

ANNEX

Annex 1

THE GDE MATRIX

		Essential elements of driver training		
		Knowledge and skills	Risk-increasing factors	Self-evaluation
Hierarchical levels of driver behaviour	IV. Personal characteristics, ambitions and competencies (General level)	<p>Knowledge and control of general ambitions in life, values and norms and personal tendencies which effect driving behaviour</p> <ul style="list-style-type: none"> • lifestyle • peer group norms • motives in life • self-control and other characteristics • personal values and norms • etc. 	<p>Risky tendencies</p> <ul style="list-style-type: none"> • acceptance of risk • self-value through driving • sensation-seeking • adapting to social pressure • use of alcohol and drugs • attitude towards society • etc. 	<p>Self-awareness regarding.:</p> <ul style="list-style-type: none"> • impulse control • risky tendencies • personal unsafe motives • personal risky characteristics • etc.
	III. Trip-related context and considerations (Strategic level)	<p>Knowledge and skills regarding:</p> <ul style="list-style-type: none"> • choice of route • estimated driving time • effects of social pressure from passengers • estimating urgency of the trip • etc. 	<p>Risks relating to:</p> <ul style="list-style-type: none"> • physiological condition of driver • road environment (urban/rural) • social context and company in vehicle • other motives (e.g. competition in traffic) • etc. 	<p>Self-awareness regarding.:</p> <ul style="list-style-type: none"> • personal skills with regard to planning • typically risky motives when driving • etc.
	II. Mastery of traffic situations (Tactical level)	<p>Knowledge and skills regarding:</p> <ul style="list-style-type: none"> • traffic rules • observation and use of signals • anticipation • speed adaptation • communication • safety margins • etc. 	<p>Risks caused by:</p> <ul style="list-style-type: none"> • poor decision-making • risky driving style (e.g. aggressive) • excessive speed • vulnerable road users • breaking traffic rules / unpredictable behaviour • information overload • difficult (road) conditions (e.g. darkness, bad weather) • insufficient automatisisation of basic skills • etc. 	<p>Self-awareness regarding:</p> <ul style="list-style-type: none"> • strengths and weaknesses regarding driving skills in traffic • personal driving style • personal safety margins • strengths and weaknesses in dangerous situations • realistic assessment of own skill • etc.
	I. Basic vehicle control (Operational level)	<p>Knowledge and skills regarding:</p> <ul style="list-style-type: none"> • control of direction and position of car • surface grip, tyre pressure • dimensions of the vehicle • technical aspects of vehicle 	<p>Risks related to:</p> <ul style="list-style-type: none"> • insufficient automatisisation of basic skills • difficult (road) conditions (e.g. darkness, bad weather) • improper use of seatbelt, headrest, sitting position • etc. 	<p>Self-awareness concerning</p> <ul style="list-style-type: none"> • strengths and weaknesses of basic vehicle control • strengths and weaknesses manoeuvring in dangerous situations • realistic assessment of own skill • etc.

Source: CIECA project 2007 "Integrating the GDE matrix into category B driver training and the practical driving test"

A hierarchical approach helps us to structure and to understand more clearly what competencies a safe driver needs. One of the important outcomes of the EU-project GADGET was a matrix for defining the goals of driver training. The GDE (Goals for Driver Education) matrix is based on the assumption that the driving task can be described as a hierarchy. The idea of the hierarchical approach is that abilities and preconditions on a higher level influence the demands, decisions and behaviour on a lower level. The hierarchy used here is developed by Keskinen (1996) and shows many similarities with the Michon hierarchy. The most important difference is the goal-oriented perspective instead of the behaviour description perspective of Michon. What is also important is the addition of a fourth level relating to personal preconditions and ambitions in life in general, which have shown to be of great importance for driving and road safety. The following four levels are described by Keskinen and were later also applied in the EU-project GADGET (Hatakka et al. 2002):

4. Goals for life and skills for living
3. Goals and context of driving
2. Driving in traffic situations
1. Vehicle control

The fourth and highest level refers to personal motives and tendencies in a broader perspective. This level is based on knowledge that lifestyles, social background, gender, age and other individual preconditions have an influence on attitudes, driving behaviour and accident involvement.

