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**RISK MANAGEMENT: A NEW APPROACH
TO IMPROVING SAFETY**

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SUMMARY

The report deals with the analysis of road accident risks and the possibilities of their reduction. In the light of actual Hungarian data, the relevant national and international objectives are described and the characteristics of the greatest accident fatality risks are pointed out. On Hungarian roads, mainly passenger car occupants are exposed to fatal injuries. More than 60% of road accident fatalities occur outside built-up areas, while most of the fatalities are the consequence of head-on vehicle collisions and single-vehicle (run off) accidents. These accident types are closely related to vehicle speeds selected deliberately by the drivers; therefore, efficient speed management is the key in improving traffic safety in the future. Measures taken in the fields of traffic safety research, legislation and infrastructure during the past years are presented, drawing to the conclusion that these were highly insufficient to date to improve considerably road traffic safety in Hungary. Finally, recommendations are set forth in view of the measures to be taken in this respect.

1. INTRODUCTION

Similarly to most other countries, the road sector demands by far the highest traffic death toll among all transport subsectors in Hungary. The number of fatalities was 2; 91; and 1278 in air, rail and road transport accidents, respectively, in Hungary in 2005. Altogether 93% of traffic accident fatalities were victims of road accidents. Consequently, the report is focused on road safety and does not deal with safety problems of other transport subsectors. Given Hungary's geographic situation and climatic conditions, road traffic is rarely hampered by natural disasters; so the latter are not dealt with, either. In Hungary, occasionally and on some places, traffic is hampered by local floods only; fortunately there are no tsunamis, avalanches, huge earth-quakes observed here.

2. OBJECTIVES OF THE HUNGARIAN TRANSPORT POLICY

The quantified objective of the third European Road Safety Programme (EC, 2003) i. e. to reduce the number of road accident fatalities by 50% in 2010 - compared to 2001 - is well known among professionals dealing with road safety problems. The authors of the effective Hungarian Transport Policy document (GKM, 2004), from the very beginning considered that EU objective unachievable. According to the "Road Safety Improvement" chapter of that document: "... The objective is to decrease by 30% the yearly number of accidents with personal injury observed in 2001, and at least by 30% of those killed in road accidents in the same year, by 2010. These values shall decrease by 50% by 2015, to the extent prescribed by the EU White Paper for 2010." (Note: the EU White Paper – like most traffic safety improvement programmes – has not even mentioned the reduction of the number of accidents with personal injury, a collateral quantified objective in this respect could be merely drafted as a consequence of the decreasing number of fatalities. Therefore, the reference made is misleading at this point.)

This objective could not be considered as over-ambitious, since it is only "targeting" to acknowledge the further widening of the already observed gap between Hungarian and EU statistical trends. On the other hand, - as we shall see - it is, highly realistic, because under the present conditions and considering planned road safety improvement measures, no better results can be expected. The objective could surely be reached, however, both methodologically and technically, since Hungary has yet plenty of untapped resources for improving road safety. Taking into consideration present organisation, management, co-

ordination, and financing of road safety improvement activities in Hungary, as well as the social and political importance associated to them, while the police enforcement measures remain moderate, chances of a breakthrough and radical improvement are very slight.

The Conference of the European Ministers of Transport (CEMT) has also set a quantified road safety improvement target which differs slightly from that of the EU: the number of persons killed in road accidents is intended to be reduced by 50% only by 2012 (instead of 2010).

Taking into consideration, that 1278 persons lost their life on Hungarian roads in 2005 (3.1% growth compared to 1239 fatalities observed in 2001), it seems to be obvious, that under prevailing Hungarian conditions, achievement of the CEMT target seems somewhat more realistic than that of the EU's objective.

