1. ENGLISH VERSION

1.1 NEWS

Project SUPREME

The objective of the SUPREME project was to collect, analyse, summarize and publish best practices in road safety in the Member States of the European Union as well as in Switzerland and Norway, with a view to implementation in as many partner states as possible. By making the study results available to a broad target audience across Europe – and thereby encouraging the take up of successful strategies – the project wants to contribute to reaching the 50% reduction target of road fatalities, which the European Commission set in its White Paper: European transport policy for 2010: time to decide! (2001).

Analysis, synthesis and further selection of collected data were carried out along nine categories of measures and covers all areas of road safety work.

1. Education & Campaigns

2. Driver Education, Training & Licensing

3. Rehabilitation and Re Licensing

4. Vehicles (incl. ITS)

5. Infrastructure (incl. ITS)

6. Enforcement

7. Statistics & In depth Analysis

8. Institutional Organisation of Road Safety

9. Post Accident Care

In order to avoid overlapping between these categories, a detailed list of subcategories and – in some cases including even sub-subcategories has been provided.

Accordingly, nine *Thematic Reports* shall give a detailed description of best available practices for each of these categories, featuring basic characteristics such as target groups, quantitative and qualitative goals, key issues, duration of implementation and effects, coverage, costs, actors involved, implementation procedures as well as key success factors and potential implementation barriers in other countries or at the European level.

The crucial task of the project lies within the sound identification of best practice from the vast amount of available measures. In order to facilitate this process, a set of tools for collection, classification, selection and ranking of measures has been developed, along with guidelines for the assessment process at country level. As the common basis of all further activities, a list of eight best practice criteria was developed and transferred into a questionnaire. While the major part of this questionnaire consisted of a common set of core elements, some questions also addressed key features for each category.

On this basis, the SUPREME network of country experts has provided information from various stakeholders in cooperation with the respective Analysis Group members. Although 227 questionnaires have been completed, not all subcategories of road safety measures have been addressed. So this is the first step of data collection.

Results of project SUPREME selecting best practices for road safety improvement you can find on official web-page of European Commission by which was project funded.

http://ec.europa.eu/transport/roadsafety/publications/projectfiles/supreme_en.htm

1.2 TRAFFIC EDUCATION

Road safety education and campaigns aimed at actual traffic issues are key element for long-term improvement of road users' behaviour. Activities are especially focused on children, young drivers and elderly drivers because within these groups exist the biggest potential. Campaign objectives should highlight areas which most contribute to accident frequency. The accent should be put on risk traffic situations resulting from driving under influence of alcohol and illicit drugs, speeding and seat belts and helmets not wearing. Selection of mass-media canal which will be easily accessible is very necessary for public addressing and holding attention.

Objective of these actions is to intensify courtesy and safety culture among road users as well as stronger observing of traffic rules. Government bodies, concerned organizations and zealous individuals create conditions for improvement of situations in the area of road safety. They try to point out serious social problem and their consequences by TV and radio spots, advertising in press or on billboards.

However, effectiveness of such measures is relatively low (2-3%) they are reasonable for modification of behaviour which is changed according to socio-economic conditions of road users.

Children

Considerable potential from population education lies behind possibility of influence attitudes among children and youth. They do not have so entrenched habits as adults. Road safety education should form attitudes before children begin attend school because

than they are busy with other duties. Parents should be involved in education process to act as example of safe movement in traffic. They should explain basic rules which children have to observe as pedestrians and cyclists and point out risk that brings individual performing on road network.

There are many activities aimed at safe behaviour of children on roads in Slovakia as:

Young traffic warden

Objective of this educational and preventive program is explain gestures of Police officer at traffic regulating, principles of safe driving and general behaviour in road traffic to children and others. Competition consists of practical and theoretical part. Pupils simulate traffic environment on traffic playground as skaters, cyclists or pedestrians and the competitor regulates traffic together with Police officers. Questions on traffic rules related to cycling, road signs and road users´ responsibilities create framework for tests. Tests verify knowledge from health care on theoretical level and providing of first aid show practical abilities of children. The most successful children are awarded by certificate and material prizes.

For safe school – Road and me

Public television provides video spots *„Where was made a mistake?“* which are object of discussion between pupils and Police officers. Through eight videos with loose end they talk together about correct and incorrect behaviour of road users from presentation. Each of skits is finished by moral lesson. Children talk about their way to school and opinions on traffic risks, safe cycling and wearing of reflexive materials.

Happy zebra

Main objective of this action is training of safe manners on roads and checking of knowledge gained at traffic-educational lessons. Children by playfully form check their knowledge on traffic rules, skills and teamwork in seven competitive disciplines. All children who gained the highest number of points in disciplines will get their first *driving license*.

Behave yourself!

It is a project of cooperation between Police and schools that is realized as preventive and informative programme for pupils of primary schools (11-12 years) on the territory of Slovakia. It should give concrete advices to children how don´t become victims of crime, how to control specific hazardous situations and where to call for help. Project is wider aimed: Specially trained Police officer provides clarification of 10 thematic topics for children with help of worksheets. Each topic is monthly discussed during whole school year (September-June). Two topics are aimed on traffic problems - "Behave yourself" and "You should know about this" – with objective to inform about safe cycling rules, behaviour of pedestrians in road traffic and in public transport means and especially about road traffic rules. The other lessons are aimed at vandalism, using of fireworks, racism, and violence among us, drugs alcohol and environmental protection. Mascot ROBO (logo of the project) accompanies the children within all lessons. After project finishing each child

obtain the certificate. Within the scope of this project Police assign the patrols for schools with busy traffic to help the pupils with safer journey to school.

Safe on bicycle

Traffic-educative event for 10-12 years pupils from all primary schools in SR. The competition checks theoretical knowledge of pupils by tests on road safety subjects as well as practical and technical skills in cycling. Competition proceeds from concept of internationally organized children traffic events under the patronage of FIA (Féderation Internationale de l´Automobile). Special benefit of this program lies in officially patronage of Ministry of Education SR whereby the overall realization is guaranteed.

Drivers

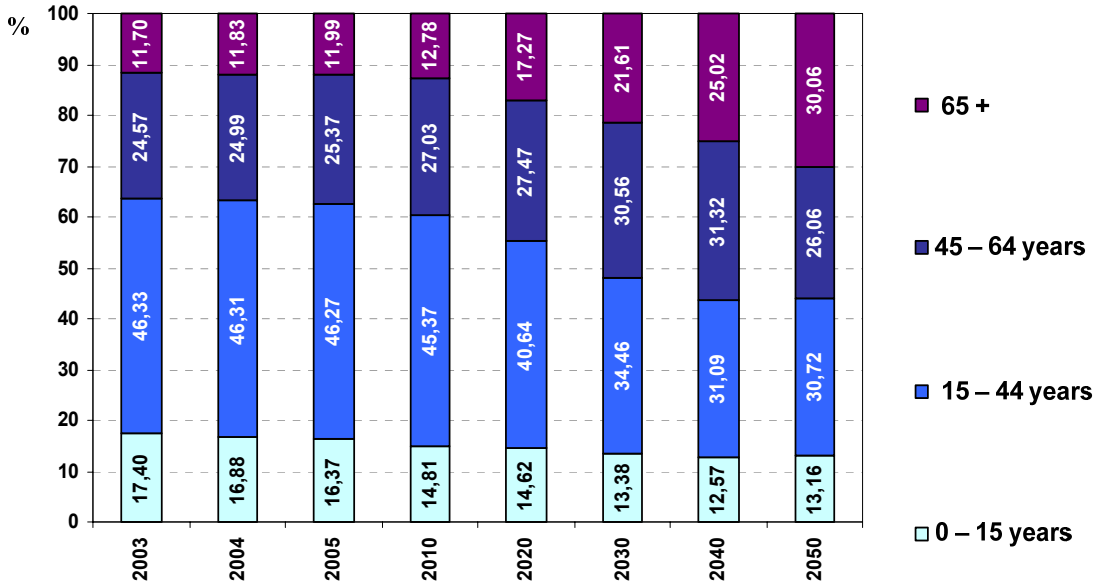
Subject of matter for road safety campaigns addressing mainly drivers of motor vehicles are accident causations. Information about influence of alcohol and drugs on driving, seat belts not wearing or traffic rules observing are followed with accident statistics which confirm importance of message in given problem area. Lately, negative effects of mobile phones and courtesy among drivers on the roads are presented in mass-media.

