Breakdown of pedestrians (killed or victims) in and outside built-up areas**

Year 1995				
	Killed		Victims	
Country	**In built-up areas**	**Outside built-up areas**	**In built-up areas**	**Outside built-up areas**
A	121	79	4 180	511
B	88	61	3 637	564
BG	320	88	2 726	273
CH	89	37	2 853	214
CZ	324	101	6 147	629
D	890	446	40 804	2 985
DK	77	41	972	179
E	480	520	11 697	2 228
F	662	365	20 709	1 515
FIN	42	30	950	153
H	298	189	4 192	608
L	7	2		
LT	135	136	1 388	394
LV	120	65	1 377	242
MA	547	594	16 205	2 726
NL	81	61	873	189
P	390	208	9 023	1 191
PL	1 164	1 426	15 833	7 247
S	46	25	1 236	167
TR	1 208	279	20 759	1 330
UK	832	253	45 256	1 017
Total	**7 921**	**5 006**	**210 817**	**24 362**

Table 6. **Breakdown of pedestrian (killed or victims) by day and by night**

Year 1995				
Pedestrians				
Country	**Killed by night**	**Total killed**	**Victims by night**	**Total victims**
A	11	200	1 350	4 691
B	71	149	902	4 204
BG	145	414	601	3 035
CH	61	126	750	3 067
CZ	208	425	1 671	6 351
D	735	1 336	11 763	43 789
DK	53	118	429	1 151
E	511	1 000	4 645	13 925
F	535	1 027	5 944	22 224
FIN	36	72	411	1 103
H	320	487	1 808	4 800
LT	182	271	800	1 857
LV	103	185	508	1 619
NL	60	142	272	1 062
P	139	598	801	10 214
PL	1 397	2 590	7 370	23 080
S	37	71	549	1 403
UK	499	1 085	13 274	47 173
Total	**5 103**	**10 296**	**53 748**	**194 748**

Table 7. **Population Sub-groups**
(in per cent of total population)

	Population aged 65 and over (elderly share)						Population aged 0-14 and 65 and over						Population aged 75 and over				
	1960	**1990**	**2000**	**2010**	**2020**	**2030**	**1960**	**1990**	**2000**	**2010**	**2020**	**2030**	**1990**	**2000**	**2010**	**2020**	**2030**
United States	9.2	12.6	12.5	13.6	17.5	21.9	40.3	34.1	34.2	33.5	36.5	40.5	5.3	5.8	6.2	7.1	10.0
Japan	6.1	11.9	16.5	21.1	25.6	26.1	36.1	30.3	32.1	36.2	40.4	41.4	4.7	6.3	9.4	12.1	4.7
Germany	10.8	14.9	16.2	20.2	22.5	28.1	32.2	31.2	31.8	33.3	36.4	42.9	7.2	6.9	8.4	10.9	12.4
France	11.6	13.8	15.5	16.3	20.2	23.3	38.8	33.8	34.6	33.9	37.3	40.4	6.5	6.7	8.1	8.5	11.4
Italy	9.0	14.8	17.9	20.6	23.6	27.9	32.4	31.3	32.3	34.0	37.0	42.1	6.5	7.7	9.9	11.4	13.4
UK	11.7	15.7	15.9	17.0	19.7	23.0	34.9	34.6	35.1	34.3	36.8	40.5	6.8	7.3	7.9	8.8	10.6
Canada	7.6	11.3	12.3	13.8	18.2	23.1	41.3	32.2	32.6	32.2	36.0	40.8	4.5	5.3	6.2	7.3	10.3
Australia	8.5	10.7	11.3	12.6	16.3	20.3	38.7	32.9	32.4	32.3	34.9	38.5	4.1	4.8	5.3	6.4	8.9
Austria	12.2	15.1	15.6	18.3	20.8	25.7	34.3	32.5	33.0	33.9	36.2	41.6	7.1	7.2	8.3	10.1	11.6
Belgium	12.0	15.0	16.6	17.1	20.3	24.3	35.5	32.9	33.7	33.0	36.3	40.8	6.7	7.1	8.2	8.5	10.9
Denmark	10.6	15.4	14.5	16.4	20.1	22.6	35.8	32.4	32.9	33.9	36.7	40.1	6.7	6.6	6.6	8.3	10.4
Spain	8.2	13.2	16.2	17.6	20.1	24.9	35.5	33.0	31.2	31.9	34.5	39.3	5.4	6.6	8.6	9.4	11.2
Finland	7.3	13.3	14.4	16.2	21.3	24.1	37.7	32.6	33.0	33.5	38.5	41.5	5.6	6.2	7.3	8.4	12.1
Greece	8.1	14.2	17.1	19.0	21.2	24.6	34.2	33.2	32.8	34.1	36.4	39.9	6.4	6.7	9.3	10.1	11.8
Ireland	10.9	11.4	11.2	11.9	14.2	16.4	41.4	38.1	33.3	33.9	34.5	35.3	4.6	4.9	5.1	5.9	7.4
Iceland	8.1	10.6	11.3	12.0	15.5	19.6	42.9	35.3	34.3	32.8	35.2	38.6	4.3	4.9	5.5	6.4	8.6
Luxembourg	10.8	13.6	14.8	17.3	20.9	25.6	32.1	30.6	32.6	33.4	36.7	42.1	6.0	6.0	7.6	9.0	11.5
Mexico	...	3.7	4.3	5.3	7.2	10.0	...	41.7	38.1	33.4	31.3	32.5	1.3	1.3	1.8	2.4	3.5
Norway	10.9	16.3	15.5	15.8	19.7	23.0	36.8	35.2	35.1	34.1	36.9	40.6	7.0	7.9	7.7	8.3	11.2
New-Zealand	...	11.1	11.3	12.6	15.9	18.9	...	33.7	34.2	33.4	35.4	38.1	4.4	4.8	5.2	6.3	8.3
Netherlands	9.0	13.2	14.1	16.4	21.5	26.0	39.0	30.8	32.3	32.2	36.7	42.3	5.6	6.3	7.2	8.8	12.1
Portugal	8.0	13.0	14.3	15.0	16.9	20.9	37.1	33.7	31.7	31.8	33.3	37.4	5.2	5.8	6.7	7.2	8.6
Sweden	11.8	17.8	17.0	18.4	21.6	23.1	34.1	35.6	36.7	36.9	39.4	41.3	7.9	8.7	8.6	9.9	12.1
Switzerland	10.3	15.0	15.8	19.1	23.3	27.5	34.0	31.6	33.2	34.9	38.4	43.5	7.1	7.2	8.7	11.0	13.6
Turkey	3.7	4.3	5.7	6.4	8.0	10.9	44.9	39.9	36.7	31.9	31.6	32.7	1.5	1.5	2.3	2.7	3.7
Total OECD	9.4	12.9	13.9	15.6	18.9	22.5	36.9	33.7	33.6	33.6	36.1	39.8	5.5	6.0	7.0	8.2	10.4
OECD Europe	9.7	13.7	14.7	16.4	19.5	23.2	36.5	33.6	33.5	33.6	36.3	40.2	6.0	6.4	7.5	8.6	10.8

