

# Data and monitoring on road safety performance in Hungary

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## 1. The system of data collection

Collection and evaluation of some kinds of road safety performance indicators began in 1992 in Hungary. All work items were carried out by the TUV NORD-KTI Kft. [1]. Since the usage of Daytime Running Lights (DRL) became obligatory from 1993 on, it seemed to be obvious to collect the safety belt wearing and DRL usage rates together. The yearly sample size is approximately 10000 vehicles, including cars, minibuses and small vans (categories M1 and N1). The cars equipped with foreign and taxi licence plates haven't been taken into account. Sample sizes by different road types (country roads, motorways, roads inside built-up areas) were above 3000. Since collection of the DRL usage and the safety belt wearing rates have been combined, the observations were carried out always in good weather and visibility conditions in order to avoid the influence of these factors on DRL usage rates. Data collection was carried out always in the same period of the year (May, June) for the sake of comparability.

Performance indicators mentioned are so-called behavioural ones [2], since they reflect the rate of following the rules by drivers.

As the next examples show, there are already relatively long time series of SPIs in Hungary. They reflect different trends, which are useful in the evaluation and elaboration of road safety policies.

The methodology of Hungarian data collection in the field of safety belt wearing rate and the usage rate of DRL has been considered as best practice in the framework of the SafetyNet project.

After the introduction of uniform EU legislation regarding DRL (automatic DRL for new cars), this kind of performance indicators will lose its importance step by step.

## 2. Safety belts

### 2.1. Changes in safety belt wearing rates

In Figure 1 the development of the safety belt wearing rate can be seen by seat positions and in general. The first survey was carried out in 1992 and for the year 2006 - in lack of contract - we do not have data.

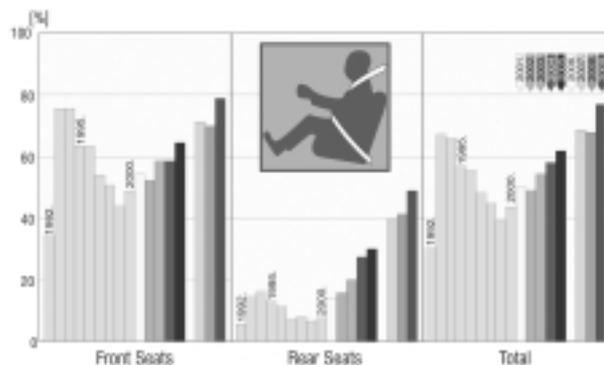


Figure 1: Safety belt wearing rates in Hungary

After a sudden increase in the wearing rate in the front seats, following the modification of the Highway Code in 1993, a declining trend was characteristic from this year until 1999. It is very contradictory and shows clearly the necessity of the road safety performance indicators, that this declining trend in safety belt wearing rate could be observed in a period, which was a so-called "success story" in the history of the Hungarian road safety. (Between 1990 and 2000, the number of the people killed in road traffic accidents decreased by more than 50%).

After the nadir in 1999 there was an increasing trend in safety belt wearing rate not only in the front, but in the back seats as well. This trend is the same even today; the values in 2009 are higher than the earlier ones. Although safety belt wearing rate in the back seats of passenger cars is below 50% yet, the relative change (from 6.6 % in 1999 to 49.3 % in 2009) was higher (42.7 %) than in the front seats (from 43.8 % in 1999 to 79.2 % in 2009 = 35.4 %).

The Figure 2 shows the changes in safety belt wearing rate outside built-up areas by road categories and seat positions.

