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DRUID
Driving under the Influence of Drugs, Alcohol and Medicines

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State of the Art on Driver Rehabilitation: Literature Analysis & Provider Survey

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Status: Restricted to other programme participants

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List of Abbreviations

5-HTOL	5-hydroxytryptophol
AA	Alcoholics Anonymous
ADF	Australian Drug Foundation
ADI	Adolescent Drinking Index
ADS	Alcohol Dependence Scale
ALAT	Alanine Aminotransferase; equivalent to ALT or GPT
ALT	Alanine Aminotransferase; equivalent to ALAT or GPT
ANDREA	Analysis of Driver rehabilitation programmes
APA	American Psychiatric Association
ARF	Inventory for Drinking Situations
ASAT	Aspartate aminotransferase; equivalent to AST or GOT
ASI	Addiction Severity Index
AST	Aspartate aminotransferase; equivalent to ASAT or GOT
AT	Austria
AUD	Australian Dollar
AUDADIS	Alcohol Use Disorder and Associated Disabilities Interview Schedule
AUDIT	Alcohol Use Disorders Identification Test
AUI	Alcohol Use Inventory
AUS	Australia
BAC	Blood alcohol concentration
BASt	Bundesanstalt für Straßenwesen (Federal Highway Research Institute), DE
BDS	Behaviour Data Systems
BE	Belgium
BG	Bulgaria
BI	Brief Interventions
BIVT	Belgian Institute for Traffic Therapy
BIVV	Belgisch Instituut voor de Verkeersveiligheid, vzw (Belgian Road Safety Institute), BE
BMT	Buprenorphine Maintenance Therapy
BMVIT	Ministry of Traffic, Innovation and Technology, AT
BrAC	Breath alcohol concentration
CA	Canada
CAGE	Cut down, Annoyed, Guilt, Eye opener
CASAA	Center on Alcoholism, Substance Abuse, and Addictions, University of New Mexico, US
CBT	Cognitive Behavioural Therapy
CCT	Controlled Clinical Trials
CCTS	Drug Abuse Collaborative Cocaine Treatment
CDT	Carbohydrate Deficient Transferrin
%CDT	Percentage of total Carbohydrate Deficient Transferrin
CERTIFIED	Conception and Evaluation of Roadside Testing Instruments to Formalise Impairment Evidence in Drivers
CH	Switzerland
CM	Contingency management
corr.	Reduction after correction
CS	Coping Skills
CSAT	Center for Substance Abuse Treatment, US

CY	Cyprus
CZ	Czech Republic
d	day
DAST	Drug Abuse Screening Test
DAST-A	Drug Abuse Screening Test-Adolescents
DE	Germany; equivalent to GE
DG TREN	General Department for Traffic and Energy
DI	Driver Improvement
DICA-R	Revised Diagnostic Interview for Children and Adults
DIN	Deutsche Industrienorm (German Industrial Norm)
DIS	Diagnostic Interview Schedule
DK	Denmark
DOKDAT	Databases of the KfV based on ITRD, AT
DR	Driver Rehabilitation
DRI-II	Driver Risk Inventory-ll
DSM-III-R	Diagnostic and Statistical Manual of Mental Disorders (version 3, revised)
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders (version 4)
DUI	Driving under influence of alcohol
DUID	Driving under influence of (illicit) drugs
DWI	Driving while impaired/intoxicated
e.g.	exempli gratia (Latin): for example
EC	European Commission
EE	Estonia
EEC	European Economic Community
EL	Greece
EM	Electronic monitoring
EN	European Norm
ES	Spain
ESTC	European Transport Safety Council
et al.	et alii (Latin): and others
EtG	Ethyl Glucuronide
ETOH	Ethanol
EU	European Union
EUR	Euro
EuroASI	European adaptation of the ASI
FAEE	Fatty Acid Ethyl Esters
FeV	Fahrerlaubnisverordnung (German Driving Licensing Act), DE
FI	Finland
FIVE-SHOT	Dutch version of the screening instrument CAGE
FR	France
FSG	Führerscheingesetz (Austria Driving Licence Law), AT
FSG-GV	Führerscheingesetz-Gesundheitsverordnung (Driving Licence Health Act), AT
FSG-NV	Nachschulungsverordnung Driving Licence Rehabilitation Act), AT
g/d	gram per day
g/ml	gram per millilitre
GADGET	Guarding Automobile Drivers through Guidance Education and Technology
GC	Gas chromatographic
GDC	Group Drug Counselling
GGT	Gamma-glutamyltransferase

GHB	γ-Hydroxybutyric Acid
GOT	Glutamat-Oxalacetat-Transaminase; equivalent to AST or ASAT
GPT	Glutamat-Pyruvat-Transaminase; equivalent to ALT or ALAT
h	hour(s)
hex	Hexosaminidase also named N-acetyl-β-D-glucosaminidase
HMT	Heroin Maintenance Treatment
HTA	Scottish Health Technology Assessment
HU	Hungary
i.e.	id est (Latin): that is
IBSR	Institut Belge pour la Sécurité Routière, asbl (Belgian Road Safety Institute), BE
IC	Individual Counseling
ICADTS	International Council on Alcohol, Drugs & Traffic Safety
ICD-10	International Statistical Classification of Diseases and Related Health Problems (10th Revision)
IE	Ireland
IFT	Institut für Therapieforschung (Institute for Therapy Research), DE
INRETS	Institut National de Recherche sur les Transports et leur Sécurité (National Institute for Transport and Safety Research), FR
ISO	Common short name for the International Organization for Standardization
IT	Italy
ITRD	International Transport Research Documentation
IVT- Hö	Individual Psychologische Verkehrs Therapie (traffic therapeutic model by Höcher, 2007)
KfV	Kuratorium für Verkehrssicherheit (Austrian Road Safety Board), AT
LAAM	Levo-alpha-acetyl-methadol
LMT	LAAM Maintenance Treatment
ln	Natural logarithm
LSD	Lysergic acid diethylamide
LT	Lithuania
LU	Luxembourg
LV	Latvia
MA	Medical assessment, DE
MAC	MacAndrews Alcoholism Scale
MAC-R	Mac Andrew Alcoholism Scale (Revised)
MALT	Munich Alcoholism Test
MAST	Michigan Alcoholism Screening Test
MCMI	Millon Clinical Multiaxial Inventory
MCV	Mean Corpuscular Volume
MD	Medical Doctor
MDMA	Methylenedioxymethamphetamine
MDT	Methadone Detoxification Treatment
MeSH	Medical Subject Heading is the U.S. National Library of Medicine's controlled vocabulary used for indexing articles for MEDLINE/PubMed. MeSH terminology provides a consistent way to retrieve information that may use different terminology for the same concepts.
MET	Motivational Enhancement Therapy
MF	Mortimer-Filkins Test
MFQ	Mortimer-Filkins Questionnaire

mg/dl	milligram per decilitre
mg/ml or mgs/mls	milligram(s) per mililiter(s)
MI	Motivational Interviewing
mls	Milli-litres
MMPI	Minnesota Multiphasic Personality Inventory
MMT	Methadone Maintenance Treatment
MPA	Medical psychological assessment, DE
MRT	Methadone Reduction Treatment
MS	Mass spectrometric
MT	Malta
n or N	Number
n.d.	no date
n/a	Data not available
NEEDS	Is an expanded version of assessment instrument SALCE
NEPOD	Australian National Evaluation of Pharmacotherapies for Opioid Dependence
ng	nanogram (10–9g)
NGO	Non governmental organisation
NHTSA	National Highway Traffic Safety Administration, US
NIAA	National Institute on Alcohol Abuse and Alcoholism, US
NL	Netherlands
NMT	Naltrexone Maintenance Treatment
ns	not significant
NTA	National Transport Authority's, HU
NTORS	National Treatment Outcome Research Study
p	p-value
p.	page
PESQ	Personal Experience Screening Questionnaire
PEth	Phosphatidyl Ethanol
pg	picogram (10–12g)
PL	Poland
PQ	Provider Questionnaire
PRISM	Psychiatric Research Interview for Substance and Mental Disorders
PT	Portugal
PubMed	PubMed is a service of the U.S. National Library of Medicine that includes over 17 million citations from MEDLINE and other life science journals for biomedical articles back to the 1950s. PubMed includes links to full text articles and other related resources.
QM	Quality management
RAPI	Rutgers Alcohol Problem Index
RCT	Randomised Controlled Study
RH	Rehabilitation
RIASI	Research Institute on Addictions Self-Inventory
RO	Romania
ROSITA	Roadside testing Assessment
RTCQ	Readiness to Change Questionnaire
SALCE	Substance Abuse Life Circumstances Evaluation
SASSI	Substance Abuse Subtle Screening Inventory-II
SBNT	Social Behaviour and Network Therapy
SBU	Swedish Council for Technology Assessment in Health Care
SCID	Structured Clinical Interview for Diagnosis
SE	Sweden

SES	Socio-economic status
SET	Supportive Expressive Therapy
SI	Slovenia
SIJ	Plasma Sialic Acid Index of Apolipoprotein J
SK	Slovakia
SOCRATES	Stages of Change Readiness and Treatment Eagerness Scale
SPSS	Statistical Package for the Social Sciences
StGB	Strafgesetzbuch (Criminal Code), DE
StPO	Strafprozessordnung (Code of Criminal Procedure), AT
STRID	Canadian's national Strategy to Reduce Impaired Driving, CA
STS	Skinner's Trauma Scale
StVG	Strassenverkehrsgesetzt (German Road Traffic Act), DE
SUPREME	Summary and publication of best practices in Road safety in the Member States
TAAK	Testverfahren für alkoholauffällige Kraftfahrer (test for alcohol prone drivers), AT
THC	Tetrahydrocannabinol
THCCOOH	Tetrahydrocannabinol carboxylic acid
TOP	Traffic Offender Programmes
TPB	Theory of Planned Behavior
TRA	Theory of reasoned action
TRIS	Transport Research Information Services
TSA	Total Serum Sialic Acid
TTM	Transtheoretical Model of Change
TWEAK	Tolerance, Worry, Eye opener, Amnesia, Cut down (a modified version of the screening instrument CAGE specifically for pregnant women)
UK	United Kingdom
USA or US	United States of America
VAST	Veterans Alcoholism Screening Test
VIP	Victim Impact Panel
VPU	Verkehrspsychologische Untersuchung (traffic psychological assessments), AT
vs.	versus
WBAA	Whole blood-associated acetaldehyde assay
WHO	World Health Organisation
WMD	Weighted Mean Difference
WP	Work Package
µg or mcg	microgram (10–6g)

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Executive Summary

Research aims and contents

Work Package 5 (WP5) of the integrated EU research project DRUID (Driving under the Influence of Drugs, Alcohol and Medicines) deals with rehabilitation of substance impaired drivers. The overall aim of WP5 is to increase knowledge and to elaborate Europe-wide standards for intervention measures for drivers under the influence of alcohol (DUI) or illicit drugs (DUID). All outcomes and recommendations regarding rehabilitation include the entire group of DUI/DUID offenders.

The research activities in WP5 are carried out in two steps. In WP5 task 1 (WP5.1) a comprehensive overview on the state of the art is provided and in WP5 task 2 (WP5.2) best practices on DR (driver rehabilitation) of DUI and DUID offenders on all important issues of this topic are worked out, resulting in recommendations on how to carry out DR in Europe in future.

The deliverable at hand (D5.1.1) is the result of the research activities in WP5.1 and closes the task's actions. It aims at providing updated comprehensive knowledge on all issues which are important to file recommendations on best practices of DR. These topics comprise the identification of different types of DUI/DUID offenders, options for assessment including different available approaches, current rehabilitation programmes in- and outside Europe, their scientific evidence regarding traffic safety criteria and research on addiction treatment. With focus on the European situation, actual information from DR providers is specially considered.

Methodology

The deliverable (D5.1.1) is the result of the investigations in WP5.1 on the state of the art. Five partners of WP5 were involved:

- Belgian Road Safety Institute (IBSR/BIVV), Belgium
- Federal Highway Research Institute (BASt), Germany
- Austrian Road Safety Board (KfV), Austria
- Institute for Therapy Research (IFT), Germany
- National Institute for Transport and Safety Research (INRETS), France

The conduction of the research is carried out in three parts:

- Part I: Literature analysis
- Part II: Provider survey
- Part III: Overall results, discussion and conclusions

Parts I and II are complementary. The literature analysis delivers important information from the scientific community and experts dealing with DR. In addition, the provider survey presents the actual situation on a day-to-day basis in this field. And finally, the results of both parts are summarized and analyzed together in Part III.

Part I: Literature analysis

The literature review is mainly based on publications in national and international scientific journals. These include primary studies as well as systematic reviews and meta-analyses. The methodology of each chapter and the search strategies for each topic are documented and attached in the annex of

the deliverable. Furthermore, information of field experts in- and outside the DRUID WP5 team and thus unpublished literature is included. The report of the analysis covers four areas and hence, consists of the following chapters:

1. Identification of different types of DUI/DUID offenders
2. Review of existing DUI/DUID assessment procedures
3. Review of existing DUI/DUID rehabilitation measures
4. Review of addiction treatment and options for dependent DUI/DUID offenders

Part II: Provider survey

The investigation on DR measures implemented and applied in Europe at present is done by means of a questionnaire survey. The questionnaire has been developed by the WP5 research team and has been sent to those organizations that provide DR services in their countries. It covers three areas, thus resulting in three questionnaire forms:

- Form A – Organisational issues
- Form B – Programme information
- Form C – Prior driver assessment or diagnostic screening.

The report of the results of the provider survey is structured according to these topics.

Part III: Overall results, discussion and conclusions

In the last step the main outcomes of Part I and Part II are collated, discussed and evaluated, and preliminary decision criteria on DR are elaborated.

Results

Part I. Literature analysis

Identification of different types of DUI/DUID offenders

Although the entire group of DUI/DUID offenders seems to be heterogeneous, the following characteristics of DUI/DUID offenders are identified:

- Socio-demographic variables: male gender; young age; lower educational or professional level; lower socio-economic status; single or separated marital status.
- Traffic related variables: prior traffic offence records.
- Consumption habits: heavy to problematic substance use (major risk factors); first offenders are often moderate drinkers; co-morbidity of substance use problems with other clinical disorders.
- Personality traits: e.g. sensation seeking or aggression; general risky life style; low self-control, poor coping styles.
- Decision making processes: deviant attitudes; poor knowledge; low risk perceptions; influence of the social surrounding, group norms and expectations.

Identified characteristics of the high risk group of DUI/DUID recidivists were:

- Socio-demographic variables: male gender; young age; lower educational level.
- Traffic related variables: the higher the amount of prior records, the higher the recidivism risk.

Review of existing DUI/DUID assessment procedures

The review on assessment procedures shows that DUI/DUID assessments are carried out to evaluate fitness to drive and to assign offenders to rehabilitation programs. The context determines the selection of tools and the whole procedure. In contrast to the assessment for rehabilitation

assignment, the legal context of a fitness to drive assessment requires especially a high specificity and thus an integrated and comprehensive approach. Objective parameters like BAC or prior offences can serve as assignment criteria for more elaborate assessments or even directly for specific DR. In Europe DUI/DUID assessment is primarily carried out in the frame of the fitness to drive decision. It is mostly a multidisciplinary approach, covering medical, psychological and social aspects.

The comparison of different country approaches in- and outside Europe reveals that national guidelines on DUI/DUID assessment exist but that the country approaches vary widely regarding the criteria, procedure and the link of the assessment with further rehabilitation planning. The authors of the EU project ANDREA recommend a standardized screening/assessment procedure, before rehabilitation course participation, and so do the national guidelines of the USA and Canada. In Australia an assessment for alcohol dependence prior to DR is mentioned in the literature.

The literature analysis identifies a broad range of DUI/DUID assessment measures and tools. Many are not evaluated on the DUI/DUID population, as they were developed and applied for clinical diagnoses. Traffic psychological research led to the development of assessment tools which are fine-tuned to the specific problems of DUI/DUID offenders, and which are often validated on this population.

Review of existing DUI/DUID rehabilitation measures

DR programmes for DUI offenders are based on a rather long term tradition in development and practical application in Europe. They are also the base for the later on developed programmes for DUID offenders.

The analysis of different scopes of current DUI/DUID rehabilitation procedures in- and outside Europe shows that in Europe no uniformity regarding the implementation and application of DUI/DUID rehabilitation in the national contexts exists. In the five selected European countries (Austria, Belgium, France, Germany and Hungary) national regulations on different aspects of DUI/DUID rehabilitation are established. The USA and Canada have national guidelines for implementation into the legal system, although its realization differs largely between the states or territories. In Australia the situation is more diverse.
Regarding the DUI/DUID rehabilitation programme access the literature shows that countries in Europe use very different approaches, ranging from voluntary, over recommended, up to obligatory participation.

The review of DUI/DUID DR effectiveness identifies 61 studies on the topic. European standard group intervention programmes for DUI offenders show an average recidivism reduction rate of 45.5% (36 studies and 2 reviews) although a large variation of recidivism reduction rates was observed (15% - 71%). In general, the interventions received positive participant feedback and in addition to that, led to individual changes (such as enhanced knowledge and positive attitude). Only one study on DUID rehabilitation was identified by the literature search. Some methodological limitations of the studies were commonly recognized, e.g. lack of control groups and randomized case-control study designs, self selection bias, lack of control of other intervening variables and varying time periods.

Alcohol ignition interlock devices as structural interventions for DUI offenders are included in the literature review as well. Study results from in- and outside Europe show that they are feasible and practical devices that can control objectionable, unrequested behaviour as long as they are imposed, but achieve this without changing individual attitudes or behaviour in a longer term. In combination with strict medical supervision a long-term effect can be caused though, as the Swedish experiences

reveal. Altogether, the results indicate that an ignition interlock use needs the offenders' motivation and readiness for change to be successful in a long-term. This should be supported at least by medical counselling or other psychological/psychotherapeutic interventions in order to result in a treatment process.

Review of addiction treatment and options for dependent DUI/DUID offenders

The main results of the literature review of addiction treatment and options for dependent DUI/DUID offenders can be summarized as follows:

- Alcohol and drug dependent drivers are, by EU legislation, not considered to be fit to drive (Directive 91/439/EEC).
- Psychosocial treatments of alcohol and drug dependent patients are well established interventions to support the maintenance of abstinence and to lower the amount and frequency of alcohol and drug consumption. No strategy could be identified to be superior in general. It is important to consider characteristics of the patient, predominant symptoms of the dependence, and also motivation aspects while matching patients and treatment approaches. A combination of different treatment strategies provides the advantage of simultaneously addressing different factors and levels of influence.
- In general, the relapse-rates of alcohol or drug dependent patients are high, even after successful completion of addiction therapy.
- Pharmacological treatment is, according to the existing literature, often used as an adjunctive approach to psychosocial therapy.
- The addiction-specific approach is a fundamental element within the rehabilitation of dependent DUI/DUID offenders.

Part II. DR provider survey

Realization of DR for DUI/DUID in Europe

Based on the established DR provider questionnaire which was sent to European countries resp. identified providers which agreed to participate, a comprehensive picture of the actual situation can be drawn: At least 47 providers, mainly non-governmental, private organisations in 12 European countries (Austria, Belgium, France, Germany, Hungary, Italy, Netherlands, Poland, Portugal, Sweden, Switzerland, United Kingdom) carry out DR services on a regular base at present. In total 87 DR programmes are in use, thereby 53 for DUI offenders, 21 for DUID offenders and 13 for mixed groups (DUI/DUID/other traffic offenders). All 12 European countries offer programmes for DUI offenders, in addition four Member States (Austria, Belgium, Germany, and Portugal) for DUID offenders. The vast majority of DR providers do not offer treatment programmes for substance dependent offenders. At least 1.431 persons, mainly psychologists with further education are working as trainers/course leaders. The participation fee for the DR courses is mostly paid by the offenders.

Half of the providers report to have a quality assurance system, yet mainly not according to international, national or European standards but to intra-organisational criteria (this issue will be analyzed in detail in WP5.2).

Information on existing European DR programmes

Legal frame. Participation in DR programmes is mostly legally regulated, mainly by the licensing authorities and to a less degree also by courts. Thereby, participation is not always obligatory, about half of the programmes are voluntary ones. The consequences of participation are mostly linked to licensing (re-licensing, licence reinstatement, reduction of suspension periods, ongoing validity of

licence), but also to a penalty point system, to an upcoming driver assessment or to criminal prosecution.

Programme concept, conduction and evaluation. The overwhelming number of programmes was developed within the providing organizations. The programmes are more or less specific as they mostly focus on DUI or DUID without further differentiations between additional subgroups. A mixture either between these two problem groups or with other traffic offender groups is less frequent. Addiction and language problems are reported as the most frequent reasons for excluding offenders from a DR programme. The vast majority of programmes are principally designed as a group intervention, but the number of participants varies considerably. Moreover, nearly all programmes have exclusion criteria for participants either before or during the course. The reasons in the first case are above all addiction and communication problems, and in the latter case acute substance intoxication by alcohol or drugs. Rather big differences can be observed regarding the duration and intensity of intervention.
Regarding specific DR services, language is the most frequent considered aspect (about one third of the providers) while gender, age and cultural background are no important criteria. In general, exclusion criteria before and during course conduction exist.

The programmes' concepts are by far predominantly treatment (psychological/therapeutic), followed by the educational approach. According to the providers the most important success factors are self-observation and -reflection, discussion and confrontation, development of alternative, new behaviour and an open and trustworthy climate. In the second place are emotional experiencing and involvement, goal setting and commitment to stick to them as well as achievement of behavioural goals/self-control. Information is less important. Alcohol or drug screening is even of minor importance. Medical treatment or alcohol ignition interlocks are of nearly no importance.

Most of the documented programmes have already been evaluated, whereby participant feedback is the predominant approach. Content evaluation, process evaluation and outcome evaluation are less frequently conducted.

Prior driver assessment or diagnostic screening

Fifteen providers in seven countries indicated to apply driver assessment or diagnostic screening prior to the DR within their organisation. Seven providers in three countries report that such driver assessments are carried out outside their organisation. For both, DUI and DUID, the assessment approach is mainly psychological, most frequently carried out by psychologists, although medical examinations are conducted as well. Psychologists are the most frequent professional group involved. Interviews are most frequently conducted to assign both groups, but especially DUI offenders, to rehabilitation. Objective measurements regarding substance use disorders (physical examination, external medical/therapeutic information, biological markers, screening tools of substance use and functional/performance testing) are applied in some organizations as well. Personality testing as well as practical driving tests are of nearly no importance in this scope.

Overall evaluation of outcomes and resulting decision criteria

Literature analysis and provider survey give a comprehensive picture of the situation of DR for DUI and DUID offenders in Europe at present, whereby experiences and practices from other important parts of the world are also considered. In general, some uniform patterns can be identified, but there are also a lot of variations and differences. The latter do not only refer to the European situation, but also to the state of the art outside Europe.

Commonalities

European standard group interventions are not only the approach which proved empirical evidence on effectiveness regarding traffic safety (reduction of recidivism rate), they are also applied by the majority of providers in Europe. The common concept of the programmes is rather therapeutic than educational, although it includes both elements. A large consensus exists on which constitute successful methods and what the important programme aims are. The majority of the programmes have a scientific background, and the course leaders are mainly psychologists.
The vast majority of the programmes are legally regulated, and do not mix DUI and DUID offenders. Most of the DUI and DUID programmes do not further consider subgroups of offenders, although about a third does (essentially: repeat offenders, novice drivers). Substance use related criteria (specific BAC levels, types of illicit drugs) are the most often used determination criteria for the programmes' participation; recidivism and prior driver assessment are mentioned as well, in about a fifth of all programmes.
Regarding exclusion or entry criteria for DR, addicts are mostly not subject of either DR for DUI or DUID offenders. They need addiction treatment which differs from the common DR interventions.
During the conduction of courses, acute substance consumption is broadly determined as an exclusion criterion for further course participation.

Gaps and differences

There is actually a gap between DR programmes for DUI and DUID. This was above all confirmed by the literature analysis where only little information was available on the effectiveness of DUID programmes. Nevertheless, based on the provider survey, about one third of the European countries provide not only DR for DUI but also for DUID. Thus, a considerable number of programmes for DUID offenders exist, although still far less compared to those for DUI offenders. Moreover, according to the providers, almost all of these programmes were evaluated.
Although participation to programmes is very often legally regulated, participation is just slightly more often obligatory than voluntary.

Resulting decision criteria

Taking all the state of the art results (literature analyses, including good practices in- and outside Europe, and the EU provider survey) into consideration, the DRUID WP5 team draws the following concrete conclusions regarding specific issues.

Implementation of DR in Europe

- DR measures should be an integrated part of a comprehensive countermeasure system.
- Participation in DR measures should be legally regulated.
- DR measures should be provided for DUI as well as for DUID offenders, although the scientific evidence regarding the latter group still has to be improved.
- Regulations on DR participation should care for an early access of the offenders to specific measures in order to minimize the risk of problem escalation and secondary delinquency.
- As traffic safety is widely accepted as one of the major public health concerns DR should be connected to the health care system.
- To assure the best and most appropriate measure for all types of offenders, DR providers should be integrated into a knowledge network with addiction treatment providers and specialists.

Types of DUI/DUID

- DUI/DUID offenders are a heterogeneous group and there is general agreement on the relevance of identifying various types of DUI/DUID offenders with regard to their different needs and opportunities for rehabilitation. Two groups, namely non-addicts and addicts should minimally be distinguished as they require different interventions or treatments.
- A pool of programmes should be offered matching with the specific offender needs in order to gain optimal effectiveness of rehabilitation. At least, interventions or programmes for four different types or groups should be available: DUI addicts and non-addicts, DUID addicts and non-addicts. The majority of the European programmes already differentiate between DUI and DUID offenders, and addiction is a very common exclusion criterion for the European DR programmes.
- The literature furthermore suggests that young drivers and recidivists may require different points to focus on in the DR. About one fifth of the current EU programmes take such aspects into consideration.
- Ideally DR services should be available for all DUI/DUID offender groups; e.g. special programmes/treatments for non-addicted recidivists. With regard to individual conditions, special services, e.g. conduction of programmes in different languages or exceptions from the normal procedure should be possible.
- Drivers in substitution treatment should be considered as a separate group in the frame of DR measures

Assessment prior to DR

- Driver assessment is necessary to identify addicts in order to assign them to adequate intervention.
- In a cost-effective approach DUI/DUID offenders should shortly after the offence be screened based on objective factors like the BAC or prior offences. Additional information regarding the substance use problem severity could be gathered by the use of short screening devices.
- DUI/DUID offenders identified as high-risk drivers should afterwards be assessed in a more elaborated procedure.
- A wide range of screening and assessment measures exist. Many are not evaluated on the DUI/DUID population, as they were developed and applied for clinical diagnoses. Traffic psychological assessment tools are very fine-tuned to the specific problems of DUI/DUID offenders and are often validated on this population.
- An in-depth psychological investigation of DUI/DUID offender characteristics can provide important information on underlying aspects of DUI/DUID, and thus help to identify specific rehabilitation needs.
- The aims of a fitness to drive assessment versus an assessment purely to assign to a DR differ. The consequences of the first are much more life-invasive because the permission to drive and thus an important part of the mobility is at stake. Therefore the needs for comprehensiveness, thoroughness, and an integrative approach are clearly stricter for fitness to drive assessments. As assignment to the not most adequate rehabilitation is less invasive or harming, formal assignment criteria, which can take into account risk factors for recidivism, can be a minimal or first step. Short screenings focussing on the most relevant needs (like addiction or not) could provide additional valuable information. In the most ideal situation though – for the most fine-tuned rehabilitation assignment – a link exists between the fitness to drive assessment, which is in general more elaborated, and the rehabilitation assignment. Looking at the current situation in Europe, about 30% of the providers indicate that some kind of assessment prior to the DR is performed within their organisation. Further investigation is

required though to analyse the exact scope of these assessments/screenings. Formal assignment criteria are indicated in nearly all programmes (e.g. BAC).

- In general DUI/DUID assessment should be carried out close in time to the offence.

Courses and treatments

- DR courses for offenders without substance use disorders can follow the good practice example of the European standard group interventions' concept.
- Psychological and therapeutic approaches with educative elements are the most promising ones.
- DUI, DUID and other traffic offenders should not be mixed in the courses.
- Offenders with a more severe problem behaviour, above all recidivists or heavy consumers with a substance use problem should be treated more intensely.
- Motivational aspects should be considered, e.g. course participation leading to a reduction of the suspension period.
- For clients using alcohol and drugs in a dependent way, addiction-specific approaches should be a constitutive element of treatment. This could be realized either by:
  a) allocation of alcohol or drug dependent DUI/DUID offenders to addiction treatments or
  b) integration of addiction specific treatment strategies in the DUI/DUID rehabilitation treatment of alcohol or drug dependent DUI/DUID offenders.

In general, the state of the art reveals that DR is an established intervention in about half of the European member states focussing on non-dependent DUI offenders. Thereby the necessary organisational and personal infrastructure as well as numerous programmes exists for carrying out this intervention on a day-to-day basis. Non-dependent DUID offenders can be integrated easily into this available structure. The deficit of appropriate programmes for dependent DUI/DUID shows the need for future development of concepts, evaluation of these and provision of staff which is experienced and well educated in addiction treatment in order to care for a sufficient supply for all offender groups.

Introduction

Background and importance to traffic safety

Driving under the influence of psychoactive substances remains one of the main causes of serious and fatal traffic injuries in the EU (ESTC, 2003). Driver rehabilitation (DR) is one possible countermeasure for drivers under influence of alcohol (DUI) and drivers under influence of illicit drugs (DUID). Within the context that sanctions (e.g. withdrawal of driving licence, fines and/or imprisonment) of drivers having committed serious offences or accidents while being impaired due to alcohol and/or illicit drugs did not always seem to result in behavioural change, while it was acknowledged that driving is a learned behaviour that can be influenced or changed, the German speaking countries took the first initiative to develop DR programmes in Europe in the late 1960s and early 1970s. Meanwhile DR programmes for drink driving offenders are implemented in many Member States and DR for drug driving offenders has started as well. Due to the specific national situation and traditions in this context though, DR did not develop uniformly in Europe. The programmes do share a fundamental aim to modify the individual problem behaviour that led to the offence in traffic and to establish safety oriented attitudes and behaviour in order to minimize re-offences in future. At the same time DR allows a more dynamic approach of fitness to drive by providing an opportunity to modify safety endangering behaviour for otherwise unfit drivers. Different studies have yet revealed the effectiveness of this approach (Braun & Christ, 2002).
In conclusion, extensive knowledge and expertise on DR exists nowadays, but remains fragmented. DR was included as Work Package 5 (WP5) of the integrated EU research project DRUID (Driving under the Influence of Drugs, Alcohol and Medicines) aiming at increasing and transferring the knowledge and at elaborating Europe-wide standards on DUI/DUID intervention measures.

Del. 5.1.1 is the result of the investigations in WP5.1 on the state of the art. Five partners of WP5 were involved:

- Belgian Road Safety Institute (IBSR/BIVV), Belgium
- Federal Highway Research Institute (BASt), Germany
- Austrian Road Safety Board (KfV), Austria
- Institute for Therapy Research (IFT), Germany
- National Institute for Transport and Safety Research (INRETS), France

Scope of DUI/DUID rehabilitation

DUI/DUID RH is defined in this deliverable as a collective term for specific secondary interpersonal prevention measures that focus on attitudinal and behavioural changes of DUI/DUID offenders.
It mainly comprises post-licensing measures for different driving under influence offender groups regarding alcohol and/or illicit drugs, while also covering applicants for a driving licence with an official record related to alcohol and/or illicit drug use.
Drink driving offenders (DUI) with a problematic drinking and driving pattern compose the main target group. Illicit drug driving (DUID) offenders and individuals whose fitness to drive is also in question due to an alcohol or illicit drug history, are further target groups.
The primary aim of driver rehabilitation is to avoid new traffic offences under the influence of alcohol and/or illicit drugs, and/or to re-integrate the individual into the traffic system without imposing a risk on other traffic participants.
DUI/DUID RH does not cover primary prevention measures or campaigns to inform the public or certain potential risk groups on the dangers of drinking and/or drug use and driving. It either does not

cover RH related to medical indications other than alcohol or illicit drug use problems in order to (re-) establish medical fitness to drive.

Research activities of task 5.1

The research activities in WP5 task 5.1 (State of the Art) of the DRUID project include two main parts: an international literature review and a survey of European DR providers. Annex I of the DRUID Core Contract describes task 5.1 as follows:

- "Identification of different types of driving under influence of psychoactive substances including the three main categories: i) drivers under the influence of alcohol, ii) drivers under the influence of illicit drugs, iii) drivers in substitution treatment. Additional (sub-) categories such as consumption pattern, and environment, multiple substance intake, addiction or not, recidivism will be considered as well. Based on the findings uniform criteria to assign an intoxicated driver to a certain type of driving under influence of psychoactive substances will be defined.
- Review of existing assessment procedures oriented towards the selection of the RH method(s) of choice for each type. The analysis will consider the specific assessment tools determining the rehabilitation measure that is indicated. Additionally, it will be considered whether the assessment only includes an RH assignment decision or also a fitness-to-drive decision (i.e. if a DUI may continue driving or not). The analysis will elaborate uniform standards on assessment procedures and point out shortcomings or gaps if existing.
- Review of RH measures applied in the Member States at present. This includes a comprehensive documentation of the different kinds of RH-approaches, from psychologically oriented driver improvement programmes to addiction treatment, substitution therapy, or other measures, like electronic monitoring or alcohol ignition interlock systems. The measures will be analysed primarily from the content-related point of view, above all their aims, target group(s), their contents and methods, their efficiency according to published evaluation studies. Frame conditions like duration, setting, voluntarily vs. compulsory participation, etc. will be mentioned as far as they are considered necessary for the success of a measure. Based on the information gathered, uniform criteria for successful RH approaches will be elaborated" (p. 100-101).

Structure of Deliverable 5.1.1

Deliverable 5.1.1 "State of the Art on Driver Rehabilitation" combines two main research parts: a literature analysis (I) and an empirical data collection of current DR practices in Europe (II). The literature analysis presents the scientific and theoretical state of the art on DR, while the DR provider survey adds information on the current practical state of the art in Europe. Combining both is considered essential as information on actual practices is lacking in literature or difficult to reach due to language problems while theoretical/scientific evidence is never fully integrated in the real practices which are always liable to a variety of frame conditions. Part III of the deliverable integrates the results of part I and II, and discusses them critically. A separate Annex report which is systematically referred to in the deliverable includes detailed content and methodology related information

Chapter 1 of the literature analysis aims at finding scientific evidence for characteristics typifying DUI/DUID offenders (1.1) with special emphasis on predictors for recidivism (1.2). Chapter 2 focuses on DUI/DUID assessment as a multidisciplinary approach (2.1), and gives a theoretical overview of measures and tools currently in use. Chapters 3 and 4 respectively review rehabilitation measures specifically developed for DUI/DUID offenders (3), and addiction treatments that may be opted for the specific group of dependent DUI/DUID offenders (4). After presentation of the general aspects of DR (3.1), including results from previous EU-projects ANDREA and SUPREME, and of the theoretical

background of dependency treatment (4.1), their effectiveness is surveyed (3.3; 4.2 and 4.3). Chapters 2 and 3 additionally provide an overview of current scopes (essentially legal) of DUI/DUID assessment (2.2.1) and rehabilitation (3.2.1) in a selection of European countries; and of best and good practices outside Europe (2.2.2 and 3.2.2). Finally, opportunities of alcohol ignition interlock systems within DUI rehabilitation procedures are shortly presented in chapter 3.4.

The empirical part of this deliverable presents current practices of DUI/DUID rehabilitation providers in Europe. At first, the arrangements prior to the survey are described: development of the provider questionnaire (1), questionnaire format and items (2), organisation (3) and conduction (4) of the survey; while the following parts present the methods (6) and the detailed results (7) of the data analysis. The survey results are described on country level and discussed integratedly.

I. Literature analysis

General methodological considerations

The literature part of the deliverable integrates different information sources. Systematic reviews and meta-analyses were included for topics most thoroughly investigated by the scientific community. These approaches identify, acquire and summarize the results of single studies in a systematic way. Besides that certain chapters also required selecting and reviewing primary studies. All literature reviews were supported by the methodological guidelines provided by the Cochrane Collaboration though (Higgings & Green, 2005). Furthermore, information was derived from field experts in- and outside the DRUID WP5 team on the most specialized field-related topics, including also unpublished material. Through combining these information sources all relevant topics could be covered. Thus, depending on the subject of the chapters, different methodological approaches were chosen. Their lowest common factor is the aim to achieve a high level of objectivity and validity as a base for the deduction of “Best Practice” in task 5.2. The methods and procedures used in the reviews are shortly outlined in the particular chapters and detailed information can be found in the related annex.

1 Identification of different types of DUI/DUID offenders

Simone Klipp (BASt), Sofie Boets (IBSR) & Uta Meesmann (IBSR)

The first main chapter of the deliverable aims at investigating whether different types of offenders with possible different needs for rehabilitation can be distinguished. With regard to the psychoactive substance, the main groups of offenders considered, are drivers under influence of alcohol and/or illicit drugs, and drivers in substitution treatment.
The first part of the review focuses on specific characteristics' patterns and profiles of DUI/DUID offenders in general (1.1), while the second part investigates whether certain characteristics differentiate recidivists from first offenders (1.2). Single studies as well as reviews are included in the first part; the second part focuses mainly on follow-up studies that compare first offenders to repeat offenders.

The different approaches to deal with the information are the following:

1) Explorative, descriptive approach;
2) Characterization of special groups of offenders (typologies);
3) Integrative approach.

Detailed information is gathered on different levels allowing 1) the description of DUI/DUID offenders/recidivists: socio-demographic characteristics (gender, age, educational/professional level, socio-economic level and marital status); and 2) the characterization of DUI/DUID offenders/recidivists in terms of needs and opportunities for rehabilitation: consumption habits (dependent or not, patterns of use…), driving related characteristics (driving frequency…), and psychological characteristics (personality, attitudes, decision making…). At the most integrative level (3), studies with a theoretical approach to explain DUI/DUID (e.g. decision making models) are investigated.
Complementary, readiness to change of DUI/DUID offenders is considered as this is a main factor influencing rehabilitation effectiveness.

1.1 Specific characteristics of DUI/DUID offenders

This part presents information from the available literature dealing with the multiple interrelated characteristics of DUI/DUID offenders in general and in comparison to the general population. Types of studies included are literature reviews and separate studies, including:

- descriptive studies on DUI/DUID offenders;
- studies with comparison groups but no control for confounders, providing more details about specific groups who are at higher risk of driving under influence;
- studies with comparison groups controlling for confounders, providing more information on possible causes of driving under influence.

Details on the review methodology can be found in the annex.

Each paragraph first describes the results for DUI offenders, followed by the results with regard to DUID.

1.1.1 Socio-demographic characteristics

The studies included here provide information on socio-demographic characteristics of drivers which drive under the influence more often compared to the general population.

1.1.1.1 Gender

The literature is quite consistent with regard to gender characteristics of DUI offenders. Males are consistently found to be over-represented (Macdonald & Mann, 1992; Siegrist, 1992; Braun, 1995; Ferguson et al., 1999; Ferguson et al, 1998; Vingilis, 2000; Leal et al. 2006). An extensive literature review of Vingilis (2000) concludes on a male prevalence ranging from 75 to 95%. Within the Study of Health in Pomerania (SHIP) Glitsch (2003) compared a sample of N=276 registered DUI offenders to a sample of N=330 persons of the normal population. They found a clear overrepresentation of males in the DUI group (88.9%) compared to the prevalence of male gender in the normal sample (69.5%). Krüger (1998) showed in a German Roadside Survey (N=20186 drivers) that the rate of male DUI offenders is 3 - 4 times higher than the female one.

With regard to DUID offenders, the results are less consistent (Kelly et al, 2004), but still most studies find an overrepresentation of males. A recent literature review by Van Vlierden & Lammar (2007) concludes that males are at increased risk of driving under the influence of drugs, but they mention that the amount of women is increasing. Results from a-select road side checks show that illicit drugs or combined illicit drugs and alcohol prevalence is highest among male drivers (Matthijsen & Houwing, 2005; Behrensdorff & Steentoft, 2002). Also other studies found an overrepresentation of males: 85% of illicit drug impaired suspects in Victoria (Boorman, 2002) and 87% of apprehended DUID drivers in Norway (Hausken et al., 2004) were male. Hausken et al. (2004) furthermore stated that the gender difference is too big to be explained by males driving more often and using drugs more frequently. When different types of illicit drugs are considered separately, the results do not seem to change: 85%, respectively 90% of apprehended offenders who drove under the influence of heroine, respectively of ecstasy, were males in their study; Walsh & Mann (1999) and Beirness et al. (2003) (both according to: Mann et al, 2003) came to equivalent results for drivers under the influence of cannabis.

1.1.1.2 Age

Vingilis (2000) concludes from his review that most drinking drivers are likely to belong to the age group 20 to 50 years, but most studies and reviews indicate that persons most at risk of DUI are younger than 30 years or 35 years (Macdonald & Mann, 1993; Siegrist, 1992; Braun, 1995; Leal et al., 2006; Ferguson, 1999; Zancaner et al., 2002). The mean age of the DUI offenders within Glitsch's (2003) study was 36.1 years, clearly younger than the mean age (50.1 years) of the normal group sample. The proportion of DUI drivers aged 17-23 years was with 20% more than three times as much as the proportion of this age group in the controls (6%).

Recent reviews on illicit drug drivers indicate that drug driving is most common in young drivers (aged <30 years or <35 years) (Kelly et al., 2004; Van Vlierden & Lammar, 2007). Similar results came from a study of Vollrath et al. (2001) who found that male drivers under 30 years are consuming drugs more frequently than older or female drivers. A-select road side surveys in the Netherlands showed that illicit drugs use was highest among 18- to 24-year old males: 17.5% of this age group was positive on illicit drugs. Of male drivers aged 25 to 34 years, another 12.2% were tested positive on illegal drugs. In the other age groups illegal drugs were detected less often (<5%) (Matthijsen & Houwing, 2005). The randomly checked drivers in the study of Behrensdorff & Steentoft (2002) who appeared to be under the influence of an illicit drug alone or combined with alcohol were mainly aged 22 to 44 years. Zancaner et al. (2002) also found a high prevalence of drug intoxication, particularly cannabis, among the youngest drivers in his study: more than 50% younger than 25 years and around 3/4th younger than 30 years were DUID. Even more different studies indicate that offenders driving under the influence of cannabis seem to belong to the younger age groups. Survey data on the prevalence of cannabis use and driving in Canada showed that it was higher among younger age groups (below 35

years) (Jonah, 1990; according to: Mann et al., 2003). Beirness et al. (2003 according to: Mann et al., 2003) also found that driving under the influence of cannabis was most likely for drivers aged below 30 years. Also Walsh & Mann (1999 according to: Mann et al., 2003) revealed that driving under the influence of cannabis happened most frequently in younger age groups (9.3% of the 18-19 year olds). Boorman (2002) found that the average age of drug suspected drivers is 27 years with 21% being younger than 21 years. The median age of all apprehended DUID offenders in Norway (1998-1999) was 30 years (Hausken et al., 2004). The ones driving under the influence of ecstasy had a median age of 24 years, clearly younger than the median age of the apprehended heroine-impaired offenders (32 years). Vollrath et al. (2001) found that the highest frequency of detected cannabis was in the group of 22-24 year old drivers. Amphetamines and ecstasy were more often detected in drivers between 18 and 21 years.

1.1.1.3 Educational / Professional level

Most studies show a predominance of less educated persons among DUI offenders (Macdonald & Mann, 1992; Ferguson, 1999; Vingilis, 2000). In addition to that, drinking drivers are more often found to be unemployed or to have blue collar occupations (Vingilis, 2000; Ferguson et al., 1999). Braun's review (1995) defined certain professional conditions that possibly elevate the risk for drink driving, e.g. professions which require a high mobility and showing an alcohol affinity. Additionally, frequent job changes, professional problems due to alcohol consumption, stressful work and low feeling of professional satisfaction, contentment or gratification, are mentioned. Leal et al. (2006) found that convicted first and recidivist DUI offenders had completed lower levels of school years (≤year 10) than self-reported drink drivers in the general population (≥year 12). Employment was also less common in this DUI offender groups. In the study of Glitsch (2003) almost 58% of the drunk drivers were unemployed compared to 35.5% of the normal population in the Pomeranian area.

Also DUID offenders tend to have a lower educational level (Kelly et al., 2004; Van Vlierden & Lammar, 2007). A connection between educational level and DUID behaviour is shown in studies by Walsh & Mann (1999 according to: Mann et al, 2003) who found that driving under the influence of cannabis was least common among persons with a university degree. Zancaner et al. (2002) also found a higher level of education to be a protective factor. In the study of Boorman (2002) 66% of the illicit drug suspected drivers reported to be unemployed.

Stephan (2005) investigated the alcohol and drug consumption of students by means of a questionnaire survey. He found that the normality of the students' consumption pattern interferes with separating intake and driving. The author estimates that about 6% of the respondents of the survey are driving while being intoxicated.

1.1.1.4 Socio-economic status

Another quite consistent characteristic of drink drivers is their lower socio-economic status (Macdonald & Mann, 1992; Vingilis, 2000; Ferguson et al. 1999). According to Braun (1995) DUI offenders often are in a less satisfying financial situation. This is also confirmed by findings from Glitsch (2003). He found that the DUI offenders had almost only half the money freely available each month than the persons in the control group. Another interesting finding was revealed by Anderson et al. (1992) who found that female DUI offenders generally have lower SES compared to male DUI offenders. Baum (1999) showed that the socio-economic characteristics that seem to differentiate DUI offenders from the general population in individual-level analyses can also be illustrated through analysis on a spatial or aggregate level. Combining DUI offender data over geographic units linked with socio-economic data revealed that areas characterised by low socio-economic status, low residential stability, low use

of and access to public transport and unemployment disadvantages show higher rates of DUI offences.

Besides the age, gender and education related characteristics, Kelly et al. (2004) did not find studies on other social characteristics, like SES, of drug drivers in their review. They even suggest that eventual associations would rather be indirect and due to the relation between poor social functioning and substance use.

1.1.1.5 Marital status

The reviews of Braun (1995), Ferguson et al. (1999) and Vingilis (2000) describe that DUI offenders or drinking drivers are more often characterised as being single, separated or divorced. Glitsch (2003) reported that only 30.8% of the examined DUI offenders were married and living with the partner compared to 68.3% of the control group. A study by Anderson et al. (1992) showed that female DUI offenders in general were more often unmarried compared to males.

Not much literature was found on family conditions of DUID offenders. Only the study of Walsh & Mann (1999 according to: Mann et al, 2003) reported that drivers under the influence of cannabis were most frequently unmarried.

1.1.2 Consumption habits

This part focuses on research on substance use patterns (frequency or amount of substance use, substance use locations, the relationship between substance dependency and driving, etc.) of DUI/DUID offenders.
Most of the mentioned studies rely on self-reports of substance use, a method often criticised on psychometrical values. Different studies indicate that self-reported alcohol use data may not always be accurate, e.g. young drivers during a drinking night significantly over-estimate their level of consumption (Assailly, 1995; Kraus et al, 2005). A recent state of the science review by Del Boca & Darkes (2003) concluded though that this method can offer reliable and valid measures of alcohol consumption.

1.1.2.1 Medical definition of substance use problems and disorders

The internationally recognized clinical classifications systems DSM-IV (APA, 1994) and ICD-10 (WHO, 1992) summarize diagnostic criteria for alcohol/illicit drug abuse (harmful use) and dependence. These diagnostic systems allow distinguishing between clinically problematic and non-problematic substance use patterns. The DUI/DUID related literature generally refers to them when reporting about substance abuse or dependence.

The following two figures display the diagnostic DSM-IV and ICD-10 criteria for substance use disorders.

Figure 1: DSM-IV diagnostic criteria for substance dependency and abuse.

The ***DSM-IV*** (APA, 1994) defines a ***dependency syndrome*** as:

A maladaptive pattern of substance use, leading to clinically significant impairment or distress, as manifested by three (or more) of the following, occurring at any time in the same 12-month period:

- tolerance, as defined by either of the following:
  - a need for markedly increased amounts of the substance to achieve intoxication or desired effect;
  - markedly diminished effect with continued use of the same amount of substance;
- withdrawal, as manifested by either of the following:

- the characteristic withdrawal syndrome for the substance;
- the same (or a closely related) substance is taken to relieve or avoid withdrawal symptoms;

- the substance is often taken in larger amounts or over a longer period than was intended;
- there is a persistent desire or unsuccessful efforts to cut down or control substance use;
- a great deal of time is spent in activities to obtain the substance, use the substance, or recover from its effects;
- important social, occupational or recreational activities are given up or reduced because of substance use;
- the substance use is continued despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by the substance (e.g., continued drinking despite recognition that an ulcer was made worse by alcohol consumption).

Substance abuse is defined as:

A. A maladaptive pattern of substance use leading to clinically significant impairment or distress, as manifested by one (or more) of the following, occurring within a 12-month period:

- recurrent substance use resulting in a failure to fulfil major role obligations at work, school, or home (e.g., repeated absences or poor work performance related to substance use; substance-related absences, suspensions or expulsions from school; neglect of children or household)
- recurrent substance use in situations in which it is physically hazardous (e.g., driving an automobile or operating a machine when impaired by substance use)
- recurrent substance-related legal problems (e.g., arrests for substance-related disorderly conduct
- continued substance use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of the substance (e.g., arguments with spouse about consequences of intoxication, physical fights).

B. The symptoms have never met the criteria for Substance Dependence for this class of substance.

Figure 2: ICD-10 diagnostic criteria for substance dependency and harmful use.

According to the ***ICD-10*** (WHO, 1992), a definite diagnosis of ***dependence*** is to be made if three or more of the following criteria have been present together at some time during the previous year:

- "a strong desire or sense of compulsion to take the substance;
- difficulties in controlling substance-taking behaviour in terms of its onset, termination, or levels of use;
- a physiological withdrawal state when substance use has ceased or have been reduced, as evidenced by: the characteristic withdrawal syndrome for the substance; or use of the same (or closely related) substance with the intention of relieving or avoiding withdrawal symptoms;
- evidence of tolerance, such that increased doses of the psychoactive substance are required in order to achieve effects originally produced by lower doses (clear examples of this are found in alcohol- and opiate-dependent individuals who may take daily doses sufficient to incapacitate or kill non-tolerant users);
- progressive neglect of alternative pleasures or interests because of psychoactive substance use, increased amount of time necessary to obtain or take the substance or to recover from its effects;
- persisting with substance use despite clear evidence of overtly harmful consequences, such as harm to the liver through excessive drinking, depressive mood states consequent to periods of heavy substance use, or drug-related impairment of cognitive functioning; efforts should be made to determine that the user was actually, or could be expected to be, aware of the nature and extent of the harm" (WHO, 2007, http://www.who.int/substance_abuse/terminology/definition1/en/).

The ICD-10 uses the diagnostic term ***harmful use***, which supplanted the previous term *non-dependant use*. Harmful use is according to the WHO (2007a) defined as:

"…a pattern of psychoactive substance use that is causing damage to health. The damage may be physical (e.g. hepatitis following injection of drugs) or mental (e.g. depressive episodes secondary to heavy alcohol intake). Harmful use commonly, but not invariably, has adverse social consequences; social consequences in themselves, however, are not sufficient to justify a diagnosis of harmful use" (WHO, 2007, http://www.who.int/substance_abuse/terminology/definition2/en/).

The WHO (2007) presents the following guidelines to diagnose ***harmful use***:

- "the diagnosis requires that actual damage should have been caused to the mental or physical health of the user.
- harmful patterns of use are often criticized by others and frequently associated with adverse social consequences of various kinds. The fact that a pattern of use or a particular substance is disapproved of by another person or by the culture, or may have led to socially negative consequences such as arrest or marital arguments is not in itself evidence of harmful use.
- acute intoxication, or "hangover" is not in itself sufficient evidence of the damage to health required for coding harmful use.
- harmful use should not be diagnosed if dependence syndrome, a psychotic disorder, or another specific form of drug- or alcohol-related disorder is present" (WHO, 2007, http://www.who.int/substance_abuse/terminology/definition2/en/).

The WHO also defines clinical criteria of ***dependence*** and ***harmful use*** specifically for research purposes, which can be found on the same WHO websites quoted above.

Besides these clinical definitions the field of traffic medicine in German speaking countries defines the incidence of DUI inherently as "alcohol misuse" (Stephan et al., 2003).

Regarding driver assessment of substance impaired drivers, Brenner-Hartmann (1998) proposes the following consumption patterns (see table below).

Table 1: Consumption pattern of psychoactive substances (according to Brenner-Hartmann, 1998, p. 258)

Consumption pattern	Description
Tasting behaviour	Motives of behaviour: Curiosity and group models, collection of first experiences and development of expected effects
Occasional consumption	Linkage of consumption with irregular, seldom events (e.g. holidays, special occasions), no severe consequences on lifestyle yet
Habitual consumption	Development of habit, consumption is getting a fixed place in the individuals' leisure time activities, more frequent unconscious consumption decisions, still enough ability to adapt due to experienced disadvantages
Harmful use	Diagnostic category of the ICD10: Damage of physical and psychological health due to the consumption
Misuse	Diagnostic category of the DSM: Continued consumption in spite of known negative consequences or consumption in dangerous situations (e.g. alcohol in traffic)
Polyvalent consumption	Habitual consumption of several drugs at the same time, high danger of development of a psychological dependency
Addiction	See diagnostic categories of DSM and ICD-10
Polytoxicomania	Simultaneous dependency from several psychoactive substances or dependency from one substance and misuse of additional drugs

1.1.2.2 Patterns of alcohol use

Many studies and reviews conclude that DUI offenders differ from the general driver population in terms of drinking patterns. Drink drivers often seem to consume high levels of alcohol and/or have alcohol use problems (Hyman, 1969; Stephan, 1988; Macdonald & Mann, 1992; Krüger et al., 1998

Bergman et al., 2000; Lapham et al., 2000a; Vingilis, 2000; Lapham et al., 2001a; Kelly et al., 2004). Vingilis' review (2000) furthermore states that most survey results indicate an overrepresentation of problematic alcohol use or dependency in drink driving offenders and crashed drivers, although many of them, especially first-time offenders, are actually only moderate drinkers.
Macdonald & Mann (1992) reviewed epidemiological research on causes and correlates of drinking and driving. Their results showed that DWI[1] offenders are more often alcohol dependent, binge drinkers, aggressive, impulsive, depressed, have negative attitudes towards the law and experience more stressors in life. Based on studies controlling for confounders though, it seemed that many psychological risk factors are actually related to problematic alcohol consumption rather than directly to drink driving. Excessive or abusive alcohol use, binge drinking and drinking to relieve tension and stress seemed to be stable risk factors for driving under influence. Ferguson et al. (1998) also found that DUI offenders report moderate to high risk for alcohol problems (AUDIT scores) clearly more often compared to the general population. Almost 80% of the offenders seemed to be harmful consumers or dependent. Bergman et al. (2000) compared AUDIT self-assessment outcomes of a large sample of DUI suspected drivers to a control group: 59% of the male suspected DUI drivers had hazardous or harmful alcohol use patterns, which was four times as much as the males in the control group (18%). For the female group, the percent frequencies were respectively 40% in the DUI suspicious group and 3% in the controls. Of the total suspected DUI sample more than half had alcohol use problems and 18% had severe problems. Lapham et al. (2000a) analyzed data from a five-year follow-up study of drinking and driving offenders who underwent a court mandated screening programme and found that nearly 2/3rd of the offenders could be diagnosed as alcohol dependent based on DSM-III-R criteria. Lapham et al. (2001a) furthermore investigated the prevalence of DSM-III-R psychiatric disorders among 612 female and 493 male (aged 23-54 years) convicted DWI offenders of which 80% were first time offenders and who were all referred to a diagnostic screening program. Diagnostic interview results were compared to rates from a matched (age, education, ethnicity) sample of a USA general population survey. Results showed that the DWI group is rather a clinical than a non-clinical population, with 85% (alcohol) / 32% (drugs) of female and 91% (alcohol) / 38% (drugs) of male offenders reporting a lifetime use disorder (abuse or dependency) compared to, respectively, 22% (alcohol) / 16% (drugs) of females, and 44% (alcohol) / 21% (drugs) of males in the general population. Lifetime alcohol dependence was found in 61% of female and 70% of male offenders, more than double of the prevalence in the control group. Glitsch et al. (2001) discovered that the reported daily per-capita consumption rate of pure alcohol among DUI offenders (N=1135) was 66.7g in contrast to 34.1g consumed by the normal population (N=271). A detailed analysis of the usual blood screening markers of the delict blood samples taken at the DUI incident revealed that over 40% of the DUI offenders showed elevated GGT values and further 21% had elevated CDT values. Thus 61% of the examined DUI offenders could be diagnosed as belonging to the group of hazardous drinkers, meeting the ICD-10 criteria. Also in contrast to Vingilis' (2000) findings, 70% of first time DWI offenders scored in the impaired range of both, the MAST and the MAC, in a study by Sutton & Benton (1992).

On the other hand Veneziano & Veneziano (1992) examined 498 Missouri DWI offenders and found that certain alcohol related symptoms were more frequently mentioned by the offenders (drinking more than planned, objections from surrounding, blackouts, unusual behaviour while drinking, neglect of responsibilities and automobile accidents), but only a minority (23.9%) seemed to have current symptoms of alcohol dependency according to DSM-III-R[2] (APA, 1987). Within this sample though, the recidivists generally had experienced more stressors and were more often diagnosed as dependent.

[1] The term DWI refers to DUI offenders as well as to DUID offenders and is more widely used within the U.S. and Canada for phrases which imply both groups.
[2] DSM-III-R (APA, 1987) was the precursor of DSM-IV (APA, 1994) and thus the current clinical classification system of the APA when the cited study was conducted in 1992.

Furthermore, a survey of a random sample of the general population in Stockholm showed that the reported drink-driving prevalence increased with increased alcohol consumption and binge drinking frequency. The prevalence was high among the persons with alcohol dependence, but the great majority of drink drivers were low to moderate consumers (Karlsson et al., 2000). In their review on drink driving rehabilitation ("The present context") Ferguson et al. (1999) define first time DUI offenders, like Vingilis (2000), as possible social drinkers, but taking the low probability of being caught into consideration they assume that a lot of first time offenders actually drink drive more often and share characteristics of recidivist offenders. They mention substance use problems, deviant drink and drink driving attitudes and poor knowledge among the DUI offenders' characteristics.
Based on an analysis of randomly selected traffic-psychological expertises of 140 DUI offenders with a BrAC of 0.8 mg/l (respectively 1.6‰ BAC) and more at the Austrian Traffic Safety Board, Christ (1999) found that the percentage of drivers addicted to alcohol is slightly below 10%. In Germany as well, in the medical-psychological assessment centres, the majority of DUI offenders is not classified as being dependent, although severe misuse is often diagnosed (Schubert et al., 2005).

1.1.2.3 BAC

The BAC is widely accepted as an indicator for alcohol tolerance and thus may indicate heavy and/or frequent alcohol intake. Holubowycz & McLean (1995) indeed found that drinking patterns (quantity and frequency variables) become more extreme with increased accident BAC levels in injured drivers and motorcycle riders. Twenty-five percent (25%) of those with a BAC of 150 mg/dl scored positive on at least 2 of 3 problem-drinking indices, suggesting significant drinking problems. The reported drinking problems at BAC levels of 80 to 149 mg/dl and at lower BAC levels did not differ though. Higher BAC levels were also related to a higher drink driving frequency and more liberal attitudes towards drink driving. Previous DUI offence related driving licence suspension was the best predictor of having a high BAC, which may also suggest that DUI recidivists have the more severe drinking patterns.

In contrast though, several studies reveal that the BAC at the time of arrest has actually low utility as objective indicator for alcohol problems (Bergman et al., 2000; Lapham et al., 2000a; Zancaner et al., 2002). In the study of Bergman et al. (2000) almost half of the suspected DUI offenders with a BAC below the Swedish legal limit (0.02%) had actually severe drinking problems (AUDIT). Lapham et al. (2000a) found that the overall accuracy of a BAC level of 0.15% or higher and of 0.20% or higher as a screening for alcohol dependence ranged from 45% to 64%. They summarized that the BAC is related to alcohol use problems, but on its own has low utility as a screening indicator. These authors also found a statistically significant negative correlation between BAC and age: a higher proportion of offenders under the age of 20 years had BAC levels less than 0.15% compared to older convicted drunk driving offenders. This is consistent with results from a study by Zancaner et al. (2002), in which DUI offenders with a higher BAC (>0.08%) were slightly older than those with a lower BAC.

1.1.2.4 Patterns of drug use

The systematic review by Kelly et al. (2004) indicates that results of studies on the relation between drug use and drug driving are less consistent compared to study results on alcohol use and drink driving, but a very recent literature review by Van Vlierden & Lammar (2007) on drugs and medicines in traffic generally concludes that there is an increased risk for driving under the influence of substances in the following groups amongst others:

- heavy drug users – dependent or not – driving under the influence of their favourite drug;
- drug using persons going to parties, disco's;
- users of cannabis (as compared to other drug types);
- truck or bus drivers using stimulating drugs on-the-job.

Different authors found a positive relationship between drug consumption and driving under the influence of drugs. Löbmann & Krüger (2000) found that self-reported drunk and drugged drivers share a higher consumption level of the respective substance compared to substance using but sober drivers, and that drugged drivers refrain less from driving than drink drivers. Vollrath & Widera (2000) found a higher association between impaired driving and illicit drugs use than between impaired driving and alcohol use. In this field study on drivers at discotheques, the amount of alcohol use alone and the combined use of drugs and alcohol seemed to strongly influence the decision to drive as hindering factor, but this was not the case for the amount of drug use alone. Krüger & Vollrath (2002) found that the probability to drive under the influence of illegal drugs increases with increased substance consumption (frequency, quantity). This link appeared to be stronger for illegal drug users than for alcohol drinkers. Begg & Langley (2002) found that males persistently driving under the influence of cannabis were significantly more likely to report cannabis dependency, and also Darke et al. (2004) found a relationship between drug driving and more severe substance use: injecting drug users who reported recent driving under the influence were significantly more dependent on their favourite drugs, used that drugs more often and reported multiple drugs use more frequently then those not reporting recent DUID.

On the other hand, Albery et al. (2000) found no link of drug use frequency or drug dependence severity with DUID frequency, and other research showed that only a small portion (22.8% of the questioned cannabis users) of the large drug using population report DUID (Walsh & Mann, 1990 according to: Mann et al., 2003).

With regard to types of illicit drugs used, the systematic review by Kelly et al. (2004) indicates that among suspected or arrested DUID offenders, ***poly-drug use*** is widespread (40 to 80%) and that ***cannabis*** is the most common drug detected, followed by benzodiazepines. Other types of illicit drugs often detected among this group are cocaine (3 to 30%), amphetamines (2 to 20%) and opioids (10 to 40%). This is also consistent with the findings from road side studies by Matthijsen & Houwing (2005), and Behrensdorff & Steentoft (2003) and with the results of Berghaus & Krüger (1998), in which cannabis was the type of illicit drugs detected most often in DUID offenders. Jones et al. (2003) state, that these results are not surprising as most illicit drug users use this type of drug. This is contrary to a study of Jones (2005) in which most DUID offenders were male poly-drug users, but the leading drug of abuse there was amphetamine followed by THC. Additionally, in the study by Hausken et al. (2004) 91% of the police apprehended drivers drove under influence of ecstasy and had also used other illicit drugs (69% amphetamine and 55% THC). In almost half (49%) of the heroine impaired drivers other illicit drugs were detected. In the study of Löbmann & Krüger (2000) 63% of the drugged disco drivers also report to drive with a BAC above the legal limit. This is also consistent with results from surveys (Terry & Wright, 2005; Jonah, 1990; Walsh & Mann, 1999; Beirness et al., 2003). Terry & Wright (2005) surveyed cannabis users and found that almost half of regular users report driving under combined cannabis and alcohol use, and more than half report DUI, and Canadian survey data on cannabis use and driving also indicated a strong association between reported driving under the influence of cannabis and reported drinking and driving (Jonah, 1990; Walsh & Mann, 1999; Beirness et al., 2003). DWI offenders seemed to report using cannabis significantly more often than a control group in a case-control study by Macdonald & Dooley (1993).

Taken altogether, the literature indicates an association between alcohol use patterns (heavy consumption or problems) and drink driving. Most of the studies on DUID offenders are in accordance with this, suggesting that increased drug use correlates with increased DUID. Furthermore, evidence with regard to multiple drug use and driving is found.

1.1.2.5 Context of substance use

Main drinking environments of convicted DWI offenders were investigated by Chang et al. (1996). They concluded that older educated or employed offenders reported more drinking in bars/lounges, while younger offenders report more drinking on private parties. Lange et al. (2006) also found that young people mostly drink within groups of peers or in social contexts, showing the important role of alcohol in social activities among youngsters.

Different studies reveal an association between in-vehicle drinking and substance use severity and/or DUI. Snow & Wells-Parker (2001) found evidence that DUI offenders with more severe alcohol problems drink more often in a moving vehicle than persons with less severe alcohol problems. In their study the scores of convicted drink drivers on two alcohol abuse screening instruments were more strongly related to the frequency of drinking in moving vehicles than in other locations (home, party, bar, restaurant…). Holubowycz & McLean (1995) also found that drinking in motor vehicles, but also solitary drinking, and drinking in bars and hotels seemed more common with increasing BAC in injured drivers/riders. Mann et al. (2000) and Walker et al. (2005) came to the same results on vehicle drinking in studies on self-reported DUI. Mann et al. (2000) found vehicle drinking, next to home drinking, to be one of the strongest predictors of reported drinking and driving. Walker et al. (2005) found that the frequency of drinking when riding in cars and drinking in restaurants (after accounting for overall alcohol use) are good predictors of self-reported drink driving.

In comparison for DUID, Darke et al. (2004) found that one of the risk factors for drug driving among drug users is the injection and drug use in the car which provides frequent opportunities for drugged driving. Zancaner et al. (2002) furthermore found that the majority of the DUID offenders of cocaine (41.84%) and of amphetamines (70%) in police road checks came from a disco, while only 37.13% of the control group came from a disco. They identify discos as a place where psychoactive substances are frequently used. Also other investigations at dancings and night clubs show that high percentages of visitors report driving under the influence (Krüger & Vollrath, 2002).

1.1.2.6 Co-morbidity related to substance use disorders

Some studies indicate evidence that DUI offenders differ significantly from non DUI offenders on various measures of psychopathology, besides the alcohol use problems (e.g. Sutton & Benton, 1992; Sutton, 1992; Sutton, 1995; Cavaiola et al., 2003). A co-morbidity of alcohol abuse and dependence and disorders like depression, mood disorders and anxiety disorders has been shown in different studies (Anderson & Baumberg, 2006). The authors urge the need for in-depth assessment and additional (psychiatric) treatment or rehabilitation beyond the scope of alcohol problems.

Sutton & Benton (1992) examined the psychological/psychiatric profile of first time DWI offenders (N=216). Besides the majority scoring in the impaired range on different alcoholism surveys, 38% seemed to suffer additionally from clinical psychiatric problems (depression, emotional distress), but most were not in treatment for these disorders prior to the DUI arrest. Cavaiola et al. (2003) compared first and repeat DWI offenders with non offenders using the MMPI-2 and MAST. Results revealed significant higher scores of both DWI groups compared to the comparison group on MMPI-2 scales K (i.e. index of attempts to deny psychopathology and to present oneself in a favourable light or, conversely, to exaggerate psychopathology and to try to appear in a very unfavourable light), Psychopathic deviate (Pd), Over-Controlled Hostility (O-H), and MacAndrews Alcoholism Scale-Revised (MAC-R), and on the MAST. In a case-control study of DWI offenders by Macdonald & Dooley (1993) two drinking related factors differed between the groups: besides DWI offenders having tried to reduce the alcohol consumption last year, they were also more likely to drink due to sadness or loneliness.

A specific female psychological profile of first time DWI offenders was made up by Sutton (1992). Although the sample was very small (N=61), thus making generalizing difficult, the results did suggest that female DWI offenders may be suffering from clinical psychiatric problems in addition to alcoholism: 87% had – without the alcohol problems being considered – high enough scores on the MMPI to require psychiatric evaluation/treatment. The authors indicate that some women may use alcohol to get relief from other problems.

Sutton (1995) compared two age and education matched samples of clients at a female addiction treatment centre: females who sought treatment themselves and females ordered by court after a DUI offence. The latter group showed to have more acute psychopathological symptoms as a whole while the other group had more symptoms of severe depression. Almost all met the DSM III-R criteria for addiction. Based on this the author suggests that DUI offenders who seek for treatment due to a problem with alcohol or drugs may have an additional emotional disorder which also requires treatment.

Some authors indicated the relevance of differentiating depressed mood DUI offenders for rehabilitation (Dill et al., 2006; Wells-Parker & Williams, 2002; Wells-Parker et al., 2006). Dill et al. (2006) examined the relationship between depressed mood, self-efficacy and affective states during the drinking driving sequence in a sample of first time DUI offenders. The study confirmed that offenders with a depressed mood (41% of the sample) have a lower efficacy in abstaining and a higher temptation to drink – for both negative and positive mood states –, and experience in general more negative mood states before or during the drinking driving sequence. They also report more positive states during the drinking and driving sequence though, which is hypothetically allocated by the authors to an expression of experienced relief from the frequent negative emotions. This way, driving to favoured drinking locations can become a negative reinforcer, making a negative mood state a very high risk situation for combined driving and heavy drinking. Implications for interventions are that while most interventions aim at inducing dissonance or emotional arousal, offenders who have a conditioned risky drinking behaviour in response to negative affect (for whom negative affect has become a strong cue for drinking) require interventions to modulate negative affects. Reference is made to Karno & Longabaugh (2003) who found that patients with clinically elevated depressive symptoms only had improved drinking outcomes when there was a low focus of the therapist on painful emotional material. Also studies of Wells-Parker & Williams (2002) and Wells-Parker et al. (2006) have shown the relevance of differentiating depressed mood DUI offenders as it impacts the therapeutic process. The first study indicated that depressed first time DUI offenders were 35% less likely to re-offend when following an enhanced offender programme including brief counselling intervention in comparison to depressed offenders who had followed a standard programme without counselling. The second study indicated that depressed mood is related to higher receptivity and lower resistance towards counselling.

In contrast to the results above, Darke et al. (2004) found that psychopathology (antisocial and borderline personality disorder, general distress) was not related to drug driving within a sample of drug users, and the DUI offenders in the study by Ferguson et al. (1998) indicated experiencing high levels of mental health.

Overall, the results show that some literature suggests that some DUI offenders may have additional emotional and/or psychiatric problems besides alcohol related problems which require specific treatment.

1.1.3 Driving related characteristics

1.1.3.1 Prior arrests

Veneziano & Veneziano (1992) examined 498 Missouri DWI offenders with regard to prior arrests and found that more than half of the sample had no previous arrests but a small proportion seemed to be high risk offender (10.3% had three or more arrests). Similarly, Leal et al. (2006) found that almost 15% of convicted drink drivers in the Queensland Transport data set had more than one drink driving breach in the same year or one in the same year and at least one in the previous two years. The authors suggest that this is an underestimate as only data from the previous two years were taken into account. Glitsch (2003) checked the Central Register of Traffic Offences for his two study groups, DUI offenders as well as a control group. Unlike the results of Veneziano & Veneziano (1992) he found that 59% of the DUI offenders had prior records, 27% had already been registered for a DUI offence, while only 10% of the normal population had entries in the register; only 0.3% was registered for a DUI offence in the past. These findings are in accordance with results from a study by Stewart et al. (2000): almost half (45%) of the DUI offenders had other, non-drinking and driving related charges or convictions. Some identified as first time offenders were actually recidivists. Thirty-six percent (36%) had previous drink-driving offences of which more than half had multiple prior offences (18% of total). After finding that 26% of fatally injured drivers with a BAC ≥ 0.20%, but only 3% with a lower BAC had previously received one (72%) or more (28%) impaired driving convictions, Brewer et al. (1994) concluded that assessment for substance use problems is important even after only one conviction. Also Vingilis & Stoduto (1992) and Vingilis et al. (1994) found that the amount of BAC positive injured drivers with two or more prior traffic violations was twice as much as the amount of BAC negative victims. Braun (1995) concluded in her review that the tendency towards other traffic violations (speed violations, prohibited parking etc.) and broad acceptance of rule violations are some of the most discriminating variables between DUI offenders and non DUI offenders. Ferguson et al. (1999) conclude on criminal, offence and accident history as some of the main characteristics of DUI offenders.

With regard to illicit drug drivers, Boorman (2002) investigated the offence history of drivers suspected of being impaired by illicit drugs in Victoria: 67% had previous traffic offences; only 25% had a drink driving offence history. In addition to that he found that 21% of suspected illicit drug impaired drivers in Victoria did not hold a valid driving licence, with 10% being disqualified. Most of the police apprehended drivers impaired by heroine or ecstasy in 1998-1999 in the study of Hausken et al. (2004) had previous DUI/DUID offences (retrospectively measured since 1985): 78% of the drivers under the influence of heroine with the first arrest being mostly due to DUI; and 47% of the ecstasy group with amphetamines most frequently found at first arrest.

1.1.3.2 Driving exposure

Braun (1995) concluded from her review that high annual kilometre performance differentiates DUI offenders from drivers with no alcohol offences. Furthermore, several surveys on self-reported DUI/DUID found a link between DUI/DUID frequency and driving frequency. Mann et al. (2000) found driving frequency and kilometres driven to be strong predictors of reported drinking and driving of 16-18 year olds. Darke et al. (2004) found evidence that within the sample of drug users, the ones who drug drive significantly drove more frequently than not drug driving users.
Kelly et al. (2004) on the other hand found no studies on the relationship between driving frequency and drug driving and confounding results on the relation between drink driving and driving frequency. Macdonald & Mann (1992) also concluded after a review of many studies that variables related to driving behaviour in methodologically rigorous studies do not appear to be causative factors for DUI, and Macdonald & Dooley (1993) found no differences between DUI offenders and a control group on

driving behaviour (distance driven, frequency). In a study by Albery et al. (2000) drug driving frequency was not related to other driving convictions.

All in all, most results indicate that most of the DUI/DUID offenders are highly suspicious for any kinds of unsafe driving and that a high number tends to recidivate DUI/DUID (for details on recidivists see 1.2). With regard to driving exposure mixed results are found.

1.1.4 Psychological characteristics

This chapter focuses on characteristics that may provide an explanation for DUI/DUID. At this level, the associations between DUI/DUID and aspects of personality, attitudes and decision making are investigated.

1.1.4.1 Personality and lifestyle characteristics

The term "personality" includes the rather stable, enduring personal characteristics like one's character and temperament (traits), but also refers to certain intermittent or temporary conditions like motivations and emotions (states). Lifestyle furthermore reflects broader patterns of one's behaviour. Many studies examined the impact of personality traits on DUI/DUID. Some results indicate that impaired drivers have higher levels of sensation seeking, extraversion, negative emotionality and aggression (Donovan & Marlatt, 1982; Saltstone & Poudrier, 1989; McMillen et al, 1991; Donovan, 1993; Braun, 1995; Sommers et al., 2000; Fernandes & Soames Job, 2003; Hope et al., 2005), while others do not find such links or relate these factors to the substance consumption (Vingilis & Stoduto, 1992; Macdonald & Mann, 1992; Vingilis et al., 1994) (Kelly et al. 2004). Bauer & Baab (1995) found out that repeated offenders are less social resonant, less strongly controlled, have less social potency and less permeability. First offenders feel more competent in coping with problems, feel more secure concerning behaviour and decision making and think to be more appreciated.

***Sensation seeking, hostility, deviance, impulsivity, aggression, risky lifestyle*.** Hope et al. (2005) hypothesized that DUI and DUID, and other risky driving behaviours, are related to sensation seeking. This goes along with findings that DUI/DUID is more related to a lifestyle that deviates from the norm.

Donovan (1993) came to the same conclusion when investigating self-reported drinking and driving of 2.300 young adults and finding that drink driving can be seen as a single factor of general risky driving behaviour and as a part of a larger problem behaviour style (problem drinking, drug use). Social unconventionality, risk taking, hostility/aggressiveness seemed to be the differentiating psychosocial characteristics. This was confirmed in a study by Sommers et al. (2000) who interviewed serious injured young adult drinking drivers (alcohol dependents were excluded). The DUI drivers demonstrated a more pervasive pattern of risky behaviours which exceeded the normal national rates. Also McMillen et al. (1991) came to such results. They found that drivers stopped for DUI after an accident or traffic offence differed significantly from drivers stopped for road checks on other measures: the first were more deviant, had higher scores on hostility and deviance, consumed more alcohol, had more accidents after drinking, drove more often impaired and had more arrests for non-traffic offences. Like the previous authors, these authors suggested that for some persons impaired driving is rather a part of a more general risk-full life style. Braun (1995) also found risk behaviour, namely preference for a risk seeking driving style and tendency to sensation seeking, differentiating factors for DUI offenders. In a study by Fernandes & Soames Job (2003) drink driving was predicted strongly by specific attitude, followed by sensation seeking, optimism bias and crash avoidance. But in contrast to the previous studies they found no generalizability of predictive factors for different risky behaviours: a range of factors predicts different deviant behaviours. They argue that separate underlying mechanisms for individual risky driving behaviours should be considered.

Glitsch (2003) furthermore found in his study that DUI offenders differ significantly regarding the following variables: they report lower behaviour control, lower self-directedness, lower self control, and score higher on scales for psychopathy and readiness to assume risks. This is confirmed by findings from Soderstrom et al. (2001). They interviewed injured drivers and found that patients without current diagnoses of psychoactive substance use disorders (DSM-III-R) and without pre-injury driving convictions tended toward less risk-taking/impulsive behaviour than patients with substance use disorders and with convictions.

Contrary to these results, Macdonald & Mann (1992) found associations with antisocial behaviour, aggression, sensation seeking, risk taking, impulsivity and poor self-control, but the predictive effects of certain suggested psychological risk factors (like aggressiveness, impulsivity) disappeared when controlled for alcohol consumption. Also van Beurden et al. (2005) found evidence that heavy episodic drinking has a greater effect on drink driving than sensation seeking in their cross-sectional survey of 2.698 adolescents; both heavy episodic drinking and sensation seeking were significant separate predictors of different types of harmful driving behaviours though. Sensation seeking tendency was one of the significant predictors of heavy episodic drinking. These results show that the chances to engage in unintended behaviour like drink driving are strongly increased after heavy episodic drinking (even at levels normative for adolescents), even in persons with low or average sensation seeking personality traits (low/average risk takers).

Drugged drivers were found to be more sensation seeking and extrovert compared to drink drivers in the study of Löbmann & Krüger (2000). They concluded that the behaviour of drugged drivers seems to be more related to personality factors, whereas the behaviour of drink drivers seems to depend more on exterior factors (group pressure, enforcement). Begg & Langley (2002) found that persistence in DUI and driving under the influence of cannabis was significantly related to aggressive behaviour. Furthermore, results from an extensive literature review by Donovan et al. (1983) suggested that hostility and aggressiveness are major interacting personality traits in general high risk driving. Based on their review results Van Vlierden & Lammar (2007) concluded though that both DUI/DUID can be related to personality traits like sensation seeking, but that in many cases this behaviour is based on specific decision making processes.

Schulze (1999) investigated the lifestyle of young drivers. He classified the data of his German sample (18 to 24 years) into five categories. Two types were of special interest: “Action type” – drivers who were found to consume alcohol several times a week, drinking high amounts and also consumed marihuana several times or regularly; and “Looking for a kick” type – drivers who drive less often, but have more frequent driving accidents as they often tend to violate norms and rules. This group had the highest percentage of marihuana consumers and highest amount of alcohol consumption of 18 to 24 years olds.

Criminal offence rate. Evidence for a more general pattern of risky lifestyle, also comes from findings of DUI/DUID offender criminal offence rates. In a study from Nochajski et al. (1993b) criminal history besides DWI arrests seemed to be a distinctive factor for DWI re-arrest after following a group treatment program: DWI offenders with a criminal history were twice as likely to be re-arrested for DWI. Prevalence of criminal offences is also one of the risk factors defined by Braun (1995).
Cavaiola et al. (2003) contrariwise did not find that prior criminal history differentiated first DWI offenders, repeat offenders and non-offenders.

In the study of Boorman (2002), 82% of the illicit drug impaired suspects in Victoria had a conviction history of criminal offences and 67% had one of traffic offences.

Stress. Different studies found evidence for a connection between DUI and reported stress and drinking to reduce stress. Donovan et al. (1983) pronounced an influence of stressors, frustration, tension and feelings of personal control and self-efficacy on the evolution of high risk driving. Veneziano & Veneziano (1992) examined 498 Missouri DWI offenders regarding psychosocial and socio-demographic characteristics. Their results revealed that more than a third of the offenders experienced certain stressors in life during the last year (like job loss, financial difficulties, and divorce/separation). Additionally, the only psychological risk factors remaining stable for DUI in the most rigorous studies in the review by Macdonald & Mann (1992) were "drinking to relief tension" and "stress". An association between stressful life events, alcohol consumption and DUI was also discovered by Glitsch (2003). He reported that the group of DUI offenders aged between 34-50 years was characterised by heavy burdens of private and professional problems and a very high BAC (averaged 0.20%). Seventy-two percent (72%) of this group showed elevated liver values. He concluded that a DUI incident could be seen as one symptom of a generally difficult life constellation.
Some studies even show gender differences with regard to personality characteristics. For example, Anderson et al. (1992) found that female DUI offenders had poorer emotional adjustment and self-esteem, whereas male DUI offenders exhibited more often assaultiveness, driving for competitive speed, driving related aggression and sensation-seeking.

In general, some evidence is found on the possible influence of underlying traits (sensation seeking, antisocial traits) to impaired driving, but the results are not consistent. On the other hand, a higher reported stress and drinking for stress reduction seems to be prevalent among drinking drivers, as well as higher criminality rates (also for DUID).

1.1.4.2 Attitudes, risk perceptions and social factors

Attitudes and risk perceptions of DUI/DUID offenders have been examined thoroughly. Most studies concern DUI though. Different reviews concluded that deviant drink and drink driving attitudes are among the main DUI offender characteristics (Ferguson et al.; 1999; Braun, 1995; Kelly et al. 2004; Van Vlierden & Lammar, 2007). Braun (1995) summarized the attitudes that were found to differentiate most between DUI offenders and non-offenders: attitudes towards alcohol, drinking behaviour, and attitudes towards alcohol in traffic and towards alcohol related norms. Based on this, the following attitudes and related variables were selected as most relevant (Bukasa, 2000): attitudes favouring alcohol consumption (functions of alcohol), influence of alcohol related social environment (peer pressure), alcohol specific norm acceptance (attitudes towards regulations), awareness of risks (permissive attitudes), lack of knowledge about alcohol specific issues (basic knowledge) and alcohol specific dissimulation (tendency for socially desirable answers).

Attitudes. Case-control studies by Macdonald & Dooley (1993) and Baum et al. (1998) found DUI offenders to have more permissive attitudes towards DUI. Macdonald & Dooley (1993) focussed on self-reported data on: (a) attitudes, knowledge and behaviour related to drinking and driving; (b) driving behaviour; (c) drinking behaviour and drug use; (d) social issues; and (e) attitudes towards policies to reduce drinking and driving, and found that DWI offenders and the matched control group essentially differed on items of the first category. DWI offenders were more likely to think that "some persons drive better after using alcohol" and that "there is an excuse for drinking and driving". Baum et al. (1998) specifically compared drinking and driving related attitudes and knowledge of a sample of DUI offenders (N=149) and a matched control group without reported DUI offences (N=149) and also found significant differences essentially with regard to the drink driving related attitudes: offenders agreed more often with statements like "drink driving risk is overrated" and "everybody drinks and drives once in a while". They furthermore found that both groups agreed on most of the strategies to

avoid DUI expect for “leaving the car” and “keep track of drinks” which were significantly less accepted by the offenders. Also Glitsch (2003) discovered that DUI offenders find it less condemnable and show higher intentions to DUI than non-DUI offenders. Both differences proved to be highly significant. In his overall regression model, the general ethical evaluation of DUI behaviour was a highly significant variable with the highest predictive value for DUI.

Studies on self-reported impaired driving, considering also DUID, came to the same conclusions. Löbmann & Krüger (2000) investigated factors influencing driving under influenced by alcohol and drugs through in-depth interviews at discotheques and found that both drink and drug drivers share more permissive attitudes towards DWI as compared to their control groups (i.e. alcohol and drug users who drive sober). Attitudes were even revealed as the strongest predictors of reported DUI/DUID by different other studies on self-reported drink/drug driving. Fernandes & Soames Job (2003) for instance examined personality and attitudinal factors related to different risky driving behaviours in students. They found that different factors predicted different driving behaviours, but that attitudes were found to be the strongest predictors of risky driving, including drink driving. Davey et al. (2005) surveyed 275 university students on alcohol/drug use, drink/drug driving and attitudes towards drink/drug driving. Drink/drug driving related attitudes proved to be predictors of the behaviour, and for drink driving even the strongest one before alcohol consumption. The general attitude of this population sample towards drink/drug driving was rather negative. Furthermore it appeared that drug users significantly reported more positive drug driving attitudes than non drug users.

Van Vlierden & Lammar (2007) indicated that the attitudes towards drink/drugged driving or attitudes towards rule breaking, are related to perceived risks and (legal, accident) consequences.

Risk perceptions and knowledge. Van Vlierden & Lammar (2007) indeed indicate that attitudes towards impaired driving and rule breaking are related to personal beliefs in the objective danger/effect of substance use on driving ability and to the perceived chances to be involved in an accident or to get caught; which all play a role in the decision making process to DUI/DUID. Different studies confirm that drink driving (tendency) is influenced by risk perceptions.
Poor knowledge on effects of alcohol was shown by Holubowycz et al. (1992) who found that Australian crash involved injured male drivers and motorcycle riders with a high BAC (≥0.08%) differ from those with a zero BAC in their beliefs about alcohol-impaired driving skills. Also Ferguson et al. (1998) revealed that DUI offenders in general seem to have poor knowledge on safe alcohol consumption levels for driving. Their knowledge on legal BAC limits was better. Brown (1980) found that convicted DUI offenders who report additional alcohol-related problems perform worse on a knowledge test about responsible drinking than problem-free convicted DUI offenders and social drinkers, who both scored alike. The study results furthermore showed that problem drinkers’ (as well as problem-free drinkers’) knowledge could strongly improve after just a short educative input. Contrary to these results, a study of Baum et al. (1998) indicated that the knowledge of safe driving, alcohol impact and BAC limits was comparable (although low for safe driving) between the DUI offenders and a control group.
Span (1995) furthermore found some differences in risk perceptions between male and female drink drivers. The primary motivations to avoid drinking and driving were “fear of arrest”, “fear or crashing”, “injuring others” and “loss of licence”. “Fear of crashing” was more important for women to refrain from DUI behaviour while “loss of licence” was more important for males. “Perceived probability of getting arrested” appeared to be a significant factor in refraining all drivers (with no, one and multiple DUI offences) from drink driving in a study by Turrisi & Jaccard (1992). Awareness of effects of being arrested or of having an accident increased with increasing amount of offences, but were not related

to drink driving tendency though. The only perceived consequences (of arrest) that were related were: fines, name in the news paper and criminal record.

With regard to DUID, literature is quite consistent on the fact that drug users and drugged drivers have low(er) perceptions of DUID related risks. Löbmann & Krüger (2000) did not reveal differences in risk perceptions (being caught, severity of punishment etc.) between drugged drivers and non-drugged drivers, and referred to the fact that perceived chances of being caught for DUID are just in general low. The review by Kelly et al. (2004) concluded that illicit drugs users are less concerned, have more permissive attitudes, and have a perception that drug use does not significantly impair driving. According to the authors the perception of a small chance to get caught and the perception that illicit drugs do not significantly impair driving skills, are firm contributing factors to DUID. They link this to an effective lack of negative consequences of the behaviour or to rationalisations to justify the behaviour. Unlike Löbmann & Krüger (2000), Darke et al. (2004) found that these lacking risk perceptions are more pronounced in drug drivers as compared to drug users who don't drug drive.

Van Vlierden & Lammar (2007) found that drugged drivers lack knowledge of the dangers of DUID as compared to the dangers of DUI which are better known. Also other studies indicated that attitudes/risk perceptions tend to differ according to DUI/DUID experience or frequency, and according to the type of drug (Kelly et al., 2004; Albery et al., 2000; Löbmann & Krüger, 2000; Davey et al., 2005; Macdonald & Dooley, 1993; Baum, 2000). Krüger & Vollrath (2002) found that drug drivers' estimation of the subjective danger posed by illegal drugs is lower than drink drivers' estimated risk for alcohol, drug drivers thus have a less negative evaluation of drug use and of drugged driving which together with a lower subjective probability to be detected, results in less refraining from driving under the influence of illicit drugs. Therefore these authors conclude that the drug user group is more willing to DUID than alcohol users to DUI, although both have the same decision processes. A clear link was found though with amount of drug consumption: subjective evaluation is less negative the more drugs are consumed, thus illegal drug use does not automatically imply drug driving. Löbmann & Krüger (2000) also found that compared to drink drivers about drink driving, drugged drivers seem to have a more tolerant attitude towards driving while impaired (of cannabis); they furthermore think that driving under the influence of stimulants is less damnable than drink driving.

Drugged drivers often think of alcohol as the most driving impairing drugs. In the study of Albery et al. (2000) drugged drivers thought that alcohol impairs the driving much more than any other drug, while sober driving illicit drug users thought that alcohol is equally impairing as both heroine and methadone. Vollrath & Widera (2000) found that the use of drugs alone did not seem to stop persons from driving whereas the combination of drugs and alcohol did. The authors claim this to the perception of drug users that drug use alone is not harming the driving skills and is hardly detected by the police. Terry & Wright (2005) came to the same conclusion from their survey of cannabis users. All report DUI of cannabis behaviour until recent. Most of these users believed that cannabis only slightly impairs driving, many regular users even consider it promoting better driving; most are very willing to drive under the influence of cannabis, and in contrast to other results almost half of regular users even reported driving under combined cannabis and alcohol use. More than half report DUI, but cannabis users' attitudes towards drink driving are much more negative. It is said that for them only roadside drug testing would be a deterrent – but currently they rarely end up in convictions. Lenné et al. (2000) also studied regular cannabis users and found a high willingness to drive under influence of cannabis (60% minimum once a month, 28.1% even daily), while the vast majority reported never (42.5%) or seldom (42.5%) to drive when cannabis and alcohol were combined. A bit more than half of the sample believed that cannabis affects driving, but 34% believed it does not, while an overwhelming majority thought combined cannabis and alcohol use affects (negatively) the driving skills, essentially

relating this to the effects of alcohol. Also Davey et al. (2005) found that drug drivers reported more favourable attitudes towards driving under influence of drugs than of alcohol, while non-drug drivers had similar attitudes towards drug or drink driving. In summary, many studies show a general lack of concern for drug (essentially cannabis) related driving among drug users, but an awareness of the dangers of combined drug (cannabis) and alcohol driving, which is more often avoided.