Source: Ageing in OECD countries: A Critical Policy Challenge, Social Policy Studies No. 20, OECD, 1996.

Table 8. **Number of moped and motorcycles - 1995**

Country	**Inhab. x 10^6**	**Moped**				**Motorcycles**			
		Slow	**Others**	**To x 10^3**	**To/inh. x 10^3**	**<125**	**>125**	**To x 10^3**	**To/inh. x 10^3**
A	8		370	370	46			194	24
B	10			290	29			212	21
BG	8		285	285	34			230	29
BY	10					151	412	563	40
CH	7	334	38	372	52	157	175	332	51
D	82	578	1075	1653	21	356	2114	2460	26
DK	5	100	18	118	22			55	11
E	40		2101	2101	52			1301	32
F	58		1800	1800	31	452	531	983	17
FIN	5		96	96	19	25	42	67	13
H	10							151	15
I	57.7		3 750	3 750	65			2 530	44
IRL									
L	0.4							9	22
LT								16	
LV									
MA								19	
MD	4					15	117	132	37
N	4		114	114	26	4	39	43	10
NL	16	160	380	540	34		350	350	22
PL	39							876	23
S	9	120		120	14	11	110	121	14
SK	5		85	85	16	147	79	226	42
UK	57		105	105	18	162	324	486	9