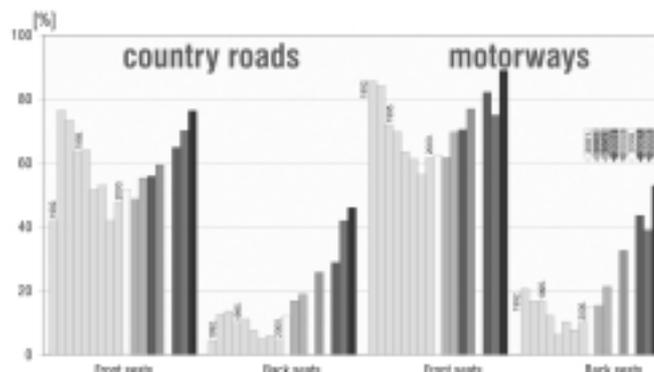


Figure 2: Safety belt wearing rates outside built-up areas on rural roads and on motorways

There are similar changes on rural roads (in the IRTAD database: country roads) and motorways as well: after a declining trend, until this year there was an increasing rate in the safety belt wearing. It can be observed that the rates are higher on motorways than on rural roads. It seems that car occupants consider the accident risk on motorways (travelling at higher speed) higher than on rural roads. In 2009, the safety belt wearing rate was 75.5 % in the front seats of passenger cars on rural roads and almost 89.0 % on motorways.

The safety belt wearing rates inside built-up areas have been always the lowest in Hungary in comparison with roads outside built-up areas (country roads and motorways).

This is the case in 2009, too, in spite of the fact that increasing trend is characteristic on roads inside built-up areas as well. The amount of increase is outstandingly high in back seats of passenger cars. This can be seen in the Figure 3 very well.

Although the increasing trend in safety belt wearing seems to be general in Hungary, the international comparison shows that there is a further potential of improvement in this field.

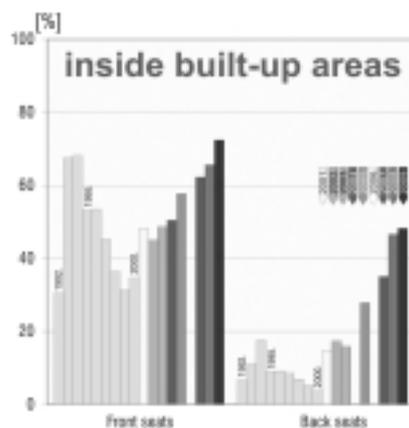


Figure 3: Safety belt wearing rates inside built-up areas (in Budapest)

## 2.2. International comparison of safety belt wearing rates

In the IRTAD database there are data for safety belt wearing rates observed in the front seats of passenger cars. These data are appropriate for international comparison. Unfortunately only some countries have data for 2008, most of them have only those for 2007.

In Figure 4 the safety belt wearing rates observed inside built-up areas in 2007 and 2008 can be seen.

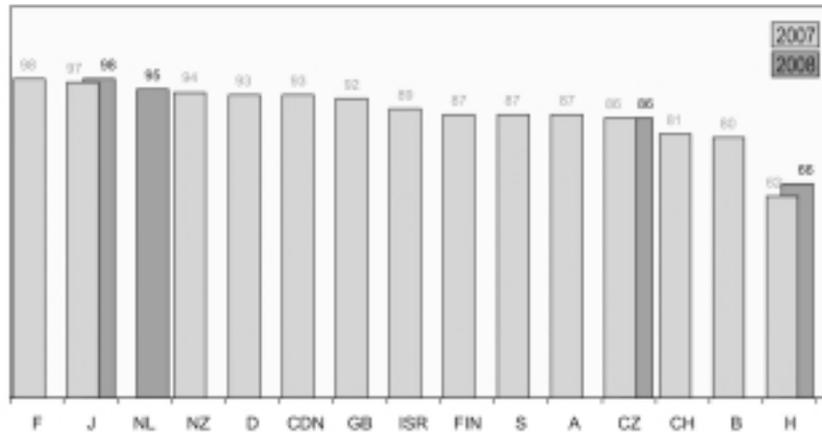


Figure 4: International comparison of safety belt wearing rates in front seats of passenger cars inside built-up areas (Source: IRTAD)

In spite of the improvement of recent years, Hungary is the last one out of the investigated countries. Even the rate of 2009 (72 %) would be the lowest among the countries shown in Figure 4. It is surprising that in France, Japan and the Netherlands 95-98 % of the drivers are wearing the safety belt inside built-up areas.