On the third level, the focus is on the goals behind driving and the context in which driving is performed. The focus is on why, where, when and with whom the driving is carried out. More detailed examples include the choice between car or bus, day-time or night-time driving, rush-hours or not, decision to drive under the influence of alcohol, fatigue or stress etc., all in relation to the purpose of the trip.

The second level is about mastering driving in traffic situations, which are defined as more limited than the driving context above. A driver must be able to adapt his/her driving in accordance with the constant changes in traffic, for example in junctions, when overtaking or when encountering vulnerable road users. The ability to identify potential hazards in traffic is also on this level.

The bottom level emphasises the vehicle, its construction and how it is manoeuvred. Knowing how to start, change gears, etc. well enough to be able to use the car in traffic belongs to this level as well as more complex evasive manoeuvres, reducing skids on low friction and understanding the laws of physical forces. The functioning and benefits of injury preventive systems such as seat belts and airbags also belong here.

Driver training traditionally focuses on levels 1 and 2.

A safe driver is, however, not only skilled but also aware of risks and of his own abilities and characteristics as a person. In order to cover these different dimensions the hierarchy was expanded into a matrix, which - in addition to the four levels - includes the following three dimensions:

- Knowledge and skills
- Risk increasing factors
- Self-evaluation

The content of the first column describes the knowledge and skills that a driver needs for driving under normal circumstances. On the lower hierarchical levels, this equates to how to manoeuvre the car, how to drive in traffic and what rules must be followed. On the higher levels, the column relates to how trips should be planned and how personal characteristics may influence behaviour and safety.

In the second column about risk-increasing factors the focus is on awareness of aspects related to traffic and life in general that can be associated with higher risk. On the basic level, this may be worn-out tyres, poor brakes, lack of routine in performing basic manoeuvring, etc. Higher in the hierarchy the column refers to risky driving in darkness, on low friction, among vulnerable road users, excessive speeding, mental overload, etc. It also relates to dangerous motives and risk-increasing aspects of lifestyle and personality.

The third column is about how the driver assesses his/her own situation on the four levels. It relates to the calibration of one's skills on the basic levels¹ and awareness of one's personal characteristics and tendencies, as well as abilities in decision-making about trips and in life in general on the upper levels.

The cells in the matrix thus define a framework for the definition of detailed competencies needed to be a safe driver. The matrix can be used for defining educational goals and educational content in driver training. The suggestion from the designers of the matrix is that driver training strives to cover as much as possible of the whole matrix, and not only the bottom left cells that are traditionally focused on.

An important prerequisite for a driving instructor who should teach these matters is that he/she possesses the same competencies. Thus, the GDE matrix is suggested as a framework for defining the part of the instructors' education that applies to road safety and driver behaviour.

Many learner drivers in EU are not well educated on these things. Most countries are still focusing on traffic rules and managing the vehicle in different traffic situations, which is the historical basis for driver education all over the world. Some countries have gone much further, but there is no licensing system that provides all the necessary competencies to all candidates.

¹ Good calibration is when the driver's self-perceived skills correspond to his/her actual skills. Young drivers often tend to overestimate their skills.

Annex 2

PROJECTS CO-FINANCED BY THE COMMISSION

ADVANCED
Study of post-licence driver and rider training
Duration 2000 - 2002
Web site
http://www.cieca.be/advanceddoc_en.pp

Description

Study on post-licence training for motorcyclist and car drivers, examining ways of improving current training. It focuses on stopping learners from becoming overconfident about their driving ability. Guidelines for more effective training (examples of exercises, evaluation methods, etc.) are established.

ANDREA
Analysis of Drivers Rehabilitation Program
Duration 2002
Web site
http://www.kfv.at/fileadmin/Publikationen_englisch/ANDREA%20Final%20Report.pdf

Description

Driver rehabilitation courses for the reintegration of traffic violators are a growing market in many EU-states. It was the objective of the "Andrea"-project (Analysis of Driver Rehabilitation Programmes) to analyse which elements of these courses are more or less effective.