Social norms, social expectations and peer pressure. Van Vlierden & Lammar (2007) concluded in their review that social factors, like peer encouragement, can play a huge role in the decision making process to drive under influence. They furthermore state that social factors can explain the over-representation of young drivers in the population of drivers under influence since young drivers are very sensitive to peer-pressure and peer-influence and have a higher chance for using drugs. Many studies indeed underline the impact of social factors.
Glitsch found in his overall regression model that besides the general ethical evaluation of DUI behaviour, the subjective norm was the only highly significant variable with a predictive value for DUI. Australian crash involved injured male drivers and motorcycle riders with a BAC of 0,150g/ml or more clearly reported more often than drivers with zero BAC that most of their friends drive under the influence of alcohol (Holubowycz et al., 1992). Also results from a population-representative survey of South Australian drivers (N=1.300) showed that drivers who admitted drinking and driving clearly more often had the perception that their peers would drink and drive or would approve of it (Brown, 1995). This result was controlled for age, gender, residence region and drinking behaviour, but the authors indicate a possible bias due to social appropriate answers (not admitting drinking and driving) or over-estimations of friends' behaviour and attitudes (when admitting drinking and driving). Indications of the impact of peer pressure among adolescents came from cross-sectional surveys. Gibbons et al. (2002) showed that adolescents with higher tendencies to engage in social comparison perceived fewer risks in drinking and driving the more common they thought this behaviour is among their peers. Also beyond DUI, Shope et al. (2000) found that susceptibility to peer pressure was one of the main separate elements that contributed to the predicted probability of serious driving offences. Furthermore, Gulliver & Begg (2004) found evidence that persistent modelling (driving with impaired persons) at early and late adolescence 'normalises' the behaviour, indicated by more reports of DWI behaviour by males, and to differences in perceived safe and legal alcohol limits for both genders.
Different studies show that group norms and role norms (dynamics in natural drinking groups) may have a competing influence on an individual's drink driving intentions and behaviour. Johnson et al. (2002) and Lange et al. (2006) surveyed young adults on their way to and back from going-out places. The results from Johnson et al. (2002) suggest that "group" norms influence drinking intentions and that "driver" roles can protect against normative group pressure. There was a strong relation between perceived drinking climate of the group and passenger drinking intentions, while for drivers it appeared that males were less resistant to it than females. Furthermore, men having a negative attitude towards alcohol were more likely to be drivers, while for women this did not differ. Survey results (Lange et al., 2006) showed that drivers were resistant to normative pressures to drink, possibly indicating an effect of norms related to the role of being a driver. They furthermore found that male drivers more often had no previous history of heavy drinking compared to passengers (there was no difference for women), indicating that male drivers may in general be less heavy drinkers and may have the role of driver based on such personal characteristics.

Besides the role of the social surrounding (family, peers, friends, subcultures …) Ferguson et al. (1999) furthermore stress the (psycho-)social problems underlying drinking and the (psycho-)social role of drinking as social determinants of drink driving. With regard to the latter, for example Lange et al. (2006) showed the important role of alcohol in social activities among adolescents.

All in all, it can be concluded that most studies indicate the important influence of social norms and expectations or peer pressure in driving under influence.

1.1.5 DUI/DUID offender clusters

The literature review identified 6 studies that specifically aimed at determining DUI/DUID typologies (mainly DUI) based on some or multiple dimensions mentioned in the previous chapters (1.1.1 until 1.1.4) (Donovan & Marlatt, 1982; Saltstone & Poudrier, 1989; Wieczorek & Miller, 1992; Span, 1995; Wells-Parker et al., 1995; Lillsunde, 1997; Chang et al., 2001). They distinguished 3 to 6 different DUI/DUID clusters and provide suggestions to match these clusters with the appropriate intervention.

Donovan & Marlatt (1982) analyzed self-reported data from DWI offenders (N=172; mean of 3.88 traffic violation convictions in the prior 3 years to the study) and found evidence that this group consists of several clinically and theoretically relevant subtypes. Based on this they urge the need for differential assessment of DWI offenders in order to match each one to the most appropriate type of intervention. In the studied sample five distinct offender subtypes could be discriminated based on personality characteristics and attitudes (driving related attitudes, personal adjustment and functioning, and hostility):

- Cluster 1: high on “driving for tension reduction” and “general and driving related externality”; low on “depression” and “resentment” (heavy, frequent drinkers);
- Cluster 2: high on “assertiveness”, “emotional adjustment”; low on “driving for tension reduction”, "aggression”, “hostility” and “sensation seeking” (older, moderate drinkers);
- Cluster 3: highest on “depression” and “resentment”; lowest on “assertiveness”, “emotional adjustment” and “perceived control” (moderate drinkers);
- Cluster 4: highest on “driving related aggression”, “competitive speed”, “assaultiveness”, “sensation seeking”, “indirect and verbal hostility” and “irritability” (younger, heavier drinkers);
- Cluster 5: highest on “assertiveness”; lowest on “driving for tension reduction” (similar to Cluster 2 but younger, less frequent drinkers).

Clusters 2 and 5 accounted for almost half (45%) of the sample; they were overall the least deviant and had lowest risk score. Cluster 3 and 4 clearly seemed to have higher risk-enhancing traits compared to the whole sample. These furthermore were of lower social position, heavier drinkers and had higher risks of accident involvement. In the discussion the authors suggest appropriate modes of interventions for each subtype. They conclude that offenders with high levels of hostility and who drink on any given occasion represent a group with the highest risk driving style, while the lowest risk is associated with older offenders, having a higher social status and a more reasonable drinking pattern.

An examination of a sample of Ontario multiple recidivist DWI offenders (mean of 2.2 for those referred to a rehabilitation programme; mean of 5.8 for those in correctional centres) by Saltstone & Poudrier (1989) supported the findings of Donovan & Marlatt (1982) on the integrity of most clusters, although focussing more on alcohol dependence and abuse. They found evidence for four general groups of impaired driving offenders with elevated scores on clinical and alcohol scales, and gave input for the development of intervention strategies.

- Type 1 (highest number): alcohol dependent, no clinical scale elevation, greatest number of DWI offences, was referred to as the “alcoholic multiple-recidivist”;
- Type 2: excessive drinking, depression, internalised hostility;
- Type 3: higher salary, better education, traditional male values, lack of internal locus of control, episodic drinkers;
- Type 4: low internal control, drinking for self-enhancement, assaultive, hostile, hypermanic and sensation seeking.

For the Type 1 subgroup, with the highest risk for DUI recidivism, the authors recommended mandatory (residential) dependency treatment. They furthermore suggested that Type 3 offenders may benefit from a mandatory education programme and/or from outpatient behavioural treatment focussing on controlled drinking. For the less homogeneous Type 2 offenders the authors suggested to perform further DWI assessments in order to identify the main problems and to evaluate the possible effects of alcohol addiction treatment and/or treatment for psychological problems. The same counted for the Type 4 offenders, with the remark that DWI offenders who are also involved in other criminal activities may not be influenced by most educational interventions.

Based on a survey of 500 male drivers (general population) who drink at least once a month alcohol Span (1995) revealed that drinking drivers can be divided into four groups with different risk for drink-driving, based on three key attitudinal elements (i.e. fear of being detected DUI, fear of crashing, acceptance of the 0.05% BAC limit and related enforcement):

- "Believers": high motivation for law compliance, higher fear for being caught or crashes, higher acceptance of countermeasures and legal limit. This group had the lowest reported drink driving;
- "Pressured": high motivation for law compliance, lower acceptance of countermeasures/legal limit, higher level of social pressure. In this group social pressure to keep up with the group while drinking is experienced, an element of potential risk taking;
- "Deterred": higher agreement with countermeasures/legal limit, not so highly motivated for law compliance, higher threat of being caught than crashing, with a lower level of self-motivation to comply;
- "Opposers": most reported alcohol use, highest reported drink driving behaviour, lower motivation to comply, lower agreement with countermeasures/legal limit, higher social pressure, and lower fear of crashing. This group was perceived as having the highest drink driving risk elements. They drank most on the last drinking occasion and reported more frequent DWI of alcohol behaviour than the other groups.

In a meta-analysis on the effectiveness of DUI offender remediation (N=215 studies) Wells-Parker et al. (1995) found that only two types of offenders (related to alcohol or DUI problem severity) were defined frequently enough to be included in the analysis: (a) number of prior DUI offences and (b) problem risk. A three-category scheme for offender types could be selected, including:

- low risk offenders or first offenders;
- middle risk offenders (first offenders classified as high risk, moderately high risk offenders based on multiple risk criteria, second offenders or those classified as multiple offenders);
- high risk offenders (offenders with three of more offences, classified as "problem" or "severe" risk on multiple risk indicators).

The average goal score of treatment (1-5 scale with low score indicating treatment with abstinence goals and high score indicating broad spectrum goals) differed significantly between the low risk and higher risk groups, and between both higher risk groups, indicating that treatment type and goal were confounded with offender risk severity. The finding that the moderate risk offenders seemed more responsive to treatment is thus only suggestive, as this group probably received more often the more effective combination modalities.

In a review on alcohol, drugs and traffic safety Lillsunde (1997) also mentions a classification of drink drivers with impact on rehabilitation: (a) drivers without alcohol problems who committed a DUI offence in an occasional circumstance; (b) drivers, usually also no alcoholics, with a general risky life style for

whom driving under the influence is just one of many behaviours deviating from the norm; and (c) the largest group, drivers with alcohol related problems or dependency. With relevance to rehabilitation, the first group is said to be easily changed without extensive treatment, the second group is harder to be influenced as these offenders may be reluctant to change lifestyle; and the last group requires the most intensive treatment.

And finally, Chang et al. (2001) used clustering analysis of the AUI (Horn et al., 1987) scales of 1.644 first-time DWI offenders to develop a typology of 6 clinically meaningful groups, ranging from the least clinical severity to the greatest. They examined their risks for re-arrests within 5 years and gave propositions for matched treatment:

- Cluster 1 (low-profile type) was characterized by low scores across all scales with mean scores all below the standardized means. It represented one half of the sample (50%, N=825) and indicated minimal involvement in alcohol use or abuse patterns. Individuals in this cluster had the least alcohol involvement with a mean score of 1.65 and the lowest 5-year recidivism rate with 22%, but this rate was still high. The authors suggest that this may be due to a defensive underreport of alcohol involvement.
- Cluster 2 (alcohol-preoccupation type) was characterized by high scores for obsessive, compulsive and sustained drinking and slightly elevated scale scores for problem awareness. Offenders in this cluster were older and less educated It represented 14% (N=236) of the sample, with a mean score for alcohol involvement of 2.41. The recidivism rate of this cluster population was 24%. The authors suggest detoxification and in-patient treatment for these offender types.
- Cluster 3 (enhanced type) can be described by scoring high on the scale that measures drinking to enhance functioning. Twenty-two percent (N=367) of the sample were identified to belong to this cluster, their mean alcohol involvement score was 5.00 and the recidivism rate was 29%. Offenders in this cluster were more often single, more likely to be employed. The social value of drinking is high and they never experienced negative consequences. For this group the authors suggest harm reduction strategy training.
- Cluster 4 (enhanced-disrupt type) was typified by high scores on the scale that measures drinking to enhance functioning and high scores on the scales that measure negative drinking consequences. The scores suggest drinking for sociability, symptomatic drinking and symptoms of alcohol abuse. Nine percent (9%, N=144) of the sample was categorized in here. This cluster's mean alcohol involvement score was 8.85. The evaluation of the re-arrest rates showed that this cluster had the highest recidivism rate with 40%. Individuals in this cluster appeared more likely to be younger and single, more likely to be employed. Treatment goal for this cluster should be abstinence achieved by means of cognitive-behavioural or motivational enhancement treatment and relapse prevention. A close further monitoring with direct negative consequences for continued drinking and driving is advised.
- Cluster 5 (anxious disrupt type) could be distinguished by high scale scores on the scales that measure negative drinking consequences. Further the score on the scales for anxious concern and awareness were also elevated compared with other cluster groupings, indicating a readiness for treatment. Just a slight small number of 3% (N=55) of the offenders belonged in this cluster. Their mean alcohol involvement score was with 17.65 quiet high and indicates dependence; the recidivism rate was 29%. A longer-term treatment focussing on abstinence is suggested. Relapse could be prevented by drugs.
- Cluster 6 (high profile type) was conspicuous because of high scores across all drinking related problems. All scale scores were significantly higher than the overall mean scores for the entire population. This cluster represented only a small portion of the DUI offenders (1%, N=17). Their mean alcohol involvement score was highly elevated with 30.12 and the

recidivism rate for this group was 25% whereas 18% had two or more DUI offences. An intensive, prolonged treatment with a strong emphasis on relapse prevention is proposed.

1.1.6 Environmental factors

Also situational and environmental factors and the broad society context are mentioned in literature as determinants of DUI/DUID.

Ferguson et al. (1999) indicate the importance of aspects like living environment (rural versus urban areas, related to e.g. opportunities for public transport, need for car …), level and costs of enforcement (e.g. perceived risk for being caught seems to be essentially low with regard to DUID (see also 1.1.4.2)), travel distances, societal policies and social-society norms on DUI.
Van Vlierden & Lammar (2007) state, that for some substance users, the decision to drive under influence is just governed by a pure need for transport. They say that being in a situation where driving is necessary in combination with drug use in the same situation is often a main cause of impaired driving, e.g. many heavy users or dependents drive under the influence for situational reasons (in order to buy their drugs). They state that this also counts for social or leisure time users whose use often takes place at social places from which they have to depart afterwards. It is nevertheless remarked that being in a situational position that leads to impaired driving is often the (in) conscious choice of the driver. Aberg (1993) also found that past decision to drink drive in a sample of male drivers was related to a need for transport. A study by Turrisi & Jaccard (1992) also stresses situational determinants: they found a relation between drink driving tendency and perceived behaviour alternatives. Similarly, a population-representative survey of 1.300 South Australian drivers by Brown (1995) revealed the importance of transportation patterns in reported drinking and driving. The number of times drinking at a location further away than walking distance from home, as well as number of individual drinks away from home controlled for alcohol consumption variables, were associated with admitted drinking and driving. The study by Baum (1999) even showed that rates of DUI are in relation to characteristics of geographic units. Areas with low use of and access to public transport for instance showed higher rates of DUI offences. Other risk increasing characteristics of areas were related to socio-economic aspects. And finally, society norms also influence DUI/DUID, e.g. societies where a belief that DUI/DUID is usual and inevitable is widely accepted versus societies with a large public rejection of DUI/DUID.

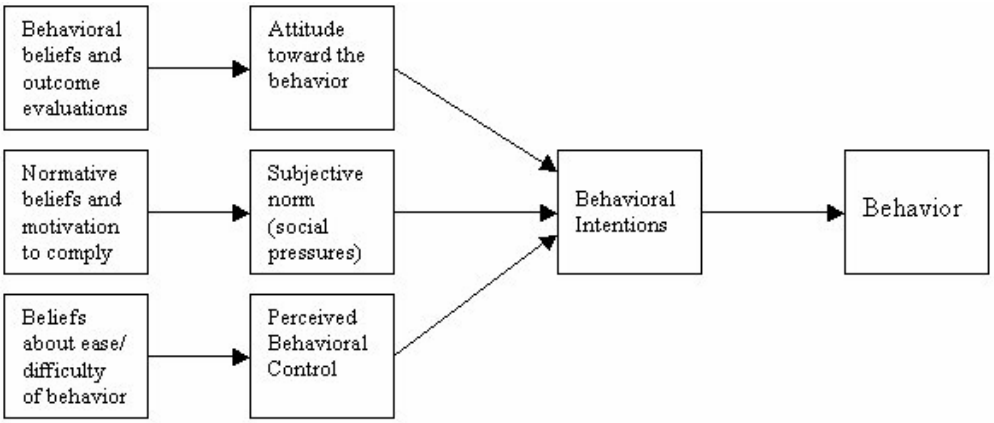
1.1.7 Decision making theories and models

As listings of personal characteristics or situational factors related to impaired driving do not fully explain DUI/DUID, this subchapter will focus on the most integrative approach to explain the dynamics of the behaviour. Vingilis (2000) indicated that there are only few well-developed theories of drinking and driving. Many theoretical models based on diverse professional disciplines (criminology, psychology, sociology) provide explanations of the phenomenon of abnormal behaviour though. Such models can provide input towards identifying and understanding the underlying mechanisms and processes of DUI/DUID.

Some researchers have developed and used explanatory theories of impaired driving. An extensive literature review by Donovan et al. (1983) led to the development of a hypothetical cognitive-behavioural model of high risk driving, including a consistent interaction between drinking behaviour (heavy and frequent use), certain personality traits (high levels of hostility and aggressiveness), acute emotional stress, driving and drinking related attitudes/expectations and the availability of appropriate coping skills (deficient social skills to express anger, for stress or frustration or depression management).

One of the theoretical frameworks most often cited in literature on human action is the Theory of Planned Behaviour (TPB) (Ajzen, 1985). In short the TPB (Ajzen, 1985) states that behavioural intention, and thus behaviour, can be predicted through a combination of attitude to the behaviour, subjective norm and perceived behavioural control. This theory goes originally back on the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975; Ajzen & Fishbein, 1980), which was extended by adding perceived behavioural control. The "attitude towards the behaviour" is determined by beliefs about the consequences of the behaviour (behavioural beliefs), weighed by the evaluations of these outcomes (outcome evaluations). The "subjective norm" is determined by the perception of whether significant others think that the behaviour should be performed (normative beliefs), weighed by the motivation to comply with the wishes of these significant others (motivation to comply). "Perceived behavioural control" is determined by the perception of one's ability to perform a given behaviour (control beliefs), weighted by the perceived power of the control factor that impedes or facilitates performance. This factor is related to the actual behavioural control or the extent to which one has the skills, resources, and other prerequisites to actually perform a behaviour. The figure below gives an overview of the "Theory of Planned Behaviour" (Ajzen, 1985):

Figure 3: Theory of Planned Behaviour (Ajzen, 1985)



The usefulness of the TRA (Ajzen & Fishbein, 1980) to explain self-reported DUI was shown in a study of Beck (1981). This study used the "Fishbein"-model and the Health Belief Model (Becker, 1974) to investigate the relationship between certain attitude-belief factors and frequency of DUI in a college population. Whereas the "Fishbein"-model states that behaviour is a function of behavioural intention, which in turn is predicted by attitudes towards that behaviour and subjective norms, the Health Belief Model states that behaviour is a direct function of three main beliefs: seriousness of the consequences, susceptibility to these consequences if no action is taken to reduce them, and the effectiveness of a course of actions to reduce or avoid these consequences. The results showed that decisions (or intentions) to drink drive were very clearly related to one's attitudes towards the behaviour. Besides that, the beliefs about effectiveness to control the negative consequences from drinking and driving (i.e. belief of still being a safe driver after having drunk) also seem to have direct effect on the behavioural intention. The believed seriousness of the possible drink driving consequences was more related to the attitudes than to direct behavioural intention. The author suggested that certain attitude changing strategies, combined with convincing young drivers about their actual impairment while driving under the influence of alcohol, can help reducing the risk for DUI behaviour. The TRA was also used as a starting point in studies by Aberg (1993). Aberg (1993) measured self-reported drink driving intentions in a large sample of Swedish male drivers (N=1.085) and found evidence for a causal structural model in which attitude had the strongest influence on behaviour intention, while the social norms actually preceded both attitude and the evaluation of

sanctions which deviates from the original model. He argued that this may be due to the very low probability of detection/accident so that only a few drivers will ever learn from their own experience, and therefore most drivers learn from others via e.g. social norms. In his derived model, drinking habits had an influence on all other variables (i.e. social norms, evaluation of sanctions, attitude and behaviour-intention), based on which he suggested that the factors determining one's consumption may be the same as the ones influencing drink driving. With regard to this, results from a study of Glitsch et al. (2000) provided input to suggest that both alcohol consumption and the combining of drinking and driving are influenced by behavioural self-control. They found drinking habits (conspicuous, abusive drinking behaviour) and behavioural self-control (loss of control, i.e. risk takers, thrill seekers) to be the factors of relevance in predicting drink driving, but the impact of lack of self-control proved to be much bigger. Furthermore, co-morbidities in different fields of social and health life were found, indicating that DUI is only one symptom of different possible underlying problems (low self-control, personality disorders, social disintegration, risky traffic behaviour in general). Based on this, the authors recommend extensive diagnostics after a DUI offence in order to match offenders to the most appropriate rehabilitation, and that rehabilitation focusing on drink driving and alcohol consumption may be better embedded in a more general training of effective behavioural skills and coping styles.

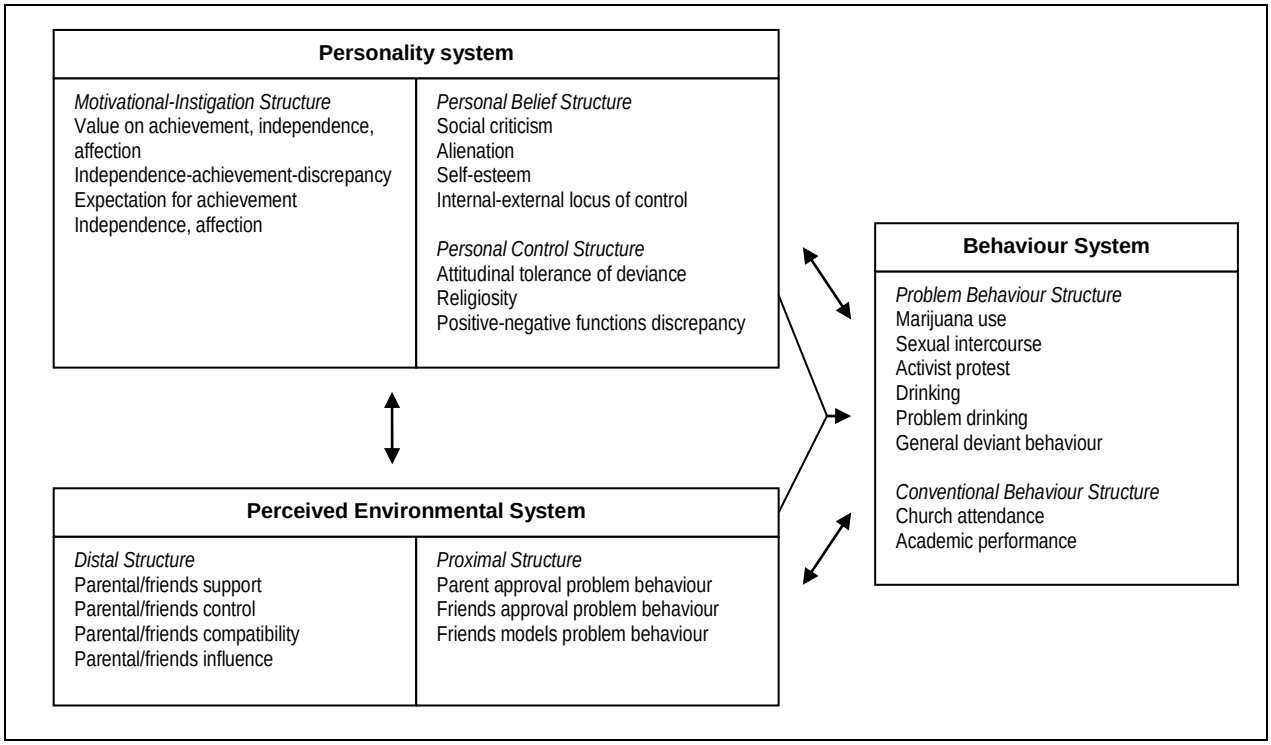
Bornewasser & Glitsch (2000) furthermore investigated cognitions and motives underlying the decision making in DUI in 185 DUI offenders compared to 145 drivers never arrested for DUI. Oriented towards the TPB (Ajzen, 1985) the authors conceptualized that (intention to) DUI is determined by an integration of "beliefs about valence and expectancies of outcomes" (e.g. "short distance, I'll arrive without problems"), "perceived social norms" (e.g. "my family will be angry when I crash") and "situational conditions" (e.g. "my friend asked me"). In their concept, these factors are affected by a "fundamental readiness to drink drive" (general attitude towards drink driving) as a primary determinant and "experiences with drink driving" (habitual experience). Intentions are predicted to be the result of the cognitively "reasoning and balancing" of the differently weighted (impelling and inhibiting) factors. Furthermore, the authors indicate possible effects of "alcohol myopia" (Steele & Josephs, 1990, according to: Bornewasser & Glitsch, 2000): alcohol intoxication limits the amount of information that gets attention, thus only salient cues are processed (no DUI if inhibiting cues are more pronounced and vice versa with impelling cues), and it leads to biases in one's self-evaluation and risk assessment. Their results confirmed that the DUI decision is a result of a mix of facilitating/inhibiting cognitions, with social disapproval of reference groups and overestimation of own driving capacities as most important inhibiting, respectively impelling factors. While the non-detected persons reported more inhibiting beliefs, the detected DUI offenders essentially showed a lack of inhibiting beliefs; they were less oriented to social norms, more convinced by positive previous experiences (both salient impelling cues), overestimated their driving capacities and underestimated the risk for detection/accident. The authors suggest that habitual low moral attachment together with low self-control and salient impelling cues increase the DUI probability, which is even more stressed in scope of certain personality disorders like sensation seeking. Proposals towards rehabilitation are a need to focus on social disapproval and individual moral attachment, and on strengthening of inhibitory cues.
Dünkel & Glitsch (2000) assessed furthermore the influence of alcohol consumption, situational aspects and general deterrence on the DUI decision making. Habitual drinking persons showed higher vulnerability to situational incentives, like risk of apprehension/accident, social disapproval or restricted transport alternatives, to DUI than low consumers. The perceived probability to get caught only had a small impact on future DUI and severity of the punishment did not play a role. Moral attachment to the norm not to DUI on the one hand and social disapproval (especially by friends, peers) on the other hand seemed to very strongly influence the decision on drink driving; the vast majority of the sample considered social factors not to DUI and penal consequences only to a lesser extent.

Parker et al. (2004) used the TPB to measure road safety related attitudes and intentions of a large stratified sample of drivers (N=881). They found a relation of increased intentions towards four driving violations (under which drink driving) with decreased perceived behavioural control, which was suggested to be related to an unconsciously underestimation of control to protect self- or social esteem. Subjective norm was very strongly and thus more related to behavioural intention than attitude. Furthermore, essentially younger drivers, compared to older, appeared to be less concerned or aware of negative outcomes, to see their peers as less likely to put pressure to avoid violations and to perceive less control to resist committing violations. In 1995 Parker et al. extended the TPB with a construct of "personal norm" which reflects one's internalised moral norm and anticipated regret.

The "Problem-Behaviour Theory" (PBT) introduced by Jessor & Jessor (1977) has also been used to explain impaired driving. The theory defines problem behaviour as behaviour that departs from the norms of the larger society. The original theoretical framework includes three major systems of explanatory psycho-social variables: the personality system, the perceived environment system and the behaviour system. Each system is composed of variables that serve either as instigations for engaging in problem behaviour or controls against involvement in problem behaviour. The balance between instigations and controls determines the degree of "proneness" for problem behaviour within each system, and the balance across the three systems determines the overall level of problem behaviour proneness or psychosocial unconventionality. A study of Jessor (1987) revealed that self-reported deliberate risky driving, taking driving under the influence of alcohol and marijuana into account, was systematically associated with psychosocial susceptibility towards problem behaviour. The risky driving measures correlated very strongly with other problem behaviour variables, which led to the suggestion that risky driving is rather part of a more risky general lifestyle. The theoretical framework proved to be slightly more useful in explaining male adolescents' risky driving than female. Significant risk factors in the personality system were: higher attitudinal tolerance towards deviance and higher independence relative to achievement. In de perceived environment system, risk factors were: less parent-friends compatibility, fewer parental models for healthy behaviour, greater influence of friends relative to parents, and more friends' models for problem behaviour. In the behaviour system, risky driving was significantly associated with a higher frequency of: deviant behaviour, of times drunk or marijuana used in the past 6 months, of negative consequences of drinking, of involvement in smoking, and of sexual intercourse experiences.

The following figure presents the model of the Problem-Behaviour Theory (Jessor, 1987, p. 3)

Figure 4: Problem-Behavior Theory model (Jessor, 1987, p. 3)



In 1991, Jessor introduced a conceptual framework for understanding risk behaviour in adolescents, including problem behaviour like drink driving. He identified "risk" and "protective" factors in five interrelated domains: (1) biology/genetics (e.g. family history of alcoholism vs. high intelligence), (2) social environment (e.g. poverty vs. quality schools), (3) perceived environment (e.g. models for deviant behaviour vs. high controls for deviant behaviour), (4) personality (low self-esteem vs. value on achievement) and (5) (other) behaviour (problem drinking vs. involvement in school).

Klepp et al. (1991) confirmed that the PBT is useful as theoretical framework to identify factors predictive of drink driving in their prospective study on self-reported drink driving among adolescents (N=1.482). Specific personality, perceived environment, behavioural and demographic factors accounted for about 50%, respectively 40% of the reported (baseline), and respectively follow-up (5 months after baseline) variance in drink driving. Eighty-seven percent (87%) of the students with the highest drink driving psycho-social risk score at baseline (calculated from regression coefficients of the independent personality, perceived environment and behavioural variables) versus 3% with the lowest risk score reported drink driving at follow-up. Their results indicated that drink driving is part of a larger syndrome of drink driving related behaviours (driving under the influence of marijuana and riding with a drinking driver) as well as other problem behaviours (alcohol, drugs use).

Some studies found that different factors play a major role in the decision making to DUI versus DUID. Drink drivers' behaviour seemed to be more depending on exterior factors like group pressure and enforcement, while personality aspects were more related to DUID (Löbmann & Krüger, 2000). And in the study of Davey et al. (2005) the predictive attitudes for drink drivers were also related to law/detection ("ok, if you don't get caught") and peer influence ("everybody drink drives sometimes"), while attitudes concerning peer influence ("friends say it is ok") and harm risk ("it is ok if I'm not too 'high'") were most predictive for drug driving. These authors suggested that measures should address different foci as a basis of the type of offender: e.g. for drug drivers the focus should lie on the illegal and harmful aspects.

1.1.8 Motivation for change

As motivation for change is an important determinant of effectiveness of rehabilitation, this subchapter reviews literature on DUI/DUID offenders incorporating the Transtheoretical Model of Change (TTM).

The TTM, developed by Prochaska & DiClemente in 1983, describes the underlying cognitive, affective and behavioural processes of intentional behaviour change and has been approved in the field of diagnostic and treatment of alcohol problems. It is a stage model of readiness to change, which modifies the successful (or even unsuccessful) coping process from substance abuse or addiction to healthier target behaviour. It assumes that an intentional change of a problematic behaviour proceeds via five stages:

1. Precontemplation: Individuals at this stage show no intention to change their behaviour in the foreseeable future, because they are unaware of their problems or deny then.
2. Contemplation: Individuals at this stage become aware that a problem exists which makes them seriously thinking about behavioural changes without making a commitment to take action yet.
3. Preparation: This is the stage that combines intention and behavioural criteria. Individuals at this stage are intending to take action within the next month. In some cases the individual has already made efforts to change but without reaching the target behaviour successfully.
4. Action: Individuals at this stage modify their behaviour, experiences, or environment in order to reach the target behaviour. Action involves the most overt behavioural changes and requires considerable commitment of time and energy as the initial intention is transformed actively into action.
5. Maintenance: Persons at this stage have to work steadily to hold up the achieved change and prevent relapse to an earlier stage. They must cope with the new life-style and situation, but with time running on they become less tempted and more confident. This stage may last long, in some cases even lifelong.

The stages display the temporal dimension of the change. An individual runs sequentially through the stages; relapse from a higher stage to a lower one may occur at any time.

Four publications were identified which used this model to categorize different DUI/DUID offenders and assign them to the different stages of the TTM (e.g. Ferguson et al., 1998; Wells-Parker, 1998; Wieczorek et al., 1997; Klipp et al., 2005). Furthermore, two studies (Polacsek et al., 2001; Wells-Parker et al., 2000) focussed on the TTM within their recidivism research (see chapter 1.2.5). Most of the studies were actually designed to evaluate different rehabilitation/intervention programmes.

Some results of the studies regarding the distribution of DUI/DUID offenders to the different stages of changes are contradictive.

Wieczorek et al. (1997) interviewed 656 DWI offenders recruited from several sources. The results revealed that 62% of the offenders were in the precontemplation stage, 5% in the contemplation stage while the action and maintenance stages counted for 17% and 15% of the DWI. Variables that significantly varied across the different stages of change related groups were: alcohol dependence severity (lowest in the precontemplation stage), attitudes about drink driving, locus of control, self-esteem, treatment history, psychiatric problems and treatment expectations in terms of costs and benefits.

In a study conducted by Klipp et al. (2005) (N=361) DUI offenders were interviewed in order to allocate the offenders to the different stages of change and to identify the connection between the stages of

change and utilisation of a free of charge counselling offer. The authors came to similar results as Wieczorek et al. (1997): most of the DUI offenders (73.7%) showed a lack of problem awareness without any motivation to change soon after the offence (precontemplators). Only 6.6% had an adequate awareness of the problem and thus were identified as contemplators. The 19.7% remaining had already initiated first steps to take action, therefore belonging to the action stage. In addition to that they revealed that increased problem awareness goes with an increased probability of participation in a rehabilitative programme (the higher the stage, the higher the probability of participation), but it is not essential for participation. Early information and the communication of possible incentives lead to a significant increase in participation rates as well.

In the study of Ferguson et al. (1998) about the same amount of DUI offenders were in the precontemplative stage of change as in the action stage, but within the group unaware of a problem, more scored higher on AUDIT for alcohol use problems. About 53% of the alcohol dependent offenders were in the precontemplation stage, as compared to 13.3% of the non harmful users and 32.7% of the harmful users. Most offenders would rather change driving behaviour than drinking behaviour to avoid drink driving.

Wells-Parker et al. (1998) examined self-efficacy and motivation to change with regard to drinking and drinking and driving in a sample of 210 DUI offenders in a court-based intervention program. Self-administered questionnaire results indicated that personal efficacy to control drinking is closely related to efficacy to avoid drinking and driving. Most offenders were in a stage of action for both drinking and drinking and driving. Precontemplation was the least common stage, with slightly more drinking precontemplators than drinking and driving ones. Correspondent with the results of Wieczorek et al. (1997) precontemplators had lower levels of alcohol problems; contemplators had higher levels. Social drinkers who were unluckily caught once for a DUI offence, form part of this group, so these did not state to have a problem with drinking, but were planning actions for avoiding drink driving in the future. Wells-Parker et al. (1998) suggest that matching offenders to the most effective intervention and predicting future drink driving offences not only requires examination of the single stage of change but also of the stages' patterns (multiple or pure elevations on the drinking scale or rather on the drink-driving scale, (in)consistent patterns).

In conclusion it can be said that taking problem awareness and motivational aspects into account is important as offenders in different stages of change may experience rehabilitation differently and may require different rehabilitation approaches in order to be effective. When linking motivational aspects to rehabilitation strategies, Klipp (2008) suggests that for unmotivated, unaware or denying offenders motivational enhancement approaches or even just brief interventions may be an initial step in the direction of behavioural changes, while for already motivated offenders who show problem in shaping their behaviour, cognitive, behavioural or skill-related approaches may be more appropriate .

1.2 General Characteristics of DUI/DUID recidivists

This chapter contains information from available literature dealing with characteristics of recidivists in contrast to non-recidivists and variables that may predict recidivism. After the identification of 103 publications mainly dealing with the current question of research, as an initial step 12 publications were randomly selected in order to receive a first impression of the topic and get a general idea of possible characteristics. An eye-catching issue of the 12 reviewed articles dealing with the subject was that the studies' findings reveal inconsistencies regarding several aspects. More details on the methodology can be found in the annex.

Drinking habits or problem drinking were often identified as strong correlates of DUI recidivism (Wieczorek et al., 1990; Veneziano & Veneziano, 1992; Gould & Gould, 1992), but a lot of studies did

not find a significant connection between consumption habits and the risk of subsequent DUI offences. For example, in a recent study conducted by Cavaiola et al. (2007) no differences were found between first and repeat offenders regarding either the BAC or the severity of an alcohol problem, measured directly by self-reported alcoholism symptoms or indirectly by MAC-R. The results of studies on drugged drivers appear to be quite similar: on the one hand Begg et al. (2003) found dependence on cannabis at the age of 21 for male as well as female subjects as one of the most important predictors of persistent DUID, on the other hand Soderstrom et al. (2001) did not find a connection between psychoactive use disorder diagnose and impaired driving convictions.

Personality and psychological characteristics often fail to distinguish first from multiple offenders (e.g. Cherpitel & Tam, 2000), too, but some studies indicated that multiple offenders were significantly higher in hostility, sensation seeking, psychopathic deviance, mania, and depression than first offenders (McMillen et al., 1992). Diversity persists also regarding the tendencies to respond socially desirable: Schell et al. (2006) found that high scores on social desirability scale were associated with less self-reported frequent drinking which stands in contrast to findings from Greenberg et al. (2005) who found that high social desirability scores are associated with a greater likelihood of self-reported DUI.
In order to obtain more detailed and less confusing information on the question of research, i.e. characteristics of recidivists and predictors of recidivism, it was decided to review all abstracts again and focus on recent studies (since 1997) with a follow-up design. In this case a follow-up study was defined by meeting the criteria of pre- and post-testing, including at least one variable as baseline data (e.g. age, BAC, etc.) for both groups (i.e. those who recidivated and those who did not recidivate) and not only the fact of at least one prior offence. A further criterion was the measurement of recidivism by hard fact data, i.e. driving records and not only by self-report data on DUI or DUID behaviour. The second review of all abstracts dealing with the topic “characteristics of recidivists” revealed 28 publications meeting the defined criteria for a follow-up design. After the reading of all 28 publications, five more were excluded; three due to missing details about recidivism predictors and two because they examined the same sample and same variables as studies which remained for the review. The results of this second literature analysis of the remaining 23 publications reflect mainly the same picture as the first summary, but are summed up according to the examined variables in detail.

1.2.1 Socio-demographic variables and their impact on recidivism

1.2.1.1 Gender differences in recidivism rates

The results of studies which analysed gender differences in recidivism rates are more or less consistent. Only one publication (Cavaiola et al., 2007) resulted in the conclusion of no gender specific recidivism risk. All other studies go along with the fact that males have a higher recidivism risk than females do. Moloney & Palaia (1997) found that for every one female offender there were 5.62 males and concluded that males obviously dominate recidivism, whereas females who have been caught, do not generally re-offend. This is supported by a Finish study by Riala et al. (2003) who observed that 18% of male DUI offenders were recidivists, but none of the females was, as well as by German researchers (Jehle & Kirchner, 2002; Kaue-Prinzig, 1998; Jacobshagen, 1998). Also Skurtveit et al. (1997) and McCartt et al. (2004) state that female drivers have lower re-arrest rates than males. Christophersen et al. (2002) detected the frequency of re-arrest for males to be at 61%, compared to only 32% for females and Marowitz (1998) examined that the odds for recidivism increases 56% for males over females. Tashima (2006) noted that males show much higher cumulative proportions re-offending than females. After 10 years, 27% of males have re-offended as compared to 19% of females. Chang et al. (2001) located the odds ratios for being re-arrested at 1.95 for males versus 1 for females, in contrast to Kunitz et al. (2002) who found that the hazard ratio for female gender is

0.88, but the difference to male gender failed to be statistically significant. C'de Baca et al. (2001b) who used a multiple risk factor approach for predicting recidivism also found that non-recidivists are more likely to be female. When computing their multivariate models for males and females differently, only the demographic variables (e.g. age, marital status, cultural background) contributed significantly to the prediction of recidivism, whereas neither the measured five personality variables nor a counsellor's recidivism risk estimation were eligible predictors.

Lapham et al. (1997) also discovered a higher recidivism risk for males than for females. As they noticed that women are less likely to be arrested for DUI/DUID and re-arrest rates are lower than those of males, but that the data on specific gender characteristics in risk factors for recidivism is rare, they analysed their data concerning specific gender differences related to re-arrest (Lapham et al., 2000b). They measured various demographic variables, used scores of standardised assessments and data regarding family and personal history in a 5-year follow-up design. The sample consisted of 628 female and 659 male first offenders convicted between 1989 and 1992, which were sentenced as first offenders, but may have been re-offenders (cases plead down to first offence or prior arrests without convictions). The results revealed that females and males did not differ regarding BAC, cultural background, education level, reported lifetime use of illegal drugs and physical or sexual abuse before age 18. Twice as many males as females had previous DUI/DUID arrests. Women reported more often a parental problem with alcohol or the partner having an alcohol problem and a history of hitting or throwing things at their partner, but they were less likely to have elevated MAST and MAC scores. A higher proportion of men were married. All in all females had just a slightly higher mean number of risk factors. The overall 5-years re-arrest rate was 26%, but the female recidivism rate was 20% compared to 33% of the males. The difference was proven to be statistically significant. To obtain more information about the gender differences an interaction effect analysis was conducted on the data. The only significant interaction was between age and gender, whereas the age group was not associated with DUI/DUID recidivism risk for females but strongly associated for males. The additional variables identified to be associated with recidivism were cultural background, educational group, marital status, prior DUI/DUID, BAC, parent alcohol problem, partner alcohol problem, lifetime use of illegal drugs, hitting/throwing things at partner, high MAST and MAC scores. Regarding the number of risk factors, females with 5 or more positive risk factors had a recidivism rate of 37% and males had a rate of 55%. All in all they concluded that one in four is re-arrested in five years, whereas one in five females, but one in three males. The gender groups did not differ regarding their BACs. Younger age did not predict female, but male recidivism. The most distinguishing factor is that young males are at high risk. The results show that females do not have fewer risk factors than males, but female DUI/DUID offenders differed from males regarding several factors: they are less likely to be married, to have prior arrests or to be referred to treatment. They scored lower on screening instruments for alcohol abuse; conversely a larger amount of females reported parental or partner's problems with alcohol and hitting and throwing things at partner. The authors see the latter as an indicator for aggressive behaviour which may be associated with recidivism.

1.2.1.2 Impact of age on the risk to re-offend

Young age was often identified as a risk factor for recidivism. For example, Harmon & Woods (2005) found younger convicted DUI/DUID offenders to have the highest re-arrest rates. Tashima (2006) concluded within her report that re-offence rates are inversely related to age. The recidivism rates are highest for the youngest group and lowest for the oldest group. After 10 years, the youngest two groups re-offended by 29% and 27% while 21% of the middle age group and 12% of the oldest group recidivated. Kunitz et al. (2002) analysed the recidivism risk for each additional year of age to be reduced by a factor of 0.98. C'de Baca et al. (2001) found in their 4-year follow-up study that repeat offenders were significantly younger than non-repeat offenders. In their multivariate analysis of

different variables they identified that young age, which was tested on its univariate contribution, was reliably associated with recidivism. In their further analysis they set the cut-off point for an above averaged recidivism risk at the age below 29 years. The data of Chang et al. (2001) support this thesis as they found the highest risk for young offenders aged 16-25 years. They were more likely to be re-arrested with an odds ratio of 1 versus the age group of 26-40 years (odds ratio: 0.77) and the 40+ aged group (odds ratio: 0.50). Thus they mentioned young age as a clearly identified risk factor. McCartt et al. (2004) identified a higher recidivism risk for drivers below the age of 24 years compared to older drivers. The same conclusion was drawn by Schützenhöfer & Krainz (1998) who revealed a recidivism rate for drivers aged between 18-24 years of 40.4%, compared to 30% for all other drivers. Similar tendencies are shown by the study of Kaue-Prinzing (1998). Jehle & Kirchner (2002) combined age with gender and identified young male DUI offenders as the group with the highest risk of recidivism. Lapham et al. (1997) also found that young males have higher re-offence rates than older males or females. In their further analysis (Lapham et al., 2000b) they noticed that younger age was not associated with recidivism risk of female drivers but strongly associated for males, meaning that young age did predict male, but not female recidivism.

Higher risks for younger males were also found in a study on DUID offenders which was conducted by Christophersen et al. (2002). Drivers aged below 36 years showed higher re-arrest rates (60%) than drivers aged older (44%). However, two studies (Skurtveit et al., 1998; Cavaiola et al., 2007) did not reveal any significant age difference between the groups of recidivists and non-recidivists.

1.2.1.3 Educational level as protective variable against recidivism

All studies that took the education level into account for calculating the recidivism risk found that a higher degree in education is associated with a lowered recidivism risk. Jacobshagen (1998) discovered education to be the best predictor for recidivism, whereas with a higher level of education the risk decreases. C'de Baca et al. (2001b) found less than 12 years education as a main risk factor in their multiple risk factor approach. Chang et al. (2001) revealed that more educated offenders (education =12 years and education >12 years) are less likely to be re-arrested than less educated ones (odds ratios: 0.69 vs. 1 and 0.48 vs. 1). Riala et al. (2003) found that two third of the recidivist male drunk drivers had remained at a basic educational level.

1.2.2 Consumption habits and recidivism risk

1.2.2.1 BAC at arrest and its predictive value

A lot of studies examined the association between BAC level at arrest and the recidivism risk. For example Kunitz et al. (2002) identified the BAC as a significant predictor of recidivism with a hazard ratio of 1.32 for a BAC increase of 0.1%. Chang et al. (2001) found an increased odds ratio of 1.49 for offenders with a BAC above 0.2%. Also C'de Baca et al. (2001b) discovered in a multivariate analysis of different variables, that a high BAC at arrest, which was tested on its univariate contribution, was reliably associated with recidivism. Skurtveit et al. (1998) came to a similar result regarding high BACs predicting high recidivism risk. In their prospective 9-year study of drivers selected in 1986 they discovered that the probability for recidivism was highest during the year of selection and the first following year, whereas the probability of re-arrests did not differ in high vs. low BAC level groups during these first years. Over a long-term period the re-arrest rates were higher for drivers from the high BAC interval group compared to the low level BAC group. The further data evaluation of the frequency and the mean numbers of re-arrests during a 3-year period after selection revealed a rate of 30% re-arrested drivers selected in 1986, but lower rates for those selected in 1991 (21%) and 1992 (19%). The reduction in the later years was most pronounced for lower BAC intervals: the lowest interval of 0.06%-0.09% had a rate of 28% re-arrests in 1986 and 12.5% in 1992 ($p < 0.001$) and the

recidivism rate of the middle interval of 0.13%-0.16% dropped from 31% in 1986 to 18% in 1992 (p< 0.01). The authors explain their results with the hypothesis that the chances of re-arrest are higher for drivers with very high BACs due to heavy drinking habits. These findings are supported by conclusions of Kaue-Prinzig (1998). She discovered that the averaged BACs increase with subsequent DUI offences and interprets high BACs as indicators for an existent alcohol tolerance. Results of a study by Moloney & Palaia (1997) indicated as well that repeat offenders progressively increase their BAC as they continue to offend.

Contradictory, Schützenhöfer & Krainz (1997) found neither a higher recidivism risk for high BAC offenders nor an increasing BAC value from the first to a second offence. Marowitz (1998) also noticed that BAC levels at arrest on two occasions occurring within 15 months of each other tend to be similar. Cavaiola et al. (2007) who did a 12-year follow-up study and observed no significant differences between recidivists and non-recidivists regarding the BAC at first DUI arrest. Thus they doubt the utility of the BAC for screening purposes on recidivism risk and recommend that the BAC should be interpreted cautiously or just in conjunction with other potential predictors of recidivism. Besides that, they did not identify any difference regarding the self-reported alcoholism symptoms (measured directly) or alcoholism potentially (measured indirectly) in their study. In addition to that Lapham et al. (1997) found no significant correlation between the BAC and the MAC score, resulting in the conclusion that the presence of alcohol-related problems is less important for recidivism prediction than personality traits, but it must be stated that within the combined model they used to predict recidivism, the BAC was at least one variable of four which added some value in the predictive model.

McCartt et al. (2004) even concluded from their data that recidivism rates for offenders with BAC>0.20% were generally about 1.5 percentage points lower than for those with BACs of 0.17% - 0.19%. Persons who refused the alcohol test and those with a BAC of 0.17%-0.19% were significantly more likely to recidivate, whereas they discovered a higher percentage of high BACs and test refusals among repeat offenders compared to first offenders. They explain these findings with enhanced sanctions applied for high BAC offenders. Also Marowitz (1998) found high recidivism rates for BAC test refusers, whereas his other data is somehow confounding. BAC test refusers were with 22.7% significantly more likely to recidivate than test-takers. Surprisingly, the maximum predicted rate of recidivism was for offenders at a BAC of 0.0%. This is explained by the author by a predominant use of other substances: 90% of offenders with a BAC of 0.0% were tested positively for other drugs and the use of drugs was found with decreasing BAC level. BAC level predicted increased recidivism when it was high or very low; the moderate BAC (0.09%) predicted a much lower re-arrest rate.

1.2.2.2 Drug use patterns and recidivism

Chistophersen and her working group (2002) aimed at finding out if the probability of becoming a recidivist was connected to specific characteristics of the drivers or the types of drugs detected. Their sample consisted of 1102 drugged drivers with a BAC below 0.15% selected in 1992 and they examined them for previous DUI or DUID incidents back to 1984. Furthermore they followed them prospectively until 1998. As a reference group they used a sample of 850 drunk drivers with a BAC between 0.16% and 0.19% selected in 1992 as well and also traced for the 15-years period (1984-1998). They discovered that 78% of the drugged drivers with previous arrests (during the period back to 1984) had a BAC above the legal limit the first time they were arrested. Other drugs detected on first arrest were THC (48%), diazepam (34%), amphetamine (17%), flunitrazepam (16%) and morphine (8%). The highest probability of re-arrest occurred during the first year (21%), and during the following three years. Three years after the selection, 475 of the drivers had reoccurred with a new incident, with drivers with multi-drug detection showing higher re-arrest rates than those with just one drug detected (62%, N=529 vs. 41%, N=100). The same counts for drivers with drugs combined with alcohol above the legal limit (0.05%); they had the same recidivism rate as the whole group of the multi-drug users (62%, N=173).

The re-arrest rate for drunken drivers was 28%, which is less than the half of the rate for drugged drivers. Of the DUI offenders which were traced for 15 years, a total of 40% were recorded as recidivists compared to 71% of the DUID offenders in the same observation period. This means that the recidivism rate for drugged drivers was twice as much as for drunk drivers.

1.2.2.3 Predictive value of screening devices for substance use

Screening devices for substance use patterns are often used to assess DUI/DUID offenders' abuse or dependence severity in order to calculate their recidivism risk and to refer them to an appropriate treatment or programme if necessary (for details see chapter 2). Different studies were conducted to examine the validity of specific instruments to predict offenders' recidivism risk. The following paragraphs are not giving any content-related details on the different instruments, because all information on them is covered by chapter 2 of this report. This sub-chapter is just focussing on studies which examine the use of screening instruments and their utility to predict recidivism.
Chang et al. (2001) designed a study in order to define typologies of DUI/DUID offenders using the AUI and to determine the predictive validity for recidivism of the AUI, whereas they just used the second-order scale, measuring drinking style, consequences of drinking and concerns and acknowledgement of drinking problems, and the third-order scale, indicating an individual's involvement with alcohol. Their sample consisted of only first offenders and recidivism was measured by 5-years re-arrest and conviction statistics for at least one subsequent event. Their analysis revealed six clusters of offenders with different recidivism risks (for details on cluster description see 1.1.5 DUI/DUID offender clusters):

- Cluster 1 (Low-Profile Type) representing one half of the sample (50%, N=825) with a recidivism rate of 22%.
- Cluster 2 (Alcohol-Preoccupation Type) representing 14% (N=236) with a recidivism rate of 24%.
- Cluster 3 (Enhanced Type) representing 22% (N=367) with a recidivism rate of 29%.
- Cluster 4 (Enhanced-Disrupt Type) representing 9% (N=144) with a recidivism rate of 40%.
- Cluster 5 (Anxious-Disrupt Type) representing 3% (N=55) with a recidivism rate of 29%.
- Cluster 6 (High-Profile Type) representing 1% (N=17) with a recidivism rate of 25%.

All differences in recidivism rates were statistically significant. The members of the more severe alcohol use related clusters (4, 5 & 6) were more likely to offend two or more times. The AUI clusters 3, 4 and 5 predicted recidivism better compared to cluster 1 (odds ratios: 1.48 vs. 1 and 2.40 vs. 1), but clusters 5 & 6 did not predict recidivism significantly which may be due to their small sample sizes. All in all the authors concluded that there is a statistically significant relationship between the degree of clinical severity and recidivism rates. Furthermore, the clusters were characterized by different socio-demographic profiles: the three most severe groups (cluster 4, 5 & 6) contained a higher proportion of Native Americans; older offenders were more likely to be of the cluster 2 or cluster 5 type; offenders in cluster 3 or 4 were more likely to be single; offenders of the cluster 2 type were less educated than those in the other clusters and offenders of the cluster 3 or 4 type were more likely to be employed. One of the most important risk factors for recidivism was to be a member of cluster 3 or 4.

C'de Baca et al. (2001b) applied the AUI within their multivariate risk factor approach as well. A forward stepwise logistic regression resulted in the 'receptive awareness' scale of the AUI as one of the remaining variables to predict recidivism, besides age, education, BAC, prior DUI/DUID offences. The raw score of 7 or higher on this scale was one of five variables of the most effective combination predicting recidivism.

Lapham et al. (1997) also found an increased recidivism risk for individuals with an elevated AUI score. All AUI scales were associated with recidivism and the overall score was even a better predictor than the MAST. The study aimed at assessing the effectiveness of different screening devices: AUI, MAST, MAC of the MMPI and STS in identifying first offenders that are at high risk for recidivism. The study sample consisted of 1.384 first offenders between 1989 and 1991 in an observing period from 1984 to 1994. They found an overall 4-year recidivism rate of 21% and discovered the MAC score of 23 or above as most significant single factor in determining recidivism risk. The best combination of four independent variables for predicting subsequent DUI were the MAC score, the AUI score, high BAC and gender/age status. Thus they classified clients according to MAC score (low vs. high) and then defined further subgroups by counting the number of additional risk factors (0=none, 1=one, 2+=two or more). This analysis resulted in six groups with statistically significant differences in recidivism curves. The authors concluded that the MAC's usefulness in predicting recidivism may be due to its ability to identify personality traits which are not only associated with substance abuse, but also predict a person's tendency towards risk behaviours including risky driving. As another favourable characteristic of the MAC they mention its indirect nature that makes it less vulnerable to manipulations. The MAST was a useful predictor as well with a cut-off point preferably at 7 to increase its specificity without scarifying much sensitivity. Further, the researchers found neither the STS nor the MMPI-2 useful to predict recidivism. In a following analysis of the data, Lapham et al. (2000b) discovered the MAC as the only variable associated with recidivism after controlling for all other risk factors.

Nochajski et al. (1997a) conducted a study to identify DUI recidivists with screening instruments, too. They examined the utility of specific items within the RIASI for identifying potential recidivists. Their sample consisted of 3.585 DUI offenders, mostly first time offenders (90%). They chose 8 to 28 months as the follow-up period. Within this period 5.1% was convicted of a subsequent DUI offence. The further analysis identified 12 items of the RIASI that showed a significant interaction with DUI recidivism, an additional 3 showed marginal associations. In addition to that the authors stated that not all recidivists met the requirements for an alcohol or drug diagnosis. All in all they concluded that it is possible to identify potential recidivists using a combination of characteristics that are directly or indirectly associated with alcohol and/or drug problems. Within the RIASI they found a subset of items that appears to be more effective at identifying potential recidivists than the full RIASI or a more complex system using BAC, offender status and direct alcohol related measures. The items they identified suggest that drink driving behaviour may be part of a general deviance construct and not necessarily a specific function of problem drinking or drug use.

A very special question of research was followed by Anderson et al. (2000). They designed a study to discover the differential validity of the Mortimer-Filkins Questionnaire (MFQ) in predicting DUI recidivism with respect to ethnicity. The MFQ is a self-report questionnaire and one part of the Mortimer-Filkins Test (MF). The other component of the MF is a structured interview (MFI). The MFQ questions cover marital and family problems, recent stress, employment and finances, depression, nervousness, drinking, feelings, and ability to cope. Scores place a respondent into one of three risk categories: social drinker, presumptive problem drinker or problem drinker. The questionnaire does not contain a correction or assessment for truthfulness. The study sample consisted of 4.633 DUI offenders selected in 1992 and 1993, whereof 71% were Caucasian, and 28% were African-American. The tracking periods were fixed at 12-, 24-, 36- and 48-months. The authors found out that the MFQ score is a statistically significant predictor of 48-month recidivism for both groups even after controlling for confounding variables, but with different odds for the two groups. One standard deviation increase in the MFQ score increased the odds of recidivism by a factor of 1.453 for the Caucasians and by a factor of 1.222 for African Americans. Further the MFQ score was a significant predictor for all tracking

periods among the Caucasians, but only a slightly stronger predictor of long-term than short-term recidivism among African Americans. The overall analysis revealed that the MFQ score is a significantly less effective predictor of DUI recidivism for African-Americans than for Caucasians

1.2.3 Driving history as a predictor of recidivism

Data on the value of the driving history for the estimation of an increased recidivism risk are convincing. All studies which took prior offence records into account came to the same result. Cavaiola et al. (2007) found differences between recidivists and non-recidivists regarding their driving records prior to and after the first DUI/DUID conviction, whereas at this point it must be emphasized again, that not every DUI/DUID arrest results in a conviction and thus there may be prior records without convictions. Repeat offenders were more likely to have had their licence revoked prior to and after the first DUI/DUID conviction for reasons unrelated to DUI/DUID, i.e. repeat offenders were more likely to have been convicted for reckless and careless driving and to have at least one accident. Hence the authors conclude that driving history is a variable that most strongly differentiated between first and multiple offenders and that more attention should be drawn to the offender's prior record, especially with respect to prior licence suspensions and reckless driving offences. Jacobshagen & Utzelmann (1997) also discovered that DUI offenders with at least two other traffic offences in their record have the highest recidivism risk.

C'de Baca et al. (2001) analyzed the influence of prior records within their 4-year follow-up study as well. In their multivariate analysis of different variables they identified previous DUI/DUID incidents as reliably associated with recidivism. Also Lapham et al. (2000b) found the occurrence of previous DUI/DUID incidents as a variable that was strongly associated with recidivism. The data evaluation done by Cherpitel & Bond (2003) showed that those convicted for DUI in the last year were over three times more likely to recidivate than those who were not convicted for a previous DUI offence (odds ratio: 3.45). Kunitz et al. (2002) calculated the hazard ratio of the number of prior arrests at 1.7.

Also Christophersen et al. (2002) found within their study on drugged drivers that re-arrest rates are higher for those with previous records (73%, N=396 vs. 42%, N=233). Fifty-seven percent (57%, N=629) of the drugged drivers reappeared in the data system twice or more between 1992-1998 due to arrests for DUI, DUID or DUI+DUID. These recidivists accounted for 2.385 re-arrests, averaged to a mean of 4 re-arrests per driver during the 7 years. They calculated the highest odds ratio for the factor on previous DUI or DUID and consider this as one of the most important risk factors for recidivism. Skurtveit et al. (1998) also discovered that the number of previous arrests was significantly lower for those not re-arrested than those re-arrested. The results are additionally supported by a study conducted by Wells-Parker et al. (2000). In a stepwise discriminant function analysis with recidivism as dependent variable, including prior DUI offences and various other variables, they found that besides one other variable, only prior offences entered the equation and thus can be regarded as one of the best predictors of recidivism.

Marowitz (1998) wanted to determine if BAC at arrest could, along with other driving history and demographic factors, contribute significantly to the prediction of DUI recidivism. His analysis resulted in the conclusion that the rate of recidivism is often predicted to be greater for a lower BAC level with many previous 2-year total convictions than for higher BAC levels with few total previous 2-year convictions. Thus the prior 2-year overall convictions can increase predicted recidivism as much as large as the BAC.

1.2.4 Personality characteristics connected to recidivism

Cavaiola et al. (2007) applied the MMPI-2 within their 12-years follow-up study of first offenders with an interesting outcome. They found that the ones who re-offended had significant (p=0.036) higher scores on the L scale of the MMPI, which indicates a tendency to present themselves in a favourable manner ("fake good"). Further, the data approached significance (p=0.058) regarding the scores on the K scale, showing higher scores for re-offenders. High scores on this scale indicate defensiveness on the person's part. No group differences were found on the F scale, which measures of one's "fake bad" tendency. The authors conclude that potential recidivists and non-recidivists may try to present themselves differently during the screening process. The authors recommend when utilizing the MMPI-2, to pay special attention to those who respond falsely or lack insight into the own behaviour.

1.2.5 Stages of change and recidivism risk

Two studies (Polacsek et al., 2001; Wells-Parker et al., 2000) focussed on the stage of change model (Prochaska & DiClemente, 1983) within their recidivism research and came to contrasting results. Both studies were actually designed to evaluate different intervention programmes.

Polacsek et al. (2001) wanted to assess the effectiveness of participation in a Victim Impact Panel (VIP) additionally to DWI school in moving first offenders through the stages of change, compared to participation in a DWI school alone. Additionally they aimed at determining if the initial or ultimate stage is related to drink driving recidivism. Their sample contained 813 first DUI offenders randomly assigned to one of the two treatments (DWI school only vs. DWI school + VIP). The stages of change were measured by interview questions, whereas 335 offenders provided one-year follow-up data and 422 provided 2-year follow-up data. The records of the whole sample were checked 24 months after completion of the treatments. Evaluation of the interviews showed that participants in both groups reported less likely to engage in DUI behaviour and no differences between the groups were found in initial or final assessment or in progress through the stages. The overall recidivism rate was 17.9% with no statistically significant difference between the two groups. The initial and final stages of change scores were both significantly lower (indicating lower stage) for recidivists than for non-recidivists two years after intervention. Thus the authors conclude that an individual's stage of change proves to be a significant predictor of who would eventually become a recidivist, whereas a lower stage is connected to a higher risk.

Wells-Parker et al. (2000) evaluated a court-mandated DUI intervention programme. They suggested that those classified as „precontemplators" include those offenders who actually have relatively low levels of alcohol and driving problems and thus should have low recidivism rates. They measured the changes in motivational stage scores in drinking and drinking and driving and self-efficacy scores between the beginning and end of the 4-week intervention. Further they examined the relationship between recidivism, stage classification and different scores on stage of change and self-efficacy scales within a DUI sample of 472 first offenders. The questionnaires were administered in 1996 during the first and the last session of the programme. The driver records were checked one year later. The results showed that over three quarters of the sample were classified as 'actors' in each domain (drinking and drink driving) and time period (start/end of programme), with the lowest percentage of actors in the drinking domain at pre-test and the highest percentage of actors in the drink-driving domain at post-test. The least frequent classification was precontemplation. However, drinking contemplators showed significantly higher recidivism rates than did the drinking precontemplators or drinking actors at post-test follow-up. Between-group differences in the drinking driving domain were not significant, but the authors admit methodological restrictions due to undifferentiated and inconsistent answer patterns (e.g. combined elevated scores in precontemplation and action) which accounted for 14-16% of all patterns. The stepwise discriminant function analysis

with recidivism as dependent variable resulted in only one of all scales, the action scale in the drink driving domain, entering the equation. Higher action and self-efficacy scores were modestly associated with lower recidivism and the best predictor of recidivism was the drinking and driving action scale. In terms of drinking stage classification, contemplators had higher recidivism rates than the other two stages combined. When pure dinking/driving patterns were examined, two out of three contemplaters who showed the pure pattern at pre- and post-test recidivated, whereas pure precontemplators did not recidivate. The authors explain this with the suggestion that this is the pattern most logically shown by social drinkers – not stating a problem or a need to change in drinking – who rarely exceed the limit and thus rarely DUI.

1.2.6 Concept of the "hard core drinking driver"

The inconsistencies regarding the characteristics of recidivists may be due to several reasons, but the origin is supposed to be based on the fact that a lot of first offenders are actually charged incorrectly as first offenders. Kazenwadl & Vollrath (1995) report a dark figure of 600 alcohol intoxicated rides of more than 0.8‰ till the first arrest. Grunwald et al. (2001) estimate that the amount of mismatched first offenders is around 40%, Simpson et al. (2004) appraise that 50% of DUI offences involve multiple or "hard core" offenders and call this even a "conservative estimation". As reasons for underreport of repeat offenders the following issues can be identified:

- The likelihood of detection is low. A lot of offenders drive under the influence of alcohol or other illicit substances for years before they get caught for the first time. Thus an offender charged as "first offender" is actually a habitual or at least a multiple offender.
- Studies refer to inconsistent or too short look-back periods.
- Studies refer to different regions. Results may vary according to different national habits and proceedings (e.g. drinking habits, detection and road control strategies, etc.).
- First offenders are allowed to plea bargain which leads to the fact that impaired driving is not followed by a conviction for DUI. Thus no DUI record occurs in the following.
- Participation in a diversion programme is followed by a deletion of the DUI record.
- Repeat offenders were identified to be more likely to avoid the co-operation with the police and to refuse evidentiary breath tests (Robertson & Simpson, 2002). This reduces the likelihood of a conviction.
- The record systems are inappropriate or do not even exist.
- Prosecutors fail to check for prior records.
- Communication between the involved institutions (police, administration, court) is lacking.

Due to these mostly operational issues which make it difficult to distinguish if a DUI/DUID offender belongs to the group of first or repeat offenders, Simpson et al. (2004) shape the concept of the "hard core drinking driver" for a special offender group. These DUI offenders are supposed to impose a very high threat to traffic safety: although they are a small group of all licensed drivers, it is estimated that they make up 35% of drivers in alcohol-related fatal crashes and two thirds of drinking driver fatalities.
The term "hard core drinking driver" conceptually refers to drivers who repeatedly drive at high BAC levels; drivers who frequently drive at low BAC levels or rarely at high BAC levels are excluded from this concept. Within this concept, a BAC is considered as high at a value of 0.15% or above and the term repeated is defined as a frequency of once a month on average or more. Thus the conceptual definition "hard core drinking driver" refers to DUI drivers who drive with a BAC equal or above 0.15% at least monthly. For the identification of hard core drinking drivers the authors suggest two groups of driver, which are likely to qualify:

1. Repeat offenders, meaning drivers with at least one previous impaired driving offence within a look-back period of ten years. These repeat offenders have been detected while drinking and driving at least twice, but due to the low chance of being detected it is highly likely that they

have driven after drinking many times. As the median BAC of arrested drivers is about 0.16-0.17%, the authors state that most repeat offenders are likely to satisfy the “hard core” definition.

2. Drivers who have been arrested with a BAC level of 0.15% or above; these offenders have obviously driven at a high BAC level once, but due to the low chance of being detected it is highly likely that they have driven after drinking many times.

For an operational definition of “hard core drinking driver” the authors suggest to include all drivers who have driven with a BAC of 0.15% or above and drivers with more than one recorded alcohol impaired driving offence. This operational definition embraces both: all high BAC drivers and all repeat offenders, although it may misclassify a few drivers (e.g. young drivers who are caught driving back from a party with a high BAC, but do not regularly drive impaired).
As hard core drinking drivers are proposed to belong to the group of recidivists, they logically feature the same characteristics as analysed for this group:

- overwhelmingly male;
- typically aged between 25-45;
- high school education or less;
- history of prior traffic or criminal offences.

As other common characteristics of hard core drinking drivers, the authors mention that many of the hard core drinking drivers may meet the clinical diagnosis of alcohol dependence or abuse. In addition to that, they are assumed to show anti-social or deviant tendencies (Simpson et al., 1996) such as hostility or aggression or have personality and psychosocial problems (Jones & Lacey, 2000). Furthermore they seem to have a good knowledge and a special attitude regarding the DUI control system: they know how to exploit the loopholes in the control system in order to avoid the detection, apprehension, prosecution and even sanctions.
As main strategies against this group of hard core drinking drivers, Simpson et al. (2004) recommend, besides certain sanctions as ignition interlock obligations, to launch legislation on assessing offenders for alcohol problems, requiring appropriate treatment and monitoring them closely.

2 Review of existing DUI/DUID assessment procedures

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This chapter gives an overview of current DUI/DUID assessment procedures in- and outside Europe. Assessment implies all kinds of offence and/or offender related data to guide decision making on (further) steps to deal with DUI/DUID offenders, including e.g. data on offence severity, offender profile or recidivism risk. Assessment can thus include consideration of formal group criteria, like age, gender, type of psychoactive substance, arrest BAC level, but can additionally imply a closer investigation of specific offender characteristics. The approach, as well as the measures, methods, tools and possible outcomes can differ greatly depending on specific legal frame conditions. At EU level only medical criteria for fitness to drive in case of substance use problems are foreseen (2.3.2.1). This chapter will present first the scope of DUI/DUID assessment in a relevant selection of EU countries (2.2.1), followed by a general presentation of selected approaches outside Europe (2.2.2). A more detailed presentation of the current DUI/DUID assessment procedures in Europe can be found in part II of this deliverable (provider survey). Furthermore, as chapter 1 indicated that different DUI/DUID offenders with different rehabilitative needs can be identified, assessment prior to rehabilitation aims specifically at providing information to identify these needs and opportunities. The state of the art literature and expertise within the WP5 team concerning DUI/DUID assessment measures and tools will be presented (2.3).

2.1 Multidisciplinary approach

Depending on the aims of a DUI/DUID assessment different professional experts can be included in the process.

Fitness to drive related decisions minimally include the assessment of the medical criteria mentioned in the European Driving Licence Directives (91/439/EEC, Annex III of this document), and thus minimally require intervention of a medical doctor (MD) and/or medical specialist. As fitness to drive implies besides medico-legal criteria, also functional-cognitive and psychological criteria (Brouwer & Withaar, 1996; Withaar, 2000), other specialists also play a role in such assessment processes. A fitness to drive assessment of DUI/DUID offenders essentially includes a comprehensive screening of substance dependency or abuse, which includes an evaluation of physical-medical aspects (medical assessment) but also of psychological, social and other personal life related aspects (psychological assessment).
Casselman (2002) points out that substance related disorders are underestimated when the assessment is limited to a certain professional field or specialist, as individual specialists are often not able to interpret single observations linked to substance related disorders. According to the bio-psycho-social approach of Engels (1977, 1980) a substance related disorder is caused through an interaction of biological, psychological (which entails thoughts, emotions, and behaviour) and social factors. In this general model all of these three areas play a significant role in human functioning in the context of disease or illness. Eeckhout (2005) states that such a general approach is necessary to find correct answers to the central questions within a DUI/DUID assessment (see 2.3).

With regard to assignment or assessment prior to a rehabilitative measure, psychological investigation of DUI/DUID offender characteristics like substance use, personality, psycho-social and/or decision making related aspects underlying the offence, and of offender's readiness to change and motivation

for rehabilitation can provide relevant input to identify the offender's rehabilitation needs and opportunities, and thus the most appropriate (most probable effectiveness) rehabilitation measure.

Besides medical and psychological assessments other professional fields can be involved too as a function of the individual case requirements, e.g. functional behind-the-wheel driving assessment in case of performance decline or disorders...

2.2 Different scopes of DUI/DUID assessment procedures

2.2.1 Selected current approaches in Europe

This chapter is based on information from the European project ANDREA (Bartl et al., 2002) and the expertise of the country experts within the DRUID WP5 team. The SUPREME project (European Commission DG TREN, 2007a) didn't provide sufficient information on assessment within the assignment procedure to DUI/DUID rehabilitation.

Diagnostic procedures in order to assign different types of traffic offenders to driver rehabilitation programmes tailored to their specific needs was a topic of investigation within the EU-Project ANDREA (Bartl et al., 2002). The authors firstly point out that drivers who should not be licensed anymore because of lacking fitness to drive should be detected. Secondly, they state that screening should divide the group of potential course participants into main subgroups, like those having DWI-problems, those having speeding or other offences and those being addicted to a substance. In some countries also the age of the offender is a criterion for discrimination. "This is needed to assure maximum fit between course goals, methods and client problems. To put it simply, a system is needed to find out if the person has potential for getting advantage of the course, and to what kind of a course the person should go" (Bartl et al., 2002, p.45).

As a result of their survey the authors of ANDREA state that random selection to a rehabilitation measure has to be avoided because this opposes the offender's acceptation of the measure. Being selected according to defined criteria can on the other hand underpin the offender's understanding of having done a mistake. The authors point out that especially alcohol offenders are different from other traffic offenders, that they thus shouldn't be mixed and even that within this group addicts should be separated from non-addicts. The authors recommend a standardized diagnostic procedure before course participation.

In order to give an insight on the variety of assessment approaches within Europe, each country expert of the DRUID WP5 team and – in order to include a representative of one of the new EU member states – a country expert from Hungary described the national DUI/DUID assessment procedures (assignment for DUI/DUID rehabilitation) and the respective legal framework. More information on the selection criteria of the chosen countries can be found in 3.2.1. More detailed information on the specific DUI/DUID assessment approaches prior to rehabilitation in Europe will be presented in part II of this deliverable (provider survey).

2.2.1.1 Austria

In Austria driver assessment is part of the licensing system that demands physical and psychological fitness of the driver in order to get a driving licence ("Lenkberechtigung"). The Driving Licence Health Act (Führerscheingesetz-Gesundheitsverordnung, 1997) specifies that driver assessment aims at verifying the subjects' capabilities concerning driving a motor vehicle and his or her willingness to adapt to traffic regulations (minimum requirements).

For the conduction of traffic psychological assessments ("Verkehrspsychologische Untersuchung" (VPU)) on official request by traffic authorities, only those providers authorized by the Ministry of Traffic, Innovation and Technology (BMVIT) are allowed to do this assessment. The legal base is the Austria Driving Licence Law (Führerscheingesetz, FSG §8 and §24). In the subordinated decree on health (Führerscheingesetz-Gesundheitsverordnung, FSG-GV) the inducements which lead to a traffic psychological assessment are specified. Furthermore the assessment contents and methods to be used are defined. The decree also covers the organisational, personal and professional requirements of the traffic psychological assessment providers, the required education and training of traffic psychologists, and the procedures to officially approve new test methods. Additionally, the decree regulates the approval of traffic psychological providers and the measures for quality assurance (e.g. providers should have a uniform organizational structure for providing services all over Austria; providers have to assure the quality of driver assessment; only specially qualified psychologists who completed defined curricula are allowed to work in driver assessment; applicants for new assessment centres have to follow authorization procedures).

Until 1997 the "Kuratorium für Verkehrssicherheit" (KfV; Austrian Road Safety Board) was the only provider of traffic psychological assessment services in Austria. Until then the development of the necessary instruments (tests and test devices for driver assessment) and the support for evaluation and validation studies were raised from the budget of this organization.

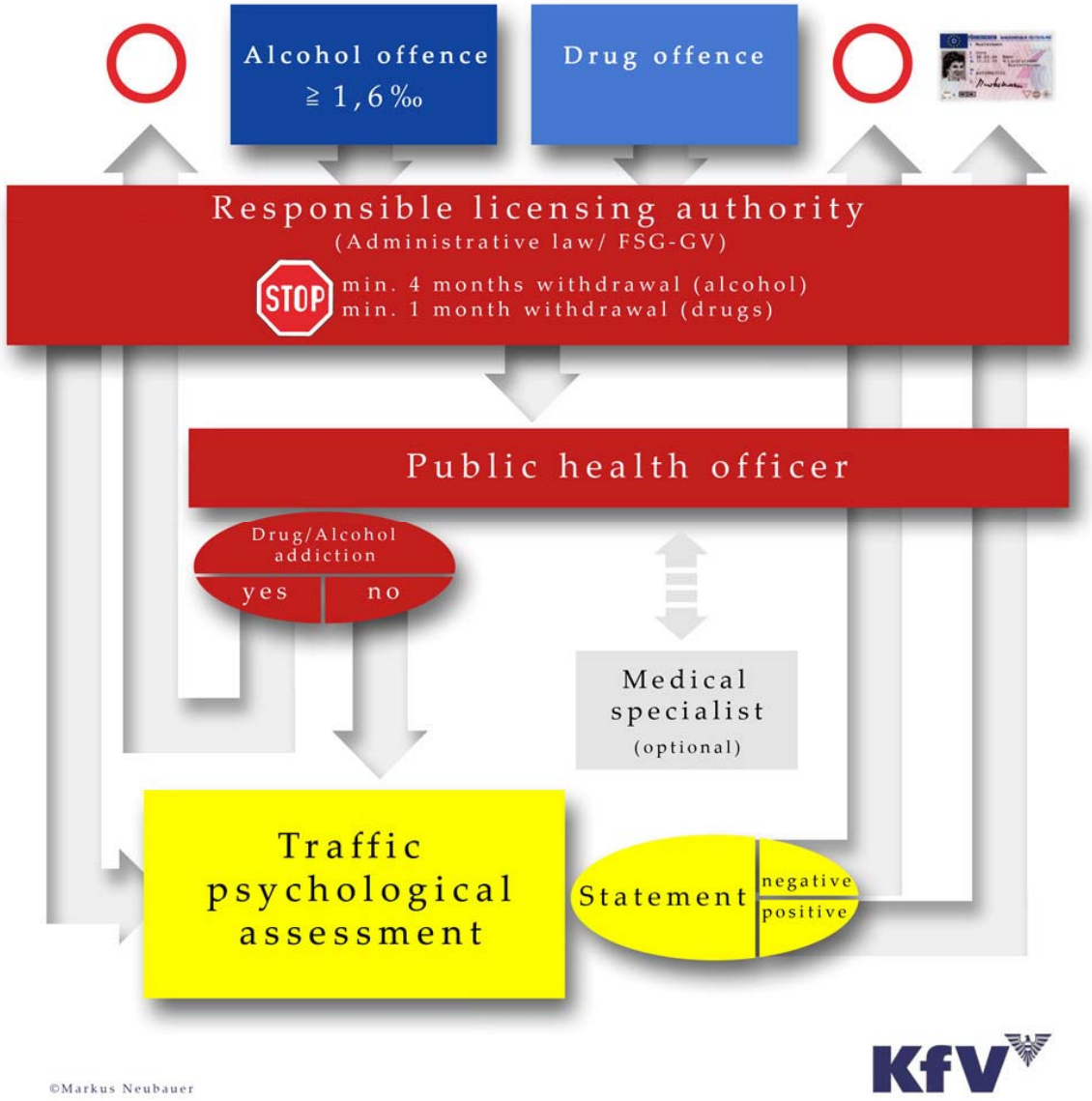
Since 1998 the number of organizations authorized to carry out driver assessment has raised up to ten. The increased number of providers and the tendencies towards market orientation raised the need for quality regulations regarding the organizations which carry out driver assessment.
Additional aspects with regard to the profession of a psychologist and/or concerning formal matters are regulated through ministerial orders. For example, there are directives for producing traffic psychological expertises (Richtlinien zur Erstellung verkehrspsychologischer Stellungnahmen gemäß § 17 FSG-GV; BMVIT, 2003) and for the practical education and training of traffic psychologists (Ausbildung von Verkehrspsychologen, BMVIT, 2001).
Based on these directives a consistent standard for expertises and uniformity of assessment all over Austria can be guaranteed.
In Austria, driver assessment combines traffic psychology and traffic medicine approaches – based on legal regulations – in a hierarchic system.
If there are doubts concerning the fitness to drive of a driver, the public health officer has to perform a medical fitness to drive expertise focussing on the requirements of the driving licence category that is claimed. In defined cases the public health officer has to include in his expertise the result of a traffic psychological assessment. The traffic psychological assessment is thus not a standalone expertise, but has to be integrated into the medical expertise on health status of the individual driver.
In some cases traffic psychological as well as additional medical specialist's expertises have to be integrated.
Each traffic psychological assessment has to be reported to the driving licence authorities and the expertise has to be sent to the public health officer; the client gets a copy of the traffic psychological expertise.
Already one of the following matters of fact lead to the demand of a traffic psychological assessment:

- offence in traffic with a BAC of 1.6‰, respectively 0.8 mg/l breath alcohol concentration (BrAC) or more;
- breath test refusal;
- driving a vehicle while being impaired by medication or drugs;
- withdrawal of driving licence for three times within a period of 5 years;

- causing traffic accidents or committing severe traffic violations which raise suspicion of deficits in the fields of performance and/or personality;
- specific questions on health (e.g. psychiatric, neurological or other medical indications, age related problems and so forth);
- failing the licence test too often (5 times theoretical part, 4 times practical part).

Addiction to alcohol or other substances is mostly assessed by the public health officer. In this case the alcohol or drug addicted driver does not have to attend a traffic psychological assessment but he/she is referred to an examination by a medical specialist. If addiction is assessed (yes) it leads to a driving ban.

Figure 5: Frame of traffic psychological assessment in Austria



In 2006 a handbook for public health officers and medical specialists for conducting a medical expertise was established (Leitlinien für die gesundheitliche Eignung von Kraftfahrzeuglenkern, BMVIT

2006), pointing out the background for the medical examination in connection to the driving licence and what to do concerning health aspects in question.
Independently to the medical demand of a VPU there are some causes where drivers only have to do a part of the traffic psychological assessment. In case of such a "screening" the lawyer of the driving licence authority is responsible. These are:

- drivers who apply for passenger transport (buses);
- candidates for an advanced driving licence of category B.

The drivers themselves have to pay for the assessment.

Concept of driver assessment

There are two main groups of drivers who have to undergo a driver assessment[3]:

a) "problem" drivers, e.g. due to drink driving, drug abuse, psychiatric, neurological or other medical indications, age related problems, failing the driving licence examination several times;
b) drivers with a "higher responsibility", i.e. drivers who apply for passenger transport (buses).

There are four variants of examinations depending on the reasons for driver assessment:

a) complete driver assessment (traffic specific performance and personality are examined);
b) short psychological assessment (screening regarding performance and personality);
c) restricted driver assessment (either on performance or on personality only);
d) driver assessment focussing on maturity (concerning personality and psycho-social development).

According to the Austrian Driving Licence Health Act a complete driver assessment - e.g. for alcohol or drug offenders - demands the examination of the following aspects:

- Performance dimensions:
  observation capacity and ability to gain an overview of a traffic situation, reactive behaviour, in particular reaction speed and certainty of decision and reaction, as well as stress-resistance of the reactive behaviour, concentration capacity, sensory-motor coordination, intelligence and memory capacities.
- Personality dimensions:
  social responsibility, self-control, emotional stability, willingness to take risks, tendency towards aggressive interaction in road traffic, emotional relation to cars.

The relevance and validity of these dimensions for safe driving are based on numerous research findings on driver behaviour during the last decades (see also Brenner-Hartmann & Bukasa, 2001). The dimensions are assessed by means of:

- performance tests;
- personality tests;
- a personal interview.

At the KfV for example, specific test devices for driver assessment are in use for daily testing (ART 2020; Bukasa et al., 1997).

The results of the entire traffic psychological assessment and the corresponding conclusions regarding the fitness to drive of a driver have to be documented in a traffic psychological expertise.

[3] 95% of the clientele in driver assessment is assigned by the licensing authorities; only 5% are sent by private companies (e.g. public transport, emergency transport, VIP transport). Therefore, only the obligatory assessments will be considered.

This expertise is a decision-making aid for the licensing authorities regarding the question whether a person's licence can/may be re-granted or not.

Concerning alcohol- or drug-use related doubts – two results are possible:

- Positive result of the traffic psychological assessment: the offender will regain the driving licence or the licence remains to be valid - with a restriction for a certain time period, mostly and possible to supply the evidence of abstinence (of alcohol and/or drugs).
- Negative result of the traffic psychological assessment: the offender gets recommendations or is informed that the driving licence can only be regained after for example a proven period of abstinence, or that a specific treatment has to be followed, etc.

Connection of assessment to rehabilitation

Until 1992 a recommendation for rehabilitation was given by the traffic psychologist – based on the results of a traffic psychological assessment – if deficits were found in the areas of attitude and personality. A pre-requisite to recommend rehabilitation was the absence of deficits of the driver in the traffic related performance tests. It was then up to the licensing authority to follow this recommendation; there was no obligation to do it.

Since 1992 certain DUI offenders have to attend a rehabilitation course obligatorily, i.e. the ones having a:

- BAC of 0.01% or more (novice driver in the probation period);
- BAC of 0.12% or above (all drivers).

That means that under these two conditions traffic psychological assessment and rehabilitation are completely independent from each other and the measures are working in parallel.

Only in case of demand of traffic psychological assessment due to a drug offence the driving licence authority may in advance demand participation in a rehabilitation programme but participation can also be recommended as a results of the VPU.

2.2.1.2 Belgium

Article 73 of the Royal Decree 23/03/1998 on the driving licence regulations states that in case of "deprivation of the right to drive" medical and/or psychological assessments can be imposed in order to retrieve the right to drive and thus the driver's licence. Both the deprivation of the right to drive and the 're-instatement assessments' are part of the sentence.

In the adaptation of the driving licence law by Royal Decree 08/03/2006, new criteria of the Belgian Federal Public Service of Mobility and Transport to officially recognize assessment centres as such were defined. Formal criteria exist on the personnel, the technical equipment and assessment environment, but also on the content and methods of the medical and psychological assessments. In each centre providing medical and psychological assessments at least one medical doctor (MD) and one psychologist must work. The coordinating personnel must have the expertise (defined in years) and know the mental and medical criteria of fitness to drive (i.e. the driving licence medical criteria).

The assessment costs are paid by the convicted, but can be subtracted from the fine. The law also determines the maximal price: 80 EUR and 270 EUR for, respectively, the medical and the psychological assessment.

Legal framework

When an offender is deprived from the right to drive as pronounced by the court, the judge can furthermore impose medical and/or psychological assessments – besides theoretical and/or practical driver aptitude examinations – as a condition for possibly regaining the right to drive. The driver's licence withdrawal can last from 8 days to several months and in some cases even to lifelong. Assessments are always programmed near the end of the withdrawal period, and in case of a positive advice, the driving licence can be obtained again.

Certain DUI/DUID offences lead immediately to a decision of deprivation of the right to drive at police court level:

- state of drunkenness or equal state (observable signs of impairment) due to drug or medicine use;
- recidivism (within 3 years) for DUI ≥ 0.35 mg/l (0.8‰) or for drunkenness or for equal state due to drug or medicine use.

Other DUI/DUID offences may – in function of the judge's decision – lead to a decision of deprivation of the right to drive at police court level:

- DUI ≥ 0.22 mg/l (0.5‰) < 0.35 mg/l (0.8‰);
- DUI ≥ 0.35 mg/l (0.8‰);
- refusal of a breath test or blood analysis without valid reason.

When these offences occur in the context of a conviction for a fatal traffic accident though, a minimum of 3 months deprivation of the right to drive is always pronounced.

Furthermore, medical and psychological assessments are always imposed in case of:

- involuntary manslaughter + DUI/DUID offence;
- involuntary manslaughter + recidivism DUI/DUID offence;
- involuntary injury + recidivism DUI/DUID;
- DUID recidivism;
- DUI recidivism ≥0.35 mg/l (0.8‰) or state of drunkenness (observable signs of impairment) or equal state due to drug or medicine use;
- driving while suspended due to DUI/DUID;
- recidivism of refusal of legal alcohol controls;
- recidivism of refusal to hand in the driving licence;
- state of drunkenness or equal state due to drug/medicine use;
- false declaration to obtain a driving licence.

Within 5 days of the court's decision, the public prosecutor announces the following information to the Federal Public Service of Mobility and Transport where the driving licence administration is centrally registered:

- deprivation of the right to drive decision, duration, reason, restrictions categories, period;
- examinations/assessments to be performed.

When the convicted offender deposits his/her driving licence at the central registry, he/she should choose one of the listed recognized assessment centres. At the moment of writing three main organisations are recognized by the Federal Public Service (i.e. IBSR/BIVV, AXIOS and IPMT), providing in total around 30 assessment offices spread over the Belgian provinces. When a location is chosen, the public prosecutor informs the respective centre and within 14 days the convicted has to be summoned.

After the assessment(s), the fitness to drive result is communicated to the registry, the public prosecutor and to the convicted. The public prosecutor informs the Federal Public Service of Mobility and Transport. The convicted can collect his/her driving licence at the registry after a positive fit to drive decision and when the period of the deprivation of the right to drive is expired.

Medical and psychological assessments

The medical and psychological assessments are fitness to drive assessments. In accordance with the driving licence regulations (Royal Decree of 23/03/1998) it is stated that an advice of fitness to drive is a medical decision. The medical norms (annex 6 of Royal Decree of 23/03/1998 and Royal Decree of 5/09/2002) on the use of alcohol and psychotropic substances stipulate that:

- The MD decides on the fitness to drive and the duration.
- Persons dependent on psychotropic substances or who excessively use psychotropic substances without being dependent, are not fit to drive. Persons, who regularly use psychotropic substances that can have detrimental effects on the fitness to drive or those who use such amounts of psychotropic substances that the driving behaviour is negatively influenced, are not fit to drive.
- Persons dependent on alcohol or who cannot stay abstinent while driving, are not fit to drive.
- In case of previous dependency or excessive use, persons can be declared fit to drive after a six months period of proven abstinence. The duration of this fitness to drive decision is limited to three years.

The general idea within the medical and psychological assessments is that recidivism is a judicial term referring to the recurrence of an offence within a certain time frame. Because of the recurrence the judge's sanction will be heavier; the judge thus announces the appropriate sanction in case of recidivism. The question that arises then is whether the recidivism may be caused by a medical and/or psychological problem. Both types of assessments thus aim at investigating whether the offender has sufficient medical/psychological capacities to drive safely and whether there may be pathologies/impairments that lead to an increased road accident risk. This means that the assessments do not aim at predicting (the probability of) recidivism, the criterion instead is the road accident risk like for all medical conditions in the driving licence medical criteria (annex 6 of the Royal Decree of 23/03/1998 on the driving licence). Recidivism thus has to be clinically interpreted – is there a medical pathology 'dependency' or 'abuse' on the basis – and not absolutely. At court level recidivists are already sentenced appropriately, in the assessments recidivism is no reason per se to declare a person unfit. The medical/psychological status of the offender is assessed and the basis for the assessment, are 'dependency' and 'abuse', and the relationship with the driving task. (Eeckhout, 2007)

Psychological assessment: contents and methods

The driving licence law (Royal Decree of 23/03/1998) declares that in case of driving under the influence of alcohol, drugs or medicines the psychological assessment should provide answers to the following questions (diagnostic profile):

1) Is the status of the convicted conforming the norms declared in annex 6 of the Royal Decree of 23/03/1998 on the driving licence (i.e. minimal norms and certificates for physical and mental fitness to drive a motorised vehicle)?
2) Are there indications of misuse/abuse or dependency of substances?
3) What is the nature and severity of the problem (e.g. amount and frequency of the use, impact on different life domains)?
4) Are there indications of polytoxicomania?

5) Are there indications of a sufficiently stabile and long-lasting abstinence in case of substance abuse/dependency in the past?
6) Are there indications of a psychiatric co-morbidity, personality disorders or adaptation disorders related to the substance abuse, that lead to a risk for the safe driving task?
7) Is there problem insight and does the person take responsibility for the (DUI/DUID) behaviour?
8) Is there motivation to change or to adjust attitudes and behaviour?
9) Are there indications for recidivism?