Figure 5 shows the same comparison for country roads. Here, the Hungarian data for 2009 (75.5 %) were found to be equal to the Belgian ones for 2007.

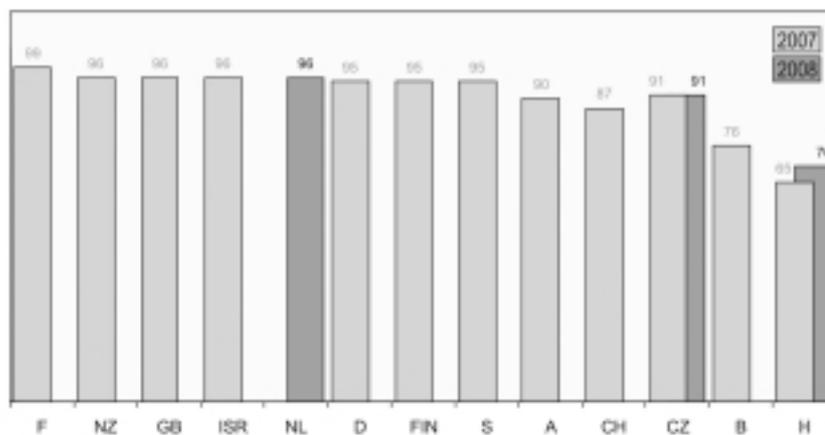


Figure 5: International comparison of safety belt wearing rates in front seats of passenger cars on rural roads (Source: IRTAD)

Despite the clear improvement in Hungary, we are still the last considering the usage of safety belts on country roads, out of the countries displayed in Figure 5. The French rate is almost 100 % and the rates in New-Zealand, Great Britain, Israel, and the Netherlands are 96 %.

The safety belt wearing rates observed in front seats of passenger cars on motorways can be seen in Figure 6. Here, the number of countries compared is lower than in the earlier two Figures. If we take into account the Hungarian rate for 2009 (89 %, cannot be seen in the Figure), we can say that perhaps Hungary could "overtake" Belgium, what is more, this data would be very close to the Swiss and Austrian figures registered in 2007.

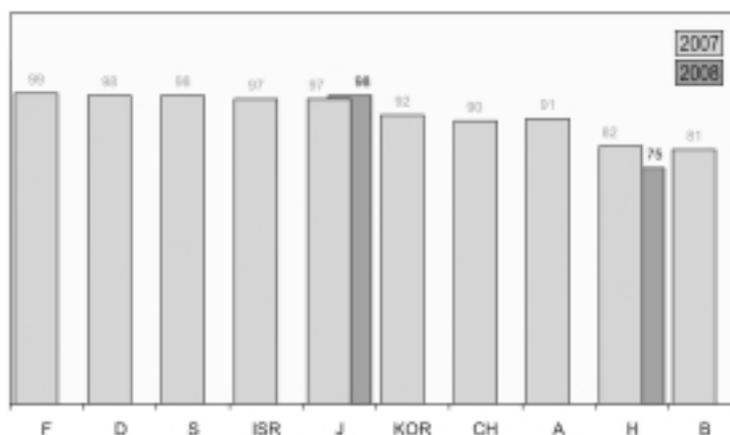


Figure 6: International comparison of safety belt wearing rates in front seats of passenger cars on motorways (Source: IRTAD)

### 2.3. Child Safety

The safety of children is of high priority in Hungary.

In Figure 7 the usage rate of child safety devices can be observed.