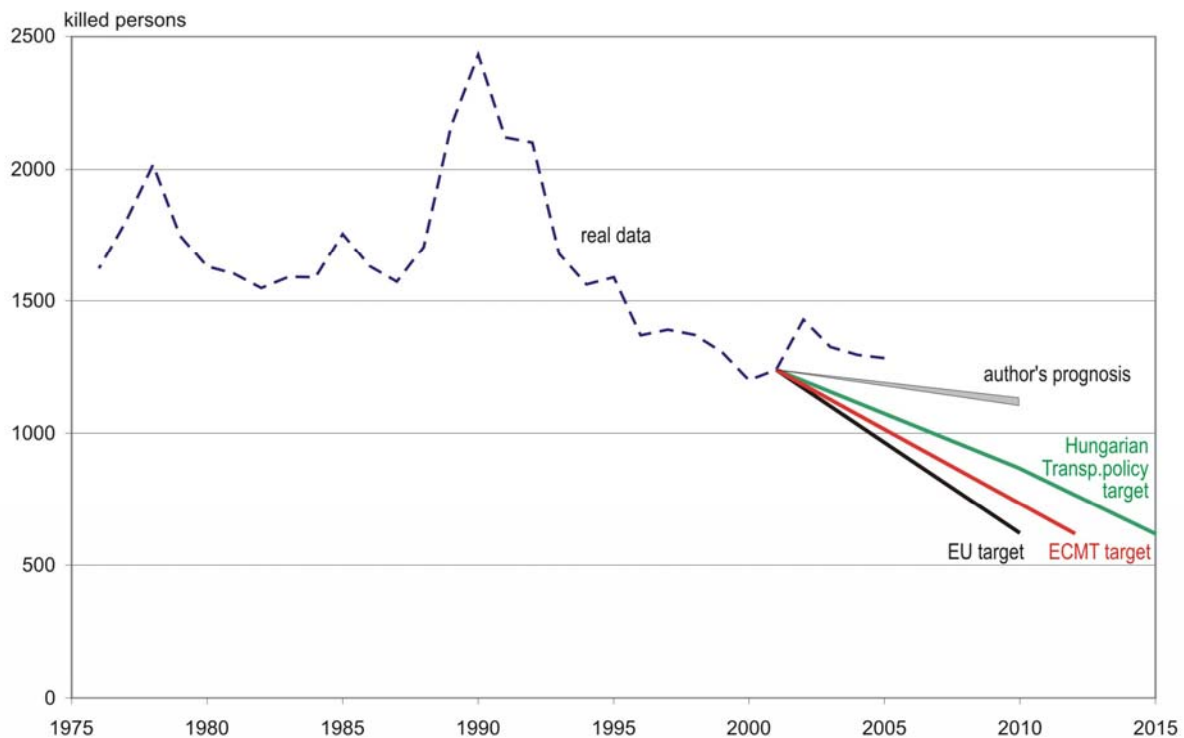


Figure 1 - Number of road accident fatalities in Hungary between 1976 and 2005; EU, CEMT and Hungarian transport policy targets, the author's forecast

The number of persons killed in road accidents in Hungary between 1976 and 2005 is presented and different policy targets are indicated in Figure 1. The author's forecast (Hollo, 1999) was established in 1999, using a simple accident model (updated version of the so-called Smeed relationship). Actual data will most probably lagging far behind all targets (forecasts) presented above.

3. WHERE IS FATALITY RISK THE HIGHEST?

As the main goal remains to decrease road users' fatality risk, the next step may be to investigate, which kind of road transport is characterized by the highest death toll.

The distribution of the number of road accident fatalities by participants between 1984 and 2005 is presented in Figure 2. Most victims lost their life as car drivers or passengers and not as pedestrians, since 1988. It is especially alarming that the rate of these participants (around 40%), which seemed to get stabilised between 1996 and 2001, has started to rise abruptly, and reached nearly 50% in 2005. This means, that nearly half of the victims of fatal road accidents were passenger car occupants. Decreasing rate of pedestrians can be interpreted as the natural consequence of incessantly growing car ownership and use.