In case of co-morbidity of the substance use problems and psychiatric/personality problems, the psychological assessment furthermore focuses on the direction of this relation. Besides that, the cognitive status of the convicted is also screened.

The driving licence law furthermore describes the assessment tools and states that they should meet psychometric qualities of validity, reliability, sensitivity and specificity: questionnaires or self-judgement scales for substance use, personality questionnaires, psychological tests to measure a whole scope of cognitive functions (as attention, memory, information processing speed, executive functions), and semi-structured interviews to assess possible problem areas in life (medical, professional, substance use, juridical, familial, social, psychological). The risk factors that should minimally be assessed are: impulsivity, low frustration tolerance, low anger control, deficient coping strategies, sensation seeking behaviour, antisocial characteristics, negative environmental factors (e.g. poor housing, poor education, negative family history, badly paid job or unemployment, …), limited and poorly supporting social network, history of offences or violence, limited social and intellectual capabilities, and indications of psychiatric diseases or personality disorders.

Possible psychological assessment outcomes are: fit, fit with restrictions/conditions, unfit.

Medical assessment: contents and methods

The driving licence law (Royal Decree of 23/03/1998) declares that a medical assessment of DUI/DUID offenders should at least include the following elements:

1) medical anamnesis with focus on use of alcohol, psychotropic substances or medicines, co-morbidity and polytoxicomania;
2) examination of relevant medical information (delivered by external MDs) in scope of the legal medical and mental fitness to drive norms;
3) conduct of a profound medical examination;
4) request for advice from medical specialists if required;
5) assessment of the indicators for misuse/abuse or dependency of substances;
6) screening of misuse/abuse or dependency of substances.

Possible medical assessment outcomes are: fit, fit with restrictions/conditions, unfit. If considered necessary, the MD can make the medical fitness to drive decision dependent on a blood analysis in case of the DUI offence and on a hair analysis in case of a DUID offence.
When both a medical and a psychological assessment were performed, the MD is responsible for the final fitness to drive advice based on the multidisciplinary consultation.

At the assessment centres from the “Institut Belge pour la Sécurité Routière/Belgisch Instituut voor de Verkeersveiligheid, asbl/vzw“(IBSR/BIVV); Belgian Road Safety Institute) the final decision can also include an alcohol contract. In such cases an offender is declared fit to drive with a restriction in time and with regular controls of the relevant biological markers for alcohol within this time frame.

Link with DUI/DUID rehabilitation

Until today no link exists in Belgium between the DUI/DUID assessments imposed by court - as part of the deprivation of the right to drive sanction - and the DI[4] (Driver Improvement; equivalent to Driver Rehabilitation) courses which are the legally determined alternative measures for DUI/DUID offenders, provided by the IBSR/BIVV.

Furthermore, no specific assignment/assessment is performed prior to the DI courses.
These courses are since 1996 recognized and subsidised by the Belgian Federal Public Service of Justice as alternative measures for traffic offenders (Royal Decree of 6/10/1996 on community work and educative projects; Law on Probation of 10/02/1994). A DI measure can be proposed as alternative measure at the level of the public prosecutor via penal mediation or at the level of the court within probation. Via the penal mediation procedure, DI courses can exclusively be proposed to young drivers, and no alternative measure is proposed if the driving licence was already withdrawn for preventive reasons, or for DUI offenders with a BAC > 1.6‰. But, besides this, there are no strict formal criteria to propose a DI course as an alternative measure to an offender. The law (Law on Probation of 10/02/1994) prescribes though that prior to deciding to propose an alternative measure, the public prosecutor or judge can request a social inquiry or a brief advisory report from the probation officer. A social inquiry aims at finding out – through one or more consultations with the offender with or without relatives – which alternative measure would be most effective. In a brief advisory report an advice is given on a specific request, e.g. if a DI course would be helpful for the person. In practice these inquiries almost never take place and DI courses are proposed as a function of the public prosecutor's or judge's choice.
The DI team nevertheless notifies (but not in a formal way) the referring judicial instances of dependency being an exclusion criterion for the DI courses and about the necessity of sufficient social interaction capacities of the offender.

2.2.1.3 France

In France, a dual system comes into force in the case of a DUI/DUID offence: the administrative system and the judiciary system. Both systems are interdependent. In case the DUI/DUID offender shows a high level of intoxication, the administrative system takes an immediate measure: the driving licence is withdrawn for up to 6 months. Meanwhile, the offender has to go to court and is sentenced by the judge to one or several penalties.

Administrative system

Laws of 1989 and June 25th 1992

France uses a penalty point system: DUI/DUID offences immediately lead to a loss of points on the driving licence. Driving licences for experienced drivers have a total of 12 points. Driving licences for drivers with less than 3 years' driving experience have a total of 6 points: during 3 years, they gain 2 points per year if they have not committed any DUI/DUID offence or any other offence which leads to a loss of points (it is different for people who got their licence with "accompanied driving": they gain three points per year if they have not committed any offence which leads to a loss of points). DUI/DUID offences result in an automatic deduction of 6 points.

Offenders can volunteer to follow a training course which leads to a regaining of 4 points (the driving licence can not have more than a total of 12 points). The participation in such a course can not be

[4] Driver improvement (DI) course is the official term of the Belgium law. Thus, this term will be used within this county description. The term is equivalent to driver rehabilitation

repeated within two years. In some cases the repetition of such a course is excluded for a longer period.
Inexperienced drivers (less than 2 or 3 years depending on the way they got their licence) have to follow the training course as soon as they lose three points or more. The first participation in this course leads to a regaining of points on the driving licence.

When the licence runs out of points, the licence is cancelled. Then, the driver has to wait for 6 months to get it back and has to attend several examinations:

- The offender must undergo a medical and a psychological assessment. The MD who is authorized by the administrative director, does a physical examination, inquires on the medical history relevant for the fitness to drive decision and checks the findings from a laboratory analysis (relevant biomarkers) in case of DUI/DUID offences. The psychologist evaluates the offender's driver aptitude through an assessment interview and using psychological tests to check some performance dimensions (such as concentration and memory capacities, sensory-motor coordination, reactive behaviour) and personality aspects (e.g. self-control, emotional stability, aggressiveness). Concerning driver's alcohol- or drug-use, specific tests may be used (such as for example AUDIT or CRAFT). Until today, there are only a few legal criteria governing the psychological examination but the French government is working on extension of these criteria. In 2000, 173 providers were authorized by the administrative director of regions to provide the psychological assessment but since then, the number has increased a lot.
- Experienced drivers (more the 3 years) have to undertake a theoretical test
- Inexperienced drivers (less than 2 or 3 years depending on the way they got their licence) have to undertake a theoretical and a practical driving test.

Judiciary system

Many laws, concerning the legal level of intoxication for drivers, exist
In France, the measurement of the level of intoxication is possible since 1954. Many laws evolved then and the legal level of intoxication has changed over the years. The following laws are effective nowadays:

- Law of December 1983: the level of intoxication which conducts to a serious case is: ≥0.40 mg/l (≥0.8‰)
- Law of September 1995: the level of intoxication which conducts to a fine is: ≥0.25 mg/l and <0.40 mg/l (≥0.5‰ and <0.8‰)
- Law of October 2004: the legal level of intoxication for bus drivers is: ≥0.10 mg/l (≥0.2‰)
- Law of February 2003: makes the measuring of drug intoxication possible.

Many laws fix the different legal decisions according to the level of intoxication

- Decree of July 2003: DUI ≥0.25 mg/l and <0.40 mg/l (≥0.5‰ and <0.8‰): fine of 90 EUR and 6 demerit points deducted from the driving licence.
- Laws of January 1986, July 1987, laws of June 23rd 1999 and 2003: in case of a level of intoxication ≥0.40 mg/l (≥0.8‰) or breath test refusal without a valid reason, the legal decisions are reinforced: The driver has to go to court and is judged. Several scenarios are possible, depending on level of intoxication, first versus repeated offence, accident involvement, etc. Depending on the severity of the offence, the sentence can include one or several of the decisions listed below:
  - pay a fine, according to the severity of the offence;
  - do community work (up to approximately 240 hours);

- attend a demerit points recovery course (no demerit points can be recovered on the driving licence when it is an obliged participation, only voluntary participation leads to recovering points);
- withdrawal of driving licence for up to 3 years;
- imprisonment;
- attend a treatment programme.

In the case of a recurring offence, a seriously high level of intoxication, or accident involvement, according to article L-234 and all subsequent articles, as well as article R234 and all subsequent articles of the Highway Code, the judge can make one or several of the following decisions:

- driving ban for more than one month;
- annulment of driving licence in the case of a recurring offence;
- assessment when the licence is cancelled (annulment): In this case, the offender must undergo a medical assessment before getting his/her licence back. A psychological assessment is also requested. In this case the psychologist evaluates the offender's driver aptitude through an assessment interview and using psychological tests to measure performances functions and personality aspects. It is the same assessment which is held if the driving licence is cancelled by the administrative way (demerit points system) or the judiciary way;
- in case of pathological dependency, the judge can oblige the offender to follow a treatment program;
- DR course must be proposed by the judge (these programmes are not all the same throughout the country but the Ministries of Transportation and Justice are working on it);
- community work for up to 240 hours;
- attend a points recovery course (when it is an obligation, no points can be recovered on the driving licence);
- imprisonment for up to 2 years (4 years in case of a recurring offence);
- pay a fine of up to 4.500 euros;
- Confiscation of the offender's vehicle.

The alternative judiciary system:

- Article 40-1 of the penal code: The public prosecutor may decide to offer an alternative penalty to the offender, particularly if it's a first offence and/or a low level of intoxication. In this case, the offender must usually undergo the demerit point recuperation two days-courses. Then, no offence is retained. Consequently, the offender does not lose any point on his/her driving licence.

- Article 41-2 of the penal code: The public prosecutor may decide an alternative measure to the judgement. Despite to go to court, the offender is received by a public prosecutor assistant who is allowed to propose one or several penalties of the following:
  - pay a fine, according to the severity of the offence;
  - do community work (up to 240 hours);
  - attend a demerit points recovery course (no demerit points can be recovered on the driving licence when it is an obliged participation, only voluntary participation leads to recovering points);
  - withdrawal of driving licence for up to six months;
  - attend a treatment programme.

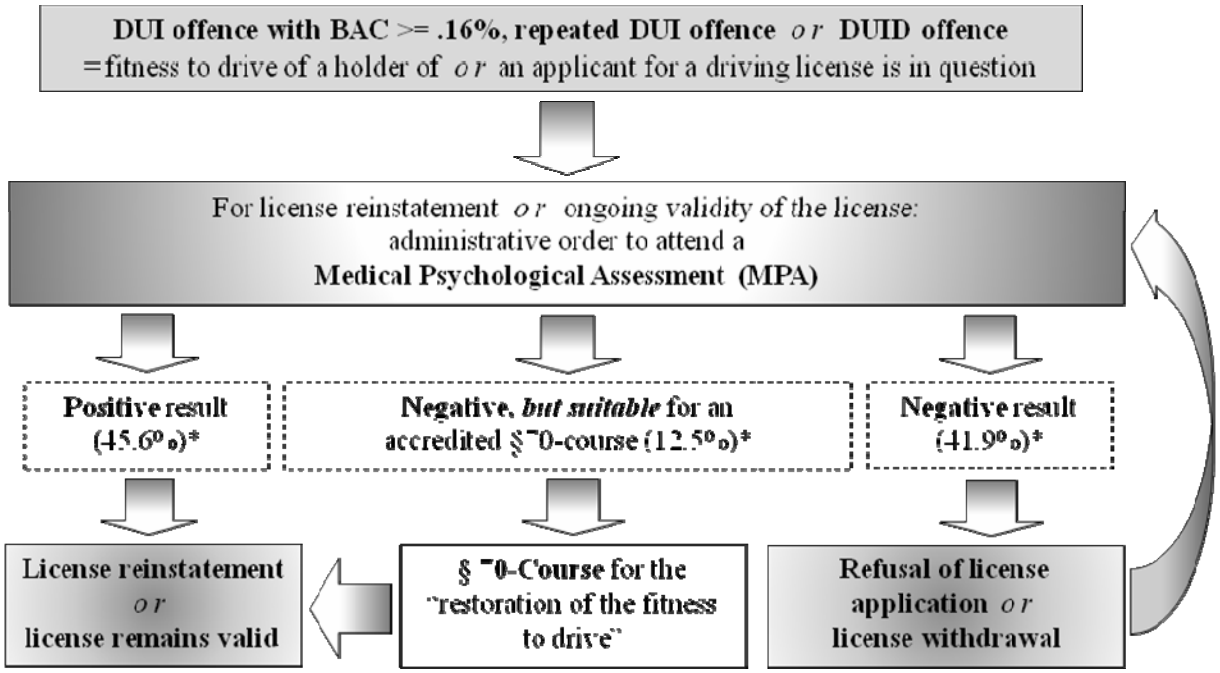
2.2.1.4 Germany

The German Driving Licensing Act (FeV) contains regulations about the requirements people have to meet before they receive the official valid permission to drive a motor vehicle on motor roads in

Germany, i.e. requirements to gain a driving licence. More precisely, the §11 FeV regulates that only those persons who meet the physical and mental requirements are allowed to drive in Germany; regularly named the "fitness to drive". This paragraph further states that if this fitness to drive of an applicant or owner of a driving licence is in question a medical assessment (MA) or a medical psychological assessment (MPA) that gives detailed information about the driver's aptitude regarding the question of concern can be ordered. Competent for the enforcement of this regulation is the driving licence authority respectively. The MA is only to be done by advanced educated physicians, e.g. experts for traffic medicine. In case of an ordered MPA, this assessment has to be done in an officially accredited MPA agency, whereas the agencies have to meet high requirements and normative standards for quality assurance to get accredited by the "Bundesanstalt für Straßenwesen" (BASt; Federal Highway Research Institute).

As the focus of this report lies actually on assessments which are connected to rehabilitation the following section will mainly describe the MPA regulations and its process because the MPA more often serves as trigger for the initiation of any rehabilitation efforts than the MA do.

Figure 6: Overview of the assessment procedure in Germany (according to Klipp; numbers relate to cases in 2006).



Detailed regulations about the administrative order to undergo a MPA due to a driver's or licence applicant's potential problem with alcohol or drugs are included in the §§13 and 14 FeV, whereas

- §13 refers to alcohol; in connection with the enforcement of the German Road Traffic Act (StVG) and the Criminal Code (StGB) analogously stating that a MPA has to be ordered in cases of:
  - DUI offences with a BAC equal or above 0.16%;
  - repeated DUI offences regardless the BAC reached at the incident;
  - any other incidents that indicate an alcohol problem or alcohol abuse consumption pattern and
- §14 refers to other drugs than alcohol; in connection with the enforcement of the German Road Traffic Act (StVG) and the Criminal Code (StGB) analogously stating that a MPA has to be ordered in cases of:

- consumption of illicit drugs, which leads to a withdrawal of the driving licence regardless the relation to driving in any case except cannabis;
- driving under the influence of cannabis or indications of cannabis consumption related to traffic participation (e.g. carrying a rolled cannabis "joint" in the car);
- occasional cannabis consumption in connection with other incidents leading to doubts concerning the fitness to drive.

The assessment process itself lasts two – three hours and consists of three main parts:

1. ***Testing of driver-specific performance capacities.*** This check implies different tests that check central performance functions which potentially may be impaired as a consequence of long-lasting heavy alcohol or drug consumption. The checks mainly focus on:
   - visual perception, i.e. visual orientation, traffic-specific view and peripheral perception;
   - concentration and attention, i.e. concentration under monotony and attentiveness flexibility;
   - reaction, i.e. reaction capacity, decision and reaction ability in a dynamic environment.

   In case of a negative test result in this part of the MPA the person who was checked may undergo an on-road test to demonstrate that he or she is able to compensate the functional deficits under regular traffic conditions. In this on-road test the driver is observed by a psychologist with an advanced education as driving observer and a driving instructor while driving in real traffic.
2. ***Medical Assessment.*** This assessment consists of a cause-related physical examination, integrating the inquiry of the medical history relevant for the fitness to drive decision and findings from a laboratory analysis of the case relevant biomarkers.
3. ***Psychological Assessment.*** In contrast to the testing of driver-specific performance capacities which is to be done by standardized valid tests and special machines for testing, within the psychological assessment no standardized tests are applied. The assessment comprises a talk of a traffic psychological expert and the MPA participant, regularly referred to as "traffic psychological exploration". Within this talk the assessor aims to collect comprehensive traffic and cause relevant data systematically by exploring all issues necessary for the fitness to drive decision. These include questions about details of the DWI incident(s), the participant's attitudes towards the incident(s), attitudinal and behavioural changes as well as strategies for the avoidance of future traffic offences. The focus of the inquiry lies on the participant's problem awareness and resulting behaviour changes regarding a problematic alcohol or drug consumption. Only when the participant can explicitly make clear that he or she reliably changed the consumption pattern to a stable unproblematic pattern of intake or abstinence, the chances of a positive assessment result will remain.

After the assessments the physician and the psychologist discuss the results of the interdisciplinary examination in order to come to a final decision about the participant's fitness to drive. Concerning alcohol- and drug-related doubts on driver aptitude three results are possible:

1. A positive result with the recommendation to reinstate the driving licence or leave the licence valid. In these cases the responsible driving licence authority will most likely follow the recommendation.
2. A negative result leading to the recommendation to reject the application for a driving licence or to withdraw it. In most cases the assessor gives further recommendations for the offender on next steps to take, i.e. what rehabilitation measures to attend to restore the fitness to drive and thus enhance the chances to get a positive result in a subsequent MPA. As a

consequence the responsible driving licence authority will reject the application or withdraw the licence and order a new MPA before coming to another decision.

3. A negative result with the recommendation to participate in a §70-course to restore the fitness to drive. If the responsible driving licence authority agrees on this, the applicant for or owner of the licence can participate in such a course and will regain the licence after successful participation without any new MPA (for details see 3.2.1.4).

The last two results will lead to rehabilitation efforts of the client and thus trigger the participation in a rehabilitation programme. To give an idea about the amount of clients who demand any alcohol- or drug-related programmes the data on the assessments in 2006 are presented (BASt, 2007):

- Of all 105,470 MPAs done in 2006 80,530 were alcohol- or drug-related in some case.
- Almost 45.6% of them ended with a positive result.
- 41.9% ended negative, leading to a number of almost 36.700 potential drivers who need assistance to restore their fitness to drive and hence most likely is followed by a participation in one of the rehabilitation programmes on the German market.
- For 12.5% of the DUI/DUID MPA participants the assessment resulted in a §70-course recommendation, coming up to an amount of about 10,075 potential §70-course participants.

2.2.1.5 Hungary

The following information is based on the input of the Department for Training and Examination, National Transport Authority - Hungary (2007).

In Hungary DUI/DUID offender assessment is directly linked to the assignment to a specific DUI/DUID rehabilitation program. The legal base of the rehabilitation system of Hungarian drivers is the Government Decree 139/1991. (X.29.) based on the article 18§ (2) of Law no. 1 of 1988 about road transport. The law directly links the assessment (so called: exploration) to the assignment to one of the 7 rehabilitation programs (for more information on the legal frame and the rehabilitation measures see 3.2.1.5).

Depending on the results of the exploration the National Transport Authority's (NTA's) appoints the most suitable programme for the person who is obliged to undergo it. Aim of the exploration is thus to determine the individual problem in order to allow assignment to an appropriate, personalized rehabilitation programme.

The exploration is carried out by the exploration team operated by the NTA, which is composed of at least 3 members; the members are qualified professional psychologists and transport pedagogical experts registered as rehabilitation course holders.

The assessment of existing shortcomings concerning transport knowledge, skills of transport legislation and vehicle driving theory is done via a computerized test containing a set of question compiled by the NTA. Further the observation of shortcomings and faults regarding transport skills, culture and behaviour is carried out in the frame of a driving trial.

The psychological exploration thus includes a broad information collection followed by an integrative decision making.

Based on the wrong act (based on which the candidate is obliged to drivers' rehabilitation) and the results of the tests, the exploration team orients the obliged persons towards the programme which is expected to serve the solution of the dominant problem in the most efficient way.

Exploration or assessment fee varies between 40 and 107 EUR, depending on whether a vehicle had to be used or not and on the category of the vehicle, and has to be paid by the offender who is obliged to undergo the exploration.

2.2.2 Selected current approaches outside Europe

2.2.2.1 United States of America

The National Highway Traffic Safety Administration (NHTSA) and the National Institute on Alcohol Abuse and Alcoholism (NIAA) (2005) recommend that an evaluation of the DWI offender's problem with alcohol or other drugs should be conducted prior to the decision on potential sanctions/treatment to be imposed. NHTSA & NIAA (2005) state, in their guide for judges and attorneys "A guide to sentencing DWI offenders", the following recommendations (minimal components) on assessment:
The offender evaluation should contain at least two components (Lapham et al., 1995):

1. an assessment of alcohol and other drug use (i.e., frequency and quantity of use, consequences of alcohol and other drug use, and evidence of loss of control over use);
2. an assessment of DWI recidivism risk based on factors in addition to drinking behaviour.

The DWI evaluation usually consists of:

- the administration of at least one standardized assessment test;
- a personal interview by a trained evaluator.

The information obtained should be supplemented with external information from:

- the courts (or other appropriate sources) regarding the client's criminal and driving history;
- the family members, regarding the offender's alcohol and other drug use".

The NHTSA & NIAA (2005) guide further explains that various standardized alcohol-screening tests are available, including several tools which are especially designed for DWI offenders. For descriptions of these tests they refer to Popkin et al. (1988), Beirness (1991), Lacey et al. (1999) and Chang et al. (2002). The guide points out that a number of well-researched and validated standardized tests exist, which are specifically created for youth and therefore may be more age-appropriate for DWI offenders under age 21 and that in general an increasing number of standardized instruments has been developed during the past decade. The guide emphasises that the NHTSA and NIAA do not endorse a particular instrument in this guide. Anyhow some tests are in particular named in this publication: the Adolescent Drinking Index (ADI) and the Rutgers Alcohol Problem Index (RAPI) which are two specific alcohol screening instruments for young DWI offenders and the Personal Experience Screening Questionnaire (PESQ) and the Drug Abuse Screening Test-Adolescents (DAST-A) which are among several other validated screening instruments that encompass all drugs, including alcohol. The guide refers to Winters (2003) for further description and discussion of these tests and other instruments (NHTSA & NIAA, 2005).

For more detailed information on screening/assessment tools see 2.3.
NHTSA & NIAA (2005) point out, that if, the court has the option of choosing an evaluating agency, the following characteristics should be considered:

- "the qualifications of staff;
- the ability to track clients and monitor compliance with treatment recommendations;
- the willingness to work as a team in coordinating efforts with the court and the State, taking into consideration the specific facts of the case;
- the avoidance of conflicts of interest (ideally, the agency doing the screening should not be providing treatment);

- the capability of evaluating offenders who are illiterate or non-English-speaking, when needed" (Popkin et al., 1988 in NHTSA & NIAA, 2005, p. 6).

An overview table on Impaired Driving State Substance Abuse Assessment and Treatment Laws for Convicted Impaired Drivers in the US is presented in the annex.

2.2.2.2 Canada

The information in this chapter is based on the best practice recommendations of Health Canada (2004).

The Canadian's national Strategy to Reduce Impaired Driving (STRID) 2010 recommends screening/assessment and educational or treatment intervention programmes. Thus, they are mandatory in many provinces/territories. Health Canada (2004) states that assignment to a rehabilitation measure should be in the context of the results from screening/assessment and that a clearly delineated screening/assessment process is important to support the decisions around matching.

In the context of identifying impaired drivers who may benefit from particular levels of substance abuse education or treatment, Health Canada (2004) states the following key points on DWI assessment:

- "There is a need for different levels of interventions for different DWI offenders as research indicates that they differ in the extent of their substance use and other ways that can influence DWI recidivism.
- There is no simple or reliable method for identifying those most in need of any particular type or level of education or treatment.
- A clearly delineated screening/assessment process is important to support the decisions around matching.
- Several screening instruments, validated using DWI populations and programmes, have been identified, and their use is consistent with best practice" (Health Canada, 2004, p. 39).

According to Lapham et al. (2001b) the DWI offenders' tendency to deny or misrepresent their drinking and drug use behaviours and problems, is one of the major challenges in the identification of DWI offenders who may benefit from a particular type of remedial programme. Thus, screening and assessment instruments may use objective and/or disguised indicators to evaluate substance use problems. The most commonly used objective indicators are according to Health Canada (2004) DWI arrest history and BAC level at the time of arrest. Health Canada (2004) names the following screening/assessment instruments that feature at least some disguised or indirect indicators of substance use and related problems:

- Mortimer-Filkins Questionnaire (MFQ) (Mortimer, Filkins & Lower, 1971);
- MacAndrew Alcoholism Scale (Revised) (MAC-R) (MacAndrew, 1965);
- Research Institute on Addictions Self-Inventory (RIASI) (Nochajski & Miller, 1995; Nochajski et al., 1993a);
- Substance Abuse Subtle Screening Inventory-ll (SASSI) (Miller, 1994).

For more detailed information on screening and assessment tools see 2.3. An overview table of the different provinces'/territories' rehabilitation/treatment programmes and their key aspects (including information on their used screening/assessment tools) is presented in 3.2.2.2.
Health Canada (2004) announces the following best practice recommendations regarding DWI screening/assessment:

"Identification issues:
Best Practice 6

- All convicted DWI offenders should complete a screening/assessment process to inform decisions about the most appropriate level or type of intervention.

Best Practice 7

- Instruments that have been shown to be of value in assessing alcohol and drug use problems and recidivism risk should form part of the screening procedure. The performance of these instruments should be monitored on an ongoing basis" (Health Canada, 2004, p. 45).

For more detailed information on the best practice recommendations for treatment and rehabilitation for DWI offenders, of Health Canada (2004), see 3.2.2 (Rehabilitation practices in North America).

2.3 Review on DUI/DUID assessment measures and tools

The descriptions of the current DUI/DUID assessment approaches (2.2.1 and 2.2.2) indicate that DUI/DUID offenders can be assigned to rehabilitation measures based on formal group level criteria (e.g. BAC at offence, first versus recidivist offence etc.) alone or that specific individual characteristics of the DUI/DUID offender are additionally taken into consideration. This chapter will focus on measures and tools that help identifying the type of offender, in terms of substance use and other problems related or underlying the DUI/DUID behaviour, and motivation for change, in order to determine more accurately the specific needs for rehabilitation and to weigh the expected effectiveness of measures.

The specific goals and the context of such a DUI/DUID assessment determine which instrument or combination of instruments is selected in the procedure. Connors & Volk (2003) state that in the selection of a screening or assessment instrument the following four central questions need to be addressed:

- What is the goal of the screening or assessment?
- What are the performance (psychometric) characteristics of the instrument for the target population?
- How much time and which resources are available for conducting the screening or assessment?
- How many and which resources are available for scoring the screening or assessment instrument and for providing feed-back or referral for positive cases?

Currently a number of approaches to assess DUI/DUID offenders are in use. A main source for the identification of the relevant psycho-social and personality related characteristics influencing or underlying all kinds of traffic related misbehaviour, including DUI/DUID, is the traffic psychological approach. Assessment tools, fine-tuned to the specific problems of DUI/DUID offenders, have been developed and validated on the population by institutes with long-lasting expertise in traffic psychological assessments. Some selected assessment measures derived from traffic psychology and existing tool formats will be presented. Furthermore, many tools used within DUI/DUID assessment have been originally developed within clinical setting (e.g. personality, substance use inventories). Clinical substance use related tools allow examining abuse and dependency and are thus often fundamental tools in DUI/DUID assessments (Boland et al., 1998; Chang et al., 2002; Eeckhout, 2005; Health Canada, 2004). As many of these substance use related tools are very common in the assessment of the DUI offender population, they will be considered in detail in this chapter.
Assessment instruments mainly consist of either self-report, observer report or both. The information can be gathered via written questionnaires, behavioural ratings or recordings, face-to-face interviews

(structured, semi-structured or open, administered by clinical or non-clinical staff), or computer-administered protocols. Additional tools in the scope of substance use assessment are laboratory tests that can tap biological markers of current and chronic use of certain substances (Boland et al., 1998).

The literature on the assessment procedure of DUI/DUID offenders often differentiates between screening and assessment instruments or measures. "Screening" generally refers to relatively brief measures designed to identify individuals likely to have a problem (e.g. a problem with alcohol or drugs) and "assessment" to a more detailed and extended process designed to confirm the results of screening and to generate more detailed information for further treatment planning (Health Canada, 2004). However, in the case of some instruments, there seems to be disagreement as to whether they are screening instruments, or whether they provide enough information to classify as assessment tools (e.g., the MAST or DAST) (Boland et al., 1998).

In order to evaluate the quality of a screening or assessment instrument, its context and certain performance characteristics have to be considered. Validity and reliability, sensitivity and specificity are typically viewed as essential elements for determining the quality of any standardized test. For more information on the theoretic background of these performance characteristics (also called psychometric variables) of assessment DUI/DUID tests see annex.

As a general rule, screening tests tend to emphasise maximizing sensitivity over specificity. This is a logic conclusion considering the purpose of screening: to identify as many individuals as possible with a substance related disorder among unselected groups, even if this possibly puts persons without disorder under suspicion. For people with 'positive' screening results, additional testing is done to affirm the presence of a problem and/or to determine the severity. Specificity becomes more important in the later assessment phases, so that individuals with a false positive result in the screening procedure are correctly identified as true negative in the further elaborate assessment (Eeckhout, 2005). Screening/assessment tools always have to be seen as elements within a broader DUI/DUID assessment procedure, as none of these tools can function as a standalone instrument to evaluate DUI/DUID offenders sufficiently.

In most cases the outcome of a DUI/DUID assessment is directly or indirectly linked to legal consequences, such as withdrawal of a driving licence. Korzec et al. (2001) see two major problems caused by the legal context of a DUI/DUID assessment:

- low validity of self-reported substance related problems in DUI/DUID subjects;
- unacceptability of high chances of false positive diagnoses in the legal procedure.

In the DUI/DUID assessment procedure the offender mostly wants to escape further legal sanctions or consequences and therefore tempts to hide potential substance use disorders. Underreporting of such disorders is very common in the screening of DUI/DUID offenders (Lapham et al., 2004). In order to avoid false responses to obvious substance use disorder related questions, Cavaiola & Wuth (2002) suggest that any measure should utilize both obvious and non-obvious indicators for substance use disorders as well as other observatory measures like BAC at the time of arrest, number of arrests (drinking and non-drinking related offences, such as careless driving), any prior history of treatment or twelve-step involvement, police reports at the time of the DUI/DUID arrest, familial history and any psychiatric history (see also Nochajski et al., 1995).

In the legal context of assessing the driving ability of DUI/DUID offenders, high chances of false positive outcomes are unacceptable (Korzec et al., 2001). The withdrawal of a driving licence presents a curtailment of somebody's personal rights, thus outcomes have to produce certain legal evidence, i.e. a high specificity is obligatory (Brenner-Hartmann et al., 2005). On the other hand the right of the

general population to be protected against risks caused by DUI/DUID offenders constitutes a high sensitivity of assessment tools (of substance related disorders). The weighting of one or the other is not a scientific but juridical and political question, which varies by country.

The review on DUI/DUID assessment measures and tools is based on expertise of partners within the DRUID WP5 team and several systematic literature reviews and meta-analyses from different sources (PubMed, libraries of KfV and IBSR), for more detailed information on the systematic literature research see annex.

2.3.1 Traffic psychology related measures and tools

Traffic psychological assessment is an approach to examine defined traffic offenders regarding their fitness to drive from the psychological point of view. In general, traffic psychology focuses on the "human factor", which is one of the key elements in traffic as the majority of accidents are not caused by problems of the vehicle but rather by problems of the driver. Therefore, since the beginning of the 1920ies, psychology started to assess those aspects which are important for driving. The task of traffic psychological driver assessment is to give a prognosis about the drivers' future behaviour in traffic. This requires specific knowledge about the human in traffic, e.g. about the influence of certain performance and personality characteristics on driving, about safety endangering or enhancing attitudes in traffic, about acute and chronic impairments and changes due to fatigue, alcohol, drug use or certain medication. DUI/DUID offenders are the predominant group to be assessed by means of this approach.

Based on the specific conditions of the problem groups, traffic psychological assessment tools were developed during the last decades according to the following criteria: i) discriminative power of the tools between offenders with a high and low recidivism risk, ii) restriction to those dimensions which are relevant for driving, iii) scientific evidence and explanatory power of the applied measures and tools regarding traffic safety criteria and fitness to drive decision, iv) standardization of assessment procedures, v) significance of the measures in a non-voluntary, decisive situation, vi) simple comprehensibility and accomplishment of the instruments for the driver to be assessed. Traffic psychological assessment requires highly selective assessment instruments. With regard to DUI/DUID multilevel DUI/DUID assessment, traffic specific performance tests, traffic specific questionnaires and traffic specific exploratory interviews are often carried out.

2.3.1.1 Traffic specific test systems

Although many tools for this type of assessment derive from the clinical setting, specific traffic psychological test systems have been developed, such as the ART 2020 (Act & React Testsystem; Bukasa, 1999; Bukasa & Wenninger, 2004; see the following figure) or the TAP-M (Test for Attentional Performance – Mobility version; Fimm & Zimmerman, 2005).

Figure 7: The ART 2020 test system

ART 2020 is based on a long term tradition in the composition of tests and test systems for different groups of traffic participants at the KfV. ART 2020 is a multifunctional testing device that allows a comprehensive assessment of traffic-relevant performance and personality dimensions. It is a user-friendly, ergonomically designed device and is equipped with monitor, accelerator/brake pedal, steering wheel and peripheral displays besides several reaction buttons. It provides highly standardized and objective procedures, guarantees test fairness and objectivity (Wenninger, 2001). Multimedia assisted test instructions explain the individual task of the tests visually and acoustically which eases learning of the individual tests. More realistic response modes with enhanced user interaction, e.g. steering wheel or pedals with an acceleration and break mode are included in order to enhance user acceptance. Not only the performance tests but also the personality questionnaires are presented on the device. In general, pre-defined test batteries – according to the specific assessment question - are available. This procedure guaranties equal conditions for the offenders as well as quick and error free analyses of the test results whereby the outcomes are directly compared to a large representative sample of drivers having underwent the test procedure.

2.3.1.2 Traffic specific performance measures and tests

Psychoactive substances have direct impact on the brain tissue and central nervous system. In case of long-lasting and excessive alcohol use, atrophy of the white brain matter can occur, leading to a loss of neurons, primarily in the frontal lobes (Schweinsburg et al, 2001; Netrakom et al, 1999; Oscar-Berman & Marinkovic, 2007; Lezak et al, 2004). As a consequence, different types of co-morbid disorders with alcohol disorders have been reported in literature, with regard to: (VAD, 2004; Eeckhout, 2005; Lezak et al, 2004; Garrido & Fernandez-Guinea, 2004)

- information processing speed;
- reaction times, decision times;
- visuo-spatial abilities;
- attention, concentration;
- memory (visual, learning, working memory);
- executive functions (planning and organisation of behaviour, flexibility in thinking, problem solving, impulse control / motor inhibition).

After years of severe alcohol abuse – especially when accompanied with malnutrition – significant cognitive deterioration can occur, even resulting in alcoholic dementia or Korsakoff's syndrome (Lezak et al, 2004; Kolb & Whishaw, 1996).

In a study on DUI recidivists, neuro-cognitive impairment on different dimensions was found, with excessive alcohol use as the most obvious associated factor (Ouimet et al., 2007).

Performance or cognitive-functional assessment of DUI/DUID offenders can thus provide relevant information about possible health damage due to substance use disorders. It clarifies whether traffic related performance is decreased or impaired due to one's psychoactive substance consumption pattern. In case of a performance decline or deterioration, it is important to determine the nature and extent (performance/neuropsychological/cognitive functional tests), and the impact on the driving task (behind-the-wheel test), as it may influence someone's fitness to drive.

In general, the main functions focussed on in current traffic specific performance assessment include visual perception and orientation, concentration capacity, reactive behaviour and reactive stress tolerance, sensory-motor coordination, memory and intelligence capacities (Bukasa & Brenner-Hartmann, 2001).

Several traffic psychological test systems were developed to assess the relevant capacities (TAP-M, ART 2020).

The TAP-M (Fimm et al., 2003) is developed by PSYTEST as a short form of the Test for Attentional Performance (TAP) (Zimmerman & Fimm, 1993) which was initially developed for the assessment of attentional deficits in patients with cerebral lesions. The TAP-M is compiled to measure attentional aspects of the ability to drive. The effect of disturbing effects on the task performance is kept minimal by presenting clear and easily distinguishable stimuli that have to be reacted to by simple motor responses. Possible disturbing effects of motor problems, visual disorders and language deficits are taken as much as possible into account. Visuo-spatial, non-spatial and executive attentional aspects can be measured with the system, like: alertness, divided attention, flexibility of focused attention, inhibitory processes, working memory, visual search, selective visual attention and suppressing potentially distracting stimulation which are relevant for safe driving. All the tests were validated with an on-road test drive.

In the following the traffic psychological ART 2020 performance test battery is described shortly.

Regarding visual perception, structuring ability is measured with the LL5 test. The test material consists of several images; each contains nine mutually intertwined lines of identical length. The task is to follow each line from start to finish under time pressure. Visual orientation is measured with the TT15 test (test for traffic specific overview). Several traffic situations are displayed shortly and relevant details have to be perceived in a short time. Peripheral perception is measured with the PVT test (test for peripheral perception with simultaneous tracking task). Analogue to real-life driving, visual stimuli are moving from the periphery to the central view, some of them are relevant and have to be stopped as early as possible by pressing a pedal. Simultaneously a tracking task has to be carried out by using a steering wheel.

Regarding attention and concentration, the Q1 test (test of attention under monotonous conditions) measures the concentration capacity under monotonous conditions. The test material consists of model and changing comparison figures, the latter have to be compared with the model figures by indicating, whether they are identical or different. Flexibility of attention is measured with the FAT test. Different to the Q1, the model figures change as well. Again comparisons between the model and comparison have to be carried out.

Regarding reaction capacity several aspects are tested. Speed and accuracy of reaction is measured with the DR2 test (test for decision and reaction behaviour in a dynamic driving environment). In traffic sequences showing a city drive from the driver's perspective contain, stimuli are presented from time to time, on one of them has to be reacted This is done by leaving the foot from the right pedal and change over to the left pedal ("brake") as quick as possible. Reactive stress tolerance is measured with the RST 3 test. Different visual and acoustical signals are presented under low high and medium time pressure. Responses are made by pressing different buttons and pedals.

Coordination capacity is measured by the SENSO test (test for sensorimotor coordination). A small circular figure has to be kept within a curvy track by using a steering wheel. Phase 1 and 3 consist of self-paced speed which has to be controlled by means of a pedal with n acceleration function. Phase 2 has a default speed on a faster level.

Regarding intelligence and memory two aspects are checked: Logical reasoning is measured with the MAT test, whereby pattern of increasing difficulty have to be completed. The ability to memorize relevant information for a short time is assessed with the GEMAT test (visual memory test). Sets of three subsequent figures are presented and have to be memorized. By means of the multiple-choice method, the before presented figure has to be recognized out of four alternatives.

These ART 2020 traffic psychological performance tools and dimensions have confirmed traffic related relevance as they were validated on offenders (e.g. Bukasa, 2000, Bukasa et al., 2003) (see description of the assessment systems in selected countries in 2.2).

2.3.1.3 Traffic specific personality tests

With respect to the measurement of traffic specific personality dimensions, substance and non substance related tools are available.
The following non substance related tools are included for example in the ART 2020 test system:

- VPT2 – traffic-related personality test. By means of this questionnaire social expressivity/self-confidence, social adjustment, emotional engagement, self control, self perception and self reflection are measured.
- VIP – traffic-related item pool. This questionnaire measures uncritical self-perception, aggressive interaction, emotional relationship to vehicles and driving. Moreover, a control scale for social desirable answering is included.
- FRF – questionnaire for willingness to take risks. By means of this tool, willingness to take physical, social and financial risks is assessed.

The following part of this chapter gives examples of traffic specific personality test which are substance related tools (more detailed information on general substance related tools can be found in 2.3.2.2).

“Testverfahren für alkoholauffällige Kraftfahrer” (TAAK; Hutter et al., 2000)

The traffic psychological questionnaires, TAAK (test for alcohol prone drivers), has been developed for DUI offenders measuring alcohol related dimensions on a multidimensional basis by KfV. The construction of TAAK is based on empirical results concerning differences between DUI offenders and drivers with no alcohol offences in traffic. Furthermore, long term experiences with the traffic-psychology assessment clientele and driver improvement clientele at the KfV contributed considerably not only to the test construction but also the development of a specific presentation and answering concept. The following scales are measured with TAAK (see also Bukasa, 2000):

- Attitudes favouring alcohol consumption: This scale focuses on functional drinking, subjective meaning and expected effect of alcohol (e.g. reduction of social restraints, relaxation, enhanced social competency or enhanced experience/adventure).
- Influence of alcohol related social environment: This scale refers to individually perceived peer group pressure regarding alcohol consumption as well as regarding driving under the influence of alcohol or being passenger of a drunk driver.
- Alcohol specific norm acceptance: This scale comprises attitudes towards regulations on alcohol and driving, enforcement and criteria for enforcement, e.g. with or without suspicion.
- Risk awareness related to DUI: This scale contains aspects uncritical attitudes towards DUI drivers, amongst others in case of being passenger, individually perceived low probability having an accident due to drunk driving, trust in the decision still being able to drive.
- Lack of knowledge about alcohol specific issues: This scale focuses on lack of basic knowledge regarding alcohol, i.e. absorption, the physical and psychological effect, duration of drinking and speed of break down, residual alcohol.
- Alcohol specific dissimulation: An alcohol specific dissimulation scale has been added to the above five categories in order to measure the individual tendency to answer in a social desirable way.

Methodological analyses of the TAAK confirm the reliability of the scales (.79 up to .87) as well as regarding the construct and criterion validity. Significant differences in the TAAK scales between DUI offenders and non offenders were found (Hutter, 2005).

Research Institute on Addictions Self-Inventory (RIASI; Nochajski & Miller, 1995)

Nochajski et al. developed the Research Institute on Addictions Self-Inventory (RIASI) in 1995. It is a free of charge instrument with 52 yes/no items, which are directly or indirectly related to, or indicative of drinking problems (Health Canada, 2004). It is especially designed for DWI assessment and uses mainly non-obvious indicators of Alcohol use, problem areas, personality and behaviour questions (Chang et al., 2002). It can be administered in about 14 minutes, in a pencil-and-paper format. The RIASI has been empirically derived from three large samples of DWI offenders (Nochajski & Miller, 1997).

The instrument assesses the following problem areas (Chang et al., 2002):

- drinking habits;
- number of drinking locations;
- number of drinks;
- family history;
- alcohol beliefs;
- preoccupation with alcohol;
- health issues;
- personal competence;
- aggression;
- depression;
- anxiety;
- deviant behaviour;
- sensation seeking.

Chang et al. (2002) furthermore say that the authors of the RIASI have been engaged in research efforts that have demonstrated some degree of validity, but more independent research is still needed (Nochajski & Wieczorek, 2000; Nochajski et al., 1995).

Driver Risk Inventory-II (DRI-II; Lindeman & Scrimgemour, 1999)

The Driver Risk Inventory-II (DRI-II) is a commercially available DWI assessment instrument developed by Lindeman and Scrimgemour in 1999. It assesses the domains alcohol and drug dependence, life stress issues and attitudes. The DRI-II consists of 140 items and can be administered in 30 to 35 minutes in pencil-and-paper or computer-based format. The instrument is based on the original DRI which was especially designed for the assessment of DWI offenders, by the organization Behaviour Data Systems (BDS) in 1987. The DRI includes a truthfulness correction and is especially normed for convicted impaired drivers (Chang et al., 2002). In the new version (DRI-II) a substance dependency scale built on DSM-IV criteria has been added to the five original scales. The DRI-II assesses the following problem areas:

- truthfulness;
- alcohol use;
- drug use;
- driver risk;
- stress coping abilities;
- substance dependence and substance abuse.

Chang et al. (2002) point out that very little research has validated this instrument. They consider it as a psychometrically well-constructed instrument but criticise that no follow-up validation research to determine whether the DRI-II truly achieves the developers' purposes have been carried out. He only found two independent quantitative studies that compare DRI results to prior arrest status (Leshowitz & Meyers, 1996 in Chang et al., 2002) and a criterion measure (Lacey, 1999 in Chang et al., 2002). Leshowitz and Meyers (1996) showed positive discriminative validity of the instrument, distinguishing between first-time and multiple offenders. Lacey et al. (1999) found good validity statistics between the test and the expert survey. However, the methodological issues of the study were also discussed in the same section. Marsteller and Davignon (1997) summarized in their study of validation of the DRI-II in a large sample of DWI offenders, reasonable reliability and validity statistics. Chang et al. (2002) think that although the DRI is popular in the USA, because it meets the need of the DWI screening administrators for reasonable processing time, there has not been enough research to demonstrate its validity. They point out that further research is urgently needed.

Substance Abuse Life Circumstances Evaluation (SALCE/NEEDS; ADE Inc., 1986)

The Substance Abuse Life Circumstances Evaluation (SALCE), developed by the ADE Inc. (1986) assesses attitudes, life stress issues, alcohol and drug use and driving records. It is a commercially available instrument especially developed for DWI offenders. The NEEDS is an expanded version of SALCE, which was developed in 1990. It assesses attitudes, emotional stability, substance abuse, employment, relationships, health, education and criminality. The instrument includes estimation of truthfulness. The substance abuse scale and recommendations for both instruments are based on DSM-IV criteria. The original version contains 85 true/false or Likert items and the NEEDS 98 items. They can be administered in about 20 minutes in paper-and-pencil format (Health Canada, 2004; Chang et al., 2002). The main assessed problem areas of the NEEDS are according to Chang et al. (2002):

- test attitude;
- problem solving;
- emotional health;
- substance abuse;
- employment;

- relationship;
- physical health;
- education;
- criminal record.

Chang et al. (2002) criticise that the instrument lacks sufficient rigorous research that would demonstrate its validity and as its use is widespread in the USA, more research is needed.

2.3.1.4 Traffic specific exploration

The exploratory interview (also called elaborate and/or diagnostic interview) is of great importance as well in the DUI/DUID offender assessment, especially regarding the assessment of the recidivism risk. This measure can provide individual-related information, above all the contributing factors to the actual offence, the realistic evaluation of traffic safety risk regarding driving under influence, the consumption pattern and habits of psychoactive substances, the motivation for change and actual behavioural changes, and the strategies to avoid future drink-driving conflicts and incidents. Besides that, the explorative interview can provide information on compensation possibilities, clarify inconsistencies or can check the plausibility of other test results. Based on a group discussion on the 5th of July 2007, the experts of the DRUID WP5 team summarized the following major topics which should be addressed in this kind of interviews:

- socio-demographic data;
- driving licence related information;
- general driving related information;
- analysis of the actual DUI/DUID offence;
- analysis of the general substance use, also medication, treatment history/compliance;
- impact of substance use on different life domains;
- leisure time activities;
- problem/risk awareness;
- motivation changed, attitudinal and behavioural changes;
- awareness of, coping with future risk situations / recidivism;
- self-evaluation and client feedback regarding the test phase;
- additional advices / counselling on further steps in the procedure;
- feedback on the psychological assessment outcome.

Popkin et al. (1992) state that a clear discriminating analysis of the following qualitative factors may contribute to a more accurate identification of a specific high risk groups:

- "socioeconomic factors;
- behavioural characteristic;
- psychological predispositions;
- the extent of the individual's substance abuse problem;
- family history of substance abuse, drinking behaviour of peers, the extent to which alcohol is an integral part of the individual's social life, the nature of support available to the individual, the assessment instrument used); and
- what score it produced and the treatment modality used (Popkin et al., 1992, p. 20).

Furthermore, it may provide useful information for the development of a treatment plan.

2.3.2 Medical related measures and tools

2.3.2.1 Medical criteria including physical examination

The following summary was carried out by a member of the DRUID WP5 team who is an expert on EU fitness to drive legislation (Tant, 2007) and is based on the indicated legal sources and the expertise of several MDs within the IBSR/BIVV.

National legislations for EU Member States regarding fitness to drive are governed by the European directive 91/439/EEC. A directive applies only within the European Community pillar of the European Union, is usually addressed to all Member States, and fixes objectives to be pursued by the Member States, but leaves freedom of choice for the ways of obtaining them. The national legislations of individual Member States can be stricter than what is specified in the directive, but not more lenient or liberal.

Directive 91/439/EEC of July 29th 1991 on driving licences, the so called 'second driving licence directive', harmonises the minimum standards of physical and mental fitness. On December 20th 2006 the third driving licence directive entered into force. Eventually, by 2013 the third directive will be completely replaced by the second one.
In both directives article seven specifies that "driving licences shall only be issued to those applicants who have passed a test of skills and behaviour, a theoretical test, and who meet medical standards". The third and last requirement basically refers to the fact that fitness to drive in this respect refers to a certain medical state. The specific minimum standards for driving a power-driven vehicle are laid down in Annex III of this Driving Licence directive. It mentions in general terms the necessity of medical examinations to be performed by a competent (medical) authority. Subsequently and more specifically, minimal criteria are formulated concerning sight, hearing, motor disability, cardiovascular disease, diabetes mellitus, neurological disease, mental disorders, alcohol, use of drugs and medicinal products, and renal disorders. For alcohol the directive quotes:

"**ALCOHOL**
14. Alcohol consumption constitutes a major danger to road safety. In view of the scale of the problem, the medical profession must be very vigilant.

Group 1[5]: 14.1. Driving licences shall not be issued to, or renewed for, applicants or drivers who are dependent on alcohol or unable to refrain from drinking and driving.
After a proven period of abstinence and subject to authorised medical opinion and regular medical check-ups, driving licences may be issued to, or renewed for, applicants or drivers who have in the past been dependent on alcohol.

Group 2[6]: 14.2. The competent medical authority shall give due consideration to the additional risks and dangers involved in the driving of vehicles covered by the definition of this group.

DRUGS AND MEDICINAL PRODUCTS
15. *Abuse:*

[5] drivers of vehicles of categories A, B and B+E and subcategory A1 and B1 (hence the ordinary car and motorcycles, mopeds, etc…)
[6] drivers of vehicles of categories C, C+E, D, D+E and of subcategory C1, C1+E, D1 and D1+E. (hence trucks and busses) and drivers of category B vehicles using their driving licence for professional purposes (taxis, ambulances, etc.).

Driving licences shall not be issued to or renewed for applicants or drivers who are dependent on psychotropic substances or who are not dependent on such substances but regularly abuse them, whatever category of licence is requested.

Regular use:
Group 1: 15.1. Driving licences shall not be issued to, or renewed for, applicants or drivers who regularly use psychotropic substances, in whatever form, which can hamper the ability to drive safely where the quantities absorbed are such as to have an adverse effect on driving. This shall apply to all other medicinal products or combinations of medicinal products which affect the ability to drive.
Group 2: 15.2. The competent medical authority shall give due consideration to the additional risks and dangers involved in the driving of vehicles covered by the definitions of this group" (Council Directive 2006/126/EC of 20th December 2006 on driving licences, p. 32-33).

As can be seen, the medical examination, to be performed by a competent medical authority, should investigate the subject of dependency and abuse, although this last 'diagnosis' is an interpretation of the text. Further, if dependency and/or abuse have been diagnosed, proof is to be provided of abstinence. Each member state is apparently free for the implementation of the required period as well as for the methods and tools of obtaining the required information. This has as a consequence that the examinating MD can base his conclusions also on the information provided by external medical experts, in addition to or as alternative for his own examination. Only after the positive advice of the examining MD a new driving licence can (not need to) be issued.

During the physical examination, the MD can give attention to numerous signs and indications. Some MDs will only make a functional survey, as the examination can only be limited in time. He will specifically pay attention to tremors for example by checking whether hands are shaking when holding them out in front. The balance and coordination can be checked, for example by asking to stand with eyes closed and subsequently to walk placing the heels directly in front of the toes. Other functions that may be tested are reflexes and fine motor-coordination abilities (like finger to nose pointing).
If the MD has the opportunity or possibility to perform bodily examinations he/she can verify blood pressure, heart beat, body temperature and examine the belly for an enlarged or tender liver.
More observationally, the MD may be interested in the smell of the breath, and check the skin for changes that may be related to alcohol use over time, such as redness in the palms, tiny red dots from which small blood vessels radiate (spider veins), or a skin condition similar to acne (rosacea). Further attention can be paid to signs of drowsiness and behavioural changes, slurred speech, signs of aggression or inappropriate sexual behaviour, and nystagmus.
Sometimes the MD is also to judge more cognitive functions, although preferably this is to be performed by a psychologist (see 2.1). These functions are attention span and concentration, memory, and visuo-motor and spatial abilities. The MD, or again in consultation with the psychologist, can be attentive for complications due to alcohol/drug dependency or abuse as for example physical harm due to accidents and falls, or other injuries.
All these physical and observational items can be complemented by drawing a sample of blood for certain laboratory tests. Certain biomarkers (see chapter 2.3.2.4) can give an indication of the previous alcohol/drug consumption or period of abstinence.

2.3.2.2 Substance use related screening/assessment tools

A huge variety of screening and assessment tools for drug or alcohol consumption exists. Most of these instruments are developed within the clinical context. Thus, the question needs to be answered if they are applicable to the specific characteristics of a DUI/DUID assessment. Several reviews, such as Cavaiola & Wuth (2002), Eeckhout (2005), Health Canada (2004), Chang et al. (2002) or Korzec et

al. (2001) evaluate this question (also see discussion on the effect of the legal context on the DUI/DUID assessment procedure in chapter 2.3) .

This subchapter is mainly based on information from North American reviews. It gives an overview of existing screening/assessment measures which can be used within the DUI/DUID assessment. These tools have to be seen as elements within a broader DUI/DUID assessment procedure which usually combines several tools and approaches (see 2.3).

This chapter starts with a presentation of rather brief screening measures, continues with more elaborate assessment tools and, at the end, presents the most elaborate assessment instruments, which are usually administered in structured or semi-structured interview format. The substance use related assessment tools: RIASI, DRI-II and SALCE/NEEDS have been described already in the chapter before, as they are especially designed to assess DWI offenders. An overview table of selected substance use related DUI/DUID screening/assessment tools can be found in annex.

Alcohol Use Disorders Identification Test (AUDIT; WHO, 1992)

The Alcohol Use Disorders Identification Test (AUDIT) is a very short questionnaire developed by the World Health Organization (WHO; Babor et al., 1992) to identify alcohol use disorders. It is free of charge and can be administered in written or spoken format in about 2 minutes. The AUDIT consists of 10 questions (items) addressing the following problem areas:

- consumption (frequency, binge drinking);
- dependence symptoms (inability to stop, drinking in the morning, blackouts, guilt);
- alcohol related problems (interference with life activities, injury to self or others, others expressing concern).

The main temporal reference point is the past year, although a few items refer to lifetime frequency.
The selection of the items is based on the definitions of alcohol dependence and “harmful use” provided in the ICD-10 of the WHO (1992).
Each question can score 0 to 4 points. An absolute score of eight (males) and six (females) or more is considered indicative for an alcohol use disorder.

Boland et al. (1998) see the main advantages of the AUDIT in its cross-cultural validity as it has been developed in a study across six countries and in the availability of good psychometric data and normative data (Sobell et al., 1994 in Boland et al., 1998; Allen et al., 1997; Conley, 2001).The AUDIT was standardized on "heavy drinkers" and alcoholics (Allen & Columbus, 1995).

The AUDIT does not show any gender effects in his results (Eeckhout, 2005). According to Reinert (2002 according to Eeckhout, 2005) this test performs very well in the detection of hazardous drinking, but is less suited to expose harmful use/abuse patterns or dependence. Barbor et al. (2001 according to Eeckhout, 2005) stress in their guidelines for the use of the AUDIT in Primary Care settings, that the reliability and validity of the test has been proven in several studies, and that the test is also suitable in the assessment of DWI offenders.

Cut down, Annoyed, Guilt, Eye opener (CAGE; Ewing & Rouse, 1970)

The Cut down, Annoyed, Guilt, Eye opener (CAGE) is an extremely brief four-item screening instrument. It has been developed by Ewing and Rouse in 1970 as a free of charge screening measure for alcoholism (Boland et al., 1998; Chang et al., 2002). The administration takes about 1 minute and it can be used in a paper-and-pencil or computerized self-administered or interview format (Connors et al., 2003).

The items assess the feeling of need to reduce drinking, the acknowledgement of others criticizing one's drinking, the feeling of guilt about drinking and drinking habits in the morning. The endorsement of two or more items suggests problem drinking. In most cases the CAGE is administered in oral form (Boland et al., 1998).

The reported values on sensitivity and specificity vary within the literature. While Cherpitel (1997) reports excellent sensitivity of 68% to 89% and specificity of 85% to 91%, Cooney et al. (1990) and Kinney (1991) found that sensitivity generally ranges from 60% to 95%, and specificity from 40% to 95% (Kitchens, 1994 in Boland et al., 1998). Those variations are mainly imputed to differences in the study populations (Eeckhout, 2005).

According to Eeckhout (2005) the CAGE is less suitable in the assessment of adolescents, women and individuals with moderate drinking problems. Chang et al. (2002) furthermore, see the limited value of this test for the DUI offender screening. Research has shown that the test has difficulties in the areas of reliability and validity (Chang et al., 2002). Matthys (2004) noted that the performance of the test can be enhanced through adding questions on the quantity and frequency of drinking.

As the questions of the CAGE are not alcohol specific, the test can be modified to assess the use of illicit drugs. Carolinas Healthcare (2007), suggest, for example, the following modified version to assess both, alcohol and drug use:

IN THE LAST YEAR:

- Have you ever felt you ought to **C**ut down on your drinking or drug use?
- Do you get **A**nnoyed at criticism of your drinking or drug use?
- Do you ever feel **G**uilty about your drinking or drug use?
- Do you ever take an **E**arly-morning drink (eye-opener) or use drugs first thing in the morning ("a little hair of the dog that bit you") to get the day started or to eliminate the "shakes"?

The CAGE has been translated into many languages and modified versions for specific subgroups are available (e.g. FIVE-SHOT, the Dutch version of the CAGE (Seppa, 1998 according to Eeckhout, 2005) and TWEAK, a modified version specifically for pregnant woman (Russel, 1994)) (Boland et al., 1998).

Drug Abuse Screening Test (DAST; Skinner, 1982)

The Drug Abuse Screening Test (DAST) has been developed by Skinner in 1982. The original version consists of 28 yes/no items and can be administered in about 5 to 10 minutes (Cavaiola & Wuth, 2002). The modified version of 20 items is in greater use than the original version (correlation between the two versions is .99; Skinner, 1982) and also, a brief 10-item screening exists (Boland et al., 1998). The DAST is a modified version of the MAST (see later in this chapter), geared towards non-alcohol drug abuse. It assesses drug dependence symptoms and drug-related problems (Health Canada, 2004; Boland et al., 1998). The DAST items include questions regarding the following aspects (Boland et al., 1998):

- frequency and type of drug use;
- withdrawal and dependence symptoms;
- physical and legal consequences;
- disruption to work, family and social life;
- feelings of guilt;
- prior treatment.

The temporal referent of the DAST is the past 12 months, but like the MAST, this time-frame has been modified to suit particular settings. One point is given for every positive item endorsement. A score of five or more points indicates the need for further evaluation. Boland et al. (1998) conclude from several studies that low scores are associated with alcohol-only abuse, mid-range scores characterize alcohol and drug-abusers, and higher scores tend to be indicative of abuse of drugs other than alcohol. The test can be administered in paper-and-pencil or computer format.

Munich Alcoholism Test (MALT; Feuerlein et al., 1977)

The original Munich Alcoholism Test (MALT), developed by Feuerlein et al. in 1977 has later been extended by Van Limbeek & Walburg (1987). It meanwhile consists of two parts: the original MALT-Z and the MALT-A.

The original MALT(-Z) is a self-report screening tool of 24 items, assessing attitude to drinking behaviour, psychosocial problems and somatic problems. The MALT has three possible outcome categories: no alcohol related disorder, at risk of alcohol dependence and alcohol dependence. The MALT(-Z) part can be administered in 10 minutes and an absolute score of 11 is considered indicative of alcohol dependence.
Furthermore, the extended MALT contains a medical anamnesis[7], a heteroanamnesis[8], a medical examination and a blood test examining abnormalities of biological markers (MALT-A; 7 items). This part has to be filled-in by a physician.

Feuerlein et al. (1979), one of the developers of the original MALT(-Z) test, reported a reliability and validity of respectively 94% and 85%. Boland et al. (1998) report that psychometric properties of this test seem promising, and that the scale has fairly good discriminative ability, but that little information is derived beyond the very small original normative sample. Evers et al. (1996) concluded in their documentation of tests and test research in the Netherlands, that the MALT is a reliable and valid instrument in the screening of alcohol related disorders.

The test is not-transferable to the assessment of illicit drug use.

Michigan Alcoholism Screening Test (MAST; Selzer, 1971)

The Michigan Alcoholism Screening Test (MAST) has been developed by Selzer in 1971 to detect alcoholism. It is available without any charges, consisting of 25 yes/no items concerning drinking habits, alcohol dependence symptoms and drinking-related problems. The MAST can be conducted in a pencil-and-paper self-administered format or as an interview which is frequently incorporated into larger inventories or structured interviews (Boland et al., 1998). The whole administration takes about 10 minutes (Health Canada, 2004; Connors & Volk, 2003).

Modifications of the MAST include the Brief Mast (10 items), the Malmo Modification (Mm-MAST; 9 items) and the Short Mast (SMAST) (13 items) (Chang et al., 2002). These briefer instruments may be more appropriate for screening purposes, while the original 25-item scale may already present a more elaborate assessment (Boland et al., 1998). In addition, the G-MAST, was developed for use with older adults by Blow et al. (1991) and the Veterans Alcoholism Screening Test (VAST; Magruder-

[7] The medical history of a patient (sometimes called anamnesis) is information gained by a physician by asking specific questions, either of the patient or of other people who know the person and can give suitable information (in this case, it is sometimes called heteroanamnesis).

[8] Heteroanamnesis is information gained by a physician by asking specific questions, of other people who know the person and can give suitable information.

Habib et al., 1982), also an extension of the MAST, to asses alcohol problems over multiple historical periods (Boland et al., 1998).

The original MAST validation sample of 526 included a control group, hospitalized alcoholics, convicted DUI offenders, persons convicted of drunk and disorderly behaviour and drivers whose licences were under review.

According to Boland et al. (1998) reliability and validity data are available across a number of populations. Kitchens (1994) reports that the internal consistency of this test ranges from .83 to .95, test-retest reliability values from .84 to .97, sensitivity from 71 to 100% and specificity from 81 to 96% (Kitchens, 1994). Conley (2001) says that the MAST also has an acceptable validity among drunk drivers.

Sutton (1994) found that a combination and MAST and MAC-R (see 1.6.2.1) proved to be a useful combination in defining alcohol dependence in the assessment of DUI offenders. Although the test was originally designed, among others, on DUI offenders, it has been criticized for the ease with which clients can deliberately and undetectable falsify responses (Myerholtz & Rosenberg, 1997; Otto & Hall, 1988 in Chang et al., 2002). Boland et al. (1998) say that this criticism of the MAST's transparency (obvious face validity) does apply equally for a lot of other assessment tools as well. Chang et al. (2002) concluded in their review that the validity of the MAST as a DUI screening instrument has not been established and that considering the widespread use of the MAST in the assessment of the DUI population, rigorous studies of these issues are urgently needed.

The DAST is a modified version of the MAST, geared towards non-alcohol drug abuse (Boland et al., 1998; Health Canada, 2004).

Mac Andrew Alcoholism Scale – Revised (MAC-R; Mac Andrews, 1965)

The original version of the Mac Andrew Alcoholism Scale – Revised (MAC-R) has been developed by Mac Andrews in 1965. The MAC-R is part of the wider Minnesota Multiphasic Personality Inventory (MMPI; Butcher et al., 1989). The MAC-R assesses with 49 true/false items personality characteristics related to (alcohol) abuse (i.e. harmful use) and dependence, without explicitly mentioning alcohol (Health Canada, 2004; Chang et al., 2002). Therefore this instrument is especially suitable for questioning individuals likely to deny problems with drinking when asked directly (Connors & Volk, 2003). The MAC-R can be administered in 10 minutes in pencil-and-paper or computer-based format.

Sutton (1994) found that a combination of MAC-R and MAST proves to be a useful combination in defining alcohol dependence in the assessment of DUI offenders. Chang et al. (2002) concluded in a review on common screening (i.e. assessment) instruments of DUI offenders in the USA, that the MAC-R together with the Alcohol Use Inventory (AUI; Horn et al., 1987) were the only two instruments in the report to show predictive validity for DUI recidivism. First results of a study reported by Chang et al. (2002) showed that the MAC-R detected about 67% of the recidivists and identified an additional 48% as problem drinkers. However, research has only been carried out on a single DUI-offender population and more information on the psychometric applicability of the MAC-R, or the whole MMPI, in the assessment procedure of DUI is necessary. Chang et al. (2002) highly recommend this instrument as it has demonstrated to have predictive validity. Further, they encourage researchers to validate this instrument in other DWI offender populations.

Substance Abuse Subtle Screening Inventory-II (SASSI; Miller, 1985)

The Substance Abuse Subtle Screening Inventory-II (SASSI) was developed by Miller in 1985. The test assesses substance abuse and includes questions that help the clients identify negative consequences of their use of alcohol and other drugs.

It consists of 62 true/false items with low face validity for substance abuse. Furthermore it provides 26 questions that help the clients to evaluate the negative consequences of their substance use themselves (Health Canada, 2004). Connors and Volk (2003) provide slightly different information on the number of items. They say that two versions of the SASSI exist, one for adults containing 93 (10 subscales) items and one for adolescents, defined as teenagers between 12 and 18 years, with 100 (12 subscales) items (Connors & Volk, 2003). The SASSI is free of charge. It can be self-administered within 10 to 15 minutes in a pencil-and-paper or computer-based format (Health Canada, 2004; Connors & Volk 2003). The authors of Health Canada (2004) state, that although the SASSI is quite widely used within the assessment of DWI in Canada, it has not been validated for this DWI population. Gray (2001 in Health Canada, 2004) found that the reliability is generally good for the direct scales but poor for the indirect scales.

Alcohol Use Inventory (AUI; Horn et al., 1987)

The Alcohol Use Inventory (AUI) has been developed by Horn et al. (1987) and addresses several domains critical to assessment of an alcohol problem. It is commercially available and probably one of the most expensive of all the instruments evaluated (Chang et al., 2002). It is based on multidimensional models of abuse which emphasise the uniqueness of each individual's alcohol problem (Allen & Columbus, 1995 in Boland et al., 1998; Chang et al., 2002; Eeckhout, 2005). The AUI consists of 228 items with 24 subscales addressing the following five aspects:

- benefits of drinking (e.g. is the alcohol use experienced as an activity that ameliorates the social skills, is alcohol perceived as a means to lower stress levels);
- drinking style (e.g. quantity, situations, associated compulsive behaviour);
- negative consequences of drinking (e.g. physical-, psychological-, social consequences);
- concerns about drinking (e.g. sense of guilt, concerns, seeking help);
- acknowledgement that drinking causes problems (Health Canada, 2004; Eeckhout, 2005).

The items consist of yes/no questions and multiple choice questions with 3 to 5 possible options (Boland et al., 1998). It can be administered in a paper-and-pencil or computer-based format in about 35 to 60 minutes (Chang et al., 2002). The questionnaire can also be administered as a standardized interview. In case the AUI is used in a self-administered format a combination with an interview is suggested (Eeckhout, 2005). The AUI can be scored quite quickly and easily by non-clinical but trained staff or by computer. Computer packages also offer interpretations (Boland et al., 1998). Horn et al. (1987) report a sufficient reliability and validity. Boland et al. (1998) say that psychometric work on test-retest reliability, internal consistency, and validity (content, predictive, concurrent, and construct) has been carried out.

The AUI is designed as an assessment tool rather than a screening tool (Chang et al., 2002) and provides useful information for further treatment planning (Boland et al., 1998; Eeckhout, 2005). Chang et al. (2002) suggest to use lower cut-off values for determining alcohol abuse and dependence when using the AUI with DUI populations, as the test has been developed and normed on a hospitalized population rather than a DUI population. The AUI does not evaluate other drug/substance use than alcohol use (Chang et al., 2002).

Addiction Severity Index (ASI; McLellan et al., 1980)

The ASI has been developed by McLellan et al. in 1980. It is possibly the most commonly used standardized instrument in the field of substance abuse. The ASI is free of charge and available in

several different languages. It provides an overview of problems related to substance abuse, both alcohol and illicit drugs. It can be used to assess both alcohol and drug use and it is free of charge. The ASI has been standardized on alcohol and drug abusers in a treatment setting. Its primary application is in guiding treatment planning and treatment outcome evaluations (Boland et al., 1998; Chang et al., 2002).
The ASI is administered as a semi-structured interview with 200 questions, which address the following six life problem areas (Eeckhout, 2005; Chang et al., 2002):

1. medical;
2. drug/alcohol use;
3. legal/criminal justice involvement;
4. family/social;
5. employment/financial support;
6. psychological/psychiatric.

In addition to these life problem areas, a part investigating personal and family background is included. The ASI addresses both recent and lifetime substance use (Boland et al., 1998).

For each life problem area the person is asked to indicate to what extent there is concern and to what extent he/she feels that treatment is required (on a 5-point rating scale). In addition to the client's self-report data, the interviewer rates his/her subjective assessment of the client's problem severity, the client's honesty about the problem, and client's understanding (on 10-point scales) (Boland et al., 1998). Each assessed problem area is thus composed of subjective ratings derived by the interviewer about the severity of the problem and of composite scores based on individual item responses from the patient. In case the patient appears to be misrepresenting information, the interviewer notes this in his report (Chang et al., 2002).

Multiple administrative assistance tools are available for the ASI (e.g., manuals, training videos, scoring guidelines), and a trained and experienced clinician or technician is required for competent administration (Boland et al., 1998).

The administration is time-consuming and takes between 45 and 60 minutes. Furthermore, the interviewer needs to follow a specific training to correctly administer the ASI. Dom et al. (2004) state that approximately two days need to be invested for the specific training of an ASI interviewer. Another criticism raised against the ASI is its lack of attention to problems specific for female populations (Boland et al., 1998).

The ASI had been widely used within clinical settings and has proven good test-retest reliability (average values between .83 and .89), good inter-rater reliability (cross-clinician severity ratings "virtually identical", with a reported average concordance of .89) and good concurrent validity in general (Carey et al., 1997 in Boland et al., 1998). Matthys (2004 in Ansoms et al., 2004) states, that the instrument is effective in the assessment of treatment planning and treatment outcomes. Boland et al. (1998) say that its widespread use in both assessment and treatment outcome studies has led to the establishment of a strong database of information in which one can place much confidence. Chang et al. (2002) point out that the ASI has not been tested or researched for use within a DWI sample and therefore, the normative statistics reported by these investigators may not be appropriate in DWI settings. Interviewers should be aware that the composite scores derived with ASI may not be as informative or as reliable as those derived with instruments developed specifically for use in DWI-offender populations. They furthermore criticise the length of this assessment tool in the DUI setting (Chang et al., 2002).

The ASI is clearly an elaborate assessment tool. Its complex assessment provides good information for diagnostics and further treatment planning (Eeckhout, 2005).

Kokkevi published in 1995 a European adaptation of the multidimensional assessment instrument for drug and alcohol dependence, the so-called EuropASI.

2.3.2.3 Diagnostic interviews based on DSM-IV or ICD-10 criteria

A number of instruments have been developed specifically to render diagnoses based on the criteria stipulated by the Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R; DSM-IV, American Psychiatric Association), or the International Classification of Diseases (ICD-10, World Health Organization, 1992). Information on the clinical criteria of abuse/harmful use and dependency can be found in chapter 1.1.2.1). As Boland et al. (1998) say these are typically clinician-administered structured interviews, and they assess a wide spectrum of psychiatric and psychological problems. Examples of these clinical measures are the:

- Structured Clinical Interview for Diagnosis (SCID), also known as the Psychiatric Research Interview for Substance and Mental Disorders (PRISM; Spitzer & Williams, 1987);
- Revised Diagnostic Interview for Children and Adults (DICA-R; Reich et al., 1990 in Boland, 1998);
- Diagnostic Interview Schedule (DIS; Robbins et al., 1989);
- Alcohol Use Disorder and Associated Disabilities Interview Schedule (AUDADIS; Grant & Hasin, 1992; Grant, 1996);
- Minnesota Multiphasic Personality Inventory (MMPI; MacAndrew, 1965);
- Millon Clinical Multiaxial Inventory (MCMI; Millon, 1977 in Boland, 1998).

Boland et al. (1998) say that these instruments are long and time-consuming, and were developed for use mainly in psychiatric populations. For these reasons, Boland et al. (1998) do not recommend them as optimal instruments for use in screening, or assessing for treatment planning of offender populations, although some have some history of use in the criminal justice system (e.g., the DIS; Breteler et al., 1996; and the MCMI; Weekes et al., 1997) (Boland et al., 1998).

2.3.2.4 Biological markers

Biological markers[9] of alcohol and drugs can provide objective information on substance use pattern in the DUI/DUID assessment procedure. Most important difference to the psychological measures is that they do not rely on self-reporting. They are thus not vulnerable to problems of inaccurate recall or reluctance of individuals to give candid reports of their drinking behaviours or attitudes (Allen, 2003) and, hence, are very suitable in the assessment procedure of DUI/DUID offenders (Allen et al., 2003; Eeckhout, 2005). Biological markers can be used in the screening and confirmation of recent consumption and intoxication, as well as, in the assessment of the consumption behaviour. They are for example used to monitor abstinence in case of restricted fitness to drive decisions using *alcohol contracts* after a DUI/DUID offence (see 2.2.1.2 Assessment Belgium).

A variety of body matrices can be analysed to detect use, abuse and dependence of alcohol and drugs (Allen, 2003; Wolff & Marshall, 2006).

The choice of biological marker depends according to Allen et al. (2003) and Eeckhout (2005) on the following considerations:

[9] A biological maker, respective biomarker, is a substance used as an indicator of a biologic state (Wikipedia, 2007a). Peterson 2004/2005 defines a biomarker as a specific biochemical feature (a compound or series of compounds) used to measure or indicate the effects or progress of a disease or condition (Peterson, 2004/2005).

- Which psychoactive substance is under examination?
- What is the context of the test? Does the test focus on results concerning recent consumption or on parameters which provide information on the consumption behaviour such as use-, abuse- or dependence of the substance?
- What is the nature of the tested population? Biomarkers may perform differently as a function of age, gender, ethnicity, health status or consumption behaviour of the respondent.
- What is the, as Allen et al. (2003) call it, "window of assessment" of the biological marker (i.e. the period of abstinence needed to return to normal levels of the marker)?[10]
- Which are the performance characteristics of the test? Most notable of these are sensitivity and specificity.

Furthermore it has to address the laboratory point of view, which requires of a biochemical measurement to be available, simple, quick, and inexpensive (if possible) and of minimal risk to the client (Wolff & Marshall, 2006).

This chapter is based on a systematic literature review in PubMed (detailed information on the search strategy can be found in annex) and key reference texts based on the expertise of members of the DRUID WP5 team.

The text presents an overview of current biological markers of alcohol and drugs. It focuses on those markers, which are commonly used in the assessment procedure of DUI/DUID offenders. The first part gives an overview of biological markers of alcohol. A detailed description of the most common laboratory indicators of heavy alcohol consumption, emerging markers and the discussion around combining different markers can be found in annex. The second part presents an overview of the discussion around biological markers of illicit drugs and commonly used body matrices which are used in these analyses. On overview of typical detection times of commonly used drugs and their metabolites can be found in annex. The presented psychometric characteristics of a test are based on common laboratory reference values. Reference values can vary widely and depend on the analytical methods.

Biological markers of alcohol

Biological markers can be used in combination with psychological tests to detect alcohol abuse and dependence (Matthys, 2004, 2004, Miller & Anton, 2004).

The Working Group on Alcohol Ignition Interlocks within the International Council on Alcohol, Drugs and Traffic Safety (ICADTS) (2005) roughly divides biological markers of alcohol into two groups: direct markers which directly reflect ethanol and indirect markers, which reflect an indirect consequence of ethanol exposure, as for example liver enzymes, such as AST (aspartate aminotransferase) and ALT (alanine aminotransferase), which are non specific indirect markers because they become elevated with alcoholic liver disease, as well as other liver disorders. They can be analysed in a variety of body matrices such as breath, serum/plasma, whole blood, urine or hair (see table below) (ICADTS, 2005).

Traditionally used biological markers of alcohol are: the physiological presence of alcohol per se, serum gamma-glutamyltransferase (GGT), aspartate aminotransferase (AST), alanine aminotransferase (ALT), mean corpuscular volume (MCV) and carbohydrate-deficient transferrin (CDT respectively %CDT), a protein that has received much attention in recent years. Except MCV, these

[10] In the analyses on illegal drug use, the literature rather uses the term "detection time" as in this case, the "normal level" is defined with a non detection of the illegal substance (Wolff, 2006).

indicators reflect the activity of certain liver enzymes. MCV refers to the volume of red blood cells (Peterson, 2004/2005, Eeckhout, 2005, Allen 2003, Wolff & Marshall, 2006).

Emerging biological markers to detect alcohol abuse and dependence are: plasma sialic acid index of apolipoprotein J (SIJ), total serum sialic acid (TSA), urine – and serum hexosaminidase, Phosphatidyl Ethanol (PEth), fatty acid ethyl esters (FAEE), whole blood-associated acetaldehyde assay (WBAA), ethyl glucuronide (EtG), 5-hydroxytryptophol (5-HTOL) and acetaldehyde.

Table 2: Selected biological markers of alcohol and their window of assessment in different body matrices

Biological marker	Indirect or direct marker	Window of assessment in different body matrices				
		Breath	Serum/plasma	Whole blood	Urine	Hair
Alanine Aminotransferase (ALT)	indirect		weeks			
Aspartate Aminotransferase (AST)	indirect		weeks			
Gamma-glutamyltransferase (GGT)	indirect		weeks			
Mean Corpuscular Volume (MCV)	indirect			weeks		
Carbohydrate Deficient Transferrin (CDT)	indirect		weeks			
Plasma Sialic Acid Index of Apolipoprotein J (SIJ)	indirect*		weeks			
Total Serum Sialic Acid (TSA)	Indirect		weeks			
Hexosaminidase (hex) also named N-acetyl-β-D-glucosaminidase	Indirect		days		weeks	
Alcohol/Ethanol (ETOH)	Direct	Hours	hours	hours	hours	
Phosphatidyl Ethanol (PEth)	Direct			weeks		
Ethyl Glucuronide (EtG)	Direct		hours		days	months
5-Hydroxytryptophol (5-HTOL/HIAA) ratio	Direct				days	
Whole blood-associated acetaldehyde assay (WBAA)	Direct			weeks		
Fatty Acid Ethyl Esters (FAEE)	Direct		days			months

* Based on an altered structure of a target protein

Data source: (ICADTS, 2005; Javors & Johnson, 2003; Allen et al. 2003; Borucki et al. 2004 ; Peterson, 2004/2005)

Although the level of interest in the development of these markers is high, no single marker has been found yet that has the diagnostic efficiency (combined sensitivity and specificity) of directly measuring the severity of alcohol consumption patterns (Wolff & Marshall, 2006). There is a general agreement on suggesting the use of more than one marker for the assessment procedure of alcohol ingestion (Bortolotti et al., 2006; Wurst et al., 2005b; Eeckhout, 2005; Wolff & Marshall, 2006; Allen et al., 2003; Miller & Anton, 2004; Niemelä, 2007). Allen et al. (2003) propose a combination which exists of GGT, CDT and MCV. CDT should be expressed in a percentage of total transferrin (i.e. %CDT) (Peterson, 2004/2005). MCV is the only traditional biomarker which does not show a gender effect, whereas others often perform better for men than women (CSAT, 2006; Mundle et al., 2000). For the discrimination between male alcohol abusers and hazardous drinkers the combination of GGT and CDT performs better than any of these single markers alone. For women, the best accuracy was provided by the use of GGT alone (Sillanaukee & Olsson, 2001). Sillanaukee & Olsson (2001) and Chen et al. (2003) concluded, that a compensatory model with the formula y = 0.8 x ln GGT + 1.3 x ln CDT, respectively y = 0.8 x ln GGT + 1.7 x ln CDT reached the best results. Schwan et al. (2004) proposes the use of CDT as a “first line” marker and GGT as a support for differential diagnosis

between alcohol abuse and alcohol dependence in individuals with high CDT (Schwan et al., 2004 in Bortolotti et al., 2006; Wolff & Marshall, 2006). Eeckhout (2005) furthermore confirms the usefulness of %CDT as a marker for follow-up. Once a base line value is established, fluctuations in %CDT provide significant information about changes in the amount of alcohol use.

Emerging biological markers, such as SIJ, TSA, hex, PEth, FAEE, WBAA and EtG seem to be promising. Preliminary findings on other combinations then GGT and CDT such as GGT and hex or combinations with FAEE or EtG, show good results, but further study is needed to evaluate the validity of these approaches.

Biological markers of illicit drugs

As well as for alcohol consumption, there are biological markers to examine illicit drug use patterns. Usually the psychoactive substance itself or its metabolites (both direct measures) are used as markers to identify illicit drug use. Indirect measures, which reflect the indirect consequence of consumed illicit drugs, such as liver enzymes (ICADTS Working Group on Alcohol Ignition Interlocks, 2005) are not common in the assessment of DUID).

Information on the severity of the consumption pattern can be based on the detection of polyvalent consumption of several drugs or variations of the detection times of a specific illicit drug (or its metabolites), as the detection time is among others depending on the amount of the consumed drug and can increase in case of chronic consumption (see for example cannabinoids and cocaine). The detection time of THCCOOH (inactive metabolite of THC) in urine for example varies from two days in case of occasional use to six weeks in case of chronic consumption (Wolff, 2006; Aderjan, 1998 in Brenner-Hartmann et al., 2005). The detection time of cocaine metabolites in urine extends form 1-3 days in case of occasional use up to 22 days in case of chronic use (Weiss & Gawin, 1988).

A variety of different body matrices can be utilised in the detection. The drug of interest, and the timeframe which the testing instance wishes to consider, influence the choice of the biological matrix. Wolff (2006) summarized the timeframe and test quality of the different matrices as follows:

- Blood gives the most accurate measurement of drugs currently active in the system.
- Urine test provides a somewhat broader time period than blood tests but with less quantitative accuracy.
- Hair provides a substantially longer timeframe.
- Tests on oral fluid provide information over a short timeframe. They are less advantageous than urine but beneficial in terms of procedural ease.

The detection time of the substance depends on many factors, as for example the dose taken, the severity of the consumption behaviour (i.e. use, abuse, dependence), the kind of administration of the drug, the nature of the molecule or its metabolites and inter-individual variations which may have influence on the metabolism of the drug (Vandevenne et al., 2000). In general, the largest window of assessment is found in hair, followed by urine, sweat, oral fluid, and blood (Verstraete, 2004).

The standard in drug testing is the immunoassay screening, followed by the gas chromatographic-mass spectrometric (GC/MS) confirmation performed on a urine sample (Kintz et al., 2003). Initial drug screen tests are non-specific. They identify only in a non-quantitative fashion the class of drug present, as for example opioid, amphetamine or benzodiazepine. According to the golden standard any positive test result should afterwards be confirmed by a second test working on different physicochemical principles from the screening test. The practical limitations to the extent to which

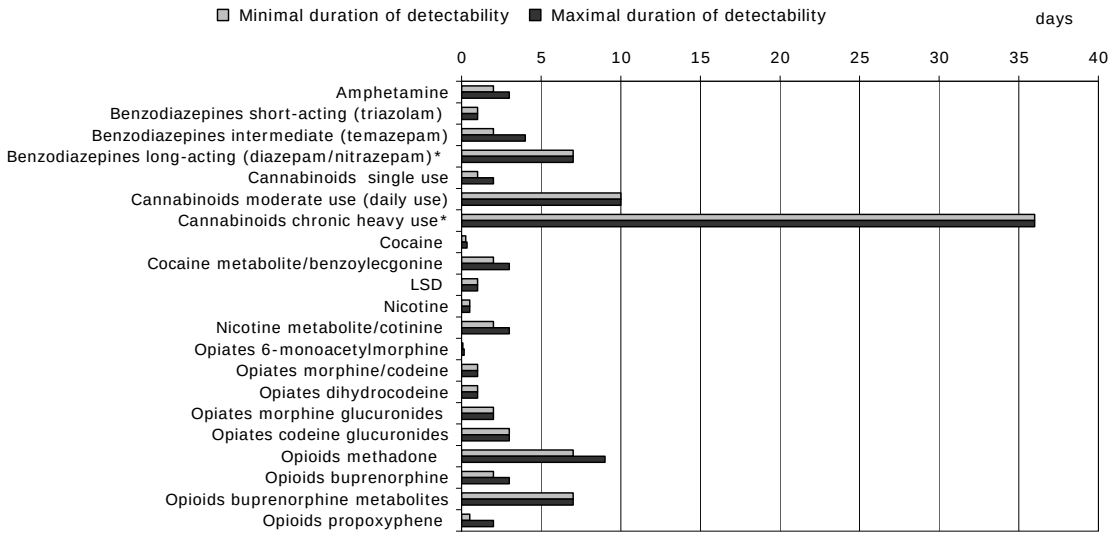
samples can be used, and the mechanism of collection and supervision of samples are critical to the procedure (Wolff, 2006).

Within the context of road side checks, blood and urine test are commonly used by the police. They can provide a good picture of the consumption behaviour over the last 3 days. In the assessment procedure of DUID this timeframe is far too limited. Information on consumption behaviour over time is necessary to differentiate between use, abuse and dependence. Furthermore, these tests cannot be used as an instrument to assess periods of abstinence of heavily consuming or drug depending individuals (Eeckhout, 2005).

The analysis of hair enables examination of a broader timeframe than blood and urine tests (Eeckhout, 2005). Since 1974, hair is being used in the identification and evaluation of chronic drug abuse. It differs from other materials used for toxicological analysis because of its unique ability to serve as a long-term storage of foreign substances (Pragst & Balikova, 2006). The detection time of a psychoactive substance depends on the length of the hair. Providing the client's hair is of sufficient length (hair grows between 0.8 and 1.3 cm per month) and thickness (50–100 strands are needed), a drug history of 3 months can be obtained (Wolff, 2006). The validity of the qualitative results of hair analysis is generally accepted (Kintz et al., 2003 according to Eeckhout, 2005; Sachs & Kintz, 1998). The main advantages and disadvantage of hair analysis compared to urine and blood samples are summarized in annex.

Cannabinoids and LSD are according to Wolff (2006) and Sachs & Kintz (1998) difficult to detect in hair, but recent development shows that it is possible (Eeckhout, 2005; Tagliaro et al., 2000). Furthermore, the slow clearance of cannabinoids allows a sufficiently wide diagnostic window in urine testing (Tagliaro et al., 2000). Eeckhout 2005 and Tagliaro et al. (2000) suggest for the assessment of DUID a combination of hair analysis with urinalysis. The following figure shows the approximate minimal and maximal detectability of commonly used substances and some of their metabolites in urinalysis.

Figure 8: Approximate duration in days of detectability in urine of commonly used substances and some of their metabolites



*Chronic heave use of cannabinoids is detectable for 36 days

Data source: Wolff, 2006

One of the most significant questions within hair analysis is to know the minimal dose of an illicit drug, which can be detected in a laboratory test. This is important in order to avoid falls positive results (e.g. passive consume or consume during a period before the timeframe of interest). A summary of the little existing data on this topic from can be found in Verstraete (2004, p. 204). An overview of approximate detection times of selected drugs and some of their metabolites can be found in annex.

Germany and Italy are using hair analysis in the assessment procedure of licence withdrawal and reinstatement (Kintz et al., 2003; Eeckhout, 2005). After being offended for DUID the person has to prove a certain period of abstinence by a hair sample (Montagna et al., 2000; Ricossa et al., 2000; Tagliaro et al., 2000). Kintz et al. (2003) conclude that only hair analysis is able to provide legal evidence on chronic drug abuse or sufficient abstinence periods. The authors propose that the assessment procedure of licence reinstatement in case of DUID should always be combined with hair analyses to evaluate if the period of abstinence was sufficient.

Pragst & Balikova (2006) point out, that hair analysis for drugs is, however, not a simple routine procedure and needs substantial guidelines throughout the testing process, i.e., from sample collection to result interpretation.

2.3.3 Model of change related tools

Motivation for change is one of the main predictors of effectiveness of rehabilitation (see chapters 1.1.8 and 1.2.5). This part gives an overview of tools that are based on the Transtheoretical Model by Prochaska & DiClemente (1983; see 1.1.8 for a description of the model)...

Readiness to Change Questionnaire (RTCQ; Heather et al., 1991)

The Readiness to Change Questionnaire (RTCQ) developed by Heather et al. (1991) is an inventory based on the Prochaska & DiClemente model (1983). If provides information on the “readiness to

change" of the assessed individual, which may be helpful for the further rehabilitation planning. The RTCQ has 12 items and can be administered in paper-and-pencil format within 2-3 minutes. No special administration training is required. Three different outcomes are possible: Pre-contemplation, Contemplation, or Action stage of change. Sample items include "I don't think I drink too much", "I enjoy my drinking, but sometimes I drink too much", and "I am actually changing my drinking habits right now". According to Boland et al. (1998) there is good inter-rater reliability, internal consistency, and validity (content, predictive, concurrent, and construct). Norms are available and the normative sample consisted of problem drinkers in a general hospital population (Allen & Columbus, 1995 in Boland et al., 1998).

Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES, Miller & Tonigan, 1996)

The Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES Version 8) is a measure of readiness to change that can be used in treatment planning. It was developed by Miller & Tonigan in 1996 and can be downloaded free of charge at the Center on Alcoholism, Substance Abuse, and Addictions (CASAA) University of New Mexico (CASAA, 2007): http://casaa.unm.edu/inst.html.

The SOCRATES Version 8 has two different forms: the Personal Drinking Questionnaire (SOCRATES 8A) and the Personal Drinking Questionnaire (SOCRATES 8A). Both forms are structured in the same way and assess with 19 self-reporting items the readiness to change in alcohol/drug-dependent individuals. In instrument can be administered in pencil-paper or interview format in about 5-10 minutes. The instrument assesses the following three scales (Miller & Tonigan, 1996):

1. recognition of the problem, or problematic use: acknowledgement of having problems related to their drinking/drug use, expression of a desire for change and to perceive that harm will continue if they do not change;
2. ambivalence: individual wonders if he/she is in control of drinking/drugs use, if he/she is drinking too much/ or using too much drugs, if he/she is hurting other people, or if he/she is depending. Note that the score of ambivalence has to be interpreted in relation to the Recognition score, as low scores of ambivalence could either be based on the knowledge that their drinking is causing problems (high Recognition), or because on the knowledge that they do not have drinking problems (low Recognition);
3. taking steps: doing things to make a positive change in their consumption behaviour, and may have experienced some success in this regard.