Table 9. **Moped drivers**
Casualties (dead + injured) in 1985 and 1995

	Dead		**Number of moped riders killed per million mopeds**		**Seriously injured**		**Slightly injured**		**TOTAL**	
	1985	**1995**	**1985**	**1995**	**1985**	**1995**	**1985**	**1995**	**1985**	**1995**
A	130	64	307	180	3 840	1 254	6 727	2 451	10 697	3 739
B	108	67	325		1 995	1 176	5 828	4 868	7 931	6 111
BG		9		42		140		-	-	149
BY					-		-		-	-
CH	88	28	140	87	4 277	1 678	-	-	4 365	1 706
CZ		14				50		254		318
D	325	183	221	106	6 990	4 713	15 263	10 935	22 578	15 831
DK	56	28			1 049	517	511	351	1 616	896
E	417	343		184	3 668	4 453	6 701	10 234	10 786	15 030
F	760	446		274	8 089	4 466	22 373	14 785	31 222	19 697
FIN	32	19	212	213	462	429	-	-	494	448
GR	193	201		A	439	588	2 638	3 885	3 269	4 674
H	94	60		169	951	702	1 139	873	2 184	1 635
I	-	600			-	-	-	-	-	38070
IRL	-				-		-		-	-
L	-	2		50	-	-	-	-	-	-
LT	-	10			-	110	-	-		120
LV	-	11			-	77	-	16		104
MA	-	-			-	-	-	-	-	-
MD	-	5			-	0	-	-	-	-
N	23	5	162	43	153	89	701	452	877	546
NL	-	98	169	222	-	2 129	-	8 740		10 967
P	-	461			-	2 366	-	12 136	-	14 963
PL	211	129			1 203	842	767	750	2 181	1 721
S	26	9		75	282	235	471	576	779	820
SK	10	10		20A	92	71	193	194	295	275
TR	-	220			-	-	-	-	-	5 821
UK	60	19		170	2 911	551	8 044	1 882	11 015	2 452

Table 10. **Breakdown of dead by age bracket (1995)**
All moped users

	0-14	15-19	20-24	25-29	30-34	35-49	50-65	>65	Not spec.	Total	% 14/19*
A**	12		2	2	3	7	8	12	-	46	26
B	18		10	2	3	8	12	11	-	64	28
BG	3		-	7				1		11	27
BY	-		-	-	-	-	-	-	-	-	
CH	1	11	-	-	-	1	6	10	-	29	41
CZ	0	3	1	3				7	-	14	21
D	47		1	5	6	16	23	36	-	134	35
DK	9		1	-	2	3	6	5	-	26	35
E	10	130	41	35	22	44	50	47	7	386	36
F	204		39	24	15	88	48	52	1	471	43
FIN	8		-	-	-	1	4	4	-	17	47
GR	2	42	20	25	20	34	122	30	-	201	21
H	5		3	7	4	12	12	16	-	59	8
I	11	196	120	49	160		114	159	9	618	32
IRL	-		-	-	-	-	-	-	-	-	-
L	1		-	-	1	-	-	-	-	2	50
LT	4		2	1	1	2	-	-	-	10	40
LV	1		1	1		1	2	4	1	11	10
MA	52			89		125		22	2	290	-
MD			1		-	-	-	-	-	1	-
N	1	1	1	-	-	-	-	3	-	6	33
NL	1	51	9	4	3	7	6	26	-	107	48
P	1	81	37	38	87		54	57	3	368	22
PL	7	19	8	3	8	19	20	17	-	101	26
S	2	4	-	-		2	1	5	-	14	43
SK**	-	-	-	2	1	2	1	1	-	7	-
TR	-	-	-	-	-	-	-	-	-	100	-
UK	-	3	-	-	2	2	2	2	-	11	27

* Most vulnerable age bracket.
** 1996.

Table 11. **Breakdown of injured by age bracket (1995)**
All moped riders

	0-14	**15-19**	**20-24**	**25-29**	**30-34**	**35-49**	**50-65**	**>65**	**Not spec.**	**Total**	**% 14/19 ***
A	58	2 102	148	215	166	396	306	178	-	3 569	59
B	95	2 939	847	420	312	712	286	148	153	5 912	50
BG	9	25	12	55				8	-	109	23
BY	-	-	-	-	-	-	-	-	-	-	-
CH	159	738	100	371			225	102	43	1 738	42
CZ	6	33	24	183				58	-	304	11
D	284	7 300	745	988	1 172	2 486	1 670	702	36	15 383	47
DK	13	356	67	70	68	172	90	53	2	891	40
E	308	8 710	2 433	1 475	783	1 091	725	366	922	16 813	52
F	1 228	12 253	3 034	1 218	790	1 646	770	506	42	21 487	57
FIN	83	307	4	5	2	24	21	31	-	477	64
GR	96	1 458	803	629	341	617	268	161	92	4 473	33
H	27	413	190	150	82	255	217	117	2	1 453	28
I	1 183	9 672	13 784	5 582	7 372		4 185	2 127	850	-	22
IRL	-	-	-	-	-	-	-	-	-	-	-
L	-	-	-	-	-	-	-	-	-	-	-
LT	21	26	10	13	11	17	10	12	-	120	22
LV	14	21	5	13		13	18	6	1	91	23
MA	223	3 350		3 224		1 835	1 298	270	175	10 375	-
MD	-	-	-	1	-	-	-	-	-	1	-
N	10	374	24	17	13	20	13	25	8	504	74
NL	122	6 619	1 004	700	366	793	417	431	-	10 452	64
P	335	4 847	2 983	1 659	3 178		1 454	895	108	15 459	31
PL	174	362	80	100	68	203	161	119	-	1 267	29
S	74	464	27	38		49	18	36	3	709	65
SK	3	67	18	20	20	43	31	15	-	217	31
TR	-	-	-	-	-	-	-	-	-	2 863	-
UK	42	969	142	217	128	312	249	126	33	2 218	44

* Most vulnerable age bracket.