BASIC
Basic Driver Training: New Models
Duration 2001-2003
Web site
http://www.cieca.be/basicdoc_en.pp

Description

Analysis of new basic driver training allowing a reduction of accident risk. Conclusions include guidelines.

DAN
Description and Analysis of measures for Novice drivers
Duration 2001-2003

Web site

http://www.kfv.at/fileadmin/Publikationen_englisch/DAN%20Final%20report.pdf

Description

In the course of the EU-project "DAN" - Description and analysis of post licensing measures for novice drivers, measures for the reduction of the disproportionately high accident rate of novice drivers were analysed. As a first step, all measures for novice drivers implemented in the EU countries and Switzerland were described. As a second step, evaluative studies of specific measures (if any) were judged, expert workshops held, and the measures rated in the light of a theoretical model of a "good driver".

GADGET

Guarding Automobile Drivers through Guidance Education and Technology

Duration 1998-1999

Web site

http://www.kfv.at/fileadmin/Publikationen_englisch/Gadget/GADGET_Final_report.pdf

Description

Overall objective of GADGET is to assess traffic safety measures on driver behaviour. GADGET analysed the influence of in-car safety devices, various road environments, education and training programmes, safety campaigns and legal measures (including enforcement).

MERIT

Minimum European Requirements for Driving Instructor Training

Duration: 2004-2007

Web site

<http://www.cieca.be/download/MERITFinaReportEn.pdf>

Description

The project MERIT project is the first EU funded project to focus upon the skills and competencies of the intermediary for road safety issues in the case of learner drivers, namely the driving instructor.

NovEv
Evaluation of Novice Driver Training Schemes

Duration 2002- 2004

Web site

<http://www.cieca.be/download/NovEVFinalReportEn.pdf>

Description

NovEV brings together 7 schemes for 2nd phase training for novice drivers in 6 EU Member States: Austria, Belgium, France, Germany, the Netherlands and Spain (X2). All the schemes included in NovEV are temporary apart from the one in Austria, which introduced its new compulsory multiphase driver training programme in 2003.

TEST

Towards European Standards for Testing

Duration 2002- 2005

Web site

<http://www.cieca.be/download/TESTProjectFinalReportEn.pdf>

Description

The TEST project is an analysis of the Contents, the Location and the Duration of the practical driving test for obtaining a category B driving licence.

TRAINER

System for driver Training and Assessment using Interactive Evaluation tools and Reliable Methodologies

Duration 2000-2003

Web site <http://www.trainer.iao.fraunhofer.de/achievements.htm>

Description

It is well known that young drivers overestimate their driving skill more than older drivers. Furthermore, they are not familiar with the actual dynamics of their vehicle, which define for example the minimum stopping distance in a certain speed. Traditionally, driver training has focused on vehicle control skills and traffic rules without reaching far enough in the efforts to provide risk awareness and other higher order skills. The risk awareness problem is included in driver training in many countries but rather in a theoretical way, included in text books, and is not covered in practical training.

TRAIN ALL

Integrated System for driver Training and Assessment using Interactive education tools and New training curricula for ALL modes of road transport

Duration 2006-2009

Description

TRAIN-ALL aims to develop a computer-based training system for the training and assessment of different land-based driver cohorts (motorcycle riders, novices, emergency drivers and truck drivers) that integrates multimedia software, driving simulator, virtual driving simulator and onboard vehicle sensors into a single modular platform.

CLOSE TO

Module Close To aims at developing "peer education" methods in which young drivers who have been involved in road accidents present their experience to learning drivers

Duration 2007-2010

Web site

<http://www.close-to.net/index.phtml?sprache=en>

Description

The objective of Module Close To is to confront young beginning drivers with severe road accidents through discussions with young drivers responsible for road traffic accidents. These sessions are to be integrated into driving education programs.

HERMES

High Impact approach for Enhancing Road safety through More Effective communication Skills for driving instructors

Duration 2007- 2010

Web site

<http://www.gutefahrt.at/hermes/>

Description

HERMES will draw on existing experience of coaching and other active learning methods in driver training and on expert advice on coaching. The expected result is a training package that novice and experienced driving teachers can use.