Scores are interpreted based on a sample of 1.726 adult men and women presenting for treatment of alcohol problems through Project MATCH. The individual scores are being ranked as low, medium, or high relative to people already presenting for alcohol treatment (Miller & Tonigan, 1996).

According to the authors, the SOCRATES has demonstrated reliability (Cronbach alphas 0.60-0.96 and test-retest from 0.82-0.94) and validity with adult samples (Miller & Tonigan, 1996). Figlie et al. (2004 according to Eeckhout 2005) analysed this instrument in a sample with 326 alcohol-dependent outpatients. The results showed that two correlated factors provided the best fit for the data and that there was less evidence to support a three-factor structure. To our knowledge this test has not yet been evaluated on a sample of DWI. As this measure was developed in a clinical setting on a sample of alcohol dependent individuals, this instrument may not be useful for the DWI assessment of the fitness to drive, as this population tends to negate substance related problems (see above), but it may be an interesting tool in the DWI assessment prior the assignment to DR programmes.

Form 90-DWI (Miller & Del Boca, 1994)

Hettema et al. (in press) is currently developing an adapted version of the existing Form 90 (Miller & Del Boca, 1994), the Form 90-DWI. The basic principle of the Form 90 is to combine in a structured interview the advantages of timeline follow-back and consumption grid methods. Usdan et al. (2002) have recently applied the timeline follow-back method to the assessment of DWI behaviour with promising results. Within the Form 90, a calendar is used to help reconstruct the drinking behaviour of the last 90 days. The new instrument, the Form 90-DWI, will follow the same format, but assess intoxicated driving (Hettema et al., in press).

3 Review of existing DUI/DUID rehabilitation measures

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This chapter provides an overview on DUI/DUID rehabilitation measures based on international literature analysis as well as on expert knowledge from DRUID WP5 team members and selected others who were asked to summarize the situation in their particular country. Contents of the chapter are the development of driver rehabilitation in Europe up to date (3.1.1), relevant research carried out on EU level until now (3.1.2), description of European standard group intervention (3.1.3), selected driver rehabilitation approaches in Member States (3.2.1) and outside Europe (3.2.2), a review on effectiveness studies of driver rehabilitation measures for DUI/DUID (3.3) and a survey on alcohol ignition interlock devices as a structural intervention measure for driver rehabilitation (3.4).

Although this chapter documents the scope of current driver rehabilitation approaches in major parts of the world, it does not contain a detailed documentation on programme level in Europe. This is subject of the empirical part of the state-of-the art analysis which can be found in part II of this deliverable. Moreover, rehabilitation measures regarding addiction treatment including substitution therapy are not included in this part. As this topic has not been focused on in the frame of driver rehabilitation so far, it was decided to deal with it in a separated chapter (see chapter 4).

3.1 Origin and spreading of DUI/DUID rehabilitation in Europe

3.1.1 Development of driver rehabilitation in German speaking countries

In the late 1960s and early 1970s first initiatives to implement DR programmes in Europe were taken by some countries, above all Germany, followed by Switzerland and Austria. Its coming up was based on three facts: Firstly, the recognition that driving is a learned behaviour, and thus can be influenced or changed. Secondly, fines and/or withdrawal of driving licence are not always sufficient for behaviour modification. Thirdly, measures helping to re-establish fitness to drive were needed supplementary to driver assessment. Along with the introduction of driver rehabilitation at that time, the largely static model of fitness to drive changed in favour of a dynamic one, which did no longer just divide drivers into those who are fit and those who are unfit. It rather assumed that potentially each driver could acquire dangerous types of behaviour relevant for driving - especially due to “positive” learning experiences in daily traffic -, but also that safety endangering behaviour can be corrected by specific learning processes (Bukasa, 2007). Thus, rehabilitation programmes developed for drink driving offenders in Europe are person-based interventions (psychological, therapeutical, and educational). They focus on a change of the individual problem behaviour that led to the offence in traffic and they aim at establishing safety oriented attitudes and behaviours in order to minimize re-offences in future. The main approach is discussion and self reflection supported by learning and information material.

The driver improvement (DI) programmes were firstly developed for drink driving offenders and were put into practice in Germany in 1971 (Winkler, 1993). Switzerland followed in 1972 (Huguenin, 1989). In Austria, the first rehabilitation programmes for imprisoned drink driving offenders who caused accidents with severe personal damage or deaths were conducted in 1976 (Schmidt et al., 1979) and since 1977, traffic licensing authorities started to assign multiple repeated drink driving offenders outside prison to these courses on a case to case decision as a prerequisite for licence reinstatement (Panosch, 2001).

Quantitative and qualitative scientific research accompanied the development of DR from the beginning, on the one hand in order to optimize the measures and procedures continuously and on the other hand in order to prove its relevance for traffic safety. When the first evaluation studies in Germany, Switzerland and Austria demonstrated these programmes' effectiveness on recidivism (e.g. Michalke et al., 1987; Huguenin, 1989; Jacobshagen et al., 1988), DI courses for drink driving offenders gained increasing importance and a step by step process of integrating this measure into the licensing system of these countries started.

Together with the development of the rehabilitation measures on the national level, Germany, Austria and Switzerland started to pool their findings and to foster the exchange of knowledge on this topic. From 1978 on, the German BASt, the Swiss bfu and the Austrian KfV started to organize so-called Driver Improvement Workshops, held at regular intervals (every four years, see e.g. Zuzan & Michalke, 1989). These workshops contributed considerably to the widespread of driver rehabilitation in Europe. In 1997, the group of participants expanded broadly: professionals and experts from 17 European and other international countries joined the workshop. In October 2001, the seventh and last of these Driver Improvement Workshops took place in Salisbury, Austria. It was the first "International Congress on Driver Improvement" with four hundred experts from 15 countries participating.

Regarding rehabilitation programmes for DUID offenders, first developments in Europe started in the late 1990s only. In general, experience and knowledge from courses with drivers under the influence of alcohol served as a model for DUID courses as well. In Germany, rehabilitation courses for drug driving offenders are running since 1997 (Ziegler et al., 1998). Although in Austria first experiences were made with DUID offenders who were assigned on a case to case decision by driving licensing authorities, this course type was legally implemented in October 2001 only. Due to an increase of drug impaired drivers in some Member States, the DG TREN expert group on alcohol, drugs, medicines and traffic safety considered the issue of DUID rehabilitation for the first time in 2001. In a paper on this topic the following was stated (Bukasa & Christophersen, 2001*:* "In several countries, the sentence for driving under the influences of drugs is suspension of driving licence, fines and/or imprisonment. These reactions may not be adequate regarding drugged driving, as the recidivism rate is very high (e.g. approximately 50% re-arrest rate during 3 years in Norway). Therefore, in analogy to drunk driving, additional psychological rehabilitation may be a promising approach in order to change attitudes and behaviour and thus to reduce the number of repeated drug-driving offences as well." Yet, the authors stated that empirical evidence on the success of rehabilitation courses for DUID offenders is still lacking.

Meanwhile, driver rehabilitation for drink driving offenders is no longer an activity of the German speaking countries. It has become Europe-wide spread and has been implemented in many Member States. Driver rehabilitation for drug-driving offenders has started as well, although its conduction is still far less frequent compared to for alcohol offenders. In 2002, DR programmes for DUI offenders were carried out 10 European countries (Austria, Belgium, England & Wales, Finland, France, Germany, Italy, The Netherlands, Portugal, Switzerland) in one or another way, while rehabilitation for DUID offenders was conducted in one Member State (Germany) only (Bartl et al., 2002). Due to the specific national situation and traditions in this context, the development of DR was not a uniform one in Europe. Rather a variety of at least partly different developments took place.

The actual utilization of DUI/DUID driver rehabilitation in Member States including Switzerland is documented in part II of this deliverable.

3.1.2 Previous research on EU level

As over the years the interest in DR in Europe steadily grew, first initiatives were also taken on EU-level to investigate this measure in order to evaluate its benefits for all Member States. Especially the EU-projects ANDREA but to a certain part SUPREME as well evolved within this context.

3.1.2.1 EU-project ANDREA

The transition of DR research from national to EU level started with ANDREA (Bartl et al., 2002). ANDREA (Analysis of Driver Rehabilitation Programmes) was specifically dealing with rehabilitation measures for different traffic offenders. It gave a first picture of the scope of DR in Europe, its approaches, conduction and factors of effectiveness. Not only DUI/DUID rehabilitation measures were investigated, but also driver improvement courses for drivers with multiple general traffic offences were examined.

The programmes referring to DUI/DUID described within the project were the following (in alphabetical order of countries):

- Austria: Courses for drivers on probation with an alcohol offence (A-courses);
- Belgium: Educational programme for traffic offenders (including DWI);
- England and Wales: Drink Impaired Drivers' programme, drink/driver rehabilitation courses, National Driver Improvement Scheme;
- Finland: Traffic safety training for persons sentenced by court to community service for drinking and driving;
- France: Sensitization to causes and consequences of traffic accidents (including DWI);
- Germany:
    - ALFA (Driver improvement for novice drivers with an alcohol or illegal drug offence within period of probation);
    - IFT (course for DUI offenders during suspension period);
    - IRaK (Driver rehabilitation for DUI offenders based on "Individualpsychologie");
    - LEER (Rehabilitation for DUI offenders);
    - DRUGS (course for DUID offenders);
- Italy: traffic psychological training (for DUI);
- Netherlands: Educational Measure on Alcohol and Traffic (EMA);
- Portugal: Driver rehabilitation programme for drink-driving offenders;
- Switzerland: Bfu - course for repeated drink-driving offenders.

ANDREA carried out a questionnaire survey in the Member States and Switzerland in order to get information about existing rehabilitation programmes at that time. The questionnaire consisted of 35 questions in total referring to the following two parts: i) general frame conditions (20 questions on aspects like name of programme, provider, target group, consequences of participation, costs, duration of measure, information on trainers) and ii) quality criteria of the measure (15 questions regarding aspects such as aim of the programme, circumstances of participation, duration, setting, trainer qualification, programme laid down in a manual, introduction of a quality control system). ANDREA gave a detailed overview on the results.

Overall evaluation of the results (including effectiveness studies), led to the following recommendations (Bartl et al., 2002, p. 129):

"Specific types of DR courses have proven to change attitudes and behaviour of traffic violators positively. The following preconditions must be fulfilled:

1. The programme must fit to the specific deficits of the target group. At least the major distinctions between alcohol and other than alcohol offenders and between novice and experienced drivers are recommended.
2. The staff must be educated sufficiently to set up a professional working relationship with problematic and resisting clients who are not concerned about their problems.
3. The methods applied shall rather be personal self-reflection instead of teaching. Tailored interventions are better than a fixed programme scheme.
4. The course sessions shall run over weeks in order to make also use of the time between the sessions, because change in attitude and behaviour needs time.
5. The group size shall be about ten participants.
6. A transparent and objective client selection system is as important as a consequent police surveillance to make the order to participate more acceptable for the clients and to avoid that it is attributed just as bad luck.
7. Quality assurance primarily is the responsibility of the state as the main customer is the public. Programmes shall be approved by an official institute which proves the contents of the programme and if the following preconditions are fulfilled:
    - The programme must be laid down in a written manual.
    - Basic, specific and further education of staff must be defined.
    - Programme evaluations must be carried out."

Information on the current situation in Europe on these issues can be found in part II of this deliverable.

3.1.2.2 EU-project SUPREME

The EU-project SUPREME (European Commission DG TREN, 2007a) focused on best practices in road safety in the Member States plus Norway and Switzerland. For this purpose, a list of potential best practice measures was established. In this list, driver rehabilitation was included amongst others. Data collection was carried out by means of country experts who were asked to give information on these measures currently in use.

The measures provided by the country experts to the SUPREME team were analyzed according to a selection process which included the following evaluation criteria:

- the measure causes sustained reduction in road accident rates;
- the effects of the measure are evidence-based and/or the effects are expected to identify risk factors (which were influenced positively by the measure);
- the measure must be sustainable successful, repeatable, applicable in a clearly defined and sufficiently large sector;
- the measure must be easily transferable (and not marked to regional peculiarities), cost-efficient and accepted by the authorities and those affected.

The main selection criterion was that the measure should have proven its effectiveness in reducing traffic injuries and/or fatalities. The included driver rehabilitation measures were not limited to DUI or DUID offenders. Besides, a literature review on driver rehabilitation measures was carried out.

Regarding DUI/DUID, the following rehabilitation measures were submitted by the country experts:

- Austria: Mandatory Driver Improvement for DUI/DUID offenders;
- Belgium: Educational courses for young DUI offenders;
- Netherlands: Educational Measure Alcohol and Traffic (EMA);
- Portugal: Rehabilitation of driving offenders;

- Switzerland: Training course for recidivist DUI offenders.

After the analysis of the literature and the submitted interventions, SUPREME concluded that driver rehabilitation measures "represent a complementary high risk group intervention that not only reduces relapse rates (and thus improves traffic safety) but also improves quality of life for many of the participants" (European Commission DG TREN, 2007b, p. 73). Yet, none of the submitted measures was assessed as best practice because none could have been evaluated by criteria of reduced injuries/fatalities. This is not a surprising result as these criteria do not fit for evaluating the effectiveness of driver rehabilitation (the usually applied traffic safety criterion is recidivism; see also 3.3).

Nevertheless, SUPREME defined the following best practice criteria for driver rehabilitation (European Commission DG TREN, 2007b, p. 73):

- "early intervention (after the first serious offence);
- mandatory participation;
- specific courses for different target groups;
- allocation to courses based on diagnostics;
- contents of intervention focused on self-reflection and change in behaviour;
- educational and therapeutic methods of intervention;
- consideration given to the cultural and ethnic background of offenders;
- highly-qualified course leaders, who are independent of authorities;
- several course meetings during several weeks, follow-up".

The SUPREME report "Implementation of DR at the country level" (European Commission DG TREN, 2007c) provided information on DR, but it was not restricted to DUI and DUID offenders. Thus, many of the countries identified as having introduced some kind of DR measure do not carry out DUI/DUID rehabilitation until now. The actual situation on this topic is documented in part II of this deliverable.

Regarding those rehabilitation measures that didn't fulfil the SUPREME best practice criteria, the authors stated that the weakest points were the assignment procedure and the contents of the courses. In several countries the course is the same for all offenders, irrespective of the type of offence or offender. In other countries, the courses are only proposed by judges or prosecutors without any decision criteria. The contents of the courses are, in many countries, not based on any psychological background but consist of mere provision of information or of a repetition of the same driver education courses that are obligatory for obtaining a driving licence. None of the countries could report a short time lag between offence and measure or a systematic effort to adjust courses to the ethnical background or language of participants.

3.1.3 Description of European standard group intervention

The European standard group interventions have been developed and optimized for the target group of traffic offenders, mainly alcohol offenders. Besides some variations depending on different national legal frame conditions, there are common features which will be described in the following.

As the programme lasts over several weeks, with the same course leader and course participants, the sessions are built up upon each other depending on the group progress. In general, the first session focuses on establishing an open, trustworthy group climate and on establishing the willingness to work on the problem behaviour, but also to clarify the frame conditions of participation. In this phase, it is very important to give the opportunity to the participants to speak out their frustration, anger, shame or reluctance to participate. Another issue is to clarify the course leader's role and his or her

confidentiality as very often participants are worried to get instructions and lessons from a teacher including examinations like during school or driving school. At this point, the course leader's task is to give space for these apprehensions, but at the same time to show and make clear that there will be mainly discussions in the group and that each participant could feel free to give contributions. For the group cohesion, it is also important that each participant introduces him- or herself to the others which can be done directly in front of all others or by means of so called partner interviews.

When the initial phase is finished, the first attempts to content related topics can be made, e.g. collection of relevant themes which should be discussed during the course, collection of the main conditions or factors which led to the drink-driving offence. Based on this, common goals can be identified and an agreement on the further steps can be made more easily. Very often, participants have questions about their individual situation or next steps to get the license back. This again gives the opportunity to include the experiences of other course participants. At the end of the first session, a short feedback of each participant can provide information on the group climate reached so far.

In the next following sessions – the exact number varies according to national regulations – the main issues dealt with are directly or indirectly related to the DUI offence. This includes self-estimation of alcohol related impairments and contrasted with objective results, prior and actual drinking habits and interferences with driving, prior drink-driving habits, motives for alcohol consumption, influence of friends, colleagues, peer group members on ones one alcohol consumption, basic physiological information on alcohol, importance of car use in private and professional life, negative consequences of loss of driving license, detailed analyses of the DUI offence that led to the course participation, establishment and/or reinforcement of change motivation including individual homework tasks between sessions, e.g. avoiding alcohol consumption in a local at the weekend or keeping an alcohol consumption diary.

In the final course phase, the future behaviour regarding drinking and driving is the main focus. Thereby, potential strategies, plans and intentions to avoid re-offences in traffic are collected and discussed against the background of the individual constellation of the problem behaviour. Based on a rather strong group openness and trustworthiness developed until then, realistic solutions can be worked out and unrealistic ones can be problematized. In the exit phase it is important to reinforce the offender that he or she is in the position to realize the personal goals in order not only to get the license back but also to keep in future.

3.2 Different scope of DUI/DUID rehabilitation procedures

3.2.1 Selected current approaches in Europe

In order to show the scope of rehabilitation approaches in Europe currently in practise, the situation of a selected number of countries is documented more in detail. Decisive for the choice of the included countries was that they cover different scenarios: voluntary versus obligatory access for the offenders, more educative versus more therapeutic approach, assignment within a penalty point system or not, assignment due to administrative law or due to court decision in individual cases. Moreover, the geographic perspective was considered as well: countries from Southern, Central and Eastern Europe should be represented. Thus, Austria, Belgium, France, Germany and Hungary were selected.

Despite Hungary, the presentations were done by DRUID WP5 team members of the respective country. Regarding Hungary, a country expert described the national procedures and respective legal framework.

In addition to the information provided in the following, further information on the DR system in these countries as well as in other European countries can be found in the empirical part II of this deliverable.

3.2.1.1 Austria

General issues and legal framework

Austria has got a tradition in DR for more than 35 years. DR measures like driver improvement (DI) or nowadays the so-called “Nachschulung” (DR) are well-established and approved measures for certain offender groups.

The aim of the Austrian DR is to discuss and reflect the traffic violations or reasons that led to the demand of the authorities to participate in a course. Furthermore, a connection should be set up in the course between the offence, the individual behaviour and attitudes that led to the offence. Corrections, at least rudimentary should be made and more safety oriented attitudes and new behaviour should be worked out on an individual basis in order to prevent re-offences in traffic.

Along with the scientific evidence of the effectiveness of the Austrian driver rehabilitation approach (see 3.3.1) DR became a key element of the licence on probation which came into force in 1992. For the first time DR was introduced as an obligatory measure for novice drivers who violated defined traffic rules within the licence on probation period. The next spreading of DR in Austria took place in 1997 when DR became a compulsory measure for all drink-driving offenders with a licence suspension due to a BAC of 1.2‰ and more. The time period of licence suspension is at least 3 months if the BAC ranged between 1.2‰ and 1.59‰ and if the BAC is 1.6‰ or more or if the offender refuses the alcohol breath test the licence withdrawal is at least 4 months. It was established that the driving licence would only be re-granted after having participated in the DR measure. Moreover, in 2002, when the legal base of DR was established with the so-called Führerscheingesetz-Nachschulungsverordnung (Driving Licence Law – Driver Rehabilitation Act, FSG-NV, 2002), DR courses for DUID offenders were introduced as well. Since then, the course types, the aims, frame conditions and requirements for providers of driver rehabilitation courses, etc. have been fixed.

In 2005 a further spreading of DR took place, when the so-called Vormerksystem (similar to penalty point systems in other countries) was introduced in Austria which includes obligatory DR in certain cases as well (see below).

For many years the KfV was the only authorized organisation to carry out driver rehabilitation. Since the FSG-NV came into force, 11 organisations have been authorized by the Ministry for Traffic, Innovations and Technology (BMVIT) to provide DR services until now (for more details see part II of this deliverable. A DR provider has to fulfil certain requirements in order to be authorized. The requirements which are laid down in the FSG-NV as well are the following:

- organisational structure: having an entity in order to guarantee a standardized conduction of the courses all over Austria;
- appropriate room and settlements in at least 6 provinces;
- at least 6 trainers with special standardised education and further training;
- an appropriate conception of the course (course model);
- an accompanying control of the courses;
- availability of training vehicles.

The requirements for course leaders are defined in the FSG-NV as well. The person has to be a psychologist (according to § 1 Psychologen-Gesetz - Law for Psychologists, 1991). Moreover, the following additional criteria have to be fulfilled:

- 1.600 hours professional experience in the scope of in traffic psychology;
- 160 hours post gradual education in traffic psychological theory;
- 160 hours introduction in therapeutic intervention techniques;
- special education on the course model (20 hours theory, 2 courses as a co-trainer and 3 courses under supervision), and additionally;
- all course leaders have to undergo every year an 8 hours further education, supervision and intervision.

Concerning the effectiveness of the programmes, the FSG-NV states that each provider gets its recidivism rate in a five year interval from the Central Driving Licence Register via the BMVIT. In case of high recidivism rates the provider is obliged to make corrective actions or it can be decided that the provider is not allowed to continue its services until evidence for success of the courses has been shown.

General rehabilitation approach

In Austria, driver improvement is conceptualized as an attitude and behaviour modification training in order to prevent further traffic offences. The focus of the approach is more therapeutic and less pedagogic/educative. Therefore, DR courses can be carried out only by specially trained psychologists as already mentioned above.

In general, courses are carried out in group settings because group interaction processes and feedback from peers are important elements in the course conception in order to initiate self-mirroring, self-reflection, attitudinal and behavioural modification in a rather short time.

The Austrian Road Safety Board's programme is an example of an integrative training programme structured in a modular system (Schmidt et al., 1992). This means that different course modules can be applied depending on the group compositions, i.e. the different participants, their problem situations and needs. Modules are available for initiating and intensifying group dynamic processes, for non-directive therapeutic interventions as well as for self-reflection and self-assessment interventions, for verbalization of ones emotions, etc. Moreover, psycho-dramatic and cognitive-behavioural elements are included.

Obligatory DR programmes

In Austria, according to the FSG-NV the following types of courses are defined for DUI/DUID:

- ***DR for alcohol offenders***

  Course in a group setting, 15 course units, and every unit takes 50 minutes; at least to be divided over 4 different group sessions. Target groups are:

  - Novice drivers holding a licence on probation, who exceeded a BAC of 0.1‰ and other alcohol offenders having exceeded a BAC of 1.2‰ or with repeated offences or having refused the alcohol breath test. (Special form: DR within frame of "Vormerksystem").

  Course consisting of 6 units at 50 minutes, at least in 2 group sessions:

  - For offenders having two offences in the „Vormerksystem" and thereby at least one alcohol offence with a BAC between 0.5‰ and 0.79‰ within a two years period.

- **DR for other problems**

  Course in group setting, 15 course units (50 minutes each), at least divided over 4 group sessions for:

- Novice drivers (licence on probation) and non-novice drivers, who drove while impaired due to drugs or medication.

The assignment of participants to a special course model is done by the authorized organisation.
In special cases the course may be conducted as one-to-one-intervention, e.g. for persons who have difficulties with the language or with communication problems, persons who cannot work in group settings and persons with handicaps. In case that a participant did not attend one course session, he or she has the possibility to make up the missed session, which can be done in a single setting. In case of a DUI or DUID re-offence within 5 years, the offender has to undergo DR again, but with an additional course session which can be carried out in a single setting as well.
The costs of participation in a DR course are regulated by law, and the participants have to pay the fee by themselves. At present, the fee for participation in group courses is 495 EUR and in one-to-one-intervention 515 EUR.

As soon as the course is finished, i.e. the participant has fulfilled his or her participation duties (see below), the DR provider delivers a certificate on attendance to the traffic authorities and the participant.

If there is a demand from the traffic authorities to undergo a traffic psychological assessment and a DR programme, the driver has to attend the traffic psychological assessment first. In this case, the traffic psychological assessment and DR course can not be conducted by one and the same psychologist.

The DR system for obligatory course participation is presented in the following picture:

Figure 9: The driver rehabilitation system in Austria

General issues on obligatory DR course conduction

The following requirements have to be fulfilled by DR providers in Austria as they are defined by the FSG-NV:

- group sessions with 6 to maximum 11 participants (the group consists of the same members throughout the entire course);
- division of course units on preferably equal time spans over 22 to 40 days; an exception exist for the DR within “Vormerksystem” where the minimum time span is 7 days;
- maximum one course session per day;
- time span between two course sessions has to be a least 2 days.

Moreover, the participants have to fulfil the following requirements:

- attendance of all course units;
- sufficient co-operation in the course units;
- being sober in all course sessions (tested by alcohol breath tester at least once during the course; BAC limit of 0.1‰ was not exceeded);
- payment of the course fee.

Additional voluntary DR programmes

- ***Courses in prison***

In Austria, a programme for imprisoned traffic offenders exists since the very beginning of DR in 1976 (Klebel et al., 1977) at the KfV. Yet these courses are of minor importance. By the end of every year, as a stimulation for Christmas amnesty, some prisons offer DR courses on a voluntary base for DUI offenders who had been convicted to imprisonment due to having carelessly caused an accident with heavily injured persons or even fatalities while being impaired by alcohol.
This course model consists of 3 group sessions of 2 ½ hours and 1 one-to-one interview at the end of the course.

- ***Diversion courses***

In 2000, the so-called "Diversion" was adopted into the Austrian criminal law. In case of a traffic accident with violation of other persons, the intoxicated drivers (DUI or DUID), may choose:

- either to have the normal criminal procedure, that may be followed by a sentence and a registration of the criminal record, or
- to have an alternative measure (diversion) proposed by the public prosecutor or the court which the offender can accept and follow on a voluntary base.

The duration of the diversion course, provided by the KfV, depends on the seriousness of guilt. Due to the small numbers, the courses are normally carried out in a one-to-one intervention setting:

- courses for slight guilt: three one-to-one sessions (50 minutes each) during a period of 4 weeks;
- courses for medium guilt: five one-to-one interventions (50 minutes each) during a period of about 6 weeks.

3.2.1.2 Belgium

Legal framework

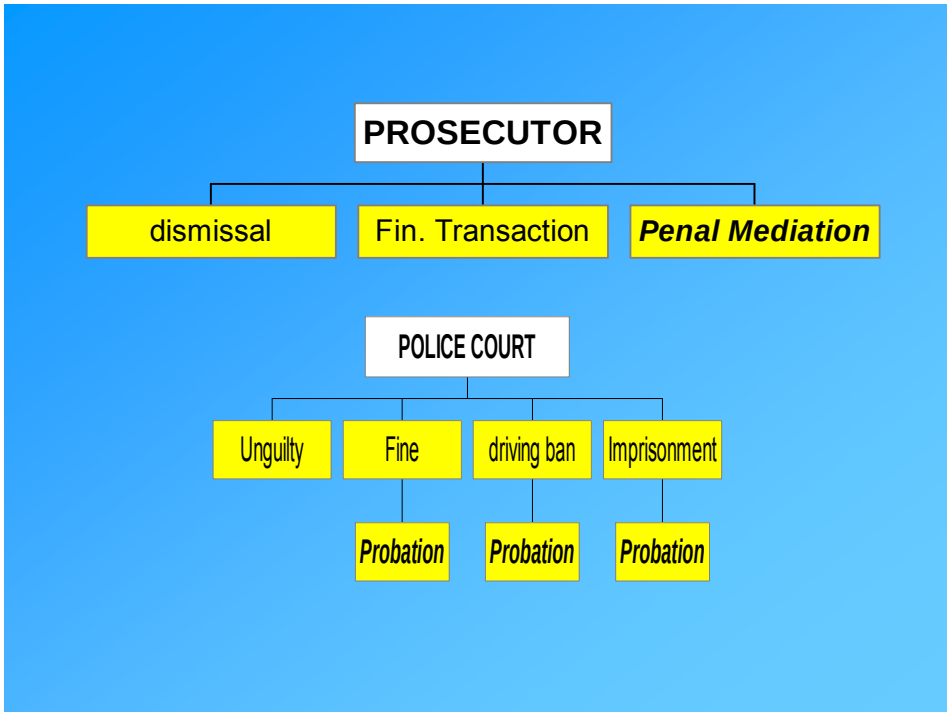
Since 1996, the Belgian Federal Public Service of Justice has recognized and subsidized DI[11] courses, as alternative measures for traffic offenders (Royal Decree of October 6th 1994 on punishment and educative projects). Within this scope the IBSR/BIVV is the only legally recognized provider which established specific DI courses for the group of DUI/DUID offenders.

A DI measure can be proposed on two levels:

1. as an alternative measure at the level of the public prosecutor (via penal mediation), where other measures on this level are a payment (called "financial transaction") or the dismissal of the case. In case of a penal mediation there is neither a legal action, nor a police record; or
2. as a demand within probation at the level of the police court, where the judge pronounces a fine, a withdrawal of the driving licence or even an imprisonment which can be replaced by or completed with a DI course.

[11] Driver improvement (DI) course is the official term of the Belgium law. Thus, this term will be used within this county description. The term is equivalent to driver rehabilitation.

Figure 10: Overview of the legal framework of DI courses in Belgium



The following part describes the legal frame of DUI/DUID rehabilitation measures in more detail.

The Traffic Law (31/03/2006) classifies DUI/DUID offences into five categories based on their severity:

1. BAC ≥ 0.5‰ < 0.8‰ (equivalent to a BrAC ≥ 0.22 mg/l < 0.35 mg/l);
2. BAC ≥ 0.8‰ (equivalent to a BrAC ≥ 0.35 mg/l);
3. state of drunkenness or equivalent state due to the use of drugs or medicines;
4. recidivism for DUI ≥ 0.8‰ or for state of drunkenness or equivalent state after the use of drugs and medicine;
5. refusal of breath or blood analysis without valid reason.

The category determines the type of sanction and the legal procedures to be followed. The more dangerous the offence, the heavier the sanction, counts as the general principle.

For the first category, the police can automatically give a fine (called “immediate payment”).

For the more severe offences, the police have to make a report of the offence and send it to the public prosecutor who can decide whether to bring the offender to police court or to propose an alternative for further prosecution (alternative measure). An alternative measure can be a payment (called “financial transaction”), a kind of community work or an educational measure (like a DI course). The choice to propose an alternative is thus up to the public prosecutor. The law only mentions a few restrictions (Law on Probation, 10/02/1994):

- Financial transaction: there are guidelines for the amount;
- Community work: max. 120 hours;
- DI course: no prescriptions.

The possibility to propose an alternative sanction is limited though. The directives on DUI offenders for the public prosecutors (College of Public Prosecutors, 2006) state that no alternative measure is proposed if the driving licence is already withdrawn for preventive reasons or for DUI offenders with a

BAC >1.6‰. Furthermore, the procedure to propose a DI course within penal mediation is exclusively for young drivers (<26 years).

Very serious offences are always brought to police court by the public prosecutor. At that level the judge can announce a fine in combination with a deprivation of the right to drive. In some cases the judge can also pronounce an imprisonment and/or even a confiscation of the vehicle. Sentences can be pronounced 'effectively' or 'conditionally', the latter meaning that the sentence will only be carried out effectively in case of not fulfilled probation conditions.

In case the judge puts the execution of the sentence conditionally, he lets the offender off with probation. A judge can only propose a DI course as an alternative within the scope of probation. It is then up to the offender to accept this or not. When it is not accepted the original sentence will have to be carried out though.

In summary, on the level of the public prosecutor DI courses can be proposed as an alternative for further prosecution, and on the level of the police court, DI courses can be proposed by the judge as probation condition in replacement of sanctions like fines.
The DI courses, provided by the IBSR/BIVV, are the only legally based and recognized alternative measures for traffic offenders within penal mediation and probation. Regular rehabilitation or treatment can nevertheless also be formulated as a condition within probation (e.g. Anonymous Alcoholics - AA), but these are not recognized as alternative measures.
Although the decision to accept a DI course is strictly speaking voluntary, the offenders are quite forced to make this decision as the alternative would be either to be brought to police court, or having to execute the full sentence.

There are no legal regulations on the DI programmes' structure and content, or on frame conditions like the trainer/course leader qualification etc. The DI courses are free of charge for the offender. They are financed by the Federal Public Service of Justice.

Legally recognized DUI/DUID rehabilitation: DI courses (IBSR/BIVV)

The DI courses are legally recognized as alternative measures within penal mediation and probation and financed by the Federal Public Service of Justice. The IBSR/BIVV provides three different DUI/DUID courses: two for novice drivers (one for DUI and one for DUID offenders) and one for DUI recidivists. The IBSR/BIVV carries out the courses for the DUI offenders, and two other organisations, INTRO and DELTA, carry out the DUID offender course for young drivers.

The three courses are constructed on the same basic plan. The content of the courses is based on the particular needs of each target group. Group discussions, short video extracts, articles and role-playing are the main methods used for confronting participants with the risks associated with their DUI/DUID behaviour. The primary approach of the courses is informative and educational, including main principles from group dynamics and the behavioural model of Ronis et al. (1989).

The main principles behind this model are (Wuyts et al., 1997):

- Information and education: Participants are informed about the risks of their driving behaviour.
- Behavioural therapy: Driving behaviour is learned behaviour. Learned behaviour can be altered. In this way, behavioural alternatives can be mastered by practice and be stabilised (e.g. resistance to group pressure). Also cognitive behaviour techniques are used, for example self-control, rational emotive therapy or restructuring.

- Social interaction: Driving behaviour is based on a process of social interaction. The DI programmes are based on the mutual influences of the different participants (group dynamics).

The general objective of the DI courses for DUI/DUID offenders is to prevent DUI/DUID recidivism. In order to achieve this main goal, two sub-goals have been defined:

1. knowing the consequences of DWI (safety, juridical, insurance, health, etc.);
2. reflection on drinking behaviour / drugs use, importance of the use in life, etc.

On an operational level this means:

- to make the offender aware of his/her behaviour in the sense that he/she recognizes the possible physical and emotional damage from this behaviour (e.g. “I’m responsible for my actions”);
- to make the offender aware of all the stimuli that interfere in the developmental process of his/her driving behaviour;
- to teach the offender alternative behaviour to cope with stress and frustration in traffic;
- to modify his/her attitude with respect to traffic safety (e.g. “I’m more aware of other people in traffic and I will be a more social driver”);
- to modify his/her attitude with respect to the law in general.

The main themes which are addressed within the DUI/DUID rehabilitation programmes are:

- substance information;
- legal consequences of DUI/DUID behaviour;
- effects of alcohol/drugs on driving skills;
- difference between consumption and alcohol/drug abuse;
- lifestyle;
- leisure time;
- life goals.

Until today, the DI courses for DUI/DUID offenders play a marginal role within legal penalties for these traffic offenders in Belgium. Based on statistical data on DUI and DUID offences of the Belgian Federal Public Service of Justice (2005) and the annual statistics of the IBSR/BIVV on the amount of DUI/DUID participants in DI courses (BIVV, 2007) a first estimation shows, that less than 2% of the DUI/DUID offenders of 2005 were sent to DI courses. The States-General of road safety (Staten-Generaal Verkeersveiligheid, 2007) as well as the States-General of road casualties (Staten-Generaal Verkeersslachtoffers, 2007) – both steering committees with governmental stakeholders and field experts which lay out the spearheads in the governmental policies – give recommendations for DI courses as alternative sanctions for DUI/DUID offenders. The States-General of road safety (Staten-General van de Verkeersveiligheid, 2007) furthermore recommends that the offer of alternative punishments should be extended and further differentiated.

Other DUI/DUID rehabilitation / treatment

At police court level, a judge can propose a DUI/DUID offender to get treatment within a regular care organisation as a probation condition. These organisations (e.g. AA, hospitals, therapists…) are not legally recognized as an alternative measure for traffic offenders though.
As stated before, the judge (police court) can not force this, but if the offender accepts this condition, it can lower the fine. This is thus a completely voluntary act, paid by the offender him/herself.

Within this scope, the Belgian Institute for Traffic Therapy (BIVT) can be mentioned as this organisation specifically focuses on traffic offenders, offering more therapeutically oriented rehabilitation.

The BIVT was founded in 2002 following the traffic therapeutic model "Individual Psychologische VerkehrsTherapie" by Höcher (IVT-Hö, 2007) which is ins use in Germany and Luxemburg. This type of traffic therapy tries to increase the understanding of the problematic behind dangerous or irresponsible driving behaviour. The traffic therapeutic method IVT-Hö in particular, addresses and helps to develop the self-management competences of the individual (BIVT, 2007).

The BIVT offers traffic therapeutic rehabilitation programmes for drivers after offences, fines, traffic accidents and serious offences of DUI/DUID, speeding, hit-and-run driving after a traffic accident and aggressive traffic behaviour. The traffic therapeutic programmes are for (BIVT, 2007):

- individuals on probation;
- individuals on their own initiative;
- individuals on the recommendation of a third person (for example a lawyer or physician).

The content and form of their rehabilitation programme are based on the individual needs of each participant. The BIVT uses two different approaches (BIVT, 2007):

- a short traffic therapy which is an intensive seminar of 20 hours on three days;
- a long traffic therapy (minimum 10 unites) which combines different elements:
  - individual sessions;
  - group sessions;
  - intensive three day seminar;
  - self-help groups.

3.2.1.3 France

Legal framework

The 25th of June 1992 law defines the conditions of the participation in the demerit points recuperation two days-courses:

- they must be led by a psychologist and a driving teacher's trainer: both have previously attend a 5 weeks training;
- participants number in a course must be between 10 and 20;
- the courses run over two consecutive days (16 hours).

Offenders can volunteer to follow a training course which leads to a regaining of 4 points. The participation in such a course cannot be repeated within two years. In some cases the repetition of such a course is excluded for a longer period.

They focus on the analysis of causes of accidents. DUI/DUID offenders attend the same course as other types of traffic offender (speed, seatbelt, phone…); however, the trainers may target on a specific topic such as alcohol if most of the participants are following the course for this kind of problem.

Recently, specific DUI programs have been introduced; those were traditional educational programmes focusing on explaining how alcohol impairs driving, and on the biological and social consequences of alcohol abuse. But now, in 2007, as a result of 15 years' experience and research, the programmes have moved from a primarily didactic approach to interventions with specific

programmes based on self-diagnosis of alcohol abuse and self-control strategies concerning coping skills, lifestyle changes etc.

The 23rd of June 1999 law also sets the penal arrangement, a judge can propose to a DUI/DUID offender which has not been condemned yet. The penal arrangement can be:

- to pay a fee, according to the severity of the offence;
- to do a "public interest work" ;
- to attend a demerit points recuperation two days-course.

3.2.1.4 Germany

General issues

In Germany, rehabilitation of traffic offenders is established as an essential part of a comprehensive countermeasure system for secondary prevention of DUI/DUID. The 30 years of experiences with rehabilitative measures and programmes has lead to a wide range of systematic and targeted measures. According to Willmes-Lenz (2001) the general characteristics of the German rehabilitation system are the following:

- the wide variety of measures starting from low threshold services for novice drivers up to intensive therapeutic interventions for drivers with pervasive fitness to drive problems;
- the well directed diversification and orientation of measures for specific target groups;
- the conduction of the decisive rehabilitative and fitness to drive assessing task by academic psychologists with an additional education in traffic psychology;
- the systematic integration of driver educational competence of the driving instructors in the remit of specific driver improvement measures sub-threshold the fitness to drive problem;
- the relevance of the medical psychological assessments (MPA) as assignment filter and trigger for rehabilitative activities and thus the integration of psycho-diagnostic professionalism in the fitness to drive decision which is basically the competency of courts or licensing authorities.

A description of the rehabilitative landscape including all measures for DUI/DUID offenders in Germany needs to cover mainly two divisions:

a) the domain of programmes regulated by law, i.e. special advanced driver improvement courses according to §§36 / 43 FeV (driving licensing act) and courses for the restoration of the fitness to drive according to §70 FeV (driving licensing act);
b) the domain of programmes without any legal base and thus not regulated by law, i.e. voluntary programmes that mainly serve as a preparation for the medical psychological assessment or as a precondition for an application to reduce the revocation period.

The following paragraphs will give a systematic overview over the different measures within each division.

DR programmes regulated by law

a) Special advanced driver improvement courses according to §§36 /§43 FeV (driving licensing act), e.g. NAFA+, Dekra mobil etc.

The §36 and §43 of the German driving licensing act (FeV) serve as legal bases for the participation in and conduction of these courses. These paragraphs define the target groups:

- novice drivers driving under the influence of alcohol or drugs within the probation period according to §36 FeV and further;

- according to §43 FeV, drivers with repeated offences whereof one is a DUI/DUID offence when reaching a certain demerit point threshold.

The administrative licensing authority is responsible for the enforcement of these regulations and thus it orders the mandatory participation in this kind of courses. Hence the successful participation is a necessary condition for the ongoing validity of the permission to drive or the reinstatement of a withdrawn driving licence.
Beyond this the §36 FeV regulates:

- the group size of each course, which is at least 6, but up to a maximum of 12 people;
- the programme structure and duration, consisting of one preliminarily talk followed by three sessions of at least 180 minutes length in a time period between two and four weeks plus homework between the different sessions;
- the aims and topics of the course, which are:
  - discussion of the origin of the traffic offence(s);
  - transfer of knowledge about alcohol and other psychoactive drugs;
  - development of individual and adequate behaviour alternatives to reduce alcohol or avoid drug consumption, leading to a reliable competence to avoid future DUI/DUID;
- the conditions for the conduction of the course as single intervention;
- the necessity of a personal governmental authorization of the course leader by the supreme authority of the responsible federal state;
- the necessary qualifications of and conditions for becoming a course leader which are:
  - academic degree in psychology;
  - additional education in traffic psychology;
  - knowledge and experience in the assessment of the fitness to drive;
  - education and experience as course leader in courses for DUI/DUID offenders;
  - doubtless reliability;
  - presentation of a scientific based appropriate course concept;
  - evidence of appropriate locations for the course conduction;
- the regulation surveillance by the supreme authority of the responsible federal state.

b) Courses for the restoration of the fitness to drive according to §70 FeV (driving licensing act), e.g. IRAK, LEER, DRUGS etc.

The target group of these courses are DUI/DUID offenders who passed the MPA (see 2.2.1.4) and who were recommended to participate exactly in one of these so called “§70 courses”, whereas the licensing authority has to give an additional permission for each driver that allows him/her to participate. The successful participation has legal consequences: the driving licence is reinstated without any new assessment or additional obligations. Although the participants of these courses often feel obliged to participate mandatory, the participation actually is voluntary. The alternative for a §70 course participation would be to pass the MPA again, as often as the assessment succeeds in a positive result. Due to the fact that this alternative seems to be more insecure and complicated (and actually is often not communicated by the licensing authority) most of the offenders participate in the course to get the licence reinstated. The yearly amount of participants is around 15.000 persons; this number can be estimated due to the yearly data on MPAs: 105.470 applicants for and owners of a driving licence had to pass the assessment in 2006 whereof almost 15% resulted in a §70 course recommendation.
The providers of these courses need a governmental accreditation assigned by the BASt. To gain this they have to meet high requirements and normative standards for quality assurance according to the norm DIN EN 45013 as regulated by §72 of the German driving licensing act (FeV).

Legal base for the governmental course authorization is the §70 of the German driving licensing act (FeV). It regulates that:

- the course needs a scientific based concept;
- the appropriateness of the course has been confirmed by an independent scientific expert report;
- the course leader proves evidence to have:
  - an academic degree in psychology;
  - an additional education in traffic psychology;
  - knowledge and experience in the assessment of the fitness to drive;
  - an additional education as course leader for these specific courses;
- the effectiveness of the course has been proved by an evaluation and the courses have to be re-evaluated every 15 years;
- a quality management system is presented.

DR programmes without legal base

A variety of measures exist within this domain. The services range from one-time counselling offers over short group interventions to long-term group or single interventions. The services are often provided by accredited course providers, but even addiction services offer so called "Führerscheingruppen" (driving licence groups), often carried out by psychologists or social workers.
Most of these measures target offenders who aim to prepare for the MPA. A negative result in a MPA is often a trigger for voluntary participation in such programs, because the offenders recognize that they need some preparation to have better chances to succeed in the MPA and achieve a positive result. Another target group of these measures are offenders who want to reduce the revocation period. This concerns the opportunity given by the German Criminal Code as fixed in §69a (7) StGB (Criminal Code). This paragraph reveals that the competent court that sentenced the offender is able to reduce the assessed revocation period if there are references that indicate that the offender's fitness to drive is no longer in doubt, which is the fact when the offender participated in some kind of rehabilitation. Unfortunately most offenders are not aware of this opportunity and this incentive for the initiation to entry a measure is only spread in some parts of Germany (Baden Württemberg, Rheinland-Pfalz) by the competent authorities (e.g. courts or licensing authorities). Klipp et al. (2005) conducted a study which aimed at analysing the relevant determinants for early participation in voluntary DUI counselling supplies and found out that only 6-8% of eligible offenders take part in a voluntary intervention soon after the DUI/DUID incident early within the revocation period. Based on their findings they draw some conclusions and stated the following recommendations to optimise and advance the rehabilitation processes of DUI/DUID offenders (Klipp et al, submitted):

1. A proactive contacting approach guarantees an early sensitisation and activation of DUI offenders. All potential channels of information flow should be used to support the provision of available information regarding all aspects of rehabilitation (e.g. providers and incentives).
2. An early counselling offer should motivate and call on DUI/DUID offenders to engage in rehabilitation, whereas
   - a personal and committing invitation to a first counselling session and
   - a free of charge counselling offer

   are supporting factors that ensure high participation rates. Over 80% of those drivers who had attended the counselling session decided to participate in a rehabilitation programme on a voluntary base.
3. The successful participation in a programme should be connected to specific incentives, e.g. the option to shorten the suspension or revocation period. Such incentives should be widely communicated and always be visible and transparent to the offenders.

4. An economic and valid screening or diagnostic within the first counselling session could help to chose, plan and optimise an appropriate rehabilitation measure.
5. The assignment to a certain measure should necessarily meet the offenders' requirements and resources. Not only the severity of the underlying alcohol or drug problem is of interest but also the offender's financial situation needs to be considered. The next steps of action after the counselling should be planned in detail. If the offender is not going to participate in a measure of the institute where the counselling took place the contact to another provider should be fixed within the counselling session.

In addition to these issues another aspect regarding these voluntary measures without any legal base has to be mentioned. Due to the missing legislation or regulations for these programmes the market is big, uncontrolled and the supply is unmanageable. Many experts criticize the missing regulations for quality management in this area, but quality caring providers apply some kind of quality management systems on a voluntary base. Further they care for evaluation studies of their programmes although they do not need to. Actually a serious measure does not only aim at helping the offender to gain a positive MPA result but rather aims at developing long-lasting strategies to separate drinking/drug consumption and driving, i.e. reduce the problematic consumption or stay sober.

3.2.1.5 Hungary

The aim of drive rehabilitation in Hungary is improving self-knowledge, strengthening of compliance with the law and the developing and establishing the correct behaviour in traffic.

General issues

The rehabilitation system for Hungarian drivers operates since the 1st of January 1992 according to the government decree 139/1991 (based on the article 18§ (2) of law no. 1 of 1988 bout road traffic). The whole DR system consists of seven types of programmes, which are applicable in nine variants. Thereof, three programmes (V-IIV) are available for different kind of DUI offenders

A permission to conduct a programme can only be obtained by those who fulfil the required personnel and material requirements for the respective programme. The activities of those carrying out DR are regularly controlled by the NTA regional entities and in case of lacking conditions or an unsatisfying professional level the permission can be withdrawn.
A rehabilitation course can only be held by a person registered as a rehabilitation course holder at the NTA central office. The rehabilitation courses – with the exception of programmes I and II – are carried out with a limited number of participants (8 to 12 persons) in the form of psychological trainings. The courses are led by 2 persons, who are qualified psychologists; one of them – in case of programmes III and V – can also be a traffic pedagogue.

The DR programme conduction is organized by the National Transport Authority (NTA) regional centres under the direction of the NTA's central office. The drivers participating in this programme are those whose driving licence was withdrawn for a longer period than 6 months. The driver who is obliged to undergo rehabilitation can register himself at the NTA territorial branch office using the authority's notification on the reason for the obligation. At that point, the personal programme of the rehabilitation will be determined following an exploration. Programmes I and III can be applied together with programme V as well as separately.

Depending on the results of the exploration the NTA appoints the most appropriate programme to the offender (for more information on the assessment, see chapter 2.2.1.5). In case the aim is to dissolve traffic knowledge imperfections (programmes I and II), the rehabilitation ends according to the

programme with a theoretical or practical exam. In case of failure the rehabilitated person has the right to re-take the exam.

After completion of the rehabilitation the NTA issues a certificate based on which the driver can regain his/her driving licence. A certificate cannot be issued to a person who has not participated in one of the courses or who has presented him/herself in an unsuitable state for driving.

Short summary of the DR programmes' contents for DUI

For drunk drivers the programmes V, VI and VII can be delivered gradually depending on the level of drunkenness and the severity of the substance use problem and/or related (personality) problems.

Programme V: Course for "lightly drunk drivers"

The main elements are legal and health knowledge conveyance, as well as grouped topic focused discussion, psychological-behaviour therapy elements. The aim of application is targeted partial modification. The programme can be determined for the obliged together with programmes I, II or II as an addition to them. The fee of the programme is 140 to 678 EUR, depending on the vehicle category.

Programme VI: Course for "moderately drunk drivers"

This programme focuses on knowledge transfer, exploration of individual motives, making use of group dynamics and corrective-behaviour therapy in order to separate drinking and driving. The aim is to change of false motives, to increase of self-knowledge and to acquire self-control methods (negation, aversion - avoidance). The fee of the programme is 300 EUR.

Programme VII: Course for "heavily drunk" or "repeated drunk drivers"

Exploration and confrontation with the personality attributes that were connected with the inappropriate behaviour in traffic are carried out. Explorative dynamically orientated therapy (definition of focus: 1. at the level of inclination, 2. at the level of prevention mechanism) is applied as well as analytically orientated group therapy (influence of personality's structure) supported by group dynamic processes. The fee of the programme is 502 EUR, depending on the vehicle category.

3.2.2 Selected current approaches outside Europe

The following chapter is mainly based on information gathered within a research project conducted by the Department of Social Psychology of the University of Greifswald, Germany. The project aimed at giving an overview of rehabilitation measures and systems in different countries in order to compare them and to conclude with recommendations for the optimization of the German rehabilitation practices and procedures. By means of additional internet searches and expert contacts (more information on the methodology can be found in the annex) the following findings on rehabilitation practices and underlying legal structures in the USA and Canada can be summarized. The Australian information is based on literature references selected from an ITRD database search and recommended by an Australian expert.

3.2.2.1 United States of America

In the USA the participation of DUI/DUID offenders in some kind of rehabilitation measure or treatment is regarded as a method of choice in order to reduce recidivism rates, whereby a variety of programmes is considered as "treatment". Measures include educational programmes (e.g. brief classroom discussions like "DWI school"), self-help groups (e.g. AA), and outpatient counselling sessions of varying intensity and long-term inpatient programmes which are conducted in hospitals or clinics. Due to the fact that most DUI/DUID offenders are considered to be reluctant to any treatment effort, the National Highway Traffic Safety Administration together with the National Institute on

Alcohol Abuse and Alcoholism (NHTSA & NIAAA, 2005) recommend treatments in a motivational-interviewing-style, which has been found effective to reduce recidivism (Nochajski & Stasiewicz, 2002).

The implementation of rehabilitation measures into the legal systems of the different US states is diverse. In some states the attendance of a measure is a mandatory part of the sentence and thus ordered by court (e.g. Colorado or California). Other states see the participation in a DR measure as a mandatory condition for re-licensing or as the option to gain a restricted licence. Legislation in other states (e.g. Texas) provides the option to benefit from participation in the adherent court procedure, e.g. a reduction of the suspension or revocation period or the replacement of jail sanctions.

In general, the NHTSA & NIAAA (2005) recommend that:

- an evaluation of the offender's problem with alcohol should be conducted prior to the decision which sanctions/treatments should be imposed;
- treatment should be an addition to, rather than a replacement of licence suspension or revocation;
- treatment should combine strategies of education, therapy and aftercare;
- treatments should be more intense with increasing problem severity.

According to the Center for Substance Abuse Treatment (CSAT, 1994), the following criteria are presumed to be characteristics of a good treatment, regardless of the type of treatment:

- treatment for each client should follow a specific treatment plan with measurable goals,
- it should provide family involvement and aftercare;
- providers should be willing to report back to the court in order to support compliance;
- medical back-up for safe detoxification and healthcare should be available;
- sensitivity to ethnic, gender and other differences is needed and bilingual capacity would be an advantage.

An overview table on the legislation regarding the participation in educative or rehabilitative programmes in the different states of the USA can be found in annex.

3.2.2.2 Canada

In Canada DUI and DUID are widely accepted to be more public health concerns than only matters of traffic safety. Thus Health Canada, the federal department which is responsible for helping Canadians to maintain and improve their health, assigned and published a report on best practices for rehabilitation and treatment for driving while impaired offenders (Health Canada, 2004). Moreover it needs to be mentioned that Canada was one of the first countries which initially introduced the idea of rehabilitation of traffic offenders, beyond just sanctioning, in the early 1960s. Until today screening/assessment and educational or treatment intervention programmes are recommended by the Canadian's national Strategy to Reduce Impaired Driving (STRID) 2010 and thus are mandatory in many provinces/territories prior to licence reinstatement. These interventions are three levelled. For first offenders or those considered to be at low risk a brief educational session is recommended. At a second level of intervention the sessions take place over a longer period of time. They may involve a comprehensive assessment, as well as an opportunity to work on strategies to address identified problem areas. These programmes are designated for the offenders at an early stage of a substance use problem or at higher risk. The third level involves a referral to a substance abuse treatment, which is indicated for the offenders who are assessed as having a serious substance use problem or dependency.

Regarding DR, Health Canada (2004) published a set of best practices for all remedial programmes, whereby the term "remedial" refers to all education and therapeutic programmes for DUI/DUID offenders. In the following, these best practices, 19 in total, are listed:

"Remedial education and treatment programs:

Best Practice 1

Remedial programs should occupy an integral place in a comprehensive impaired driving countermeasure program. Participation in such programs should be a condition of licence reinstatement for all persons convicted of an impaired driving offence.

Best Practice 2

Remedial programs should also be an integral part of comprehensive efforts to reduce driving while impaired by drugs other than alcohol. Participation in such programs should be a condition of licence reinstatement for all persons convicted of a drug-related driving offence.

Different types of remedial interventions for different types of DWI offenders:

Best Practice 3

Comprehensive remedial programs for convicted impaired drivers should incorporate at least two levels of intervention for individuals with differing levels of substance use and related problems.

Best Practice 4

All programs for convicted DWI offenders should incorporate both educational and therapeutic activities, regardless of program length.

Best Practice 5

Mandatory clinical follow-up after license reinstatement should be required for all DWI offenders sent to remedial programs.

Identification issues:

Best Practice 6

All convicted DWI offenders should complete a screening/assessment process to inform decisions about the most appropriate level or type of intervention.

Best Practice 7

Instruments that have been shown to be of value in assessing alcohol and drug use problems and recidivism risk should form part of the screening procedure. The performance of these instruments should be monitored on an ongoing basis.

Programs that combine treatment with other measures:

Best Practice 8

Remedial programs should supplement, not replace, licensing actions.

When DWI offenders are not processed through the courts:

Best Practice 9

Individuals who receive pre-conviction roadside suspensions for impaired driving should be considered for referral to assessment and participation in remedial programs.

Governance and training issues:

Best Practice 10

Remedial programs should be located in an environment in which a behavioural health perspective and treatment orientation are well established and can be maintained.

Best Practice 11
Those providing remedial services to DWI offenders should be trained in substance use issues, and in adult education (particularly those delivering educational interventions) and group facilitation (particularly those delivering more therapeutic interventions).

Best Practice 12
Those providing remedial measures to convicted impaired drivers should be supported in accessing provincial or national training opportunities on an annual or biennial basis.

Relationships between DWI programs and licensing authorities:
Best Practice 13
Remedial programs should be operated using an administrative model, where program completion is a requirement for re-licensing.

Best Practice 14
Remedial programs should be operated by an agency other than the licensing authorities.

Best Practice 15
There is a need for formal and clear mechanisms for coordination and collaboration between licensing authorities and remedial programs, to ensure reciprocal exchange of information to serve the best interests of clients and the public.

Payment Structures:
Best Practice 16
Measures should be taken to reduce the financial burden for offenders, particularly those who are assigned to more expensive program options. This could include applying a single blended fee for all clients, or providing some form of financial assistance for low-income clients.

Program evaluation and research:
Best Practice 17
Evaluation should be an integral part of any remedial measures program.

Best Practice 18
Program evaluation and research costs should be built into program budgets.

Best Practice 19
More emphasis should be placed on quality assurance, and studies of the cost-effectiveness of programs and their component parts." (Health Canada, 2004, p. 59f)

Information on the different Canadian provinces'/territories' programmes and their key aspects can be found in annex.

3.2.2.3 Australia

Palk & Davey (2004) point out that all states and territories in Australia have adopted the 0.5‰ BAC limit. For first offenders the fines vary across Australia from 100 AUD to 1.050 AUD; second offenders

have to pay from 700 AUD to 2.250 AUD. The authors also state that there are substantial differences concerning licence disqualification periods and terms of imprisonment.
Fines and penalties increase by range of offence, but there are jurisdictional variations. According to Palk & Davey (2004), the situation is as follows (p.9): "Only half of the jurisdictions offer comprehensive rehabilitation/education programmes and these vary in cost, content and length. There have been some attempts to evaluate these interventions but only Queensland has investigated the outcomes, using a quasi experimental design incorporating a control group. Three of the Australian states also offer alcohol interlock devices but participation rates have been largely low." The authors demand national approaches to manage drink driving and obligatory driver rehabilitation. The table below summarizes their results.

Palk & Davey (2004) point out that a number of rehabilitation and education programmes are available all over Australia. The participants have to pay for them and the programmes vary regarding content and duration but also concerning the targeted type of drink driving offender and how the programmes are offered.

Table 3: Australian territories, their respective laws and regulations and DR programmes (according to Palk & Davey, 2004)

Federal state/territory	Laws, regulations and DR programmes
Northern Territory (NT)	Traffic Act 1986 (NT) and Traffic regulation 1995 (Regulation 86 and 90). Drink Driver Education Programme since 1995 DUI offenders who have been disqualified from driving must complete this programme as a legislative requirement before they are eligible to be re-licensed. Outcome evaluation: participants of the programme have a re-offending rate of 12.8% within 2 years after re-licensing.
New South Wales (NSW)	Safety & Traffic Management, Section 9 of the Road Transport Act 1999. NSW offers for general traffic offenders generalized Traffic Offender Programmes (TOP), for recidivists a Sober Driver Programme (which is part of a wider Safe Driver Programme). The Sober Driver Programme consists of three two-hour sessions and is conducted by Probation and Parole Officers. Offenders who have a licence withdrawal due to a serious alcohol related offence may at the Magistrates discretion be offered the opportunity to participate in the Interlock Programme. The offender has to pay for it.
Victoria (VIC)	Road Safety Act 1986 (VIC), sections 49 and 50. Certain categories of drink drivers are required by law to complete an approved Drink Driver Education Programme of 8 hours duration with an accredited agency as well as being assessed for alcohol dependency. Participation is compulsory for those offenders (since 1990) who are under the age of 25 and exceeded the prescribed BAC. First offenders aged over 25 with a BAC between 1.0‰ and 1.5 ‰ as well as repeat offenders can be required by a magistrate to attend. Process evaluation of the programme (on procedures and impact on participants and stakeholders) showed good to very good assessments. An evaluation study is carried out at present. An alcohol interlock programme for certain offenders is in discussion.

South Australia	Road Traffic Act 1961, section 47B.
	In South Australia there were no specific Drink DR / Education programmes by 2004.
	Offenders may apply to the Registrar of Motor Vehicles after having completed half of their disqualification period to have their licence re-instated if they are prepared to participate in the "Alcohol Interlock Scheme" for a period twice the number of days remaining on their disqualification. The Interlock scheme has been in force for two years and 130 offenders participated. Financial support is granted if the offender is a low income earner. Counselling is also one aspect of the programme in order to address alcohol dependency – if addiction was identified.
Australian Capital Territory (ACT)	Road Transport (Alcohol and Drugs) Act 1977 (ACT), sections 19 and 26
	The court may provide offenders with the option of attending a drink-driving rehabilitation programme on their own costs. The court when assessing the penalties will take into consideration the fees paid by the offender to complete the programme.
	The Drink Driver Programme (based on "Under the Limit drink driving rehabilitation programme developed by CARRS-Q) is conducted by the Alcohol and Drugs Foundation of the ACT and lasts three months and 90-minutes-sessions are held weekly. A shorter drink driver educational programme is planned.
Western Australia	Road Traffic Act 1974 (WA), sections 64 and 64AA
	There are currently no rehabilitation/education or Alcohol Interlock programmes offered
Tasmania (TAS)	Road Safety (Alcohol 6Drugs) Act 1970 (TAS), section 17
	There are currently no rehabilitation and education programmes or Alcohol Interlock programmes conducted for full licence holders. Provisional licence holders with a DUI offence may be referred to a short educational programme by magistrate court. The programme is conducted by Road Safety consultants and focuses on the consequences of and alternatives to drink driving.
Queensland (QLD)	Transport Operations (Road Use Management) Act 1986 (QLD), section 79.
	Drink drivers can be given the option of choosing between the prescribed fine and licence suspension, or paying the course cost of $500, licence suspension and being placed on probation with a condition to attend the prescribed drink driving rehabilitation programme of 11 1,5 hour sessions.
	An outcome evaluation of the Under The Limit programme showed that participants had a 15% lower recidivism rate compared to a matched sample; for repeat offenders with a BAC above 1.5‰ it was 55% lower (Siskind et al, 2000, In: Palk & Davey, 2004).

3.3 Effectiveness of DUI/DUID rehabilitation measures

According to Annex I of the DRUID Core Contract (see p. 101), the results of the EU project ANDREA (Bartl et al. 2002) which covered a time period from 1987 to 2001 serve as the starting point for the literature review on the effectiveness of driver rehabilitation measures. The DRUID survey will include further publications not having been mentioned in ANDREA and covering a time period from 1997 to 2007.

Sources for the effectiveness literature, mentioned in this chapter, are the ITRD and additional databases of the DRUID WP5 partners, namely the BASt internal library plus TRIS, MEDLINE, the IBSR/BIVV and Institut National de Recherche sur les Transports et leur Sécurité (National Institute for Transport and Safety Research of France (INRETS) internal libraries and the KfV library DOKDAT. Relevant search terms were driver rehabilitation/road user, driver improvement, retraining of drivers, DUI, DUID, drinking driver, evaluation/assessment/rehabilitation, efficiency studies, recidivism, recidivist, before and after study. Moreover, not only European studies, but also those from USA, Canada and Australia were considered. Search included literature in Dutch, English, French and German. By means of this search strategy, major effectiveness studies on driver rehabilitation could be identified as the included DRUID WP5 partners represent major European traffic safety organisations which are collecting publications on driver rehabilitation issues since decades.

This part of the literature review distinguishes between effectiveness studies based on recidivism and those with other evaluation criteria. Furthermore, a distinction is made between European standard programmes for DUI/DUID and additional approaches different to the standard ones in- and outside Europe. More details on the methodology can be found in the annex.

3.3.1 Recidivism criterion

According to Nickel (1992) rehabilitation measures having an impact on driving licence have to confirm their efficiency by means of scientific proof. The most famous criterion is the so-called legal probation in traffic which is usually measured by recidivism, i.e. another drink-driving or drug-drug offence in a defined time period. Other important traffic safety criteria, such as accident rates, traffic injuries or fatalities are hardly suitable criteria to measure the effectiveness of driver rehabilitation due to the well-known methodological problems with these criteria in general (Bartl et al., 2002). Therefore, in the EU-Project SUPREME, the identification of driver rehabilitation as best practice measure for road safety based on accident reduction was not possible (European Commission TREN, 2007).

As criteria for the measurement of recidivism Nochajski & Stasiewicz (2007) listed the following options:

A) driving with any amount of alcohol (or drugs);
B) based on established legal limits (of a country) for driving while impaired or intoxicated;
C) subsequent DUI arrest;
D) alcohol or drug related crash.

Recidivism is a hard fact assessment although in case of A) self-reported information can be used as well. Yet, objective information on recidivism has methodological weak points. For example, in case of B), the detection rate is confounded by factors, such as the legislation of the country, if random breath testing at roadside is allowed, the enforcement strategy, control density, police equipment, and trained personnel. In case of C), only those persons who are arrested and convicted are subjects of the investigation. Methodological problems, like the underestimation of the “true” number of offences (dark figure) lacking the representativeness of samples are resulting from these restrictions.

3.3.1.1 Recidivism results of European standard group interventions

Standard group interventions are those group intervention programmes which are well-known under the term driver improvement courses. They were developed for drink driving and drug driving offenders in some European countries and represent the core model of rehabilitation programmes for DUI offenders (see also the chapter before).

ANDREA results on recidivism

On EU-level, studies on the effectiveness of DR were reviewed in ANDREA for the first time, resulting in the 'magical minus 50 percent'. This means, that driver rehabilitation could approximately half the recidivism rate of drink driving offenders. Bartl et al. (2002) summarized this in the following table.

Table 4: ANDREA evaluation studies on recidivism (Bartl et al., 2002, p.29)

country	study	observation period	recidivism rates of:		reduction of recidivism
			course participants	control group	
Austria	Michalke et al. (1987)		A 15.8% B1 12.5% B2 10.3%	30.6%	A 48.4% B1 59.2% B3 66.3%
Austria	Schützenhöfer & Krainz (1999)	3 years	22.7%	40.4%	43.8%
Germany	Winkler et al. (1988)	3 years	IFT 13.5% IRAK 12.8% LEER 14.0%	(17.7%) (18.6%) (18.3%)	no comparison •)
Germany	Winkler et al. (1990)	5 years	IFT 19.6% IRAK 20.5% LEER 22.9%	(25.7%) (24.6%) (26.3%)	no comparison •)
Germany	Jacobshagen (1997)	3 years	14.4% (NAFA) ••••)	31.6%	54.4%
Switzerland	Mahey et al. (1997)	5-6 years	19.7%	19.7%	0 ••)
United Kingdom	Davies et al. (1999)	3 years	3.4%	9.6%	after correction 54% •••)
USA	Jones et al. (1997)	1 year	5.6%	10.7%	47.7%

• No control group, but a base line group of clients diagnosed positive.

•• The programme analyzed was essentially different to the other programmes evaluated.

••• Reduction after correction in a mathematical model weighting the influence of self selection bias.

•••• Added by the DRUID WP5 team.

Bartl et al. (2002) explained the lower recidivism rates of Winkler's studies (1988, 1990) in Germany with the specific reference groups (drivers with a positive fitness-to-drive assessment) and the self selection bias (voluntary participation). Only in one study (Switzerland) no recidivism reduction was found which was - according to the authors – due to the method, as it was conducted in prison as a pure educational programme without any self-reflection (about 20 participants). This programme is not offered any longer.

The authors of ANDREA identified some common factors of those courses which led to a reduction in recidivism rates of approximately 50%:

- The group size was limited to max. 10 participants.
- The course duration was 3 to 8 weeks.
- The courses had a certain number of sessions.
- The courses were held by special educated professionals.
- The content aims more at individual self reflection than teaching, the intervention scheme was client centred.
- The programme was targeted to the clients.

Results on recidivism of standard group interventions additional to ANDREA

A follow-up of the evaluation studies of Winkler et al. (1988, 1990) including the psychological-therapeutically based German rehabilitation programmes IFT, IRAK and LEER for alcohol offenders was carried out by Jacobshagen (1996). The re-offence data came from the German Central Register of Traffic Offences. The comparison of the study group (N=1.675, mainly repeat drink driving offenders with medical-psychological assessment and course participation) with the control group (N=1.475, mainly repeat drink driving offenders and only positive medical-psychological assessment) still show highly significant differences after 10 years (30.4% recidivism of the experimental group and 36.9% of the control group). Birnbaum et al. (2002) evaluated the German driver rehabilitation programme "Mainz 77" which was designed or first time DUI offenders who voluntarily participate in order to reduce the revocation period. The results reveal differences in the recidivism rates of course attendees and comparable non-course participants (N=460 each): 12.6% of the study group had another drink driving offence compared to 17.4% of the non-participant group in an observation period of slightly more than 5 years. The difference between both groups was 4.6% in exactly five years. Birnbaum et al. (2005) analyzed the impact of the driver rehabilitation programme IRAK-S for first time DUI offenders in Germany. In this study N=106 course participants were compared to N=106 non-participants. The control group was the one of the Mainz 77 evaluation study (see above) and parallelized according to age, sex and BAC level. Comparison of both groups led to the following outcomes: The study group had an averaged re-offence rate of 3.7% after 38 month while 13.2% of the participants in the control group had re-offences after 3 years and 17.5% after 5 years. Besides the significantly lower recidivism rate, they also found a slower tempo of recidivism.

Vanlaar et al. (2003) evaluated the effectiveness of the Belgium driver rehabilitation courses (voluntary group interventions for high risk DUI offenders based on a court proposal; see 3.2.1.2) by means of survival analysis. DUI offenders who finished the course between 1997 and 1999 (N=197) were compared to a matched control group of traditionally sanctioned drivers (N=263) during the same time period. Based on the survival time until re-offence, it was found that for course participants, the risk of becoming a recidivist was only 93.3% of the risk of traditionally sanctioned DUI offenders although the results failed to prove statistical significance.

Additionally to the study of Davies et al. (1999) documented in ANDREA, Davies & Smith (2003) carried out a further investigation of the British Drink/Drive Rehabilitation Scheme (DDR). The reconviction rates of DUI offenders who attended the courses between 1993 and 1996 were analyzed. At that time only designated courts gave offenders the possibility to participate which then led to a reduction of the disqualification period, but participation was still voluntary. Over 80% of the treated sample was included. Reconviction rates of course attendees and non-course participants were compared in a follow-up of at least 6 years. The results show that only 7.6% of course attendees compared to 17.9% of non-participants had another drink driving offence. After the nationwide implementation of the British DDR scheme in 2000 (participation is still voluntary), Smith et al. (2004) again investigated the reconviction rates: only 1.4% reconviction rate of course participants compared to 3.7% of non-attendees were observed. This means that non-participants are 2.6 times more likely to

have a repeated drink driving offence than the course participants. Inwood et al. (2007) carried out a further follow-up of the DDR scheme in Britain. They found that over a time period of three years, non-participants had an 8.4% recidivism rate compared to 3.9% of the attendees. This means that the non treated group was 2.15 times more likely to be reconvicted for a DUI offence compared to course participants. Over a period of five years, they observed that non-participants were 1.75 times more likely to be reconvicted for a DUI offence than attendees. Participation was found to be more effective for younger male offenders and those with a previous motoring conviction.

In Switzerland, Bächli-Bietry (2006) evaluated the effectiveness of a rehabilitation programme for alcohol offenders, which was applied in the frame of the Swiss criminal justice system. Participation was obligatory. One programme version (TAV) was a more intense and longer lasting intervention and LAST was a short one. Based on an assessment, drivers were either assigned to the study or control group. N=131 subjects underwent TAV and N=63 LAST. The control groups consisted of persons assessed either not being adequate for the particular programme or being adequate, but not having been assigned (N=115). The observation period was one year. Comparisons of study and control groups revealed no significant differences: 11% recidivists in the group of participants compared to 13% and 18% in the control groups. The author expounds the problem of sample selection and of the short observation period.

Regarding rehabilitation of DUID offenders, Biehl & Birnbaum (2004) conducted an evaluation study of the German programme DRUGS. The assignment to DRUGS was based on a recommendation in the medical psychological assessment. In a case-control design, drug-driving offenders who attended DRUGS (N=91) were compared to a comparable group of DUID offenders who participated in a drug control programme in which they only had to undergo some drug screenings. Recidivism was not only measured by means of a re-offence in traffic, but also by means of a positive drug test. In an observation period of 3 years, 8.8% of the course participants and 21.1% of the non-participants had a new drug offence in traffic or were detected as ongoing drug users.

3.3.1.2 Recidivism results of other interventions inside and outside Europe

Main differences of other interventions to the standard programmes are the single setting, the duration (generally longer or shorter than 3 - 8 weeks) and/or the intervention concept. The identified studies are documented in the following.

Jacobshagen (2001) evaluated the effectiveness of the German BUSS model for alcohol intoxicated drivers which includes individual advice and assessment additional to a standard rehabilitation programme (model LEER) within the legal ban period. It mainly aims at restoration of the fitness to drive and thus passing the medical psychological assessment. Participation is voluntary, and the standard intervention is mainly conducted in a group setting. Recidivism rates of the two BUSS groups (with N=871 and N=956 subjects) were compared to a baseline group (N=863, positive assessed clients after the medical psychological assessment) over a 3-years period. No significant differences between both groups were found (recidivism rate of the BUSS groups: between 4.6% and 6.8% according to different regions, baseline groups: 6.5% and 8.3% according to different regions). Graumann (2002) analysed the efficiency of another German counselling model for DUI offenders, called pbz. This short term intervention is carried out in a single setting with 3 to 10 sessions. Participants of pbz (N=609) were contacted by means of a questionnaire survey, N=133 participated (corrected respondents' rate of 23.2%). No control group was included in the study. Recidivism rates of the investigated group, split according to their different periods of licence revocation, were analysed. The results show, that drivers with 1-year revocation (N=74) had a re-offence rate of 2.7%, drivers with a 2-year revocation (N=44) had a re-offence rate of 2.3%, drivers with a 3-year revocation

(N=21) had a re-offence rate of 4.8% and drivers with a 4-year revocation (N=5) had no recidivism at all.

Scheucher et al. (2002) investigated the impact of traffic therapy on DUI recidivism. In Germany, traffic therapy is an approach which provides therapeutic support for high risk offenders based on models of short term and cognitive therapy. It focuses on the individual problems and needs and is carried out in single settings on a voluntary basis. The traffic therapy evaluated in this study lasted about 12-14 hours. Information on recidivism was collected by means of a questionnaire sent to participants (N=285) five years after the intervention. The respondents' rate was 30%, thus resulting in a study group of N=66. No comparison group was included in the study, but the authors pointed out that the investigated sample was representative for the clientele of this traffic therapy group regarding sex, age, frequency and severity of offences. The outcomes revealed that after five years only 9.15% of the study group had a new drink driving offence while 90.85% had no recidivism. Höcher (1999) investigated the effect of the German long term rehabilitation model IVT-Hö for DUI offenders. This individual psychological traffic therapy was carried out within the withdrawal period on a voluntary basis. The study was conducted without a control group. The results revealed that 6.4% (N=12) of the 188 participants in total were re-arrested within 5 years.

Schülken et al. (2006) evaluated two other therapeutic German programmes, called CONTROL and REAL for alcohol offenders which are carried out within the licence withdrawal period. Participation is voluntary. The programmes are mainly carried out in a group setting. CONTROL is designed for DUI with a misuse diagnosis (drivers who are able to control their alcohol consumption) while REAL is for those DUI with heavy alcohol problems (drivers who are unable to control their alcohol consumption reliably). The treatment is based on the rational emotive therapy according to Ellis (1957). Recidivism data came from the German Central Register of Traffic Offences. The study was carried out without a control group. Re-offence data of N=358 clients were analysed. The results showed that within three years 5.3% of the REAL participants and 2.6 % of the CONTROL attendees were re-arrested.

Michiels et al. (2007) examined the effect of three different intervention schemes for DUI on recidivism rates in Switzerland. One intervention covers two hours only, the other intervention covers a half day session and the third one lasts for one day. Participation in one of these educative measures was voluntary and led to a reduction of the suspension period. Comparisons of the recidivism rates of participants in this short term intervention with a control group without this measures show the following results: within the observation period of three years, 11.7% of the investigated group (N=85 drivers of the totally included N=648 subjects) were re-arrested for drunk driving while 13.3% of the control group were re-arrested. Thereby, the recidivism rate of the two-hour intervention was 9.2%; of the half-day intervention 9.4% and of the one-day session 15.9%.

Schermer & Moyers (2006) evaluated brief interventions (BI) in a US Trauma Center (New Mexico) and analysed if they have a long term effect on legal probation. Participants (N=64) randomized assigned to the BI condition had a 30-minutes discussion in form of motivational interviewing[12] with either a social worker or a trauma surgeon. This group was compared to patients (N=62) who received standard care only. DUI re-arrests were followed for three years after hospital discharge. 11% of the brief intervention subjects were rearrested for DUI compared to 22% of patients without additional intervention within this time period.

[12] The terms brief intervention and motivational interviewing are fixed terms for specific treatment methods. For detailed explanations of these methods see chapter 4.

Woodall & Kunitz (2004) analyzed the effects of a US jail treatment programme on subsequent DUI recidivism and crashes. The San Juan County in New Mexico has instituted this 28-days program, including a 6 months post discharge monitoring component, for first-time DUI offenders. Participation is voluntary. The study outcomes showed that re-arrest rates were significantly lower for the treatment group than for the non-treatment group. No significant reductions could be observed regarding subsequent alcohol-related crashes, due to insufficient numbers. Lapham et al. (2006) analyzed the effect of the DUI Intensive Supervision Program (DISP) on recidivism rates of repeated DUI offenders (≥3 times). The DISP is an intensive court/-based intervention developed in Multnomah County, Oregon. The programme is a collaborative effort among several governmental divisions and private agencies. It consists of electronic monitoring to ensure sobriety, mandates sale of vehicle which is owned by the offender and periodic polygraph tests required to demonstrate compliance. Offenders have to attend weekly Alcoholics Anonymous meetings and frequent follow-up by a probation officer. If the offender is not compliant, additional jail is mandated. The authors compared the hazard of re-offending between DISP participants (N= 460) and a comparison group (N= 497). The stratified Cox proportional hazards model was used to model the hazard of re-offence, adjusting for matching criteria and stratified by county of residence. The adjusted hazard of DUI re-offence for DISP participants was 0.52 of that of comparison offenders (95% CI = 0.36–0.76). The study also showed that DISP clients had lower arrest rates for driving while revoked/suspended and for all other traffic offences. The authors concluded that DISP is an effective means to reduce recidivism among repeat impaired-driving offenders.

Breckenridge & Winfree (2000) evaluated a therapeutic DUI court programme in New Mexico. N=152 convicted first-time DUI offenders were included in the study. N=75 of the sample were assessed as alcohol dependent. Half of subjects were assigned to the DUI court program and half were assigned to routine municipal court processing. There were no significant differences in recidivism rates between the alcoholic and non-alcoholic groups (groups not defined by random assignment). Furthermore, no significant differences were found between the treatment and control groups on any of the recidivism measures, including subsequent convictions for traffic and serious offences, whereas the small sample sizes may have reduced the power to detect such differences. Macdonald & Morral (2007) also evaluated the effectiveness of a therapeutic court programme for DUI offenders in Los Angeles County/USA. Study participants (N=284) were randomly assigned either to a DUI court or a traditional criminal court. Comparisons of subsequent arrests for driving under the influence (official record checks) showed little difference between both groups.

Applegate & Langworthy (1997) evaluated a residential treatment programme for multiple offenders in Ohio/USA, the Turning Point Program, over a period of two years. It is a 28-days lasting cognitive and behavioural approach with an additional aftercare component. The participation is voluntary. The global evaluation of this programme led to the result that experimental subjects were 9.2% less likely to be rearrested than members of a control group for any new offence and that 4.8% of the study group was less likely to be rearrested than the control group for any new alcohol related offence. Pratt & Holsinger (2000) did a further evaluation of the Turning Point Project with a follow up period of 10 years. During this time period, the original cohort of N=531 participants of this programme and N=192 controls were analyzed. The authors found 30% reduction for any new offence, 10% for any new alcohol related offence, and 14% for any new DUI offence of the study group compared to the control group. The authors finally conclude that the Turning Point is efficient in the long term, especially for chronic drunk drivers.

C'de Baca et al. (2000) studied the impact of another type of intervention, the so-called victim impact panels (VIP) on recidivism rates of first time DUI offenders in the USA. VIPs confront DUI offenders

with a group of victims of an impaired driving crash. The victims simply tell their stories, describing how their lives and the lives of their families and friends were affected by the crash without blaming or judging the DUI who listen. The authors compared DUI offenders (N=3.517) who voluntary attended this measure with a control group of non-attendees (N=1.721). In their follow-up study after five years, they observed very small effects of VIP regarding the reduction of recidivism rates. Their further analyses (C'de Baca et al., 2001a) revealed that VIP referral was not statistically associated with recidivism for female or male first time DUI offenders (N=6.702, 79% men). However, female repeat offenders referred to VIPs were significantly more likely to be re-arrested compared with those not referred, with an odds ratio of re-arrest more than twice that of females not referred. Wheeler & Rogers (2004) evaluated the effectiveness of customized VIPs on first-time DUI offenders. They also found no significant differences between the two groups in recidivism rates within two years.

Taxman & Piquero (1998) compared different sanctions and rehabilitation approaches in Maryland/Australia. They analyzed N=3.671 DUI offence records of the Motor Vehicle Administration (MVA) database of three years. The calculated Cox proportional hazard models showed that rehabilitation sentences appear to reduce the likelihood of recidivism better than sanctions for all groups of offenders. For first-time offenders the use of less formal sanctions was the most effective.

In a meta-analysis of 215 studies on convicted drink driving offenders, Wells-Parker et al. (1995) found that DUI treatment (alcohol abuse treatment and rehabilitation interventions) reduces re-offending and alcohol-related collisions to a greater extent (7-9% more) than conventional criminal justice measures (fines, licence suspension, etc.). In his review on the effects of all California drinking driver programmes (jail, suspensions, rehabilitation programmes) for DUI offenders, De Young (1995) additionally differentiated between first, second and multiple offenders. The author found that for first offenders, jail is ineffective in reducing recidivism while alcohol programs are effective, especially when combined with licence curtailment (restriction or suspension). For second offenders, the 18 months lasting SB 38 rehabilitation programmes (with at least 12 hours education, 52 hours counselling and bi-weekly face to face interviews) combined with licence suspension was more effective in reducing recidivism than licence suspension alone. For multiple offenders, the SB 38 programmes or even 30 months programmes associated with licence revocation are more effective than licence withdrawal alone.

3.3.2 Evaluation criteria besides recidivism

Although recidivism is the most relevant criterion for traffic safety, other criteria are also applied to evaluate the effectiveness of DR measures. In several studies, recidivism and additional criteria – hard and soft data – are combined. Measurements regarding certain attitudes, beliefs, knowledge, behaviour, etc. that are supposed to be related to the offence, conducted pre and post the programme are frequent approaches to determine changes caused by an intervention.

3.3.2.1 Evaluation results of European standard group interventions

ANDREA results on other evaluation criteria

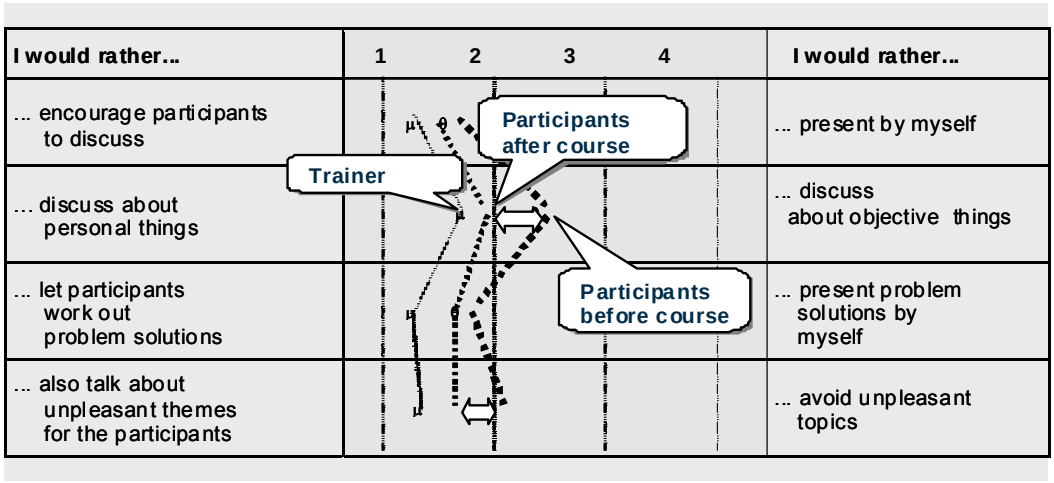
According to the literature analysis carried out in Bartl et al. (2002) the following changes due to course participation were found:

- increased knowledge concerning the impairment of alcohol (Davies et al, 1999, Posch, 2000, Winkler et al,. 1990, Jacobshagen, 1997 in Bartl et al., 2002);
- less alcohol consumption (Jacobshagen, 1997 in Bartl et al., 2002);
- more sensitivity concerning alcohol impairment (Posch, 2000, Davies et. al., 1999 in Bartl et al, 2002);

- lower fatalistic traffic attitudes (Posch, 2000 in Bartl et al,. 2002);
- less external attribution (Posch, 2000 in Bartl et al, 2002).

Moreover, within the ANDREA project a feedback study focussed on client feedback and course contents, based on answers from the participants (N=1.375) and course leaders (N=60). In a pre-post design, participants from Austria, Belgium, France, Italy and the Netherlands stated that the course was useful (mean value 1.96, range 1 to 5) and interesting (mean value 1.94, range 1 to 5). The averaged trainer feedback was 1.87 for 'useful' and 1.91 for 'interesting'. Regarding the course contents, modules aiming at self reflection, also talking about unpleasant topics were evaluated as most useful compared to a method that is rather informative, as presenting facts and given solutions (see figure below). Additionally, 89.2 % of the participants judged the course contents as being personally useful.

Figure 11: Feedback regarding how to lead a course (according to Bartl et al., 2002)



Index: 1 = strongly agree with the statement on the left, 2 = agree with the left statement, 3 = agree with the right statement, 4 = strongly agree with the right statement

Results on other evaluation criteria additional to ANDREA

In a pre-post study Christ (2001) investigated the clientele of DR courses, based on a sample of N=1.583 DUI offenders in Austria. No differences regarding socio-demographic and driving-related variables, personality characteristics and specific traffic-related attitudes were found between the included groups (DUI offenders within and out off the driving on probation period). Moreover, the outcomes showed that participants who were not overstrained in the course and who were able to develop positive perspectives for the future, showed more favourable attitudes. Schickhofer (2003) evaluated an Austrian DR course focussing on competence- and control beliefs and on opinions about the course in a pre-post design without control group (N=248 prior, N=221 directly after the course, N=67 six weeks later). The author found a significant increase in knowledge, a change directed towards more realistic self-evaluation and an increased approval of low BAC limits in traffic. Drexler (2005) carried out a similar questionnaire survey in the frame of another Austrian driver rehabilitation programme. Course participants (N=147) were compared to a control group (N=41 offenders from the near Southern Tyrol/Italy, registered as dependent). Moreover, about eight months later N= 62 subjects of the study sample voluntarily participated in follow-up interviews. Knowledge on alcohol specific impairments, on safety risks and health consequences of problematic alcohol consumption increased not only in the treatment group, but also in the control group. No significant differences were found between the two groups.

Bächli-Bietry (2003) presented the evaluation results of the Swiss DR courses. The study was done within the frame of ANDREA, but was not mentioned yet, because the data collection was not finished at that time. The Swiss courses are carried out in a group setting and are offered to repeat DUI offenders. Voluntary participation leads to an earlier reinstatement of the driving licence. In total, N=124 course attendees completed a questionnaire at the beginning of the course and after course completion. Moreover, 56% of the sample participated in a follow-up interrogation. More than 90% of the subjects found that the course had a major influence on separating alcohol and driving in future. The development of individual strategies to separate drinking and driving led to course success. The analyses of the past alcohol consumption pattern was of minor importance.

In an investigation of the drink-drive rehabilitation courses in Great Britain, Inwood et al. (2007) carried out a survey of the referred DUI offenders. Although the response rate was very low (8.38%; N=840 of N=10.028), it was found that attendees scored significantly higher on alcohol specific knowledge, showed a safer attitude towards drinking and driving and had a greater perceived behavioural control regarding the ability to avoid drinking and driving in future. All reported less drink driving behaviour.

Regarding DUID offenders, Biehl & Birnbaum (2004) analyzed additional effectiveness indicators to recidivism of the German DRUGS programme. The authors found that the treated DUID offenders had a reduced number (about 50%) of overall convictions. The participants were not only less likely to DUID, but also had less criminal records of e.g. driving while suspended and drug dealing.

3.3.2.2 Evaluation results of other interventions inside and outside Europe

Regarding other evaluation criteria than recidivism, relevant study results for further interventions besides the standard ones inside and outside Europe are documented in the following.

In their evaluation of a German traffic therapeutic model, Scheucher et al. (2002) also investigated the impact of this intervention on long-term changes in behaviour and attitudes of the participating DUI offenders. The results show that the changed drinking behaviour remained stable in most cases, which means that the participants steadily reduced their consumption of alcohol or were still abstinent. The majority of the participants reported about separating drinking and driving. In their follow-up investigation of the German rehabilitation programmes CONTROL and REAL Schülken et al. (2006) found significant changes in psycho-diagnostic criteria. Problem awareness increased, participants learned more positive coping strategies.

Klipp et al. (2007) evaluated the effectiveness of an intervention within the period of driving licence withdrawal. DUI offenders (N=69) who voluntarily participated in any kind of treatment were compared to a group of offenders (N=38), who did not undergo a treatment. By means of a questionnaire survey (pre-post condition) based on the stage of change model which was carried out soon after the offence and after the treatment one year later, the following results were found: Treatment led to significant changes in the three scales: i) denial of the problem, ii) cognitive engagement and iii) initiation of behavioural changes.

Andren et al. (2002) analyzed three types of Swedish rehabilitation programmes for DUI (BAC of 0.1% or more) carried out in prison: an educational programme (SWT), the Minnesota 12-step model and the dynamic cognitive behaviour modification (DCB). Convicted DUI offenders (N=800) were randomly assigned to the treatment programmes while being imprisoned. The clients were followed up 2 years after treatment by means of ASI-interview. In general, the authors found that all three treatments were effective and that no programme was superior. Taking the type of client into account (antisocial neurotic vs. normal), there were no statistically significant interaction between programme and client

typology for the psycho-social development, but for alcohol and drug use a significant interaction was observed. For “antisocial neurotics” a significant reduction of alcohol use was found two years after treatment (DCB and SWT). Regarding drug use “antisocial neurotics” in the DCB programme had fewer problem days in the follow-up, while clients in the educational STW programme had an increased number of problem days. No differences in effectiveness were found between the two prisons involved. Macdonald & Morral (2007), in their study on the effectiveness of a therapeutic court for DUI offenders in the Los Angeles County/USA, also included other criteria than recidivism, namely self-reported drink driving, alcohol use and stressful life events based on interviews. In a 24-month follow-up, little additional therapeutic or public safety benefit over the traditional court process was found. Nochajski & Stasiewicz (2007) investigated the outcomes of a court-mandated intervention for DUI offenders focussing on psychiatric symptoms. From a sample of N=518 DUI offenders who have completed an initial clinical assessment including the SCL-90-R, 84% (N=4.37) were interviewed 18-24 month later. Interactions between treatment success and severity of depression were found: the group with elevated depression scores showed greater improvement than those with lower depression values.