Table 12. **Casualties (dead + injured) in 1995**
Moped riders

	Men				**Women**			
	Drivers		**Passengers**		**Drivers**		**Passengers**	
	Dead	**Injured**	**Dead**	**Injured**	**Dead**	**Injured**	**Dead**	**Injured**
A	38	2 527	2	171	4	704	2	167
B	52	4 095	1	270	12	1 805	-	331
BG	-	-	-	-	-	-	-	-
BY	-	-	-	-	-	-	-	-
CH	24	1 288	1	37	4	390	-	23
D	17	11 723	2	600	14	2 481	1	534
DK	24	717	1	27	-	137	1	10
E	322	12 219	26	1 015	21	2 277	17	1 302
F	404	15 910	12	1 177	42	3 341	13	1 059
FIN	14	402	1	21	2	43	-	11
GR	173	3 309	12	351	7	456	9	357
H	57	1 279	-	33	2	117	-	24
I*	507	29 013	32	2 084	75	9 594	11	1 923
IRL	-	-	-	-	-	-	-	-
L	2	-	-	-	-	-	-	-
LT	9	105	1	11	-	-	-	4
LV	11	89	-	2	-	-	-	-
MA	250	8 082	28	1 431	1	209	11	476
MD	-	1	-	-	-	-	-	-
N	-	-	-	-	-	-	-	-
NL	-	-	-	-	-	-	-	-
P	319	11 556	21	1 294	17	1 424	11	1 185
PL	95	1 188	-	-	6	79	-	-
S	-	-	-	-	-	-	-	-
SK	7	208	-	-	-	11	-	-
TR	-	-	-	-	-	-	-	-
UK	10	1 603	-	32	1	563	-	20

* 1997.

Table 13. **Mopeds - types of accidents**

	% urban environ.		% countryside		% helmets		% no helmet		% by day		% by night		Slow mopeds		45km/h mopeds	
	CAS[2]	INJ	CAS[2]	INJ	CAS	INJ	CAS	INJ	CAS	INJ	CAS	INJ	CAS	INJ	CAS	INJ
A	70.9	71.3	29.1	28.7	90.3	90.5	9.7	9.5	64.8	65	35.2	35	-	-	-	-
B	73	73	27	27	-	-	-	-	90	90	10	10	3 574	3 534	2 402	3 278
BG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CH	80.7	79.6	19.3	20.4	72.4	71.5	27.1	26.37	-	-	-	-	1 767	1 738	246	245
CZ	35.7	78.9	64.3	21.1	0.0	4.9	100	95.1	-	-	-	-	-	-	-	-
D	80	80.3	20	19.7	-	-	-	-	68.1	68.2	31.9	31.8	6 169	6 108	9 348	9 275
DK	76	76	24	24	63	63	26	27	62	62	38	38	817	792	100	99
E																
F	85	86	15	14	79.5	79.8	5.5*	5.5**	70	70	30	30	-	-	24 544	20 072
FIN	71	72	29	28	-	-	-	-	69	39	31	31			494	477
GR																
H	85.4	86.7	14.5	13.2	13.1	12.8	86.9	87.2	77.7	77.8	22.3	22.2	-	-	-	-
IRL																
L	1	-	1	-	-	-	-	-	-	-	-	-	-	-	--	-
LT	40	74	60	26	-	-	-	-	70	65	30	35	-	-	-	-
LV	63.7	68.1	36.3	31.9	-	-	-	-	74.8	75	25.2	25				
MA	89.2	90.3	10.8	9.7	10.6	10.6	89.4	89.4	-	-	-	-	-	-	-	-
MD	-	-	100	100	-	-	100	100	-	-	100	100				
N	63	-	37	-	80.7	-	11.7	-	-	-	-	-		-	-	-
NL	82	82.5	18	17.5	6.5***	6.5***	3.2***	3.2***	75	75	24.5	24.5	1 871	1 839	8 115	8 042
P	74.5	75	25.5	25	92	92	3****	3****	-	-	-	-	-	-	-	-
PL	74	76	26	24	-	-	-	-	78	78	13	12	-	-	-	-
S	80	80	20	20	95	95	5	5	82	82	18	18	100	100	-	-
SK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TR	2 277	2 207	276	249	-	-	-	-	-	-	-	-	-	-	-	-
UK	85	85	15	15	-	-	-	-	66	66	34	34	-	-	-	-

