It is well known that the human factor remains the principal cause of road unsafety both in terms of behaviour leading to an accident and in terms of the physical vulnerability of the individuals involved.

Yet, human error as a principal accident cause is not only an issue related to information, education, training or enforcement, but also depends largely on other elements such as limitations in the human capacity to predict and anticipate hazardous situations or underestimations of speeds or distances.

The total number of accidents recorded by the police has increased substantially by 9.2% when compared to 1998, and amounted to 6,459 accidents. The growth rate 1997/98 had already been 13.2%, subsequent to a somewhat stagnating evolution in the 90’s with an annual average of only 5,591 accidents.

The number of injury accidents which had decreased consistently since 1990, grew tremendously from 944 to 1,154, i.e., a growth rate of 22.2% (while the 1997/98 rate had been -0.9%).

The number of slight injuries also rose very strongly with 948 compared to 869 injured persons in 1998, i.e., an increase of 9.1% (the 1997/98 rate being +0.35%). In contrast, the number of serious injuries, compared to slight injuries, decreased a little from 409 in 1998 to 398, hence a reduction of 2.7% (+1.5% for 1997/98).

As to the number of persons that lost their life in a road accident, there were two more in 1999 than in 1998 and 1997. In 1999, 58 persons were killed against 56 in 1998 and 53 in 1997. There were 53 fatal accidents compared with 55 in 1998, and 53 in 1997.

The data indicate that the upward trend in the number of road accidents is probably due to the combined effects of increasing traffic - as the direct consequence of the growth in the active population (boosted moreover by the more than 80,000 commuters entering Luxembourg at peak hours from neighbouring countries) - and higher driving stress associated with increased traffic flow. Still, the upward trend remains below the growth rate of the vehicle fleet and total veh.-km travel performed on the Luxembourg road network.

It can therefore be stated that since the last two years the number of police recorded road accidents is again rising rapidly by 500 accidents annually. The growth rate for injury accidents is less pronounced, while accidents with killed persons remained just over 50 accidents per year, after having exceeded 60 in the beginning of the 90’s. In other words, accidents are more and more frequent while accident severity seems to follow a decreasing trend. This may be explained by the improvements in active and passive vehicle safety, a shift of a major proportion of traffic towards motorways and the simultaneous elimination of accident black spots on ordinary roads as well as the enhancement of emergency services.

The table below presents an overall view of police recorded accidents in 1999 and compares them to the statistics of preceding years.

The Transport Ministry intends to act on two fronts:
(1) on the one hand, traffic education and training should put more emphasis on the individual responsibility of the road user for road safety and his/her understanding of the need for a preventative driving style and the respect of the rights of the other road user; and (2) on the other, traffic enforcement should be stepped up with a both preventative and coercive aims in mind.

<table>
<thead>
<tr>
<th>Total Accidents</th>
<th>Injured</th>
<th>Serious Injury</th>
<th>Slight Injury</th>
<th>Fatal Accidents</th>
<th>Killed</th>
</tr>
</thead>
<tbody>
<tr>
<td>6,459</td>
<td>1,154</td>
<td>398</td>
<td>409</td>
<td>58</td>
<td>53</td>
</tr>
</tbody>
</table>

Serious Injury = hospitalised at least 24 hours; Slight Injury = ambulant patent or hospitalised for less than 24 hours; Killed = died within 30 days after accident occurrence.


2.1 Age of road fatalities

The annual average of road fatalities occurring in individual decades since the 1950’s are as follows:

1950-1959: an average of 70.4 victims per year
1960-1969: an average of 90.2 victims per year
1970-1979: an average of 108.6 victims per year
1980-1989: an average of 80.4 victims per year
1990-1999: an average of 67.8 victims per year

In spite of much lower risk of being killed in a road accident since the beginning of the 50’s, and against the background of a 30 times larger national vehicle fleet and similar road traffic increases, road deaths continue to range among the most frequent causes of death affecting, in particular, the young age groups.

As in 1997 and 1998, 2/3 of the persons killed on the road were less than 40 years of age: 20 fatalities, i.e., 1/3 were less than 25 years old and 16 had an age between 25 and 40 years.

2.2 Age of road users responsible for fatal accidents

The age of those considered to be responsible for the accidents - whether victim or not, whether being behind the steering wheel, driving a two-wheeler or walking - is as follows.

Figure 2 confirms the empirical knowledge about the national situation and does not very much deviate from foreign data and analysis. Under the influence of both lack of experience and the strong inclination for taking risks at the age of becoming an adult, new drivers are especially exposed to the risk of causing an accident with, unfortunately, a great likelihood of injury and fatality.

2.3 Geographic distribution of fatal accidents

During many years, the distribution of fatal accidents outside vs. inside built-up areas fluctuated around a 2:1 relation (Fig. 3). In 1998, this ratio was 5.3:1 with as much traffic deaths on motorways as inside built-up areas; in 1999 this ratio was 3.4:1.

2.4 Distribution of fatal accidents by time of day

35 (33 in 1998) fatal accidents, i.e., 66.1% occurred during daytime (06:00 - 22:00), 18 (22) or 33.9% during night (22:00 - 06:00).

The 2:1 ratio (3:2 in 1998) between day and night time accidents must be interpreted against the fact that the daytime period extends over 16 hours compared with 8 hours for night-time and that only 7% of all trips by
the Luxembourg population start between 20:30 and 06:30 (Fig. 4).

Fig. 4 Distribution of fatal accidents by time of day

2.5 Distribution of fatal accidents by day of week
The distribution of fatal accidents by day of week is shown in Figure 5.

Fig. 5 Distribution of fatal accidents by day of week

As for preceding years, with the exception of 1995, this figure shows that more than 2 fatal accidents out of five occur at weekends (from 20:00 on Friday to 06:00 on Monday), with a traffic intensity of 90% for Saturdays and 60% for Sundays compared to normal working day traffic.

2.6 Methodological conditions
No fatal accident in 1999 was due to snowy or icy road conditions (2 in 1998), but 23 (21) fatal accidents occurred on wet road surfaces, while 30 (32) other accidents happened in dry road conditions.

Ice and snow generally impose drivers’ caution, while the risks of wet road conditions are largely disregarded.

2.7 Accident generation factors
Amongst the assumed causes of fatal accidents, speed remains by far the highest ranking accident generation factor attributable in 32 (27 in 1998) of the 53 fatal accidents in 1999.

The other major factors are lack of attention and fatigue with 9 (13) fatalities, alcohol and drugs with 9 (6) fatalities as well as disregard of traffic priority and aquaplaning, respectively with 5 (3) and 5 (0) deaths, followed by incorrect overtaking with 3 (2) killed.

Alongside any safety measure of any kind, the preparation of children to cope with a more and more complex environment must be the principal objective of traffic safety.

Likewise, it is imperative that drivers be permanently informed and sensitized. The design of safety campaigns must be based on most recent well-proven knowledge. The presently planned programs must be wider reaching and systematically take account of measures that target concurrently the driver, the road and the vehicle.

(Based on the report of the Ministry of Transport of the Grand Duchy of Luxembourg)