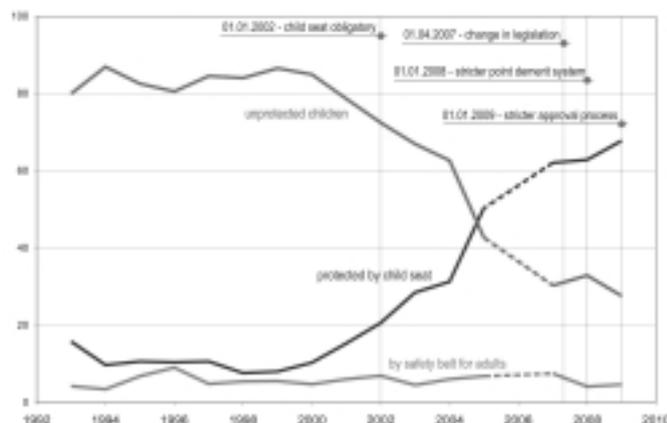


Figure 7: Usage rate of child safety devices in Hungary

Until the year 2000 the usage rate of child seats and the rate of protected children were very low, about, or below 10%. It means that the rate of unprotected children was very high, between 80 and 90 %. The first step towards the higher safety of children was the introduction of the mandatory use of child seats as of 1 January 2002. From that time children younger than 12 years and below 150 cm height are obliged to travel in child safety seats. From 1 April 2007 the legislation changed. It means that instead of age, the body height is decisive. Under 150 cm height, children have to travel in child restraint systems which are in accordance with their weight.

From 1 January 2008 the point demerit system became stricter. The number of demerit points for non-using the proper safety device has been doubled: from this date on the number of demerit points for this offence are two.

As of 1 January 2009 only the child safety seats having an approval number starting with 03 or 04 can be sold and used. This means a stricter approval procedure.

Due to all of these measures and road safety campaigns, the usage rate of child restraint systems was almost 70% in 2009. The rate of children restrained by adult safety belts remained below 10%. Promising result is that the rate of unprotected children decreased from 65% (1994) to 28% (2009). Of course, in the future there is a lot to do for the higher safety of children, but there is a clear positive progress.

The number of killed and injured child car-occupants in the last three years shows clearly the positive development (Table 1).

Year	Killed	Seriously injured	Slightly injured	All casualties
2000	13	128	641	782
2001	15	114	837	966
2002	17	124	843	984
2003	15	156	907	1078
2004	22	142	988	1152
2005	19	135	1044	1198
2006	23	134	1033	1190
2007	18	118	1063	1199
2008	13	104	915	1032

Table 1: Number of killed and injured child (0-14 years) car-occupants

#### 2.4. The remaining safety potential of safety belt wearing in Hungary

In 2008, as car occupants not wearing safety belts, 260 people were killed, 980 seriously injured and 2244 slightly injured. In the same year the average safety belt wearing rate was 77.0% in Hungary. According to research results [3] in case of 100% safety belt wearing rate 50% of the persons killed and seriously injured and 80% of the slightly injured could have been saved.

In other words:

$$\begin{aligned} 260 \times 0.5 &= 130 \text{ killed,} \\ 980 \times 0.5 &= 490 \text{ seriously injured,} \\ 2244 \times 0.8 &= 1795 \text{ slightly injured} \end{aligned}$$

car occupants could have been saved in case of 100% safety belt wearing rate.

Taking into account that 100% wearing rate is unrealistic, especially in Hungary, the real target could be 95%. The persuasive example of countries with high level of motorisation has shown that the rate of safety belt wearing could be kept permanently above 90% subject to well co-ordinated awareness campaigns and police enforcement.

In case of 95% safety belt wearing rate:

$$\begin{aligned} 123 \text{ fatalities} \\ 465 \text{ serious injuries} \\ 1705 \text{ slight injuries} \end{aligned}$$

could have been prevented.

This estimation could be considered as pessimistic, because it is based on earlier research results [3].

Nowadays - in the era of high-tech, safety belt systems (belt retention system, pyrotechnic device) - the safety potential of the belts is higher, not to mention the fact that they "work together" in most cases with airbag systems.