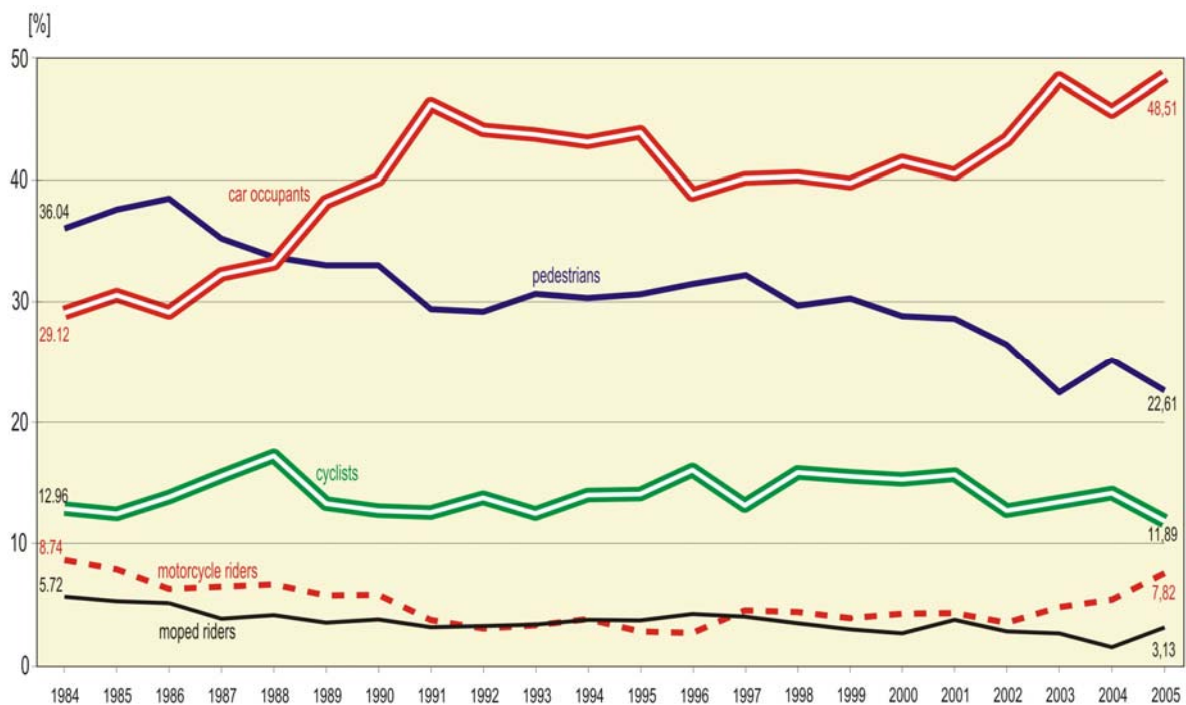


Figure 2 - Distribution of road accident fatalities by participants in Hungary between 1984 and 2005.

Although the share of motorcyclists is slightly rising since 2002, aiming to reduce road users' fatality risk, the best result can be achieved by increasing the safety of passenger car drivers and passengers.

A simple and efficient measure in this respect is to increase further the rate of the safety belt wearers, by enforcing efficiently the existing legislation. The observed frequency of wearing safety belts in the front and rear seats of passenger cars in Hungary is illustrated in Figure 3 (Véssey, 2004).