Annex 3

Fatalities at ages 18–25

Table 1 compares the development of the number of **fatalities at 18-25** per million inhabitants with fatalities per million inhabitants for all ages. Table 2 compares the development of the number of **driver fatalities at 18-25** per million inhabitants with fatalities per million inhabitants for all ages.

Data are given for 1991-2007 for Member States that joined the EU before 2004. For Member States that joined the EU after 2004, data are given for 2001-2007.

Table 1. Fatalities at 18-25 by population compared with fatalities for all ages

(all users)	1991-2007		2001-2007	
	All ages	18-25	All ages	18-25
Belgique/België	-46%	-56%	-30%	-34%
България (Bulgaria)	2%		3%	43%
Česká republika	-8%		-9%	-16%
Danmark	-37%	-47%	-7%	-14%
Deutschland	-58%	-59%	-29%	-38%
Eesti	-53%		0%	41%
Éire/Ireland	-38%	-37%	-27%	-22%
Ελλάδα (Elláda)	-30%	-40%	-16%	-27%
España	-62%	-78%	-37%	-49%
France	-60%	-66%	-47%	-49%
Italia	-39%	-55%	-30%	-35%
Κύπρος (Kypros)/Kibris	-35%		-19%	-16%
Latvija	-51%		-22%	-39%
Lietuva	-32%		8%	7%
Luxembourg	-58%	-75%	-43%	-64%
Magyarország	-40%		1%	-12%
Malta	-35%		-28%	
Nederland	-49%	-56%	-30%	-19%
Österreich	-59%	-68%	-30%	-30%
Polska	-29%		1%	
Portugal	-72%	-79%	-44%	-55%
România	-4%		15%	26%
Slovenija	-37%		4%	-51%
Slovensko	1%		2%	-4%
Suomi/Finland	-43%	-38%	-14%	-13%
Sverige	-40%	-45%	-21%	-21%
United Kingdom	-39%	-42%	-18%	-12%

Member States that joined the EU before 2004 show a greater reduction of road deaths amongst young people than of road deaths for all road users; except for Ireland and Finland, the percentage decrease in deaths amongst young people is greater than the percentage decrease observed for all road users. This is not the case in Member States that joined the EU after 2004: the number of deaths among young people has declined less than the number of deaths for all road users and in some of them (Bulgaria, Estonia and Romania), the number of deaths among young people has increased.

Table 2. Fatalities of 18-25 car drivers by population compared to car drivers' fatalities for all ages

(car drivers)	1991-2007		2001-2007	
	All ages	18-25	All ages	18-25
Belgique/België	-33 %	-55 %	-14 %	-35 %
България (Bulgaria)			36 %	
Česká republika			-19 %	49 %
Danmark	-42 %	-48 %	-30 %	-25 %
Deutschland	-70 %	-71 %	-29 %	-38 %
Eesti			36 %	40 %
Éire/Ireland	-1 %	17 %	-8 %	28 %
Ελλάδα (Elláda)	8 %	6 %	-5 %	-1 %
España	-64 %	-75 %	-46 %	-53 %
France	-62 %	-66 %	-56 %	-59 %
Italia	-43 %	-61 %	-38 %	-43 %
Κύπρος (Kypros)/Kibris			-10 %	12 %
Latvija			2 %	-33 %
Lietuva			25 %	13 %
Luxembourg	-35 %	-51 %	-29 %	-52 %
Magyarország			19 %	24 %
Malta			91 %	
Nederland	-55 %	-59 %	-42 %	-43 %
Österreich	-55 %	-62 %	-33 %	-27 %
Polska				
Portugal	-59 %	-61 %	-32 %	-48 %
România			18 %	
Slovenija			-42 %	
Slovensko			0 %	-12 %
Suomi/Finland	-19 %	-24 %	-5 %	6 %
Sverige	-38 %	-42 %	-24 %	-1 %
United Kingdom	-30 %	-31 %	-22 %	-10 %

Member States that joined the EU before 2004 show a decrease in the number of fatalities among young drivers which is higher than that observed for all drivers, except in Greece and Ireland. On the contrary, in Member States that joined the EU after 2004, the number of fatalities among young drivers has increased except in Latvia.

Annex 4

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