CAS = Casualties / INJ = Injured

* In fact, 15% undetermined

** In fact, 14.7% undetermined

*** In fact, 90.25% undetermined.

**** The 5% difference are undetermined.

Table 14. **Regulatory aspects**
Moped riders training

	Specific training system for future moped riders (Instruction)	**Is a licence necessary to ride a moped ? (Exam)**
A	Yes, minimum age 16 + theoretical exam without compulsory theoretical and practical training	Yes, to be obtained in compliance with Chapter III, Section2.2.
B	Yes, A3 licence issued after a theoretical and practical test on a « closed » field (not on the road)	-- or slow moped riders (- 25km/h) (Class A) : No -- for fast moped riders (- 45km/h) (Class B) : Yes
BG	Yes	Yes
BY	No	No
CH	No	Yes, theoretical test
CZ	Minimum age 15, compulsory training course and exam (theoretical and practical) Mopeds and small motorcycles can be driven also by holder of any "higher" driving licence category	Yes, valid also for "small motorcycle" National category "M" or "A/50"
D	Yes, theoretical training: twelve 90 min. lessons For practical training, non minimum required	Yes, with practical and theoretical test
DK	Yes Age 16 Theoretical and practical test	Yes Theoretical and practical test
E	Yes Theoretical test	Yes Theoretical test + certificate for training courses in driving schools or sec. schools
F	Yes Road safety certificate to drive a moped between 14 and 16 years	No, but training compulsory
FIN	No	No
GR		
H	Yes	Yes
IRL		
I	No	No
L	12 hours of theoretical training	Theoretical test
LT	No	No
LV	No	Minimum age 14 Theoretical test 10 questions on traffic rules
MA	No	No
MD	No	No
N	Special driving licence	Training in schools with issue of certificate
NL	No	Yes
P	Yes	Yes
PL	Primary school	Primary school
S	Training recommended but not compulsory	No
SK	Yes	Yes
TR	No	At least 37 hours of theoretical and 10 hours of practical training, and test
UK	Training required before taking to the road Theoretical and practical test	Yes

Table 15. **Special rules for mopeds**

	Is there a specific carriageway for mopeds?	**Helmet**	**Lighting**
A	Mopeds not allowed on motorways or expressways	Compulsory	Dipped headlights by day compulsory
B	When a highway has a cycle track, it must be used by cyclists and riders of slow mopeds (< 25 km/h)	Compulsory for « fast » mopeds (< 45km/h)	Dipped headlights by day compulsory for all two-wheeled mopeds
BG	-	Compulsory	No
BY	-	No	Dipped headlights by day compulsory
CH	Moped drivers must use cycle tracks and cycle lanes (marked on the road)	Compulsory, except for holders of a medical certificate, door to door delivery men, country lanes and inside a firm	Dipped headlights strongly recommended, even by day
CZ	Mopeds (vehicles with maximum speed under 50 km/h) are not allowed on motorways and expressways. Mopeds are not allowed on cycle lanes (non-motorised)	Compulsory for drivers and passengers of motorcycles with speed above 40 km/h. For all motorcycle drivers (including mopeds) compulsory protection of eyes (glasses, glass/plastic shield).	Dipped headlights by day.
D	-	Compulsory	Daytime lights compulsory
DK	-	Compulsory, as well as for passengers aged over 8	
E	Not allowed on motorways, if a specific lane exists, must be used. Otherwise, on the right side of the carriageway	Compulsory	Lights compulsory including dipped headlights by day
F		Compulsory	No dipped headlights by day
FIN		Compulsory	Dipped headlights by day
GR			
H	-	Compulsory in built-up area as from 1.07.98	Front and rear lights + dipped headlights by day
IRL	-	Compulsory	Front and rear lights + dipped headlights by day
I		Compulsory	-
L		Compulsory	Dipped headlights on
LT		Not compulsory	Lights by day
LV		Compulsory	Lights by day compulsory
MA		-	-
MD		Not compulsory	Dipped headlights by day compulsory
N		Compulsory	Dipped headlights by day