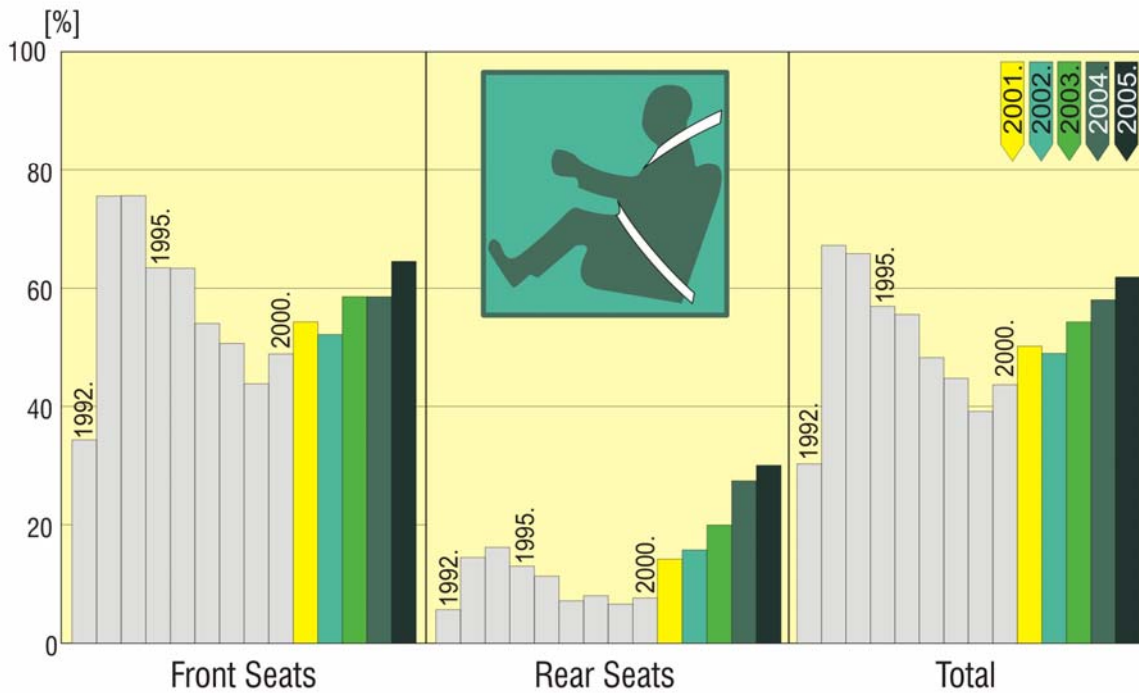


Figure 3 - Safety belt wearing frequency rates on the front seats and rear seats of passenger cars in Hungary

It is obvious that the declining trend characterizing the earlier years has been replaced by a rising tendency, however, the actual figures are still very low in the light of an international comparison. This is clearly demonstrated in Table 1, which on the basis of the data related to 2004, compares the safety belt wearing frequency rates observed in EU Member States (ETSC, 2006).

Investigating the frequency rates mentioned above, it can be found, that concerning the front seats of passenger cars, that rate only in Greece (40%) is lower than in Hungary. Related to the rear seats, the situation is the same: the data characterising Hungary - 20%, Greece - 15% and Estonia - 21%, are lagging far behind those observed in other Member States (Denmark: 63%, France: 68%, Poland: 49%, etc.)

In case the road accident fatalities are classified on the base of the site of their occurrence, 60% of the victims are killed in accidents outside built-up areas. From 1278 victims, 776 lost their life outside built-up areas in 2005. Consequently, road accident fatality risk must be significantly reduced by appropriate measures first of all outside the built-up areas. This is indicated by accident severity indicators too. Whereas in 2005, the average number of fatalities within 100 accidents with personal injury was 3-4 in built-up areas; 11~12 persons were killed in 100 accidents with personal injury outside these areas, basically as a consequence of significantly higher vehicle speeds. Therefore, the risk of a fatal injury is 3-4 times higher outside of built-up areas than inside of them. The accident types with the highest death tolls are the head-on vehicle collisions and the single-vehicle (run off the road) accidents. Such tragedies happen mainly on the national roads (especially on main roads) with bi-directional traffic flows (2x1 lanes), quite often lined with roadside objects (trees, etc.). From 776 persons killed in accidents outside built-up areas in 2005, 439 lost their life on main roads. Among them 215 suffered fatal injury in head-on vehicle collisions, while 68 in collisions with some off-road solid objects.

**Table 1 - Safety belt wearing frequency rates in the EU Member States
(2004 data, or of the year given) (ETSC, 2006).**

Country	Wearing rate (%) in the front seats	Wearing rate (%) in the rear seats
Austria	77	56 (adults)
Belgium	66	No data
Cyprus	No data	No data
Czech Republic	75 (drivers)	No data
Denmark	84	63
Estonia	75	21
Finland	89	80
France	97	68
Germany	94 (drivers)	90 (adults)
Greece	40 (2003)	15 (2003)
Hungary	59	20 (2003)
Ireland	85 (2003)	46 (adults, 2003)
Italy	No data	No data
Latvia	No data	No data
Lithuania	No data	No data
Luxembourg	88 (drivers)	72
Malta	95 (drivers)	43
The Netherlands	86 (2003)	63 (2003)
Poland	71	49
Portugal	88 (drivers)	25
Slovakia	No data	No data
Slovenia	81	40
Spain	86 (2003)	42 (2003)
Sweden	92 (drivers)	79
United Kingdom	93 (drivers)	83

4. ROAD SAFETY IMPROVING MEASURES IMPLEMENTED IN RECENT YEARS

Although it is apparently not reflected yet in the accident statistics, safety improvement measures have been implemented and supported by professionals in Hungary during the recent years.