As target group is quite broad substantial part of projects is aimed at novice drivers who have become relatively risk road user category. Their driving skills do not reach level of older and more experienced drivers but they could compare to them with alcohol consumption. Young drivers take more risk than is allowable and they exposed themselves and others to the higher possibility of accident occurrence. For this target group it is recommended to choose more radical form of campaigns to could imagine consequences which are associated with risk driving.

Such form of road safety campaigns could be for example *Road shows* where victims or relatives are invited to tell their stories and experiences with accidents. They try to explain road safety problems to young drivers according to real examples and moderate their behaviour in road traffic. Campaigns where during weekend nights group of young people choose their driver are very popular in the Europe. Designed driver has than non-alcoholic drinks for free in pubs.

Elderly road users

Participation of elderly road users in road traffic permanently increases what is caused by global trend in ageing of population. Despite the fact that Slovak republic presents country with relatively *"young population"* this tendency is possible feel also in our conditions. This reality urges us to deal seriously with this situation.



Population age structure with outlook till 2050.
Source: Demographic Research Centre

Why elderly will drive more frequently?

- » number of elderly workers will be higher
- » elderly will be more active than today
- » they will prefer living outside inner cities (higher crime rate and costs of living)
- » they will be more independent (passing interest in retirement homes)
- » they will have better financial background

The primary conclusion from accident analysis related to elderly road users is that they do not take more risks but are more at risk.

Why are elderly more at risk?

- » in comparison with other road users are more frequently involved in collisions on side of pedestrians than drivers or passengers
- » for elderly are typical multi-vehicle crashes
- » older peoples are more vulnerable against collisions than other road users

Public especially younger population holds opinion that elderly drivers should have limited access to driving. Despite this argument, individual transport remains the safest mode of transport for older people. Risk related to public transport consists mainly in journey to/from station which is higher than for driving. Typical accidents for elderly are collisions at intersections which are results of slower reaction time and inadequate assess of gaps in the oncoming traffic stream.

Older drivers become standard group of road users and development of activities for redirection to public transport can have adverse effects on their safety. It is necessary to concentrate on assessment of health ability for driving and informative campaigns which could help with explaining of new technologies in road traffic.

1.3 SPEED

Nowadays, speed is the key element of road safety improvement which realize also drivers themselves. There are two forms of adverse influence of speed on road safety:

- speeding
- inappropriate speed

Many drivers openly admit that exceed speed and this behaviour argue with rational or emotional motives. The most frequently reasons are usually:

- adaptation of speed to traffic flow
- weakness for higher speeds
- rush caused by present life-style

Another argument is fact that drivers do not realize speed limit in force on given road segment. Absence of expressive road marking or its oversight has influence on selecting of higher speed by drivers. According to statistical data were selected drivers groups that exceed speed more than others. These offenders are mainly young drivers and professional drivers. It has been showed also that higher speeds are preferred by male drivers.

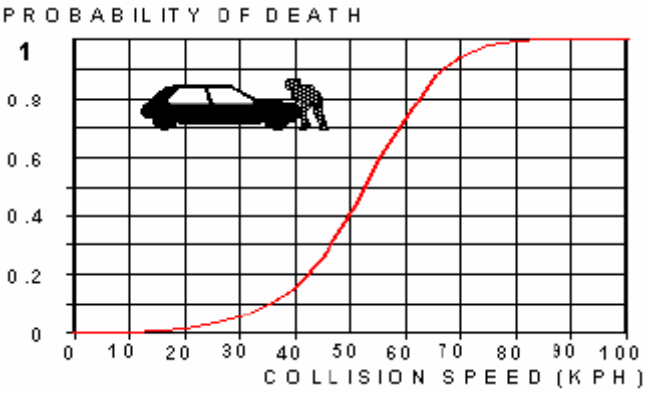
While all vehicles are equipped by tachograph for objective control of selected speed many drivers rely on subjective perception of safe speed which does not have to be always correct. Situations as speed maintenance for a long time, entry to lower speed road sections and areas with reduced peripheral vision (wide roads without reference point, night driving or fog) lead to speed underestimate.

Effects of speed

By assessment of speed effects that exceed legal limit on given road section or is inappropriate in respect of roadside conditions is necessary to examine this adverse phenomenon from road safety, environmental and quality of life point of view.

From road safety standpoint has inappropriate speed influence on number of road accidents as well as their severity level. High speeds reduce drivers' possibility respond to dangerous situations because drivers need more time for information processing and selection of optimal variant. Obviously, with higher speeds increase also stopping distance what results in more serious injuries for vulnerable road users. Energy released at impact

is absorbed by lighter object what presents higher risk for pedestrians, cyclists and drivers in smaller vehicles.



On picture above probability that pedestrian will be killed at impact with passenger vehicle is presented and ascending curve has steepest course between speed values 50 km/h and 60 km/h. These speeds present difference between speed limits within urban areas in Slovakia and other European countries. As a result of higher speeds visual field of drivers is narrowed where he could register information about traffic situation ahead. Not only speed exceeding has influence on accident frequency but also speed deviation between individual vehicles on roads. Different speeds lead to more often overtaking and to higher probability of vehicles contact. By lowering speed limits on black spots expected effects on accident frequency and severity could be determined according to *Power model* (Nilsson, 1997).

Adverse impact of speed on environment results from aggressive driving of drivers who markedly change speeds especially in towns. Swift acceleration increases the fuel consumption and more amount of harmful emission come to air. These emissions consist mainly of carbon dioxide, hydrocarbons and nitrogen oxides. During hot summer months air pollutants come into the contact with solar radiation what produce increased level of ozone. Ground-level ozone has influence especially on health of seniors and children.

Average speed in urban areas affects people well-being who live at close quarters. Adverse social consequences bear mainly those who do not sit in the vehicles. They are exposed to the noise that intensity increase with higher speeds. Positive effect from higher speeds is in reducing of travel time but this savings are usually overestimated by drivers.

Speed – Measures

It is hard to find one universal solution for speed related accidents within road safety area which would allow reduction of fatalities and injured persons. Package of measures is needed that could use synergic effects of individual countermeasures and become strategic tool for road safety improvement. Speed management seems to be such tool because it considers mobility and economic demands on the one hand and road safety and environmental issues on the other hand. Speed management should deal with following areas to become complex tool for road safety improvement.

Education and public awareness are necessary elements for acceptation of specific measures related to speeding. Usually such measures are unpopular for drivers so positive effects on road safety and environment should be highlighted. Promotion of vehicles with high engine performance should not compete with this continuous activity.

Settings of speed limits are the heart of speed management and define safe speed with respect to road function, vehicle fleet composition and characteristics of roadway and its environment. These speed limits should be reliable and clear on whole road network. Difference between speed limits on motorways and other rural roads should be set such way that drivers choose driving on safer motorways. Within urban areas is necessary to take into account the ability of human body to resist impacts which are caused by motor vehicles. Prevalence of pedestrians and cyclists in residential areas lay stress on minimal contact between motorized and non-motorized road users. Speed limit 30 km/h for residential areas is popular within many European countries. Consensus for mobility demands and speed adaptation seems to be in dynamic speed limits which respect weather conditions, traffic intensity as well as road design. Speed limits for individual road categories are not harmonized yet in Europe what results in many speed offences from foreigners.

Measures related to road infrastructure improvement are relatively expensive so their implementation especially on lower road level is problematic. Reconstruction of existing urban roads for traffic calming zones is much easier and cost effective. Road audit for future road segments should be broadly applied to avoid conflicts with road safety demands.

Essential part of safety management is Police enforcement that should be aimed not only at domestic drivers but also at foreign and professional drivers. Setting of appropriate speed tolerance allow prosecute only drivers for exceeded limit more than 10 km/h. Police do not have available permanent staff for all roads within road network so automated enforcement by cameras and satellite seems to be very effective for rule observing. Legislative in Slovakia should be able to pursuit owner of the vehicle if real offender is not recognized by device. Sanctions for speed offences may deter drivers from repeating rule violations.

Development of new technologies achieves success with support of drivers with rule observing. The most known is probably *Intelligent Speed Adaptation* (ISA) which uses information on vehicle position and actual speed limits in force on given road section. The main benefit of ISA technology is in possibility of speed limits observing on whole road network. Current system is based on permanent speed limit however there are activities with its using on dynamic limits. Negative effects from using of advanced technologies are hiding in drivers' reduced attention and excessive trust in similar systems.

