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ROAD-USER BEHAVIOUR IN ESTONIA - BELIEFS AND ATTITUDES TOWARDS THE ROAD SAFETY MEASURES

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1. INTRODUCTION

With increasing motorization the number of highway fatalities is a serious international problem. While the number of fatalities is decreasing in some nations it is increasing in many others. There are dramatic decreases in the number of fatalities in some western countries as Finland (39 per cent decrease from 1990 to 2000 (Fig.1)). Several countries follow the well-recognized pattern of increasing and then decreasing fatalities. In the United States the maximum number of fatalities was registered in 1972 at 54,600 followed by a steady declines to less than 42,000 in the year 2000.

Change in road traffic fatalities, 1990-2000

Figure 1.

Conversely, many nations are still experiencing increasing numbers of fatalities or meet problems with rapid development of motorization.

Most nations with long histories of motorization are actively seeking and achieving decreases in the number of fatalities. In this context Estonia, the subject of this research, has established rather challenging goals for road safety improvement. The national road safety program declares that the number of fatalities should drop to less than 100 in 2015. The first step in developing measures needed to achieve this important goal is the analysis of road-use attitudes and behaviours /4/.
The road users behaviour studies, described here, are attempts to assess perceptions about generally well-known safety measures, as well as to observe actual road-use behaviour.

2. RECENT ROAD-USE-BEHAVIOR STUDIES

It is widely recognised that human factors intervene in most, if not all, road accidents. It is a major reason for the present project; contribute to put in light the role of human factor in the road accidents genealogy. More specifically, it is the social dimension of human factor that will be studied. What are the social groups that are supporting or against some measures, are they numerous or influent? Main purposes here are to describe the state of road users attitudes and reported behaviour with regard to road traffic risk, to evaluate the range from approval to opposition towards regulations and countermeasures, to search for underlying social or cultural factors leading to various behaviour in term of risk, and lastly to recommend actions to take in consideration when improving road safety policies.

The trends are also important to detect. The situation in various countries can be improving or in contrast deteriorating. We can also differentiate the evolution regarding the individual countermeasures and notice that in some cases such as drink driving; the attitude is improving, whereas the attitude to speeding is deteriorating.

In the last decade substantial literature has emerged focusing on the interrelationship between driving behaviour and traffic accidents /5, 6, 7, 8/. The incidence of road rage and aggressive and discourteous driving is perceived to be increasing and a number of researchers have focused their efforts on this phenomenon.

2.1. LiMo surveys

In 2001 the first road user behaviour survey, called LiMo (Liikluskäitumise monitooring in Estonian), was conducted in Estonia. After that, every year the similar surveys have been conducted, using same method and survey samples. The survey is consisting of two parts:

- Questionnaire survey;
- Road user behaviour field survey.

There were 20 questions asked of road users (drivers and pedestrians) in the first part of the survey, the questionnaire. Trained surveyors randomly selected and interviewed 1000 subjects. The survey was conducted at numerous locations throughout the country during the months of September and October 2004. The subjects were asked about mandatory circumstances covered by national traffic laws including:

- Headlight use (during 24 hours a day);
- Turning signal use;
- Yielding to pedestrians in zebra-crossings;
- Red-signal adherence (by pedestrians and drivers) at signalized intersections and crossings;
- Drinking and driving (the BAC limit in Estonia is 0.2 per mil);
- Speeding (urban and rural roads);
- Seat-belts use (front and rear seats);
- Child-restraint use;
- Use of reflectors by pedestrian on rural roads;
- Overall road-use behaviour.
The second part of the survey, the field survey was introduced in a numerous locations of Estonian road network. Trained surveyors conducted a video recording on selected sites (road sections, pedestrian crossings and intersections). The survey was also conducted throughout the country during the months of September and October 2004. The subjects of road user behaviour, which were followed, were mandatory road safety measures covered by national traffic laws including:

- Headlight use (during 24 hours a day);
- Turning signal use;
- Yielding to pedestrians in zebra-crossings;
- Red-signal adherence (by pedestrians and drivers) at signalized intersections and crossings;
- Drinking and driving (the BAC limit in Estonia is 0.2 per mil);
- Speeding (urban and rural roads);
- Seat-belts use (front and rear seats);
- Child-restraint use;
- Use of reflectors by pedestrian on rural roads.