4.1. Research

Hungarian transport professionals are participating in the implementation of several important international road safety improvement projects (ROSEBUD, SafetyNet, Sunflower+6, RIPCORD-ISEREST, etc.) National support, however, is provided only occasionally to these EU projects. It can be stated, that neither the recommended measures, nor their implementation did attire the interest of the politicians and decision makers to date. As a consequence, adaptation of the best international practice has been often neglected or delayed. An important achievement to be mentioned is, that accident costs determined by the method of willingness to pay were introduced recently and as a result, the value of statistical life to be applied in cost-benefit analysis increased significantly.

4.2. Legislation

For road safety improvement, the rules of circulation have been revised several times. Results of an impact analyses carried out in due time clearly proved, that the demerit point system introduced in 2001 had no effect at all on road users' behaviour, so the system was made stricter on 1 April 2004. The evaluation of some offences – previously sanctioned generally by one single demerit point only – became more differentiated, and depending upon severity/accident risk attached to the offence, they may result in obtaining up to 3 demerit points. While before that amendment practically no offenders' driving licence could be withdrawn (due to the very low number of the demerit points collected), this has become a real possibility by now.

Another important change of the demerit point system was the extension of the scope of offences to be sanctioned, including that of non-compliance with safety belt wearing obligations. Probably, due to this measure and thanks to the information campaigns organised, the declining trend of safety belt wearing frequency rate has stopped and shows a gradual increase since 1999.

It is also a significant change for better, that as from 1st of January 2002, a rule stipulates the mandatory use of children's safety seat as well that of the safety belts installed on rear passenger car seats (before that date wearing safety belts on rear seats of passenger cars equipped with them was mandatory outside built-up areas only).

4.3. Infrastructure

The motorway and expressway network has been extended gradually and significantly; the construction of bypasses around settlements and roundabouts is accelerated; the safety of railroad level crossings has been increased (installation of appropriate barriers is under way). At the same time, due to lack of funding, maintaining the safety level/condition of the existing road network became more and more difficult as well. In some cases, even the replacement of road markings and signs is delayed significantly. Based on case studies, the first steps towards the revision of the safety level of the existing and planned public roads (safety inspection, safety audit) have been made; the drafting and approval of an appropriate legislation in this respect is under way.

5. NECESSARY ROAD SAFETY IMPROVEMENT MEASURES

As illustrated by the number of accidents, the measures taken up to date were highly insufficient to improve appropriately road safety in Hungary. Therefore, further firm steps are to be prepared and taken in the following fields.

5.1. Research

Determination and selection of the tools of an efficient speed management; safety inspection of the existing road network and safety audit of the planned public roads; exploration of the high-risk accident locations on the main road network and drafting recommendations for the implementation of most efficient low cost safety improvement measures on the basis of the results of the EuroRAP projects – these are the main research tasks.

5.2. Implementation

First of all, the probability of being caught in case of an offence has to be increased significantly by police enforcement measures. International comparisons (ETSC, 2006), (Hollo, 2002) demonstrate that the probability of being caught in case of exceeding the speed limits, drinking and driving, or neglecting safety belt wearing obligations is very low in Hungary. A more stringent demerit point system and appropriate sanctions may only be effective if they will be combined with consequent and intensive police enforcement measures.

5.3. Infrastructure

As most human lives are lost because of accidents caused by head-on vehicle collisions and that of single vehicle (run off the road) accidents occurring on main roads other than motorways, the safety inspection of such roads and a significant improvement of their safety level through appropriate low cost measures is an urgent task.

On the motorways and expressways planned to be built, it is important to prevent any economies obtained at the expense of the standard safety level, and an appropriate road pricing policy has to be implemented to avoid redistribution of the traffic towards less safe secondary roads. Significant results could be expected from the participation of Hungary in the IIIrd EuroRAP project. In this project stars are intended to be used for assessing the safety level of each public road (just like in the EuroNCAP project for evaluating the passive safety level of passenger cars). Accident risk is expressed by risk mapping, and the safety of main roads outside built-up areas is increased by using comprehensive low-cost measurements. Similarly, significant progress can be expected from the application of the „self-explaining” and „forgiving” roads, as well as from minimising the probability of human errors and developing energy-absorbing, obstacle-free, etc. road environment in Hungary.

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