1.4 VEHICLE

Growth of motor vehicle production in our country and abroad is associated with increased motorization of population and their demands on equipment. Car manufacturers show great activity for production of safer and intelligent vehicles with objective gain trust of potential customers. Vehicles have become more and more robust and faster engines which can educe huge energy.

Tendency in area of developing safer vehicle is oriented towards two objectives. On the one hand possibilities of crash avoidance are considered and on the other hand potential from reducing of consequences resulting from road accidents is subject of research activities. Financial resources used for such aimed projects established safety standards which serve for comparison of specific vehicle models. According to this comparison we have precious information for buying of specific car model.

Program Euro NCAP which was established according to project NCAP (USA) began with vehicle assessment in 1995 and its logo decorates many promotional materials. Euro NCAP guarantees routine testing and evaluation of results for most passenger cars. IDS applications contribute also to accident reduction thanks to technologies that are able to avoid collisions. However, their implementation to mandatory equipment is limited by high initial costs. That is the reason why is research presently oriented to development of low-cost and effective applications which would be available for general public.

Euro NCAP

Efforts related to road safety improvement through better vehicle equipment and their crashworthiness become more and more promotional strategy of many car manufacturers. Programme *Euro NCAP* is initiative currently supported by five European governments, European Commission and motorist and consumer organizations. Since 1997 programme provides information on safety level of vehicles to general public. Main objective of Euro NCAP is in increasing of public awareness in the area of active safety and consumer demands on selection and purchase of individual passenger car.

A lot of new cars are tested according to specific protocols that are more strict and extensive than manufacturer tests. The most important factor of safety potential assessment is compatibility between passenger cars. Differences in vehicles' mass and weight require different criterions for assessment of their safety level. Currently Euro NCAP distinguishes between nine vehicle categories. Vehicle safety assessment is carried out just within the same category. These vehicle categories include:

- Supermini

- Large Family Car
- Executive
- Small MPV
- Large MPV
- Roadster Sports
- Small Off-Road 4x4
- Large Off-Road 4x4

Euro NCAP presently performs several tests that have to assess quality of vehicle at different crash situations. Testing of vehicle' crashworthiness in the case of frontal impact is carried out through simulation of vehicle collision against fixed, concrete block. Vehicle speed at the time of crash is 64 km/h what is higher value than minimal requirements of European Union (56 km/h). Impact forces released at crash are monitored on special equipped dummies which represent driver, passenger and child situated in child restraint. There are two kinds of tests for assessment of vehicle crashworthiness at side impact. In the first case, car to car side impact is simulated by mobile barrier which hits driver's door at speed 50 km/h. Devices connected to dummy record released forces and assess their impact on human body. Consequences of these road accidents are mainly head and neck injuries. In the second test vehicle is moved at speed 29 km/h towards to narrow steel pole. Vehicles equipped by side airbags markedly decrease probability of severe injury. Besides safety level providing by vehicle to driver and passenger, Euro NCAP assess to what extent vehicle is able to protect pedestrians. Designed impact speed is 40 km/h and results are in form of graphic display with more or less safe zones on the vehicle bonnet.

There are a lot of reasons for selection of new or older car but safety standard belongs to the cleverest criterion that we could have. On official Euro NCAP web sites you can find how safe your car is: www.euroncap.com or www.euroncap.sk

ITS applications

Adaptive Cruise Control (ACC)

ACC system is a *cruise control* upgrade that allows keeping predefined speed according to driver demands. Keeping the speed at the same level for a long period is not currently adequate for our road network conditions. Adaptive cruise control is based on the usage of radar or laser (lidar) that is located behind vehicle grill and monitors the distance to the following vehicle. If the mutual distance is reduced to the pre-defined value, the system automatically activates the brakes to set lower speed. After the distance returns to a safe length, the system will accelerate back to set speed. The disadvantage of the laser technology is in its sensitivity to the weather conditions as heavy rain or fog.

Steering wheel sensor allows the recognition of vehicles parked at the roadside or opposite vehicles what avoids unwanted system activation. ACC is suitable for utilisation in the cities with higher traffic intensity where the vehicles must change their speed. This system is also effective for a reduction of accidents caused by driver fatigue or by longer reaction time. ACC is a good addition for systems preventing crashes. The technology is

also effective within the frame of fuel consumption, because of the vehicle speed harmonisation.

Equivalent or similar systems could be known as well as: Distronic, ADR, AICC, ART, ICC, DFGF, etc. Due to the safety reasons, the ASS is limited to brake with the retardation of 2m/s^2. So the system doesn't substitute the emergency braking.

Electronic Stability Control (ESC)

This modern, computer assisted technology supports drivers with stay in control and decreases the number of collisions at special traffic manoeuvres. Situations as fast change of driving direction or sudden braking are thanks to ESC better controlled. ESC is practically advanced version of ABS technology which contains speed sensors and allow independent braking each of wheels individually. In addition it has special sensors for monitoring of vehicle direction and intended driver direction according to steer angle. Vehicle tries to stay under control by using of brakes on one or more wheels.

ESC is activated automatically as device recognizes change which could lead to crashes. This system is not almighty and the driver should adapt speed to road environment. It applies in special conditions as wet road when ability of wheels to reduce speed is limited. Effectiveness of ESC is decreased by inadequate state of tires because it depends on skidding between wheel and road pavement. Using of ESC doesn't require special abilities or skills with driving.

ESC technology proved at single-vehicle accidents caused especially by runn-off crashes, rollovers and collisions with roadside obstacles. These accident types is typically for motorways with number of traffic manoeuvres that driver perform and on wet roads. Studies from USA find out that implementation of ESC into the new vehicles will results in 30 - 40 % single-vehicle accident reduction. Effectiveness of ESC for SUV vehicles is even 67 %.

Manufacturers use this technology in their vehicles under various names where the difference is only in period of system activation (response time). This system you can find under these labels:

Electronic Stability Program (ESP) – Audi, Mercedes, Saab, Volkswagen

Dynamic Stability Control (DSC) – BMW, Land Rover, Jaguar

AdvanceTrac – Ford, Lincoln, Mercury

Vehicle Dynamic Control (VDC) – Subaru, Nissan

Vehicle Stability/Skid Control (VSC) – Toyota, Lexus

Vehicle Stability Assist (VSA) – Acura

Dynamic Stability Traction Control (DSTC) – Volvo

Stability Management System – Porsche

Active Handling – Porsche

Lane Departure Warning System (LDWS)

LDWS is electronic in-vehicle system that follows traffic lane and warns driver even if vehicle has tendency deviate outside the lane. System controls vehicle trajectory on road lane with support of in-built mini camera situated on the vehicle. Currently available systems are based on using of video sequences for estimation of vehicle position. System analyses vehicle position according to road characteristics as width road lane or road curvature.

When vehicle follows the traffic lane axis system works in safety zone. Well marked lane boundary divides warning zone on *earliest* warning line situated on roadway and *latest* warning line outside of road. When vehicle moves from safe to warning zone system activates and warns the driver.

LDWS is only warning system so manoeuvre with vehicle have to perform driver. Application will activate also when road marking is not readable or the system is out of order. On wet and snow roads system could not provide information because road marking is unreadable for sensors. System is designed mostly for motorways where road marking is evident. Also for system operation minimal speed is needed what is reason why is not suitable for low speed roads.

Using of LDWS in road traffic could reduce frequency of single-vehicle accidents as ESC system. Run-off crashes, rollovers as well as driving in the opposite direction provide potential for accident reduction. Higher effects are mainly reached by heavy vehicles as by passenger cars because these events occur during driver micro sleep. Drowsiness is main accident factor for collisions during night or at long distances that are characteristic for professional drivers.

1.5 ALCOHOL AND DRUGS

Accident statistics showed that more than 25 % crashes in EU are caused by driving under influence of alcohol. There are popular misconceptions among drivers about effect of time on blood alcohol content (BAC). Thanks to them are drivers more exposed to risk of accidents or detection by Police patrol. Extent of acute alcohol influence on human body depends on body weight, time after consumption and sex. Nowadays, it is possible to find out your BAC by simple alcohol calculators on the web.

For example, man with body weight 85 kg which drank two glasses of wine has 1 hour after consumption BAC level 0,61 g/l. Driving is possible 6 hours later after consumption when BAC is zero.