The main goal of the study was to elaborate the share of road users breaking the law and not following the mandatory measures listed above.

2.2. SARTRE surveys

In 1989, researchers from different road safety institutes in Europe started a consortium to explore car drivers’ attitudes to road safety: SARTRE, Social Attitudes to Road Traffic Risk in Europe. When the survey started, 15 countries participated, each represented by a research institute or road safety organisation. In 1995, INRETS of France took the initiative for a second survey called SARTRE 2. All EU countries except one participated again and some other countries joined the consortium. In 2002 the SARTRE 3 project was launched, and this time already a number of new EU countries participated, among them also Estonia.

SARTRE, is a research project which aims to study the opinions and reported behaviour of car drivers throughout the European continent. The project is based on ad hoc gathering of data, which involves a representative questionnaire survey.

All countries in our scope apply similar countermeasures to improve the safety of road traffic. As concern drivers’ behaviour, everywhere use of speed, driving under influence of alcohol or wearing of seat belt are submitted to regulations. An interesting fact is that the various countries, beyond common aspects, obtain apparently different success in their policies to reduce road traffic risk. This is a reason to develop a comparative study to learn, one from each other, best practices.

The SARTRE-project premise is that we must understand the nature of unsafe driving before countermeasures can be developed and implemented. The same logic is used in behaviour studies of Estonia.

This paper is focusing on road users perception on three of these selected measures—speeding, drinking and driving and pedestrian reflector usage. These measures were selected especially because of the general results of the SARTRE questionnaire, were drinking and driving and speeding (driving too fast) were mentioned as two of the most important risk factors in road safety (Fig. 2). The question asked was “How often each of the following factors are the cause of road accidents?”
The third selected measures, safety belt usage, was elaborated as a comparative indicator, with well published safety effect and lately largely campaigned measure. When asking a road users opinion about the situation with following road safety measures, we got a picture as shown on Figure 3.
Survey Results

3.1. Speeding

Do consider the road users attitudes towards speeding a couple of questions were asked.

The first of them was:

How often do you drive faster than the speed limit?

Figure 4 shows a share of answers, considering the main roads between towns, figure 5 indicates similar results on urban, built up area roads. The existing speed limit system in Estonia is as follows:

- On main and local (rural) roads- 90 kph;
- On some road sections on main roads- 100 or 110 kph, at summer period;
- Built up areas- 50 kph.

Due to these answers 25 per cent of drivers break speed limits on main roads always, often or very often, and 32 per cent do it sometimes. The picture is a bit different on urban roads, were 12 per cent of drivers response to do it always, very often or often, and 27 per cent sometimes.

But if we asked drivers about other drivers’ behaviour: How often OTHER drivers break speed limit? (Figure 6), almost 95 per cent (!) of drivers answered, that other drivers do it always, very often or often.

Under the rural road speed-monitoring project we have also gathered information about the real speed behaviour situation. The results as in table 1 show that about 20 per cent of drivers break the speed limit more than 10 kph regularly.

![Main roads between towns](image1)

![Built-up areas](image2)
How often OTHER drivers break speed limit

![Speed Breakdown](image)

Figure 6.

Table 1. Speed monitoring results (Main road No 2).