Wells-Parker et al. (2000) found effects of an US court-mandated programme on the individuals’ change processes according to the stage of change model (for more details see 1.2.5). Rider & Kelley-Baker (2006) evaluated the PARC (Preventing Alcohol-Related Convictions) in Florida. The primary aim of the programme is to avoid impaired driving offences, not to control drinking. Three critical decision points faced by drivers who are at risk are focussed (before leaving home, upon arrival at the drinking location and upon leaving the location). The effect of the PARC programme was analyzed by means of the stage of change model. DUI first-offenders (N=9,982) were randomly assigned either to the PARC programme or to a “traditional” approach, the latter aiming at reducing drinking. The authors found no difference in the increase of readiness to change between the two groups in a two years follow-up.

Similar to Schermer & Moyers (2006), Dill et al. (2004) reviewed the effects of the US BI approach in acute care settings on changes in alcohol consumption. In summary, the outcomes of the studies differed. On one hand, it was observed that many studies show a reduction in alcohol use or even in (reported) binge drinking episodes and less drunk driving after the intervention compared to offenders who did not participate. On the other hand, it was found that non-attendees also changed their behaviour. The authors explain this by methodological difficulties arising from study comparisons.

Polacsek & Rogers (2001) studied the effectiveness of a VIP by means of investigating motivational changes based also on the stage of change model (see also 1.2.5). DUI offenders (N=813) were randomly assigned either to a DWI school or to a DWI school plus VIP. Participation in the latter was voluntary. There was an immediate effect caused by the highly emotional communication during the penal, but this effect did not last over time: After a two-year observation period, participation in VIP did not produce a more effective movement through the stages of change concerning drunk driving. In their study on the effectiveness of customized VIPs in the USA Wheeler & Rogers (2004) included other criteria than recidivism. No significant differences between the treatment group and control group regarding alcohol consumption as well as drinking and driving behaviour were observed within two years.

Ferguson et al. (2001) evaluated the Australian cognitive-behavioural DUI programme “Under the limit” (UTL). Participation in this programme is voluntary. In a pre-post design, follow-up interviews about lifestyle changes were carried out after nine months. The results of the treatment group (N=62) were compared to a control group (N=63), the latter consisted of DUI offenders who refused

participation. The authors found significant differences between experimental and control group at first interview. The study group had more prior drink driving convictions, more accurate knowledge of alcohol-related issues and more willingness to change their alcohol problems. But there was no difference in reported drinking behaviour between both groups. Furthermore, the course participation did not significantly improve the knowledge. Though over time, UTL participants changed their intentions towards their driving behaviour in order to avoid further DUI offences. There was a decrease in self reported drink driving as well. Moreover, the authors found a positive effect of UTL on the change motivation according to the stage of change model: the experimental subjects were more likely to be in the action stage after the programme compared to the controls. Sheehan et al. (2005) reported in their investigation of the Victorian driver rehabilitation programmes (VDDEP) for DUI offenders, that in most cases the interventions that aim at a reduction of the harm associated with hazardous alcohol consumption were judged as being good or very good by external evaluators and course participants (more detailed information are not presented). The VDDEP lasts 8 hours which are carried out in a minimum of two sessions with at least seven days between the first and last session.

Only the study of Macdonald et al. (2004) included DUID offenders. The authors investigated the effect of an US alcohol, cannabis and cocaine abuse treatment on driving behaviour. Telephone interviews within the follow-period of six years were carried out. The results of the treated clients (N=110) were compared to a control group. As evaluation criteria, the amount of driving, self-reported violations, impulsivity, risk-taking and sleep problems were selected. The authors found, that the treatment group had a reduced number of violations.

3.3.3 Summary of results

In order to give an overview on the findings, a summary of the relevant research findings is made. For the comparison of the study results, the ANDREA procedure was followed to calculate the reduction of recidivism based on the reported data of the recidivism rates of the control and study groups. The effectiveness results other than recidivism are listed as short verbal descriptions.
The following two tables present firstly the effectiveness results based on the recidivism criteria and secondly those outcomes based on other effectiveness criteria.

Table 5: Summary of results of recidivism studies in- and outside Europe

No	State	Authors	Recidivism					
			Standard programme			Further intervention		
			Recidivism rate (%)		Reduction of recidivism (%)	Recidivism rate (%)		Reduction of recidivism (%)
			Study group	Control group		Study group	Control group	
DUI programmes - ANDREA (inside and outside Europe)								
1	AT	(Michalke et al., 1987)	15.5 12.5 10.3	30.6 30.6 30.6	48.4* 59.2* 66.3*			
2	AT	(Schützenhöfer & Krainz, 1999)	22.7	40.4	43.8*			
3	DE	(Winkler et al., 1988)	13.5 12.8 14.0	(17.7)** (18.6)** (18.3)**	Incalculable			
4	DE	(Winkler et al., 1990)	19.6 20.5 22.9	(25.7)** (24.6)** (26.3)**	Incalculable			
5	DE	(Jacobshagen, 1997)	14.4	31.6*	54.4			
6	CH	(Mahey et al., 1997)				19.7	19.7*	No differen.
7	UK	(Davies et. al., 1999)	3.4	9.6*	54.0 corr.^			
8	US	(Jones et al., 1997)	5.6	10.7*	47.7			
DUI programmes - Inside Europe								
9	DE	Jacobshagen, 1996	30.4	36.9**	17.6			
10	DE	Birnbaum et al., 2002	12.6	17.4*	27.6			
11	DE	Birnbaum et al., 2005	3.7	13.2*	71.9			
12	BE	Vanlaar et al., 2003	[93.3]	[100.0]*	Incalculable			
13	UK	Davies & Smith, 2003	7.6	17.9*	57.5			
14	UK	Smith et al., 2004	1.4	3.7*	62.1			
15	UK	Inwood et al., 2007	3.9	4.8*	18.7			
16	CH	Bächli-Bietry, 2006	11.0 11.0	13.0* 18.0*	15.4 39.0			
17	DE	Jacobshagen, 2001				4.8 6.8	6.5** 8.3**	Incalculable Incalculable
18	DE	Graumann, 2002				2.7 2.3 4.8	None None None	Incalculable Incalculable Incalculable
19	DE	Scheucher et al., 2004				9.1	None	Incalculable
20	DE	Höcher, 1999				6.4	None	Incalculable
21	DE	Schülken et al., 2006				5.3 2.6	None None	Incalculable Incalculable
22	CH	Michiels et al., 2007				11.7	13.3*	12,0
DUI programmes - Outside Europe								
23	US	Schermer & Mayers, 2006				11.0	22.0*	50,0
24	US	Woodall & Kunitz, 2004				No numb.	No numb.*	Partly sign.

25	US	Lapham et al., 2006				[0.52]	[1.00]*	Incalculable
26	US	Breckenridge & Winfree, 2000				No numb.	No numb.*	ns differen.
27	US	Macdonald & Morall, 2007				No numb.	No numb.*	Little differen.
28	US	Applegate & Langworthy, 1997				[90.8] [95.2]	[100.0]* [100.0]*	Incalculable Incalculable
29	US	Pratt & Holsinger, 2000				[70.0] [90.0] [86.0]	[100.0]* [100.0]* [100.0]*	Incalculable Incalculable Incalculable
30	US	C'de Baca et al., 2000				No numb.	No numb.*	ns differen.
31	US	Wheeler & Rogers, 2004				No numb.	No numb.*	ns differen
32	AUS	Taxman & Piquero, 1998						
DUI programmes – REVIEW								
33	US	(Wells-Parker, 1995)	7 – 9% reduction comp. to criminal justice measures (fines, licence suspens., etc.)					
34	US	(De Young, 1995)	RH measures more effective than licence withdrawal alone					
DUID programmes - Inside Europe								
35	DE	Biehl & Birnbaum, 2004	8.8	21.1	58.2*			

Index: *) Control group = non participants; **) only baseline group; ns = not significant; ^) corr. = reduction after correction according to Bart et al., 2002; [ ] = calculated risk relation

Table 6: Summary of results of other effectiveness criteria in- and outside Europe

No	State	Authors	Other effectiveness criteria than recidivism	
			Standard programme	Further intervention
DUI programmes - ANDREA (inside Europe)				
1	DE	(Winkler et al., 1990)	Increased knowledge*	
2	DE	(Jacobshagen, 1997)	Increased knowledge, less alcohol consumption*	
3	UK	(Davies et. al., 1999)	Increased knowledge, more sensitive regard. alcohol impairm.*	
4	AT	(Posch, 2000)	Increased knowledge, more sensitive regard. alcohol impair-ment, less extern. attribution*	
5	AT BE, IT, NL	(Bartl et al., 2002)	Positive participant feedback, personal useful*	
DUI programmes - Inside Europe				
6	AT	Christ, 2001	Developm. of pos. future perspec-tives, more favourable attitudes*	
7	AT	Schickhofer, 2003	Increased knowledge, more realistic self evaluat., pro lower BAC limits*	
8	AT	Drexler, 2005	Increased knowledge on alc. specific impairment, on safety risks, on health consequences of problem.	

			alcohol consumption – ns**	
9	CH	Bächli-Bietry, 2003	Development of strategies to separate alcohol & driving*	
10	UK	Inwood et al., 2007	Increased knowledge, safer attitud. towards drink. & driving, greater perceived behaviour. control*	
11	DE	Biehl & Birnbaum, 2004	– 50% other offences and convictions**	
12	DE	Scheucher et al., 2002		Stable decision regard. alcohol made during the course*
13	DE	Schülken et al., 2006		More pos. coping strategies, increased problem awareness*
14	DE	Klipp et al., 2007		Sign. changes in denial of problem, cognitive engagement, initiation of behavioural changes**
15	SE	Andren et al., 2002		Sign. interaction with client type regard. alcohol & drug use*
DUI programmes - Outside Europe				
16	US	Macdonald & Morral, 2007		Little additional benefit regard. self report. drunk-driving, alcohol use, stressful life events**
17	US	Nochajski & Stasiewicz, 2007		Sign. interaction with client type (depress) regard. treatment success*
18	US	Wells-Parker et al., 2000		Effects on motivation to change process*
19	US	Rider et al., 2006		Increased readiness to change – ns**
20	US	Dill et al., 2004		Less alc. consum. & drunk driv. – ns**
21	US	Polacsek & Rogers, 2001		Only short term effect, no long term effect**
22	US	Wheeler & Rogers, 2004		Alcohol consumption, drink. & driving – ns**
23	AUS	Ferguson et al., 2001		Change of intention to avoid DUI offences, decrease in self-reported drunk-driving, posit. effect on change motivation Knowledge improvement – ns**
24	AUS	Sheehan et al., 2005		Positive feedback of participants & external evaluators*
DUI + DUID programmes - Outside Europe				
25	US	Macdonald et al., 2004		No more impulsivity, risk-taking, sleep problems, but less violations**

Index: *) pre-post design without control group; **) pre-post design with study and control group comparison; ns = not significant

3.3.4 Discussion

The literature analysis on the effectiveness of DR carried out in DRUID WP5 confirms the difficulties of this research field. Wells-Parker et al. (1995), Bartl et al. (2002), Vanlaar (2002) and Sheehan et al. (2005) point out to a number of methodological problems, above all absence of randomized case-control research designs, quasi-experimental designs of poor quality, self selection bias, lack of control groups or comparable controls, lack of representativeness of samples, lack of control of other

intervening variables or factors, especially in long term observation periods. In general, these drawbacks are not limited to the DR effectiveness research, but are often connected with field studies, as they are restricted by ethical, financial and legal restrictions. In so far, all study results, documented here, can only reflect the actual research realities in this field.

3.3.4.1 Discussion of recidivism outcomes

Regarding recidivism, 36 studies (including two reviews) provide information on this criterion. Thereby, the majority of European studies refer to standard group interventions for offenders while the majority of studies outside Europe refer to further programmes with partly very different approaches. Almost without exception, the recidivism studies evaluate rehabilitation programmes for DUI offenders. Research on programmes for DUID offenders is rare; only one European study was identified.

Concerning the study design, most of the research on recidivism includes case-control group comparisons. Control groups are predominantly non participants, especially in case of programmes with voluntary participation. Partly, no comparable control groups were available, which is linked to the legal frame conditions regarding driver rehabilitation, i.e. due to obligatory participation of certain DUI offender groups.

Regarding the observation periods, the studies vary from one to 10 years, whereby the majority ranges between three and five years. The subject numbers range from several thousand to less than hundred, the majority dealt with several hundreds. In a few studies, the numbers dropped down to less than fifty when the sample was separated into case and control group.

European standard group programmes

As far as the outcomes of recidivism studies for DUI offenders are concerned, the reduction rates in the European standard group interventions range from 15.4% up to 71.9%. Taking the available reduction rates into account (N=15), the average reduction rate is 45.5%. The recidivism risk reduction of the only DUID programme is in line with this outcome.

Further interventions inside and outside Europe

Regarding the recidivism results of further interventions for DUI offenders (N=24), only few reduction rates (N=5) were calculable because the underlying data of experimental and control group were not available: i) due to lack of control group or not adequate comparison group (N=9), ii) due to not identified or published numbers (N=5) and iii) due to the method of recidivism risk calculation (N=5). Thereby, in four studies, no or little differences were reported, in one study partly significant effects were found. No effects were mainly found in approaches which differ from the European ones, such as victim impact panels.

In sum, the recidivism results confirm the minus 50% recidivism of ANDREA for the European standard group programmes. For the different kinds of further interventions no general conclusions can be drawn at the moment due to the inconsistent results.

3.3.4.2 Discussion of outcomes of other effectiveness criteria

Twenty-five studies provide information on other criteria than recidivism, the majority from European countries. All studies are investigating programmes for DUI offenders. DUID offenders are included in the intervention only in one study outside Europe. No specific DUID programme either in Europe or outside Europe was evaluated on other criteria than recidivism.

The predominant study design for additional criteria is a pre-post comparison. The majority only dealt with study groups (N=15). Case-control comparisons were included in N=10 studies. Information gathering is based in interviews and/or questionnaire surveys, i.e. self-reports from the studied subjects.

Regarding the observation period, the pre-post phases were partly restricted to the time span before or beginning of the intervention respectively. The subject numbers show similar sizes as the recidivism results.

Concerning the outcomes, nearly half of the results refer to European standard group programmes and the other half to further interventions inside and outside Europe. Regarding the contents of the outcomes, no remarkable difference can be found between these intervention types. In general, the studied effects mainly refer to the following areas or topics:

- knowledge regarding alcohol and sensitivity on alcohol specific impairments;
- increased problem awareness;
- safer attitudes towards drinking and driving;
- cognitive beliefs and less external attribution;
- effects on motivation for change;
- positive participant feedback;
- perspectives and strategies to avoid future offences;
- fewer violations and other offences.

Regarding the change of alcohol consumption habits, the results are not consistent. Partly no significant reductions were found in the treatment group compared to the control groups, although both groups reported less or changed alcohol use. On the one hand there are some hints that the effectiveness of programmes differ due to individual characteristics regarding psychopathology and/or severity of alcohol problem. On the other hand, some studies show that individual variables, like age, profession or number of prior offences do not have a significant influence on the outcomes. Concerning the influence of first, second or multiple offences on course success, limited information is available, often due to the legal frame conditions.

In sum, driver interventions - almost regardless of the type of programme – can influence the individual on several levels. The effects having found in the empirical studies are of additional value to recidivism as they are important contributing factors in the causal structure of conditions which lead to drink driving offences in traffic.

3.4 Different rehabilitation approaches: structural interventions

This chapter sums up findings about selected structural interventions against drinking and driving. Structural interventions are defined according to DrugInfo Clearinghouse (2006), a service provided by the Australian Drug Foundation (ADF). They state, that community interventions consist of individual interventions (“downstream interventions”) and structural interventions (“midstream interventions” and “upstream interventions”). In contrast to individual interventions which use an individual approach to change behaviour, structural interventions target populations. They serve as contributors to behavioural changes of populations and their main advantage is that they can achieve this without changing individual attitudes. These include organizational arrangements and structural conditions targeting environmental factors that enable or assist people to show healthy behaviours. People are passively exposed to structural interventions, thus these interventions have the power to influence a larger amount of people from a specific group at the same time. According to DrugInfo Clearinghouse (2006), structural interventions commonly target the following factors:

- “availability;
- physical structures (or physical characteristics of products);
- social structures or policies;
- media and cultural messages”(p. 2).

The following measures and tools are common examples of structural interventions to reduce DUI:

- BAC limits;
- random breath testing;
- media campaigns against DUI;
- licence withdrawal;
- electronic monitoring;
- vehicle sanctions like vehicle impoundment, vehicle forfeiture, plate and registration impoundment, vehicle immobilization and ignition interlocks.

Particularly the last examples are commonly used as secondary preventive measures. Vehicle sanctions are more often applied in the USA than in the European area though.

In the following, only alcohol ignition interlock systems will be considered as they provide (ongoing) mobility for the offenders (and their families) while the other measures will mainly taken to avoid the offenders’ subsequent participation in road traffic. Electronic monitoring was excluded as well as experience regarding its utilization in traffic related issues is still lacking. At present, only first considerations or pilot projects on electronic monitoring with prison inmates (other than traffic offenders) have started in a few European countries. Thus, the only focus will be on ignition interlocks. Another aspect why research on ignition interlock programmes is presented here is that study results indicate that the future recidivism risk of offenders can be calculated by the data of the ignition interlock recorder. In addition to that these data may be useful to give a therapeutic feedback of the rehabilitation process of the individual driver.

3.4.1 Alcohol ignition interlock systems

The literature search on alcohol ignition interlock systems was done in the databases ITRD and TRIS on June 6th 2007. Due to the fact that a comprehensive literature review on the effectiveness of alcohol ignition interlock programmes was published by Willis et al. in 2004, the electronic search for this report was restricted to publications since 2003. Search terms were “alcohol ignition interlock”, “alcolock”, “ignition” AND “immobilization” AND “alcohol”.

Further data presented here are mainly based on information which was gathered within a research project conducted by the Department of Social Psychology of the University of Greifswald, Germany in 2005. In addition to that, experiences and results from the last EU-project on this topic “Alcolock Implementation in the European Union - An in-depth qualitative field trial” (SUB-B27020B-E3-ALCOLOCK-2003-S07.26578), coordinated by the IBSR/BIVV, are being considered. Furthermore, main findings from the EU-project “SUPREME - summary and publication of best practices in road safety in the member states” (SER-TREN/E3-2005-SUPREME-S07.53754) contracted by the European Commission, Directorate-General for Energy and Transport (DG-TREN) are taken into account as well.

3.4.1.1 Device description and technical issues

Ignition interlocks are technical devices which are installed in the car and aim to avoid drink driving. The operation of the devices is as follows: before starting the car, the driver has to provide a breath sample into the mouthpiece of the device. If the test reveals a breath alcohol concentration above a

certain limit, the device prevents the engine from being started. The breath alcohol limit can be chosen individually (e.g. 0.2‰). Devices for secondary prevention, i.e. to control recidivism of drivers with a prior drink driving history, regularly include a second part. They are equipped with a data recorder which logs every breath test with its result and all connected data, e.g. date and time. Breath test refusals are registered additionally.

The devices usually feature a variety of anti-circumvention tools. To assure that the breath test is done by a human being, a special pattern of blowing and sucking is necessary for a valid test. Further, a specific minimum air volume is required, whereas the limit can be chosen individually to guarantee that persons with certain illnesses, e.g. asthmatics, can handle the device as well. To prevent the driver from drinking while driving and to assure that it was the actual driver and not another person who provided the breath test, ongoing tests at randomly chosen time periods are required while driving.

3.4.1.2 Feasibility and application

The primary preventive application of ignition interlocks is rare. Legislation on mandatory equipment of ignition interlocks in all cars is only discussed in Sweden so far, but from 2004 to 2006 the EU project "Alcolock Implementation in the European Union - An in-depth qualitative field trial" (SUB-B27020B-E3-ALCOLOCK-2003-S07.26578) contracted by the European Commission DG-TREN was carried out in order to study the feasibility of ignition interlock implementation in an European context. It consisted of a qualitative field trial which aimed at assessing the practical, psychological, social and behavioural impact of ignition interlock devices by interviewing drivers about their experiences. The study was conducted simultaneously in four European countries and included five groups of drivers:
Norwegian and Spanish bus drivers, German truck drivers and Belgian drink driving offenders and alcohol dependent patients. All drove with an ignition interlock installed in their commercial or rather personal car for a one-year period and were interviewed before, during and after the trial-period. In addition to that their social surrounding participated in interviews, too. The main outcomes of these interviews and the analyses of the data of the devices' records were that ignition interlocks could be considered as relatively practicable in both commercial and non-commercial contexts and may be marketed as an element of quality improvement (Silverans et al., 2006).

More often than in a primary preventive context, the devices are used as secondary preventive measures for the safe re-integration of DUI offenders into the traffic system. In contrast to other vehicle sanctions, which are more widely applied in the USA and Canada than in the European area, these systems provide (ongoing) mobility for the offenders and their families. Currently 43 states of the USA have introduced interlock programmes for DUI offenders so far and most of the Canadian provinces have laws requiring interlock systems to be installed in cars owned by repeat DUI offenders.
The following paragraphs will give more detailed information about these secondary preventive issues and sum up the current state of research on this topic.

3.4.1.3 Evaluation

Outcome evaluation

Research over several years seems to have proven the positive effect of ignition interlock devices on recidivism rates, at least as long as they are installed in the vehicle (Voas et al., 1999). Another important aspect - in contrast to other legal countermeasures – is that they seem to be effective for first offenders as well as for multiple offenders (Beck et al., 1999; Fulkerson, 2003).

Willis et al. (2004) conducted a literature review on the effectiveness of alcohol ignition interlocks and their impact on recidivism. Their data collection included one randomised controlled trial (Maryland)

and ten controlled trials (Alberta, California, Colorado, Hamilton County, Hancock County, Illinois, North Carolina, Oregon, Quebec, West Virginia) while three trials were still ongoing (Queensland, Sweden, Victoria). According to the results of their analysis the authors concluded that ignition interlocks reduce recidivism while the ignition interlock device is installed in the car. Unfortunately any evidence for long-term effects is missing. Re-arrest rates of interlock users after programme participation and completion increase up to the normal rate of non-users. Some methodological limitations of the studies included are not only mentioned in the review but often also discussed in the scientific community of interlock researchers. Non randomized controlled trials should be interpreted with caution due to the fact that they are subject to bias. Regarding the studies on the effectiveness of alcohol ignition interlock programmes the following biases occur and need to be mentioned:

1. Court bias. This bias refers to the fact that the offenders who are viewed as eligible for the programmes are selected by judges based on selection criteria that seem arbitrary, irreproducible and remain invisible. Uniform and transparent criteria for the selection are often missing. This leads to an error in the studies which afterwards lacks control by the researcher.

2. Offender bias. Although a lot of offenders are court-mandated to install an ignition interlock device, just a few in fact do as ordered. The main reason for this may be the high costs for the device and programme participation and the offenders' inability to pay these. In addition to that, extraordinary charges regarding time and co-ordination are required. Further, many offenders surely are aware of the low likelihood of detection when not obeying as ordered.

3. Self-selection bias. This bias concerns aspects of intrinsic motivation[13] which support the compliance. The fact that only highly motivated offenders who are willing to participate and to pay the costs comply with the ignition interlock order may falsify the results on effectiveness in a positive direction. To invalidate this argument Voas et al. (1999) stated that the increase in recidivism rates after de-installation of the device indicates a less strong effect of the self-selection process.

The best results are available from a Swedish study on alcohol ignition interlock usage for secondary prevention (Bjerre, 2005). In this study the researchers not only tried to prove the effectiveness of their two year programme which involved strict regulations entailing regular medical checkups in general, but also made an effort to control the self-selection bias while including two control groups: one with offenders who did not want to participate, thus experiencing the regular licence revocation and another one with offenders who were actually willing to participate, but due to regional limitations of the trial were not able to join the programme. The results of the study show a substantial reduction of the alcohol consumption (measured by the regular alcohol biomarkers and the AUDIT scores) among the ignition interlock users during the programme. In addition, a high impact of the programme on traffic safety was concluded. The analysis discovered highly significant differences for all ignition interlock users between the annual rate of DUI incidents before the programme (whereas an average annual frequency of the five years prior to the programme was formed) and during the programme. The effect was inversely for both control groups, where the annual rates actually were raised by licence revocation, which further indicates that the degree of driving without a licence illegally was very high. In the control groups there were no statistically significant differences in recidivism rates between the three time periods prior, during and after the programme. Additionally, it needs to be mentioned that alcohol intention interlock participants who were dismissed from the programme due to a lack of proving sober lifestyle within the programme's period showed similar increases in recidivism rates after dismissal as the controls. The fact that those offenders who did not comply with the strict medical

[13] The term intrinsic motivation describes a drive to behave somehow without any external incentives that may support this behaviour. In contrast to this, extrinsic motivation stands for a behaviour that is performed because of external constraints or incentives.

regulations were not allowed to finish the programme results in methodological limitations, similar to the self-selection bias, because the “hard cases”, i.e. the offenders who really cause the main risk for the public due to their potential risky drink driving style, were excluded from the ignition interlock group which then assures that only those with a less severe drinking problem remain in the programme and arranged for good evaluation results.

Regarding all issues concerning the outcome evaluation it should be emphasised that recent research indicates that it is possible to predict subsequent DUI behaviour with the data from the ignition interlock recorder (Marques et al., 2003). The results of their study show that BAC elevations recorded by the data logger are better predictors of repeat DUI incidents than prior DUI, which is regularly found to be the strongest indicator. Thus the offenders’ recidivism risk can be calculated and those who impose a high risk can be identified which can be followed by an obligation to drive only with the ignition interlock equipped car further on.

All in all the outcome evaluation results are promising. Thus, ignition interlock programmes are mentioned as one of the best practices in road safety regarding vehicles and safety devices for the prevention of DUI in the handbook for measures at the country level of the SUPREME report (European Commission DG TREN, 2007a).

Process evaluation

Since a lot of studies regarding the impact of alcohol ignition interlocks on recidivism are available, scientists, programme providers and other involved institutions are more concerned about the factors that support or impede programme conduction.
The main reasons identified as exerting influence on programme processing are described as follows (Beirness, 2001):

1. Low participation rates. Just a minimal proportion of eligible DUI offenders have the device installed. This applies particularly for voluntary programmes, although those who do participate evaluate the programmes as positive (Baker, 1987; Coxon & Earl, 1998; Morse & Elliott, 1990). Moreover, according to Beirness et al. (2003) the conditions for participation, i.e. voluntary versus mandatory, do not have an impact on the effectiveness of the programme. Nevertheless voluntary programmes list participation rates between 3% (e.g. Nebraska, according to Stanton in TIRF, 2005) and 11% (e.g. Sweden, according to Bjerre, 2005) of eligible DUI offenders whereas mandatory programmes reach up to 90% (e.g. Indiana, according to Sheridan in TIRF, 2005).
Besides the mode of the programme, i.e. mandatory versus voluntary, the following factors also have an impact on the participation rates:

- the administration of the programme: judicial authority versus licensing authority;
- the cost of programme participation.

2. Circumvention attempts. The technical standard of the ignition interlock devices was low when interlocks were introduced initially in the early 1980s thus ignition interlock users frequently tried to circumvent the systems. The EMT Group (1990) found out that 50% of the ignition interlock programme participants attempted to bypass the device, Morse & Elliott (1990) refer to 10% of the participants who tried to circumvent the device according to self reports, whereas just 3% of these trials were successful.
Due to the technological progress the newer generation of the devices includes a variety of circumvention features nowadays. Above all the data recorder helps to detect every event of bypassing. Nonetheless it cannot be doubted that highly motivated individuals can bypass the system

somehow. The easiest way, of course, is to use another, non-interlock restricted car; although Voas et al. (2000) report that they did not find any evidence for that due to prior alcohol consumption.

3. False positives. Common problems frequently reported by alcohol ignition interlock users are related to starting the engine although being sober (e.g. Morse & Elliott, 1990). These problems are eliminated now by new technologies, i.e. fuel cell technology for alcohol detection.

4. Negative participant reactions. On the one hand embarrassment and inconvenience of the obligation to provide a breath sample are basic factors which lead to certain unpleasant feelings of participants and seem to produce a negative attitude towards the devices. On the other hand positive reactions are also common, e.g. according to Baker (1987) a lot of participants reported that the device was helpful and effective in preventing them from drink driving.

5. Deficits in knowledge and communication. Inappropriate knowledge about the existence, the effectiveness and the functioning of the ignition interlock devices and programmes impede the operation of these and make judges reluctant to assign more offenders to a programme.
For future processing and operation of alcohol ignition interlock programmes it is recommended that ignition interlocks should not substitute any form of licence suspension, but should be a condition for licence reinstatement.

Recommendation for best practices
Beirness (2001) published the following recommendations for the future operation of interlock programmes:

- "alcohol ignition interlock programs must be viewed as a coordinated set of activities to prevent impaired driving among participants and not just as a device installed in a vehicle;
- the programme needs to be supported by strong, clear legislation;
- the selected ignition interlock device must be alcohol-specific and must meet or exceed established performance standards;
- the programme must be offered by a dedicated and committed ignition interlock service provider;
- the programme should set participation criteria that include as many DWI offenders as possible;
- participation in the programme by all eligible offenders should be mandatory, with provisions that allow early voluntary entry into the program;
- administrative authority for the programme should reside with the agency responsible for driver licensing and control;
- participants should be monitored regularly, including a review of data from the ignition interlock data recorder;
- the length of the programme should be linked to participants' success in it;
- the programme should be integrated with other DWI countermeasure programs and sanctions, particularly rehabilitation." (pp. 43 and further).

3.4.2 Alcohol ignition interlocks within DUI rehabilitation

Only the Belgian study within the EU-project "Alcolock - An in-depth qualitative field trial" (SUB-B27020B-E3-ALCOLOCK-2003-S07.26578) applied alcohol ignition interlocks to DUI drivers and combined the programme with driver rehabilitation courses. In the following, this study will be presented.

3.4.2.1 Study design

The DUI offenders' group in this study consisted of drivers who were sentenced more than once for drink driving or who were sentenced only once but with a breath alcohol concentration above 0.53 mg/l (equal to a blood alcohol concentration of 1.2 g/l). This group consisted of 33 persons to whom the alcohol ignition interlock system was proposed by police judges as an alternative sanction for DUI offenders. Thus, the judges decided who to propose it to. It was for instance not proposed after a first DUI offence because the normal period of the driving licence withdrawal in that case is only one month, which is a relatively less severe sanction than driving a full year with an ignition interlock device.

Two different procedures were followed to include the offenders. In some judicial departments the court informed the potential participant who then had some time to consider the alcohol ignition interlock option instead of a licence suspension and/or a fee. In other departments the judges requested a positive advice based on a social inquiry before an offender had the possibility to choose the device. During these social inquiries, probation officers assessed whether the alcohol ignition interlock could be considered an appropriate measure for a particular candidate. An important criterion was that candidates showing manifest signs of alcohol dependency were excluded. In practice however, this criterion sometimes proved very difficult to be assessed by probation officers.

The group of the alcohol dependent persons consisted of 7 persons who were asked by their treating psychiatrists to participate on a voluntary basis. For motivated abstinent alcoholics, the ignition interlock device may be a possible support tool for executing and maintaining their intention not to drink and drive anymore, and it may perhaps even have therapeutic effects with respect to their drinking behaviour.

The recidivist participants in the study were followed-up by probation officers and the alcohol dependent patients by their treating psychiatrists. During the trial alcohol ignition interlock data logs were collected.

Besides the installation of the ignition interlock device in their car, all participants furthermore underwent two tailored driver rehabilitation courses according to the Belgian system (see 3.2.1.2) aiming at supporting them in their mental reflections about improving their behaviour and in their efforts to face the constraint of the ignition interlock system in their car. They followed driver rehabilitation courses immediately before the device was installed and after using the ignition interlock for 6 months.

3.4.2.2 Key role of motivation in the process of change

Starting-up an alcohol ignition interlock programme requires a considerable level of motivation for the drivers concerned. A new restricting device has to be accepted and this requires efforts to be made. For some persons, these efforts are easily made, while for others this experience can represent many obligations and duties.

For persons not strongly motivated, the presence of the device can be perceived as a major loss of freedom which may lead to a lot of resistance from the start.

Different elements play a role in the self-motivation and in the positive versus negative perception of the possible changes due to the device. Some factors seem to be very important to create a positive intrinsic motivation and to stimulate behavioural change using the alcolock device (Kluppels, 2007).

- One factor is the feeling of being free to make ones own decisions. In the court, the persons felt either free or not to participate in the 'alcolock' trial. On the other hand, the offender may have perceived pressure from the judges, from family or the professional setting. This can influence his/her motivation.
- Another factor is the understanding of the sanction and the legitimacy of the rules. Besides the external pressures, some offenders may not understand the sanction or the legitimacy of the rule they have broken. They may also underestimate the danger of drink driving or in extreme cases, they are totally unaware of the possible consequences of the risks taken for themselves and for the other road users.
- Another element is the feeling of readiness, the will to change and the trust in the ability to change behaviour. If the person is convinced that the result will not be positive, he/she will be reluctant to embark on the required changes. For some authors like Rollnick et al. (1999) a person may change his/her behaviour if: a) he/she feels this change as a priority; b) he/she wants it really (will to change) and realizes the importance of it and c) he/she feels capable of achieving this change.
- A fourth factor is the fear of having to cope with a new device. Every innovation can be a factor of concern, and, for some people, of real fear. The innovative aspect of the alcolock experience may on the other hand also be a positive aspect, leading to curiosity.
- Another point is the social perception, i.e. the opinion of other people and the way relatives and even unfamiliar persons may consider the presence of the device in the vehicle. The alcolock can for example be a mean to demonstrate to oneself and to the others that it is possible to make a success of this experience and to meet the challenge despite the difficulties.

3.4.2.3 Influencing the motivation to change

First DR course – prior to alcolock installation

The objective of the first course was to develop a positive feeling towards accepting the idea of changing behaviour, or, in other words, to elicit, to select and to reinforce the people's own self motivational expressions of desire, intentions to change and ability to change.

To achieve this, it was important that people felt reassured: at first the trainer had to reassure worried persons on the device and its operating, secondly, he/she had to encourage persons in their behaviour changes and, finally, he/she had to try to bring the rebellious or opposed persons towards a more positive approach. This was the ideal moment for the involved persons to speak, to ask questions and to get concrete answers.

In order to make this possible, the trainer had to develop a listening attitude, show empathy and create a trustful and non-judging atmosphere. This attitude was very important to allow persons to explain their fears, to ask questions about the device and to express their own factors of motivation, which added additional weight to their feeling that they were able to achieve it. It allowed also a proof of personal commitment, as people were able to show at that moment that the device was not just imposed by someone else, or as Rossignol (2001) said: "If I tell and nobody forces me to tell it, it's that I must believe in it".

Another way to overcome the fear of the unknown was to offer pertinent information. People got technical knowledge about the device and its way of functioning. Testing the device concretely was also necessary to let people develop their confidence in the system and their capacity to use it. It was furthermore important to provide information about the effects of alcohol in the body, like the time for assimilation and destruction of alcohol and the mechanisms that may lead to dependency. After this,

people got a better idea of their relation to the product, and were able to decide in full knowledge not to drink before driving or to calculate to stay below the device limit.

In case of not motivated persons, the trainer assessed the level of readiness to change. The theory of Prochaska & DiClemente (1983) mentions six steps to achieve a change of attitudes and behaviour. In the first step of 'precontemplation', the person is not inclined to change because he/she denies having a problem or minimizes the importance and consequences of it. In the second step, it is recognized that there is a problem but the person is ambivalent towards changing. If a person didn't pass these two first stages, it was difficult to reach a positive alcolock experience.
It was thus the trainer's aim to help the person to go through at least these stages in order to reach the further stages of change which are the 'preparation' and 'action' stages. In these stages, the person starts to think about behavioural change through balancing the costs and benefits, and about how to avoid drinking before driving.

The group dynamics formed a strong support for the trainer. Persons were able to feel like members of a group – they committed the same offence and/or experienced the same drinking problems, had the same device with the same constraints – and could thus be more open to the point of views of the other members. Through the sharing of experiences and opinions they were able to gain more insight in and awareness of their behaviour which could prompt them towards a further stage of change.
Besides this, the group dynamics also provided support for individuals in their progress. Such social support was important, especially for the persons whose own social and/or familial support was weak.

Second DR course – after 6 months of alcolock use

The objective of the second training, conducted six month after the installation, was to consolidate the new behaviour and to offer the opportunity to explain the difficulties or advantages of the different changes in the person's life within the last six months.

The second objective was to prepare for driving again without the alcolock device (it was a one year trial). Building on the alcolock experience, the trainer aimed at motivating the participants to continue the changed behaviour, even after removal of the device.

- **Strengthening behavioural change**

After 6 months of driving with the alcolock device, most persons realized the importance of dissociating driving and drinking. The majority realized the importance of continuing the experience – with concrete actions – and was well aware of the advantages and disadvantages of the change they had achieved.
Except in case of a relapse, the stages of 'precontemplation', 'contemplation,' 'decision' and 'action' were reached at this stage. The most important focus at that moment was to consolidate the new behaviour. For that, the trainer encouraged the participants to identify problems that may lead to a relapse. At this stage the persons tried to resist the different temptations that may lead to the initial problematic behaviour, but regression was always possible. When this occurred before the end of the alcolock experience, the possibility to share experiences (regarding traps, solutions found, adaptations sets, limits etc.) and the trainer's support were very important in order to reach a more long-term success.

- **Development of self-efficiency feelings**

Throughout the course, the trainer encouraged the persons to reinforce the confidence in one's efficiency in the change process started. Even in case of failure, it was very important that the person felt supported. Relapse is part of the process of behavioural change. Making persons feel guilty,

moralising or judging them, is contra-productive and could have led them into a negative trend. On the other hand, supporting them, analysing the origin of the difficulties, setting up concrete support and showing them the progress already achieved, proved to be much more productive and increased the chances of a successful alcolock experience.

3.4.2.4 Summary of the study results

The conclusions presented here should be understood as hypotheses which can be taken into account in future alcolock applications in a European context. Only large scale studies with appropriate control groups can allow general conclusions regarding the real impact of alcolock devices.

The results regarding the practical, psychological, behavioural and sociological impact of the alcolock device are focussed (Silverans et al., 2006). From the alcolock data it appeared that the device had a clear impact on drink driving. A total of 895 tests above the device threshold were recorded, of which 30 while driving. At the re-tests 4 were above the legal limit, whereas at the pre-tests 275 were. In each of these cases the engine was locked out, preventing drink driving. The inquiry about the practical aspects revealed that a high number of technical difficulties and problems with the devices occurred in the first 6 months of the project, while after that, only two participants reported serious technical dysfunctions. Although the technical dysfunctions caused a lot of frustrations, the participants were generally satisfied with the device. They especially appreciated the impossibility of being caught again for DUI. From interviews with relatives of the participants as well as from self-reported data it appeared that the participant's social surrounding was often very much in favour of the device. On the other hand, participants were also confronted with negative reactions of other people and/or with people labelling them as alcohol dependent persons. The impact of the alcolock on the participants' drink driving and drinking behaviour was difficult to assess. Although the self-reported data indicated an impact on drinking and drink driving, the alcolock data contradicted these self-reports to some extent.

Regarding the tailored DR courses – developed to raise the participants' awareness of the DUI problem and to help the participants to learn from the alcolock experience instead of conceiving it only as a means of controlling the participants' behaviour – it was explicitly checked what the participants' impressions were. Although the answers were liable to social desirability, 25 of the 37 interviewees (67%) found the course after six months 'useful' to 'very useful', and only 3 participants (8%) disagreed with this, which indicates that most participants subjectively found these courses helpful. Both DR courses were also perceived as a motivation to reduce the drink driving by a majority of 21 of 37 participants (57%). Of the 9 subjects that disagreed with this statement (24%) though, several indicated explicitly that they already stopped drinking or drink driving before following the course, and hence they did not need to be motivated supplementary.

Summing up the study results, it can be stated that alcolock application seems to prevent drink driving, although the number of included DUI offenders was very small. But alcolock systems itself can not modify behaviour. Based on this experience, it can be recommended that judges should carefully evaluate which probation conditions would be helpful for particular cases. For some persons it may be sufficient to install the alcolock device for a short period in combination with a limited DR course. Other DUI offenders, with a serious alcohol problem may better be imposed to a medical/therapeutic treatment in combination with the alcolock device. In general though, it is recommended that the offenders have to continue the alcolock programme as long as the monitoring results indicate continuing risk regarding drinking and driving behaviour.

Recommendations

Based on the experiences documented above, recommendations were formulated considering different types of DUI offenders.

- **Persons addicted to alcohol**

For persons addicted to alcohol, driving with an alcolock device and undergoing two tailored DR course sessions can not be sufficient. These persons proved to be incapable of controlling themselves, and some abandoned the programme, despite their intention to change and their signs of goodwill. Although, in such cases, the alcolock protects the person and the other road users, but it doesn't help these offenders to resolve their alcohol problem which led to the offence. Therefore, a regular follow-up combined with a therapeutic measure would perhaps be a necessity before the installation of the alcolock.

- **Persons not intrinsically motivated to change**

Some persons are only motivated to change their behaviour because of judicial fear. When no other interest in this behavioural change is seen, the risk to return to the original behaviour as soon as the alcolock is removed increases. These are also the persons investing a lot of energy in the circumvention of the device. In order to avoid this, an individual can be questioned on his/her motivation (e.g. through a 'motivational interviewing') prior to the installation of the device. Only persons who are really motivated would then enter the alcolock programme and follow the DR courses.

- **Motivated persons without social support**

Social support from family and relatives is necessary to feel encouraged in this difficult process. When such support is missing or insufficient, a regular follow-up by a professional can be helpful. This can be done parallel to the DR group courses.

- **Importance of social and medical inquiry**

In order to psychologically and physically determine the severity of the alcohol problem, the degree of motivation and of potential social support, as important determinants of programme success, communication between physicians or other health workers and the justice agents seems necessary before proposing a programme to an offender. DUI assessment of the relevant characteristics can be a good consideration to assign the offender to a rehabilitation measure adequate to the severity of his/her problem.

4 Review of addiction treatment and options for dependent DUI/DUID offenders

Susanne Rösner (IFT) & Ludwig Kraus (IFT)

Alcohol is used in broad levels of the population. Furthermore, the use of illicit drugs, especially the use of cannabis, cocaine and opioids, was increasing in many European countries within the last decade. The excessive use of alcohol and drugs restraints physical and mental health as well as social, family, or job responsibilities. It is associated with different types of hazardous behaviour including high-risk driving, which increases the risk of fatal accidents. According to Movig et al. (2004), the risk for road accidents is five times higher with an alcohol blood concentration between 0.5-0.79 g/l, compared to sober drivers or drivers with an alcohol blood concentration of less then 0.5 g/l. Drivers using combinations of drugs and/or drugs and alcohol are estimated to have the highest risk of fatal traffic accidents.

Within the population of alcohol and drug impaired drivers, special attention needs to be given to those drivers who are dependent on alcohol and/or drug. The prevalence of alcohol dependent drivers in DUI populations is estimated between 16% and 60%, depending on the population and the criteria used for the diagnosis (Korzec, 2001). Furthermore, drivers who fulfil the criteria of alcohol dependence are highly over-represented in all kinds of alcohol-related traffic crashes. It is estimated that the collision rates of alcohol dependent drivers are twice as high as those of non-addicted drivers (Vingilis, 1989) and that alcohol-dependent drivers are responsible for two-thirds of motor vehicle crashes that are caused under the influence of alcohol.

The nature of dependence, which is defined by a cluster of somatic, psychological and behavioural symptoms including e.g. tolerance, withdrawal, craving and impaired control, raises the question if common strategies for DUI/DUID offenders based on information, education and legal sanctioning are sufficient to prevent a relapse to DUI/DUID in subjects who are alcohol or drug dependent. From a theoretic point of view it rather seems that the severity of alcohol and drug dependence with symptoms like e.g. craving, loss of control, withdrawal and tolerance requires treatment strategies, which adequately account for the high complexity and specificity of addiction related processes.

In the last 50 years, a variety of psychosocial strategies have been developed to treat alcohol and drug dependence, which integrate the knowledge and experience from different theoretical and professional backgrounds. These strategies may have important implications for the planning and conduction of rehabilitation programmes, not only for alcohol and drug dependent drivers, but also for the treatment of excessive drinking and alcohol induced high-risk behaviour of drivers who do not fulfil the criteria of dependence. Over the years, the variety of these approaches and studies on there effectiveness increased. Thus, the multiplicity of treatment conceptions and their efficacy estimations is meanwhile hardly comprehensible. The present summary review gives an overview of the state of the art regarding relapse prevention and rehabilitation of alcohol and drug dependence based on current meta-analyses and systematic reviews.

To guarantee the objectivity and the transparency of the methods of the summary review, the criteria of in- and exclusion, as well as the search strategies and the identified database have been documented before and during the course of the review process. The steps and criteria of the data-search, the criteria of in- and exclusion and the identified database are to be found in the annex.

2.046 abstracts on alcohol dependency were identifies with the first search strategy (see annex). Thus, the authors decided to restrict the database to meta-analyses and reviews with the exception of three multi-centre studies (Projects: MATCH, COMBINE and UKATT), which were included because of comprehensiveness and high methodological quality. After the application of inclusion and exclusion criteria (see annex), a total of 16 meta-analyses and reviews of rehabilitation treatment of alcoholism was included in the review. Three reviews provided a comprehensive evaluation of different psychosocial as well as pharmacological treatment strategies for alcoholism and problematic drinking.

For the reviews of rehabilitation treatment of drug dependants, a total of 24 abstracts were identified for opioids, one abstract for cannabis and 11 abstracts for cocaine. For each topic, only the latest update of the Cochrane Review was included. After the adaptation of the criteria of inclusion, 9 Cochrane Reviews of opioid dependence, one Cochrane Review of cannabis dependence and three Cochrane Reviews of cocaine dependence were considered for the summary review. Additionally, a comprehensive practice guideline for the "treatment of patients with substance use disorders (Kleber et al., 2006), which was already known to the authors, was included. The guideline does not provide summary statistics but referred to single studies that were relevant in this context.

This chapter does first give an overview of the theoretic background of addiction treatment. It presents different treatment approaches within the psychosocial as well as the pharmacological (including substitution) strategies. In the second and third part this chapter will concentrate on the presentation of the results of the identified multi-centre studies (MATCH, COMBINE and UKATT), meta-analyses and reviews. More details on the methodology of these studies can be found in annex. The second part of this chapter describes the state of the art on effects of alcohol dependence treatment and the third part the state of the art on effects of drug dependence treatment. In the final part conclusions for alcohol and drug treatment in general as well as conclusions regarding the specific situation of DUI/DUID rehabilitation are being drawn.

4.1 Theoretical background

For the treatment of addictive behaviour, a variety of psychosocial approaches have been developed. Psychosocial treatment strategies are based on different psychological theories including e.g. psychodynamic theories, learning theories or cognitive approaches. Accordingly, the interventions range from gaining the patient's understanding of his conflict relationship patterns, as well as the function of alcohol and drug use, through the reduction of reinforcing consequences of drinking and drug use, up to the strengthening of coping skills, the enhancement of social support and the development of new social and behavioural competences. Within the last decades, the repertoire of treatment strategies has been extended by pharmacological treatment options. Pharmacological treatments in the rehabilitation of alcohol and drug dependence mainly aim to reduce the desire to drink or take drugs (Anti-Craving), to diminish the reinforcing properties of substances or to substitute their effects. To provide a fundament for a comprehensive understanding of alcohol and drug treatment, the rehabilitation treatments, the theoretical frameworks, aims and procedures for the most common psychosocial and pharmacological approaches are described in the following.

4.1.1 Psychosocial treatment strategies

Cognitive Behavioural Therapy. Cognitive Behavioural Therapy (CBT) subsumes several techniques based originally on learning theory and combines them with cognitive elements. Many of these techniques are also classified under the heading of Behavioural Skills Training or Coping Skills Training (Wolwer, 2001). According to CBT, associations between conditioned and unconditioned stimuli, the influence of behaviour consequences as well as cognitive and emotional processes, play an important role in the development and maintenance of substance abuse and dependence.

According to the mechanism of classical conditioning, internal states (e.g. emotions, physiological changes) and external cues (location of drinking, social drinking environment), which are repeatedly associated with drinking, can become conditioned stimuli that trigger subsequent substance use. On a subjective level, conditioned reactions initiated by triggers are often perceived as a strong desire to drink (craving). Compliant with the principles of operant conditioning, pleasant effects of substance use like relaxation or euphoria increase the probability of subsequent consumption and thus act as positive reinforcers. From a cognitive behavioural view, alcohol or drugs provide the desired results on repeated occasions, and thus become the preferred way of achieving these results, particularly in the absence of other options meeting these desired effects.
According to assumptions of cognitive learning theories, CBT strategies should aspire to:

a) identify and eliminate stimuli that serve as triggers for substance consumption;
b) identify the reinforcing consequences of drinking or taking drugs as well as the cues and situations that promote and trigger drinking;
c) develop skills that provide alternative ways of meeting those needs (Kadden, 2002).

According to the different therapeutic targets of CBT, various strategies can be distinguished:

The *Cue Exposure Approach* (CEA) attempts to identify the triggers of drinking and drug taking, and to reduce their impact by extinction. These triggers or cues can include the sight and smell of the favourite alcoholic beverage, mood states or situations in which drinking or drug taking previously occurred. Further cues can be people, places and objects that had previously been associated with the alcohol's pleasurable effects. The Cue Exposure Approach basically involves exposure to cues without showing the consumption behaviour (Drummond & Glautier, 1994), e.g. alcoholic patients are asked to "*act out drinking*" by picking up, looking at, and smelling a drink and thinking about drinking it.

The *Relapse Prevention Approach* can be conducted in either group or individual sessions. In either setting, each session includes a variety of components, e.g. the instruction in effective coping skills for specific situations, the modelling and rehearsal of these behaviours in role plays, the feedback about the patients' responses or the instructions on cognitive processes used in generating the responses. The *Relapse Prevention Approach*, which is primarily based on the work of Marlatt and Gordon (1985), not only provides a systematic way of assessing the full range of cognitive antecedents and consequences of substance use, but also supports the development of strategies dealing with risk situations and reducing negative thoughts and feelings in relapse situations. This has been shown to be important in order to break through the circuit of negative emotions and thoughts and excessive consumption. The modification of negative mood states and self-judging processes after a lapse also constitute the main targets of Behavioural Self-Control-Training (BSCT), which accordingly aims at controlled consumption rather than abstinence (Walters, 2000).

The *Communication Skills Training* (CST) partly overlaps with the *Relapse Prevention Approach* (RPA), as both strategies include the improvement and the training of coping skills. In contrast to the more general RPA, the CST focuses more on communication skills rather than on high-risk situations. The Communication Skills Training addresses different high-priority skills which include (1) refusing a drink or drug, (2) giving positive feedback, (3) giving criticism effectively, (4) receiving criticism about alcohol and other drug use, (5) developing listening skills, (6) improving conversation skills, (7) developing sober supports, and (8) learning effective approaches for solving conflicts (for an overview see Monti & Rosenhow, 1999).

Community Reinforcement Approach. The Community Reinforcement Approach (CRA) is based on the theoretical view that consumption-related contingencies and the concurrent lack of social

reinforcers promote the use of substances as an alternative way of reward. Consequently, the establishment of alternative activities that are incompatible with substance use and abuse is essential to initiate and maintain abstinence (Schottenfeld et al., 2000). These include social, recreational and familial support to assist alcohol dependent patients in the relapse prevention process. Its goal is to make the abstinence from substances more rewarding than its use. In doing so, CRA combines principles of operant behaviour modification with social system theory. The social community is supporting the modification of substance use by awarding behavioural change (Berglund et al., 2003). Some authors classify the CRA as a CBT, as it uses social resources to strengthen coping skills and promotes alternative ways of reinforcement.

Brief Interventions. The topic of Brief Interventions (BI) has attracted a great deal of attention in the alcohol field in recent years, but this has also been accompanied by a great deal of confusion (Raistrick et al., 2006). This is partly because, rather than being a single, well-defined method of intervention, the unique characteristic of BI is their brevity. According to Aalto et al. (2001), BI is defined as any therapeutic or preventive consultation of short duration, which is restricted to four or fewer sessions, each session lasting from a few minutes to one hour. Mostly it is provided by healthcare workers such as general physicians, nurses or psychologists in general practice. On major characteristic of BI is that it is also designed to be conducted by health care professionals who are not specialized in addiction treatment. Patients usually do not seek treatment in this setting (Kaner et al., 2007). Rather, patients are routinely asked about their alcohol consumption during registration and health screenings. If their alcohol consumption is considered as problematic, they are offered BI, which includes a feedback on alcohol use and harms. Thus, one of the primary goals of BI is to promote the awareness of the negative effects of drinking and to motivate patients for a behavioural change. Accordingly most interventions include certain components such as information about the adverse effects of alcohol, comparison of the individual's consumption pattern with drinking norms, and motivational elements, but the content of BI can vary in function of the severity of the patient's alcohol problem and the therapeutic aim. One possible resource for reaching untreated individuals with BI is *Bibliotherapy,* the provision of self-help materials to motivate and guide the process of changing drinking behaviour. In a further step, high risk situations are identified with the patient and motivational support for the plan to reduce drinking is provided. Even though the approaches used in BI are similar for alcohol-dependent and non-alcohol-dependent patients, BI can be used to motivate alcohol-dependent patients to enter specialized treatment. Most often it is used with clients who are not alcohol dependent, and its goal may be moderate drinking rather than abstinence (Bien et al., 1993; Graham, 1998). The term BI is mainly used in alcohol addiction treatment, for drug abuse treatments of short duration, it is less common.

Motivational Interviewing. Motivational Interviewing (MI) or Motivational Enhancement Therapy (MET), developed by Miller & Rollnick (2000), is based on theories of cognitive dissonance and attempts to promote a favourable attitude to change. MI techniques are predominantly based on the assumption that the common method of instructing patients on the advantages of abstinence tends to encourage them to present contradictory arguments. This may reinforce their entrenched attitudes and encourage continued drinking or drug taking. In MI, the clients themselves give reasons why they should be abstinent and draw up a list of problems caused by their alcoholism or drug taking. In MI, the clients themselves give reasons why they should be abstinent and draw up a list of problems caused by their alcoholism. The principles of MI are also known as FRAMES formulations (Miller & Rollnick, 2000):

F Provide **f**eedback on behaviour;
R Reinforce the patient's **r**esponsibility for changing behaviour;
A State your **a**dvice about changing behaviour;

M Discuss a **m**enu of options to change behaviour;
E Express **e**mpathy for the patient;
S Support the patient's **s**elf-efficacy.

Many persons with drinking-related problems have not yet formed a definite commitment to change their behaviour and even when a person seems convinced that a change is necessary there is often a lingering attachment to heavy drinking and intoxication. The strategies of MI are closely linked with the Stages of Change Model (Prochaska & DiClemente, 1983; see 1.1.8). Therefore MI includes a collection of therapeutic principles, a set of counselling techniques and a certain style of interaction, which is defined by Miller & Rollnick (2002, p. 25) as "a client-centred, directive method for enhancing intrinsic motivation to change by exploring and resolving ambivalence".

12-Step Programmes. 12-Step Programmes consist of a brief, structured, and manual-driven approach to facilitate early recovery from alcohol abuse/alcoholism and other drug abuse/addiction. It is intended to be implemented on an individual basis in 12 to 15 sessions and is based on behavioural, mental, and cognitive principles that form the core of 12-Step fellowships such as Alcoholics Anonymous (AA) and Narcotics Anonymous (NA), two international organisations established and maintained for recovering alcoholics (Amato & Davoli, 2007). 12-Step Programmes are suitable for problem drinkers and other drug users and for those who are alcohol or drug dependent (Nowinski, 1995). These programmes seek to facilitate two general goals in individuals with alcohol or drug problems:

a) acceptance of the need for abstinence from alcohol or other drugs and
b) surrender as the willingness to participate actively in 12-step fellowships as a means of sustaining sobriety.

These goals are in turn broken down into a series of cognitive, emotional, relational, behavioural, social, and mental objectives. 12-Step Programmes are based on the assumption that substance dependence is a mental as well as a medical disease that affects individuals in a way that they are unable to control their use of alcohol or other drugs (Nowinski, 1995). Accordingly alcoholism and drug addiction are considered as relapsing illnesses that require complete abstinence. From this perspective, the concept of controlled use of alcohol or other drugs amounts to denial of the primary problem. Clients are required to acknowledge their alcoholism or drug addiction and also the harm they are causing to themselves and to others.

Contingency Management. Contingency Management (CM) treatments are almost exclusively used in the treatment of drug dependence and based upon positive reinforcement as a principle of operant conditioning: Positive consequences that follow a certain behaviour increase the probability of its reoccurrence and thus can be used to modify its frequency (Petry, 2000). Thus, in many CM treatments, patients provide urine specimens multiple times each week and receive explicit rewards for negative drug test results. These rewards often consist of vouchers that have a monetary basis and can be exchanged for retail goods and services.

Supportive-expressive therapy. Supportive-expressive therapy (SET) is a short-term psychodynamic treatment that has been developed for a variety of disorders, including depression, generalized anxiety disorder, opiate drug dependence (Luborsky et al., 1984; Luborsky et al., 1995) and cocaine abuse (Mark et al., 1995). It subsumes a variety of rather unspecific psychotherapeutic approaches which aim at helping patients to understand their interpersonal and psychological functioning as well as the psychodynamic interactions between psychological processes and the abuse of alcohol or drugs. SET intends to provide an understanding of the conflict relationship

patterns, the functions of drug use in the context of the individual situation and the self influences that complicate the steps needed to stop taking drugs in the context of a supportive relationship (Knapp et al., 2007). SET is one of the four therapeutic approaches tested in the Drug Abuse Collaborative Cocaine Treatment Study (CCTS; Crits-Christoph et al., 1999).

Combined Approaches. In the clinical application of treatment strategies developed for the treatment of alcoholism and drug dependence, different approaches are often combined in order to address different therapeutic targets. Combinations of different approaches have also been evaluated in treatment research to adequately consider the clinical reality. An example of a combined approach is the Combined Behavioural Intervention (CBI) as applied and tested in the COMBINE study. The CBI uses different aspects of CBT, 12-step programmes, MI and external support. *Social Behaviour and Network Therapy (SBNT)*, a therapeutic approach which is very close to the CRA, was specially developed for the United Kingdom Alcohol Treatment Trial (UKATT; Copello et al., 2002). SBNT is based on a number of different therapeutic strategies and approaches which focus the aim to help the client to build positive social support for a change in drinking (UKATT Research Group, 2005). Additionally, the therapists use a range of cognitive and behavioural strategies to prevent a further drinking relapse.

In the treatment of drug addiction, the combination of educational and motivational elements is often termed as “Drug Counselling Approach” (DCA). Drug counselling is not based on specific theories and mainly describes a mixture of strategies: Patients are educated about the substances of abuse, the underlying processes of addiction and are additionally encouraged to participate in a 12-step programme. Motivational elements play an important role, but the motivational strategies used within in the DCA are less elaborated than the techniques of MI. Even though drug counselling can be delivered in individual and group formats, it is mainly used in groups as it is important to express feelings, discuss problems and learn to draw strength from one another (Knapp et al., 2007). In the CCTS study (Crits-Christoph et al., 1999), drug counselling was applied in accordance wit a manual developed by Mercer et al. (1994).

4.1.2 Pharmacological treatment strategies

As psychobiological research has shown, different neurotransmitter systems and neural circuits are involved in the development and maintenance of alcohol and drug dependence. In both animal and human models of addiction, different stages in the addiction process have been classified as initiation, continuation and withdrawal abuse. Thereby different neurotransmitter systems, brain structures and neural circuits are involved in each of these phases (van den Brink, 2003). Opioid receptors and dopamine mediate reinforcing effects of alcohol and drugs and thus already play in important role before symptoms of dependency have been developed. During continued alcohol and drug use, a large variety of neurotransmitters are involved, including dopamine in the nucleus accumbens, the corticotropinreleasing hormone (CRH) in the amygdala and glutamate in the frontal-cingulate brain circuits. In many of these systems, the chronic use of drugs and alcohol causes an adaptation, which means that withdrawal symptoms and craving occur, if the dose of the substance of abuse is reduced. During detoxification and withdrawal, glutamate and norepinephrine play an important role and finally, after sustained abstinence the orbitofrontal cortex, the gyrus cingulate and the amygdala pare important brain regions (Kosten & George, 2002; van den Brink, 2003). Accordingly, many of the neurotransmitter systems and neural circuits that are assumed to be involved in the development of addictive behaviours have been the main targets of pharmacological interventions. In the following, current pharmacological strategies to treat alcohol, opioid and cocaine dependence are introduced. As there are no medications approved for the treatment of cannabis dependence, the corresponding chapter is restricted to a short summary introduction.

4.1.2.1 Strategies for alcohol dependence

While relapse prevention therapy in alcoholism was exclusively dominated by social and psychological treatments for many years, in the last decade the benefits of pharmacological agents for relapse prevention in alcoholism have become increasingly evident. One of the first substances used for pharmacological relapse prevention was disulfiram, an irreversible inhibitor of the acetaldehyde dehydrogenase (ALDH), which is supposed to prevent a relapse to drinking by producing unpleasant if not dangerous effects, if combined with alcohol. Efficacy data for disulfiram are mixed and its general use is not recommended anymore (Soyka & Rösner, 2006). Additionally a variety of substances and psychotropic drugs have been tested like selective serotonin reuptake inhibitors, dopamine agonists and antagonists, but only two substances have been shown to be effective on a primary as well as on a secondary level of evidence: The glutamate-antagonist acamprosate and the opioid-antagonist naltrexone. Acamprosate is available in 24 countries, mostly in Europe, Australia, South Africa and Latin America. It is approved in the USA since 2004 after a first application was rejected by the Food and Drug Administration in 2002. Naltrexone has been approved in the United States for the treatment of alcohol dependence since 1994 and is meanwhile used for this indication in many countries all over the world. Both substances are introduced in the following.

Acamprosate. Acamprosate (calcium acetylhomotaurinate) is structurally similar to the inhibitory neurotransmitter GABA and the neuromodulator taurine (Scott et al., 2005). Even though several potential mechanisms of action have been postulated for acamprosate, the way acamprosate works is increasingly, but not completely, understood until today (Forest Pharmaceuticals Inc., 2007). One of the mostly discussed mechanisms of action is Acamprosate's modulatory effect on hyper-glutamatergic states caused by the increased calcium influx into the cells, which occurs during alcohol withdrawal. Additionally, Quermont et al. (2002) demonstrated acamprosate's reductive effect on conditioned counter regulatory processes in the context of drug preparation symptoms (Siegel, 1988). Acamprosate accordingly acts by reducing immediate as well as conditioned withdrawal symptoms and counter-regulatory reactions, which are related to the concept of negative craving (Littleton et al., 1996). The influence on conditioned reactions explains why acamprosate is still effective in preventing a relapse long after acute withdrawal symptoms have been cured. Besides its effects in immediate and conditioned withdrawal, animal models indicate that acamprosate also reduces positive reinforcing effects of ethanol: Acamprosate was shown to decrease conditioned place preference (McGeehan & Olive, 2003) and attenuates the ethanol-induced release of dopamine in the nucleus accumbens of rats (Olive et al., 2002).

Naltrexone. Naltrexone is a competitive antagonist for mu-opioid receptors in the brain (Preston & Bigelow, 1993), especially in the ventral tegmental area, which plays a central role in the mediation of alcohol's reinforcing effects. Naltrexone was originally used in the pharmacological treatment of opiate-dependent patients to reverse the effects of opiate overdose and to prevent a relapse in opioid addicted patients. With an approval of naltrexone by the Food and Drug Administration (FDA) as an adjuvant therapy for relapse prevention in alcohol dependent patients in 1994, the indication of the substance was expanded to the treatment of alcoholism. Since then, naltrexone has been approved in many countries all over the world including most of the European countries, but with some exceptions e.g. Germany and Switzerland. Naltrexone does not only block the immediate release of endorphins and dopamine. It is also diminishing conditioned emotional and motivational processes induced by conditioned stimuli associated with drinking. Accordingly, in animal models, naltrexone was shown to prevent the development of a conditioned place preference for alcohol (Matsuzawa et al., 1999; Middaugh & Bandy, 2000). Thus, it is theoretically related to the concept of positive craving or "conditioned high".

4.1.2.2 Strategies for drug dependence including substitution treatment

Pharmacological treatment strategies for opioid dependence

Opioid dependence. Given the chronic, relapsing nature of opioid dependence and the generally disappointing long-term results of detoxification in combination with relapse prevention, agonist maintenance treatment has become the most important treatment modality for opioid dependence in many countries (Haasen, 2006). Opioid agonist treatments, such as methadone and buprenorphine, stabilize opioid receptors and the intracellular processes and thus prevent opioid withdrawal and reduce craving. Other aims of agonist maintenance treatment is the reduction of illegal drug use and drug-related criminality, improvement of health and well being and the reduction of drug-related harm. Methadone is the most extensively studied and most widely used opioid in maintenance treatment. Other mu-opiate agonists that are used include Levo-alpha-acetyl-methadol (LAAM), codeine, slow-release morphine and diamorphine, as well as the partial mu-opioid- agonist buprenorphine. Morphine hydrochloride (e.g. Substitol) is only approved in some European countries like Austria, Bulgaria and Slovenia. Another pharmaceutical strategy to treat opioid dependence is the application of opioid antagonists. Opioid antagonists like naltrexon with a high affinity for opioid receptors, displace opioid agonists (for example heroin) and thus block their euphoric effects. The most common substances used for relapse prevention of opioid dependence are introduced in the following.

Methadone and LAAM. There are two approved full mu-receptor agonist opioid medications available for the treatment of patients with chronic and relapsing opioid dependence: methadone and LAAM. Methadone is the most thoroughly studied and widely used pharmacological treatment of opioid dependence (Kleber et al., 2006). The mu-receptor agonist opioid methadone is a synthetic agent that works by “occupying” the brain receptor sites affected by heroin and other opiates. Methadone Maintenance Treatment (MMT), a programme in which addicted individuals receive daily doses of methadone, was initially developed during the 1960s as part of a broad, multicomponent treatment (CDC, 2001). LAAM is structurally related to methadone and shares many similar features (oral activity, withdrawal suppression, blockade effects), but has a longer duration of action, allowing dosing on a less than daily basis. Although it is still an FDA-approved medication, LAAM has been withdrawn from the United States market by its manufacturer because of an associated risk of cardiac arrhythmias (Deamer et al., 2001).

Buprenorphine. Buprenorphine is a mixed opioid agonist-antagonist which produces a partial agonist effect at the mu-receptor and an antagonistic effect at the kappa receptor (Gutstein et al., 2001). Because it has poor oral bioavailability but fair sublingual bioavailability, buprenorphine is applied sublingual in the treatment of opioid dependence. Thus it has a pharmacological profile different from that of full mu-agonists such as methadone, which has clinical implications for treating opioid dependence. Buprenorphine is generally safe, and its side effects can be similar to those seen with full mu-agonist opioids. However, in the context of abrupt cessation of opioid use, buprenorphine is associated with a comparatively mild withdrawal syndrome (Gutstein et al., 2001). Another notable difference from methadone is that overdose with buprenorphine generally does not produce significant respiratory depression (Davids et al., 2004), which probably reflects buprenorphine’s partial mu-agonist effects. Nevertheless, there have been reports of fatalities when individuals overdose with a combination of buprenorphine and a benzodiazepine, typically when both are taken parenterally. These reports base on experiences from France, where buprenorphine is used extensively for outpatient treatment of opioid dependence and where prescribing benzodiazepines is also quite common (Kleber et al., 2006).

In France, since 1996, any general practitioner can prescribe high-dosage buprenorphine maintenance treatment of opioid-dependent patients. Meanwhile, buprenorphine has received

marketing authorization in over 30 countries around the world. As in October 2006 the European Commission approved buprenorphine for use in all 25 European Union countries, Iceland and Norway, it is currently the only centrally-approved product for treatment of opioid dependence in the European Union (EU).

Diamorphin. Heroin maintenance is still a controversially discussed treatment of addicts who did not succeed in methadone treatment. A Swiss cohort study (Rehm et al., 2001), a controlled trial in the Netherlands (Van den Brink et al., 2003) and a study of the North American Opiate Medication Initiative (NAOMI) demonstrated that heroin injection programmes improved health and social outcomes.

Naltrexone. Naltrexone is an opioid antagonist, which is also used in relapse prevention of alcoholism (see 4.1.2.1). By tightly binding to opioid receptors without producing a psychoactive effect, naltrexone blocks the pleasurable effects of usual street doses of heroin and other opioids and thus diminishes conditioned craving (Kleber et al., 2006). Naltrexone can not be given to individuals while they are actively dependent on opioids because the opioid antagonist agonist fit can precipitate an immediate opioid withdrawal syndrome. Before starting naltrexone, patients must be completely withdrawn and abstinent for at least 5 days from a short-acting opioid such as heroin or 7 days from a longer-acting opioid such as methadone. A urine toxicology screen for opiate medication may be indicated before naltrexone therapy is initiated.

Pharmacological treatment strategies for cocaine dependence

The primary action of cocaine concerns not only blocking of the presynaptic transporter for dopamine (DAT), but also the presynaptic transporters for serotonin (5-HTT) and norepinephrine (NET). The consequence is a flooding of the synapses with dopamine, serotonin and norepinephrine in the nucleus accumbens and in related regions of the mesolimbic-mesocortical dopamine system (Kreek et al., 2002; van den Brink, 2003). Recent advances in neurobiology have identified various neuronal mechanisms implicated in cocaine addiction (Goldstein and Volkow, 2002; Koob, 2000) and have suggested several promising pharmacological approaches.

GABA-ergic medications. As GABA is an inhibitory neurotransmitter in the central nervous system and activation of GABA-ergic neurons tends to decrease activation in the dopaminergic reward system, medications that increase GABA-ergic neurotransmission have been suggested to prevent relapse by blocking cocaine-induced euphoria (Dewey et al., 1998, 1997). In animal models, GABA-ergic medications have been shown to reduce self-administration of cocaine (Kushner et al., 1999). Topiramate is approved by the US Food and Drug Administration for the treatment of epileptic seizures. It has effects in both the GABA and glutamate systems. Topiramate enhances GABA activity at GABA-A receptors and causes a general increase in GABA levels in the brain. Topiramate also antagonizes glutamate transmission through effects at AMPA/kainite receptors. Thus, topiramate may reduce cocaine craving (Kampman et al., 2004). Other examples for GABA-ergic medications are Baclofen, a GABA-B receptor agonist which inhibits mono- and poly-synaptic reflexes at the spinal cord level. It is primarily used to reduce muscle spasticity in neurological diseases such as multiple sclerosis or tiagabine, an anticonvulsant that increases GABA neurotransmission by blocking the presynaptic reuptake of GABA.

Dopamine agonists and dopamine antagonists. While acute use of cocaine enhances dopamine transmission, its chronic use decreases dopamine concentrations in the brain (Soares et al., 2003). As a consequence, during the early phase of abstinence, subjects experience an intense craving for cocaine as well as symptoms such as depression, fatigue, irritability, anorexia, and sleep

disturbances. Thus it was assumed that dopamine agonists could theoretically reduce these symptoms and contribute to a more successful therapeutic approach. An example is the combination of levodopa (L-dopa) and carbidopa as approved for the treatment of Parkinson's disease. Conversely, blockade of dopamine receptors in order to reduce the reinforcing effects is another plausible approach for the treatment of cocaine dependence. On this theoretical background first-generation neuroleptics, which act chiefly as dopamine D2 receptor antagonists, as well as newer second-generation neuroleptics, which also act on serotonin receptors, have currently been tested for the indication of cocaine dependence.

Agonist replacement therapy. Agonist replacement therapy uses a drug from the same pharmacological family as the abused drug to suppress withdrawal and drug craving (Grabowski et al., 2004). Analogous to the MMT for heroin dependence, potential agonist medications that replace cocaine could theoretically be used in treatment, especially in a slower onset formulation which has less abuse liability. Potential agonist medications include methylphenidate, d-amphetamine, and oral cocaine (Grabowski et al., 2004).

Active and passive vaccination. Vaccine pharmacotherapy uses anti-cocaine antibodies to sequester cocaine molecules in the peripheral circulation (Karila, 2007). As the cocaine molecule by itself is too small to evoke an antibody response, it must be coupled to a larger antigenic molecule, e.g. cholera B toxin. An anti-cocaine vaccine is considered to have two major advantages over conventional medication:

1) it has no direct psychoactive effects and therefore no abuse liability and
2) the therapeutic effects persist for months, improving patient adherence to treatment (Kosten & Owens, 2005).

A disadvantage may be a time lag of up to several months before therapeutic antibody levels were achieved (Karila, 2007).

Pharmacological treatment strategies for cannabis dependence

Over the past one and a half decades, data from basic research have contributed to an increased understanding of neuronal mechanisms involved in the effects of cannabinoids. Cannabinoids bind to two types of receptors: CB1 and CB2. CB2 receptors are found mainly outside the brain in immune cells, suggesting that cannabinoids may play a role in the modulation of the immune response. CB1 receptors are found throughout the body but primarily in the brain. Their location in the brain provides some clues about their functions. For example, the highest density of CB1 receptors has been found in cells of the basal ganglia, which are involved in coordination of body movements. Other regions that also contain a larger number of CB1 receptors include the hippocampus, which is involved in aspects of memory storage, the cerebral cortex, which regulates the integration of higher cognitive functions and the nucleus accumbens, which is involved in drug reinforcement (Hart, 2005). This suggests that the endogenous cannabinoid system modulates a broad range of behaviours.

In summary, research investigating the use of pharmacotherapies for cannabis use disorders is in its early stages and continues to be refined. A growing number of medications have been shown to alleviate cannabinoid withdrawal symptoms in laboratory animals and may provide clues to the underlying neuronal mechanisms of cannabinoid dependence. The findings, however, were not verified in human studies yet (Hart, 2005).

4.2 Treatment effects on alcohol dependence

An overview table on the findings from reviews of rehabilitation treatment of alcohol dependence can be found in annex.

4.2.1 Results from alcoholism multi-centre studies

Findings from reviews of rehabilitation treatment of alcohol dependence are shown in annex. In Project MATCH (see annex), all patients showed significant improvements in drinking-related outcomes, irrespective of the type of treatment they received (Project MATCH Research Group, 1998). Until the end of treatment, small but statistically significant differences among treatments were found only in the outpatient arm on measures of alcohol consumption and alcohol-related negative consequences. Forty-one percent (41%) of CBT as well as 12-step programmes clients were abstinent or drank moderately without alcohol-related consequences, compared with 28% of MI clients. After one year, 35% of the after-care clients who had undergone in-patient detoxification remained completely abstinent, compared with 20% of the out-patient-only sample. At one-year follow-up there were no more significant differences between the three treatment modalities.

In the Project UKATT, both interventions showed substantial reductions in alcohol consumption and alcohol-related problems and resulted in better mental health and improved quality of life based on a variety of measures. Even though the evaluated strategies clearly differed (see annex), MI and the newly developed treatment, SBNT produced similar treatment effects (UKATT Research Team, 2005). The percent days abstinent from alcohol increased from 29% at baseline (MI, SBNT) to 42% (MI) and 43% (SBNT) after three months and to 45% (MI) and 47% (SBNT) after one year. Average alcohol consumption per drinking day fell from 27 units to 19 (MI) and 20 (SBNT) after one year. The average one-year post-treatment drinking data completion rate was 83%.

In the Project COMBINE (see annex), after one-year post-treatment more than two thirds of the patients returned to heavy drinking. Drop-out rates were not explicitly mentioned in the publication (Anton et al., 2006). As in the UKATT study, the drinking data completion rate one year after treatment was 82%. At the end of the treatment, there was a significant main effect for naltrexone on percent days abstinent and the time to first heavy drinking. The best results were shown for the group treated with naltrexone in combination with *combined behavioural intervention* (CBI) and medical management (MM) one year after treatment, the direction of the effects observed during treatment persisted (Anton et al., 2006). Overall, there was a trend for CBI to produce better outcomes for the number of abstinent days than MM. For acamprosate no evidence of efficacy was shown in this study, independent of the type of psychotherapy.

4.2.2 Effects of psychosocial treatments

Cognitive Behaviour Therapy. In the review of Berglund et al. (2003), 6 studies were included in the analysis, which used different CBT approaches such community reinforcement approaches (CRA), self-control training and cue exposure. The comparison treatments were different forms of standard treatment e.g. self-confidence training or relaxation training. The follow-up period in most of the studies was six months, the outcome criterion was mostly abstinence and the samples consisted of patients with extensive alcohol problems. Berglund et al. (2003) identified a combined effect size (fixed model) of d = 0.73, which exceeds the effect sizes of any other psychosocial treatment tested in the meta-analysis. This was confirmed by the results of the Scottish HTA report (Slattery et al., 2003), where CBT showed the strongest treatment effects of all considered psychosocial approaches. According to the report, *coping skills training* doubled the chance of maintaining abstinence compared to non-treatment or standard treatment (OR=2.11; 95%; CI: 1.53 – 2.92). In the Project MATCH,

patients treated with CBT showed an abstinence rate of 41% at the end of treatment and thus was comparable effective than 12-step programmes.

Community Reinforcement Approach. In the SBU report (Berglund et al., 2003), which included 7 RCTs that examined the effectiveness of the community reinforcement approach (CRA), a combined effect size (fixed model) of d = 0.59 was obtained. The clinical trials mostly included alcohol dependent patients with moderate to high problem severity. In older studies, the control groups received only limited standard treatments, in more recent studies the control groups underwent a 12-step programme. Duration of follow-up periods was mostly 6 months. The integrated effect size of d = 0.59 was based on an integration of different outcome measures such as time to first drink, number of drinking days and percentage of patients with controlled drinking. In the meta-analytic integration based on 3 RCTs (Roozen et al., 2004), a weighted mean difference of WMD = -0.94 (95% CI: -1.60 – - 0.27) was found for CRA's effects on the number of drinking days. Concerning the patient's ability to maintain continuous abstinent, the effects of CRA were shown to be rather conflicting. Three further studies in this review which compared "CRA combined with disulfiram" versus "usual care combined with disulfiram" found moderate evidence for the superiority of the CRA/Disulfiram-Combination. In the Mesa Grande Project (Miller & Wilbourne, 2002), CRA was placed on the sixth rank of all tested psychosocial approaches, whereby but the corresponding database again had to be limited to only 4 RCTs.

Brief Interventions. The strongest evidence in the Mesa Grande Project (Miller & Wilbourne (2002) was found for brief interventions (BI). Based on 31 clinical trials, BI was placed on the first rank in unselected as well as clinical populations. In the comprehensive meta-analyses of Moyer et al. (2002), BI was shown to be effective only in the non-treatment-seeking groups. For the composite score of all drinking related outcomes after 6 to 12 month after treatment, a standardised mean difference of d = 0.24 (95% CI: 0.18 – 0.30) was identified, for the amount of alcohol consumed, the effect size was d = 0.26 (95% CI: 0.20 – 0.32). No significant effects were found for the effectiveness of BI in treatment-seeking populations (d = 0.04; 95% CI: 0.15 – 0.16). Also, at follow up, the treatment effect of BI was significantly larger, when individuals with more severe alcohol dependence were excluded.

In the meta-analysis of Ballestores et al. (2004), BI was more effective than minimal interventions and the usual care on hazardous drinkers (OR = 1.55, 95% CI: 1.27 - 1.90). The absolute risk reduction (ARR) was 11% (RD = 0.11, 95% CI = 0.06 – 0.16), for the number needed to treat (NNT) an effect estimate of NNT = 10 (95% CI: 7 – 17) was identified. According to a Cochrane review with primary care populations (Kaner et al., 2007), which includes 21 RCTs (7,286 participants), BI consistently reduced alcohol consumption with an average drop of four standard drinks per week (WMD = -41; 95% CI: -57 – -25). At the same time there was substantial heterogeneity between trials (I2 = 52%). Sub-group analysis (eight studies with 2,307 participants) confirmed the benefit of BI in men (mean difference: -57 grams/week, 95% CI: -89 – -25, I^2= 56%), but not in women (mean difference: -10 grams/week, 95% CI: -48 – 29, I2 = 45%). A current meta-analysis of Bertholet et al. (2007) confirmed the effect of BI on the consumed amount of alcohol. Alcohol consumption was reduced to 38 g of ethanol per week (95% CI: -51 – -24 g/wk) in favour of the brief alcohol intervention group in primary care, which corresponded to approximately four drinks a week. Berglund et al. (2003) reviewed five studies that examined self-treatment (bibliotherapy) for alcohol related alcohol problems. Mainly patients with low problem severity were included in these studies, in which self-treatment was compared with therapist-managed and group treatment. The combined effect size for self-treatment was 0.19.

Motivational Interviewing. Three studies that examined the effectiveness of MI were included in the review of Berglund et al. (2003). Problem severity of the patients included in two trials was moderate, in one trial patients showed extensive alcohol problems. Two of these studies showed clear effects (d = 0.70 and d = 0.78), whereas the third study demonstrated no effect (d = 0.02). If effect sizes of the three studies were combined, the overall effect was 0.29. Miller and Wilbourne (2002) used a more comprehensive database including 17 CCT for examining the effectiveness of motivational enhancing strategies on different drinking-related outcomes. Based on the methodological quality rating and the strength of evidence, motivational enhancement therapies were placed on the second rank right after brief therapies. If restricted to clinical populations only, cumulative evidence for motivational enhancement therapies was much weaker, placed on the eleventh rank. Including seven clinical studies, Slattery et al. (2003) demonstrated beneficial effects of motivational enhancement strategies on abstinence (OR=1.88; 95% CI: 1.28 – 2.77), indicating that the chances to maintain abstinence are almost two times higher with these strategies than without treatment, but only a few of the integrated trials included patients with alcohol dependence. In the meta-analysis of Vasilaki et al. (2006) nine studies compared brief MI with no treatment. The aggregate effect size was d = 0.18 (95% C.I. 0.07 – 0.29) at the end of the follow-up periods. If the duration of follow-up periods was restricted to three months or less, the effect size increased to 0.60 (95% C.I. 0.36 – 0.83). The effect sizes also increased if dependent drinkers were excluded and if the analysis was restricted to studies which compared brief MI with another treatment (one of a diverse set of interventions), yielding an aggregate effect size of 0.43 (95% C.I. 0.17 – 0.70). In the Project UKATT MI, provided over three sessions, was as effective as SBNT delivered over eight sessions (UKATT Research Team, 2005). The cost-benefit analysis conducted in the UKATT indicated that both therapeutic approaches saved about five times as much in expenditure on health, social, and criminal justice services, whereby SBNT (221 pounds sterling; 385 dollars; 320 euros) was causing higher costs than MI (129 pounds sterling). The project MATCH demonstrated less promising results for MI: With 28% of abstinence, success rates were lower with MI than with the 12-step programme (41%) as well as CBT (41%) in treating alcohol dependent patients. Even though, at one-year follow-up there were no more significant differences between the three treatment modalities.

12-Step Programmes. The results of Project MATCH demonstrate the effectiveness of 12-step programmes: Clients assigned to this programme showed comparable results with CBT, and better outcomes than MI. While 41% of the clients in the 12-step programme as well as CBT were abstinent, in the MI group only 28% did not drink until the end of the treatment. The a priori matching hypothesis that 12-step programme was more effective than MI for clients with networks supportive of drinking was supported at the three-year follow-up. In the Mesa Grande review (Miller & Wilbourne, 2002), 12-step facilitation programmes were only placed on the 24.5 rank, but it has to be considered that the ranking was only based on evidence from three clinical trials. Four studies evaluating the effectiveness of 12-Step Treatment with a total of 2,045 patients were included in the review of Berglund et al. (2003), whereby these studies compared 12-step programmes with standard treatments. Because of the quantitative limitations of the database, Berglund et al. (2003) do not provide a summary statistic in their review for 12-step programmes.

4.2.3 Effects of pharmacological treatments

A variety of meta-analyses that examined the effectiveness of acamprosate and naltrexone were conducted in the last years, which all confirmed the effectiveness of both substances in the rehabilitation treatment of alcohol dependence. According to Berglund et al. (2003), acamprosate almost doubled the chances to stay abstinent after detoxification (OR = 1.93; 95% CI: 1.64 – 2.28). For Cohen's d, an effect size of d = 0.26 was calculated for acamprosate and d = 0.28 for naltrexone. In the Mesa Grande review (Miller & Wilbourne, 2002), GABA agonists, which mainly concern

acamprosate were placed on the third rank, followed by opiate antagonists, predominantly concerning naltrexone, on the fourth rank. Odds Ratios estimated in the review conducted by Slattery et al. (2003) were OR = 1.73 (95% CI: 1.36 – 2.20) for acamprosate and OR = 1.46 (95% CI: 1.12 – 1.90) for naltrexone.

In the meta-analysis of Mann et al. (2004), which was restricted to studies of acamprosate, continuous abstinence rates at 6 months were significantly higher in the acamprosate-treated group than for placebo application (acamprosate, 36.1%; placebo, 23.4%; $p < 0.001$). The corresponding effect sizes expressed in relative benefits (RB) for abstinent rates at 3, 6, and 12 months were RB = 1.33, RB = 1.50, and RB = 1.95. After 12 months, the treatment effects indicated that more than seven patients needed to be treated with acamprosate to obtain one additional case of abstinence (NNT = 7.5; 95% CI, 7.8 – 18.7%). Acamprosate also showed a modest but significant beneficial effect to lower drop-out rates (6.01%; 95% CI, 2.90 – 8.82).

An update of the first Cochrane review of naltrexone (Srisurapanont & Jarusuraisin, 2002), which has currently been published by Srisurapanont and Jarusuraisin (2005) showed that naltrexone significantly reduced the relapse risk on 64% of the corresponding risk in the control group (RR =0.64; 95% CI: 0.51 – 0.82). The effects on return to drinking were not significant (RR = 0.91; 95% CI: 0.81 – 1.02). In the updated review, naltrexone administration also did not significantly diminish short-term discontinuation of treatment (RR = 0.85; 95% CI: 0.70 – 1.01). This was also confirmed by a review published by Bouza et al. (2004), which included 14 RCTs of naltrexone and 11 RCTs of acamprosate. In this meta-analysis, short-term administration of naltrexone reduced the relapse rate significantly (OR=0.62; 95% CI: 0.52 – 0.75), but was not associated with a significant modification in the abstinence rate (OR = 1.26; 95% CI: 0.97 – 1.64). Acamprosate was associated with a significant improvement in abstinence rate (OR = 1.88; 95% CI: 1.57 – 2.25), and days of cumulative abstinence (WMD = 26.55; 95% CI: 1.57 – 2.25), but the effects on a relapse to heavy drinking (usually defined as having more than five/four standard drinks per drinking occasion for men/women) could not be calculated because of the low number of studies that provided the corresponding results. In a systematic review of the effectiveness of naltrexone for the maintenance treatment of opioid and alcohol dependence (Roozen et al. (2006), naltrexone was shown to significantly reduce the risk of uncontrolled drinking (RD = 0.13; 95% CI: 0.07 – 0.18). At the same time, naltrexone did not lower the risk of heaving a first drink after abstinence (RD = 0.06; 95% CI: -0.02 – 0.15), whereby the effect size was only based on a very limited database. The restrictions in databases for certain outcomes were caused by the fact, that clinical studies of acamprosate or naltrexone were largely based on different types of outcome criteria – a circumstance that was determined by cultural differences in therapeutic targets. Acamprosate studies, which were conducted mainly in Europe, have emphasised the maintenance of abstinence as the main outcome, whereas naltrexone studies, which occurred mainly in the United States, have focused on relapse prevention as the primary criterion for effectiveness. In this context it has to be considered that besides restrictions on the comparability of the two drugs, selective reporting of outcomes can lead to a substantial overestimation of treatment efficacy (Williams & Gamble, 2005; Chan et al., 2005).

To counter the problem of selected outcome criteria, a current meta-analysis (Rösner & Soyka, 2007) used published results and unpublished data provided by the study investigators and the drug manufacturers in order to complete and to compare the efficacy profiles for acamprosate and naltrexone. In this meta-analysis, both substances were shown to have significant effects on both outcomes: Naltrexone was shown to significantly lower the risk of heavy drinking to 80% over that achieved with placebo (RR = 0.80; 95% CI: 0.71 - 0.91; NNT = 8.1, 95% CI: 5.5 - 16.5) and to additionally increase abstinence from alcohol, even though with a lower efficacy than acamprosate

(RR = 0.93, 95% CI: 0.88 - 0.99). Acamprosate significantly reduced the risk of having a first drink to 84% (RR = .84, 95% CI: .78 - .91; NNT = 7.7, 95% CI: 5.6 - 13.0) and the risk of heavy drinking to 92% of the placebo treatment risk (RR = .92, 95% CI: .86 - .99; NNT = 17.4, 95% CI: 9.7 – 111.1). When calculations were restricted to the subgroup of non-abstinent patients, only naltrexone produced a significant reduction in heavy drinking compared to placebo (RR = 0.88, 95% CI: 0.80 - 0.96), which indicates that only naltrexone is effective in patients who were not able to maintain abstinence.

Until today, there are only few clinical studies available which include both substances. In a study of 160 detoxified alcoholics, Kiefer et al. (2003) compared the effects of naltrexone, acamprosate as well as the combination of both substances with placebo. Both substances were shown to have significant effects on drinking outcomes and the two medications combined were significantly more efficacious than either one substance alone or the placebo. There was a non-significant trend for naltrexone to produce better outcomes than acamprosate on the time to the first drink and the time until (?) relapse. In the Project COMBINE (Anton et al., 2006), which evaluated the efficacy of acamprosate and naltrexone in various combinations with psychosocial treatments, only naltrexone was found to be effective in supporting abstinence and reducing the risk of heavy drinking, whereas acamprosate failed to do so, either alone or in combination with naltrexone. In the Australian study (Morley et al., 2006), neither one of two substances nor their combination showed a significant effect on established outcomes.