Novice drivers belongs to risk road users because alcohol is for them strong stimulant that results sometimes in aggressive behaviour. Combination alcohol with drugs (legal or illicit) and its influence on driving is hot topic for current research activities. However, Police

have not yet necessary equipment for roadside drug detection so it is problematic to express risk rates for various combinations of alcohol and drugs.

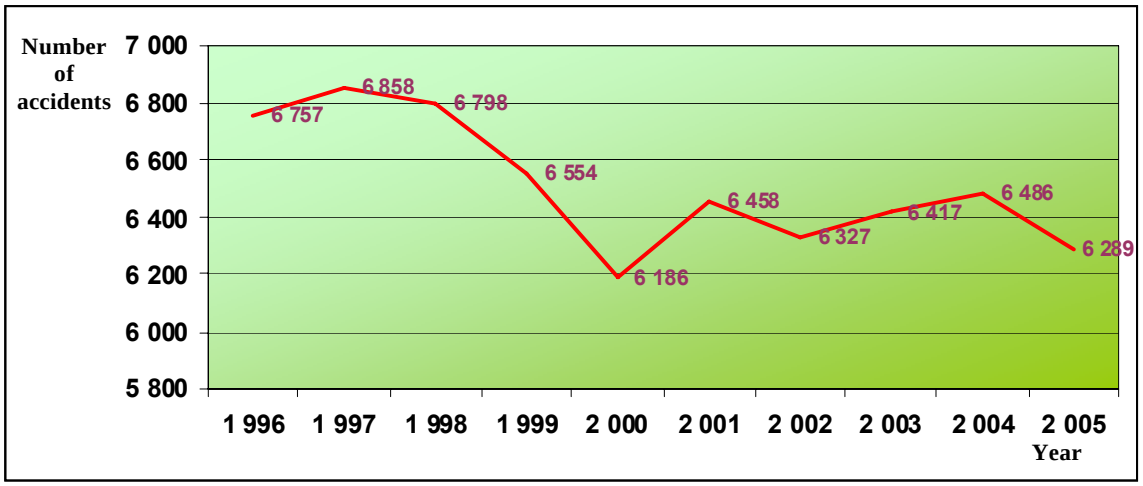


Figure: Number of accidents caused by drivers under influnce of alcohol in period 1995 – 2006 (Source: Presidium of Police Force)

Effects of alcohol

Alcohol consumption leads to acute as well as chronic effects on human body. It directly affects nervous system and causes slackening of muscles what are main causation of severe road accidents. In small doses persons shake off social restraints what evokes more emotive reactions. Impairment of distinctive visual functions and motor skills at overdose is very dangerous not only for drivers but for all road users.

An effect from alcohol consumption is suitable to split into the individual tasks related to driving. For this purpose a lot of laboratory studies and simulations were carried out which proved relatively strong influence of alcohol on driving.

Operational level presents actions related to speed and direction keeping. Driver has problem with direction maintenance from BAC 0,18 g/l. Keeping of safe distance is very problematic with BAC 0,54 g/l if vehicle in front keep constant velocity. Drivers with BAC 0,3 g/l have serious difficulties if previous vehicle changes speed. Reaction time period at minimal two options is impaired with BAC 0,6 g/l. Alcohol has also strong relation with reactions on visual perception that is impaired at BAC 0,8 g/l.

Alertness of driver and his ability to gain information from visual field are actions of *tactical level*. Using of mobile phones and involvement in conversation with passengers negative affects driver's alertness. According to difficulty of secondary activity accident risk for drivers increases from BAC 0,3 g/l up to BAC 1,0 g/l. By alcohol consumption comes to fixation on central vision field what decrease possibility to gain information from peripheral vision.

An effect of alcohol on tasks from *strategic level* is hard to express in quantitative units. In generally, alcohol has an impact on loss of self-control and many drivers believe that drive

safely although it is just a subjective erroneous impression. Impaired drivers expose to the risk situations not only themselves but also other road users.

Effects of drugs

Cannabis:

Extracts from plant *Cannabis sativa* belong to the most frequent light drugs not only in Slovakia but all around the world. This plant serves as a base for production of marihuana, hashish and hashish oil. Marihuana is mostly smoked in combination with tobacco. Extract from resin of female flowering tops is used for production of hashish and hashish oil. Effects of these drugs depend on content of tetrahydrocannabinol (THC) in mixture. By refining of this plant there is higher content of THC (up to 40 %) than twenty years ago.

Influence of cannabis is not only dependent on THC content but on personality of user and his previous experiences with this substance. Generally, it could be said that cannabis has an impact on driving by changes in visual perception of traffic conditions, increasing of reaction time and impaired alertness in unexpected manoeuvres. Drivers usually slow down, increase safety distance and perform less number of manoeuvres. Consumption of cannabis is often followed with alcohol drinking what results in adverse impacts on driving. From physiological point of view cardiovascular symptoms together with tachycardia and blood pressure changes are observed. There are noticeable bloodshot eyes with dilated pupils.

Opiates:

Opium is most known representative of this addictive drugs group. It is extracted from unripe capsules of poppy heads in form of dried milky extract. Heroin is synthesized from morphine by double acetylation. Contrary to morphine, heroin affects brain more rapidly, so euphoric effects are more intensive. Heroin can be smoked or inhaled of white powder or used in form of injections. Among opiates belongs also codeine that has analgesic and antitussive properties.

Sedative effects of opiates result in drowsiness, apathy and indifference on external stimulus. Dilated pupils have negative effect on vision adaptation in passing between light and dark areas (driving in tunnels and during darkness). Withdrawal symptoms are followed by loosing of concentration what has a result in impair of driving performance.

Cocaine:

This kind of addictive substance is retrieved from extract of coca leaves (Erythroxylon coca). Cocaine is usually used by smoking (crack), snorting or in form of injections. In combination with alcohol the effects of cocaine are longer and seriously increase the risk of myocardial infarction.

Cocaine consumption is initially followed by euphoria, tiredness and hallucinations. However euphoria is followed by period of anxiety, delusions and paranoia. User has feeling of depression, exhaustion and aggressiveness in final state which incites to a new

consumption. All of these periods are dangerous for driving. During period of euphoria driver takes more risk that could lead to danger situations.

Synthetic drugs:

In recent years began boom in production and using number of this kind of drugs because they have become popular article for young people on weekend trips. These addictive substances we could consider as stimulative and hallucinogen drugs that are usually taken orally in the form of tablets, sometimes snorted (amphetamine) or injected.

Analogous to cocaine there are several periods that have similar characteristic after drug consumption. Thanks to stimulative effects reaction time and vigilance are improved soon after consumption what results in more risk-taking. Dilated pupils are consequently sensitive to light changes that can lead to temporary blinding of driver. After euphoria period will appear exhausting and depression. These drugs are dangerous for driving either in high or low blood concentrations.

Hallucinogens:

Hallucinogens present relatively broad group of synthetic and natural drugs. The most known representatives are LSD (lysergid), magic mushrooms (psilocybin) and mescaline. LSD familiarly named acid is synthetic version of ergotamine produced by fungal parasite. This substance is possible to find in various forms thanks to strong effects evoked by small amount. The most used by young people are mainly tablets and stamps. Effects are achieved very soon after consumption (1 hour) and can last to 8 hours. Psilocybin that is psychoactive substance is chemically similar to LSD but it seems to be less panic. Mescaline is active substance extracted from cactus (peyotl) that groves on territory of Mexico or is synthetic produced.

Effects of above mentioned addictive substances are not compatible with safe driving. Especially psychomotoric skills are affected by hallucinogens. From physiological point of view consumption of these drugs increase blood pressure, frequency of heartbeat as well as body temperature. Despite the facts that exist number of evidence of adverse effects of drugs on human mentality and body there is still lack of information which would describe influence on driving.

Alcohol – Measures

Measures will be effective if will results in reduction of alcohol related accidents or in decrease of traveled vehicle kilometers by drivers under influence of alcohol. Following set of measures are aimed at meeting of these objectives.

Measures supported *restriction of alcohol availability* is possible to implement with spatial and time field of action. Petrol stations and roadside restaurants should respect ban on alcohol sale or should define hours of business for alcohol sale. Intentions promoting increased price for alcoholic beverages in favour of non-alcoholic or increasing of legal minimal age for alcohol consumption have also positive effects on road safety improvement.