<table>
<thead>
<tr>
<th>Speed limit</th>
<th>Period</th>
<th>Sample</th>
<th>Average speed kph</th>
<th>Share of vehicles driving more than 10 kph faster than speed limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>90</td>
<td>Week</td>
<td>30,934</td>
<td>93.3</td>
<td>20.0%</td>
</tr>
<tr>
<td></td>
<td>Weekend</td>
<td>7,973</td>
<td>93.7</td>
<td>20.1%</td>
</tr>
<tr>
<td>110</td>
<td>Week</td>
<td>35,068</td>
<td>101.3</td>
<td>3.6%</td>
</tr>
<tr>
<td></td>
<td>Weekend</td>
<td>8,771</td>
<td>102.7</td>
<td>3.9%</td>
</tr>
</tbody>
</table>

3.2. Drinking and driving

Drinking and driving was considered as a main problem in road safety situation in Estonia (Fig.2) and about 3/4 of the road users assess the drunk driving to have a bad or very bad situation. The road users were asked about their opinion of alcohol limit as well as about enforcement.

What the legal alcohol limit should be? More than half of road users think that there should not be any alcohol allowed for drivers, and only 10 per cent wanted this limit to be higher than today (which is 0.2 per mil BAC).
The drinking and driving situation could be improved only if the enforcement and punishment system is supporting the attitude of having less drunk drivers on roads. Thus we also asked about the current enforcement on drinking and driving. We wanted to know, on a typical journey, how likely is it that the driver will be checked for alcohol (Fig. 8)?

As it came off, the lack for enforcement is still needed very much, as only 37 per cent of drivers have been checked for alcohol during the last year.

![Figure 8](image-url)

The real situation with driving after alcohol consumption is depressing, while due to the police checks in 2003 the share of drunk drivers in a regular traffic (based on breath tests) is:

- 2.0 per cent in total on Estonian roads!
- 4.9 per cent in the City of Tallinn!

### 3.3. Seat belt usage

Seat belt usage is one of the most documented road safety measures, which are recognised to have a great effect on a degree of injury seriousness and fatality rate.

But are the road users really aware of this information.

The road users were asked a following question:

Are you agreeing with the following statement?

- If you drive carefully, seat belts are not really necessary;
- In most accidents the seat belts reduce the accident severity;
- When I am not wearing the seat belt I fell less comfortable in the car;
- There is a risk of being trapped by seat belts in case of emergency.

These optional statements could possibly describe road users attitudes and their own behavioural aspects.

We got a share of answers to these statements, illustrated on Fig. 9.
If you drive carefully seat belts aren't really necessary  
In most accidents seat belts reduce the risk of serious injury  
When I'm not wearing my belt I feel less comfortable  
There is a risk of being trapped by the belt in case of emergency

Figure 9.

Thus, based on this information we can conclude, that the most of drivers know very well the safety effect of seat belt wearing and even the potential trapping risk in emergency cases was accepted only by the minority of answered drivers. This statement is also confirmed by the results of road users self reported behaviour, when answering the question: When driving your car, how often do you wear the seat belt? (Fig.10).

<table>
<thead>
<tr>
<th>Never, rarely</th>
<th>sometimes, often</th>
<th>very often, always</th>
</tr>
</thead>
<tbody>
<tr>
<td>3%</td>
<td>8%</td>
<td>4%</td>
</tr>
<tr>
<td>5%</td>
<td>14%</td>
<td>20%</td>
</tr>
<tr>
<td>87%</td>
<td>80%</td>
<td>72%</td>
</tr>
</tbody>
</table>

On main road between towns  
On country roads  
In built-up areas

Figure 10.

Due to this result, the most of drivers, up to 80...90 per cent of the population, is always or often wearing the seat belts, even if the seat belt wearing rate is less in built up areas. Unfortunately here seems to be one of the biggest contradictions between the self-reported and surveyed behaviour.

Due to the road user behaviour field surveys, the share of car occupants ignoring the seat belt usage is as shown on table 2:
Table 2. Share of road users ignoring the mandatory seat belt usage.