4.2.4 Further results on treatment of alcohol dependence

Combining psychosocial and pharmacological treatments. As interactive effects between psychosocial and pharmacological treatments have not been studied on a meta-analytic level, the summary report has to refer to clinical studies in this point. O'Malley et al. (1992) showed that naltrexone had a differential effect on different drinking outcomes depending on the type of psychosocial therapy provided: Abstinence rates were highest in the naltrexone group treated with supportive therapy, whereby patients were encouraged by their therapist to remain abstinent, but they were not being taught specific coping skills. In contrast, relapse rates were lowest in the group that received a combination of naltrexone and relapse prevention therapy based on the cognitive-behavioural model of addiction and relapse developed by Marlatt and Gordon (1985). Heinälä et al. (2000) confirmed the results originally demonstrated by O'Malley et al. (1992), as significant effects of naltrexone over placebo were only observed if the substance was used in conjunction with coping therapy. In contrast, when naltrexone was combined with supportive therapy, no benefits were found.

While interactive effects between psychosocial and pharmacological treatments have been indicted for naltrexone, the effectiveness of acamprosate seems not to depend on the type of psychosocial treatment. In a study with 14 outpatient treatment centres, De Wildt et al. (2002) examined the question whether the addition of psychosocial intervention to the medical prescription of acamprosate contributes to treatment outcome. Therefore, patients were recruited and randomized into one of three treatment conditions: acamprosate alone, acamprosate plus motivational enhancement (three weekly sessions of 20 min) and acamprosate plus brief CBT (seven weekly sessions of 60 min). There were no statistically significant differences in medication compliance, drop-out rates, psychological distress or drinking related outcomes. Also in a non-blind, parallel-group, multi-centre study with patients who were assigned to different treatment groups (Individual psychotherapy, group psychotherapy, behavioural therapy, brief intervention or family therapy), abstinence rates with integrated acamprosate and psychosocial support in a naturalistic setting were similar regardless of the psychosocial support used (Soyka et al., 2002).

Patient characteristics. The overall objective of Project MATCH was to determine whether the matching of particular characteristics of clients to different forms of treatment would result in a significant improvement of the treatment outcomes. As a disappointing result of the meta-analysis, most of the general matching hypotheses of the study were not or could not be confirmed in the long-term perspective. Despite the general failure to find an overall improvement in treatment effectiveness through matching, some patient characteristics should at least be relevant temporarily (Raistrick, 2001):

Psychiatric severity. In the outpatient arm, clients who were low in psychiatric severity at the beginning of the trial (i.e. those with low psychiatric co-morbidity) reported more days of abstinence after 12-step programmes than after CBT. This advantage for 12-step programmes had disappeared by the time of the three-year follow-up and this matching effect was not present at all in the aftercare arm.

Network support for drinking. In the outpatient arm only, significant matching effects of the support for drinking variable emerged in the three-year outcome analysis, so that clients with more social drinking networks (i.e. those with numerous heavy drinking friends) derived greater benefit from 12-step programmes than from MI (Project MATCH Research Group, 1998). This effect did not emerge until the three-year follow-up, but when it did emerge it was the largest matching effect identified in the trial. The implication here is that clients with social networks supportive of drinking will benefit especially from a programme that encourages attendance at AA meetings.

Treatment duration and specificity. The relation between intensity of rehabilitation treatment in alcoholism and its effectiveness have been discussed controversially. Former meta-analyses (Süß, 1995; Miller & Hester, 1986) found an inverse U-like distribution with a maximum effectiveness after four weeks. Other authors state that intensive treatments are as effective as the less intensive options (Luty, 2006). Berglund et al. (2003) conclude that for persons with limited problems (moderate or low dependence), treatments of short duration yield the same effects than more intensive treatments. According to Berglund et al. (2003), the structure and the specificity of treatments play a more important role than treatment duration: Specific treatments, which were based on theoretical frameworks, conducted by a therapist with specific training, manual guided and systematically supervised were more effective than treatments that did not meet these criteria.

4.3 Treatment effects on drug dependence

4.3.1 Results from drug multi-centre studies

The NTORS study has demonstrated that a considerable portion of heroin dependent patients benefit from professional treatment. Abstinence rates increased even for the long term perspective: The percentage of residential clients who were abstinent from illicit opiates increased from 19% at intake to 47% after 5 years. For the methadone clients, more than a third (35%) was abstinent from illicit opiates at 4–5 years follow-up compared to 6% at intake. Positive effects have not only been shown for abstinence as one of the most rigorous outcome criteria for drug misuse treatment (Gossop et al., 2002), but also for the regular use of illicit opiates. According to a cluster analyses, almost 60% showed substantial reductions in their illicit drug use and criminality as well as reduced physical and psychological symptoms. It was shown that these changes represent important clinical benefits to the individual clients, to their families and to society. The results were based upon self-reported data, whereas the rate of concordance between self reported use and urine results for heroin, cocaine, and amphetamines was 89%. Only 22% percent of the patients showed poor outcomes across a range of measures.

Therapeutic benefits for opioid dependent patients in MMT, BMT and LMT were also shown in the Australian NEPOD (Digiusto et al., 2004); even though rates of complete abstinence were lower than in the NTORS study mentioned above. Complete abstinence from heroin use was achieved by over one quarter of heroin users who remained in treatment in the third and sixth month. Taking account of all heroin users who entered maintenance treatment with methadone, buprenorphine or LAAM (and assuming that patients who dropped out of treatment, or who were lost to follow-up, resumed their pre-treatment levels of heroin use), a significantly higher rate of abstinence was achieved with LAAM than either methadone or buprenorphine at three month and six months. Whereas LAAM was superior to methadone and buprenorphine in achieving additional heroin-free days and abstinence at six months, methadone, buprenorphine and LAAM produced similar results for patients remaining in treatment. In the group of patients treated with naltrexone (heroin users who were already detoxified and abstinent when they entered treatment), only 33% remained in treatment at the three month follow-up and only 5% at six months follow-up. For patients who remained in treatment, naltrexone treatment produced a large reduction in heroin consumption. In this subgroup, heroin use dropped from 8 heroin-free days in the month prior to detoxifying to 27 heroin-free days after three months in treatment. For patients that remained in treatment, complete abstinence from heroin was achieved by 66%.

The CCTS study (Crits-Christoph et al., 1999), a multi-site trial of four psychosocial treatments for 487 cocaine dependent patients, only poor retention was obtained in spite of the intensive form of the psychotherapy delivery (36 individual sessions and 24 group sessions). On average, patients completed less than half of the sessions offered and less than one third of subjects completed the treatment. For the ones who completed the trials, all tested treatments showed a significant reduction in cocaine use. Follow-up after 3 months showed abstinence rates varying from 17.8% (supportive-expressive therapy) to 38.2% (individual counselling + group therapy). Thereby individual drug counselling plus GDC showed the greatest improvement on the Addiction Severity Index-Drug Use Composite score. Individual group counselling plus GDC was also superior to the other types of psychotherapies in the number of days of cocaine use in the past month. Hypotheses regarding the superiority of psychotherapy to GDC for patients with greater psychiatric severity and the superiority of cognitive therapy plus GDC compared with supportive-expressive therapy plus GDC for patients with antisocial personality traits or external coping style were not confirmed. Compared with professional psychotherapy, a manual-guided combination of intensive individual drug counselling and GDC has promise for the treatment of cocaine dependence.

4.3.2 Treatment effects on opioid dependence

4.3.2.1 Psychosocial treatment of opioid dependence

Pharmaceutical maintenance treatment of opioid dependence were mostly combined with psychosocial interventions such as individual and group counselling or behavioural treatments with the purpose of addressing the use of opioids and other substances as well as the psychosocial problems associated with drug use (Kleber et al., 2006). In individuals who were receiving MMT, the additional application of ***Cognitive Behavioural Therapy (CBT)*** was shown to be efficacious in reducing illicit substance use and achieving a wide range of other treatment goals (Kleber et al., 2006). Especially in the presence of higher degrees of depression or other psychiatric symptoms, CBT had better treatment outcomes than drug counselling alone (Woody et al., 1983; Woody et al., 1995). Besides substance use, CBT was also shown to reduce associated target symptoms and behaviours (e.g., HIV risk behaviours) in opioid-using individuals (O'Neill et al., 1996). Promising results were obtained with group based relapse prevention therapy, when combined with self-help group participation to reduce opioid use, criminal activities and unemployment rates (McAuliffe et al., 1996).

Mainly used in the United States, ***Contingency Management (CM)*** approaches were shown to be beneficial in reducing the use of illicit substances in opioid-dependent individuals who were maintained on methadone in clinical trials (McLellan et al., 1993; Silverman et al., 1996; Silverman et al., 1998). Besides reinforcers or rewards (e.g., vouchers for movie tickets or sporting goods) which were provided to patients who demonstrate specified target behaviours (e.g. providing drug-free urine specimens, accomplishing specific treatment goals, attending treatment sessions), methadone take-home privileges were a commonly offered as incentives for reduced drug use (Stitzer et al., 1986; Stitzer et al., 1992). In a Cochrane Review of the effectiveness of psychosocial treatments for opiate abuse and dependence, Mayet et al. (2005) concluded that CM supported by other approaches (e.g. brief therapy) had significantly better outcomes than standard therapy within treatment. CM alone was no better than the control conditions. As the studies were heterogeneous, it was not possible to pool the results and perform a meta-analysis. In the literature, CM either alone or in conjunction with family therapies was recommended to be used to enhance adherence with unpopular treatments such as naltrexone (Rounsaville et al., 1995; Greenstein et al., 1997; Carroll et al., 2002).

The utility of ***psychodynamic thera*****py** to opioid dependent patients has been poorly investigated. There is some evidence from single studies that the provision of supportive-expressive therapy can be particularly helpful for patients with high levels of other psychiatric symptoms (Woody et al., 1983; Woody et al., 1995). In a study by Khantzian et al. (1999), psychodynamic oriented group therapy, modified for substance-dependent patients, appeared to be effective in promoting abstinence when combined with behavioural monitoring and individual supportive psychotherapy (Khantzian et al., 1999). Taken together, the clinical evidence concerning the effect of psychodynamic therapy on opioid dependent patients is not sufficient to recommend the exclusive use of these approaches.

4.3.2.2 Pharmacotherapy for opioid dependence

According to the practice guideline published by Kleber et al. (2006), MMT for opioid-dependent individuals has generally been shown to be effective in:

(1) decreasing illicit opioid use;
(2) decreasing psychosocial morbidity associated with opioid dependence;
(3) improving overall health status;
(4) decreasing mortality;
(5) decreasing criminal activity; and
(6) improving social functioning.

Several studies also support the usefulness of MMT in reducing the spread of HIV infection among intravenous drug users (Prendergast et al., 2001).

While its effectiveness repeatedly has been confirmed, there's conflicting evidence of the recommended daily dose of methadone. While some individuals already benefit from maintenance on lower doses such as ≤ 40 mg/day, others seem to require >100 mg/day to achieve maximum benefits, especially to block craving for opiates and associated drug use (Kleber et al., 2006). The therapeutic advantage of higher doses was supported by the results of a Cochrane Review published by Faggiano et al. (2003), which integrated the effect sizes for different dosages of MMT. According to the review, methadone dosages ranging from 60 to 100 mg/day tended to be more effective than lower dosages in terms of treatment retention (RR = 1.62; 95% CI: 0.95 – 2.77), heroin use (RR=1.59; 95% CI: 1.16 – 2.18) and cocaine use (RR=1.81; 95% CI: 1.15 – 2.85) during treatment.

Besides MMT, also maintenance treatment with buprenorphine was shown to be more clinically effective and more cost-effective than no drug therapy in opiate users. According to a Cochrane

Review published by Mattick et al. (2003), buprenorphine maintenance treatment (BMT) was shown to be superior to placebo in patient retention at low doses (RR=1.24; 95% CI: 1.06 - 1.45), high doses (RR=1.21; 95% CI: 1.02 - 1.44), and very high doses (RR=1.52; 95% CI: 1.23 - 1.88), but only high and very high dose buprenorphine suppressed heroin use significantly better than placebo. Compared to methadone, buprenorphine showed a somewhat lower effectiveness, whereas the difference did not reach statistical significance (RR=0.79; 95% CI: 0.62 - 1.01). In direct comparison, a flexible dosing strategy with MMT tended to be more effective in maintaining individuals in treatment than a flexible-dose BMT, but the authors of the review remarked the possibility of a higher mortality risk for MMT. A recent review from Connock et al. (2007) which use a Monte Carlo simulation model to assess the cost-effectiveness of BMT and MMT came to similar conclusions.

The limitations in database as well as the strong heterogeneity of current available studies of heroin maintenance treatment (HMT) did not allow a summary conclusion in the Cochrane Review of Ferri et al. (2006). Data search was performed in 2002 and up to that date, only four published RCTs have been identified that met the criteria of inclusion of the Cochrane review (Hartnoll et al., 1980; Perneger et al., 1998; van den Brink et al., 2002; van den Brink et al., 2003). One study was conducted in the United Kingdom in the 1970s (Hartnoll et al., 1980), one in Switzerland in the 1990s (Perneger et al., 1998), and two trials in the Netherlands (van den Brink et al., 2002; van den Brink et al., 2003). Heroin was more effective than methadone in refraining people from using street heroin in two studies (RR = 1.10, 95% CI = 0.79–1.53; Hartnoll et al., 1980; RR = 0.33, 95% CI = 0.15–0.72; Perneger et al., 1998). In one study, heroin reduced the risk of being charged (RR = 0.32, 95% CI = 0.14–0.78), whereas two studies showed no difference. The UK study showed a statistically significant higher retention in treatment among patients undergoing heroin treatment compared to those undergoing methadone treatment, whereas one of the largest, most recent studies (van den Brink et al., 2003) found opposite results. However, the latter study, as referred by the authors, had more restricting rules in the heroin group than in the methadone one. Patients breaking those rules were dropped out from heroin treatment, which may explain the observed contradictory results.

The quantitative summary from Amato et al. (2006) which summarizes the major findings of the Cochrane Reviews on substitution maintenance treatments for opioid dependence mentioned above (Clark et al., 2003; Faggiano et al., 2003; Ferri et al., 2003; Mattik et al., 2003a and Mattik et al., 2003b), concluded that LAAM as well as MMT are more effective in suppressing the use of illegally obtained heroin than measures that serve as a treatment control (e.g. waiting list. These findings confirm with the results of the Australian NEPOD study (National Drug and Alcohol Research Centre, 2001), where LAAM was superior to methadone and buprenorphine in achieving additional heroin-free days and abstinence. No data were included in this review for the effects of MMT compared to BMT. Considering retention in treatment, MMT was more effective than MDT and BMT and more effective than no treatment. Haasen et al. (2006) concluded that maintenance treatments with methadone, LAAM and buprenorphine are all proven effective interventions, provided that adequate dosages are prescribed (Haasen et al., 2006). In addition, there is evidence for the effectiveness of other agonists, mainly slow release morphine, intravenous and inhalable diamorphine.
Compared to opioid maintenance, treatment effects with the opioid-antagonist naltrexone seem to be less promising. One of its main obstacles is the high drop-out rate during detoxification which results in (?) reduced patient samples (van den Brink & van Ree, 2003). The authors of the Cochrane Review of naltrexone concluded that ‘‘at present, there is no sufficient evidence of efficacy of naltrexone to justify its use in the maintenance treatment of opioid dependence’’ (Kirchmayer et al., 2002, page xxx). This conclusion is corroborated by the findings of the Australian NEPOD, which showed that only 4% of the patients in naltrexone maintenance treatment were still in treatment after 6 months (National Drug and Alcohol Research Centre, 2001).

4.3.3 Treatment effects on cocaine dependence

4.3.3.1 Psychosocial treatment of cocaine dependence

Like in alcoholism therapy, the most studied psychosocial intervention for cocaine related disorders is ***Cognitive Behavioural Therapy (CBT).*** While some individual single-centre studies indicate that CBT is a promising approach to treat cocaine dependence (Carroll, 1994; Maude-Griffin 1998), the large sample size CCTS study (Crits-Christoph, 1999) was not found it to be uniquely effective. Even though the group treated with CBT had the lowest risk for an early drop-out of all groups, continuous abstinence rates in the CBT group were lower than in the groups treated with individual therapy and group therapy. Apart from the CCTS study, secondary evidence underscores the effectiveness of CBT. A recently published Cochrane Review of psychosocial interventions for cocaine- and amphetamine-related disorders (Knapp et al., 2007) which sums up the evidence of 22 RCTs, demonstrated that CBT tends to produce stronger better effects on treatment retention outcomes on dropout rates and the reduction of cocaine use than drug counselling, even though most of these studies did not reach statistical significance. The authors found evidence that the therapeutic effects of CBT can additionally be increased if combined with CM: CBT programmes that used vouchers showed significantly better results including higher rates of abstinence and treatment retention than behavioural programmes that did not use incentives. Kleber et al. (2006) stated that for the treatment of cocaine dependence CBT confers greater therapeutic benefits than less intensive approaches that have been evaluated as control conditions. The authors judged CBT at least as effective as manual-guided disease-model approaches like 12-step programmes. According to the practical guide, CBT can be associated with a further decrease in cocaine use even after subjects leave treatment. Furthermore, CBT appears to be particularly effective with more severe cocaine users or those with a comorbid psychiatric disorder (Kleber et al., 2006).

Based on the summary evaluation of available evidence, ***12-Step Programmes*** have been judged as an effective treatment approach for cocaine use disorders (Kleber et al., 2006). As some studies showed (Weiss et al., 2005; McKay et al., 1994) greater participation in Cocaine Anonymous or other 12-step self-help groups predicts less cocaine use at subsequent follow-up points. In alcoholic cocaine-dependent individuals, 12-step programmes were found to be comparable effective than CBT in reducing cocaine use (Carroll et al., 1998). In the CCTS study, the 12-step-oriented individual drug counselling (in combination with group drug counselling) was demonstrated to be the most effective treatment approach of the four interventions tested in the trial in order to obtain continuous abstinence from cocaine. Thereby the treatment was individually mediated and followed a manual (Mercer & Woody, 1992) with specific stages and aims based on the 12-step philosophy. Even though the empirical evidence supports the effectiveness of 12-step approaches, Kleber et al. (2006) conclude that self-help groups have not been shown to be a sufficient alternative for professional treatment (Kleber et al., 2007; 1303).

Similar to the treatment of opioid-dependence, the effectiveness of ***Contingency Management (CM)*** has been demonstrated for cocaine dependence in a variety of studies. According to the practice guideline of Kleber et al. (2006), the benefits of CM procedures were replicated in many different settings and samples, including cocaine-dependent individuals receiving methadone maintenance, substance-abusing homeless individuals, freebase cocaine users and pregnant substance users, but no summary statistics were provided. Moreover Knapp et al. (2007) underscore the increase of therapeutic benefits if voucher reinforcement contingency management approaches (CM) are combined with CBT. These combined programmes showed significant better results including higher rates of abstinence and treatment retention than behavioural programmes that did not use incentives.

In the only clinical study that has been conducted to evaluate the effectiveness of ***psychodynamic approaches*** to treat cocaine dependence, CBT was found to be superior to an interpersonal approach (Carroll et al., 2004). Supportive-expressive therapy was studied as part of the CCTS study and was found to be less effective than individual plus group drug counselling in decreasing cocaine use.

4.3.3.2 Pharmacological treatment of cocaine dependence

For the pharmacological treatment of cocaine dependence, no medication has been found to date with clear-cut efficacy (see Kleber et al., 2007). In a current Cochrane review of the effectiveness of antipsychotic medications for cocaine dependence, no significant differences were found for any of the efficacy measures comparing antipsychotic drugs (risperidone, olanzapine, haloperidol) with placebo. Risperidone was found to be superior to placebo in diminishing the number of dropouts (RR=0.77; 95% CI 0.77 - 0.98), but most of the studies included in the Cochrane Review did not report useful results on important outcomes such as side effects, use of cocaine during treatment and craving. The results on olanzapine and haloperidol are based come from on studies with undersized samples, thus no to give conclusive interpretations should be derived results.

The evidence for using dopamine agonists in treating cocaine dependence is also mixed. Amantadine, bromocriptine, and pergolide were the drugs evaluated in the Cochrane Review about dopamine agonists for cocaine dependence (Soares et al., 2003). The main efficacy outcome presented was positive urine sample for cocaine metabolites, with no significant differences between interventions. When retention in treatment was assessed as an acceptability measure, a similar rate of patients remaining in treatment in both placebo and active drugs was found. There were no significant differences in trials where participants had primary cocaine dependence or had additional diagnosis of opioid dependence and/or were in methadone maintenance treatment. As a conclusion, current evidence does not support the clinical use of dopamine agonists in the treatment of cocaine dependence. Given the high rate of dropouts in this population, clinicians may consider adding psychotherapeutic supportive measures, which aim at keeping patients in treatment.

Until today, no Cochrane reviews have been published about the effectiveness of selective serotonin-reuptake inhibitor (SSRI) for the treatment of cocaine addiction. Fluoxetine and the selective noradrenaline-reuptake inhibitor (SNRI) bupropion were found in some small studies but have not demonstrated superiority to placebo when evaluated in larger trials (Petrakis et al., 1998; Covi et al., 1994; Montoya et al., 1994; Margolin et al., 1995).

In treating patients who were dually dependent on cocaine and opioids, the mixed opioid agonist-antagonist buprenorphine showed some promise in open trials (Kosten et al., 1989; Gastfried et al., 1992) but not in large-scale double-blind studies (Johnson et al., 1992; Schottenfeld et al., 1997; Strain et al., 1995). More recent research, including one double-blind study (Kampman et al., 2004), suggested some promise for another anticonvulsant, topiramate, for cocaine dependent patients. The GABAB agonist baclofen showed some success in treating cocaine dependence (Ling et al., 1998), and in a recent double-blind clinical trial tiagabine, a GABA reuptake blocker, was found superior to placebo for reducing cocaine use (Gonzalez et al., 2003). However, these findings require replication.

Recent data with disulfiram suggest that this medication may increase the aversive effects of cocaine and reduce its use (Petrakis et al., 2000; Carroll et al., 2000; Carroll et al., 2004). The efficacy of this vaccine for relapse prevention is under investigation. The vaccine TA-CD was tested in a phase-I study on 345 cocaine dependent patients, where it demonstrated positive results (Kosten et al., 2002). The results of the phase-II study, which is currently conducted, are published online through press-releases (available at: http://www.xenova.co.uk/PressRelases (30.01.08)).

4.3.4 Treatment effects on cannabis dependence

Until today, relatively little research has focused on the treatment of cannabis abuse or dependence, but since the last years, cannabis use disorders are receiving increased attention. Treatment of cannabis-related disorders is primarily based on psychotherapeutic approaches (McRae et al., 2003). A current Cochrane Review of psychotherapeutic interventions for cannabis abuse and/or dependence in outpatient settings (Denis et al., 2006) indicated that group and individual sessions CBT both had effects on the treatment of cannabis dependence and associated problems. CBT produced better outcomes than a brief intervention when CBT was delivered in individual sessions. Two studies suggested that adding voucher-based incentives may enhance treatment effects when used in combination with other effective psychotherapeutic interventions (Denis et al., 2006). Abstinence rates were relatively small overall, but favoured the individual CBT condition. All included trials reported statistically significant reductions in the frequency of cannabis use and dependence symptoms. Given the lack of pharmacotherapies for the treatment of cannabis dependence and its psychological, behavioural, and social consequences, psychosocial treatments such as motivational therapy and relapse prevention were recommended as the best available option for the treatment of cannabis dependence (Kleber et al., 2007).

II. Provider survey

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Aims of questionnaire survey

Different from the literature analysis on the State of the Art on DR (part I of this deliverable), the provider questionnaire (PQ) survey on DR in part II delivers information from those organisations or institutes which are carrying out this measure on a day to day basis for DUI and DUID offenders. The aims of part II of the DRUID WP task 5.1 are the following:

- to provide actual and detailed information on all relevant parameters regarding the conduction and realization of DR in European countries;
- to get an overview of organisational, structural and procedural realities in this field;
- to receive an updated list of current programmes, including information on their practices, their approaches, contents, requirements for the trainer and participants as well as their scientific background and evidence;
- to get basic information on quality management in DR as a starting point for the further empirical data collection on this topic (see DRUID WP task 5.2);
- to identify pros and cons in carrying out DR from the practitioners point of views;
- thus to complete the picture on the State of the Art regarding DR in Europe.

1 Development of DR provider questionnaire

1.1 General considerations and concept

ANDREA (Bartl et al., 2002) was the first research project on a European level focussing on DR which delivered basic information on this topic. This project was the main source of information in this part as the DRUID Core Contract indicates that: “The important results of ANDREA will serve as a valuable tool for DRUID WP” (Annex I of the DRUID Core Contract, p.101)

Besides ANDREA, the following additional sources were considered to be useful in delivering content related information for the State of the Art on DR:

- EU Project SUPREME (European Commission DG TREN (2007a);
- EU Projects ROSITA (2000), CERTIFIED (2000) and GADGET (2000);
- Report of the Pompidou Group (2000);
- Questionnaire “Driver Improvement” (Veling & Boon-Heckl, 1987);
- KfV Questionnaire on “Model Level” (Panosch, 2000).

In line with the annex description, the target groups to be taken into account were alcohol and drug offenders. Within each group, the distinction between non-addicts and addicts was also considered.

In order to make use of synergy effects, basic questions on quality management were integrated in the DR provider questionnaire as well, although this topic belongs to DRUID WP task 5.2.

It was decided to develop the questionnaire in English. Other solutions (translation in each national language) were considered too time consuming in relation to the foreseen research months for WP5

task 5.1. In case of language difficulties, support was given individually by the DRUID WP5 team (e.g. via telephone).

Regarding structural and procedural aspects an essentially closed format answering mode and the concept of electronic survey conduction was found to be most appropriate. It provides an easier and quicker answering of the questions for the DR providers, a fast forwarding and return of the questionnaire and high standardization of survey conduction. Moreover, it saves much time in the later data evaluation process.

The following criteria were fixed for the inclusion of DR providers (at least one should be fulfilled):

- The DR provider is an officially authorized entity in the country.
- The DR provider has a nationwide structure (sufficient number of clients).
- The DR provider has a quality control system (according to national regulations, a European or international norm system).

1.2 Content related information sources

The DR provider questionnaire was developed and designed in several working steps, starting with the evaluation of the above mentioned information sources. Feedback loops with experts helped to further elaborate and develop an applicable conception for the survey in the EU Member States.

1.2.1 Questionnaire information from ANDREA

ANDREA was the main source for the development of the DR provider questionnaire. Amongst other research activities, ANDREA gathered information on DR programmes in EU countries existing at that time (at the beginning of 2000) by means of a questionnaire which covered the following topics:

Part A: General framework conditions of DR programme

This part included 20 questions on the following topics:

- title of programme;
- name of institute/s carrying out the measure;
- description of target group;
- description of aim of the programme;
- circumstances for participation;
- legal system behind;
- consequences of participation;
- consequences of not participation;
- date of implementation of the measure;
- duration of the measure;
- number of hours per session;
- number of sessions;
- sessions over how many weeks/days;
- number of clients per trainer/instructor;
- number of participants in 2000;
- number of licences issued in 2000 in the specific country;
- costs of participation;
- bearing of the costs by whom;
- other institutes involved;
- other important details.

Part B: Quality criteria of post licensing measure

This part consisted of 15 questions considering the following aspects:

- introduction of a quality control system or a standardised organisational procedure;
- written manual in which the programme is laid down;
- qualification criteria of the staff (trainer/instructor) who carries out the measure;
- validity of certification;
- official certificate of education of staff;
- responsibility for issuing the certificate;
- validity period of the certificate;
- availability of a standardised basic and continued education of the staff who carry out the programme;
- fixation of a minimum and maximum of training sessions given per trainer/instructor per time;
- availability of evaluation studies;
- if client feedback already has been recorded;
- typical problems occurring in connection with the programme/with the clients;
- ordering of further compulsory follow up measures for certain individuals by the trainer/instructor based on problems occurred during the measure;
- strengths and weaknesses of the measure;
- adding of further comments, remarks, ideas or problems.

A lot of these aspects were considered when developing the DRUID provider questionnaire.

1.2.2 TNO & Traffic Test Questionnaire "Driver Improvement"

Regarding this questionnaire developed by TNO and Traffic Test (Veling, I. & Boon-Heckl) which comprises 26 questions in total, the following issues were taken into consideration:

- content and procedure of course conduction;
- juridical and financial aspects of driver improvement measures in the country;
- evaluation studies on the effects of driver improvement measures in traffic safety in the country;
- future perspectives;
- individual statements, remarks, notices, etc.

The questions of this questionnaire were a valuable supplement to the information from the ANDREA questionnaire.

1.2.3 KfV Questionnaire on model level

This questionnaire developed by the Austrian Road Safety Board (Panosch, 2000) contained the main elements for describing DR course models. The questions (18 in total) focus on the following topics:

- programme in use since when;
- integration into the law of the country;
- target group;
- requirements for participants;
- final confirmation of course participation;
- course duration;
- number of participants;
- course goals;
- course contents, course methods and course materials;
- course schedule;

- quality assurance;
- place of course conduction.

This questionnaire also delivered valuable key aspects, especially as it was also available in a filled in version (description of a KfV rehabilitation programme for DUI).

1.2.4 EU Projects SUPREME, ROSITA, CERTIFIED, GADGET

SUPREME (European Commission DG TREN, 2007a) did not provide useful information for composing the DR provider questionnaire. Nevertheless in this project, DR was nominated as good practice, but it was just one amongst other measures and not investigated in detail or in-depth (see also Thematic Report: Rehabilitation and Diagnostics, Part F2 of the Final report, European Commission DG TREN, 2007c). But SUPREME was found to be of major importance in order to identify the DR providers concerned.

After having reviewed the deliverables of ROSITA (2000), CERTIFIED (2000) and GADGET (2000), it came out that none of these research projects contained useful information for the DR provider questionnaire development. Their focus was not at all on DR measures but on aspects like roadside testing, detection instruments, legal background and frame conditions on alcohol and drugs in traffic.

1.2.5 Report of Pompidou Group

Similar to ROSITA, CERTIFIED and GADGET, the report of the Pompidou Group (Pompidou Group, 2000) did not provide relevant information for the composition of the DR provider questionnaire.

1.3 First version of DR provider questionnaire

Based on the information from the above mentioned sources and including the expert knowledge within the DRUID WP5 team – besides the scientific experience, two partners are authorized DR providers and 3 team members are DR trainers on a regular basis since years – the first version of the provider questionnaire was established.

The questions for all relevant content related aspects as well as the answering alternatives were formulated within the research team. Regarding the design and layout additional structuring elements like colours were integrated in order to ease reading and answering of the questions. Before completion, an instruction of use was formulated and integrated as well.

1.4 Revision process

In order to check understandability and easy processing, the first questionnaire version was forwarded to experts within DRUID WP5 participating partner organisations (BASt, IBSR/BIVV, KfV) who were not involved in its development. The version was reviewed regarding feasibility but also understandability and duration of filling out.

Based on the feedback received, a restructuring of the questionnaire was carried out. It was decided to compose three separate questionnaire forms, i.e. to group the questions according to the following contents:

- organisational and structural issues - Form A;
- detailed programme information - Form B;
- prior driver assessment or diagnostic screening - Form C.

This solution was chosen in order to better structure the content and above all to reduce the filling out burdens for the providers. It was for instance expected that only few providers can give information on "prior assessment". Moreover, the instruction of use was modified resulting in a step by step instruction for each form.

1.5 Timeframe of development

The following table provides a chronological overview of the steps of development of the questionnaire.

Table 7: Timeframe and tasks in DR PQ development process

Time frame	Task
11th-12th January 07 DRUID WP5 meeting Vienna	Distribution of workload concerning literature review for important variables for the questionnaire; conception of relevant parts of the questionnaire to the providers; first concept on conduction of the survey
31st January and 2nd February 07 Internal KfV workshop	Further elaboration of parts of the questionnaire based on analyses of relevant information, important variables to be included, first conception and design of the questionnaire
12th-15th February 07 DRUID WP5 meeting Brussels	Detailed elaboration of the questionnaire, definition of variables and creation of questions and categories. In this step one questionnaire version was planned having different chapters.
Until end of February 07 Telephone sessions and e-mail exchange mainly between KfV and BASt	Completion and design of the first version of the provider questionnaire; Feedback loop: experts review of this first version
5th-6th March 07 Special DRUID WP5 meeting Vienna of KfV and BASt	Further elaboration of the questionnaire. Due to feedback of experts the questionnaire was divided into 3 parts (Form A on organisational issues, Form B on programme information, Form C on prior assessment or diagnostic screening)
March until June 07 Telephone sessions and e-mail exchange by KfV and BASt	Further elaboration and finalisation of the questionnaire Forms A and B
18th-19th June 07 Special DRUID WP5 meeting Vienna of BASt, IBSR/BIVV, KfV	Further elaboration of the Form C
June until August 07 Feedback via telephone and e-mail by BASt, IBSR/BIVV, implementation by KfV	Design and last corrections, insertion of electronic answering modus, composition of final locked version

2 Description of final DR provider questionnaire

2.1 Form A – Organisational issues

Form A of the questionnaire investigates the organisational and structural frame conditions of the DR providers. It was built as follows:

Cover page. It contains a specification of the questionnaire form, its topic within WP5 and the link to the DRUID project.

Second page. It contains the specific step by step instructions for filling in this questionnaire form and for saving the results.
Third page. It contains the questions respectively topics to be answered, 13 in total. Answering can be done by ticking the appropriate fields. Besides the pre-defined answer alternatives, one more option was added at the end providing free answering in a text field.

The topics respectively variables and further specifications covered within this questionnaire form are summarized in the following table.

Table 8: Topics/variables of DR provider questionnaire Form A – Organisational issues

No.	Topic/variable	Specification
1	Identification of provider	
2	Legal entity	NGO / private company / public service / part of hospital
3	Starting year of provider rehabilitation within organisation	
4	Local frame	Nationwide / restricted
5	Sites for carrying out DR	Rooms in own organisation, driving school, public health centre/hospital, seminar or training centre, prison, other
6	Level of quality management system	QM according to international norms / QM system of organisation / single QM elements
7	Number of trainers working in the organisation	
8	Offer of specific services as a basis of DR	Gender / age / language / cultural background
9	Number of different driver DR programme types	
10	Availability of treatment programmes for addicts within organisation	Alcohol dependency / drug dependence / containing driving related elements
11	Availability of assessment procedures or diagnostic screening prior to DR within organisation	
12	Evaluation of frame conditions regarding DR	Authorization procedure for new DR providers Quality control of DR providers Assignment criteria for offenders Co-operation between licensing authorities and DR provider Co-operation between court and DR providers Influence of competition on maintenance of quality standards Influence of competition on evaluation/further programme development Image of DR in media/public
13	Recommendations of the provider for improving DR for DUI/DUID offenders in the country	

The original DR provider questionnaire - Form A can be found in the annex.

2.2 Form B – Programme information

Form B of the questionnaire collected information on the rehabilitation programmes offered for DUI/DUID offenders by the DR providers. A comprehensive template contains the questions and associated pre-defined answering alternatives. Sometimes, an open category (“please specify”) was

included in order to give the possibility to describe specific facts. The Form B template was to be filled out for each offered rehabilitation programme separately.

The DR provider questionnaire Form B was structured as follows:
Cover page. It contains a specification of the questionnaire form, its topic within WP5 and the link to the DRUID project.
Second page. It covers the specific step by step instructions for filling in this questionnaire form and for saving the results.
Third page. It contains the questions respectively topics about the specific DR programme. Twenty topics were covered in total. Each topic was again divided into different parts, e.g. for the DUI and DUID target groups or for further specification of conditions. Answering is done by ticking the appropriate fields. In this form, pre-defined answering alternatives were not always possible. Thus, text fields were presented to write in the answers. Moreover, in questions with pre-defined answering alternatives there was an additional option with a free answering format.

Regarding the success criteria for DR (see following table: factors for programme success) a four point rating scale was used.

The topics respectively variables and specifications included in this questionnaire form are listed in the following table.

Table 9: Topics/variables of DR provider questionnaire Form B – Programme information

No.	Topic/variable	Specification
1	Identification of provider	
2	Country	
3	Name of programme	
4	Programme access	Legally regulated participation Mandatory / voluntary participation Who imposes mandatory participation Determinants of participation in programme Consequences of participation
5	Target groups of programme	Alcohol offenders / subgroups like novice drivers, repeated offenders, Drug offenders / subgroups like novice drivers, repeated offenders, Exclusion of certain groups from programme Mixed groups DUI/DUID Mixed groups of DUI/DUID with other offenders
6	Programme setting	Legal base for setting and procedure Exceptions form normal procedure
7	Programme design	Group / single intervention
8	Programme structure	Group intervention: Number of participants, total time of intervention, total number of sessions, time span between sessions Single intervention: Total time of intervention, total number of sessions, time span between sessions Combined intervention: single and group

9	Programme condition	Repeated participation
10	Trainers	Legal regulation for the trainers' qualification Profession of trainers Additional education Standard combination of disciplines
11	Costs	Participants bear costs Height of costs Legal regulation on costs
12	Programme completion	Legal regulations on course completion Criteria for exclusion of participants during programme Certificate of attendance
13	Scientific background	Description of scientific background Primarily approach of the programme
14	Aims of the programme	Legal regulations on aims Naming of major aims (max. 5) Literature reference
15	Contents of programme	Naming of the most important themes (max. 5)
16	Material	Material for the participants
17	Factors for programme success	Evaluation of aspects for programme's success: Information Self observation and reflection Discussion and confrontation Emotional experiencing and involvement Emotional verbal/non-verbal expressing Open-trustworthy group climate Goals setting and commitment to stick to them Development of alternative, new behaviour Achievement of behavioural goals / self control Medical treatment Alcohol-ignition-interlock Alcohol or drug screening Other to be specified
18	Evaluation	Evaluation of the programme Kind of evaluation Reference
19	Application frequency	Number of participants
20	Comments	Further information given by provider

The original DR provider questionnaire - Form B can be found in the annex.

2.3 Form C – Prior driver assessment or diagnostic screening

Form C of the questionnaire gathered information on driver assessment or diagnostic screening as a decision tool which determines the participation in a specific DR programme appropriate to the individual problem situation. Thus, it did not investigate the scope of assessments for a fitness to drive decision. Form C of the questionnaire asked for the specification of the assessment approaches and tools which are applied by the providers, the personnel involved and its qualification.

This questionnaire form was only to be filled out by those providers who offer such kind of prior assessment or diagnostic screening.

The provider questionnaire Form C was built as follows:
Cover page. It contains a specification of the questionnaire form, its topic within WP5 and the link to the DRUID project.
Second page. It contains the specific step by step instructions for filling in this questionnaire form and for saving the results
Third and fourth page. The questions respectively topics to be answered are presented: Eight topics are covered. Answering is made possible by ticking the appropriate fields. In a few cases there was a free-text answering format (use of text field) in order to give more specifications.

The variables respectively topics of this questionnaire form are included in the following table.

Table 10: Topics/variables of DR provider questionnaire Form C – prior assessment or diagnostic screening

No.	Topic/variable	Specification
1	Identification of organisation	
2	Country	
3	Assessment approaches used in order to assign DUI/DUID driver to a specific rehabilitation measure / programme	Medical approach for DUI/DUID Psychological approach for DUI/DUID If both used, which predominantly
4	Tools used in order to assign an offender to a specific rehabilitation programme:	To be answered separately for DUI and DUID:
	- Interview	Official instrument or institutions' development
	- Physical examination	Use of biological markers: blood, urine, sweat, saliva, hair. Specification of alcohol marker
	- Screening tools on substance use disorders	AUDIT, CAGE, DAST, MAC-R, MALT, MAST, or other tools for alcohol or drug screening
	- External medical / therapeutic information	Comprehensive information by medics / therapists, information on treatment status, opinion from external expert, laboratory results, other sources
	- Performance / functional testing	Perception, reaction, cognition; applied tests
	- Personality testing	Specification of applied tests
	- Practical driving test	On road, off road simulator
5	Qualification of the person conducting psychological Assessment	Specification
6	Qualification of the person conducting medical assessment	Specification
7	Total number of assessments in order to assign a DUI/DIUD to a specific rehabilitation programme in 2006	
8	Estimation on problem severity	Percentage of dependency diagnosis Percentage of harmful use / abuse

The original DR provider questionnaire - Form C can be found in the annex.

3 Organisation of DR provider questionnaire survey

3.1 Acquisition of DR provider addresses

The contact data from the ANDREA survey were of limited value as the study was carried out more than five years ago and the contact references may not have been valid anymore. Therefore, an entire new search had to be carried out by the WP5 team. In this acquisition process, the SUPREME project was of great help. It delivered actual information on which countries provide DR, although it did not distinguish between DUI/DUID and general traffic offenders. Moreover, within SUPREME a network of country experts was established which could be consulted by the WP5 team after having gained the permission from the European Commission.

Thus, the SUPREME country experts were contacted by phone and e-mail in March and April 2007 and were asked (a) if DR for DUI and/or DUID exists in their country and in case of yes, (b) if they can forward the contact information of the providers.
Nearly all country experts – in those countries where DR is in force – co-operated and named contact persons or providers in their specific country. This very valuable information was completed by contact data which were provided by WP5 team members based on own professional connections.

Due to these country experts' inquiry, it resulted that the Czech Republic, Finland, Greece, Ireland and Malta do not apply DR measures at present. Information from Bulgaria and Romania was also negative regarding the existence of DR. In Cyprus, Estonia, Latvia, Lithuania, Slovenia and Norway[14] a penalty point system is in force, wherein specific lectures have to be attended. Slovakia has got "refreshing courses" in driving schools for conspicuous drivers. Thus, none of these countries could be included in the PQ survey. Moreover, as Denmark and Spain started some DR measures only recently, they had to be excluded as well.
Hence Austria, Belgium, Germany, France, Hungary, Italy, Luxembourg, the Netherlands, Poland, Portugal, Sweden, Switzerland and United Kingdom were contacted for participation.

3.2 Motivating providers for participation

At conferences, workshops and meetings as well as in personal contacts (face to face, via telephone and/or e-mail) information was given by the DRUID WP5 team members about the planned research activities, its importance for future solutions regarding DR on EU-level and the importance of participation in the provider survey. As no financial compensation for filling in the questionnaire was possible, the following two incentives were announced for those providers willing to take part: being listed in the deliverable and being invited to an expert workshop on presentation and discussion of the research results.

4 Conduction of DR provider survey

4.1 Support to providers

It was decided to give support to the providers during the conduction of the survey. This was on one hand content related assistance in case of difficulties or questions regarding filling out the forms (additional questions concerning content of items, language problems...). On the other hand organizational activities had to be carried out, like contacting the providers, sending forms, providing

[14] Not belonging to the EU 27

assistance. For this reason, responsible persons of the WP5 research team were nominated to organize the survey for specific countries (see following table). In some Member States, like Great Britain or France, a responsible national co-operator was named or established, who co-ordinated the survey activities within the country and who was the direct contact person for the responsible WP5 team member.

The following table shows which WP5 partners supported providers in which country.

Table 11: Responsible DRUID WP5 partner for contacting and supporting countries respectively providers

Country	KfV	BASt	IBSR	INRETS
Austria	X			
Belgium			X	
France				X
Germany		X		
Hungary	X			
Italy	X			
Luxembourg			X	
Netherlands			X	
Poland	X			
Portugal				X
Sweden	X			
Switzerland	X			
United Kingdom	X			

4.2 Forwarding of provider questionnaire templates

The responsible WP5 team members contacted the providers in question or the national co-operators by e-mail, sometimes additionally by phone, gave information about the conduction and time schedule of the survey and forwarded the questionnaire forms A, B, C in the locked mode. In case of France, the national co-ordinator gave feedback about the impossibility of filling in the questionnaire due to language problems. To solve this, the three questionnaire forms were translated into French by the French WP5 partner. All other countries and providers received the English version.

The distribution of the questionnaire forms started at the earliest in August 2007 but in some countries due to organisational issues even later.

4.3 Organization of return run of questionnaires

For the return run of the questionnaires, the WP5 responsible team members started to contact the providers or national co-operators from November 2007 on to remind them of the deadline of the survey. Each responsible team member sampled the returned questionnaires of Form A, B and C, put the filled in questionnaire forms in a zip file, added the return run statistics on how many providers had been contacted, how many providers had answered, which and how many forms of the questionnaires had been filled out (see template of table in the annex) and sent them to the KfV for further data processing.
In order to reduce the amount of work for certain providers which apply the same programmes as other, a feedback regarding already available programme descriptions was given. This way some providers just specified programmes which had not yet been described by others.

The foreseen deadline of 23rd of November 2007 was postponed to the 13th of December 2007 in order to receive as much filled in DR provider questionnaires as possible.

5 DRUID WP5 partner co-operation

The DR provider questionnaire survey was executed in co-operation with several WP5 partners. The co-operating partners were: BASt (Germany), IBSR/BIVV (Belgium), INRETS (France) and KfV (Austria).

The following table shows the partner organisations and their main contribution in the process of survey development, organisation and conduction, of data analyses, evaluation and documentation of the results.

Table 12: Tasks and DRUID WP5 partners involved

Task	Co-operating partners
Concept of the questionnaire	KfV, BASt, IBSR/BIVV, INRETS
Development and design of questionnaire Form A, B and C	KfV, BASt, IBSR/BIVV
Survey on possible providers in the Member States	KfV; BASt and IBSR/BIVV for own countries
Concept of survey conduction	KfV, BASt, IBSR/BIVV
Conduction of survey	KfV, BASt, IBSR/BIVV, INRETS
Conduction of data analysis	KfV
Discussion on results, conclusions	KfV, BASt, IBSR/BIVV, INRETS
Data evaluation and results fixation in deliverable	KfV

6 Methodology

6.1 Evaluation procedure

In a first step the data of all filled in questionnaire Forms A, B and C were transferred and inserted into three data fields (corresponding to the three questionnaire forms) for further data analysis. This was carried out automatically by means of a programme especially developed for this purpose. This programme assigned each ticked-on field from the questionnaire to a certain column in these data fields.

In a second step a quality check was carried out. For this purpose it was checked whether each questionnaire was correctly assigned to the corresponding category. Moreover, it was controlled if the assignment of data field and columns was done correctly. After this process the preparation of the data fields for data analyses was finished.

The three data fields had an excel format and they were transferred to SPSS programme version 14.

This direct transmission of the questionnaire data into an SPSS format did not only have a big time saving effect as an additional data input phase could be left out, but transmission errors could be avoided as well.

6.2 Data analysis

The results of the DR provider questionnaire were analyzed quantitatively and qualitatively depending on the type of variable:

- Descriptive statistical analyses, above all frequencies but also further combinations of variables (chi square tables) were carried out by means of SPSS version 14 and Microsoft Excel.
- Categorisations according to qualitative criteria were done for those variables which contain written answers (given in an open answering format). This was done by research team members based on expert analysis.

Data analysis was carried out from December 2007 to February 2008.

7 Results

7.1 Description of questionnaire sample

47 providers from 12 European countries participated in the survey. Only Luxembourg did not reply and could not be considered.
The following table provides an overview on the participants of the survey in total, described at country level.
Concerning responding institutions it has to be stated that on the one hand, providers themselves responded to the questionnaire; on the other hand it was done by institutions which are responsible for DR in their country (e.g. Hungary - the National Transport Authority, the Netherlands - CBR). In case of Switzerland there was a special situation: the Vereinigung für Verkehrspsychologie overtook this part.
The DRUID WP 5 team would like to thank all providers / institutions / organisations for participating and their highly estimated, valuable input.

The names of the responding providers and organisations which took part in the survey are also listed in the annex.

- Austria: AAAV, AAP, fair partner, Gute Fahrt, INFAR, KfV Sicherheit Service GmbH , Kuratorium für Verkehrssicherheit - Verein, sicher unterwegs, 1A Sicherheit;
- Belgium: BIVT,IBSR;
- France: ANPER (Bordeaux, Auxerre, Chalon sur Saon), APAVE PARISIENNE, AUTOMOBILE CLUB ACTION +, COMARIS, Prévention routière de Dordogne;
- Germany: AFN, Dekra, Impuls GmbH, IVT-Hö ®, Nord-Kurs GmbH & Co. KG, PLUSPUNKT, SSK TUEV Thueringen Anlagentechnik, TÜV SÜD Life Service GmbH;
- Hungary: National Transport Authority;
- Italy: Azienda Sanitaria dell'Alto Adige - Settore di Psicologia Viaria/Medicina Legale;
- The Netherlands: CBR;
- Poland: Centrum Uslug Psychologicznych;
- Portugal: Prevenção Rodoviária Portuguesa;
- Sweden: Swedish Prison and Probation Service;
- United Kingdom: DDE, Devon County Council, DRIVER' S.E.A.T, Drivewise (London) Ltd, Gloucestershire County Council, Kent Probation Area, LRSP, NECA, Ogwr DASH, Prism Clearway, Reform Road Safety & Education, The Albert Centre, TTC 2000, VMCL;
- Switzerland: Vereinigung für Verkehrspsychologie.

Taking into account the total number of providers which fulfil the inclusion criteria for the study at that time (nation wide service/authorized institution/evaluated programme/having conducted DR since at least one year, see chapter 1.1), the analyzed questionnaires are a rather comprehensive sample of actual providers in European countries.

Table 13: Number of participating DR providers

Country	DR providers	
	Total number in country[15]	Participating in DRUID
Austria	9	9
Belgium	2	2
France	not known	7
Germany	10 (accredited)	8
Hungary	1	1
Italy	1	1
Netherlands	1	1
Poland	1	1
Portugal	1	1
Sweden	not known	1
Switzerland	20-25	1
United Kingdom	not known	14
Total number	-	**47**

The number of evaluated questionnaire forms is presented in the following table.

Table 14: Number of questionnaire forms A, B, C filled in by the 47 providers; presentation per country

Country	Provider questionnaire		
	Form A	Form B	Form C
Austria	9	21	0
Belgium	2	5	1
France	7	8	7
Germany	7	28	3
Hungary	1	3	1
Italy	1	1	1
Netherlands	1	1	0
Poland	1	1	0
Portugal	1	3	0
Sweden	1	1	1
Switzerland	1	1	1
United Kingdom	14	14	0
Total number	**46**[16]	**87**	**15**

7.2 Outcomes of Form A – Organisational issues

In this section the results in each answering category on organisational issues are always presented on country level and in total.

[15] Status summer 2007; DR measures have been conducted since at least one year.
[16] One provider did not send PQ Form A.

The following table shows the overall results of DRUID provider questionnaire Form A for all questions. For some questions multiple answers were possible. In some questions the number of answers does not reach 46 due to missing values.
For a better comprehensibleness the results (numbers) are always inserted in the respective PQ question in blue colour.

Table 15: PQ Form A overall results

Name of organisation: **Legal entity:**	***46 providers/organisation answered*** **this *questionnaire*** **Country:** ***12 countries participated*** **Is your organisation :** a non governmental organisation: No: ***12 providers*** Yes: ***24 providers*** a private company: with commercial aims:***19 providers*** non profit: ***21 providers*** a public service (governmental or community based): No: ***23 providers*** Yes: ***13 providers*** (part of) a hospital / health care centre: No: ***30 providers*** Yes: ***1 provider*** Other, please specify: ***3 providers***
1. Since when does your organisation provide driver rehabilitation (DR) for alcohol and/or (illicit) drugs offenders (DUI/DUID): Starting year: ***varies from 1976 to 2006***	
2. Indicate the organisation's local frame regarding DR services for DUI/DUID: Nationwide: ***21 providers*** Restricted to certain federal states/areas: ***23 providers***	
3. At which sites does your organisation carry our DR services for DUI/DUID: Rooms in own organisation: ***30 providers*** Driving school: ***12 providers*** Public health centre / Hospital: ***4 providers*** Seminar or training centre: ***26 providers*** Prison: ***5 providers*** Other: ***12 providers***	
4. Indicate the quality management (QM) level regarding DR for DUI/DUID in your organisation: QM system according to national/ international norms: ***18 providers*** ISO: ***9 providers*** DIN: ***7 providers*** EN:***5 providers*** Other: ***8 providers*** QM system defined/controlled by your organisation only: ***24 providers*** Single QM elements only: ***6 providers*** No QM: ***3 providers***	
5. How many trainers are working on DR for DUI/DUID in your organisation: number: ***varies from 1 to 118; overall 1431 trainers at present***	
6. Does your organisation offer specific DR services based on the following criteria: Gender: ***2 providers*** Age: ***3 providers*** Language: ***18 providers*** Cultural background: ***3 providers***	
7. How many different DR programme types for DUI/DUID does your organisation offer: Total number: ***varies between 1 to 7*** ➔ **Specify the DUI/DUID-programme(s) in Form B (for each**	

programme one Form B).				
8. Does your organisation offer treatment programmes for addicts: No: *38 providers* Yes: *8 providers* If yes, for: Alcohol dependency: *8 providers* Drug dependency: *6 providers* If yes, does the treatment contain driving related elements: No: *2 providers* Yes: *6 providers*				
9. Does your organisation apply any driver assessment procedures or diagnostic screening prior to driver rehabilitation: No: *31 providers* Yes: *15 providers* ➔ **If yes, please specify the driver assessment procedure(s) in Form C.** **Are there any driver assessment procedures outside your organisation prior to your DR:** No: *32 providers* Yes: *9 providers*				
10. Evaluate the following frame conditions regarding DR for DUI/DUID:	**number= number of providers**			
	Exists in country		Desirable	
	Yes	No	Yes	No
Authorization procedure for new rehabilitation providers	*35*	*8*	*29*	*1*
Quality control of rehabilitation providers	*35*	*9*	*32*	*0*
Assignment criteria for offenders	*30*	*13*	*24*	*5*
Co-operation between licensing authorities and rehabilitation provider	*30*	*13*	*27*	*6*
Co-operation between court and rehabilitation providers	*28*	*16*	*27*	*6*
	Exists in country		If exists, effect is:	
	Yes	No	Positive	Negative
Influence of competition on maintenance of quality standards	*27*	*16*	*12*	*12*
Influence of competition on evaluation/further program development	*23*	*20*	*13*	*10*
Image of DR in media /at public	*32*	*12*	*24*	*9*
11. Do you have recommendations for improving DR for DUI/DUID in your country: *11 providers*				

In the following the detailed results per question are presented. The coloured heading and the line on results always refer to the overall table above.

7.2.1 Legal entity

The specification of the DR providers' legal entity results in the following answers (see table below).

Table 16: PQ Form A, legal entities of providers per country; multiple answers possible; number of providers

Country	Participating providers PQ Form A	Non governmental organisation	Private company with commercial aims	Private non profit organisation	Public service, governmental or community based	(Part of) hospital or health centre	Other[17]

[17] In case of the „other" statements, in every case "charity" was named.

Austria	9	9	6	3	2		
Belgium	2	2	1	1	1		
France	7	4	2	5			
Germany	7[18]	4	6	1			
Hungary	1				1		
Italy	1				1	1	
Netherlands	1				1		
Poland	1		1				
Portugal	1	1		1	1		
Sweden	1				1		
Switzerland	1			1			
United Kingdor	14	4	3	9	5		3
Total	**46**	**24**	**19**	**21**	**13**	**1**	**3**

Half of the providers state to conduct DR within a non governmental organisation. 19 providers are organisations with commercial aims, 21 a non-profit organisation. 13 providers state that DR in their country is offered within a public service which is governmental or community based. One provider states that its DR courses are offered within a hospital or health care centre.

7.2.2 Starting year of DR activity

The specification concerning the starting year of DR activities shows the following results.

Table 17: PQ Form A, starting year of providers' DR activity, number of providers

Country	Participating providers PQ Form A	1965 - 1970	1971 - 1975	1976 - 1980	1981 -1985	1986 - 1990	1991 - 1995	1996 - 2000	2001 - 2005	2005 -	Total
Austria	9			1		1	1	3	1	2	9
Belgium	2						1		1		2
France	7						1	2	3		6
Germany	7			2		1	1	3			7
Hungary	1						1				1
Italy	1							1			1
Netherlands	1							1			1
Poland	1								1		1
Portugal	1						1				1
Sweden	1					1					1
Switzerland	1						1				1
United Kingdom	14						8	6			14
Total	**46**	**0**	**0**	**3**	**0**	**3**	**15**	**16**	**6**	**2**	**45**

As the results show most of the providers started their services in the period from 1991 to 2000. Pioneers in this field are Austria (1976) and Germany (1978, 1979). Till the year 2000, 37 of the nowadays providers already offered DR programmes. This means that the responding organisations have in most of the cases a rather long lasting experience in this field. In the recent years (since 2000) some new providers have started their services.

[18] In Germany, 7 out of the 8 responding providers answered PQ Form A.

7.2.3 Local frame

The specification regarding the local frame of DUI services shows the following results.

Table 18: PQ Form A, local frame regarding DR services, number of providers and numbers of regions where services are restricted to

Country	Participating providers PQ Form A	nationwide service	Service restricted to certain federal states/areas	number of areas / federal states
Austria	9	9		
Belgium	2	2		
France	7		7	1-4
Germany	7	4	3	1-8
Hungary	1	1		
Italy	1		1	1
Netherlands	1	1		
Poland	1	1		
Portugal	1	1		
Sweden	1	1		
Switzerland	1	1		
United Kingdom	14		13	1-15
Total	**46**	**21**	**23**	**1-15**

The results show that 21 providers operate nationwide while 23 offer their services restricted to certain areas of their country.

7.2.4 Sites for carrying out DR

The specification of the DR providers' sites for carrying out DR shows the following results (see table below).

Table 19: PQ Form A, sites for carrying out DR

Country	Participating providers PQ Form A	Rooms in own organisation	Driving school	Public health centre/hospital	Seminar or training centre and other facilities	Prison
Austria	9	9	8	2	9	2
Belgium	2	1			2	
France	7	4			5	
Germany	7	7	3		3	
Hungary	1	1	1			
Italy	1			1		
Netherlands	1			1		
Poland	1					1

Portugal	1	1			2	1
Sweden	1	1				1
Switzerland	1				1	
United Kingdom	14	6			16	
Total	**46**	**30**	**12**	**4**	**38**	**5**

Within this question multiple answers were possible. 30 providers have got rooms available within their organisation. 38 providers use a seminar or training centre or other facilities (e.g. rooms of Red Cross or Salvation Army Centres, or community centres) as a venue. 12 organisations conduct their courses in driving schools. Four act at a public health care centre or a hospital, 5 providers carry out rehabilitation courses in prison.

7.2.5 Level of quality management

The specification of the DR providers' quality management results in the following answers (see table below).

Table 20: PQ Form A, number of providers applying different levels of quality management regarding DR; multiple answers within QM system international/national norms

Country	Participating providers PQ Form A	QM - ISO	QM - DIN	QM - EN	QM - Other	QM defined/controlled within organisation only	Single QM elements	No QM
Austria	9				2	7	3	
Belgium	2				1	1		
France	7					7	1	
Germany	7	5	7	5	1			
Hungary	1					1		
Italy	1						1	
Netherlands	1					1		
Poland	1							1
Portugal	1							1
Sweden	1	1						
Switzerland	1					1		
United Kingdom	14	3			4	7	1	
Total	**46**	**9**	**7**	**5**	**8**	**25**	**6**	**2**

18 providers state that a quality management system is in force according to national or international norms. Thereby nine use an ISO QM system. Other QM systems are used by eight providers. 25 providers apply quality standards defined within their organisation. Only single quality elements are applied by six organisations. Two providers have no QM system at all

7.2.6 Number of trainers working within organisation

The specification of the number of trainers working within one organisation shows the following results (see table below).

Table 21: PQ Form A, number of trainers working within organisation

Country	Participating providers PQ Form A	Variation of total number of trainers per provider	Total Number of trainers per country participating in DRUID WP5 Questionnaire survey
Austria	9	10 - 80	408
Belgium	2	6-12	18
France	7	1-14	36
Germany	7	12-98	397
Hungary	1	60	60
Italy	1	3	3
Netherlands	1	118	118
Poland	1	4	4
Portugal	1	45	45
Sweden	1	approx.100	100
Switzerland	1	45	45
United Kingdom	14	4-45	197
Total	**46**		**1431**

As the results show, the variation of number of trainers across organisation and countries is wide and ranges from one up to 100.
In total 1431 trainers conduct DR at the provider instances participating in the PQ survey. That means that at least 1431 trainers work at present in the field of DR in European countries.

7.2.7 Specific DR services

The answers on specific DR services offered by DR providers show the following results (see table below).

Table 22: PQ Form A, specific DR services

Country	Participating providers PQ Form A	Gender	Age	Language	Cultural background
Austria	9			9	
Belgium	2		1	1	
France	7				
Germany	7			2	
Hungary	1				
Italy	1			1	
Netherlands	1				
Poland	1				

Portugal	1			1	
Sweden	1				
Switzerland	1			1	
United Kingdom	14	2	2	3	3
Total	**46**	**2**	**3**	**18**	**3**

About one third of providers consider language of the participants for conduction of the courses. Two providers in United Kingdom consider gender. Three providers (Belgium, UK) take account for age, further three organisations (in UK) respect cultural background of the offenders.

7.2.8 Number of different DR programme types

The specification on different DR programme types offered by the DR providers results in the following answers (see table below).

Table 23: PQ Form A, variation in DR programmes provided per country, number or reported DR programmes per country

Country	Participating providers PQ Form A	Different programme types per provider	Number of reported programmes per country
Austria	9	3-5	21
Belgium	2	2-3	5
France	7	1-2	8
Germany	7	1-7	28
Hungary	1	3	3
Italy	1	1	1
Netherlands	1	1	1
Poland	1	1	1
Portugal	1	2	3
Sweden	1	1	1
Switzerland	1	2	1
United Kingdom	14	1-2	14
Total	**46**	**1-7**	**87**

The number of different programmes offered by the providers varies normally from one to three different course types. But there are also some organisations which apply an even greater range of DR: Four to seven different types of courses are conducted.
Most of the national providers have up to two different programme types.
In total 87 programmes were reported, jet it has to be mentioned that some providers use the same programme which in fact means that the number of different programmes is considerably lower.

7.2.9 Treatment programmes for addicts

The specification of the DR providers' treatment programmes for addicts results in the following answers (see table below).

Table 24: PQ Form A, treatment programmes for addicts, number of providers

Country	Participating providers PQ Form A	No	Yes, for alcohol dependency	Yes, for drug dependency	Yes, driving related elements Included for DUI and/or DUID
Austria	9	9			
Belgium	2	1	1	1	1
France	7	5	2	1	2
Germany	7	7			
Hungary	1	1			
Italy	1	1			
Netherlands	1	1			
Poland	1	1			
Portugal	1	1			
Sweden	1		1	1	
Switzerland	1		1		1
United Kingdom	14	11	3	3	2
Total	**46**	**38**	**8**	**6**	**6**

The vast majority of the providers state that they do not offer addiction treatment service for DUI or DUID dependent offenders.
Only eight organisations treat alcohol dependent offenders, while six treat drug dependent offenders. Six out of these providers include driving related elements for DUI and/or DUID as part of their addiction treatment.

7.2.10 Assessment or diagnostic screening prior to rehabilitation

The specification on assessment or diagnostic screening prior to rehabilitation results in the following answers (see table below).

Table 25: PQ Form A, driver assessment/diagnostic screening prior to DR within organisation

Country	Participating providers PQ Form A	Driver assessment or diagnostic screening prior to DR – offered by organisation	Driver assessment outside organisation prior to DR
Austria	9		
Belgium	2	X (1)	
France	7	X (7)	
Germany	7	X (3)	X (5)
Hungary	1	X (1)	
Italy	1	X (1)	
Netherlands	1		
Poland	1		X (1)

Portugal	1		
Sweden	1	X (1)	
Switzerland	1	X (1)	X (1)
United Kingdom	14		
Total	**46**	**7 (15)**	**3 (7)**

15 providers in seven countries carry out prior assessment/screening within their organisation before assigning the offender to a DR course. Seven providers in three countries report that a driver assessment is carried out outside their organisation in order to assign the offender to the "correct" DR.

7.2.11 Evaluation of frame conditions regarding DR

The following part of the questionnaire should give a picture of the frame conditions regarding DR measures. The aspects relevant for this topic are if there is an authorization procedure for new providers in a country, if quality control is conducted, if assignment criteria for offenders do exist, if there is cooperation between the licensing authorities and the rehabilitation providers and if there is cooperation between the court and rehabilitation providers. The issues are presented separately.

7.2.11.1 Authorization procedure for new rehabilitation providers

The specification on evaluation of authorization procedure for new rehabilitation providers results in the following answers (see table below).

Table 26: PQ Form A, evaluation of authorization procedure for new rehabilitation providers

Country	Participating providers PQ Form A	Exists in country	Does not exist	Desirable condition	Not desirable
Austria	9	X		7	
Belgium	2	X		1	
France	7	X[19]		4	
Germany	7	X		5	
Hungary	1	X			
Italy	1		X	1	
Netherlands	1	X		1	
Poland	1		X	1	
Portugal	1		X		1
Sweden	1	n.a.[20]	n.a.		
Switzerland	1	X			
United Kingdom	14	X		9	
Total	**46**	**8**	**3**	**29**	**1**

In two thirds of the countries an authorization procedure for new rehabilitation providers exists. Three providers state that there is no authorization procedure. Regardless if an authorization procedure exists in a country or not the majority estimates this as a desirable condition.

[19] It depends on region if it exists or does not exist. Authorization is not taken at the national level.
[20] n.a. means "no answer".

7.2.11.2 External quality control of DR providers

The specification on evaluation on external quality control of DR providers results in the following answers (see table below).

Table 27: PQ Form A, evaluation of quality control of rehabilitation providers

Country	Participating providers PQ Form A	Exists in country	Does not exist	Desirable condition	Not desirable
Austria	9	X		7	
Belgium	2		X	2	
France	7	X[21]		3	
Germany	7	X		5	
Hungary	1	X			
Italy	1		X	1	
Netherlands	1	X		1	
Poland	1		X	1	
Portugal	1		X	1	
Sweden	1	n.a.	n.a.		
Switzerland	1		X	1	
United Kingdom	14	X		10	
Total	**46**	**6**	**5**	**32**	**0**

Half of the countries have got an external quality control of rehabilitation providers. The overwhelming majority of providers emphasises the importance of an external quality control system regardless if it exists in their country or not.

7.2.11.3 Assignment criteria to DR courses

The specification on evaluation on assignment criteria to DR courses results in the following answers (see table below).

Table 28: PQ Form A, evaluation of assignment criteria for offenders

Country	Participating providers PQ Form A	Exists in country	Does not exist	Desirable condition	Not desirable
Austria	9	X		7	
Belgium	2	X		2	
France	7	X[22]		1	2
Germany	7	X		5	
Hungary	1	X			

[21] It depends on region if it exists or does not exist.
[22] The criteria for assignment vary from one juridical district to another.

Italy	1	X			
Netherlands	1	X		1	
Poland	1		X	1	
Portugal	1	X		1	
Sweden	1	n.a.	n.a.		
Switzerland	1		X		
United Kingdom	14	X		6	3
Total	**46**	**9**	**2**	**24**	**5**

Most of the providers judge assignment criteria as valuable and important for assigning offenders to DR courses.

7.2.11.4 Co-operation between licensing authorities and rehabilitation provider

The specification on evaluation of co-operation between licensing authorities and DR provider results in the following answers (see table below).

Table 29: PQ Form A, evaluation of co-operation with licensing authorities

Country	Participating providers PQ Form A	Exists in country	Does not exist	Desirable condition	Not desirable
Austria	9	X		7	
Belgium	2		X		2
France	7	X		2	1
Germany	7	X		7	
Hungary	1	X			
Italy	1	X			
Netherlands	1	X		1	
Poland	1		X	1	
Portugal	1	X		1	
Sweden	1	n.a.	n.a.		
Switzerland	1		X		1
United Kingdom	14	X		8	2
Total	**46**	**8**	**3**	**27**	**6**

In eight countries DR providers make use of a co-operation with the licensing authorities. The overwhelming majority of providers judge this as valuable.

7.2.11.5 Co-operation between court and DR provider

The specification on evaluation of co-operation between court and DR provider results in the following answers (see table below).

Table 30: PQ Form A, evaluation of co-operation with court

Country	Participating providers PQ Form A	Exists in country	Does not exist	Desirable condition	Not desirable
Austria	9	X		5	3
Belgium	2	X		1	1
France	7	X		1	
Germany	7	X		7	
Hungary	1		X		1
Italy	1		X	1	
Netherlands	1		X		1
Poland	1		X	1	
Portugal	1	X		1	
Sweden	1	n.a.	n.a.		
Switzerland	1	X			
United Kingdom	14	X		10	
Total	**46**	**7**	**4**	**27**	**6**

Direct co-operation with court is mostly estimated as positive. The overwhelming majority of providers judge it as valuable.

7.2.11.6 Influence of competition on maintenance of quality standards

The specification on evaluation concerning the influence of competition on maintenance of quality standards results in the following answers (see table below).

Table 31: PQ Form A, evaluation of influence of competition on maintenance of quality standards

	Number of Providers answering	Positive effect stated	Negative effect stated	No evaluation
Exists in countries	27	11	12	4
Does not exist	16	-	-	

27 providers state that competition influences the maintenance of quality standards in their countries. 12 providers consider this competition raising negative effects, but nearly as many providers consider this to have positive effects. Sixteen providers state that it does not exist in their country.

7.2.11.7 Influence of competition on evaluation/further programme development

The specification on evaluation concerning the influence of competition on evaluation and further programme development results in the following answers (see table below).

Table 32: PQ Form A, evaluation of influence of competition on evaluation/further programme development

	Number of Providers answering	Positive effect stated	Negative effect stated	No evaluation
Exists in countries	23	13	8	2
Does not exist	20	-	-	

Twenty providers state that this kind of competition does not exist in their country. Twenty-three organizations report that it exists in their countries, evaluating this to have more positive than negative effects.

7.2.11.8 Image of DR in media/public

The specification on evaluation of the image of DR in media and public results in the following answers (see table below).

Table 33: PQ Form A, evaluation of image of DR in media/at public

	Number of Providers answering	Positive image stated	Negative image stated	No evaluation
Exists in countries	32	21	7	4
Does not exist	12	-	-	

Most of the providers where DR exists in the countries state that this has a positive perception in media and the public.

7.2.12 Recommendations for improving DR

11 of the 46 responding providers gave recommendations for improvement of DR.

The recommendations concern the following aspects:

Quality management:

- Better/clear/standardized quality assurance system for all providers - proposed periodically (e.g. every 3rd year) from authority side;
- Establishment of an independent national institution for all DR issues including an effective quality management system;
- Strict separation (personnel and institutional) of assessment and rehabilitation and supervision/control of this separation;
- Comprehensive neutral and objective information about offers of DR; DR close to the offence;
- All DR should be evaluated and orientated at theories of Behaviour Modification.

Co-operation with involved parties:

- More recognition and more referral by official instances (police, court, licensing authorities, assessment centres, etc);
- Making connection with medical services and co-operating between medical services and the transport authority.

Course conduction and treatment procedure:

- DR in groups before single measures take place;
- Extended post care;
- Tighter connection between the size of the punishment and participating in the rehabilitation programme, and committing probation officer to inform the court and person responsible for the rehabilitation programme about the results of the rehabilitation course.

Participation requirements of offenders:

- DR obligatory for all DUI (BAC over 0.5 ‰);
- It should be made compulsory to all offenders referred by courts, financial help should be made available for people who cannot afford the course fee from the fine paid to courts.
- Courses should be available for drivers who have been convicted for drug driving. The legal drink drive level for alcohol must be lowered to 50 mgs/100 mls of blood (0.5 ‰);
- Fixed fee (regulated by authority);
- Course compulsory in some instances (e.g. second offence) and therefore funded by state;
- The DR-scheme should be compulsory and not voluntary.

7.3 Outcomes of Form B – Programme information

7.3.1 Specification of DUI/DUID rehabilitation programmes

47 providers from 12 countries provided programmes in the PQ Form B.
In total 91 PQ Form B were submitted, yet after a first check, four questionnaires were eliminated as they referred to other offender groups than DUI/DUID.
So the final sample of programmes consists of 87 DR measures.

Table 34: PQ Form B, documented programmes per country

Country	Number of participating providers in DRUID	Number of documented programmes
Austria	9	21
Belgium	2	5
France	7	8
Germany	8	28
Hungary	1	3
Italy	1	1
Netherlands	1	1
Poland	1	1
Portugal	1	3
Switzerland	1	1
Sweden	1	1

United Kingdom	14	14
Total	**47**	**87**

Table 35: PQ Form B, documented programmes regarding target groups

Country	DR programmes for		
	DUI	DUID	DUI, DUID and others mixed at regular level
Austria	12	8	
Belgium	2	1	2
France	2		5
Germany	13	11	4
Hungary	3		
Italy	1		
Netherlands	1		
Poland	1		
Portugal	2	1	
Switzerland	1		
Sweden			1
United Kingdom	14		
Total 87	**53**	**21**	**13**

53 programmes focus on DUI and 21 on DUID offenders. 13 programmes refer to mixed groups of DUI, DUID and general traffic offenders.

The following table shows the overall results of PQ Form B for all questions. For some questions multiple answers were possible. Due to missing data it is possible that in the results the numbers of analysed programmes vary.
For a better comprehensibleness the results (numbers) are always inserted in the respective PQ question in blue colour.
The details on programme structure are not documented here because this is directly linked to the individual programmes and will be mentioned later.

Table 36: PQ Form B, overall results

Name of organisation:		**Country:**
Name/title of programme:		English translation (if possible):
Origin	**Was this programme developed within your organisation:**	**20** No ***66*** Yes

Programme access and consequence

Is the participation legally regulated: *21* No *65* Yes ;

If yes, please name the law/paragraph(s):

The participation is: *49* Mandatory *38* Voluntary

If mandatory, who imposes the participation in this programme:

34 Licensing authority
13 Court
0 Rehabilitation provider
1 Assessment centre
2 Other, please specify:

What determines the participation in this programme:

19 Prior driver assessment
22 Recidivism
69 substance during the offence
55 Alcohol; if there is a specific concentration limit, please specify:
33 Drug(s), please specify the substance(s):
18 Other, please specify:

What are the consequences of participation:

28…It leads to a reduction of the suspension period
13…it leads to a reduction/extinction of penalty points
9… it leads to a reduction of other punishments (e.g. reduced fine)
0… it leads to a reduction of community service hours
14…it leads to an avoidance of further criminal prosecution
21…it leads to an ongoing validity of the license
43…it is a necessary condition for re-licensing/license reinstatement/re-granting
14…it leads to improved chances of passing an upcoming driver assessment
16 …it leads to other consequences: please specify:

Target group(s) of programme

66 **Alcohol offenders (DUI)**[23]

Does the programme focus on subgroups of alcohol offenders:

46 No
19 Yes; if yes, please specify:
11 Novice drivers
10 First time offenders
12 Repeated offenders
6 Other, please specify:

34 **Drug offenders (DUID)**[24]

Does the programme focus on specific subgroups of (illicit) drug offenders:

22 No
12 Yes; if yes, please specify:
9 Novice drivers
4 First time offenders
6 Repeated offenders
4 Other, please specify:

Does your organisation exclude certain groups from this programme:

37 Addicts *25* Drivers with communication problems
10 Other, please specify:

Are alcohol and drug offenders mixed:

63 No if yes: *4* only in special cases
13 regularly

Are alcohol and drug offenders mixed with other traffic offenders:

68 No if yes: *7* only in special cases
7 regularly[25]

[23] This amount of programmes results from 53 DUI porgrammes and 13 mixed programmes.
[24] This amount of prorgammes results from 21 DUID porgrammes and 13 mixed programmes.
[25] Those programmes mixing all three offender types (n=7) are included in the number of programmes (n=13) mixing alcohol and drug offenders.

Programme setting	**Is there a legal base for the programme setting and procedure:** *19* No *67* Yes **Are there exceptions from the normal procedure:** *43* No *44* Yes ; if yes, for which indication(s): *36* Persons with communication problems (e.g. language, deaf) *34* Persons in special conditions (e.g. VIPs, working abroad, acute stress) *12* Other, please specify:
Programme design	**Is the programme principally designed as** *73* Group intervention *1* Single/individual intervention *13* Combined group and single intervention (if yes, specify both parts separately below)
Programme structure	**Programme conducted as** *86* Group intervention *1* only as single/individual intervention *29* also as single/individual intervention
Programme condition	**Is repeated participation possible:** *21* No *66* Yes if yes and additional conditions are required, please describe:
Trainer(s)	**Are there legal regulations for the trainer/course leader's qualification:** *27* No *59* Yes **Specify the profession of trainer(s): …** ; **is additional education required:** *8* No *75* Yes **Is there a standard combination of disciplines in the programme:** *67* **No** *12* **Yes ; If yes, name the combination(s):**
Costs	**Do the participants pay for attending the programme:** *7* No *78* Yes If yes, what are the costs for the participant (€): … If yes, the participants' costs are *32* legally regulated *55* determined by the organisation
Programme	**Are there regulations for successful course completion:** **Legal ones:** *29* No *58* Yes **;** **Intra organisational criteria:** *22* No *51* Yes **Are there criteria for participant exclusion during the programme:** *2* No *83* Yes ; If yes, please indicate: *54* alcohol intoxication; please specify alcohol level: *36* intoxication by drugs; please specify how assessed: *76* missing cooperation *50* Other, please specify: **Is there a certificate of attendance:** *8* No *79* Yes
Scientific background	**What is the scientific background of the programme? Please name briefly:** **What is the primarily approach of the programme:** *47* Predominantly treatment (psychological, therapeutic) *25* Predominantly educational (information) *9* Predominantly individual tailored programme *6* Predominantly uniform tailored programme

Aim(s) of programme

Are there legal regulations on this programme's aim(s): *34* No *50* Yes

Name the major aim(s), maximum 5:

You can also give a literature reference:

Contents of programme

Please name the most important themes dealt with, maximum 5:

Material

Do the participants receive any material: *8* No *79* Yes

Factors for programme success

How important are the aspects below for the programme's success:

	relevance not	less	relevant	most
Information	*0*	*2*	*56*	*29*
Self observation and reflection	*0*	*0*	*10*	*77*
Discussion and confrontation	*0*	*2*	*17*	*68*
Emotional experiencing and involvement	*2*	*1*	*36*	*48*
Emotional verbal/non-verbal expressing	*2*	*15*	*37*	*33*
Open-trustworthy group climate	*1*	*2*	*18*	*66*
Goals setting and commitment to stick to them	*1*	*10*	*35*	*41*
Development of alternative, new behaviour	*1*	*5*	*11*	*70*
Achievement of behavioural goals/self control	*1*	*7*	*29*	*50*
Medical treatment	*44*	*36*	*6*	*1*
Alcohol-Ignition-Interlock	*57*	*16*	*6*	*5*
Alcohol or drug screening	*41*	*17*	*17*	*11*
Other, please specify:	*11*	*0*	*3*	*3*

Evaluation

Has this programme already been evaluated: *24* No *62* Yes

If yes, what kind of evaluation:

35 Content evaluation *55* Participant feedback

39 Process evaluation *41* Outcome evaluation, recidivism study

3 Other, please specify :

Has/have the evaluation/s been published: *29* No *33* Yes;

If yes, name reference(s):

The number of participants, who underwent the programmes, cannot be presented as the providers sometimes only mentioned the total number of participants and did not differentiate by the different programmes.

In the following the information on the programmes will be presented for the following three target groups:

- DUI offenders,
- DUID offenders and
- mixed offender groups (DUI and DUID mixed at regular basis, DUI and DUID and offenders with other traffic offences at regular basis).

7.3.2 Programmes for DUI offenders

All programmes which target at DUI offenders and where alcohol offenders are only mixed in special cases with other offenders are included in this part of programme analysis.

The following table presents country, name of the programme and name of provider applying the single programme. 53 filled in PQ Form B were sent and available for further evaluation.

Table 37: PQ Form B, programmes for DUI offenders

Nr.	Country	Name of programme	Programme provider(s)/ responsible authority/ documenting national organisation
1.	**Austria**	Nachschulung	1A Sicherheit
2.	**Austria**	Driver Improvement	AAAV
3.	**Austria**	Nachschulung im Rahmen des Vormerksystems	AAP GmbH
4.	**Austria**	Nachschulung für alkoholauffällige Lenker	AAP GmbH
5.	**Austria**	'A'-Kurs	Gute Fahrt - Institut für Verkehrskultur
6.	**Austria**	INKA-light/ Integrative Nachschulung für KraftfahrerInnen mit Alkoholauffälligkeit-Kurzversion	INFAR
7.	**Austria**	INKA/ Integrative Nachschulung für KraftfahrerInnen mit Alkoholauffälligkeit	INFAR
8.	**Austria**	VIT-A Verkehrspsychologisch Integratives Trainingsprogramm für alkoholauffällige Lenker	KfV Sicherheit Service GmbH
9.	**Austria**	VIT-A Verkehrspsychologisch Integratives Trainingsprogramm für alkoholauffällige Lenker	Kuratorium für Verkehrssicherheit - Verein
10.	**Austria**	VIT-AV Verkehrspsychologisch Integratives Trainingsprgramm für alkoholauffällige Lenker im Rahmen des Vormerksystems	KfV Sicherheit Service GmbH
11.	**Austria**	VIT-AV Verkehrspsychologisch Integratives Trainingsprgramm für alkoholauffällige Lenker im Rahmen des Vormerksystems	Kuratorium für Verkehrssicherheit- Verein
12.	**Austria**	VIT-AP Verkehrspsychologisch Integratives Trainingsprogramm für alkoholauffällige Lenker in Haft	KfV Sicherheit Service GmbH
13.	**Austria**	Nachschulung für alkoholauffällige LenkerInnen	sicher unterwegs - Verkehrspsychologische Nachschulungen GmbH
14.	**Belgium**	Sensibilisatiecursus voor verkeersovertreders - novice drivers	IBSR
15.	**Belgium**	Sensibilisatiecursus voor verkeersovertreders - repeated offenders	IBSR
16.	**France**	C.E.A (Sensibilisation aux causes et consequences de la Conduite en Etat Alcoolique)	ANPER
17.	**France**	Alternative	Anper
18.	**Germany**	IRaK - Individualpsychologische Rehabilitation alkoholauffälliger Kraftfahrer	AFN
19.	**Germany**	IFT- Kurs zur Wiederherstellung der Kraftfahreignung für alkoholauffällige Kraftfahrer	DEKRA
20.	**Germany**	REAL	Impuls GmbH
21.	**Germany**	CONTROL	Impuls GmbH
22.	**Germany**	K 70	Impuls GmbH

23.	**Germany**	IVT-Hö ®	IVT-Hö®
24.	**Germany**	CAR KURS (Contre l´alcool sur la route)	IVT-Hö®
25.	**Germany**	CAR SEMINBAR (Contre l´alcool sur la route)	IVT-Hö®
26.	**Germany**	KBS (Kurse zur Besserung und Sicherung)	IVT-Hö ®
27.	**Germany**	NAFA Plus	Nord-Kurs GmbH und Co.KG
28.	**Germany**	PLUS 70	PLUSPUNKT GmbH
29.	**Germany**	LEER	SSK TUEV Thueringen Anlagentechnik Gmbh & Co. KG; Nord-Kurs GmbH & Co. KG
30.	**Germany**	LEER	Nord-Kurs GmbH & Co. KG
31.	**Hungary**	Enyhén ittas vezetok programjai	National Transport Authority
32.	**Hungary**	Közepesen ittas vezetok foglalkozásai	National Transport Authority
33.	**Hungary**	A 'súlyosan ittas', vagy 'visszatéro ittas vezetok' foglalkozása	National Transport Authority
34.	**Italy**	Riabilitazione psicologica alla guida/Verkehrspsychologische Nachschulung	Azienda Sanitaria dell'Alto Adige - Settore di Psicologia Viaria/Medicina Legale
35.	**Netherlands**	EMA (Educatieve Maatregel Alcohol)	CBR
36.	**Poland**	Psycho-corrective program for the drivers detained for driving under the influence of alcohol	Centrum Uslug Psychologicznych
37.	**Portugal**	Reabilitação de Condutores Infractores-Crime	Prevenção Rodoviária Portuguesa
38.	**Portugal**	Reabiltação de Condutores Infractores - Contra-Ordenações	Prevenção Rodoviária Portuguesa
39.	**Switzerland**	bfu-FiaZ-Kurs	Vereinigung für Verkehrspsychologie
40.	**United Kindom**	DfT Drink Driver Rehabilitation scheme	dde
41.	**United Kingdom**	Rehabilitation Scheme for Drink Drive Offenders	Devon County Council
42.	**United Kindom**	Drink Drive Rehabilitation Course	DRIVER' S.E.A.T
43.	**United Kindom**	D/D rehabilitation courses	Drivewise(London) Ltd
44.	**United Kindom**	Drink Drive Rehabilitation Scheme	Gloucestershire County Council
45.	**United Kindom**	Drink Driver Rehabilitation Course	Kent Probation Area
46.	**United Kindom**	DDR	LRSP
47.	**United Kindom**	Drink Drive Rehabilitation	NECA
48.	**United Kindom**	Drivers Rehabilitation Course	Ogwr DASH
49.	**United Kindom**	Drink Drive Rehabilitation Scheme	Prism Clearway
50.	**United Kindom**	Drink Drive Rehabilitation Scheme	Reform Road Safety & Education
51.	**United Kingdom**	Drink Drive rehabilitation course	The Albert Centre
52.	**United Kingdom**	Drink Drive Rehabilitation Scheme (alcohol, education, the law & driving)	TTC 2000
53.	**United Kindom**	Drink Drive Rehabilitation Scheme	VMCL

7.3.2.1 Frame conditions of DUI programmes

This chapter deals with the frame conditions of the DUI programmes.
The following table shows the overall results of PQ Form B. For some questions multiple answers were possible. Due to missing data it is possible that in the results the numbers of analysed programmes vary.
For a better comprehensibleness the results (numbers) are always inserted in the respective PQ question in orange colour.

The specification on programme development results in the following answers (see table below).

Table 38: PQ Form B, DUI programmes, results on programme development

Origin	**Was this programme developed within your organisation:** *9* No *44* Yes

In the overwhelming majority the programmes were developed within the organisation (n=44). Nine programmes were developed outside the reporting organisation.

The specification on regulation of participation results in the following answers (see table below).

Table 39: PQ Form B, DUI programmes, results on regulation of participation

Programme access	**Is the participation legally regulated:** *11* No *41* Yes; If yes, please name the law/paragraph(s): **The participation is:** *27* Mandatory *26* Voluntary **If mandatory, who imposes the participation in this programme:** *19* Licensing authority *6* Court *0* Rehabilitation provider *1* Assessment centre *1* Other, please specify: *prosecutor (1)*[26]

In most of the cases participation is legally regulated (n=41), but there are also some programmes (n=11) where participation does not base on legislation. Nearly the same numbers of programmes are voluntary ones or mandatory ones. Participation is most often imposed by the licensing authority; assignment by court is far less often imposed.

The specification on determination of participation in the following answers (see table below).

[26] The text in the tables which is written in cursive letters is copied from the original answers in the questionnaires. If answers were identical, they were summarized and in () the number of nominating providers are presented.

Table 40: PQ Form B, DUI programmes, results on programme access

Programme access	**What determines the participation in this programme:** ***11*** Prior driver assessment ***14*** Recidivism Substance during the offence ***46*** Alcohol; if there is a specific concentration limit, please specify: *>= 1.2 g/L (3)* - *0.1 ‰, 0.5 ‰ – 0.8 ‰ (1)* - *1.2 ‰ on first offence outside license on probation, 0.8 ‰ at second offence within 5 years, more than 0. 1 ‰ on first offence in license on probation period (1)* - *0.5 – 0.79 ‰ (2)* - *1.2 ‰ on first offence outside license on probation, 0.8 ‰ at second offence within 5 years, more than 0.1 ‰ on first offence in license on probation period (1)* - *More than 0.05 mg/l AAK for novice drivers, 0.6 mg/l AAK and more if it is the first time and 0. mg/l AAK and more if it is the second time within a period of five years (1)* - *0.8 g/l et < 1.2 g/l (1)* - *1.6 ‰ (1)* - *1.6 ‰ or repeated DUI (2)* - *0.8 ‰ - 1.6 ‰ (1)* - *1.6 ‰ - 2.8 ‰ (1)* - *2. 0 ‰ --* - *First offence: 1.3 ‰; recidivism: 0.8 ‰, novice drivers: 0.8 ‰ first offence, 0.5 ‰ recidivism (1)* - *0.5 ‰ BAC (1)* - *Equal or more than 1.2 g/l (1)* - *Between 0.8 and 119 g/l* - *The legal limit in the UK is 80 milligrammes of alcohol in 100 millilitres of blood. (1)* - *In charge or driving while unfit through alcohol or over legal limit: 35mcgms/100mls of breath (1)* - *Over the legal limit (1)* - *Driving over and above the legal limit - 35 microgrammes in breath/ 80 millilitres in blood (1)* - *80milligrams per 100 millimetres of blood (1)* - *Over 35 micrograms in 100 ml of breath (1)* - *35 breath, 80 blood (1)* - *80 mg per 100 ml (1)* ***7*** Drug(s), please specify the substance(s): - *Any illegal drug (4)* - *Cannabis, Amphetamines (1)* - ***10*** Other, please specify: - *Traffic offending behaviour (1)* - *Certain traffic offences in the Austrian law ('Vormerksystem) (1)* - *At least one alcohol offence out of two offences in the penalty point system (2)* - *Et sans circonstances aggravantes (1)* - *Homicide (1)* - *Speed and other severe offences (1)* - *Driving/Attempt to drive then failing to provide a specimen of breath for analysis. (1)* - *Client offered course but court if fulfils criteria - client decides to attend or not (1)* - *Offences dr10 dr20 dr30 can be offered the course by the Magistrate (1)* - *Magistrates' referral (1)*

In most of the cases the substance during the offence (BAC level) determines participation in the course. Prior driver assessment and recidivism of the offender are relevant for only each a quarter.

The table provides detailed information on the specific alcohol limits which are associated with determination for course participation. The specification of drugs is connected to those programmes which are also conducted in mixed groups (DUI and DUID offenders) under certain circumstances.

The specification on consequences of participation results in the following answers (see table below).

Table 41: PQ Form B, DUI programmes, results on consequences of participation

Programme access and consequence	**What are the consequences of participation:** *21*… it leads to a reduction of the suspension period *7*… it leads to a reduction/extinction of penalty points *3*… it leads to a reduction of other punishments (e.g. reduced fine) *0*… it leads to a reduction of community service hours *6*… it leads to an avoidance of further criminal prosecution *13*… it leads to an ongoing validity of the license *22* …it is a necessary condition for re-licensing/license reinstatement/re-granting *6*… it leads to improved chances of passing an upcoming driver assessment *9*… it leads to other consequences: please specify:

Completing a course is - on first place – a necessary condition for re-licensing followed by reduction of the suspension period. Another very important consequence is the ongoing validity of the licence.

The specification on subgroups of the DUI target group results in the following answers (see table below).