Steps leading to restriction of driving under influence belong to the second group of potential countermeasures. There are some experiences with implementation of Alcolock programme abroad for multi-offender drivers. Sweden would like to make Alcolock as standard device equipment in all new cars from 2012. Disadvantage of such measures is fact that most of drivers do not drink alcohol before driving and installation of such relative costly devices will lead to higher prices of vehicles. Various rehabilitation programmes exist that use this kind of devices as alternative for atonement the crime related to driving under influence of alcohol. Involvement of authorized sellers in support of designed driver who will have non-alcoholic drinks for free during weekend nights could lead to reduction of accident frequency among young people.

Activities of Police enforcement are based on drivers' realizing of risk that can be convicted of traffic offence or on level of penalty or sanction which offender meet. For this purpose it is suitable to perform roadside controls on places and in time when is probably higher frequency of drivers under influence of alcohol. Financial sanctions and licence withdraw resulting from traffic offence commitment have just short-term effect if it is not carried out sufficient number of roadside controls.

Road safety benefits from education and public awareness improvement is possible to achieve if public will be informed about cruel fates of road accident victims. For more intensive impression on audience it is possible to involve the victims in these programmes (Road Show). This topic is also suitable for medial promotion which could be performing as strong emotional shock.

1.6 SAFETY RESTRAINTS

Using of safety belts and child restraint systems is one of the most effective measures that have ever been implemented in respect of road safety improvement. If passengers ignore use of restraint systems they expose themselves higher accident risk. Research findings aimed at assessment of safety belts effectiveness showed that their using will result in decreasing of fatality risk by 61 % at road accidents. Child restraints also decrease fatality risk by 71 % for children up to one year and by 54 % for children between 2 – 3 years.

These findings are probably not convincing evidence for some drivers and they realize the sorry truth too late. Some of them have even fixed idea that they save child by holding them on knees. Forces released at crash are so enormous that parent has not enough time for saving a child. Parents unconsciously expose their child to higher risk because they have to face not only impact forces at crash but also pressure of another human body.

Safety belts

Using of safety belts is traditional road safety measure which improves driver's safety in the vehicle. Function of safety belt is to protect passengers on the front and rear seats against impacts or sharp braking. Safety belts on front seats are more effective than on the rear seats because they are situated on more danger zone. Moreover, safety belts are more effective in fatal accidents than in collisions resulting in severe injuries.

Fatal injuries are closely linked with head or chest injuries. By using of seat belts are reduced forces released at impact with other vehicle or roadside obstacle. We have to remember that with higher speeds decrease efficiency of seat belts but at lower speeds are excellent safety component which were over and over approved especially at driving on urban roads.

In order to be drivers protected correct use of seat belts is required. It is important that belt have to be put over the chest and pelvis. Lower part of seat belt should be put so high over the legs to not intervene the stomach area. Diagonal part led over shoulders away from throat reduces impacts caused by inertia force. Too loose seat belt can cause throwing of upper part of body more ahead what presents higher risk for chest and head injuries. Correct tight of seat belt is actually compromise between safety and comfort at driving.

Pregnant women often hesitate about seat belt using but its correct fitting as was mentioned above provides more safety for woman as well as for unborn child. Women should use seat belts because they are exposed to unwanted abortion at accident.

Practice with seat belt reminder showed positive effects on passenger safety. Resistance to unpleasant sound emitted by device for even short travel distance will not always finish by happy-end for each of you.

Child restraints

Children have in comparison to adults different physiological characteristics which serve as base for design of child protection systems. They are smaller and their mass distribution is very different from adult's body. Child head is relatively large what put emphasis on ensure its security at the impact. The best way how to achieve it is in transport of child in way that is opposite to driving direction. From practical point of view it is complicated to transport older child this manner because it is limited by seats with disabled airbag.

Parents can provide security for their children only if they put them to the child seat by correct way. Belts should go over such parts of body how it is specified in user manual. However, the most important is fixation of child seat. Progress in child restraints developed ISOFIX system which allows fixation by special anchors between seat and back rest. You can ask sellers for information about ISOFIX equipment on child seat.

Purchase of proper child seat requires some knowledge which could save money. Firstly, it is necessary to know from which category you have to choose child seat for your baby. According to baby's weight we have following groups of child restraint systems:

Group 0 for children of a mass less than 10 kg. System should be fixed always by opposite way than is driving direction. It is possible to fix the system on front seat next to driver but airbag should be disabled than. Price is approximately 3000 - 4000 SKK.

Category 0+ for children of a mass less than 13 kg. System should be fixed always by opposite way than is driving direction. Fixation on front seat is not recommended. Price is approximately 3000 - 4000 SKK.

Category I for children from nine months to four years with mass between 9 - 18 kg. This type of child restraint system is fixed in direction of driving on rear seats but when the child is smaller system can be fixed by opposite direction. Child seats have to by equipped by safety belt in the area of crotch. Price is approximately 2500 - 4000 SKK.

Category II for children from three to six years with mass between 15 - 25 kg. They are installed according to driving direction on rear seats. As children in this age are relatively high it is suitable to have sufficient head rest. Child should be fixed by seat belts. Price is approximately 500 - 1000 SKK without head rest or 2000 - 7000 SKK with head rest.

Category III for children from five to twelve years with mass between 22 – 36 kg. This child seat category is fixed in driving direction on rear seats. Vertical adjustment is very necessary to avoid seat belt pass by throat area. Price is approximately 500 - 1000 SKK without head rest.

Unless you don´t decide for specific type of child restraint system you should find some information on label, that indicates country of origin, approval number, using options (on all or selected vehicles) and weight category. Child seats with such label are certificated for regular impact tests which proved quality of the product.

1.7 VISIBILITY/SAFE DISTANCE

Ability of road users to see and be seen is one of the most important requirement for smooth and safe movement on road network. As roads are used not only by drivers but also by vulnerable road users it is needed in interest of safety to be seen at long range. Keeping of safe distance provides driver ample time needed for performing of clever manoeuvre by which avoid collision with other vehicle.

Using of reflective materials can make easier for drivers recognition of situation during adverse weather or night-time. Parents should consider under these circumstances whether their children will be seen on their way to school. If they have not any suitable clothes it exist possibility to buy relatively cheap reflective and fluorescent belts and accessories which can be easily clipped.

As well as among drivers it is possible to improve mutual visibility through daytime running lights. Despite the fact that many drivers do not get accustomed to this measure using of DRL has justified reason.

Daytime running lights

Properties of objects which allow observer distinguish them from environment we can consider as visibility. As nowadays it exist broad spectrum of vehicle models and color variants, one of available possibilities of road safety improvement is using of daytime running lights. DRL using differs within European Union because it was not accepted uniform agreement which could define same form of usage in all countries. From available studies dealing with positive effects of DRL on road safety resulted that:

» Vehicles using DRL are more **visible** than others. This fact relates to visual contrast between vehicle and environment.

- Using of DRL results in more **accurate estimation of distance** and a shift angle. Vehicles are earlier noted if observer has them on the edge of visual field.
- DRL results probably in more **correct decisions** of road users. Vehicles using DRL seem to be closer and drivers at overtaking use longer distance. It has to be noted that results of studies aimed at observation of safe distance in situations other than overtaking are less explicit.

However, DRL using has its opponents who argue by reduced visibility of vulnerable road users and increased fuel consumption and amount of released exhaust gases. Despite these facts most of related studies drew following conclusions:

- Road users not having lighting devices, i.e. pedestrians, cyclists, mopeds *do not become less conspicuous* if all vehicles feature DRL.
- A negative effect of DRL on the visibility of motorcyclists *cannot* be ascertained.
- Dedicated DRL and dipped headlines *do not* cause glare.
- It is true that DRL increases *fuel consumption and CO_2 – emissions*. However, the increase is by up to 1.5% if dipped headlamps are used, and by up to 0.3% *only* in the case of dedicated DRL.