<table>
<thead>
<tr>
<th></th>
<th>%</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Drivers</td>
<td>28,1</td>
<td>32,3</td>
<td></td>
</tr>
<tr>
<td>Passengers on front seat</td>
<td>21,1</td>
<td>23,8</td>
<td></td>
</tr>
<tr>
<td>Passengers on back seat</td>
<td>76,1</td>
<td>70,2</td>
<td></td>
</tr>
</tbody>
</table>

CONCLUSIONS AND IMPLICATIONS

Setting goals to decrease highway fatalities is a worthy undertaking requiring the development of effective remedies. Fruitful strategies can be developed only by thoroughly understanding the fundamentals of the problem. This paper has taken two approaches; firstly to ascertain the public perception of the factors that continue to contribute to driver and pedestrian accidents and secondly to assess road-use behaviour. In combination these two elements provide the foundation for developing sound strategies.

Regarding public perception, there is the recognition that the road safety in general has been considered as a serious social problem, where especially speeding and drunken driving remain the main problems.

But same time- the passive road safety measures (use of reflectors, seat belts) are often taken as secondary, less important safety measure. Thus there is a big conflict between the attitudes and self-behaviour of the road users and the self-responsibility of safety improvement is still very low.
REFERENCES


## APPENDIX

### Appendix 1. Actions Taken to Reduce Fatalities and Injuries

<table>
<thead>
<tr>
<th>Legislative Action</th>
<th>Effective Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mandatory use of front seat belts, if equipped</td>
<td>1973</td>
</tr>
<tr>
<td>Mandatory use of motor-cycle helmets</td>
<td>1973</td>
</tr>
<tr>
<td>Urban speed limit set at 50 kph (instead of 60 kph)</td>
<td>1992</td>
</tr>
<tr>
<td>Mandatory use of rear seat belts, if equipped</td>
<td>1992</td>
</tr>
<tr>
<td>Mandatory use of headlights on rural roads</td>
<td>1995</td>
</tr>
<tr>
<td>Mandatory use of headlights in the winter</td>
<td>1995</td>
</tr>
<tr>
<td>Mandatory use of headlights in urban settlements</td>
<td>1995</td>
</tr>
<tr>
<td>Mandatory use of pedestrian reflectors on rural roads</td>
<td>1995</td>
</tr>
<tr>
<td>Mandatory use of winter tires</td>
<td>1996</td>
</tr>
<tr>
<td>Mandatory use of child restraints</td>
<td>1996</td>
</tr>
<tr>
<td>Drivers BAC limit change from 0 to 0.2 per mill</td>
<td>2000</td>
</tr>
</tbody>
</table>

### Appendix 2. Results of Field Observations

<table>
<thead>
<tr>
<th>Road-Use Behavior</th>
<th>Observed</th>
<th>No. of road users observed</th>
<th>Per cent ignoring rules</th>
</tr>
</thead>
<tbody>
<tr>
<td>Running a red light</td>
<td>Drivers</td>
<td>Signalized urban intersections</td>
<td>12,583</td>
</tr>
<tr>
<td>Violating signal</td>
<td>Pedestrians</td>
<td>Signalized urban pedestrian crossings</td>
<td>3378</td>
</tr>
<tr>
<td>Use of running headlights</td>
<td>Both rural and built up areas</td>
<td>19,523</td>
<td>0.7</td>
</tr>
<tr>
<td>Use of turning signal</td>
<td>Urban intersections</td>
<td>8674</td>
<td>23.3</td>
</tr>
<tr>
<td>Yielding to pedestrians</td>
<td>Zebra crossings</td>
<td>1830</td>
<td>64.0</td>
</tr>
<tr>
<td>Speeding</td>
<td>Speed limit 90 kmph</td>
<td>Over 100 kph</td>
<td>68,070</td>
</tr>
<tr>
<td>“</td>
<td>Speed limit 110 kmph</td>
<td>Over 120 kph</td>
<td>71,767</td>
</tr>
<tr>
<td>Small-time gaps between vehicles</td>
<td>Speed limit 90 kmph</td>
<td>&lt;= 2 sec.</td>
<td>24.4</td>
</tr>
<tr>
<td>“</td>
<td>Speed limit 110 kmph</td>
<td>&lt;= 2 sec.</td>
<td>24.2</td>
</tr>
</tbody>
</table>