### 3. Daytime Running Lights (DRL)

In Hungary, the obligatory use of DRL was introduced in two steps. First, as of 1 March 1993, this involved only the main roads outside built-up areas and the so-called motor roads (semi-motorways). Later, from 1 June 2004 the use of DRL became obligatory on all roads outside built-up areas. It means that on roads inside built-up areas the usage of DRL is not obligatory. The legislation is valid outside built-up areas throughout the whole year.

In Figure 8 the changes in DRL usage rate can be seen by road categories. (The data for 2006 are lacking here also). The trend of the DRL usage rates is entirely different from those of safety

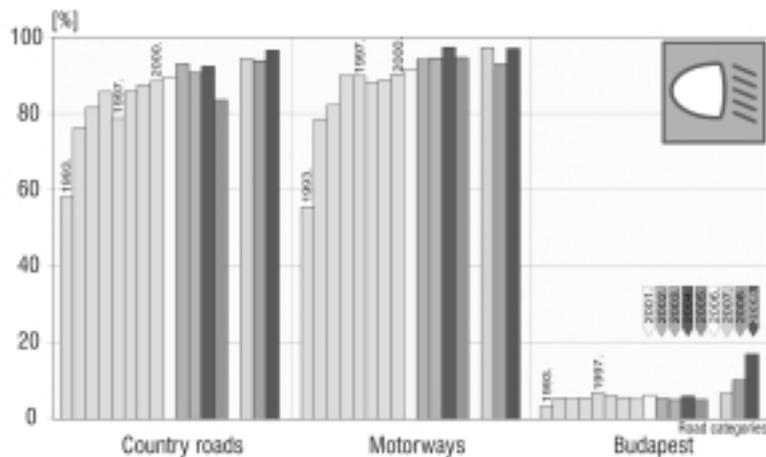


Figure 8: DRL usage rates in Hungary according to road categories

belt wearing rates. Here - outside built-up areas - an almost continuous increasing trend can be observed. After the obligatory introduction of DRL, this rate was below 60 % and in 2009 it was almost 95 % on rural roads and on motorways. The rates in Budapest are very low, which is obvious, since - as mentioned earlier - inside built-up areas the usage of DRL is not mandatory. In spite of this, DRL usage rate increased in the last two years in Budapest as well.

## 4. Conclusions

Hungary has reliable performance indicators on the rate of safety belt and DRL users. Time series of these indicators are available from 1992 or 1993, respectively. The trend in safety belt wearing shows almost the same changes on all road types and seat positions: declining rate from 1992 to 1999 and increasing rate from 2000 on until now. This positive development confirms that the road safety policy is on the right track regarding safety belt wearing. The increasing rates are the results of the further development of the point demerit system, the co-ordinated awareness campaigns, the more intensive police enforcement and the more serious consequences of non-wearing. In spite of the positive development of recent years, there is a relatively great potential in the further increasing of the safety belt wearing rates. According to estimations 123 fatalities, 465 serious injuries and 1705 slight injuries could have been prevented in case of 95% safety belt wearing rates in Hungary.

The usage of child restraint systems shows also a great development, the rate of unprotected children decreased from 65% (1994) to 28 % (2009), though on the other hand it means, that almost one third of children travel still unprotected.

The rate of DRL users shows a continuously increasing trend.

The introduction and widespread usage of other performance indicators detecting the behavioural characteristics in the field of legislation regarding speed, drinking and driving, etc. would be very important in the future

## References:

- [1] Analysis of usage of passive safety devices, suggestions for the further development of the legislation (In Hungarian: A passzív biztonsági védőeszközök használatának elemzése, javaslat kidolgozása, szabályozás korszerűsítése. Research Report No. I-8885/09, Budapest, TÜV NORD- KTI Kft., Supervisor: Dr. Tamás Véssey
- [2] Fred Wegman (working committee chair): Transport Safety Performance Indicators. Brussels European Transport Safety Council. 2001. 56 p.
- [3] Bohlin, N.: A Statistical Analysis of 28 000 Accident Cases with Emphasis on Occupant Restraint Value, Goteborg, AB Volvo, 1967.