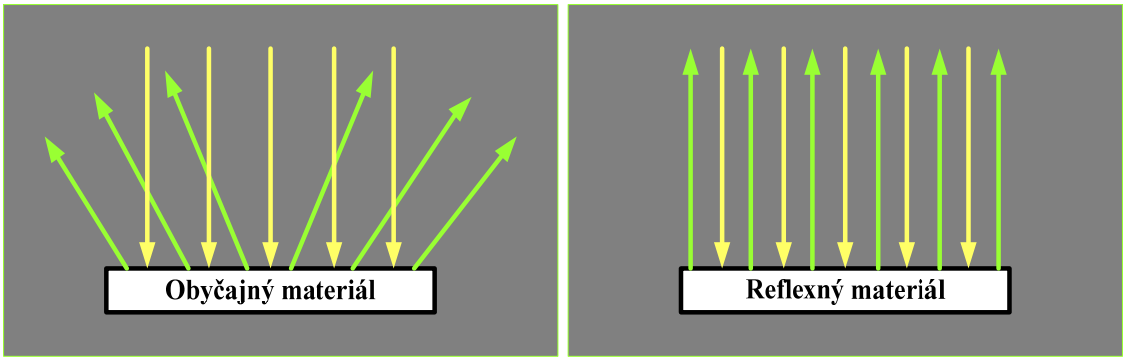
Nevertheless, even taking into account the effect on fuel consumption and CO_2 emissions, the safety benefits of a legal obligation to use dipped headlights on existing vehicles and to equip new vehicles with automatic dedicated DRL outweigh the costs by the factor 2 to 1. It should be mentioned at this point that in the case of, e.g., vehicle air-conditioning or the performance of hi-fi systems, it is not customary to investigate the environmental effects.

Visibility

Pedestrians and cyclists belong to the most vulnerable road users in road traffic. They are not protected against impact with motor vehicles by any protective means. As their body mass presents just small proportion of vehicle weight they absorb almost full amount of kinetic energy released at impact. It is therefore necessary to be seen for drivers of passenger and heavy vehicles. It applies mainly to the darkness and during reduced visibility but choice of proper clothes can save life also during the day.

Ability of material to reflect light from source describes physical quantity luminance which

depends on type of material and surface design. Statistics carried out for assessment of light reflection from specific materials showed that white clothes have luminosity 0,3. By comparison with reflective clothes that have average value 500 it is just fragment of luminous intensity of material. Reflective clothes can reflect light emitted from source directly. Reflected light from ordinary clothes is scattered to various directions what causes that observer see only part of light intensity. This effect is showed on following picture.



Information about pedestrians or cyclists in front of the vehicle comes to driver earlier thanks to the properties of reflective clothes. Such equipped road user is visible on the distance more than 210 meters what is in comparison with white clothes double and with dark clothes sevenfold value. In order to be seen by driver during darkness is not necessary to wear only reflective wear but bangles or belts will be quite sufficient.

Safe distance

Term safe distance presents minimal space between two following vehicles (driving in same traffic lane) which is needed for performing of safe manoeuvre of second vehicle. Safe distance serves also for mutual overtaking. Its length depends mainly on:

- vehicle speed
- type and weight of vehicles
- weather conditions
- road characteristics

With higher vehicle speeds and weight increases also required safe distance. It should be higher during adverse weather conditions (snow, rain, dark ...) and worsened road characteristics.

Non-compliance of safety distance results in higher probability of rear-end collisions. Drivers can estimate its length by rule of 2 seconds which they count from fixed reference point on roadside (traffic sign, tree). This rule is possible to use by passenger cars on dry roadway and during fair weather. In the case of heavier vehicles and adverse weather conditions, safety distance increase on 4 seconds. For heavy vehicles on icy roadway can this period increase even on 10 seconds.

Stopping distance also relates to safe distance. Driver should adapt speed to ambient conditions to be able stop the vehicle on distance which has within sight. Many drivers believe that if vehicle in front begin suddenly brake they can react, brake and stop vehicle on the same distance as the first vehicle. But this is a mistake that can have fateful consequences not only for driver behind.

These characteristics have influence on stopping distance of the vehicle:

- time for realizing of situation by driver
- time for performing the reaction
- time for reaction of the vehicle
- characteristics of vehicle at braking

Time required for realizing of situation presents period when driver notices danger and becomes aware that immediately reaction is needed. As brain recognizes risk situation time flows from change of foot position from accelerator on brake pedal. Time period needed for stopping distance depend on human factor and can be affected by fatigue, alcohol and level of concentration. As brake pedal is pressed down it begins time of vehicle reaction which depends on pedal clearance (it should be 5 – 7 mm), hydraulic properties of brake fluid and operation conditions of brake system.

That is the reasons why drivers driving in un-safe distance can not slow down in time when they see brake light ahead because former driver finished period for risk realizing and reaction time of himself and vehicle. Driver of the second vehicle delays at braking by 1 second. At vehicle speed 100 km/h driver need additional 28 meters for stopping.

Last factor influencing total stopping distance is brake characteristic which depends on:

- type of braking system
- material used for braking lining
- setting of brakes
- pressure in tires
- tire patterns
- vehicle mass
- coefficient of friction
- wind speed
- road gradient
- style of braking performed by driver

The tables bellow give stopping distance for driver's reaction time of 1 second.

Speed	Stopping distance (only driver)	
	Dry roadway	*Wet roadway*
30 km/h	17 m	18 m
50 km/h	34 m	38 m
90 km/h	82 m	95 m
100 km/h	106 m	118 m
130 km/h	147 m	179 m

Source: UN, 2007

Speed	Stopping distance (fully loaded)	
	Dry roadway	*Wet roadway*
30 km/h	18 m	20 m
50 km/h	38 m	44 m
90 km/h	95 m	122 m
100 km/h	113 m	145 m
130 km/h	176 m	215 m

Source: UN, 2007

1.8 CYCLING

Cycling belongs to healthy and environmental friendly mode of transport. Potential form reducing of motorized traffic in city centers and demands on parking place in historical areas should be more highlighted at developing of traffic system and its environment. Latest trends showed that population is more and more comfortable and cycling could be solution for keeping of physical and mental condition of people. The only difficulties of cycling in towns are in exposing to smog and intensive motorized traffic.

In the past, cycling was moved on periphery of interest and yielded to increasing motorized traffic. Some critics hold opinion that cycling is less safe mode of transport because cyclists belong to group of vulnerable road users. That is the reason why cycling culture in towns was on decline in the past. However, thanks to various interest groups and efforts of some bodies are developed conditions which allow safe cycling for parents and children.

Experiences from countries with established tradition and fair conditions showed that increasing proportion of cycling in urban areas results in reducing of traffic risk. However, these countries adapt their traffic environment to cyclists and pedestrians demands so people prefer cycling before driving. It is also in interest of environment and people in

cities with higher concentration of smog to promote cycling also in our country to become essential element of living and culture.

Bicycle helmets

To understand importance and purpose of bicycle helmets wearing means understand events that caused head injuries. There are two types of head injuries which are caused by swift change of speed or by impact on fixed obstacle. At collision of cyclist and vehicle comes to throwing of cyclist from bicycle. Bonnet of the vehicle is often obstacle for cyclists at frontal crash what results in abrupt impact of head and whole body on object that is much heavier and more stable. Brain bump into cranial bone by inertia energy what causes severe injury or even death.