Table 42: PQ Form B, DUI programmes, results on subgroups of the DUI target group

Target group(s) of programme	***53*** **Alcohol offenders** **Does the programme focus on subgroups of alcohol offenders:** *37* No ***14*** Yes; if yes, please specify: *8* Novice drivers *8* First time offenders *11* Repeated offenders *3* Other, please specify: - *Two times offenders means regarding the penalty point criteria which lead to rehabilitation, alcohol offence must be one of it (2),* - *Punktetäter mit Alkohol (1)*	

The majority of DUI programmes - in total 37 – focus on the entire target group. Only 14 programmes aim at specific subgroups of DUI offenders, mostly on repeated offenders but also to equal parts on novice drivers and first time offenders.

The specification on exclusion criteria results in the following answers (see table below).

Table 43: PQ Form B, DUI programmes, results on exclusion criteria

	Does your organisation exclude certain groups from this programme: ***22*** Addicts ***13*** Drivers with communication problems ***3*** Other, please specify: - *Drive/Attempt to drive/In charge of vehicle while Unfit through drugs only offences. The DfT course is not approved for drugs only driving offenders (1),* - *Must have good command of spoken English (1),* - *If person has drugs only in their system (1),* - *People who are abusive, or refuse to comply with reasonable requests e.g. the requirement to attend sessions 'free of alcohol' (1).*

Addiction is the most frequent exclusion criteria, followed by communication problems.

The specification on setting and procedure of programme results in the following answers (see table below).

Table 44: PQ Form B, DUI programmes, results on programme setting and procedure

Programme setting	**Is there a legal base for the programme setting and procedure:** ***9*** No ***43*** Yes **Are there exceptions from the normal procedure:** ***25*** No ***27*** Yes; if yes, for which indication(s): ***23*** Persons with communication problems (e.g. language, deaf) ***18*** Persons in special conditions (e.g. VIPs, working abroad, acute stress) ***12*** Other, please specify: - *Taxative Liste des VK (2)* - *People with mental disorders (1)* - *Small number of clients, therefore no group course (2)* - *Criteria of the traffic psychological co-ordination committee (5)* - *Sailors (one week programme) (1)* - *When driver is imprisoned (1)* - *Disabled (1)*

Forty-three programmes have got a legal base for programme setting and procedure. Half of the programmes allow exceptions from the normal procedure, mostly due to communication problems, but also due to more serious individual constraints.

7.3.2.2 DUI programmes: content related specification of the programmes

The following chapter deals with relevant content related aspects of the DUI programmes.

The specification on programme design results in the following answers (see table below).

Table 45: PQ Form B, DUI programmes, results on programme design

Programme design	**Is the programme principally designed as** ***46*** Group intervention ***0*** Single/individual intervention ***7*** Combined group and single intervention (if yes, specify both parts separately below)

The DUI programmes for dui offenders are primarily designed as group interventions. Some course models are designed to combine group and single interventions.

The specification on course setting results in the following answers (see table below).

Table 46: PQ Form B, DUI programmes, results on course setting

Programme	***53*** **Group intervention:** **Number of participants:** Min.***3-10*** - Max***. 10-20*** ***0*** Not specified **Total time of intervention:** number of hours ***8-39*** or number of units: ***6-25*** (minutes per unit: ***50-60***) **Total number of sessions/meetings:** ***2-15*** **Time span (days) between:** two sessions: ***2-14 days*** ***8*** Not specified first and last session: Min. ***3-180*** Max. ***4-180*** ***4*** Not defined	***15*** **courses can also be conducted as single interventions:** **Total time of intervention:** number of hours ***5-25*** or number of units: ***2-5*** (minutes per unit: ***50)*** **Total number of sessions/meetings:** ***1-6, and individual*** **Time span (days) between:** two sessions: ***2-7 days, and individual*** ***4*** Not specified first and last session: Min. ***8-22*** Max. ***40-44*** ***4*** Not defined
	In case of combined intervention: **How are the group and single interventions ordered in time:** - *Single intervention after group intervention (1)* - *Three hours single setting, 36 h group setting (1)* - *Three hours single setting, 24 h group setting (1)* - *Due individual indication (2)* - *Before group is one hour single intervention (1)*	

The course conduction setting shows a rather broad variation between the individual programmes regarding the number of participants, the intervention time, number of sessions and duration of settings and total intervention. These variations do not only refer to the group but also to the single settings.

The specification on repeated participation results in the following answers (see table below).

Table 47: PQ Form B, DUI programmes, results on repeated participation

Programme condition	**Is repeated participation possible:** ***13*** No ***40*** Yes; if yes and additional conditions are required, please describe: - *Six sessions (not five, as normal) (1)* - *One additional session (5)* - *If repeated within 5 years, there has to be one more unit (50 minutes) (4)* - *After negative assessment (2)* - *Frühestens nach 5 Jahren (2)* - *If the participation in a preceding intervention of the same kind lead to exclusion (1).* - *Bei Kursausschluss (und erneuter Einverständnis der zuständigen Verwaltungsbehörde) während der Maßnahme ist eine Wiederholung der vollständigen Maßnahme möglich, nach erneuter Auffälligkeit und erneuter gutachterlichen Empfehlung ist eine erneute Teilnahme möglich (1)* - *If there is a actually valid recommenation documented in a Medical-Psychological expertise (Medizinisch-Psychologisches Gutachten) (1)* - *The person has to pay the fee for the repeated participation (3)* - *Additional course fee must be paid (1)* - *If they reoffend and are referred again by the courts (1)* - *Another offence another course (1)* - *The decision on whether or not an offender is referred to the Scheme for a second time is made by the Court. We are not advised of the factors they use (1)*

Forty programmes offer the opportunity for repeated participation. There exists a variety of different circumstances for repeated participation.

The specification on trainers' qualification results in the following answers (see table below).

Table 48: PQ Form B, DUI programmes, results on trainers' qualification

Trainer(s)	**Are there legal regulations for the trainer/course leader's qualification:** *21* No *31* Yes **Specify the profession of trainer(s):** - *Traffic psychology (2)* - *Psychologist (32)* - *Criminologist (2)* - *Social worker (3)* - *One psychologist et one BAFM (2)* - *Psychotherapeuten (3)* - *Suchttherapeuten (2)* - *Pedagogs (1)* - *Prison wardens (1)* - *Clinical Psychologist (2)* - *1. qualified as a probation officer with a Masters in social work. 2. Masters in social work, qualified psychotherapist. Manager developing drug and alcohol services 3. Background working for the probation service, running community service projects, Youth intervention services. 4. BA (hons) Social sciences/CQSW/(social work) and works as a drug and alcohol counsellor. 5. A.D.I. (Approved Driving Instructor), Qualified counsellor specialising in road related trauma plus two diplomas in tuition and many other teaching and driving qualifications.* - *Health/social care workers in substance misuse services and in adult education staff* - *Varies (2)* - *Probation staff/ Police (1)* - *Training Officer (1)* - *Drug and alcohol workers (1)* - *Generally from GROUP counselling background, and then internally trained to apply skills to this work (1)* - *Lecturers, facilitators, freelance trainers (1)* **is additional education required:** *7* No *42* Yes **Is there a standard combination of disciplines in the programme:** *44* **No** *5* **Yes; If yes, name the combination(s):** - *Psychology-uni, FS B, 1600h work experience, 160h therapeutic intervention tactics, 20h course model, 2 course co-trainer, 2 course supervision (1)* - *Coaching, counselling and therapy (2)* - *DfT minium requirements (1)* - *Law, health, victims (1)*

More than half of the programmes have got legal regulations on trainers' and course leaders' qualification. The overwhelming majority are psychologists, further training has to be carried out.

The specification on costs of participation results in the following answers (see table below).

Table 49: PQ Form B, DUI programmes, results on costs for participation

Costs	**Do the participants pay for attending the programme:** *5* No *46* Yes If yes, what are the costs for the participant (€): *117 - 1.700* If yes, the participants' costs are *22* legally regulated *32* determined by the organisation

With a few exceptions the participants have to pay for course participation. The costs vary from EUR 117 to 1.700, depending on programme type and duration of intervention. In many cases costs are legally regulated, but more often costs are determined by the organisation.

The specification on course completion results in the following answers (see table below).

Table 50: PQ Form B, DUI programmes, results on course completion

Programme completion	**Are there regulations for successful course completion:** **Legal ones:** *16* No *37* Yes**;** **Intra organisational criteria:** *12* No *30* Yes **Are there criteria for participant exclusion during the programme:** *2* No *50* Yes; If yes, please indicate: *40* Alcohol intoxication; please specify alcohol level: *28* Intoxication by drugs; please specify how assessed: *49* Missing cooperation *30* Other, please specify: - *No payment (5)* - *Aggressive behaviour, absence for one session without make up, absence for two sessions, coming late, not paying the course fee (4)* - *Retard, non paiement du cout du stage (1)* - *Retard, absences (10)* - *Unzuverlässigkeit, Aggression, Unfähigkeit (3)* - *Zuspätkommen, Unzuverlässigkeit, Hausaufgaben unzureichend (2)* - *Abusive behaviour, or fraudulent participant (1)* - *Failiure to attend for the required hours (1)* - *Threats or violence, intimidation, discrimination & prejudice (1)* - *Course fee payment must be completed in full in advance as requested. All sessions must be attended, punctually. All participants must attend in a sober condition and not consume alcohol whilst the course is in session, including at all break times. All participants must contribute constructively and participate to the best of their ability. Participants must adhere to the reasonable requirements of the course organiser e.g. abide by agreed ground rules and complete questionnaires and drinks diaries as requested. (1)*

The clear majority of programmes have got regulations concerning successful course completion. Most often these regulations are based on intra-institutional criteria.
Nearly all programmes have got criteria for the exclusion of participants during the programme under defined circumstances. These are first of all lack of cooperation, intoxication by alcohol or drugs.

The specification on certificates of attendance results in the following answers (see table below).

Table 51: PQ Form B, DUI programmes, results on certificate of attendance

Programme completion	**Is there a certificate of attendance:** *5* No *48* Yes

With a few exceptions course participation is confirmed by a certificate of attendance.

The specification on scientific background of programmes results in the following answers (see table below).

Table 52: PQ Form B, DUI programmes, results on scientific background of programmes

Scientific background	**What is the scientific background of the programme? Please name briefly:** - *FSG (Führerscheingesetz) (1)* - *Cognitive behavioural therapy (1)* - *Handbuch über das Kursmodell der AAP GmbH, vorgelgt beim BMVIT, Handbook of the course guidelines, approved by the ministry of traffic (2)* - *Behaviour science (2)* - *Ecclectical approach: parts of 'Gestalt'-Therapy, psychodrama, behaviour-therapy,, (group-dynamics) (2)* - *Multimodal approach (group dymanics, behavioural therapy, client centered therapy, psychodrama) (5)* - *Behaviour therapy and systemic therapy (1)* - *Interiorisation des comportements (1)* - *Theory of individual psychology (1)* - *Behaviour Therapy, RET, Constructionist Therapy (1)* - *Rational-Emotive-Behavior-Therapie (REVT) (3)* - *Individualpsychologie Alfred Adlers und eigene Forschungen (4)* - *Behavioural / cognitive approach of psychotherapy, schema-theory, individual psychological approach (1)* - *Das Programm bedient sich psychologischer Methoden, die angelehnt sind an Konzepte der Verhaltenstherapie und der Lösungsorientierten Kurzzeittherapie. Die Anforderungen an die KursleiterInnen basieren auf Kenntnisse und Umsetzung des Veränderungsmodells (Prohaska&DiClemente), der motivierenden Gesprächsführung und gruppendynamischen Apekten. Das Modell stellt eine unterstützende und klärende Kurzintervention dar, die sich auf eine Vorauswahl (an den Begutachtungsstellen) stützen kann. (1)* - *Group dynamics (3)* - *Psycholgy of learning, theoretical approach of Psychotherapie by Grawe (1994, 1998), Schema-Theorie, (1)* - *Legal and health knowledge conveyance, as well as grouped topic focused discussion, psychological-behaviour therapy elements (3).* - *Scientific Evaluation of Driver Rehabilitation/Driver Improvement Programmes (1)* - *ASE model (attitudes, social influence, own effectiveness), based on the Theory of planned behaviour (Fishbein & Ajzen) (1)* - *Learning psychology (1)* - *The minimum educational requirements are set by the Department for Transport. Our course is developed around this framework. We use Cognitive Behavioural Theory offence analysis with a variety of teaching and presentation methods to create a constructive learning environment and challenge offending behaviours. (1)* - *Evidence based backed by literature and internationally made adverts and training videos* - *DfT gave guidance of content - TRL research validated effectiveness 1999 (1)* - *Elements have a scientific background. The programme is designed to increase the knowledge and understanding of alcohol, driving issues predetermination of human behaviour that leads to offending.* - *Cognitive behavioural (1)* - *Alcohol & driving (1)* - *Designed by PhD, Social Psychology. Takes a group education and counselling approach (1)* - *Six year Government experiment, with monitoring of re-offence rates. (1)* **What is the primarily approach of the programme:** ***26*** Predominantly treatment (psychological, therapeutic) ***17*** Predominantly educational (information) ***5*** Predominantly individual tailored programme ***5*** Predominantly uniform programme tailored

Almost half of the programmes have got a predominantly treatment approach (psychological/therapeutic approach). A predominantly education concept is less often given, but some of the programmes combine both approaches.
In chapter 7.4 there is a content related structuring of the nominations on scientific background of all the programmes (DUI, DUID and mixed offenders).

The specification on programmes' aims results in the following answers (see table below).

Table 53: PQ Form B, DUI programmes, results on programmes' aims

Aim(s) of programme	**Are there legal regulations on this programme's aim(s):** ***20*** No ***30*** Yes **Name the major aim(s), maximum 5: please see below** **You can also give a literature reference:**

30 programmes have got legal regulations on their aims, 20 DR measures do not.

The specification on detailed programmes' aims results in the following answers (see table below).

Table 54: PQ Form B, DUI programmes, results on programmes' aims in detail

Name the major aim(s), maximum 5: - *Information, attitude change, separating from alcohol and driving (1)* - *Enhancing self-control, filling up information deficits, attitude changes, change of drinking habits (2)* - *Discussion of causes for the offence, parts of programs for alcohol offenders and offenders with other traffic offences (but drugs), therefore: development of behaviour strategies to avoid driving under influence of alcohol, show motives and problems of misuse, show possible dangers in traffic because of misuse* - *Development of behaviour strategies to avoid driving under influence of alcohol, show motives and problems of misuse, show possible dangers in traffic because of misuse, try out and stabilise rudimentally individual solving solutions for further traffic participation without similar offences* - *Development of a co-operative relationship, getting aware of the contributing factors/reasons for the offence, establishment and strengthen of change motivation, establishment and enhancement of realistic change behaviour and strategy, realistic assessment of impairments and changes under the influence of alcohol (1)* - *Development of a co-operative relationship, getting aware of the contributing factors/reasons for the offences, establishment and strengthen of change motivation, sensibilisation on the impairments in traffic due to alcohol, concretize behaviour to prevent further offences (1)* - *Development of a co-operative relationship, getting aware of the contributing factors/reasons for the offence, establishment and strengthen of change motivation, establishment and enhancement of realistic change behaviour and strategy, realistic assessment of impairments and changes under the influence of alcohol (4)* - *The major aims are the separation between drinking and driving and the development of alternative and new behaviour (1)* - *Knowing all the consequences of DWI(safety, juridical, assurance,...), reflection on drinking behaviour (2),* - *No recidivism (6)* - *Life-long Abstinence from Alcohol (1)* - *Control of Drinking Behaviour (1)* - *Moderate Drinking, Driving without Intoxication (1)* - *Realitätsangemessenes Selbstmanagement des Lebens und des Fahrens (1)* - *Realitätsangemessenes Selbstmanagement des Lebens und des Fahrens, Punkteabbau, Sicherung der Fahrerlaubnis (1)* - *Vermeidung eines Führerscheinentzugs oder Verkürzung der Sperrfrist bei Gericht (1)* - *§ 36, Abs. 4 FeV: 'Wissenslücken der Kursteilnehmer über die Wirkung des Alkohols und anderer berauschender Mittel auf die Verkehrsteilnehmer sollen geschlossen und individuell*

angepaßte Verhaltensweisen entwickelt und erprobt werden, um insbesondere Trinkgewohnheiten zu ändern sowie Trinken und Fahren künftig zuverlässig zu trennen. Durch die Entwicklung geeigneter Verhaltensmuster sollen die Kursteilnehmer in die Lage versetzt werden, einen Rückfall und weitere Verkehrszuwiderhandlungen unter Alkoholeinfluß oder dem Einfluß anderer berauschender Mittel zu vermeiden. Zusätzlich ist auf die Problematik der wiederholten Verkehrszuwiderhandlungen einzugehen' (1)

- *Die Maßnahme muss geeignet sein, die die Gruppe der alkoholauffälligen Kraftfahrer. Die Geeignetheit muss im Programm u.a. über die Zielsetzung nachvollziehbar sein: Es gibt 6 Zielsetzungen. - Teilnehmer sollen den Zusammenhang zwischen hohem Alkoholkonsum und hohem Risiko einer alkoholisierten Verkehrsteilnahme erkennen und ihre Vorsatzplanung in Bezug auf ihren Alkoholumgang allgemein und in Bezug auf die Straßenverkehrsteilnahme daran ausrichten. - TN sollen Zusammenhänge zwischen zugrundeliegenden Bedürfnissen und ihrem Trinkverhalten erkennen und alternative Bedürfnisbefriedigungsstrategien entwickeln. - Den TN sollen vielfältige Gelegenheiten geboten werden, neue Wahrnehmungsstrukturen auszubilden und bereits ausgebildete Schemata zu verändern. - TN sollen durch das systematische Erarbeiten von Problemlösestrategien eine Handlungsanleitung für zukünftige Problemsituationen erhalten und diese auch für andere Lebensbereiche nutzen können. - TN sollen konkrete Vorsatzbildung zur Vermeidung von neuerlicher alkoholisierter Verkehrsteilnahme erarbeiten und stabilisieren. (1)*
- *Excessive drinking, drinking motives, avoiding relapses (1)*
- *Targeted partial modification. Programme can be determined for the obliged together with programmes I (knowledge of traffic rules), II (practice of driving) or III (traffic psychology) as an addition to them. (1)*
- *Aim is the change of false theme, increase of self-knowledge, with self-control methods (negation, aversion - avoidance) (1)*
- *Exploration and confrontation of the personality attributes motivating the faulty behaviour with the use of group dynamics, scaling of the opportunity for a change. (1)*
- *Increasing road safety (1)*
- *Change of attitudes and behaviours in the relation between alcohol and driving the vehicle, 2. creating the ability to form one's relation towards other road users 3. learning to respect other drivers, 4. learning to be able to refuse drinking alcohol before driving the vehicle (1)*
- *To distinct between drinking and driving (1)*
- *Education to prevent re-offending. To contribute to a reduction in drink-drive incidents. To promote a personal limit of zero when driving. Increase knowledge of alcohol and its effects on the body and driving. To plan for future safe and legal driving. (1)*
- *To help reduce the rate of re-offending among drivers who have attended these courses,to enable individuals the make informed choices,, reduce the length of their original ban, the content should have a minimum set standard approved by the Department of Transport (Secretary of State)*
- *Information about alcohol and its effects on the body, including concepts oftolerance and dependence, physical effects, disease, sensible drinking etc.(ii) Effects of alcohol consumption on performance:• Driving ability and behaviour, the legal limit, what it means.• The intoximeter. Penalties for drinking and driving. The High Risk Offender.• Effects of drink-driving on work, family, friends, victims, insurance, health.(iii) Analysis of offender's behaviour:(iv) Alternatives to drinking/driving(v) (1) Future action and sources of help. (1)*
- *Reduce re-offending, raise awareness to the effects of alcohol on the body, raise awareness of the drink drive law and general road safety (1)*
- *To reduce the risk of further drink driving (1)*
- *To reduce DUI, to improve road safety (1)*
- *Cognitive Behavioural and Educational (1)*
- *Educating and changing attitudes of offenders, to reduce reoffending, reducing road casualties, and improving road safety (1)*
- *To maximise the numbers of clients attending and appropriately completing courses in order to achieve the full potential of the course.2) To ensure that a) the course is relevant and accurate and b) teaching is at an expert level using appropriate styles to maximise learning.3) To comply with the DfT guide and the Road Traffic Act 1988 (as amended) and Albert Centre Policies to retain course provider status.4) To ensure that courses are financially viable to ensure continuance of provision. (1)*
- *Improve education, change attitudes, reduce reconviction rates (1)*
- *Reduce re-offend rate, educate drivers about the dangers of alcohol, make the roads safer, reduce road deaths and serious injuries (1)*
- *Education to prevent re-offending. To contribute to a reduction in drink-drive (1)*

A broad variety of specific course aims are documented. They are focussing on major relevant aspects for attitudinal and behavioural change of the problem behaviour or to avoid further drink

driving offences. In chapter 7.4 there is content related structuring of the nominations on programmes' aims for all the programmes (DUI, DUID and mixed offenders).

The specification on important themes results in the following answers (see table below).

Table 55: PQ Form B, DUI programmes, results on most important themes dealt with

Contents of programme	Please name the most important themes dealt with, maximum 5:
	- **The most important themes dealt with:** - *Residual alcohol, effect from alcohol/drugs, law, acquaintance with alcohol (1)* - *Reasons for drunken driving, prevention, alcohol, abuse, self control (1)* - *See FSG-NV §2 (2)* - *Enhancing self-control, filling up information deficits, attitude changes, change of drinking habits (2)* - *Significance of alcohol and what can legally substitute it, feelings of (lacking) competence and its improvement, influence of alcohol on driving behaviour, communication problems (2)* - *Influence of alcohol on driving behaviour, reasons for alcohol consumption, alcohol consumption pattern, changes of drinking behaviour, consequences of drink-driving (2)* - *Influence of alcohol on driving behaviour, reasons for alcohol consumption, future plans regarding drinking and driving (2)* - *Influence of alcohol on driving behaviour, reasons for alcohol consumption, alcohol consumption pattern, changes of drinking behaviour, strategies to prevent future drink-driving offences (1)* - *Social responsibility, self control, self reflection referring to drinking behaviour, learned behaviour and how to unlearn it (1)* - *Product information, legal consequences, effects of alcohol on driving, drinking patterns and difference between alcohol consumption and alcohol abuse, Promille (2)* - *Prise de conscience, tour de table, information, sensibilisation, exercices pratiques (1)* - *Le regle dans une société, le risque routier, l'alcool, les differences sunbstances psychoactives (1)* - *Unconscious determination of alcohol abuse, conclusions for future behaviour, background information on alcohol and driving (1)* - *Personal motivations of drinking alcohol, personal resources to change it, reflections in the group, theoretical knowledge of human behaviour and practical exercises, knowledge about alcohol and about legal consequences (1)* - *Analysis of Activating Events, Irrational Belief-Systems, Emotional and Behavioural Reactions (3) Cognitive Restructuring (2)* - *Aufarbeitung innerseelischer Hintergründe der Problematik, ihrer Psychogenese, Psychodynamik und Teleologie, Ableitung und Einübung entspr. Zukunftskonzepte (2)* - *Aufarbeitung sozialer und innerseelischer Hintergründe der Problematik und Ableitung einer Zukunftsplanung (2)* - *Improve self-control, Change of personal attitudes and behaviour concerning the consumption of alcohol, to diisociate drinkind & driving, to live abstinent of illegal drugs, to avoid relapse / recidivism. (1)* - *Alkoholkonsum, Alkoholmissbrauch und Fahren unter Alkoholeinfluss // Erarbeitung der ursächlichen Bedindungen für Alkoholmissbrauch und Fahren unter Alkoholeinfluss // Trinkmotive und Gewohnheitsbildung // Problemanalyse // Verhaltensveränderungen // Persönliche Entscheidungsfindung und Vorsatzbildung // Rückfallrisiko und Rückfallvorsorge (1)* - *Excessive drinking, drinking motives, avoiding relapses (1)* - *Improve self-control, Change of personal attitudes and behaviour concerning the consumption of alcohol, to disociate drinking & driving (1)* - *Giving information to the driver about the effects of alcohol, how can he/she calculate whether the alcohol he/she drank has left his/her body, increasing his/her responsibility, helping him/her to be able to separate drinking and driving (1).* - *Increasing his/her responsibility, helping him/her to be able to separate drinking and driving, helping him/her to modify his/her behaviour, and to comply with the traffic rules (1).*

- *Increasing his/her responsibility, helping him/her to be able to separate drinking and driving, helping him/her to modify his/her behaviour, and to comply with the traffic rules. Explorative dynamically orientated therapy (definition of focus: 1. at the level of inclination, 2. at the level of prevention mechanism), analytically orientated group therapy (influence of personality's structure). (1)*
- *Elaboration and planning of behavioral strategies for the future to avoid further alcohol offences 2. Effects of alcohol and the consequences while driving 3. Analysis of offences 4. Individual drinking motives (1)*
- *Increase of knowledge, influencing the positive and negative outcome expectations, increasing personal effectiviness, discussing habitual behaviour (1)*
- *Auto diagnosis elements: peception of one's own person and other drivers, controling emotion and risky behaviours. 2. Analysis model of the driver's behaviour in the road traffic. 3. Basic information on driving the car having consumed the alcohol (legal responsibility, accident's statistics, alcohol's influence on driver's behaviour, miths on alcohol, etc.). 4. learning the abilities to to control behaviours related to alcohol drinking and driving vehicles (1)*
- *Alcohol, offence context, relations, work, risk taking behaviours (1)*
- *Risk taking behaviours, relations, alcohol, speed, law (1)*
- *Alkohol und Verkehrssicherheit, Bestandesaufnahme des Trinkverhaltens, aktueller Alkoholkonsum, Bedeutung und Folgen des Alkoholkonsums, Umgang mit kritischen Situationen (1)*
- *Measurment of alcohol in hours (1)*
- **To increase knowledge of alcohol and its effects on the body and driving * To explore attitudes to drinking and driving * To analyse individual offences * To plan for future safe and legal driving*
- *Measurement of units of alcohol in different drinks, One drink can increase the risk of accidents (1). Consequence of drink drive ban, High risk offenders. Planning in advance of a drinking session not to drink and drive and the morning after (1)*
- *Knowledge of alcohol absorption and elimination times effect of alcohol on driving ability and the brain what constitutes sensible drinking behaviour (1)*
- *Human behaviour and the perception of danger. (ii) Identifying victims and the real cost of drinking and driving. (iii) Behavioural analysis. (iv) Alcohol and the body. (v) Drinking and driving from a law perspective (1).*
- *Facts about alcohol, alcohol and units, length of time in the body, alcohol and the body & brain, media surrounding drink drive (1)*
- *Planning, decision, consequences, victims (1)*
- *Exploring attitudes and values, raise awareness of alcohol consumption and effects of alcohol on the body. (1)*
- *Legal limits, how to count units, how long alcohol stays in body, affects on health and society.*
- *Decision making (1)*
- *Knowing what a unit is,, knowing how long it takes for the body to absorb and eliminate a unit of alcohol, changing attitudes towards drinking, driving, and drink-driving discovering own vulnerabilities and triggers to drinking and driving, planning (and challenging each other's plans) for future likely scenarios and events which might trigger an offence.(1)*
- *1, Information about alcohol and its effects on the body, concepts of tolerance and dependance, physical effects, disease, sensible drinking. 2, Effects of alcohol consumption on performance, driving ability and behaviour, the legal limit, penalties for drink driving, high risk offender, effects on work, family, friends, victims, insurance, health. 3, Analysis of offender's behaviour. 4, Alternatives to drink driving. 5, Future education and sources of help. (1)*
- *Reduction reconviction rates (1)*
- *Alcohol units and decay rates, impact of alcohol on driving ability, impact of alcohol on vision, judgement and reflexes, analysis of personal drinking habits, social aspects of alcohol abuse. (1)*

In chapter 7.4 there is content related structuring of the nominations on important themes of the programmes for all measures (DUI, DUID and mixed offenders).

The specification on materials for participants' results in the following answers (see table below).

Table 56: PQ Form B, DUI programmes, results on materials for participants

Material	**Do the participants receive any material:** *7* No *47* Yes

In most of the courses the participants receive materials (n=47). Seven out of 53 rehabilitation measures do not provide any material.

The specification on programme evaluation results in the following answers (see table below).

Table 57: PQ Form B, DUI programmes, results on evaluation

Evaluation	**Has this programme already been evaluated:** *13* No *40* Yes If yes, what kind of evaluation: *25* Content evaluation *35* Participant feedback *28* Process evaluation *28* Outcome evaluation, recidivism study *0* Other, please specify: **Has/have the evaluation/s been published:** *16* No *24* Yes; if yes, name reference(s):

40 providers report that the programme has already been evaluated. Most of all participant feedback was conducted, then outcome and process evaluation, and at third place there is content evaluation. Many providers stated references of the publication of the evaluation study. 13 programmes have not been evaluated until now.

The number of participants which underwent the measure in 2006 is not reported as there were incongruencies of reporting of this number. The data were not valuable.

7.3.2.3 DUI programmes: estimated factors of course success

The providers estimated the importance of pre given categories for the course success for each programme: if the defined dimension was of relevance for the course conduction or not. The scale is graded by four steps: not relevant, less relevant, relevant, and most relevant.

The specification on estimated factors of course' success results in the following answers (see table below).

Table 58: PQ Form B, DUI programmes, results on estimation on factors of course' success

Factors for programme success	How important are the aspects below for the programme's success:	relevance			
		not	less	relevant	most
	Information	0	2	31	20
	Self observation and reflection	0	0	9	44
	Discussion and confrontation	0	1	14	38
	Emotional experiencing and involvement	1	1	23	28
	Emotional verbal/non-verbal expressing	2	10	22	19
	Open-trustworthy group climate	1	2	9	41
	Goals setting and commitment to stick to them	1	8	23	21
	Development of alternative, new behaviour	1	2	8	42
	Achievement of behavioural goals/self control	1	4	21	27
	Medical treatment	29	21	3	0
	Alcohol-Ignition-Interlock	36	9	5	2
	Alcohol or drug screening	29	12	8	3
	Other, please specify:	8	0	1	1
	- *Highlighting issues for young and much older drivers (with high tolerance level), woman and alcohol (1)* - *Promoting sense of responsibility for self and action (1)*				

Self observation and reflection, the development of alternative, new behaviour, an open and trustworthy climate as well as discussion and confrontation are considered of highest relevance. Emotional experiencing and involvement, goals setting, commitment to stick to goals, achievement of goals and self control are also seen as very important contributing factors to course success.

Furthermore as relevant factors considered are information, emotional verbalisation and expressing. Alcohol and drug screening but also medical treatment as well as alcohol ignition interlock are not considered to be important for the programmes' success.

7.3.3 Programmes for DUID offenders

All programmes which target at DUID offenders and where drug offenders are only mixed in exceptional cases with other offenders are included in this part of programme analysis. 21 programmes were submitted.

Table 59: PQ Form B, programmes for DUID offenders

Nr.	Country	Name of programme	Provider(s) applying the programme
1.	**Austria**	Nachschulung	1A Sicherheit
2.	**Austria**	Driver Improvement	AAAV
3.	**Austria**	Nachschulungen bei sonstiger Problematik	AAP
4.	**Austria**	'S'-Kurs	Gute Fahrt
5.	**Austria**	Drofa/Programm für Drogen-Fahrauffällige	INFAR
6.	**Austria**	VIT-S Verkehrspsychologisch Integratives Trainingsprogramm für Lenker mit sonstiger Problematik (insbesondere drogenbeeinträchtigte Lenker)	KfV Sicherheit und Service GmbH
7.	**Austria**	VIT-S Verkehrspsychologisch Integratives Trainingsprogramm für Lenker mit sonstiger Problematik (insbesondere drogenbeeinträchtigte Lenker)	Kuratorium für Verkehrssicherheit - Verein

8.	**Austria**	Nachschulung für drogenauffällige LenkerInnen	Sicher unterwegs
9.	**Belgium**	Sensibilisatiecursus voor verkeersovertreders	IBSR
10.	**Germany**	DRUGS - Drogen und Gefahren im Straßenverkehr	AFN
11.	**Germany**	CLEAN	Impuls GmbH
12.	**Germany**	DRUG STOP plus	Impuls GmbH
13.	**Germany**	DRUG STOP	Impuls GmbH
14.	**Germany**	IVT-Hö ®	IVT-Hö ®
15.	**Germany**	CAR SEMINAR (Contre l´alkool sur la route)	IVT-Hö ®
16.	**Germany**	IRIS KURS (Illegale Rauschmittel im Straßenverkehr)	IVT-Hö ®
17.	**Germany**	KBS (Kurse zur Besserung und Sicherung)	IVT-Hö ®
18.	**Germany**	Speed 02	SSK TÜV Thüringen
19.	**Germany**	Speed 02	Nord-Kurs, SSK TÜV Thüringen
20.	**Germany**	NAFA Plus	Nord-Kurs
21.	**Portugal**	Reabiltação de Condutores Infractores - Contra-Ordenações	Prevenção Rodoviária Portuguesa

In total 21 programmes for DUID offenders were announced by providers, but only in 4 countries - above all in Germany and Austria - several programmes are conducted.

7.3.3.1 Frame conditions of DUID programmes

This chapter focuses on the frame conditions of the DUID programmes.
The following table shows the overall results of PQ Form B for all questions. For some questions multiple answers were possible. Due to missing data it is possible that in the results the numbers of analysed programmes vary.
For a better comprehensibleness the results (numbers) are always inserted in the respective PQ question in blue colour.

The specification on programme development results in the following answers (see table below).

Table 60: PQ Form B, DUID programmes, results on programme development

Origin	**Was this programme developed within your organisation:**	***4*** No ***17*** Yes

The overwhelming majority of the programmes were developed within the provider organisation themselves.

The specification on regulation of participation results in the following answers (see table below).

Table 61: PQ Form B, DUID programmes, results on regulation of participation

	Is the participation legally regulated: ***6*** No ***15*** Yes; If yes, please name the law/paragraph(s): **The participation is:** ***13*** Mandatory ***8*** Voluntary **If mandatory, who imposes the participation in this programme:** ***11*** Licensing authority ***0*** Court ***0*** Rehabilitation provider ***0*** Assessment centre ***1*** Other, please specify: prosecutor

In most of the cases participation is legally regulated (n=15), but there are also some programmes (n=6) where participation does not base on legislation. To a greater extent these programmes are mandatory (n=13) compared to 8 voluntary ones.
The nominations of the licensing authority as imposing authority are connected to the number of mandatory measures.

The specification on determination of participation results in the following answers (see table below).

Table 62: PQ Form B, DUID programmes, results on programme access

Programme access and consequence	**What determines the participation in this programme:** ***6*** Prior driver assessment ***6*** Recidivism substance during the offence - Alcohol; if there is a specific concentration limit, please specify: ***21*** Drug(s), please specify the substance(s): - *Any illegal drug (5)* - *Cannabis, opioids, cocaine, hallucinogens, designer drugs (ecstasy, amphetamines, ketamines, substitution medication (2)* - *Cannabis, Amphetamines (4)* - *Cannabis, Amphetamines, Cocaine, Hallucinogens etc.(1)* - *All kinds of Drugs, when in combination with DUI* - *Cannabis (1)* - *Mainly Cannabis (1)* ***2*** Other, please specify: - *Traffic offending behaviour (1)* - *Certain traffic offences in the Austrian law (1)* - *Speed and other severe offences (1)*

Above all drugs during the offence (above all cannabis) determines participation. Driver assessment or recidivism is less important.

The specification on consequences of participation results in the following answers (see table below).

Table 63: PQ Form B, DUID programmes, results on consequences of participation

	What are the consequences of participation: ***4***… it leads to a reduction of the suspension period ***2***….it leads to a reduction/extinction of penalty points ***2***… it leads to a reduction of other punishments (e.g. reduced fine) ***0***… it leads to a reduction of community service hours ***4***… it leads to an avoidance of further criminal prosecution ***6***… it leads to an ongoing validity of the license ***15***… it is a necessary condition for re-licensing/license reinstatement/re-granting ***4***… it leads to improved chances of passing an upcoming driver assessment ***3***… it leads to other consequences: please specify: - *Improved self-knowledge and coping strategies for (difficult) life events (1)* - *Bessere Lebensbewältigung (1)*

In most of the cases participation in the rehabilitation course is a necessary condition for re-licensing (n=15). In six programmes it is a necessary condition for an ongoing validity of the licence. But it can also lead to a reduction of the suspension period, improved chances of passing an upcoming driver assessment or to avoid other criminal prosecution.

The specification on subgroups of the DUID target group results in the following answers (see table below).

Table 64: PQ Form B, DUID programmes, results on subgroups of the DUID target groups

Target group(s) of programme		***21*** **Drug offenders** **Does the programme focus on specific subgroups of (illicit) drug offenders:** ***12*** No ***7*** Yes; if yes, please specify: ***4*** Novice drivers ***2*** First time offenders ***4*** Repeated offenders ***4*** Other, please specify: - *Punktetäter mit Drogen (1)* - *Consumers of mainly cannabis (1)* - *Addicts only when in substitution therapy (2)*

Most of the programmes focus on the entire DUID offender group, but several programmes are also defined for special subgroups; these are novice drivers, first time offenders, repeated offenders and offenders in the demerit point system.
Two programmes include addicts but only if they are in substitution treatment.

The specification on exclusion criteria results in the following answers (see table below).

Table 65: DRUID PQ Form B, DUID programmes, results on exclusion criteria

	Does your organisation exclude certain groups from this programme: ***14*** Addicts ***10*** Drivers with communication problems ***0*** Other, please specify:

Exclusion criteria from course participation are above all addiction and communication problems.

The specification on programme setting and procedure results in the following answers (see table below).

Table 66: PQ Form B, DUID programmes, results on programme setting and procedure

Programme setting	**Is there a legal base for the programme setting and procedure:** ***5*** No ***16*** Yes **Are there exceptions from the normal procedure:** ***7*** No ***14*** Yes; if yes, for which indication(s): ***11*** Persons with communication problems (e.g. language, deaf) ***12*** Persons in special conditions (e.g. VIPs, working abroad, acute stress) ***5*** Other, please specify: - *Taxative Liste des VK (1)* - *People with mental disorders (1)* - *Small number of clients, therefore no group course (1)* - *Criteria of the traffic psychological co-ordination committee (2)*

With only with a few exceptions DR programmes for DUID offenders have got a legal base concerning programme setting and procedure. But in many cases exceptions from the normal procedure can be conducted. Most of all this is possible for persons with communication problems or for persons in special conditions. Further exceptions from normal procedure concern people with mental disorders.

7.3.3.2 DUID programmes: content related specification of the programmes

The following part deals with relevant content related aspects of DUID programmes.

The specification on programme design results in the following answers (see table below).

Table 67: PQ Form B, DUID programmes, results on programme design

Programme design	**Is the programme principally designed as** ***16*** Group intervention ***1*** Single/individual intervention ***4*** Combined group and single intervention (if yes, specify both parts separately below)

The programmes are primarily designed as group interventions. One programme is designed as individual interventions. There are four course models where group and single interventions are combined within one rehabilitation measure.

The specification on course setting results in the following answers (see table below).

Table 68: PQ Form B, DUID programmes, results on course setting

Programme structure	***20*** **Group intervention:** **Number of participants:** Min. up to ***6*** Max.***8-12*** ***0*** Not specified **Total time of intervention:** number of hours ***12-32*** or number of units: ***6- 18*** (minutes per unit: ***50***) **Total number of sessions/meetings:** ***2-8*** **Time span (days) between:** two sessions: ***2- 28 days*** ***5*** Not specified first and last session: Min. ***10-196*** Max. ***10-196*** ***2*** Not defined	***1*** **Single intervention, and *9* courses can also be conducted as single interventions:** **Total time of intervention:** number of hours ***5-25*** or number of units: ***2-6*** (minutes per unit: ***50***) **Total number of sessions/meetings:** ***1- 10*** (and more) **Time span (days) between:** two sessions: ***2-6, also individual*** ***1*** Not specified first and last session: Min.***8-22*** Max.***40-44*** ***2*** Not defined
	In case of combined intervention: **How are the group and single interventions ordered in time:** - *Two hours single setting, 32 h group setting (1)* - *Two hours single setting, 18 h group setting (1)* - *Nach Einzelfallindikation (1)*	

The number of participants is restricted to 12. The other frame conditions, mainly regarding number of sessions, number of hours and units as well as the total duration varies considerably between the DUID programmes. This variation refers to the group as well as to the single setting.
A few programmes combine group and single interventions.

The specification on repeated participation results in the following answers (see table below).

Table 69: PQ Form B, DUID programmes, results on repeated participation

Programme condition	**Is repeated participation possible:** ***6*** No ***15*** Yes; if yes and additional conditions are required, please describe: - *Six sessions (not 5, as normal) (1)* - *Participation in an additional unit (3)* - *If repeated within 5 years, there has to be one more unit (50 minutes) (1)* - *1 additional unit if within 5 years (3)* - *After negative assessment (2)* - *Frühestens nach 5 Jahren (1)* - *If the participation in a preceding intervention of the same kind lead to exclusion. (1)* - *If there is a actually valid recommendation documented in a Medical-Psychological expertise (Medizinisch-Psychologisches Gutachten) (1)*

In most of the programmes a repeated participation is possible (n=15). Some programmes have specific conditions for repeated participation, for example an additional session, or that it is only possible after a certain time span.

The specification on trainers' qualification results in the following answers (see table below).

Table 70: PQ Form B, DUID programmes, results on trainers' qualification

Trainer(s)	**Are there legal regulations for the trainer/course leader's qualification:** ***3*** No ***18*** Yes **Specify the profession of trainer(s):** - *Traffic psychology (1)* - *Psychologist (15)* - *Psychologist, criminologist, social worker* - *Dipl.-Psych., Psychotherapeuten, Suchttherapeuten (2)* - *Clinical Psychologist (1)* **is additional education required:** ***0*** No ***21*** Yes **Is there a standard combination of disciplines in the programme:** ***17*** **No** ***2*** **Yes; If yes, name the combination(s):** - *Psychology-uni, FS B, 1600h work experience, 160h therapeutic intervention tactics, 20h kursmodel, 2 course co-trainer, 2 course supervision (1)* - *Coaching, counselling and therapy (1)*

Nearly all programmes have got legal regulations for the trainers' or course leaders' qualification. Trainers' profession is in most of the cases "psychologist", whereby additional education is always required.

The specification on costs for participation results in the following answers (see table below).

Table 71: PQ Form B, DUID programmes, results on costs for participation

Costs	**Do the participants pay for attending the programme:** ***1*** No ***20*** Yes If yes, what are the costs for the participant (€): ***198,- to 1.400,-*** If yes, the participants' costs are ***9*** legally regulated ***11*** determined by the organisation

With one exception, participants have to pay the course fee by themselves. The costs for the clients vary from 198 EUR to 1.400 EUR. In nearly half of the programmes costs are legally regulated; but in even more cases the fee is determined by the provider organisations.

The specification on course completion results in the following answers (see table below).

Table 72: PQ Form B, DUID programmes, results on regulation on course completion

Programme completion	**Are there regulations for successful course completion:** **Legal ones:** ***7*** No ***14*** Yes**;** **Intra organisational criteria:** ***6*** No ***12*** Yes **Are there criteria for participant exclusion during the programme:** ***0*** No ***21*** Yes; If yes, please indicate: ***20*** Alcohol intoxication; please specify alcohol level: - *Above 0,0 respectively 0,1 per mille (14)* ***19*** intoxication by drugs; please specify how assessed: - *No drugs (1)* - *Behavioural observation, request for a drug test from the Lab (2)* - *Interview and the participant is sent to the next hospital (1)* - *Screening (1)* - *Behaviour (3)* - *Behaviour, Drug screening positive (1)* - *Examination of Urine (1)* ***20*** missing cooperation ***13*** Other, please specify: - *Attendance (1)* - *No payment (1)* - *Aggressive behaviour, absence for one session without make up, absence for two sessions, coming late, not paying the course fee (2)* - *Delay (3)* - *Zuspätkommen, Unzuverlässigkeit, Hausaufgaben unzureichend (2)* - *Unzuverlässigkeit, Aggression, Unfähigkeit (2)* - *Delay/missing a session (2)*

The majority of programmes have got regulations concerning successful course completion, but to a large extent intra organisational criteria exist as well.
All submitted programmes apply criteria for the exclusion of participants during the course under defined circumstances. These are above all missing cooperation and intoxication by alcohol or dugs.

The specification on certificates of attendance results in the following answers (see table below).

Table 73: PQ Form B, DUID programmes, results on certificate of attendance

Programme completion	**Is there a certificate of attendance:** ***2*** No ***19*** Yes

With a few exceptions course participation is confirmed by a certificate of attendance.

The specification on scientific background of programmes results in the following answers (see table below).

Table 74: PQ Form B, DUID programmes, results on scientific background

Scientific background	**What is the scientific background of the programme? Please name briefly:** - *FSG (Führerscheingesetz) (1)* - *Cognitive behavioural therapy (1)* - *Handbuch über das Kursmodell der AAP GmbH, vorgelgt beim BMVIT, Handbook of the course guidelines, approved by the ministry of traffic (1)* - *Behaviour science (1)* - *Eecclectical approach: parts of 'Gestalt'-Therapy, psychodrama, behaviour-therapy,, group-dynamics (1)* - *Multimodal approach (group dynamics, behavioural therapy, client centered therapy, psychodrama) (2)* - *Behaviour therapy and systemic therapy (1)* - *Theory of individual psychology (1)* - *Rational-Emotive-Behavior-Therapie (REVT) (3)* - *Individualpsychologie Alfred Adlers und eigene Forschungen (4)* - *Behavioural / cognitive approach of psychotherapie, schema-theory, individual psychological approach (1)* - *Cognitive-behavioural approach to psychotherapy (1)* - *Cognitive behaviour therapy (1)* - *Group Dynamics (1)* **What is the primarily approach of the programme:** ***15*** Predominantly treatment (psychological, therapeutic) ***3*** Predominantly educational (information) ***2*** Predominantly individual tailored programme ***1*** Predominantly uniform programme

Scientific background of most of the DUID programmes for DUID offenders are well established psychotherapeutic models, concepts or approaches. Thus treatment (psychological/therapeutic) approach is the predominant approach in the DUID programmes for this offender group.
Programmes preliminary based on education or information are not important and are only applied in a few cases.
In chapter 7.4 there is content related structuring of the nominations on scientific background of all the programmes (DUI, DUID and mixed offenders).

The specification on programmes' aims results in the following answers (see table below).

Table 75: PQ Form B, DUID programmes, results on programmes' aims in detail

Aim(s) of programme	**Are there legal regulations on this programme's aim(s):** ***8*** No ***13*** Yes **Name the major aim(s), maximum 5:** - *Information, attitude change, separating from alcohol and driving (1)* - *Enhancing self-control, filling up information deficits, attitude changes (1)* - *Development of behaviour strategies to avoid driving under influence of drugs, show motives and problems of misuse, show possible dangers in traffic because of misuse, try out and stabilise rudimentally individual solving solutions for further traffic participation without similar offences (1)* - *Development of a co-operative relationship, reasons for drug consumption, establishment and strengthen of abstinence resp. compliance in case of substitution treatment, support to organise lifestyle in order to reach or keep abstinence or compliant to substution treatment (2)* - *The major aim is not to drive under the influence of drugs. Another aim is to be clean and to develop alternative and new behaviour (1)* - *Knowing all the consequences of DWI(safety, juridical, assurance,...), reflection on drugs use, importance of drugs in life (1)* - *Completely no Drugs (1)* - *Life-long Abstinence from Drugs (2)* - *Realitätsangemessenes Selbstmanagement des Lebens und des Fahrens (1)* - *Realitätsangemessenes Selbstmanagement des Lebens und des Fahrens, Punkteabbau, Sicherung der Fahrerlaubnis (1)* - *Vermeidung der Rückfälligkeit (1)* - *Vermeidung eines Führerscheinentzugs oder Verkürzung der Sperrfrist bei Gericht (1)* - *§ 36, Abs. 4 FeV: 'Wissenslücken der Kursteilnehmer über die Wirkung des Alkohols und anderer berauschender Mittel auf die Verkehrsteilnehmer sollen geschlossen und individuell angepaßte Verhaltensweisen entwickelt und erprobt werden, um insbesondere Trinkgewohnheiten zu ändern sowie Trinken und Fahren künftig zuverlässig zu trennen. Durch die Entwicklung geeigneter Verhaltensmuster sollen die Kursteilnehmer in die Lage versetzt werden, einen Rückfall und weitere Verkehrszuwiderhandlungen unter Alkoholeinfluß oder dem Einfluß anderer berauschender Mittel zu vermeiden. Zusätzlich ist auf die Problematik der wiederholten Verkehrszuwiderhandlungen einzugehen' (1)* - *Change of attitudes and behaviour, augmentation of motivation to stay abstinent of drugs, improvement of the skills to stay abstinent (1)* - *Drug abuse, motives o drug consumption, avoiding relapses (1)* **You can also give a literature reference:**

Some more than half of the programmes have got legal regulations on programme's aims. A variety of aims are documented. In chapter 7.4 there is content related structuring of the nominations on programmes' aims of all the programmes (DUI, DUID and mixed offenders).

The specification on most important themes of the programmes results in the following answers (see table below).

Table 76: PQ Form B, DUID programmes, results on most important themes dealt with

Contents of programme	**Please name the most important themes dealt with, maximum 5:** - *Residual alcohol, effect from alcohol/drugs, law, acquaintance with alcohol (1)* - *Reasons for drunken driving, prevention, alcohol, abuse, self control (1)* - *See FSG-NV §2 (1)* - *Enhancing self-control, filling up information deficits, attitude changes (1)* - *Significance of drugs and what can legally substitute them, feelings of (lacking) competence and its improvement, influence of drugs on driving behaviour, impacts of existing laws others than traffic (1)* - *Importance of driving license for life quality, analyses of drug consumption development, motives for drug consumption, risk of drug consumption in general life and traffic, elaboration of positive effects of abstinence or compliance to the substitution treatment on personal-emotional-self esteem, interpersonal-relational, occupational, health related level, concrete behaviour steps to overcome problem situations in life (2)* - *Social responsibility, self control, self reflection referring to former use of drugs, learned behaviour and how to unlearn it (1)* - *Product information (on drugs), legal consequences, effects of drugs on driving, difference between consumption and drug abuse, lifestyle, leisure time, life goals (1)* - *Unconscious determination of drug abuse, conclusions for future behaviour, background information on drugs and driving (1)*

Important themes of DUID DR programmes range from: self control, legal consequences, product information, and self reflection up to concrete behaviour to overcome problem situations in life.
In chapter 7.4 there is content related structuring of the nominations on important themes of the programmes for all measures (DUI, DUID and mixed offenders).

The specification on materials for participants' results in the following answers (see table below).

Table 77: PQ Form B, DUID programme results on material for participants

Material	**Do the participants receive any material:** ***1*** No ***20*** Yes

Nearly all course programmes provide material for their participants.

The specification on programme evaluation results in the following answers (see table below).

Table 78: PQ Form B, DUID programmes, results on evaluation

Evaluation	**Has this programme already been evaluated:** ***11*** No ***10*** Yes If yes, what kind of evaluation: ***6*** Content evaluation ***11*** Participant feedback ***6*** Process evaluation ***8*** Outcome evaluation, recidivism study ***1*** Other, please specify: outcome evaluation ongoing (1) **Has/have the evaluation/s been published:** ***7*** No ***5*** Yes; if yes, name reference(s):

About half of the programmes have been reported to be evaluated, the other half is not. In most of the cases the approach is participant feedback. But also content and process evaluations as well as outcome evaluations are carried out.

The number of participants which underwent the measure in 2006 is not reported as there were incongruencies of reporting of this number. The data were not valuable.

7.3.3.3 DUID programmes: estimated factors of course success

The providers estimated the importance of pre given categories for the course success for each programme: if the defined dimension was of relevance for the course conduction or not. The scale is graded by four steps: not relevant, less relevant, relevant, most relevant.

The specification on estimated factors of course' success results in the following answers (see table below).

Table 79: PQ Form B, DUID programmes, results on estimation on factors of course' success

Factors for programme success	How important are the aspects below for the programme's success: relevance			
	not	less	relevant	most
Information	0	0	17	4
Self observation and reflection	0	0	0	21
Discussion and confrontation	0	0	2	19
Emotional experiencing and involvement	0	0	6	15
Emotional verbal/non-verbal expressing	0	4	7	10
Open-trustworthy group climate	0	0	4	17
Goals setting and commitment to stick to them	0	1	9	11
Development of alternative, new behaviour	0	0	2	19
Achievement of behavioural goals/self control	0	1	3	17
Medical treatment	11	10	0	0
Alcohol-Ignition-Interlock	15	4	1	1
Alcohol or drug screening	7	5	4	5
Other, please specify:	2	0	0	0
No specifications				

Self observation and reflection is stated as most relevant by all of the providers, followed by discussion and confrontation and development of new and alternative behaviour. Open-trust worthy group climate and achievement of behavioural goals/self control are seen as very relevant within most of the programmes as well. Information is seen to be relevant to a certain extent. Alcohol Ignition Interlock and medical treatment are seen as not or less relevant.

7.3.4 Programmes for mixed target groups

The following presentation covers programmes which are for mixed offender groups (mixed on regular basis, different DUI and DUID offenders as well as DUI, DUID offenders and other traffic offenders).
13 programmes were submitted in total. Mixed programmes are carried out in four European countries.

Table 80: PQ Form B, programmes for mixed offenders, combination of offenders at regular level

Nr.	Country	Name of programme	Provider(s) applying the programme
1.	**Belgium**	Rehabilitatie en verkeerstherapie voor alcohol, drugs en geneesmiddelenmisbruikers - lange type verkeerstherapie	BIVT
2.	**Belgium**	Rehabilitatie en verkeerstherapie voor alcohol, drugs en geneesmiddelenmisbruikers - korte verkeerstherapie - intensief seminarie 3 daagse	BIVT
3.	**France**	Alternative à la poursuite	COMARIS
4.	**France**	stage alcool: composition pénale et complément de peine	Prevention Routiere de Dordogne
5.	**France**	Peine complementaire	Anper
6.	**France**	Sensibilisation aux causes et consequences des accidents de la route – novice drivers	APAVE
7.	**France**	Sensibilisation aux causes et consequences des accidents de la route – demerit point system	APAVE
8.	**France**	Sensibilisation a la securite routiere	AUTOMOBILE CLUB ACTION +
9.	**Germany**	DEKRA-Mobil: besonderes Aufbauseminar für alkohol- und drogenauffällige Kraftfahrer/innen	DEKRA
10.	**Germany**	ALFA - Besonderes Aufbauseminar für alkohol- und drogenauffällige Fahranfänger/Kraftfahrer	AFN
11.	**Germany**	NAFA plus	Impuls GmbH,
12.	**Germany**	avanti	Nord-Kurs
13.	**Sweden**	Prime for Life	Swedish Prison and Probation Service

7.3.4.1 Frame conditions of mixed offender programmes

The following table shows the overall results of PQ Form B for all questions. For some questions multiple answers were possible. Due to missing data it is possible that in the results the numbers of analysed programmes vary.
For a better comprehensibleness the results (numbers) are always inserted in the respective PQ question in orange colour.

The specification on programme development results in the following answers (see table below).

Table 81: PQ Form B, programmes for mixed offenders, results on programme development

Origin	**Was this programme developed within your organisation:** 6 No 5 Yes

About half of the programmes were developed by the providers themselves, the other half outside the organisation.

The specification on regulation of participation results in the following answers (see table below).

Table 82: PQ Form B, programmes for mixed offenders, results on regulation of participation

Programme access and consequences	**Is the participation legally regulated:** *4* No *9* Yes; If yes, please name the law/paragraph(s): specified in the questionnaires **The participation is:** *9* Mandatory *4* Voluntary **If mandatory, who imposes the participation in this programme:** *4* Licensing authority *7* Court *0* Rehabilitation provider *0* Assessment centre *0* Other, please specify: -

In most of the cases, legal regulations on participation exist (nine programmes compared to four without legal regulation). Regarding participation mode, more than half of the programmes have mandatory access. More often court refers to the DR than licensing authorities.

The specification on programme's access results in the following answers (see table below).

Table 83: PQ Form B, programmes for mixed offenders, results on programme access

Programme access and consequence	**What determines the participation in this programme:** *2* Prior driver assessment *2* Recidivism *11* Substance during the offence *9* Alcohol; if there is a specific concentration limit, please specify: - *Entre 0.40 mg / air et 1 mg/litre d'air expiré (2)* - *0.8 g/l sang (1)* - *Entre 0,5g et 1,2g (1)* - *À partir de 0.40 mg (1)* - *Any (1)* - *1.6 ‰ or repeated DUI (1)* - *1.0 minimum (1)* *10* Drug(s), please specify the substance(s): - *Cannabis - 1 nanogramme par litre dans le sang (2)* - *CANNABIS (2)* - *Any (1)* - *All kinds of drugs (1)* - *All substances according to narcotic law (1)* *6* Other, please specify: - *Can be proposed within the scope of probation (court level) after a DUI/DUID offence or at own initiative (2)* - *Toute infraction au code de la route y compris la conduite sous L'emprise de produits psycho-actifs (1),* - *Novice drivers, repeated offenders (1)* - *Traffic Offences (1)* - *All kinds of traffic law offences (1).*

Also in mixed offender programmes the substance during the offence determines participation in most of the cases. Prior assessment and recidivism are significantly less often reasons for referral. Within the programmes also some other causes were specified: within scope of probation after a DUI/DUID offence and other traffic offences.

The specification on results on consequences of participation results in the following answers (see table below).

Table 84: PQ Form B, programmes for mixed offenders, results on consequences of participation

Programme access and consequence	**What are the consequences of participation:** *3*… it leads to a reduction of the suspension period *4*….it leads to a reduction/extinction of penalty points *4*… it leads to a reduction of other punishments (e.g. reduced fine) *0*… it leads to a reduction of community service hours *4*… it leads to an avoidance of further criminal prosecution *2* … it leads to an ongoing validity of the license *6*… it is a necessary condition for re-licensing/license reinstatement/re-granting *4* … it leads to improved chances of passing an upcoming driver assessment *6* … it leads to other consequences: please specify: - *Acceptance of an order related to probation or electronic monitoring means imprisonment can be avoided (1)* - *Improved self-knowledge and coping strategies for (difficult) life events (1)* - *Prise de conscience du risque sous l'influence de produits psycho-actifs et trouver dans le cadre du stage un appui pour un changement (1)* - *Prise de conscience du risque lié à son comportement. (1)* - *In the scope of probation (court), it can lead to a more favourable judgement, to a reduction of the fine (2).*

Most often the participation is a necessary condition for re-licensing. But other consequences of participation are important as well: reduction of punishment, reduction of demerit points and avoidance of criminal prosecution are equally mentioned by some providers. Reduction of suspension period and keeping driving licence valid are other less frequent consequences of participation.

The specification on subgroups of mixed offender programmes results in the following answers (see table below).

Table 85: PQ Form B, programmes for mixed offenders, results on subgroups

Target group(s) of programme	***13* Alcohol offenders** **Does the programme focus on subgroups of alcohol offenders:** *8* No *5* Yes; if yes, please specify: *3* Novice drivers *2* First time offenders *1* Repeated offenders *2* Other, please specify: - *TIG SME (1),* - *exact therapy programme fine-tuned to the individual (1)*	***13* Drug offenders** **Does the programme focus on specific subgroups of (illicit) drug offenders:** *8* No *4* Yes; if yes, please specify: *4* Novice drivers *2* First time offenders *2* Repeated offenders *1* Other, please specify: - *exact therapy programme fine-tuned to the individual (1)*

Within the target group of DUI and DUID offenders, 5 respectively 4 programmes apply a further distinction of offenders. They offer courses specifically for novice drivers), for first time offenders, and 1 respectively 2 programmes for repeated offenders.

The specification on exclusion criteria results in the following answers (see table below).

Table 86: PQ Form B, programmes for mixed offenders, results on exclusion criteria

	Does your organisation exclude certain groups from this programme: *2* Addicts *5* Drivers with communication problems *0* Other, please specify:

Two exclusion reasons are mentioned: addiction and communication problems.

The specification on programme setting and procedure results in the following answers (see table below).

Table 87: PQ Form B, programmes for mixed offenders, results on programme setting and procedure

Programme setting	**Is there a legal base for the programme setting and procedure:** *5* No *8* Yes **Are there exceptions from the normal procedure:** *10* No *3* Yes; if yes, for which indication(s): *2* Persons with communication problems (e.g. language, deaf) *4* Persons in special conditions (e.g. VIPs, working abroad, acute stress) *1* Other, please specify: - *You must be able to participate and obtain knowledge and changed attitudes etc. (1)*

More than half of the programmes have got a legal base for the programme setting and the procedure. In most of the cases, there are no exceptions from the normal procedure. But persons with communication problems and/or persons in special conditions can get an exceptional treatment.

7.3.4.2 Programmes for mixed offenders: content related specification of programmes

The following chapter deals with relevant content related aspects of the mixed offender programmes.

The specification on programme design results in the following answers (see table below).

Table 88: PQ Form B, programmes for mixed offenders results on programme design

Programme design	**Is the programme principally designed as** *11* Group intervention *0* Single/individual intervention *2* Combined group and single intervention (if yes, specify both parts separately below)

The programmes are designed as a group intervention. There exist two course models where group and single interventions are combined within one rehabilitation measure.

The specification on course setting results in the following answers (see table below).

Table 89: PQ Form B, programmes for mixed offenders results on course setting

Programme structure	***11*** **Group intervention:** **Number of participants:** Min. *up to* ***10*** Max . ***4-20*** ***0*** Not specified **Total time of intervention:** number of hours ***2-20*** or number of units: ***1-60*** **Total number of sessions/meetings:** ***1-10*** **Time span (days) between:** two sessions: ***0-7 days*** ***5*** Not specified first and last session: Min. ***3-180*** Max. ***3-180*** ***5*** Not defined	***5*** **courses can also be conducted as single intervention:** **Total time of intervention:** number of hours ***5-8*** or **Total number of sessions/meetings:** *1- 10 (and more)* **Time span (days) between:** two sessions: ***2-7 days*** ***0*** Not specified first and last session: Min.***21*** (1) Max.***28*** (1) ***1*** Not defined
	In case of combined intervention: **How are the group and single interventions ordered in time:** *By mutual agreement, fine-tuned to the individual (1)*	

Also in programmes with mixed offender groups a rather broad variation regarding the number of participants as well as the time related setting can be found.

The specification on programme development results in the following answers (see table below).

Table 90: PQ Form B, programmes for mixed offenders results on repeated participation

Programme condition	**Is repeated participation possible:** ***2*** No ***11*** Yes; if yes and additional conditions are required, please describe: - *1)Si la personne est en récidive d'alcool, suivant le département, elle peut avoir un deuxième stage en composition pénale. 2) un deuxième stage pour récupérer des points et garder la validité de son permis (2)* - *Participation possible once within 5 years (§ 45 FeV) (1)* - *Only for § 43 FEV in a period of 5 years (1)* - *Individual decision (1).*

In most of the programmes repeated participation is possible although there can be some time related restrictions before a new course attendance is possible.

The specification on trainers' qualification results in the following answers (see table below).

Table 91: PQ Form B, programmes for mixed offenders results on trainers' qualification

Trainer(s)	**Are there legal regulations for the trainer/course leader's qualification:** *3* No *10* Yes **Specify the profession of trainer(s):** - *Trained psychotherapists, psychoanalysts, with additional training traffic therapy (2)* - *Psychologue et formateur en sécurité routière (2)* - *One psychologue et 1 BAFM (2)* - *Psychologue - bafm bafcri (1)* - *Psychologue ou formateur de moniteurs d'auto école. Tous spécialisés sécurité routière (1)* - *Dipl. Psych. (4)* - *Delivered by specially trained and certified program facilitators (1).* **is additional education required:** *1* No *12* Yes **Is there a standard combination of disciplines in the programme:** *6* **No** *5* **Yes; If yes, name the combination(s):** - *Tron commun de formation sur la base des formations spécifiques d'une durée de cinq semaines à l'INSERR (1)* - *Tron commun de formation sur la base des formations spécifiques d'une durée de cinq semaines à l'INSERR et une expérience de terrain de deux stages minimum (1)* - *FORMATION ET PSYCHOLOGIE (1)* - *Technique – psychologie (1)* - *Results on the latest research, combining a range of effective interventions to enhance risk awareness related to drug and/alcohol use (1).*

In almost all programmes legal regulations on trainers' qualification exist. In most of the cases trainers are psychologists. They are psychologists with additional education.

The specification on costs for participation results in the following answers (see table below).

Table 92: PQ Form B, programmes for mixed offenders results on costs for participation

Costs	**Do the participants pay for attending the programme:** *1* No *12* Yes If yes, what are the costs for the participant (€): *135,- to 590,-* If yes, the participants' costs are *1* legally regulated *11* determined by the organisation

Participants have to pay for participation in 12 of the 13 programmes. The costs vary from 135 EUR to 590 EUR. In nearly all programmes participants' costs are determined by the organisations.

The specification on regulation on course completion results in the following answers (see table below).

Table 93: PQ Form B, programmes for mixed offenders, results on regulation on course completion

Programme completion	**Are there regulations for successful course completion:** **Legal ones:** *6* No *7* Yes**;** **Intra organisational criteria:** *4* No *9* Yes **Are there criteria for participant exclusion during the programme:** *0* No *12* Yes; If yes, please indicate: *8* alcohol intoxication; please specify alcohol level: - *Taux légal inférieur à 0,25 mg /litre d'air expiré ou 0,5 g /litre dans le sang. mais surtout si trouble du comportement et perturbation du groupe (2).* - *En manqué (1)* - *Any (2)* - *0,0 ‰ (1)* - *Electronic monitoring has zero tolerans. Also offenders under probation may have an order about drug control and intoxiation can result in imprisonment. (1)* *5* *intoxication by drugs; please specify how assessed:* - *Trouble du comportement (2)* - *En manque (1)* - *Any (1)* - *Urin samples if there is an order related to probation, in prison urin samples are mandatory (1)* *7* missing cooperation *7* Other, please specify: - *Non abstinence by addicts (2)* - *Non respect des horaires (2)* - *Retard, absences (1)* - *Retard séance (1)* - *Delay (1)*

Half of the mixed offender DR programmes have got legal regulations for successful course completion. Nine report intra organisational criteria for course completion.
12 programmes apply exclusion criteria during course conduction, these concern primarily intoxication by alcohol and drugs and missing cooperation.

The specification on certificates of attendance results in the following answers (see table below).

Table 94: PQ Form B, programmes for mixed offenders, results on certificate of attendance

Programme completion	**Is there a certificate of attendance:** *1* No *12* Yes

In nearly all programmes participation is confirmed by a certificate of attendance.

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The specification on scientific background of programmes results in the following answers (see table below).

Table 95: PQ Form B, programmes for mixed offenders results on scientific background

Scientific background	**What is the scientific background of the programme? Please name briefly:** - *Psychoanalysis and traffic psychology (2)* - *MODELE THEORIQUE ENSEIGNE PAR L'INSERR - SOURCES INRETZOBJECTIFS : modifier les comportements pour prévenir la réitération d'infractions, ce qui entraînera une amélioration de la sécurité préconisé par le rapport ANDREA . MODELE THEORIQUE de Prochaska et DiClemente issus des concepts tels que la théorie des systèmes de motivations de Ford, d'auto régulation de Carver et Scheier, modèles consensuels en matière de modification de comportements de santé à risque.METHODE : auto-évaluation des compétences, auto-réflexion, discussion.ou encore diagnostic, analyse, ajustement. (1)* - *MODELE THEORIQUE ENSEIGNE PAR L'INSERR - SOURCES INRETZOBJECTIFS : modifier les comportements pour prévenir la réitération d'infractions, ce qui entraînera une amélioration de la sécurité routière.Théorie de l'engagement / la double contrainte: réflexion et prise de conscience de la réalité du risque par rapport à la projection fantasmatique et imaginaire de l'intérêt à ne pas respecter la règle, la réalité. Retrouver la signification de la règle, et de la loi, et ainsi remettre la contrainte à sa juste place donc plus aisée à respecter. METHODE et OUTILS: articulation des lois : la loi légale, les lois physiologiques et les lois physiques. La loi légale étant la résultante de l'observation de faits, marqués par les statistiques de l'accidentologie et son étude. Ce cheminement part des expériences qui engendrent des certitudes et les articuler avec des informations, de la connaissance subjective et objective et des études de cas dans lesquelles les stagaires peuvent retrouver la nécessité des règles et les énoncer eux-mêmes.Cela peut prendre valeur d'engagement et d'entendement de la règle. (1)* - *Theory of individual psychology (1)* - *Behaviour Therapy, RET, Constructionist Therapy (1)* - *Rational-Emotive-Behavior-Therapie (REVT) (1)* - *Psychodynamic Theory (1)* **What is the primarily approach of the programme:** ***6*** Predominantly treatment (psychological, therapeutic) ***5*** Predominantly educational (information) ***2*** Predominantly individual tailored programme ***0*** Predominantly uniform programme

Treatment and educational oriented approaches are equally often applied in the mixed programme types. In chapter 7.4 there is content related structuring of the nominations on scientific background of all the programmes (DUI, DUID and mixed offenders).

The specification on programmes' aims results in the following answers (see table below).

Table 96: PQ Form B, programmes for mixed offenders results on programmes' aims in detail

Aim(s) of programme	**Are there legal regulations on this programme's aim(s): *6*** No ***7*** Yes **Name the major aim(s), maximum 5:** - *Awareness of underlying problems, insight in patterns, recognition of the function of product dependency, rethinking ones own future, self-management (2)* - *DIAGNOSTIC : représentation, attentes, auto-évaluation de ses comportements. ANALYSE des INFLUENCES : norme et contexte social, compétences perçues et sentiment d'auto-efficacité. contexte scientifique. AJUSTEMENT : niveau de motivation, comportement cible, stratégies (1)* - *Changer de comportement par la prise de conscience, non coercitive, mais libératrice de la double contrainte qui souvent pousse au passage à l'acte infractionniste pour pouvoir se dégager (1)* - *SENSIBILISER AUX ENJEUX DE LA SECURITE ROUTIERE, FAIRE CONNAITRE LA DIMENSION COLLECTIVE DE LA SECURITE ROUTIERE, TENIR COMPTE DES COMPORTEMENTS PARTICULIERS ET NOTAMMENT LES EFFETS LIES A LA CONSOMMATION DE PRODUITS, FAIRE APPREHENDER LA NOTION DE RISQUE (1)* - *No rezidiv (1)* - *Moderate Drinking, no Drugs, no Traffic Offences and Driving without Intoxication (1)* - *Self-reflection of individual aims and motivations, development of a motivation to change the disfunctional approach to solve personal problems, develop alternative solutions and get practice of using them (1)* - *Reduce relapse 2. Reduce problems caused by high risk drinking or drug use. 3. Reduce risk for longt term health problems and short term impairment problems. 4 To help people protect the things they value most (1)* **You can also give a literature reference:**

About half of the programmes have got legally regulated aims, the other half does not.
Specification of aims ranges from problem awareness sensibilization of the self evaluation up to concrete behaviour modification regarding the problem behaviour. In chapter 7.4 there is content related structuring of the nominations on programmes' aims of all the programmes (DUI, DUID and mixed offenders).

The specification on most important themes of the programmes results in the following answers (see table below).

Table 97: PQ Form B, programmes for mixed offenders, results on most important themes dealt with

Contents of programme	**Please name the most important themes dealt with, maximum 5:** - *Awareness of underlying problems, insight in patterns, recognition of the function of product dependency, rethinking ones own future, self-management (2)* - *La réglementation du permis à points, réflexions sur la prise de risque, le comportement à risque avec les conduites addicti ves : alcool, drogue, médicaments, trouver les appui pour changer, synthèse (1)* - *La réglementation du permis à points, réflexions sur la prise de risque, le comportement à risque lorsque les règles perdent leur signification.(1)* - *LES CHIFFRES DE L'INSECURITE ROUTIERE, L'ACCIDENTOLOGIE, LES DONNEES PSYCHO-PHYSIOLOGIQUES, LES SUBSTANCES PSYCHOACTIVES (1)* - *La regle dans une societe, le rique routier, l'alcool, les differentes substances psychoactives (1)* - *Insécurité routière - alcool - vitesse - ceinture - études de cas (1)* - *Analysis of the offence(s) and the personal backgrounds, conclusions for future behavior, background information on alcohol, drugs and driving (1)* - *Personal motivations of drinking alcohol or consumption of drugs, personal ressources to control and reduce alcohol consumption and to obstain from drugs. reflections in the group, knowledges of human behaviour, knowledges about riscs and legal consequences (1)* - *Analysis of Activating Events, Irrational Belief-Systems, Emotional and Behavioural Reactions, Cognitive Restructuring, Informations (1)* - *Improve self-control, Change of personal motivation, attitudes and behaviour concerning the consumption of alcohol, drugs and risky behaviour (1).*

Themes to be dealt with often overlap with aims mentioned above. In general, topics focussing on problem insight, individual background and changed risk awareness due to psychoactive substances, self control and initiating change regarding problem behaviour are mentioned.
In chapter 7.4 there is content related structuring of the nominations on important themes of the programmes for all measures (DUI, DUID and mixed offenders).

The specification on material for participants' results in the following answers (see table below).

Table 98: PQ Form B, programmes for mixed offenders results on material for participants

Material	**Do the participants receive any material:**	***1*** No	***11*** Yes

In nearly all of the courses materials are distributed to the participants.

The specification on programme evaluation results in the following answers (see table below).

Table 99: PQ Form B, programmes for mixed offenders, results on evaluation

Evaluation	**Has this programme already been evaluated:** *2* No *10* Yes If yes, what kind of evaluation: *4* Content evaluation *9* Participant feedback *5* Process evaluation *5* Outcome evaluation, recidivism study *2* Other, please specify: **Has/have the evaluation/s been published:** *7* No *3* Yes; if yes, name reference(s):

The majority of mixed programmes have been evaluated, first of all by participant feedback, but also by content, process or outcome evaluation.

7.3.4.3 Mixed programmes: estimated factors of course success

The providers estimated the importance of pre given categories for the course success for each programme: if the defined dimension was of relevance for the course conduction or not. The scale is graded by four steps: not relevant, less relevant, relevant, most relevant.

The specification on estimated factors of course' success results in the following answers (see table below).

Table 100: PQ Form B, programmes for mixed offenders, results on estimation on factors of course' success

	How important are the aspects below for the programme's success:	relevance		
		not	**less**	**relevant**	**most**
Factors for programme success	Information	*0*	*0*	*8*	*5*
	Self observation and reflection	*0*	*0*	*1*	*12*
	Discussion and confrontation	*0*	*1*	*1*	*11*
	Emotional experiencing and involvement	*1*	*0*	*7*	*5*
	Emotional verbal/non-verbal expressing	*0*	*1*	*8*	*4*
	Open-trustworthy group climate	*0*	*0*	*5*	*8*
	Goals setting and commitment to stick to them	*0*	*1*	*3*	*9*
	Development of alternative, new behaviour	*0*	*3*	*1*	*9*
	Achievement of behavioural goals/self control	*0*	*2*	*5*	*6*
	Medical treatment	*4*	*5*	*3*	*1*
	Alcohol-Ignition-Interlock	*6*	*3*	*0*	*2*
	Alcohol or drug screening	*5*	*0*	*5*	*3*
	Other, please specify:	*1*	*0*	*2*	*2*
	- *To take time for the therapy (2)* - *La qualité du binôme, l'organisation, le nombre de stagiaires (*2)				

Self observation and reflection as well as discussion and confrontation are considered to be the most relevant success factors. Goals setting and commitment to stick to them, development of alternative, new behaviour, as well as an open and trustworthy climate are estimated to be very important. Information, emotional experiencing and verbal/non-verbal expressing as well as self control are other aspects of increased relevance for course success. Medical treatment and alcohol ignition interlock are more often seen as less relevant.

The number of participants which underwent the measure in 2006 is not reported as there were incongruencies of reporting of this number. The data were not valuable.

7.4 Comparison of programmes for DUI, DUID and mixed offender groups

The providers submitted information on 87 programmes in total. Thereof 53 were DUI programmes, 21 DUID programmes and 13 programmes for mixed offender groups.
The comparison between these programme types reveals the outcomes presented in the following chapter.

7.4.1 Frame of programme

7.4.1.1 Participation mode

The specification on participation mode shows the following results (see table below).

Table 101: Type of programmes and mode of participation

Participation	DUI	DUID	Mixed groups	In total
Mandatory	27	13	9	49
Voluntary	26	8	4	38
In total	**53**	**21**	**13**	**87**

DUID courses have got nearly the same number of voluntary and mandatory accesses. In case of DUID and mixed offender programmes, more mandatory measures are given.

7.4.1.2 Programme access

The predominant access to programmes is by demand of the licensing authorities. The demand by licensing authorities is primarily the case regarding DUID programmes, but also mostly in DUI measures. Only in case of the mixed programmes the court refers to such a programme much more than licensing authorities, compared to the other programme types.

7.4.1.3 Consequence of participation

Re-licensing is the most often mentioned condition for all three programme types.
A reduction of the suspension period is a very important consequence in case of DUI programmes as well, but seldom for DUID programmes.

7.4.1.4 Exclusion criteria

Exclusion criteria concern two procedures:

- exclusion criteria from entering the course;
- during course participation.

In general, exclusion criteria before and during course conduction are defined, especially in DUI and DUID programmes. The reasons in the first case are - above all - addiction and communication problems, and in the latter condition acute substance intoxication by alcohol or drugs.

7.4.2 Course conduction

7.4.2.1 Further subgroup differentiation

For all three programme types further subgroup programmes are the exception.

7.4.2.2 Programme procedure

The number of participants, the time related structure and the total duration do not only differ between the different programme types but also within each type itself.

The specification on programme procedure shows the following results (see table below).

Table 102: Programme procedure for groups in DUI, DUID and mixed programmes

Participation	DUI	DUID	Mixed groups
Number of participants	3-20	3 -12	4-20
Number of sessions	2-15	2-8	1-10
Total duration	4 to 180 days	10 to 196 days	3 to 180 days

But exceptions from the normal procedure exist, mainly due to communication problems or other individual constraints. A repeated participation is possible for most of the measures.

7.4.2.3 Payment

In most of the cases participants have to pay for attending the course in all three programme types.

7.4.2.4 Course completion

In two thirds of the cases there are legal regulations for successful course completion. This is the same for all programme types, but many also use intra organisational criteria for successful course completion.
Nearly all of the programmes regardless programme type confirms participation with a certificate.

7.4.2.5 Trainers' qualification

For many programmes there is a legal regulation for course trainers' qualification. In the overwhelming majority psychologists work as trainers in the programmes and very often further education is requested. In case of DUID programmes the qualification was nearly without any exception psychologists or therapist, with a requirement of further training.

7.4.3 Intervention

7.4.3.1 Intervention approach

The specification on intervention approach shows the following results (see table below).

Table 103: Type of programme and intervention approach

Approach	DUI	DUID	Mixed groups	In Total
Treatment	26	15	6	47

Education	17	3	5	25
Individually tailored	5	2	2	9
Uniform	5	1	0	6
In Total	53	21	13	87

Overall, treatment approaches are more represented than educational approaches. Some programmes reported to have both conceptions: treatment as well as education. Above all this refers to the DUI programme type and the mixed programmes.

7.4.3.2 Scientific background of programmes

DUI and DUID programmes mention a detailed scientific background of the programme. The specification on scientific background shows the following results (see table below).

Table 104: PQ Form B, scientific background of programmes

Scientific Background	DUI programmes	DUID programmes	Mixed programmes	SUM
Cognitive behaviour theory, behaviour therapy and systemic therapy, behaviour science, Lernpsychologie, rational emotive therapy, theory of planned behaviour	**9**	**8**	**1**	**18**
Individualpsychologie Alfred Adler; Theory of individual psychology, psychoanalysis and traffic psychology, psycho dynamic theory,	**5**	**5**	**4**	**14**
Group dynamics	**3**	**1**		**4**
Multi-theoretical approach multimodal approach, elements with scientific background, scientific evaluation evaluation of DR	**20**	**4**	**2**	**26**
Evidence based backed by literature, 6 years governmental experience and monitoring re-offend rates, manual, traffic law, alcohol and driving	**6**	**2**		**8**
			In total	**70**

In sum it can be stated that the majority of programmes has got a scientific background. A lot are psychological-therapeutically based and numerous have a mixture of theoretical approaches as background. Others are evidence based but also backed by scientific monitoring.

7.4.3.3 Aims of programmes

The major aims of the programmes nominated in the questionnaires were assigned to certain categories. Up to five aims could be mentioned for each programme. The following table gives an overview on the answers. In order to give a better overview of the responses, categories were developed and the answers assigned to the appropriate category.

The specification on aims of programmes results in the following answers (see table below).

Table 105: PQ Form B, major aims of programmes

Major aims	DUI programmes	DUID programmes	Mixed programmes	SUM
Consciousness raising				**24**
Awareness of underlying problems			**2**	2
Insight in patterns			**2**	2
Realistic assessment of impairments; sensitization	**3**			3
Recognition of connection between DUI and high risk	**1**			1
Effects of DUI to family, friends, etc.	**1**			1
Analysis of offender's behaviour	**1**			1
Recognition of the function of product dependency			**2**	2
Sensibilisation of the road safety issue, collective responsibility			**1**	1
Show motives and problems of misuse	**3**	**2**		5
Show dangers of traffic due to misuse	**3**	**1**	**1**	5
Understanding and awareness of risk			**1**	1
Motivation and reflection				**24**
Establishment and strengthen motivation for changing	**6**			6
Motivation to stay abstinent from drugs		**1**		1
Development of a motivation to change			**1**	1
Reflection on drinking behaviour	**2**			2
Recognizing connections between needs and drinking habits	**1**			1
Discussion of cause of offence	**1**			1
Reasons for drug consumption		**1**		1
Exploration and confrontation of the personality attributes motivation wrong behaviour	**1**		**1**	2
Reflection on drug use, importance of drugs in life		**1**		1
Self evaluation of behaviour			**1**	1
Increase of self knowledge	**1**			1
Self reflection of individual aims and motivations			**1**	1
Perceived capacities, feeling of self-efficacy			**1**	1
Excessive drinking	**1**			1
Drinking motives	**1**	**1**		2
Drug abuse		**1**		1
Attitudinal and behavioural change				**87**
Attitude change	**6**	**2**		8
Development of behavioural strategies to avoid DUI/D	**8**	**1**	**1**	10
Try and stabilize individual solving solutions	**2**	**2**		4
Plan future safe and legal driving	**1**			1
Establishment and enhancement	**5**	**2**		7

of a realistic change of behaviour and strategy				
Development of alternative behaviour and new behaviour	**2**	**2**	**1**	5
Control of drinking behaviour	**1**			1
Separating drinking and driving	**5**	**1**		6
Driving without intoxication	**4**			4
No recidivism	**10**	**1**	**1**	12
Reducing risk of recidivism	**2**	**2**	**1**	5
Change of drinking habits	**2**			2
Moderate drinking	**1**		**1**	2
Life long abstinence from alcohol/drugs	**1**	**1**	**1**	3
Reduce risk for lifetime health problems			**1**	1
Enhancing self control	**3**	**1**		4
Self management adapted to reality (life and driving)	**3**	**3**	**2**	7
Development of alternative strategies to satisfy own needs	**1**			1
Development of new perceptions, change of old patterns, schemes	**1**			1
To help people to protect the most valuable things			**1**	1
Sources for help	**1**			1
Avoiding relapses	**1**			1
Group dynamics				**10**
Development of a co-operative relationship	**7**	**2**		9
Learning to respect others	**1**			1
Information				**17**
Information, filling important information deficits	**4**	**3**		7
Increase knowledge on alcohol and its effects	**4**			4
Knowing all consequences of DUI/D	**3**	**1**		4
Info about high risk offenders	**1**			1
Knowledge on law and general road safety	**1**			1
			In total	**162**

The numerous programme aims refer to main categories, first of all attitudinal and behavioural change, above all no recidivism, development of alternative behaviour and new behaviour, stabilisation of new behaviour, but also consciousness raising such as show motives and problems of misuse or show dangers of traffic due to misuse and motivation and reflection, such as establishment and strengthen motivation for changing or self reflection of individual aims and motivations. Aims concerning group dynamics and information were also mentioned.

7.4.3.4 Important themes in order to reach aims of programmes

Another question with an open answering format dealt with important themes which are covered by the programmes. The categories named in this table below refer to the aims above. The lines of the following table are filled by themes discussed within the course in order to reach the aims mentioned above.

The specification on important themes in order to reach the aims shows the following results (see table below). The themes are ordered alphabetically.

Table 106: PQ Form B, important themes to in order to reach the aims within the programmes

Major themes dealt with	DUI programmes	DUID programmes	Mixed programmes	SUM
Aim: Filling up information deficits				**17**
Alcohol effects on society	**1**			1
Future education and sources for help	**1**			1
High risk offenders	**1**			1
Impacts of existing laws other than traffic		**1**		1
Knowledge on human behaviour	**3**		**1**	4
Law	**5**			5
Media surrounding drink driving	**1**			1
Speed	**1**			1
Aim: consciousness raising				**41**
Awareness underlying problems			**2**	2
Effects on health	**2**			2
Identifying victims	**3**			3
Importance of driving license for life quality		**1**		1
Information on promille	**2**			2
Insight in patterns			**2**	2
Interpersonal-relational, occupational, health related level	**5**	**2**		7
Knowledge about risks and legal consequences	**9**	**2**	**2**	13
Life style, leisure time, life goals		**1**		1
Perception of danger	**1**		**2**	3
Personal motivations of drinking alcohol or consumption of drugs			**1**	1
Real costs of drink driving	**1**			1
Risk taking behaviours	**1**		**2**	3
Aim: Motivation and reflection				**52**
Analysis of activating events	**2**		**1**	3
Analysis of the offence and personal background	**3**		**1**	4
Attitudes and behaviour concerning consumption of drugs/alcohol and risky behaviour			**1**	1
Autodiagnosis elements	**1**			1
Change of personal motivation			**1**	1
Communication problems	**2**			2
Concrete behaviour steps		**2**		2
Emotional and behavioural reactions			**1**	1
Exploring psychological reasons	**6**			6
Increasing personal effectiveness, improve self control	**7**	**3**	**1**	11
Individual decision making and plans for future; conclusions for future behaviour; rethinking one's future	**4**	**1**	**1**	6
Influencing positive and negative	**1**			1

outcome expectations				
Irrational belief systems	**1**		**1**	2
Lacking feelings of competence - improvements	**2**	**1**		3
Learned behaviour and how to unlearn it	**1**			1
Personal resources to control and reduce alcohol consumption and to abstain from drugs	**1**		**1**	2
Recognition of function of product dependency			**2**	2
Self reflection referring to former use of drugs		**1**		1
Social responsibility	**1**	**1**		2
Aim: attitudinal and behavioural change concerning alcohol				**106**
(self) reflections on (consuming) alcohol and drugs	**3**			3
abstinence	**1**			1
Alcohol consumption patterns	**8**			8
Analysis of behaviour	**1**			1
Avoid relapse	**3**			3
Background information on alcohol and driving	**1**		**4**	5
Change of drinking habits/behaviour	**6**			6
Changing attitudes towards drinking	**1**			1
Coping with difficult situations	**1**			1
Drinking motives	**3**			3
Effects from alcohol/drugs; alcohol and body	**9**	**1**		10
Elaboration and planning of behaviour strategies to prevent future drink driving, future plans for drink driving	**9**			9
Explore attitude to drink driving	**3**			3
Habit development	**1**			1
Influence of alcohol on driving behaviour	**15**			15
Measurement of alcohol in hours	**1**			1
Measurement of units of alcohol	**4**			4
Problem analysis	**1**			1
Product information on alcohol	**5**			5
Reasons for alcohol abuse	**1**	**1**		2
Reasons for alcohol consumption	**6**			6
Reasons for drunken driving	**2**	**1**		3
Residual alcohol	**4**	**1**		5
Self management			**2**	2
Separation of drinking and driving	**5**			5
Significance of alcohol	**1**			1
Unconscious determination of alcohol use	**1**			1
Aim: attitudinal and behavioural change concerning drug consumption				**19**
Analysis of drug consumption development		**2**		2
Background information on drugs and driving	**2**	**2**	**1**	5
Difference between consumption		**1**		1

and drug abuse				
Drug product information		**1**		1
Effects of drug and driving		**1**		1
Elaboration of positive effects of abstinence or compliance to substitution treatment on personal-emotional-self-esteem		**2**		2
Learned behaviour and how to unlearn it		**1**		1
Legal substitution		**1**		1
Motives for drug consumption		**2**		2
Risk of drug consumption in general life and traffic		**2**		2
Unconscious determination of drug use		**1**		1
			In total	**235**

235 important themes of DR courses were stated in the questionnaires; multiple answers had been possible. This refers to a very elaborated approach of the submitted DR measures.
Themes of the aim “attitudinal and behavioural change according to alcohol consumption” were most often mentioned (specifically for DUI courses, but also some DUID programmes deal with alcohol consumption aspects). The topics target at influence on alcohol and driving behaviour, change of drinking habits and behaviour, develop new behaviour to avoid drink driving.
Concerning change of attitudes and behaviour for drug consumption background information on drugs and driving is mentioned, furthermore analysis of drug consumption development and elaboration of positive effects of abstinence.
Aiming at consciousness raising for instance knowledge about risks and legal consequences, interpersonal-relational, occupational and health related aspects are covered within the courses. In case of motivation and reflection important themes discussed are exploring psychological reasons, analysis of offence and its background. Information deficits are resolved by topics like knowledge on human behaviour and information on law**.**

7.4.3.5 Programme evaluation

Participant feedback is the type of evaluation most often conducted.
40 DUI programmes, 10 DUID programmes and 10 mixed programmes conducted at least one kind of evaluation (participant feedback, content evaluation, process evaluation or outcome evaluation). 13 DUI programmes, 11 DUID programmes and 2 mixed programmes have not been evaluated until now. So DUID measures are less often evaluated than other programme types.