	Is there a specific carriageway for mopeds?	Helmet	Lighting
NL	Cycle track	Compulsory for fast mopeds (>25km/h)	No
P		Compulsory	Yes
PL		Compulsory	Dipped headlights by day
S	As for bicycles	Compulsory	Compulsory
SK		Compulsory	Dipped headlights by day
TR		Compulsory	Not compulsory
UK	-	Compulsory	No specific rules

Table 16. **Breakdown of casualties (dead + injured) in 1985 and 1995**
Motorcycle drivers

	Dead		**Number of motorcyclists killed per million of motorcycles**		**Seriously injured**		**Slightly injured**		**TOTAL**	
	1985	**1995**	**1985**	**1995**	**1985**	**1995**	**1985**	**1995**	**1985**	**1995**
A	123	88	1 200	486	2 460	1 326	2 959	1 607	5 542	3 021
B	108	107	892	620	871	897	1 867	2 071	2 846	3 075
BG		48		112		336	-	-		384
BY	-				-		-		-	-
CH	109	99	573	286	4 538	3 448	-	-	4 647	3 547
CZ		57		125		505		1 396		1 958
D	1 070	912	760	396	18 869	12 815	37 682	24 394	57 621	38 121
DK	52	35	1 268	692	568	335	541	130	1 161	500
E	268	401	457	368	2 862	3 617	5 462	6 610	8 592	10 628
F	671	678	1 218	804	4 618	3 881	11 170	10 840	16 459	15 399
FIN	29	11	549	200	499	369	-		528	380
GR	238	336	3 296	871	984	774	3 298	5 207	4 520	6 317
H	140	46		289	1 160	613	1 348	574	2 648	1 233
I	-	400	-	-	-	-	-	-	-	14 510
IRL	-		1 923	2 292	-		-		-	-
L		3		500	-	-	-	-		3
LT		21		1 350		226	-			237
LV		26		1 875		155		15	6	196
MA	-	-			-	-	-	-		-
MD		216				52	-	-		464
N	38	19	1 810	442	207	118	665	455	910	592
NL		90	563	292		886		2 133		3 109
P	-	223	245	935	-	811	-	2 803	-	3 837
PL	412	274		343	2 145	1 431	986	986	3 543	2 691
S	57	32	435	271	532	268	889	577	1 478	877
SK	16	13		250	89	117	188	211	293	341
TR	-	136	693	130	-	-	-	-	-	5 237
UK	643	397	650	722	12 794	5 129	26 641	13 692	40 078	19 218

Table 17. **Breakdown of dead by age bracket (1995)**
Motorcyclists as a whole

	0-14	**15-19**	**20-24**	**25-29**	**30-34**	**35-49**	**50-65**	**>65**	**Not spec.**	**Total**	**20/34***
A	1	8	19	27	11	13	4	1	-	84	68 %
B	-	3	20	26	24	15	5	3	-	96	73 %
BG	-	11	4	18				2	-	35	-
BY	-	-	-	-	-	-	--	-	-	-	-
CH	-	9	30	12	32	10	13	-	-	106	70 %
D	4	155	162	183	149	158	50	3	-	864	57 %
DK	-	1	7	4	5	4	2	-	-	23	70 %
E	2	116	113	117	55	54	8	7	7	479	59 %
F	3	66	215	233	108	128	19	8	-	780	71 %
FIN	-	8	1	4	3	-	-	-	-	16	50 %
GR	3	88	137	78	33	35	10	9	-	336	74 %
H	-	9	11	8	2	3	2	1	2	38	55 %
I	1	12	109	102	135		35	13	8	415	83
IRL	1	17	18	16	10	11	-	-	1	74	59 %
L	-	1	1	5	1	3	-	-	-	11	64 %
LT	2	12	6	5	1	1	2	2	-	31	39 %
LV	-	11	2	7		6		1	4	31	-
MA	-	-	-	-	-	-	-	-	-	-	-
MD	-	35	35	43	28	33	8	3	-	185	57 %
N	-	-	4	3	3	1	-	-	-	11	90,9 %
NL	-	2	17	19	16	26	11	-	-	91	57 %
P	-	36	69	28	51		5	2	1	196	-
PL	3	101	61	38	4	27	7	4	-	245	42 %
S	1	2	14	13		8	-	2	-	40	-
SK	-	3	4	6	1	2	2	-	-	18	61 %
TR	-	-	-	-	-	-	-	-	-	71	-
UK	1	51	64	116	82	92	12	7	4	429	61 %

* Most vulnerable age bracket.
** 20/44.