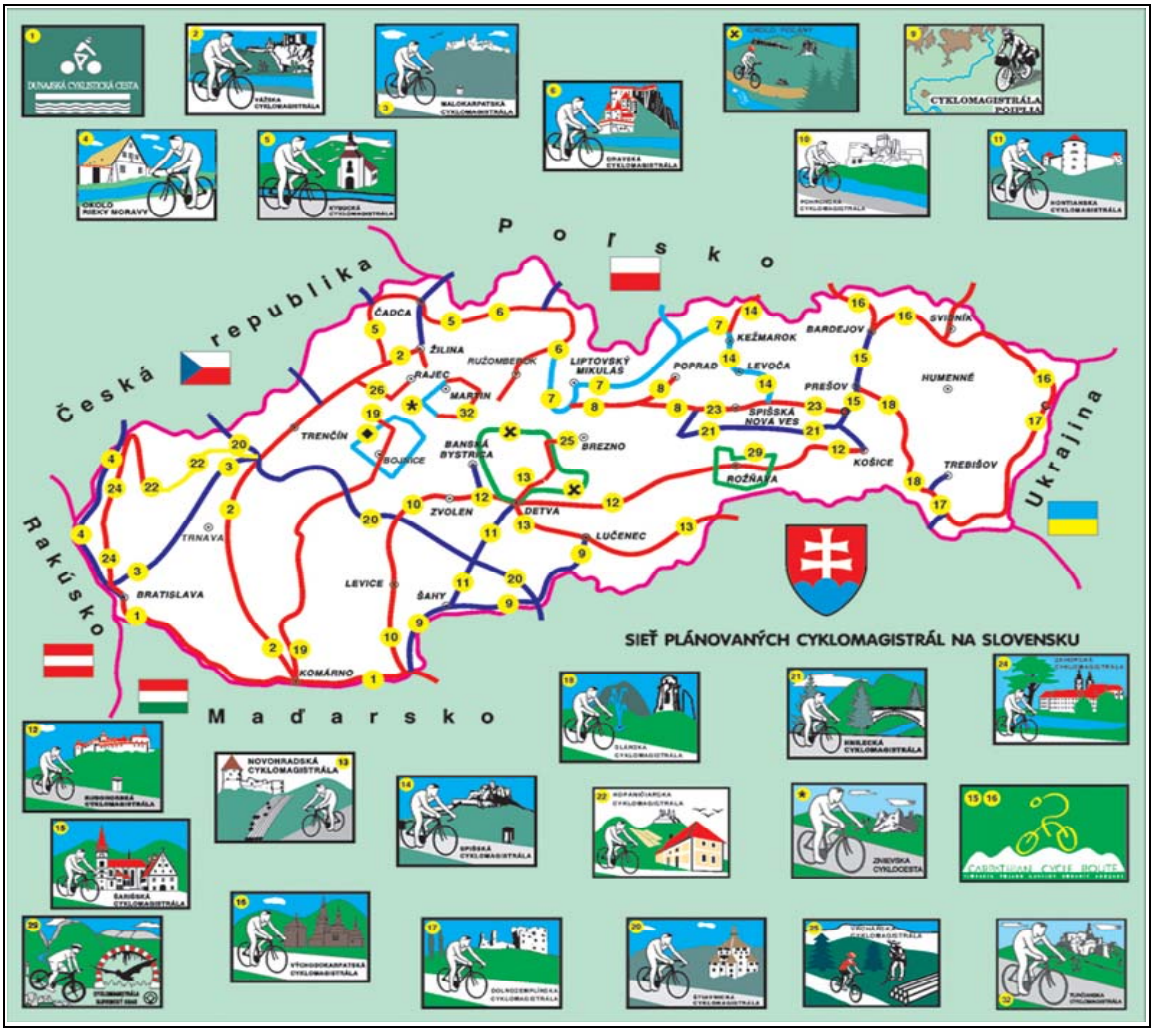
Helmets mitigate severity of injuries for motorcyclists and cyclists through natural barrier between head and fixed obstacle at impact. It helps by this manner:

- materials inside the helmet absorb part of impact force so brain hit on cranial bone with less inertia energy
- forces released at impact will be dispersed over larger area thanks to helmet's surface
- helmet serves as mechanical barrier at impact of head on fixed obstacle

It has been showed by comparison of head injuries number at road accidents with other injuries that helmets using reduces risk of head injury by 69%. Head injury is broad term for skull, brain as well as face injuries which can be moderate by using of helmets for all age categories.

Cycle routes

Despite the fact that infrastructure costs for cyclists are much lower than for motorized road users, this transport mode was on periphery of interest of land-use planning in the past. That is the reason why cycle infrastructure within Slovakia is poor developed. However, it has to be noted that more and more municipalities realize increased concern for this transport mode and work on creation of conditions for safe cycling. Cycle organizations in Slovakia promote successfully idea of cycling development by actions where present new cycle paths and routes. These cycle paths pass through nature reserves or historical monuments.



You can find cycle paths thanks to marking which is distinguished by various colors according to importance and strenuousness of given path.

C	*long-distance cycle routes*
C	*longer and demanding cycle routes*
C	*medium and modest cycle routes (for families with children)*
C	*minor cycle routes and connections*

Besides regional cycle paths it also exist Pan-european cycle route network which East Europe route pass through territory of east Slovakia. This project of European Cyclists´ Federation has as objective development of twelve long distance cycle routes that would

cruise whole Europe. Distance of East Europe route that goes from North Cape to Athens has length 5 984 km.

1.9 FIRST AID

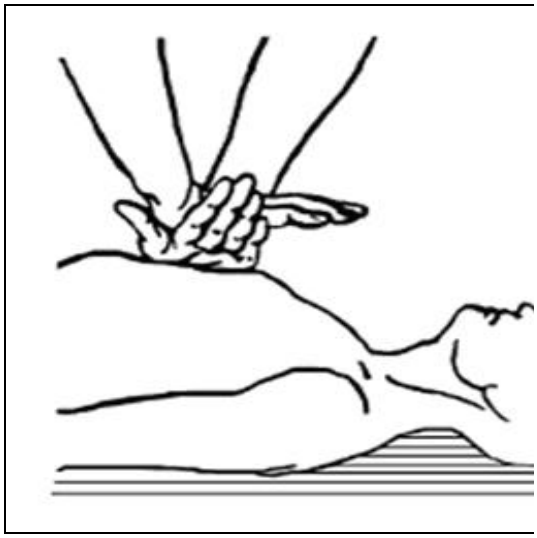
Well timed and correct providing of first aid at road accidents could save up to 40% of persons who died under these circumstances. Police controls showed that drivers have difficulties with providing of first aid. Panic results in chaos what extend time needed for rescue of accident victims. Each driver should know technique preserving life which has its own rules.

If you are as the first who came to accident location, park your car on open area in adequate distance (15 m). You create natural obstacle for activities related to life saving. After you stopped the car turn on the warning lights, take your medicine chest and warning triangle that should be situated 150 from accident location. If vehicle is still on the roadway it is necessary to put on reflective waistcoat.

After you will protect yourself against other vehicles you can go to the second phase what is visual inspection of injury extension in crashed vehicle. As emergency services arrive usually till 15 minutes since event reporting (in remote areas later) it is needed to carry out measures related to safety not only injured persons but also rescuer because his safety is priority. You have to reckon with instability of vehicle and fire hazard so it is essential to ossify vehicle by hand brake or by wedged wheel and disconnect accumulator battery. As soon as you gain basic view of accident, you have to call emergency services and provide information about accident location, number and severity of injuries and type of crashed vehicle. If you are not able define location, describe the route how you get there. On questions of emergency dispatcher you should answer patiently and matter-of-factly.

If you did all above mentioned activities you can proceed to the rescue of accident victims. The most important step is setting of priorities if more injured persons are in crashed vehicle. There is usually an unwritten rule that yelling persons are not in life-threatening emergency. Do not move with persons that are in unconscious state unless there is no fear of fire, slide of vehicle or there is not necessary resuscitation. Insufficient brain congestion or its anatomical impairment results in unconsciousness. If resuscitation is needed, lay person on horizontal position and assure that respiratory tract is free (head bending backward and advance of lower jaw). You have to realize that if blood circulation will stop, it comes shortly to stopping of breathing. It is important to compensate both of these basic vital functions by artificial breathing (*Picture 1*) and by indirect massage of heart (*Picture 2*).

Picture 1



Picture 2

Basic support of vital functions for adults (Adult BLS – Adult Basic Life Support):

Algorithm:

1. Casualty is in unconsciousness and without respond
2. Call for a help
3. Make air passages free
4. Is there a presence of normal respiration?
5. Call emergency medical service (112, 155)
6. 30 compressions of chest
7. 2 artificial breathing, 30 compressions

Place for compression – centre of breastbone

Intensity of compression – around 1/3 of chest depth (4 – 5 cm)

Way of compression – palm of both hands

Proportion of breaths and compressions – 2:30 (frequency of compressions 100/min.)

Releasing of airway passages – manoeuvre *„head tilt – chin lift“*

*Basic support of vital functions for children (*Paediatric BLS – Paediatric Basic Life Support*):*

Algorithm:

1. Casualty is in unconsciousness and without respond
2. Call for a help
3. Make air passages free
4. Is there a presence of normal respiration?
5. Five initial breaths
6. Without respond? (without presence of blood circulation symptoms)
7. 30 compressions of chest, 2 artificial breathing

8. After one minutes of resuscitation call EMS (112 or 155) and continue

Place for compression – lower third of breastbone (one finger above lower border of breastbone)

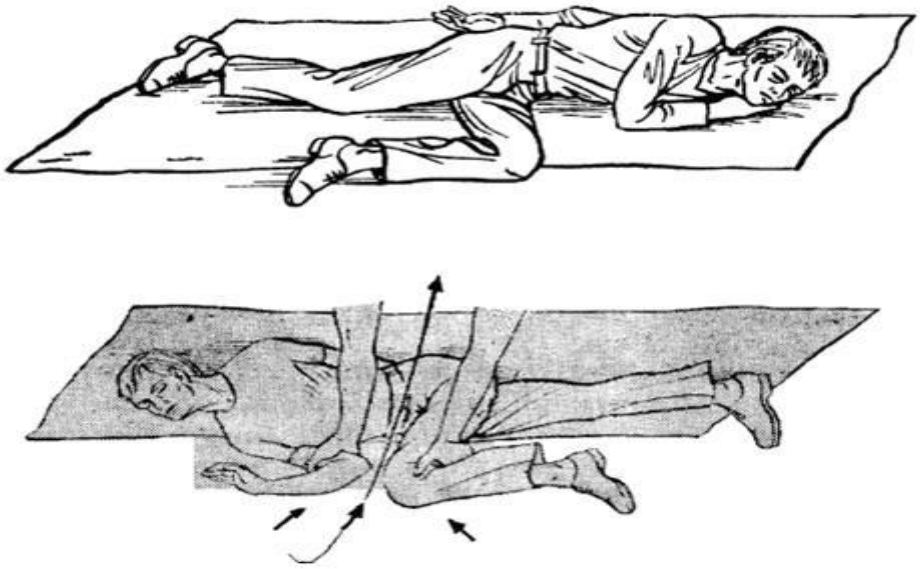
Intensity of compression – around 1/3 of chest depth

Way of compression – 2 fingers, palm of one or two hands (according to child mass)

Proportion of breaths and compressions – 2:30 (frequency of compressions 100/min.)

Releasing of airway passages – manoeuvre *„head tilt – chin lift“*

If breathing and blood circulate will be enough restored you have to lay injured person on dry place to recovery position (*Picture 3*).



Picture 3

After recovering of consciousness control breathing and apply cold compress on head. During state of consciousness do not serve any drinks or food. If injured person has heavy bleeding, tighten place above wound by belt or piece of dress. For fractures it is recommended to ossify given part of body by fixed object and put person to recovery position.

Sometimes it is not possible to open the door of vehicle and is needed to break a glass. If injured person is jammed by belts cut them by sharp thing. At unavoidable manipulation give attention to avoid spine injury. Using of Rautek's position protects spinal cord. If all injured persons are in recovery position and first aid was provided, wait for arrival of ambulance and look after safe traffic on accident location.

1.10 FATIGUE

Feeling of fatigue at driving belongs to relatively frequent causation of severe road accidents and that is the reason why we should deal with this problem. Generally, it is hard to determine its impact on accident frequency but there are some studies that find out that fatigue is main reason for almost 15 % of all severe accidents. However, this adverse phenomen in road traffic endure practically from beginning, there are currently no available tools or instruments which could effectively eliminate its extent.

Term fatigue presents drowsiness caused by lack of sleep whih results in reduction of attention as well as in extension of reaction time. Drowsiness can be chronic (lack of sleep for a long time) or acute (sleepless night). Besides, duration of rest period and its quality is also necessary. Interrupted and irregular sleep, noisy environment or health problems cause feeling of fatigue soon after awakening.

Fatigue on roads appears in hot summer days and at long and monotonous journeys. Some drivers exhibit aggressive behaviour towards to other road users. Moreover, fatigue leads to reduced alertness, delayed response to external stimulus and poor spatial coordination. Drivers have problems with keeping of vehicle in traffic lane, speed adapting to vehicles in front or at overtaking.

Accidents caused by fatigue occur often on motorways at night (from 02:00 to 05:00) or afternoon (from 15:00 to 16:00). They are caused by run-off crashes or by collision with approaching vehicles. Consequences of accidents are more severe because delayed braking results in higher impact speed. The most frequently driver groups in risk are:

- young drivers (18 – 25 years)
- drivers with insomnia
- night drivers
- professional drivers on long-distance transport
- people working on more work shifts

Application of modern technologies and infrastructure design seems to by reasonable way for avoidance of such accidents. The most used technology is *Lane Departure Warning System* which thanks to camera situated on rear mirror shows unintended steering away from traffic lane. There are systems in development that could detect feeling of fatigue of drivers through recording of heart activity and breathing frequency. Remove of obstacles from roadsides can be solution of this problem within road infrastructure measures.

However, the most effective measure is realizing of risk and taking rest

at roadside or rest areas where we recover before further driving!!!

1.11 USE OF MOBILE PHONES AND DRIVING

Despite the fact that thanks to mobile phones is possible immediately to call for a help in case of accidents, their using while driving results in higher risk of crash. This dangerous is caused by lose of control over vehicle that could have physical or cognitive character.

Physical attention diverting relates to parallel operating of mobile phone and vehicle. By dialing number and writing messages drivers desist from monitoring of situation on road and expose not only themselves but other road users to higher risk of collision. Driver is forced to hold steering wheel by one hand and call what could present faulty manoeuvre at change of traffic situation. Although, by using of hands-free mobile phones it is possible to reduce risk factors, these devices require certain extent of operation.

Cognitive distraction occurs when attention is divided between two or more tasks at the same time (driving and calling) what causes reducing of success performance each of them. Drivers´ ability to process information from traffic environment descends what results in extended reaction time. Findings from available research projects confirm assumption that most of accidents were caused during communication and not during operation of mobile phone.

Research activities using different practices for detection of drivers' performance while they use mobile phones showed the same results. Using of mobile phones while driving has adverse impacts on operation of vehicle especially within these areas:

- keeping vehicle in traffic lane
- maintenance appropriate speed
- keeping of safe distance
- extending of reaction time
- erroneous decision associated to overtaking

Avoid those impacts means don´t use mobile phones while driving,

because one of your call could cost too much!!!

PRÍLOHY

Príloha 1: Legal BAC limits in Europe

Príloha 2: DRL using in Europe

Príloha 3: Speed limits in Europe

PRÍLOHA 1

Legal BAC limits in Europe

Country	Legal limit BAC (g/l)
Belgium	*0,5*
Cyprus	*0,5*
Czech republic	*0*
Denmark	*0,5*
Estonia	*0*
Finland	*0,5*
France	*0,5*
Greece	*0,5*
Netherlands	*0,5*
Ireland	*0,8*
Lithuania	*0,4*
Latvia	*0,5*
Luxembourgh	*0,8*
Hungary	*0*
Malta	*0,8*
Germany	*0,5*
Poland	*0,2*
Portugal	*0,5*
Austria	*0,5*
Slovenia	*0,5*
Spain	*0,5*
Sweden	*0,2*
Italy	*0,5*
Great Britain	*0,8*

PRÍLOHA 2

DRL using in Europe

	Using	
Country	**Where ?**	**Wenn ?**
 Czech republic	*All roads*	*All year*
 Denmark	*All roads*	*All year*
 Estonia	*All roads*	*All year*
 Finland	*All roads*	*All year*
 Lithuania	*All roads*	*November - March*
 Latvia	*All roads*	*All year*
 Hungary	*Out-of urban roads*	*All year*
 Poland	*All roads*	*October - February*
 Portugal	*Indicated roads*	*All year*
 Austria	*All roads*	*All year*
 Slovenia	*All roads*	*All year*
 Sweden	*All roads*	*All year*
 Italy	***Motorways and out-of urban roads***	*All year*

PRÍLOHA 3

Speed limits in EU

Speed limits in EU

Country	Urban roads	Rural roads	Motorways
Belgium	*50*	*90*	*120*
Cyprus	*50*	*65/80*	*100*
Czech republic	*50*	*90*	*130*
Denmark	*50*	*80*	*110/130*
Estonia	*50*	*90/100/110*	–
Finland	*50*	*80/100*	*120*
France	*50*	*90/110*	*130*
Greece	*50*	*90/110*	*120*
Netherlands	*50*	*80/100*	*120*
Ireland	*50*	*80/100*	*120*
Lithuania	*50*	*90*	*110/130*
Latvia	*50*	*90*	*110*
Luxembourg	*50*	*90*	*130*
Hungary	*50*	*90/110*	*130*
Malta	*50*	*80*	–
Germany	*50*	*100*	–
Poland	*50/60*	*90*	*130*
Portugal	*50*	*90/110*	*120*
Austria	*50*	*100*	*130*
Slovenia	*50*	*90/100*	*130*
Spain	*50*	*90/100*	*120*
Sweden	*50*	*70/90*	*110*
Italy	*50*	*90/110*	*130*
Great Britain	*48**	*96/112**	*112**

** - speed equivalents for 30; 60 and 70 miles per hour*