Table 18. **Breakdown of injured by age bracket (1995)**
Motorcyclists as a whole

	0-14	**15-19**	**20-24**	**25-29**	**30-34**	**35-49**	**50-65**	**<65**	**Not spec.**	**TOTAL**	**% 20/34***
A	20	537	558	748	373	438	140	35	-	2 849	59
B	4	158	589	670	514	687	72	16	97	2 807	63
BG	16	107	101	159				7	1	391	-
BY	-	-	-	-	-	-	-	-	-	-	-
CH	27	379	806	688	905	547	292	120	7	3 771	64
D	344	1 107	4 606	6 384	5 054	6 394	1 782	275	68	35 978	45
DK	1	93	103	103	51	52	16	4	1	424	61
E	66	2 377	2 970	2 782	1506	1 496	274	65	698	12 234	59
F	135	1 655	4 742	3 985	2529	3 626	464	86	26	17 248	65
FIN	8	233	32	43	29	46	5	-	-	396	26
GR	53	1 487	1 444	1 344	658	665	200	68	62	5 981	33
H	12	329	257	197	59	120	42	12	4	1 032	50
I	11	495	3 337	3 448	5 331		1 486	187	245	14 540	60**
IRL	4	338	341	359	124	88	16	8	243	1 521	54
L	---	-	-	-	-	--	-	-	-	-	-
LT	12	100	52	28	5	11	5	6	-	219	39
LV	1	59	47		38	17	11	1	2	176	48
MA	--	-	-	-	-	-	-	-	-	-	-
MD	-	6	8	12	6	13	3	1	-	49	53
N	3	74	168	159	88	112	23	-	8	635	65
NL	9	119	407	716	538	826	163	37	-	2 815	59
P											
PL	69	1 295	719	345	108	188	88	38	-	2850	41
S	12	124	194		221	117	117	8	4	797	52
SK	-	112	102	62	16	25	5	2	-	324	56
TR	-	-	-	-	-	-	-	-	-	2 168	-
UK	176	3 365	2 727	5 289	3 289	4 057	955	182	346	20 386	55

* Most vulnerable age bracket.
** 20/44.

Table 19. **Number of casualties (dead + injured) in 1995**
Motorcyclists

	Men				**Women**			
	Drivers		**Passengers**		**Drivers**		**Passengers**	
	Dead	**Injured**	**Dead**	**Injured**	**Dead**	**Injured**	**Dead**	**Injured**
A	71	2 312	1	85	4	204	8	248
B	94	2 673	6	116	2	130	5	264
BG	-	-	-	-	-	-	-	-
BY	-	-	-	-	-	-	-	-
CH	99	3 056	2	97	-	392	5	226
D	762	28 435	20	1 488	42	3 787	40	2 197
DK	21	342	2	21	-	35	-	26
E	384	9 422	40	762	17	805	38	1 245
F	662	14 055	42	896	16	666	60	1 631
FIN	12	305	1	37	-	21	3	33
GR	277	497	31	553	3	163	25	568
H	33	820	4	100	1	13	-	99
I**	413	12 549	29	866	10	627	29	1 439
IRL	52	957	4	117	-	61	2	70
L	-	-	-	-	-	-	-	-
LT	21	143	7	54	-	2	3	20
LV	-	-	-	-	--	-	-	-
MA	-	-	-	-	-	-	-	-
MD	-	-	-	-	-	-	-	-
N	-	-	-	-	-	-	-	-
NL	-	-	-	-	-	-	-	-
P*	167	3 789	16	450	1	119	12	422
PL	184	2 040	45	540	1	26	15	244
S	36	661	2	37	2	39	-	57
SK	18	328	4	119	-	-	-	-
TR	-	-	-	-	-	-	-	-.
UK	393	17 475	14	650	10	1 239	12	1 019

* Figures 1996.
** Figures 1997.

Table 20. **Types of motorcycle accidents**

	% Urban environ.		% Countryside		% Helmets		% No helmet		% By day		% By night	
	Dead	**Injured**	**Dead**	**Injured**	**Dead**	**Injured**	**Dead**	**Injured**	**Dead**	**Injured**	**Dead**	**Injured**
A	45.7	46.7	54.3	53.3	94.9	95.1	5.1	4.9	82.9	83.1	17.1	16.9
B	52	53	48	47	-	-	-	-	90	91	10	9
BG	-	-	-	-	-	-	-	-	-	-	-	-
BY	-	-	-	-	-	-	-	-	-	-	-	-
CH	62	64	34	34								
CZ	35.1	69.1	64.9	30.9	71.9	88.9	28.1	11.1				
D	63.1	64.1	33.8	32.8	-	-	-	-	76.6	76.7	23.4	23.3
DK	58	59	42	41	90	90	6	5	77	78	23	22
E												
F	75		25		89	89	2	2	-	-	-	-
FIN	63	65	37	35	-	-	-	-	63	64	37	36
GR												
H	73.1	73.5	26.8	26.4	76.1	76.2	23.9	23.8	77.8	77.5	22.1	23.2
IRL	70	72	27	25	78	74	6.5	6.1	-	-	-	-
L	5		5		-	-	-	-	-	-	-	-
LT	42	60	58	40	16	25	42	37	52	37	48	63
LV	52.2	55.1	47.8	44.9	-	-	-	-	64.3	69.3	35.7	30.7
MA	-	-	-	-	-	-	-	-	-	-	-	-
MD	-	-	100	100	0.43	-	22.5	100	50	36.7	50	63.3
N	35	-	65	-	91.3	4.09	-	-	-	-	-	-
NL	53	52	47	48	81	81	0.5	0.5	18.8	18.8	-	-
P	7	76	-	24	-	91	-	2	-	-	-	-
PL	69	71	31	29	86	86	24	24	68	68	22	22
S	50	50	50	50	95	95	5	5	80	80	20	20
SK	-	-	-	-	-	-	-	-	-	-	-	-
TR	70	83	30	17	-	-	-	-	-	-	-	-
UK	72	73	28	27	-	-	-	-	75	25	25	25

Table 21. **Rules For Motorcyclists**

Instruction and exam: light motorcycles						
Country	**Regulations**					**Remarks**
	Min. age	**Instruction**		**Exam**		
		Theory	Training	Theory	Training	
A	18	-	-	+	+	6 years car driving licence + practical instruction replace examination
B	18	+	+	+	+	Choice between instruction and learner's licence
BG	na					
BY	na					
CH	18	+	+	+	+	Instruction and learner's licence
CZ	17	+	+	+	+	Currently no special regulation for powerful motorcycles, proposal for introduction in 2000
D	16	+	+	+	+	Up to age 18 max. speed 80 km/h ; car driving licence issued before 1980 replaces examination
DK	18	-	-	+	+	
E	16	-	-	+	+	
F	16	-	-	+	+	2 years car driving licence replaces examination
FIN	16	+	+	+	+	Choice between instruction and learner's licence
H	16	+	+	+	+	
IRL	na					
L	16	+	+	+	+	
LT	16	-	-	+	+	
LV	14	-	-	+	+	
MA	16	-	-	+	+	
MD	na					
N	16	-	-	+	+	
NL	na					
PL	16	+	+	+	+	
S	16	-	-	+	+	
SK	na					
UK	17	-	-	+	+	Learner's licence following basic instruction; car/moped driving licence instead of basic instruction and theoretical examination

Table 22. **Special rules for motorcyclists**

Motorcycles instruction and examination for countries recognising a 25 kW limit									
Country	**Regulations governing motorcycles < 25 kW**						**Regulations governing all categories of motorcycles**		
	Min. age	Instruction		Examination		Remarks	Experience required 25 kW	Remarks	Or min. age 21
		Theory	Training	Theory	Training				
A	18	+	+	+	+		6 years	Or 4 years + practical instruction	-
B	18	+	+	+	+	Choice between complete course of instruction and learner's licence following basic instruction	2 years		+
BG	na								
BY	na								
CH*	(20)	-	-	+	+	+ two years' experience with a light motor cycle ≤ 125 cm^3			
D	18	+	+	+	+		2 years		-
DK	18	-	-	+	+		2 years		+
E	18	-	-	+	+		2 years		-
F	18	-	-	+	+		2 years		+
FIN	18	+	+	+	+	Choice between complete course of instruction and learner's licence following basic instruction	2 years		+
H*	17	-	-	+	+	+ one year's experience with a light motorcycle			
IRL*	18	-	-	+	+				
L	18	+	+	+	+	Obligatory follow-up instruction	2 years		+
LT*	16	-	-	+	+				

Motorcycles instruction and examination for countries recognising a 25 kW limit									
Country	**Regulations governing motorcycles < 25 kW**						**Regulations governing all categories of motorcycles**		
	Min. age	Instruction		Examination		Remarks	Experience required 25 kW	Remarks	Or min. age 21
		Theory	Training	Theory	Training				
LV	18	-	-	+	+		2 years	+ follow-up instruction and exam-ination + min. age 21	-
MA	na								
MD	na								
N	18	-	-	+	+		2 years		-
NL	18	-	-	+	+		2 years		+
PL*	17	+	+	+	+				
S	18	-	-	+	+		2 years		+
SK	na								
UK	17	-	-	+	+	Learner's licence following basic course of instruction ; car/ moped driving licence instead of basic course of instruction and theoretical examination	2 years/		+

* With no 25 kW limit.

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