7.4.3.6 Programmes’ success according to providers

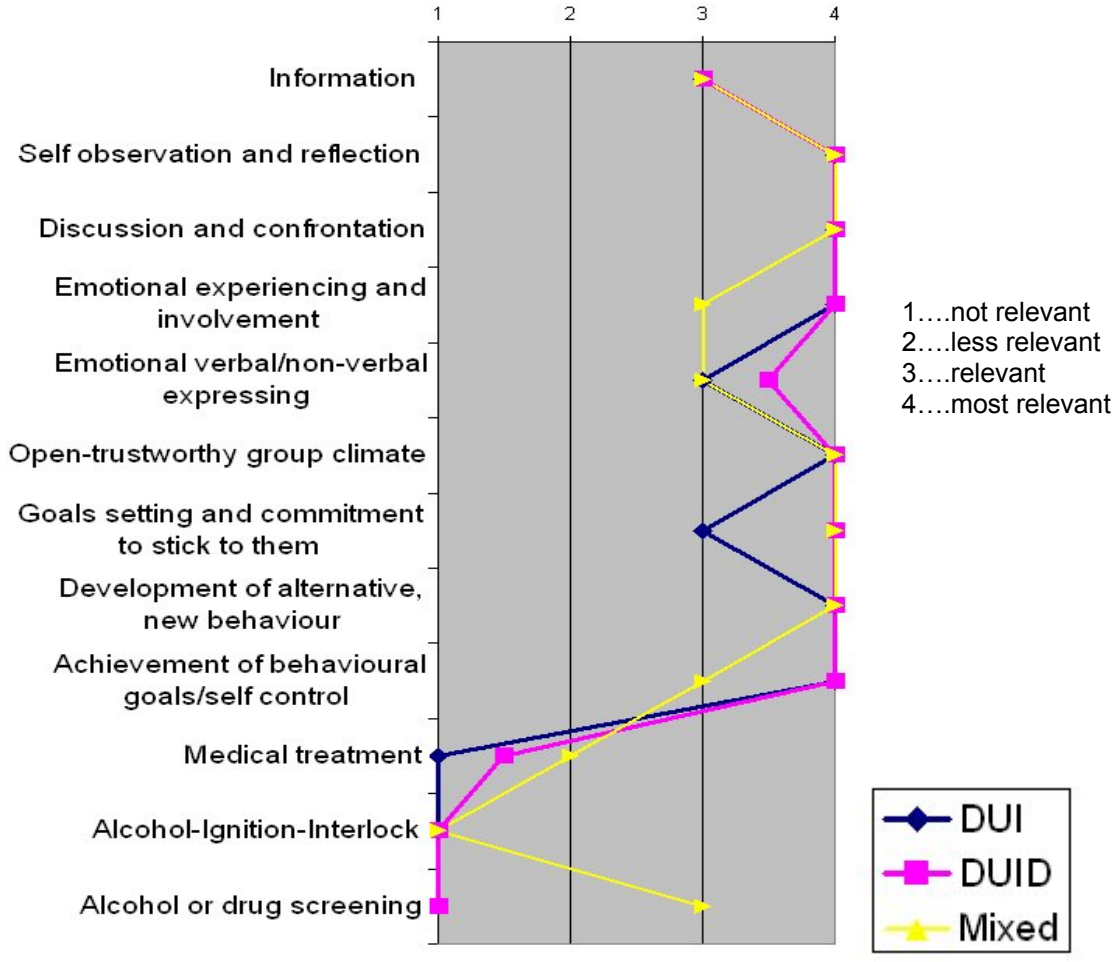
One question of the questionnaire dealt with aspects of programme’s success. Providers had to estimate relevance of certain programme aspects.
As the distribution of the values is not “normal”, non parametric tests were performed. The chart shows the medians of the groups.
Over all programmes, self observation and reflection had the highest number of “most relevant” answers. Development of alternative behaviours and further discussion and confrontation were considered as also very important.
There are many aspects where all three DR types give the same estimations:
“Self observation”, “discussion”, “development of alternate behaviour”, “open and trustworthy climate” are seen as equally most relevant.
In case of information (estimated as “relevant”) the estimations are also unique.

In case of emotional experiencing and achievement of behavioural goals there is a tendency for DUI and DUID programmes to estimate this as more relevant than mixed programmes.
Goals setting has got in tendency higher estimation in DUID and mixed programmes than in DUI courses.
Emotional expressing has got slightly higher values in DUID programmes.
Medical treatment is seen as less relevant in mixed programmes, whereas it is seen as not important in DUI and DUID programmes.
Alcohol and drug screening has got "relevant" estimations within mixed programmes.
The following figure 1 shows the "profiles" of the success factors by the three different programme types.

The specification on estimations of relevance concerning programmes' success factors shows the following results (see figure below).

Figure 12: PQ Form B, estimations of relevance concerning success factors per programme types

(Values are medians)



The figure 1 shows conformities but also small divergences between the programme types.

7.5 Outcomes of Form C - Prior driver assessment or diagnostic screening

Form C of PQ focuses on prior driver assessment carried out within the provider organisations.

The following table shows the overall results of PQ Form C for all questions. For some questions multiple answers were possible. In some questions the number of answers varies due to missing values.
For a better comprehensibleness the results (numbers) are always inserted in the respective PQ question in blue colour.

In total 15 providers from 7 countries document intra organisational assessment or screening prior to DR measure. These countries are: Belgium, France, Germany, Hungary, Italy, Sweden and Switzerland[27].

The specification on prior assessment and diagnostic screening shows the following results (see table below).

Table 107: PQ Form C, overall results

1. Which assessment approach(es) is(are) used in order to assign a DUI (driver under influence) offender to a specific rehabilitation measure/programme:		
Medical approach	*8* Yes for DUI Alcohol	*5* Yes for DUID Drugs
Psychological approach	*12* Yes for DUI Alcohol	*8* Yes for DUID Drugs
In case of both, which is the predominant approach: *2* Medical or *5* Psychological		
2. Which tools are used in order to assign a DUI offender to a specific rehabilitation programme:		
Interview:	*10* Yes for DUI Alcohol	*6* Yes for DUID Drugs
If carried out, please specify: *3* Developed within the organisation, please specify the topics: *7* Officially available instrument(s), please specify the tool(s):		
Physical examination:	*5* Yes for DUI Alcohol	*4* Yes for DUID Drugs
If carried out, please specify: Physical heath status Mental health status Other, please specify:	 *5* *2* *1*	 *3* *1* *1*
Biological marker(s):	*8* Yes for DUI Alcohol	*6* Yes for DUID Drugs
If carried out, please specify the substance examined: Blood…… Urine…… Sweat…… Saliva…… Hair…… Please specify the alcohol marker:	 *8* *2* *0* *0* *0*	 *2* *6* *1* *2* *2*

[27] In case of Switzerland it was stated that the situation on assessment varies between cantons.

Screening tool(s) on substance use disorders:	*7* Yes for DUI Alcohol	*2* Yes for DUID Drugs
If carried out, please specify:		
AUDIT (Alcohol Use Disorders Identification Test)	*4*	*0*
CAGE (Cut, Annoyed, Guilty, Eye opener)	*1*	*2*
DAST (Drug Abuse Screening Test)	*0*	*1*
MAC-R (MacAndrew Alcoholism Scale – Revised)	*1*	*0*
MALT (Munich Alcoholism Test	*1*	*0*
MAST (Michigan Alcoholism Screening Test)	*0*	*0*
1 Other tools for alcohol screening, please specify:		
3 Other tools for drug screening, please specify:		
External medical/therapeutic information:	*7* Yes for DUI Alcohol	*5* Yes for DUID Drugs
If carried out, please specify:		
Comprehensive information on medical/therapeutic status from treating medic(s)/therapist	*3*	*2*
Information on / confirmation of actual treatment status	*1*	*0*
Opinion from an external medical/therapeutic expert	*4*	*1*
Laboratory results	*5*	*4*
1 Other medical/therapeutic information for DUI of alcohol, please specify:		
0 Other medical/therapeutic information for DUI of drugs, please specify:		
Performance / functional testing:	*5* Yes for DUI Alcohol	*4* Yes for DUID Drugs
If carried out, please specify:		
Perceptual functioning	*5*	*3*
Reactive, loco-motor functioning	*5*	*4*
Cognitive functioning	*4*	*2*
If cognitive functioning testing, which areas: Memory…….	*2*	*0*
Concentration..	*5*	*3*
intelligence……	*1*	*0*
4 Which test(s) are applied for performance/functional testing, please name:		
Personality testing:	*2* Yes for DUI Alcohol	*0* Yes for DUID Drugs
2 If carried out, please specify: Which tests / questionnaires are applied, please name:		
Practical driving tests:	*3* Yes for DUI Alcohol	*2* Yes for DUID Drugs
If carried out, please specify: Off-road or simulator	*0*	*0*
On-road.	*3*	*2*

Qualification of the person conducting psychological assessment:	For DUI Alcohol:	For DUID Drugs:
Please specify: Psychologist without further qualification	*2*	*2*
Clinical psychologist	*1*	*1*
Traffic psychologist	*8*	*5*
Neuropsychologist	*0*	*0*
Other, please specify:	*1*	*1*
Qualification of the person conducting medical assessment:	For DUI Alcohol:	For DUID Drugs:
Please specify: General Practitioner	*2*	*2*
Psychiatrist	*2*	*1*
Neurologist	*0*	*0*

	Internist Specialist in traffic medicine Other, please specify:	*0* *6* *2*	*0* *4* *2*
Total number of assessments in order to assign a DUI to a specific rehabilitation programme in 2006:		Varies from 53 to 3889 (n=8)	Varies from 25 to 432 (n=3)
Estimate the percentage of dependency diagnoses (ICD-10/DSM-IV): **Estimate the percentage of harmful use (ICD-10) / abuse (DSM-IV):**		Varies from 15% to 65% (n=4) 8% to 70% (n= 6)	Varies from 5% to 50% (n= 3) 5% to 80% (n= 3)

In the following the results are presented in detail by type of offender.

7.5.1 Results on assessment/screening for DUI offenders

15 providers from seven countries filled in PQ Form C. The countries are Belgium, France, Germany, Hungary, Italy, Switzerland and Sweden.
Regarding intra organisational assessment a psychological approach is the predominant approach compared to a medical one (13:8). But about half of the providers use both approaches.

The tools that are used are shown in the following table (see table below).

Table 108: PQ Form C, tools used in DUI assessment/screening per provider (not named, only country abbreviations)

Country	DUI – medical approach	DUI – psychological approach	Interview	Physical examination	Biological markers	Screening tool on substance use disorders	External medical/therapeutic information	Performance / functional testing	Personality testing	Practical driving test
BE		X	X		X		X			
FR		X				X	X			
FR		X.			X	X		X		
FR		X				X				
FR	X						X			
FR	X						X			
FR	X	X	X	X	X	X	X	X		
FR		X	X		X					
DE	X	X	X	X	X			X		
DE	X	X	X	X	X			X		X
DE	X	X	X	X						X
HU		X	X	X	X	X	X			X
IT	X	X	X		X				X	
CH	X	X	X			X	X	X	X	
SE		X	X			X				
Total	**8**	**13**	**10**	**5**	**8**	**7**	**7**	**5**	**2**	**3**

Providers make use of

- Interview in ten cases;
- Physical examination in five cases;
- Biological markers in eight cases;
- Screening tools on substance disorders in seven cases;
- External therapeutic information in seven cases;
- Performance and functional testing in five cases;
- Personality testing in two cases;
- Practical driving tests in three cases.

Interview is the tool which is used most often, followed by biological markers. Screening tools on substance disorders and external therapeutic information are used by seven providers. Physical examination is applied by five organisations; performance and functional testing are applied by five organisations. Personality testing and a practical driving test are less often applied.

In the following, further results are summarized:

- Concerning interview, more providers apply an instrument which is officially available, but also three have developed an interview format within their organisation.
- Concerning physical examination of DUI offenders, physical health status is assessed mostly. Two providers also evaluate mental health status and one provider considers also if an addiction is given.
- Preferred biological markers are those for blood in most of the cases, two providers also use urine as specimen. Blood markers in use were named by two providers: These were GGT, GPT (Glutamat-Pyruvat-Transaminase; equivalent to ALT or ALAT), GOT (Glutamat-Oxalacetat-Transaminase; equivalent to AST or ASAT) and Ethylotest. Within category “others” four providers state to use alcohol breath tests as biological markers.
- If a screening tool for substance disorders is applied, AUDIT is carried out in four cases, one provider uses CAGE, one MAC-R and one time MALT for DUI offenders.
- Some of the providers use external medical or therapeutic information, first of all laboratory results, but also opinion from other experts and comprehensive information on medical/therapeutical status given by medics or therapists. Information on actual treatment status is only considered by one provider and by another if there was information on physical and psychical health problems.
- Performance testing covers above all concentration, perception, reactive behaviour, locomotor ability and cognitive functioning. Memory and intelligence are less often examined.
- Few providers name psycho-technical test devices (Devices: two ART2020; one Wiener Testsystem), one provider only states that psycho-technical tests are in use.
- Personality testing is only conducted by two providers (Devices: two ART2020; one Wiener Testsystem).
- A practical driving test on road is conducted by three providers.
- Concerning qualification of persons first of all traffic psychologists work in this area.
- Concerning medical assessment, the responsible personnel are first of all specialists in traffic medicine.
- Regarding DUI offenders, the estimated percentage of dependency diagnoses varies from 15 to 65%; diagnosis of harmful use from eight to 70%.

7.5.2 Results on assessment/screening for DUID offenders

Regarding DUID offenders more often a psychological approach in the assessment/screening is used than a medical one (8:5).

The tools that are used are shown in the following table (see table below).

Table 109: PQ Form C, tools used in DUID assessment/screening per provider (not named, only country abbreviations)

Country	DUID – medical approach	DUID – psychological approach	Interview	Physical examination	Biological markers	Screening tool on substance use disorders	External medical/therapeutic information	Performance / functional testing	Personality testing	Practical driving test
BE		X	X		X		X			
FR		X					X			
FR	n.a.	n.a.								
FR	n.a.	n.a				X	X			
FR	n.a.	n.a.								
FR	n.a.	n.a.								
FR	X	X	X	X	X	X	X	X		
FR		X	X		X					
DE	X	X	X	X	X			X		
DE	X	X	X	X				X		X
DE	X	X	X	X	X			X		X
HU	n.a.	n.a.								
IT	n.a.	n.a.								
CH	X						X			
SE		X			X					
Total	**5**	**8**	**6**	**4**	**6**	**2**	**5**	**4**	**0**	**2**

Providers make use of:

- Interview in six cases;
- Physical examination in four cases;
- Biological markers in six cases;
- Screening tools on substance disorders in two cases;
- External therapeutic information in five cases;
- Performance and functional testing in four cases;
- Personality testing in zero cases;
- Practical driving tests in two cases.

Interview and biological markers are the tools which are used most often, followed by external therapeutic information, then physical examination. Four providers carry out performance and functional testing. Screening tools on substance disorders are applied by two organisations and also practical driving test is carried out by two providers. Personality tests are not in use by providers responding in this interrogation.

In the following, further results are summarized:

- Concerning physical examination of DUID offenders, physical health status is assessed mostly. One provider also evaluates mental health status and one provider considers also if an addiction is given.
- Preferred biological markers are urine, but also blood markers, saliva, hair and sweat are in use.

- Only two providers apply a screening tool for substance disorders, two providers use the CAGE and one also the DAST.
- In case of external information, laboratory results are used first of all, then information from treating therapist and opinion from external expert.
- Four providers make use of performance testing, carrying out tests on reactive and loco-motor functioning, perceptual functioning and concentration; and two providers also evaluate cognitive functioning.
- Concerning qualification of persons first of all traffic psychologists work in this area.
- Concerning medical assessment, the responsible personnel are first of all specialists in traffic medicine.
- Regarding DUID offenders, the estimated percentage of dependency diagnoses varies from 5% to 50%; the diagnosis of harmful use from 5% to 80% (for both percentages: three estimations).

III. Overall results, discussion and conclusions

The conduction of the research on the state of the art was carried out in two parts: the literature analysis and the provider survey. Both parts are complementary to each other. The literature analysis delivers important information from the scientific community and experts focussing on DR. In addition, the provider survey presents the actual situation on a day-to-day basis in this field.

Main limitations of the literature review may be due to the language and publication biases. Available international literature is often limited to English language. The DRUID WP5 team added relevant literature on the topics which are published in German, but publications in other languages may be underrepresented. The use of literature databases like PubMed, offers the possibility to include international scientific literature, but may lead to an exclusion of relevant publications on traffic safety. The use of unpublished information offers the possibility to include very actual information which is particularly helpful in unexplored scientific fields.

Furthermore, it became clear during the evaluation of the provider survey that terminology may have been interpreted differently because of specific country related approaches, experiences and traditions. The information on the DR frame conditions seemed strongly linked to the programmes' approach and context and therefore did not provide relevant input for the decision criteria.

This chapter summarizes the main results of the literature analysis and the provider survey, and discusses further conclusions regarding resulting decision criteria for driver rehabilitation.

1 Summary of results of the literature analysis

The review on DR was mainly based on information published in national and international scientific journals. Additional knowledge from country experts was included. The analysis covered the four areas:

1. Identification of different types of DUI/DUID offenders
2. Review of existing DUI/DUID assessment procedures
3. Review of existing DUI/DUID rehabilitation measures
4. Review of addiction treatment and options for dependent DUI/DUID offenders

Main outcomes regarding these topics are summarized in the following subchapters.

1.1 Identification of different types of DUI/DUID offenders

The review on DUI/DUID characteristics indicates a marked heterogeneity of DUI/DUID offenders which transcends several dimensions. Many variables differentiate DUI/DUID offenders from the general population and research on subtypes of DUI/DUID offenders has furthermore led to greater awareness of the differences within this population. DUI/DUID offenders are no homogeneous group. Thus, the basic idea underlying the research question of identifying different DUI/DUID offender types may be important with regard to their different needs for DR. The matching of DUI/DUID offenders to the appropriate rehabilitation program should increase the effectiveness of the intervention and thus have a positive impact on traffic safety. Although empirical studies on the effectiveness of treatment matching are rare and limited, the literature review did identify multidimensional variables which are related to increased risk for DUI/DUID and thus may provide relevant information about rehabilitation requirements.

Socio-demographic variables. Almost nine out of ten DUI/DUID offenders are male, although the amount of female offenders seems to increase. All studies report younger age groups (<35 years) to DUI/DUID more often than older age groups (>35 years). DUID offenders (essentially cannabis) often are even younger. DUI offenders generally have a lower educational level, are more often unemployed or involved in blue collar occupations and more often belong to the lower socio-economic strata. The majority lives as singles or separated; others are divorced. Regarding these last issues, very limited results are presented on drivers under influence of illicit drugs.

Objective driving and lifestyle variables. Most of the DUI/DUID offenders are highly suspicious for any kind of unsafe driving and a high amount tends to recidivate DUI/DUID. A lot of offenders have prior traffic offence records besides DUI/DUID, or other criminal records. Furthermore, some studies found a link with high driving frequencies and high mileages while others did not.

These variables allow a formal group-level identification of persons at increased risk for DUI/DUID. Other variables allow the identification of the mechanisms and/or problems underlying DUI/DUID, and thus of resources, needs, opportunities and/or limitations of the offender with regard to (certain types of) rehabilitation:

Drinking behaviour. Heavy to problematic alcohol consumption is over-represented, comprising regular, high, uncontrolled and inadequate consumption, binge drinking, abuse and dependence. Many first offenders may be moderate drinkers though. Co-morbidity of alcohol abuse or dependence and clinical disorders (e.g. depression) can sometimes be found within this population. Different studies found evidence for a link between DUI, reported stress and drinking for stress reduction.

Illicit drug use. Heavy consumption and dependency are strong risk factors for driving under the influence of one's favourite drugs. These heavy consumers often drive under influence for situational reasons. Multiple drug use and driving are quite often reported. A substantial amount of drug users reporting DUID also report DUI, although drug users/drivers generally report more negative attitudes towards drink driving than towards drug driving. Cannabis users are emphasized as risk group for DUID as cannabis is most frequently used in general and most often detected in DUID offenders. Drivers under influence of cannabis (and even cannabis users in general) furthermore have more permissive DUID attitudes and low estimated risk perceptions.

DUI related psychosocial characteristics. Deviant drink and drink driving attitudes are among the main DUI characteristics, including attitudes favouring alcohol consumption (functions of alcohol), permissive drink driving attitudes and permissive attitudes towards general rule breaking. A lack of knowledge about the effects of alcohol, about responsible drinking and missing strategies to avoid drink-driving conflicts can increase the risk to DUI, as well as low risk perceptions like underestimation of the effects of alcohol on driving ability and of the accident or detection probability. An influence of alcohol related social norms/environment refers to the high impact of social models of DUI (essentially family, peers) and peer pressure, but also to the influence of the psycho(social) role of drinking. The important role of alcohol in social activities and the high susceptibility to peer pressure is specifically stressed among young persons. A "driver role" on the other hand may protect against normative group pressure. Specific decision making aspects seem to be related to engaging in DUI: low habitual moral attachment to the norm against DUI, low behavioural self-control and poor coping styles in combination with salient impelling cues (e.g. positive previous experiences, overestimation of driving capacities) and a lack of inhibiting cues. Low self-control is found to be an important psychological predictor of drink driving. Social aspects (social disapproval) can be identified as very important inhibiting cues for DUI.

DUID related psychosocial characteristics. Drug drivers often have more positive attitudes towards drug driving; have generally very low risk perceptions of drug effects on the driving ability and belief that the accident or detection probability is very low (essentially with regard to cannabis, but also stimulants); this is even more pronounced than for drivers under influence of alcohol. The influence of social norms/environment is characterized by peer pressure, although this seems to be less pronounced than for drivers under influence of alcohol; often there is a lack of perceived social disapproval of reference groups.

Situational or environmental aspects on DUI/DUID. Situations where driving is necessary, in combination with drug use in that same situation, often lead to DUI/DUID. At increased risk are, for example, heavy users or dependents driving under the influence for everyday purposes, but also social or leisure time users using alcohol or drugs at social places from which they have to depart afterwards (e.g. clearly identified increased risk for DUID when leaving parties, discos etc. to go home). Furthermore, truck or bus drivers also seem to be at increased risk due to the frequent use of stimulating drugs on-the-job. Other identified DUI/DUID supporting factors are restricted transport alternatives and the need for a car due to low opportunities of public transport, specific travel distances and a rural living environment. In addition to that, the actual detection chance of DUID is generally low. Finally, a rather separate factor influencing the decision to engage in DUI/DUID is related to the direct effect of the substance use in the situation itself. Alcohol myopia for instance refers to reduced information processing and decreased self-evaluation and risk assessment with increasing levels of intoxication.

General personality, lifestyle and decision making characteristics related to DUI/DUID. DUI/DUID can be related to personality traits like sensation seeking, extraversion, negative emotionality, deviance, social unconventionality, impulsivity and hostility/aggression. Some offenders are characterized by their generally risky lifestyle with also other problem/deviant behaviour. Specific decision making processes often lie at the basis of engaging in DUI/DUID. Lower (feelings of) behavioural self-control, lower self-efficacy, poor coping styles (coping with stressors, frustration, tension) and external locus of control are common. Many offenders seem to have a general difficult life constellation and/or suffer from acute emotional stress.

Special attention is drawn to the identification of characteristics of the high risk group of recidivists.

Characteristics of DUI/DUID recidivists. Even though the results of the recidivism review seem confounding regarding several aspects, most studies remain clear regarding the following risk factors:

1. Prior driving records: driving history is a variable often found to most strongly differentiate between those who will recidivate and those who will not. The higher the amount of prior records, the higher the recidivism risk;
2. Gender: males are of higher risk to drive under the influence of alcohol or drugs and they are of higher risk to re-offend;
3. Age: drug and alcohol re-offenders tend to be significantly younger at the first offence than those who do not re-offend;
4. Education: less educated drivers have a higher risk to be re-convicted for alcohol or drug driving offences.

It can be stated that special attention should be given to those drivers who combine multiple of the clearly identified risk factors, because according to all scientific knowledge the more risk factors an individual features, the higher the recidivism risk.

DUI/DUID types and rehabilitation matching. Interventions must be practical, in terms of costs and availability, and be related to consistently elicited DUI/DUID typologies. In addition though, the amount of alternatives must be kept to a reasonable number, when attempting to match the relevant characteristics of the different DUI/DUID types.
Regarding intervention programmes different studies revealed that certain types of offenders may profit more from certain types of interventions (in terms of mainly required approach (educational, psychological, therapy), long- vs. short term, etc.), e.g. offenders with clinical substance use disorders requiring more intense treatment or depressed mood offenders requiring interventions to modulate negative affects. Furthermore, the literature also provided indications that alcohol vs. drug impaired drivers, but also young drivers may require different focal points in the rehabilitation. The impact of problem awareness and motivation for change is also stressed as offenders can be in different stages of change which may require different rehabilitation approaches, which may be intercepted by flexibility in the rehabilitation execution.

1.2 Review of existing DUI/DUID assessment procedures

The review of existing DUI/DUID assessment procedures indicates a great variety in procedures, measures and tools currently in use. It should thus be stressed first that the implementation of DUI/DUID assessment procedures greatly depends on country specific approaches and legal contexts. The national context and traditions define the scope and major aims of the assessment, and also the professional categories involved (medical vs. psychological experts) which have their own competences and proper legal responsibilities. These are all are determining factors for the actual procedures, tools and measures to be used. This diversity makes it difficult to identify a uniform procedure for Europe. The literature does provide good practice guidelines though.

The selection of the most appropriate rehabilitation scheme for a DUI/DUID offender requires the identification of the individual and specific needs of offenders. In Europe comprehensive DUI/DUID assessment is primarily carried out in the frame of the fitness to drive decision.

As rehabilitation aims at avoiding re-offending, it should focus on those offender characteristics and circumstances that increase the risk for recidivism.
First indications of the risk profile of a DUI/DUID offender may be found at the DUI/DUID offence level. Parameters like the BAC at arrest for instance, but also information on previous offences (judicial recidivism), can give an impression of the risk profile. Such parameters may serve as assignment criteria for more elaborate DUI/DUID assessments or even directly for specific DUI/DUID rehabilitation. In the frame of the fitness to drive examination specific individual needs for rehabilitation may be identified. Assessment of clinical disorders like substance dependency or abuse provides indications of an offender's fitness to drive; performance tests can indicate substance use related declined driving abilities. Furthermore, traffic psychological assessment may allow a prognosis of recidivism risk. Such types of assessments support fitness to drive decisions while revealing also specific needs and options for rehabilitation.

Multidisciplinary approach. Medical and psychological examinations are the main professional fields mentioned with regard to assessment of DUI/DUID offenders. The medical examination of offenders essentially focuses on the subject of substance use disorders within a fitness to drive evaluation, while a psychological examination can provide essential information with regard to the psychological and

social aspects related to clinical diagnoses. Psychologists can furthermore judge complications due to alcohol/drug dependency or abuse (like deficits of cognitive functions), can reveal the specific constellation of underlying factors that led to DUI/DUID and can thus indicate specific needs for rehabilitation of an offender.

Country approaches. The DUI/DUID offender assessments' criterion in the current European context varies depending on the specific legal regulations (like fitness to drive criteria) in each country. In some countries legally requested DUI/DUID assessments purely focus on detecting whether a clinical disorder lies at the basis of the DUI/DUID offence (e.g. in Belgium where the fitness to drive assessment is not linked to rehabilitation), while in other countries recidivism risk per se (even without an underlying pathological condition) is additionally considered in the frame of the fitness to drive decision (e.g. Austria, Germany). The country approaches vary widely regarding the link of DUI/DUID offender assessment and the assignment to DUI/DUID rehabilitation courses. Some countries do show a direct link of both domains (e.g. Hungary) while other countries (e.g. Belgium) do not combine the fitness to drive assessment with a further assignment to a rehabilitation measure. Formal criteria to assign offenders for a fitness to drive assessment are generally existent (e.g. certain BAC criteria; license withdrawal) and some countries use similar formal legal criteria to assign offenders directly to DR (e.g. Austria). In some countries the result of a fitness to drive assessment always leads (e.g. Hungary) or may lead (e.g. Germany) to an assignment to DR. In for example Belgium and France no such strict legal assignment criteria or procedures for DR are specifically defined; here the assignment is rather individually determined (e.g. public prosecutor or judge proposal). Once legally assigned though it seems that often a differentiation is made between several types of legally provided DR, taking offender characteristics like drug type (alcohol versus illicit drugs), age, or severity of substance use problems etc. into account. The authors of the EU project ANDREA recommend a standardized screening/assessment procedure, before rehabilitation course participation, and so do the national guidelines of the examined oversee countries USA and Canada.

Measures and tools. Regarding the DUI/DUID assessment instruments, it has to be pointed out that a huge variety of tools which can provide relevant information on DUI/DUID offenders exist. Many of the tools used within fitness to drive assessment to detect the presence and/or effects of clinical disorders like substance abuse or dependency have originally been developed within a clinical setting. Additional tools being used in the scope of substance use assessment are laboratory tests that can tap biological markers of current and chronic use of certain substances. As by law clinical substance use disorders are contra-indications for driving, these tools are effective in fitness to drive decision making, but besides that, the derived information on the consumption patterns (very detailed in some tools) can guide the decision making on requirements for rehabilitation/treatment.
In general, the literature recommends using a combination of biochemical measures (biological markers) and self-reported screening or assessment measures to assess the consumption pattern of DUI offenders. On the one hand psychometric instruments on substance related disorders usually have higher specificity and sensitivity than laboratory tests in the detection of substance use disorders. On the other hand, self-reporting data depend on the willingness of the individual to acknowledge the severity of the substance use pattern. Particularly in the fitness to drive assessment of DUI/DUID offenders, where the individual is likely to be reluctant to admit his/her level of consumption or its adverse consequences, the use of biological markers and other objective facts such as for example prior offence records are advisable. Moreover, the pure awareness that someone's self-report is subject to corroboration by laboratory tests may also prompt higher levels of candour on the self-report measures.
Furthermore, as clinical disorders like substance dependency may lead to declined functional/cognitive capacities, performance tests can be used to evaluate whether an offender has

sufficient capacities to drive safely. Such tools can be selected from the broad pool of general clinical/neuropsychological assessment, although based on traffic psychological research specific test batteries validated on the driver population, and fine-tuned to their specific problems, were developed. Traffic psychological research furthermore led to specific tools' development, based on the identification of the relevant psycho-social and personality related characteristics influencing and/or underlying all kinds of traffic related misbehaviour, including DUI/DUID. The focus of DUI/DUID traffic psychological assessments lies on evaluating the relevant performance and personality aspects underlying DUI/DUID and essentially on the change processes realized by an offender with regard to his/her attitudes, behaviour and lifestyle. Such evaluations allow giving a prognosis about recidivism risk in the scope of fitness to drive evaluations.

Screening/assessment tools always have to be seen as elements within a broader DUI/DUID assessment procedure, as no tool can function as a stand alone instrument to evaluate DUI/DUID offenders sufficiently. As an offender's permission to drive is at stake in a fitness to drive assessment, it is very important that the selected DUI/DUID screening/assessment procedure fulfils psychometric standards, and it is recommended to combine several screening and assessment tools including also objective measures such as biological markers or prior offences. The importance of including a multidisciplinary approach covering medical, psychological and social aspects in order to suit the different dimensions of the DUI/DUID problematic and to be able to make a valid and reliable decision is emphasised.

Regarding the cost-efficient point of view, a DUI/DUID offender is first screened based on objective factors like the BAC or prior offences. As the country descriptions indicated, such rather strict group-level assignment criteria are yet generally applied to refer to fitness to drive assessment and sometimes even to refer directly to DR. At this early stage the identified risk factors for recidivism could also be weighed. Low cost-intensive individual risk evaluations with for example short screening tools on substance use disorders shortly after the offence could also be considered for direct referring to a type of DR and/or for referring to more elaborate assessment. Those offenders identified as possible high-risk drivers could then be assessed in a more elaborate procedure.

Of course it is very important to take the context of an assessment into account, as it determines the selection of tools and the whole procedure. In contrast to the assignment/assessment for DR, the legal context of a fitness to drive decision is characterised by two major problems:

1. low validity of self-reported substance related problems in DUI/DUID subjects, as the DUI/DUID offender wants to escape further legal sanctions or consequences;
2. unacceptability of high chances of false positive diagnoses in the legal procedure.

In the legal context of a fitness to drive decision, high chances of false positive outcomes are unacceptable. The withdrawal of a driving licence presents a curtailment of somebody's mobility, thus outcomes have to produce certain legal evidence, i.e. a high specificity is obligatory.

The importance of an integrative, thorough and comprehensive approach is thus more emphasized in the scope of a fitness to drive assessment as compared to an assessment/assignment only for DR referral. If a link exists between the fitness to drive assessment and the DR, the in-depth assessment results could indicate the needs for and form the assignment to rehabilitation. In case no link exists, and as assignment to a less adequate DR is less invasive – and may even be seen as a first step towards later more adequate assignment – a cost-efficient approach for assigning offenders to DR could be restricted to the evaluation of formal assignment criteria, taking also into account risk

characteristics for recidivism, ideally additionally combined with cost-efficient screenings for the most relevant aspects (e.g. addiction or not).

1.3 Review of existing DUI/DUID rehabilitation measures

The review on existing DUI/DUID rehabilitation measures which was to a large extent based on literature review and published information, focussed on four major areas:

1. Historical perspective and previous development of DUI/DUID rehabilitation in Europe;
2. Different scope of current DUI/DUID procedures inside and outside Europe;
3. Effectiveness of existing DUI/DUID rehabilitation measures;
4. Ignition interlock devices as a structural intervention measure for DUI.

In the following, main results and conclusions from these areas will be highlighted separately for DUI and DUID offenders.

Rehabilitation of DUI offenders

Implementation and application. Rehabilitation programmes for DUI offenders are based on a rather long term tradition in development and practical application in Europe. It is recognized on traffic safety expert level and numerous Member States have already established and realized this kind of intervention. Yet, as it has been established in the particular countries without mentioning any superordinated solutions (on EU level) so far, its way and level of integration into the particular national contexts regarding drink driving and licensing as well as its binding character (obligatory vs. voluntary participation) varies considerably between Member States.

Taking the situation outside Europe into account, it can be stated that driver rehabilitation is applied in all three states of concern. Regarding the USA, its implementation into the legal systems of different states is diverse. Nevertheless, high level organisations on traffic safety (NHTSA) and alcohol abuse (NIAAA) worked out recommendations which favour treatment as an addition of licence suspension or revocation.
In Australia, the situation is not uniform at all. While some territories/federal states have not implemented driver rehabilitation, others have, whereby in the latter participation is partly mandatory and partly voluntary.
Canada provides the most uniform picture on driver rehabilitation which can also be seen as a result of the long tradition in this area. Nowadays, being included into high level strategies on public health issues as well as on the reduction of impaired driving, the implementation of driver rehabilitation goes along with concrete recommendations and realization solutions for the entire group of drink driving offenders, addicts included. It is recommended that participation in driver rehabilitation should be a condition of licence reinstatement for an impaired driving offence.

Programme access. In Europe, different ways to enter a DR programme were found in Member States, ranging from the purely voluntary offender's decision over court recommendations or offers to participation based on a prior medical-psychological assessment in connection with the agreeing decision of the competent licensing authority or obligatory participation due to the BAC level at the offence. Thus, assignment or entering a programme can be a subjective decision either on the offenders' or the involved institutions' side, but can also be based on expert opinions or formal criteria.

Outside Europe, both the US and Canadian high level organisations consider evaluation or screening/assessment as a necessary tool for a decision on an appropriate intervention or treatment. In Australia, assessment for alcohol dependence is mentioned.

Principal rehabilitation approach. Although some differences in the main focus of the rehabilitation concepts for DUI (more educational/counselling vs. more therapeutic) were found, a clear preference for approaches which combine informative/educative, psychological/therapeutic and group dynamic elements can be observed in Europe. The topics to be dealt with are not restricted to traffic issues, but rather extend to private, lifestyle or health issues. Initiating and realizing a change process requires personal involvement of the individuals of concern. The active participation of the offenders, stimulated and supported by highly professional course leaders with a (traffic-) psychological and/or therapeutic background, was observed as a decisive element of course success.

Regarding the situation outside Europe, no uniform or general approach can be identified in the USA but rather different ones, such as self-help groups, educational programmes, in- and outpatient counselling programmes of varying intensity, victim impact panels, intense supervision programmes or treatment programmes in prison. Nevertheless NHTSA and NIAAA recommend that treatment should combine strategies of education, therapy and aftercare. In Australia, the interventions' approach is a more educational one with a rather short duration. In Canada, both educational and therapeutic activities, regardless of the programme's length, are recommended.

Differentiation of programme types. In Europe, it can be observed that in some Member States only one DR programme for all DUI offenders is applied, although alcohol addicts may be excluded by means of a prior assessment process. In other European countries specific programmes for certain kinds of DUI offender groups exist according to partly rather different criteria such as type of driver (inside or outside the licence on probation period), severity of the drink driving problem (repeat offenders), legal consequences of course participation, assessed severity of the alcohol problem itself or results of the medical psychological assessment. In general, no evidence for the superiority of one or the other differentiation was found.

Regarding the situation outside Europe, NHTSA and NIAAA in the USA recommend a more intense treatment with increasing problem severity. Health Canada provides more elaborated recommendations and points out the necessity of different types of interventions for different types of impaired offenders with at least two levels of interventions depending the substance consumption severity and related problems.

Effectiveness of rehabilitation programmes. The European standard group intervention programmes have good scientific evidence regarding reduction of recidivism and thus its direct relevance for traffic safety. An average reduction rate of 45.5% was observed which basically confirms the ANDREA result of minus 50% recidivism. Nevertheless a rather broad variation in the reduction rates was found ranging from 15.4% up to 71.9%. This suggests that the success of individual standard group intervention programmes may differ considerably.
The evaluation results of other psychological intervention approaches in- and outside Europe, e.g. longer lasting group interventions or single measures, carried out on a voluntary base within the suspension period seem also promising. Some studies clearly reveal low recidivism rates although others show problems as lack of control groups, unpublished concrete recidivism numbers and different evaluation methods which made it difficult to calculate recidivism reduction rates for some of the selected studies. Many of them do show some impact on other criteria as mentioned below.

Effectiveness criteria besides recidivism show similar outcomes in the two distinguished intervention programme categories. European standard group interventions as well as further intervention approaches inside and outside Europe lead to changes related to knowledge on and sensitivity for

alcohol specific impairments, increased problem awareness, less external attribution, influence on the motivation for change, safer attitudes towards drinking and driving, perspectives to avoid future DUI offences and positive participant feedback.

Nevertheless, methodological limitations and weaknesses were observed in many studies, above all lack of control groups which reduces the value of the outcomes.

Alcohol ignition interlock systems. Ignition interlocks serve as structural interventions that control objectionable, unrequested behaviour as long as they are imposed, but achieve this without changing individual attitudes or behaviour in a long term. This is shown frequently by international studies, revealing low recidivism rates during the time of installation, but decreasing recidivism rates after de-installation of the devices. In addition to that the results of the European Alcolock Field Trial support the assumption that ignition interlocks are feasible and practical devices when applied to DUI offenders in combination with rehabilitation with a clear impact on the current DUI behaviour although no long-term effects were supposed to be studied. The outcomes of the Swedish part of the study in which the use of alcohol ignition interlocks was combined with strict medical supervision and regular check-ups are promising though as this programme resulted in a substantial reduction of the alcohol consumption among the ignition interlock users in a long term and the impact of the programme on traffic safety was reported to be high.
All results indicate that an ignition interlock use needs the offenders' motivation and readiness for change to be successful in a long-term. This must be supported at least by medical counselling or other psychological/psychotherapeutic interventions in order to result in a treatment process. The integration of ignition interlock devices in these rehabilitative measures may even be helpful as the recorded breath-test data can serve as behavioural evidences. Hypothetically, the records may even be used as a counselling tool in different ways. First of all, recorded breath-test data could serve as an objective feedback for the counsellor or therapist about the treatment progress. Secondly, it could be used to confront the client with hard facts (e.g. failed start attempts). Thirdly, regarding the fact that recent research indicates that it is possible to predict subsequent DUI behaviour with the data from the ignition interlock recorder the data could be used in order to shape the therapeutic intervention. As these conclusions about the value and usefulness of ignition interlock devices as concomitant features are still hypothetically drawn, the need for further controlled experimental research becomes obvious. Future studies, which focus on the assessment of the magnitude of improvement of rehabilitation programmes by a combined use of behavioural and technical measures, are necessary to gain information on the added value of ignition interlocks. As another traffic-safety-related issue, not only the effect of alcohol ignition interlocks on DUI recidivism, but also on secondary delinquency (DWS, driving while suspended) needs to be considered for further analysis.

Rehabilitation of DUID offenders

Compared to the findings on DUI rehabilitation programmes, very little information was found in the literature on rehabilitation programmes for DUID offenders, regardless if it concerns areas inside or outside Europe. This may be due to the fact that interest in this problem group came up only in the last ten years when in some European countries the procedures and methods to detect drugged drivers on the roads advanced. Therefore, foremost Germany started to develop rehabilitation programmes for DUID. But only one effectiveness study based on recidivism was found with rather promising results, although the study beard some methodological restrictions as well. Reasons for the lack of published evaluation studies may be the rather small numbers of course participants, e.g. in Austria. Hence, these interventions are only conducted in a one-to-one setting at the moment. Thus effectiveness

studies need more time or are difficult to perform. But even outside Europe nearly no effectiveness study was published which focussed on this special issue.

Yet, there are some relevant aspects to be considered: Rehabilitation programmes for DUID offenders were developed in Member States based on the experience with the DUI offender programmes, whereby the principal intervention approach was overtaken, i.e. the European standard group intervention concept. This approach is in line with the general recommendations provided by Health Canada (2004; different types of remedial intervention for different types of DWI offenders, all programmes for convicted DWI offenders should incorporate educational and therapeutic activities). Moreover, according to Health Canada (2004), rehabilitation programmes for drug impaired drivers should also be part of the national countermeasure strategy against DWI. Thus, participation in a rehabilitation programmes should be a considered as a possible prerequisite of licence reinstatement for DUID offenders as well.

1.4 Review of addiction treatment and options for dependent DUI/DUID offenders

The topic addiction treatment is discussed in more elaborate way, as this issue was not considered within regular DR research in Europe before.

Treatment of alcohol dependence. As an integrative conclusion of the summary review and its underlying studies, meta-analysis and reviews, it can be stated that psychosocial treatments for alcohol dependence have been shown to be effective interventions to support the maintenance of abstinence and to lower the amount and frequency of alcohol and drug consumption. Considering the high variance of effect sizes and the comparatively high number of studies that failed to demonstrate significant treatment effects, this conclusion is not obvious from a primary perspective.

Taken together, treatment outcomes vary within a range of small and medium effects and thus may be relatively low in comparison to other fields of psychiatric treatment. In this context it should be considered that the low compliance of addicted patients to the treatment procedures and the high dropout rates usually generate a reduction in statistical power and thus impede the verification of treatment effects probably more than in most other kinds of psychiatric research. Even though it was shown that well-structured and manual-based therapies can double the chances to remain abstinent after alcohol detoxification. For the psychosocial treatment of drug dependence, the included reviews did not provide quantitative measures for therapeutic effects but conclude that the integrative treatment effects are positive.

The question, what psychosocial strategy to prefer, is not answered generally by current meta-analysis and reviews. A variety of therapeutic approaches, each strategy focussing a specific subset of therapeutic targets, have been shown to be effective in treating alcohol and drug dependent patients if compared to non-treatment or waiting-list. By contrast, comparisons between different treatment strategies rarely produced significant effects.

Compared to other treatment strategies, several systematic literature analyses indicate a relatively high effectiveness of CBT, exceeding the effect sizes of other psychosocial approaches. Apart from the magnitude of treatment effects, it has to be considered that for CBT, the proof of effectiveness is based on a comprehensive and well controlled database. Its effectiveness is furthermore conclusive from a theoretical perspective as it simultaneously addresses multiple factors that contribute to the development and maintenance of dependence by e.g. modifying triggers and rein-forcers, by supporting alternative ways of relaxation and reinforcement and by developing skills to deal with risk

situations, which prevent a lapse from turning into a relapse. Nevertheless, the database is not congruent. As other analyses placed other interventions on the first rank, it can be said that no treatment strategy has been shown to be superior in general. Thus, for the planning of treatment interventions, characteristics of the patient and the predominant symptoms of dependence should be taken into consideration rather than regarding selected approaches as the method of choice. Alcohol-dependent patients with a social environment that supports drinking (e.g. “drinking friends”) may benefit more from programmes that provide social support, patients with cue-elicited craving may profit more from CBT than others and for hazardous drinkers and problem drinkers BI and MI may already be sufficient to bring about a behaviour change.

Pharmacological strategies have been shown to produce an additional treatment benefit, but should only be used as an adjunctive approach to psychosocial therapy. For the treatment of alcohol dependence, consistent evidence was only available for two substances: The glutamate-antagonist acamprosate and the opioid-antagonist naltrexone. Both substances differ in their pharmacological properties and their mechanism of action. A meta-analysis based on published as well as unreported results pointed to specific therapeutic advantages of each drug: Acamprosate was shown to be the medication of choice if the goal is complete abstinence, whereas naltrexone should be used to prevent excessive drinking in non-abstinent patients. Given that both drugs are available, discrepancies in efficacy profiles could be used for differential indications. Based on the assumption that: (a) different therapeutic goals are appropriate for different patients and (b) continuous abstinence is generally associated with the highest benefit in the treatment of alcohol dependence, patients who are motivated to achieve complete abstinence could be allocated to an abstinence-oriented treatment that uses acamprosate, whereas patients with a long history of treatment failures and a low motivation for abstinence could be allocated to a harm-reduction treatment in which naltrexone is used. In this way, individually allocating patients to treatments according to their motivational status could further enhance the effectiveness of treatments for alcohol dependence.

Drug dependence. For the relapse prevention therapy of drug dependence, different therapeutic approaches have been tested, but like in the field of alcohol addiction treatment, none of the therapeutic approaches has been shown to be superior in general. Thereby, many of the results shown for alcohol addiction treatment also apply to the treatment of drug dependence. CBT is based on the most profound and comprehensive database as it was equally shown for alcohol dependence. Contingency management approaches (CM), mainly used in the USA, have been restricted to the treatment of drug dependence. It was shown to be beneficial in reducing the use of illicit substances in opioid-, cocaine- and cannabis-dependent individuals as well as compliance with the treatment procedures.

While no medication has been found to date with clear-cut efficacy in the treatment of cocaine and cannabis dependence, significant effects have been shown for opioid substitution therapy in reducing illicit opioid use, in decreasing psychosocial morbidity and mortality as well as in improving overall health status and social functioning. The most used substances for heroin substitution, methadone and burprenorphine, partly differ in their pharmacological properties, but the available clinical evidence does not clearly favour one of both drugs. Irrespective of the substance that is chosen for the opioid substitution treatment, sufficient doses have been provided in order to reduce craving and to suppress the use of street heroin. Besides the approach to substitute heroin by other opioids, heroin was prescribed in some studies. Because of the limitations in database as well as the strong heterogeneity of studies, the results concerning the prescription of heroin do not allow a final conclusion. Further studies are strongly necessary.

Conclusions for the rehabilitation of dependent DUI/DUID offenders. As the topic of addicted DUI/DUID offenders is rather new in the frame of European DR research, this part discusses the options for this group of offenders including links to specific studies.
By EU legislation, alcohol or drug dependent patients are not considered as fit to drive (Directive 91/439/EEC). Accordingly, the main question concerning the conclusions of the summary review for the treatment of DUI/DUID offenders is how to particularly constitute DUI/DUID rehabilitation measures for dependent patients to keep the risk of drink and drugged driving offences low in this subgroup of offenders.
Until today, only very few studies are available which examine the effectiveness of drinking-related psychotherapeutic and psychosocial interventions in dependent DUI offenders in consideration of drinking as well as driving related outcomes. There are first hints. A recent study (Gomez-Talegon & Alvarez, 2006) which tested psychosocial treatments including self-help therapy and medical treatment in alcohol dependent patients indicates that alcohol-related interventions can be useful to simultaneously reduce the risk of drink offences as well as driving offences.
As the limited evidence does not allow general conclusions, the question of concern has to be answered from a rather theoretical position. Considering the nature of alcohol and drug dependence with its symptoms like craving and loss of control, it rather seems apparent that these factors limit the effectiveness of an exclusive application of driving-related interventions including information, education, short-term group interventions and legal sanctioning. Thus, for clients that use alcohol and drugs in an acute dependent way, addiction-specific approaches should be a constitutive element of treatment before getting the driving license back. This could be realized either by a) the allocation of alcohol or drug dependent DUI/DUID offenders to addiction treatments or b) the integration of addiction specific treatment strategies in the DUI/DUID rehabilitation treatment of alcohol or drug dependent DUI/DUID offenders.

Theoretically any psychosocial approach that was shown to be effective in the summary review can be chosen as the theoretical basis for the constitution of addiction specific measures. A combination of different approaches, as it is often used in clinical practice, provides the advantage to simultaneously address different factors and levels of influence. CBT offers a comprehensive treatment, including the modification of triggers and reinforcing consequences, the development of skills to deal with risk situations and to find alternative ways of coping with these risks. MI and BI can be used to increase the client's problem awareness and his intention to change and can thus be used to strengthen and maintain motivational processes at the beginning and during the course of treatment. 12-step programmes as realized e.g. by AA- or NA-meetings provide social support and help the patients to stay away from their former drinking and drug environment, which may especially be important in outpatient treatment settings or in the aftercare treatment of inpatient settings.

In addition to psychosocial approaches, pharmacological agents can be used as an adjunctive treatment. For the treatment of DUI offenders with alcohol dependence, acamprosate is the medication of first choice, whereas naltrexone was shown to be superior in preventing a lapse from becoming a relapse in controlled drinkers. While none of both substances implies a threat to traffic safety, there is conflicting evidence concerning the influence of opioid maintenance treatment on the driving aptitude (de Gier, 2003; Berghaus, 2002). A major problem regarding substitution treatment and fitness to drive is additional consumption of psychoactive substances with substitution medication (de Gier, 2003). It can be stated that drivers in substitution treatment should be considered as a specific group in the frame of DR measures.

Continuous abstinence is generally associated with the highest benefit in the treatment of alcohol and drug dependence and thus constitutes the primary aim in most addiction therapies, but it is only

achieved by a certain proportion of patients. In the treatment of alcohol dependence abstinence rates vary between 33% - 60% one year after treatment. Even though with a lower magnitude than in the first year after treatment, abstinence rates keep on decreasing in the further course of time. For the treatment of drug dependence, abstinence rates are often far below. Thus, in situations of a driver with a former history of alcohol or drug addiction, whose licence was renewed, relapses to drinking have to be taken into consideration. As a relapse to DUI/DUID after excessive drinking episodes or drug taking can not be excluded in a long-term perspective, even after the successful complementation of addiction therapy, addiction treatment strategies in dependent DUI/DUID offenders need to be applied only in combination with driving related strategies. If realized, the combination of both types of interventions would represent a two-step-approach, in which the first step (addiction treatment) aims to prevent a relapse to any drinking/drug taking or excessive drinking/drug taking, while the second step (DUI/DUID rehabilitation) specifically focuses on the topic of intoxicated driving. It aims at increasing and further strengthening the abstinence based on the importance of the driving license for private and professional life. This could also imply to motivate the offender to look for additional professional help.

Vice versa, increased therapeutic benefits may be expected from an integration of DUI/DUID rehabilitation elements into addiction treatment, drinking- / drug taking- related interventions into DUI/DUID rehabilitation. A meta-analysis of Wells-Parker et al. (1995) demonstrated positive effects of drinking-related interventions on driving-related outcomes in unselected samples of DUI offenders. In many cases, DUI offenders are not convinced that a change is necessary and often have not yet formed a definite commitment to change their behaviour (Klipp et al., 2005; Wieczorek et al., 1997). As MI has been shown to provide effective measures to promote a behaviour change in non-addicted clients by exploring and resolving ambivalence, the method could simultaneously be used for driving- as well as drinking-related aims of the programme: a) to promote the awareness of the negative effects of drinking and drug taking and to enhance the intrinsic motivation for a reduction in alcohol or drug consumption and b) to increase the awareness about the consequences associated with DUI and to raise and strengthen the client's motivation to refrain from alcohol and drug impaired driving. This applies equally to other therapies like CBT, which can be used to identify drinking triggers as well as drinking-driving cues and to develop strategies to diminish and avoid both situations. A combination of different approaches including medical treatment, "drinking-related" as well as "driving-related" elements is also recommended by Wells-Parker et al. (1995), who summarize from their review about DUI rehabilitation, that "some education, some psychotherapy and some follow-up (in the sense of probation) may be the most effective type of intervention as it provides "something for everyone" (Wells-Parker et al., 1995, S. 924).

Finally, further research is necessary to test the transferability of therapeutic strategies developed for the treatment of alcohol and drug dependence to the rehabilitation treatment of addicted as well as non-addicted DUI/DUID offenders. The generalizability of the results obtained in the field of addiction treatment to DUI/DUID rehabilitation programmes may be limited by situational differences like frame conditions, the client's motivation to participate and the voluntariness of the rehabilitation measures. Furthermore, differential effects on drinking-related and driving-related outcomes have to be taken into consideration. Different treatment strategies like CBT or MI can provide a theoretical framework for the deduction of treatment strategies not only to reduce drinking, but also to lower the risk of driving when impaired by alcohol or drugs.

2 Summary of the results of the provider survey

The investigation on DR measures implemented and applied in Europe at present was done by means of a survey to those organizations which provide these services in their countries. The questionnaire, developed for this purpose, covered three areas, thus resulting in three questionnaire forms:

- Form A – Organisational issues
- Form B – Programme information
- Form C – Prior driver assessment or diagnostic screening.

Main results on these issues are summed up in the following.

2.1 Realization of DUI/DUID driver rehabilitation in Europe

Based on the established DR provider questionnaire which was sent to European countries resp. identified providers which agreed to participate, a comprehensive picture of the actual situation can be drawn: At least 47 providers, mainly non-governmental, private organisations in 12 European countries (Austria, Belgium, France, Germany, Hungary, Italy, the Netherlands, Poland, Portugal, Sweden, Switzerland, United Kingdom) carry out DR services on a regular base at present. In total 87 DR programmes are in use, thereby 53 for DUI offenders, 21 for DUID offenders and 13 for mixed groups (DUI/DUID/other traffic offenders). All 12 European countries offer programmes for DUI offenders, in addition four Member States (Austria, Belgium, Germany, and Portugal) for DUID offenders. The vast majority of DR providers do not offer treatment programmes for addicts. At least 1.431 persons, mainly psychologists with further education are working as trainers/course leaders. The participation fee for the DR courses is mostly paid by the offenders.

Half of the providers report to have a quality assurance system, yet mainly not according to international, national or European standards but to intra-organisational criteria (this issue will be analyzed in detail in WP5.2).

2.2 Issues related to the provided DR programmes

Legal frame. Participation in DR programmes is often legally regulated, mainly by the licensing authorities and to a less degree also by courts. Thereby, participation is not always obligatory, about half of the programmes are voluntary ones. The consequences of participation are mostly linked to licensing (re-licensing, licence reinstatement, reduction of suspension periods, ongoing validity of licence), but also to a penalty point system, to an upcoming driver assessment or to criminal prosecution.

***Programme concept, conduction and evaluation*.** The overwhelming number of programmes was developed within the providing organizations. The programmes are more or less specific as they mostly focus on DUI or DUID without further differentiations between additional subgroups. A mixture either between these two problem groups or with other traffic offender groups is less frequent. Addiction and language problems are reported as the most frequent reasons for excluding offenders from a DR programme. The vast majority of programmes are principally designed as a group intervention, but the number of participants varies considerably. Moreover, nearly all programmes have exclusion criteria for participants either before or during the course. The reasons in the first case are above all addiction and communication problems, and in the latter case acute substance intoxication by alcohol or drugs. Rather big differences can be observed regarding the duration and intensity of intervention.

Regarding specific DR services, language is the most frequent considered aspect (about one third of the providers) while gender, age and cultural background are no important criteria. In general, exclusion criteria before and during course conduction exist.

The programmes' concepts are by far predominantly treatment (psychological/therapeutic), followed by the educational approach. According to the providers the most important success factors are self-observation and -reflection, discussion and confrontation, development of alternative, new behaviour and an open and trustworthy climate. In the second place are emotional experiencing and involvement, goal setting and commitment to stick to them as well as achievement of behavioural goals/self-control. Information is less important. Alcohol or drug screening is even of minor importance. Medical treatment or alcohol ignition interlocks are of nearly no importance.

Most of the documented programmes have already been evaluated, whereby participant feedback is the predominant approach. Content evaluation, process evaluation and outcome evaluation are less frequently conducted.

2.3 Prior driver assessment or diagnostic screening

Fifteen providers in seven countries indicated to apply driver assessment or diagnostic screening prior to the DR within their organisation. Seven providers in three countries report that such driver assessments are carried out outside their organisation. For both, DUI and DUID, the assessment approach is mainly psychological, most frequently carried out by psychologists, although medical examinations are conducted as well. Psychologists are the most frequent professional group involved. Interviews are most frequently conducted to assign both groups, but especially DUI offenders, to rehabilitation. Objective measurements regarding substance use disorders (physical examination, external medical/therapeutic information, biological markers, screening tools of substance use and functional/performance testing) are applied in some organizations as well. Personality testing as well as practical driving tests are of nearly no importance in this scope.

3 Overall evaluation of outcomes and resulting decision criteria

Literature analysis and provider survey give a comprehensive picture of the situation of DR for DUI and DUID offenders in Europe at present, whereby experiences and practices from other important parts of the world are also considered. In general, some uniform patterns can be identified, but there are also a lot of variations and differences. The latter do not only refer to the European situation, but also to the state of the art outside Europe.

3.1 Commonalities

European standard group interventions are not only the approach which proved empirical evidence on effectiveness regarding traffic safety (reduction of recidivism rate), they are also applied by the majority of providers in Europe. The common concept of the programmes is rather therapeutic than educational, although it includes both elements. A large consensus exists on which constitute successful methods and what the important programme aims are. The majority of the programmes have a scientific background, and the course leaders are mainly psychologists.
The vast majority of the programmes are legally regulated, and do not mix DUI and DUID offenders. Most of the DUI and DUID programmes do not further consider subgroups of offenders, although about a third does (essentially: repeat offenders, novice drivers). Substance use related criteria (specific BAC levels, types of illicit drugs) are the most often used determination criteria for the

programmes' participation; recidivism and prior driver assessment are mentioned as well, in about a fifth of all programmes.
Regarding exclusion or entry criteria for DR, addicts are mostly not subject of either DR for DUI or DUID offenders. They need addiction treatment which differs from the common DR interventions.
During the conduction of courses, acute substance consumption is broadly determined as an exclusion criterion for further course participation.

3.2 Gaps and differences

There is actually a gap between DR programmes for DUI and DUID. This was above all confirmed by the literature analysis where only little information was available on the effectiveness of DUID programmes. Nevertheless, based on the provider survey, about one third of the European countries provide not only DR for DUI but also for DUID. Thus, a considerable number of programmes for DUID offenders exist, although still far less compared to those for DUI offenders. Moreover, according to the providers, almost all of these programmes were evaluated.
Although participation to programmes is very often legally regulated, participation is just slightly more often obligatory than voluntary.

3.3 Relevant items for a comprehensive DUI/DUID countermeasure system

Regarding all mentioned aspects some conclusions can be drawn concerning the needs of a comprehensive DUI/DUID countermeasure system in order to identify different DUI/DUID driver types and optimise the rehabilitation processes and practices. In accordance with different sources (e.g. Health Canada, 2004; NHTSA & NIAAA, 2005; Robertson & Simpson, 2002), the following crucial points are recommended to be taken into account in order to identify and thus rehabilitate different types of DUI/DUID offenders adequately:

1. Breath tests or other evidentiary methods should be mandatory to ensure the identification and prosecution of DUI/DUID offenders. The results of these tests can be used as first screening facts. Although the predictive value of the BAC to calculate recidivism is disputed, it may give some information on the underlying alcohol problem and specific treatment needs. As an objective indicator for the offender's consumption habits the blood taken at the DUI incident could be screened for elevated blood screening markers. Further, the types of drugs detected or the detection of multiple drug use imply conclusions for treatment needs.
2. Record systems should be implemented in each Member State, or even on the European level, to guarantee that those who impose the highest risk for the public are detected and treated adequately. The information on prior DUI/DUID offences can be seen as a valuable fact within the screening on DUI/DUID driver types and their different rehabilitative needs.
3. Early and economic screenings for alcohol or drug problems and readiness to change could help to evaluate the offender's individual treatment needs and to avoid problem escalation.
4. A pool of programs should be available in order to consider certain offender needs and to gain optimal effectiveness of rehabilitation. Thus offenders with a more severe substance use problem could be treated more intensely, individually and in a longer term than offenders who mainly have a more driving-related control problem and who would probably benefit from a standard group intervention. As a further aspect, motivational elements should be considered for treatment matching.
5. Sanctions should be combined with specific treatment obligations in order to ensure the earliest engagement in rehabilitation programmes and to support treatment compliance.
6. Case loads of judges should be avoided in order for them to have enough time to evaluate each offender individually and all circumstances case-specifically to assure the most

appropriate combination of sanctions and adequate rehabilitative treatment obligations for each case. A clear assignment system could serve as a decision aid.

7. Communication between courts, administration and rehabilitation providers should be enhanced to assure that offenders participate in the most appropriate measure and comply with the conditions of their sentence. Nevertheless any privacy issues are subject to data protection and need to be kept confidential.

3.4 Resulting decision criteria

In order to come to preliminary decision criteria on DR procedures for DUI/DUID in Europe which will serve as input for WP5.2 on best practices, it is not enough just to look at the similarities and to find the least common denominator. It is helpful to take the experiences of Health Canada into account, as Canada is one of the long term providers of RH measures for substance impaired drivers. Moreover, Canada is a country with cultural diversity, partly with also political and societal differences, like the EU Member States. Thus, its recommendations can serve as a standard of comparison, although the close linkage between DR and health care issues in Canada is different to the European situation at present.

The Health Canada (2004) best practice recommendations imply the need for multi-level interventions in order to flexibly tailor the specific individual strengths and problems of DUI/DUID offenders. Although the authors recommend including didactic and therapeutic elements in all interventions, a distinction is proposed as a basis of risk for relapse which essentially takes into account the severity of the substance use problem and related difficulties. They conclude that clinical experience supports the value of having two or three levels of intervention and recommend a range of more education based intervention for lower risk profiles towards more intensive treatment for those at higher risk.

Many Canadian jurisdictions typically provide two or three levels of intervention. Distinctions are often made between:

- first offenders or low risk offenders;
- offenders with an early substance use problem or at higher risk due to attitudinal and behavioural characteristics; and
- offenders with serious substance use problems or dependency.

Although not yet empirically evaluated, one current programme (Manitoba's Impaired Drivers' Program) is regarded as good practice model in Canada. It includes typifying the DWI offenders in order to categorise them into one of five intervention levels:

- No intervention: no substance use problem, no risk for re-offending, the person takes responsibility, is aware of alternatives to avoid offences, and changes in lifestyle are taken at his/her own initiative;
- Educational workshop: high-risk substance use, risk for re-offending, the person takes no responsibility, is not aware of alternatives to avoid offences, performs high-risk behaviours, and is not aware of required changes in lifestyle;
- High-risk program: high-risk substance use (periods of over-using, no dependence, health compromising use pattern, lifestyle focused on heavy consumption, substance use related family and work concerns), risk for re-offending, the person is unable to link his/her behaviour with the consequences, has a risky lifestyle, and is not aware of required lifestyle changes;
- Specialised abstinence-based (non-)residential addictions treatment program: substance dependence;
- Referral to previous effective resources: follow-up for abstinent substance dependents, relapse avoidance.

Another multi-dimensional classification scheme of DUI/DUID offenders is proposed by Cavaiola & Wuth (2002; in: Health Canada, 2004). It is in practical use in one state of the USA (Cook County, Illinois) and also has implications on treatment planning. It implies categorisation of DWI offenders on six levels of risk (minimal, moderate, significant, high, high+ and high++ risk) and besides assessment of substance use severity; it is essentially based on objective information like offence BAC level, prior DWI or reckless driving convictions, and prior suspensions.

Taking all the state of the art results (literature analyses, including good practices in- and outside Europe, and the EU provider survey) into consideration, the DRUID WP5 team draws the following concrete conclusions regarding specific issues.

3.4.1 Implementation of DR in Europe

- DR measures should be an integrated part of a comprehensive countermeasure system.
- Participation in DR measures should be legally regulated.
- DR measures should be provided for DUI as well as for DUID offenders, although the scientific evidence regarding the latter group still has to be improved.
- Regulations on DR participation should care for an early access of the offenders to specific measures in order to minimize the risk of problem escalation and secondary delinquency.
- As traffic safety is widely accepted as one of the major public health concerns DR should be connected to the health care system.
- To assure the best and most appropriate measure for all types of offenders, DR providers should be integrated into a knowledge network with addiction treatment providers and specialists.

3.4.2 Types of DUI/DUID

- DUI/DUID offenders are a heterogeneous group and there is general agreement on the relevance of identifying various types of DUI/DUID offenders with regard to their different needs and opportunities for rehabilitation. Two groups, namely non-addicts and addicts should minimally be distinguished as they require different interventions or treatments.
- A pool of programmes should be offered matching with the specific offender needs in order to gain optimal effectiveness of rehabilitation. At least, interventions or programmes for four different types or groups should be available: DUI addicts and non-addicts, DUID addicts and non-addicts. The majority of the European programmes already differentiate between DUI and DUID offenders, and addiction is a very common exclusion criterion for the European DR programmes.
- The literature furthermore suggests that young drivers and recidivists may require different points to focus on in the DR. About one fifth of the current EU programmes take such aspects into consideration.
- Ideally DR services should be available for all DUI/DUID offender groups; e.g. special programmes/treatments for non-addicted recidivists. With regard to individual conditions, special services, e.g. conduction of programmes in different languages or exceptions from the normal procedure should be possible.
- Drivers in substitution treatment should be considered as a separate group in the frame of DR measures

3.4.3 Assessment prior to DR

- Driver assessment is necessary to identify addicts in order to assign them to adequate intervention.
- In a cost-effective approach DUI/DUID offenders should shortly after the offence be screened based on objective factors like the BAC or prior offences. Additional information regarding the substance use problem severity could be gathered by the use of short screening devices.
- DUI/DUID offenders identified as high-risk drivers should afterwards be assessed in a more elaborated procedure.
- A wide range of screening and assessment measures exist. Many are not evaluated on the DUI/DUID population, as they were developed and applied for clinical diagnoses. Traffic psychological assessment tools are very fine-tuned to the specific problems of DUI/DUID offenders and are often validated on this population.
- An in-depth psychological investigation of DUI/DUID offender characteristics can provide important information on underlying aspects of DUI/DUID, and thus help to identify specific rehabilitation needs.
- The aims of a fitness to drive assessment versus an assessment purely to assign to a DR differ. The consequences of the first are much more life-invasive because the permission to drive, and thus an important part of the mobility, is at stake. Therefore the needs for comprehensiveness, thoroughness, and an integrative approach are clearly stricter for fitness to drive assessments. As assignment to the not most adequate rehabilitation is less invasive or harming, formal assignment criteria, which can take into account risk factors for recidivism, can be a minimal or first step. Short screenings focussing on the most relevant needs (like addiction or not) could provide additional valuable information. In the most ideal situation though – for the most fine-tuned rehabilitation assignment – a link exists between the fitness to drive assessment, which is in general more elaborated, and the rehabilitation assignment. Looking at the current situation in Europe, about 30% of the providers indicate that some kind of assessment prior to the DR is performed within their organisation. Further investigation is required though to analyse the exact scope of these assessments/screenings. Formal assignment criteria are indicated in nearly all programmes (e.g. BAC).
- In general DUI/DUID assessment should be carried out close in time to the offence.

3.4.4 Courses and treatments

- DR courses for offenders without substance use disorders can follow the good practice example of the European standard group interventions' concept.
- Psychological and therapeutic approaches with educative elements are the most promising ones.
- DUI, DUID and other traffic offenders should not be mixed in the courses.
- Offenders with a more severe problem behaviour, above all recidivists or heavy consumers with a substance use problem should be treated more intensely.
- Motivational aspects should be considered, e.g. course participation leading to a reduction of the suspension period.
- For clients using alcohol and drugs in a dependent way, addiction-specific approaches should be a constitutive element of treatment. This could be realized either by:
  c) allocation of alcohol or drug dependent DUI/DUID offenders to addiction treatments or
  d) integration of addiction specific treatment strategies in the DUI/DUID rehabilitation treatment of alcohol or drug dependent DUI/DUID offenders.

In general, the state of the art reveals that DR is an established intervention in about half of the European member states focussing on non-dependent DUI offenders. Thereby the necessary

organisational and personal infrastructure as well as numerous programmes exists for carrying out this intervention on a day-to-day basis. Non-dependent DUID offenders can be integrated easily into this available structure. The deficit of appropriate programmes for dependent DUI/DUID shows the need for future development of concepts, evaluation of these and provision of staff which is experienced and well educated in addiction treatment in order to care for a sufficient supply for all offender groups.

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Annex

Annex

I. Literature analysis

1 Identification of different types of drivers under influence of psychoactive substances

Annex 1: Methodology of literature review on specific characteristics of DUI/DUID offenders

Sources for literature were selected databases (ITRD, IBSR library, Doktat KfV and Pubmed). Additional online searches were done on the Road Safety Research, Policing and Education Conference Proceedings (www.rsconference.com) and the ICADTS proceedings (available at: www.icadts.org/proceedings [11.02.08]), and furthermore, several additional references were passed on by experts within the DRUID WP5 team or were selected from bibliographies of recent literature reviews

Because of the limited amount of literature focussing on DUID offenders, it was decided to include also studies on self-reports of DUID. Furthermore, some studies on self-reported DUI were also selected and included as they gave valuable additional information. It should be kept in mind though that self-reported driving under the influence is liable to social desirability bias.

A) Search:

- Date of search: 23-24.10.2007
- Database: IBSR Library
- Time frame included: 1990-2007
- Search terms: DUI, DWI, Drink*, Depend*, Drug*, Substit*, Character*, Profil*, Typol*
- Languages included: English, French, Dutch, German
- Number of records found: 811

Table 1: Literature search for specific characteristics of DUI/DUID offenders (Date of last search: October 23rd – 24th 2007)

SEARCH TERM	N TITLES	N TITLES REVIEWED	N LEFT TITLES
DUI	26	26	12
DWI	24	24	16
Drink*	140	140	80
Depend*	20	20	4
Drug*	419	419	65
Substit*	7	7	0
Character*	110	110	5
Profil*	42	42	4
Classif*	12	12	1
Typol*	11	11	0

- Number of reviewed titles: 811
- Number of excluded titles: 624
- Number of left titles: 187
- Number of left titles without doubles (independent searches were done for each term): 157

B) Search:
- Date of search: 05.11.2007
- Database: Doktat KfV (Internal library of the Austrian Road Safety Institute)
- Time frame included: 1990-2007
- Search terms: 'Charakteristika von Alkohol- und Drogenlenkern/fahrern', 'verkehrspsychologische Modelle (nur) bei Alkohol- und Drogenlenkern/fahrern', 'Typologie von Alkohol- und Drogenlenkern/fahrern'
- Languages included: German, English
- Records found: 35
- Number of titles reviewed: 35
- Number of excluded titles: 15
- Number of left titles: 19

C) Search:
- Date of search: 15.11.2007
- Database: ITRD (International Transport Research Documentation)
- Time frame included: 1990-2007
- Search terms: standard codes for 'Driver', 'Drunkenness', 'Psychology', 'Sociology', 'Drugs', 'Substitution drugs', 'Psychological aspects', 'Attitude', 'Aggressiveness', 'Personality', 'Decision process', 'Attention', 'Risk taking', 'Driving aptitude', 'Experience', 'Responsibility'
- Languages included: English, French, Dutch, German
- Records found: 337 (2003-2007), 1130 (1990-2002)

Due to the large amount of titles, a new search was done excluding the references in German language:

- Number of records found: 337 (2003-2007), 528 (1990-2002)
- Number of reviewed titles: 865
- Number of excluded titles: 741
- Number of left titles: 124

D) Search:
- Date of search: 15.11.2007
- Database: ITRD (International Transport Research Documentation)
- Time frame included: 1990-2007
- Search terms: standard codes for 'Driver', 'Drunkenness', 'Psychology', 'Sociology', 'Drugs', 'Substitution drugs', 'Psychological aspects', 'Attitude', 'Aggressiveness', 'Personality', 'Decision process', 'Attention', 'Risk taking', 'Driving aptitude', 'Experience', 'Responsibility', 'Model', 'BAC', 'addiction'
- Languages included: English, French, Dutch, German
- Records found: 195
- Number of reviewed titles: 195
- Number of excluded titles: 184
- Number of left titles: 11

E) Search:
- Date of search: 20.11.2007
- Database: Pubmed
- Time frame included: 1997-2007

- Search terms: (“Ethanol” [Mesh] OR “Street Drugs” [Mesh] OR “Designer Drugs” [Mesh]) AND “Automobile Driving” [Mesh]; (“Ethanol” [Mesh] OR “Street Drugs” [Mesh] OR “Designer Drugs” [Mesh]) AND “Automobile Driving” [Mesh] AND type
- Languages included: English, French, Dutch, German
- Number of records found: 154+9=163
- Number of reviewed titles: 163
- Number of excluded titles: 156
- Number of left titles: 7

Additional online searches were done on the Road Safety Research, Policing and Education Conference Proceedings (available at: www.rsconference.com [11.02.08]) and the ICADTS proceedings (available at: www.icadts.org/proceedings [11.02.08]).

Furthermore, several additional references were passed on by experts within the DRUID WP5 team or were selected from bibliographies of recent literature reviews.

All remaining records were compared in order to exclude the doubles. Abstracts were reviewed and only references containing information on characteristics of DUI/DUID offenders, either descriptions or comparisons to other populations / the general population, were selected. Except for two references, it was decided to exclude all German references due to language restrictions of the author.

Types of studies included, are:

- Descriptive studies: descriptive information on DUI/DUID offenders
- Studies with comparison groups but no control for confounders; within-group comparisons: more details about specific groups who are more at risk for driving under influence
- Studies with comparison groups controlling for confounders, matched case-control: more information on possible causes of driving under influence

The main study populations are:

- DUI/DUID offenders
- Accident-involved drivers
- General (driver) population (self-reported drinking and/or drug using drivers)

The main study design:

- Self-reports

This review aims at presenting patterns and profiles of characteristics related to DUI/DUID behaviour, on different interrelated domains, that are commonly found in literature.

Annex 2: Methodology of literature review on general characteristics of recidivists

The following literature searches were done:

1. Search:
   - Date of search: May 10th 2007
   - Databases: ITRD (International Transport Research Documentation); TRIS (Transport Research Information Services)
   - Time period included: 01/1988 - 03/2007

- Search term: recidi*
- Records found: 436
- Number of reviewed titles: 436
- Number of excluded titles: 193
- Number of left titles: 243
- Number of reviewed abstracts: 243

2. Search
   - Date of search: May 31st 2007
   - Database: MEDLINE
   - Time period: not defined
   - Search term: recidi*
   - Records found: 176,212
   - Number of reviewed titles: 2350
   - Number of excluded titles: 2331
   - The number of left titles: 19

Due to the large amount of records found, but just the small number of titles left after reviewing over 2000 titles, the search term was specified within another search in the same database.

3. Search
   - Date of search: June 5th 2007
   - Database: MEDLINE
   - Time period: not defined
   - Search term: recidivis*
   - Records found: 1400
   - Number of reviewed titles: 1400
   - Number of excluded titles: 1295
   - Number of left titles: 105

After the third search the left records of the databases *ITRD, TRIS* and *MEDLINE* were compared to each other in order to exclude the doubles.

- Date: June 8th 2007
- Number of excluded titles: 48 (because of doubles)
- Number of left titles: 57
- Number of reviewed abstracts: 57

4. Search
   - Date of search: June 19th 2007
   - Database: Doktat KfV (Internal library of the Austrian Road Safety Institute)
   - Time period: not defined
   - Search terms and operators: Thesaurus numbers “1783 (drunkenness)” OR “2242 (drugs)” OR “2230 (Addiction)” AND “1519 (recidivist)”
   - Records found: 205
   - Number of reviewed titles: 205

After this search the left records of the databases *ITRD, TRIS* and *MEDLINE* were compared to the records found in the *Doktat KfV* in order to exclude the doubles.

- Number of excluded titles: 66 (because of doubles)
- The number of left titles: 139
- Number of reviewed abstracts: 139
- Number of excluded abstracts: 94
- Number of left abstracts: 45

439 abstracts were reviewed and 260 articles were identified as containing some information about variables having an impact on recidivism. The selected articles were allocated according to their main questions of research into the following categories and sub-categories:

a) Characteristics of recidivists & predictors of recidivism (103 publications):
   - consumption habits/problem consumption measured by objective screening tools, like standardised questionnaires, e.g. MAC, AUI, RIASI etc., arrest BAC or blood screening markers;
   - socio-demographic characteristics like gender, age, ethnicity, education, marital and employment status or regional differences;
   - personality, psychological and psychosocial variables, e.g. attitudes, beliefs, sensation-seeking or burden of personal problems;
   - driving history and prior contacts with the criminal justice system.
b) Legal countermeasures and their impact on recidivism and legal probation (93 publications):
   - license withdrawal, license suspension/revocation and duration of the disqualification period;
   - jail, probation conditions and monitoring;
   - fines;
   - vehicle sanctions like impoundment, forfeiture, immobilisation and ignition interlocks.
c) Effectiveness of educational and therapeutic interventions (60 publications):
   - educational, rehabilitative and treatment programs;
   - victim Impact Panels;
   - self-help groups.
d) Recidivism & crash involvement (4 publications)

2 Review of existing DUI/DUID assessment procedures

Annex 3: Methodology of literature review on DUI/DUID assessment measures and tools

The review of "DUI/DUID assessment measures and tools" is based on several literature sources. The review includes four systematic reviews within the following databases:

- two independent systematic literature researches in PubMed;
- a systematic literature research in the library of the Kuratorium für Verkehrssicherheit (KfV; (Austrian Road Safety Board) in Vienna, Austria;
- a systematic literature research in the library of the Institut Belge pour la Sécurité Routière, asbl (IBSR; Belgian Road Safety Institute), in Brussels, Belgium.

This review also includes an examination of key reference texts and literature from the internal IBSR review on the assessment procedures of DUI/DUID carried out by Gert Eeckhout in 2005 and key reference texts based on the expertise of members of the DRUID workgroup on Rehabilitation.
One of the two systematic reviews within PubMed concentrated on the identification of reviews and studies on existing assessment procedures for drivers under influence of alcohol and illicit drugs, in general. The investigation was made on the 7th of August 2007 and used the following MeSH term combination:

Table 2: Literature search I. for DUI/DUID assessment measures and tools (Date of last search: August 7th 2007)

MESH TERM COMBINATION	LIMITS	IDENTIFIED TEXTS	IDENTIFIED REVIEWS
("Alcoholism/classification"[Mesh] OR "Alcoholism/diagnosis"[Mesh] OR "Street Drugs"[Mesh] OR "Designer Drugs"[Mesh]) AND "Automobile Driving"[Mesh]		138	7
("Alcoholism/classification"[Mesh] OR "Alcoholism/diagnosis"[Mesh] OR "Street Drugs"[Mesh] OR "Designer Drugs"[Mesh]) AND "Automobile Driving"[Mesh]	**only items with abstract in English, French, German or Dutch**	**97**	**5**
("Alcoholism/classification"[Mesh] OR "Alcoholism/diagnosis"[Mesh] OR "Street Drugs"[Mesh] OR "Designer Drugs"[Mesh]) AND "Automobile Driving"[Mesh]	published in the last 3 years, only items with abstract in English, French, German or Dutch	14	0

The review was limited to items with an abstract in English, French, German or Dutch. Further limitations on the publication date seemed to be too restrictive. After an examination of 97 abstracts, four full texts were included in this paper.
The second review focused specifically on PubMed reviews and studies on the assessment of alcohol dependence in impaired driver populations. It was carried out on the 7th of August 2007 and used the following combination of MeSH terms:

Table 3: Literature search II. for DUI/DUID assessment measures and tools (Date of last search: August 7th 2007)

MESH TERM COMBINATION	LIMITS	IDENTIFIED TEXTS	IDENTIFIED REVIEWS
("Alcoholism/classification"[MeSH] OR "Alcoholism/diagnosis"[MeSH] OR		582	38

"Alcoholism/epidemiology"[MeSH] OR "Alcoholism/statistics and numerical data"[MeSH] OR "Alcoholism/therapy"[MeSH]) AND ("Automobile Driving"[MeSH] OR "Accidents, Traffic"[MeSH])			
("Alcoholism/classification"[MeSH] OR "Alcoholism/diagnosis"[MeSH] OR "Alcoholism/epidemiology"[MeSH] OR "Alcoholism/statistics and numerical data"[MeSH] OR "Alcoholism/therapy"[MeSH]) AND ("Automobile Driving"[MeSH] OR "Accidents, Traffic"[MeSH])	**only items with abstract in English, French, German**	**337**	**19**
("Alcoholism/classification"[MeSH] OR "Alcoholism/diagnosis"[MeSH] OR "Alcoholism/epidemiology"[MeSH] OR "Alcoholism/statistics and numerical data"[MeSH] OR "Alcoholism/therapy"[MeSH]) AND ("Automobile Driving"[MeSH] OR "Accidents, Traffic"[MeSH])	published in the last 5 years, only items with abstract in English, French, German	40	5

The search identified 582 texts. A further limitation to items, with an abstract in English, French or German, lead to 337 findings. After reviewing the abstracts, five full texts were included in this paper.
The review within the library of the Austrian KfV was carried on the 4th of July 2007 using German keywords and a restriction to texts with an abstract. No limits on the publications date were used. The theme of interest was:
"Die psychologische (Fahreignungs-) Begutachtung, und zwar nur bei Alkohol- und Drogenfahrern/ -lenkern" (the psychological assessment of the fitness to drive limited to DUI/DUID).
Additional keywords were:

- verkehrspsychologische Begutachtung, verkehrspsychologische Untersuchung, verkehrspsychologische Stellungnahme;
- verkehrspsychologische Untersuchungsverfahren, verkehrspsychologische Tests, verkehrspsychologische Untersuchungsmethoden.

105 texts were identified. After a review of the abstracts six full texts were included in this review.

An additional review was carried out on the 15th of October 2007 in the library of the IBSR using a keyword combination of:

- (assessment OR screening) AND (DUI OR DWI OR drink OR drug OR alcohol).

13 texts were identified. After reviewing the titles and 9 abstracts, 7 full texts were included in this paper.
The review mainly concentrated on the results of identified reviews and meta-analysis.
The subchapter "Substance use related assessment tools" is mainly based North American reviews and for the subchapter "biological markers in the assessment procedure of DUI/DUID" a separate literature review was carried out, which is described in the corresponding subchapter.

Annex 4: Performance characteristics of DUI/DUID assessment instruments

In order to evaluate the quality of a screening or assessment instrument, its context and certain performance characteristics have to be considered. Validity and reliability, sensitivity and specificity are typically viewed as essential elements for determining the quality of any standardized test.

Validity and reliability

A valid screening or assessment is one that measures what it intends to measure. For example, it would not be valid to assess driving skills through a written test alone. A more valid way of assessing driving skills would be a combination of tests that help determine what a driver knows, like with a written test on driving knowledge, and what a driver is able to do, like with an assessment of actual driving performance (Wikipedia, 2007b). It is important that screening or assessment instruments possess validity. Boland et al. (1998) summarized the following relevant sub-elements of validity:

- **Content validity** refers to whether or not the content of the test items fully represent the construct being assessed; that is, has the domain been adequately and fully sampled, and are the items appropriate to the domain.
- ***Construct validity*** is the extent to which the instrument is believed to measure the construct it claims to measure. For example, does a scale purported to measure alcohol dependence syndrome truly measure the dimensions of that syndrome as they are theoretically defined? Construct validity is typically established by relating the test to theory, or by factor analytic work to establish multiple dimensions**.**
- ***Criterion-related validity*** refers to the extent to which the scale is related to some type of criterion or outcome measure. Two sub-types of criterion-related validity are concurrent validity and predictive validity.
- ***Concurrent (diagnostic) validity*** refers to whether the test is correlated with some already existing measure of the construct of interest, often a "gold standard" measure in the field. Frequently, one is interested in concurrent validity when one wishes to replace a more onerous assessment process with something briefer or more efficient.
- ***Predictive (prognostic) val*idity** is the extent to which the instrument accurately predicts outcomes deemed important to the construct, for example, likelihood of relapse after treatment; this would seem to be particularly relevant to the context of CSC, where emphasis is placed on the reduction of criminal recidivism (Boland et al., 1998, p. 13-14).

Reliability relates to the consistency of a screening or assessment instrument. A reliable screening or assessment is one that consistently achieves the same results with the same (or similar) cohort of respondents. A good assessment has both - validity and reliability - , but in practice, an assessment is rarely totally valid or totally reliable (Wikipedia, 2007b). According to Boland et al. (1998) reliability can have a number of meanings:

- ***Internal consistency*** is a measure of how well the items of a scale come together to measure a single construct; it is based on the intercorrelations among all items. Internal consistency is measured by Cronbach's alpha coefficient (known alternately as alpha, coefficient alpha, Cronbach's alpha); this statistic may range from 0.0 to 1.0, with higher values indicating greater reliability. Typically, one hopes for values of .80 or greater, but values of .70 are sometimes deemed acceptable.
- ***Split-half reliability*** is very much like internal consistency and is, in fact, somewhat redundant to it; it assesses the degree to which one half of the test, when randomly split, correlates with the other half. Acceptable values are very similar to those indicated for Cronbach's alpha.
- ***Test-retest reliability*** is a measure of the relationship between a test score at one administration and the score on the same test at a second administration, with some time delay in between.
- ***Alternate form reliability*** is the extent to which two parallel forms of a test are related; this is of particular interest in the present review with respect to the equivalence of short versus full-length forms of scales (Boland et al. 1998, p. 13).

Sensitivity and specificity

The ***sensitivity*** of a screening or assessment instrument refers to the proportion of true positives that are correctly identified by the test (Altman & Bland, 1994). In other words, does the sensitivity (or true positive rate) of a test reflect its ability to identify people with the disorder in question (Connors & Volk, 2003). For example a sensitivity of 95% in the assessment of alcohol use disorders, would mean that the test recognizes 95% of those with alcohol use disorder (see table below). However, a sensitive test might produce numerous false positives, that is, identify persons as having an "alcohol use disorder" while they do *not* have a problem (Boland, 1998). Using the grid of the following table,

sensitivity is calculated by dividing the true positive cases by the total number of persons with an alcohol use disorder (a / a+c).

Specificity refers to the proportion of true negatives that are correctly identified by the test (Altman & Bland, 1994). Thus, the specificity (or true negative rate) of a test refers to its ability to accurately identify people who do not have an alcohol use disorder. Accordingly, a specific test provides a minimum of false positives but might produce numerous false negatives, that is identify persons as not having an alcohol use disorder while actually having one (Connors & Volk, 2003). Referring again to the following table, specificity would be calculated by dividing the true negative cases by the total number of individuals without alcohol use disorder (d / b+d).

Table 4: Possible outcomes in screening or assessing substance use disorders

RESULTS OF SCREENING OR ASSESSMENT INSTRUMENT	SUBSTANCE USE DISORDER	
	Present	**Absent**
Positive	True positives (a)	False positives (b)
Negative	False negatives (c)	True negatives (d)

Source: Connors & Volk, 2003

Ideally screening or assessment tools possess both high sensitivity and high specificity, but in reality, however, one is frequently sacrificed for the other. Boland et al. (1998) say that whether one selects sensitivity over specificity or vice versa, depends upon the purpose of the screening or assessment and the consequences of false positives and false negatives in a given context.
As a general rule, screening tests tend to emphasise maximizing sensitivity over specificity. This is a logic conclusion considering the purpose of screening: to identify as many individuals as possible with a substance related disorder among unselected groups, even if this possibly puts persons without disorder under suspicion. For people with 'positive' screening results, additional testing is done to affirm the presence of a problem and/or to determine the severity. Specificity becomes more important in the later assessment phases, so that individuals with a false positive result in the screening procedure are correctly identified as true negative in the further elaborate assessment (Eeckhout, 2005).
In the legal context of assessing the driving ability of DUI/DUID offenders, high chances of false positive outcomes are unacceptable (Korzec et al., 2001). The withdrawal of a driving licence presents a curtailment of somebody's personal rights, thus outcomes have to produce certain legal evidence, i.e. a high specificity is obligatory (Brenner-Hartmann et al., 2005). On the other hand the right of the general population to be protected against risks caused by DUI/DUID constitutes a high sensitivity of assessing tools of substance related disorders. The weighting of one or the other is not a scientific but juridical and political question, which varies by country.

Annex 5: Overview table of selected substance use related DUI/DUID screening/assessment tools

MEASURE	AUTHOR(S)	MAIN FOCUS OF THE TOOL	CHARGED INSTRUMENT (YES/NO)	NUMBER OF ITEMS	TIME TO ADMINISTER (MINUTES)	SUMMARY OF SCALES/ PROBLEM AREAS
AUDIT Alcohol Use Disorder	WHO/ Babor et al., 1992	Alcohol	No	10	2	• consumption (frequency, binge drinking), • dependence symptoms (inability to stop, drinking in the morning, blackouts,

s Identification Test						guilt) • alcohol-related problems (interference with life activities, injury to self or others, others expressing concern).
CAGE Cut down, Annoyed, Guilt, Eye opener	Ewing & Rouse, 1970	Alcohol	No	4	1	• the feeling of need to reduce drinking, • the acknowledgement of other criticizing one's drinking, • the feeling of guilt about drinking • drinking habits in the morning
DAST Drug Abuse Screening Test	Skinner, 1982	Drugs	No	28	5-10	• frequency and type of drug use, • withdrawal and dependence symptoms, • physical and legal consequences, • disruption to work, family and social life, • feelings of guilt • prior treatment
MALT (-Z) Munich Alcoholism Test	Van Limbeek & Walburg, 1987	Alcohol		24	10	• attitude to drinking behaviour, • psychosocial problems • somatic problems
MAST Michigan Alcoholism Screening Test	Selzer, 1971	Alcohol	No	25	10	• alcoholism
MAC-R MacAndrew Alcoholism Scale – Revised	MacAndrews, 1965	Alcohol	Yes	49	10	• personality and attitudinal characteristics related to alcoholism
SASSI Substance Abuse Subtle Screening Inventory -II	Miller, 1985	Alcohol and drugs	No	62 (+26)	10-15	• substance abuse a • questions that help clients identify negative consequences of their use of alcohol and other drugs (26 additional items)
RIASI Research Institute on Addictions Self-Inventory	Nochajski et al., 1995	Alcohol and drugs	No	52	14	• drinking habits, • number of drinking locations • number of drinks, • family history, • alcohol beliefs, • preoccupation with alcohol, • health issued, • personal competence, • aggression, • depression, • anxiety, • deviant behaviour, • sensation seeking
DRI-II Driver Risk Inventory -II	Lindeman & Scrimgemour, , 1999	Alcohol and drugs	Yes	140	30-35	• truthfulness, / • alcohol use, • drug use, • driver risk, • stress coping abilities, • substance dependency and substance abuse
SALCE Substance Abuse Life Circumstances Evaluation	ADE Inc, 1986	Alcohol and drugs	Yes	85	20	• attitudes, • life stress issues, • alcohol and drug use and • driving records

NEEDS	ADE Inc, 1990 in Health Canada 2004	Alcohol and drugs	Yes	98	20	• test testing attitude, • problem solving, • emotional health, • substance abuse, • employment, • relationship, • physical health, • education, • criminal record, • overall summary.
AUI Alcohol Use Inventory	Horn et al., 1987	Alcohol	Yes	228	35-60	• benefits of drinking (e.g. is the alcohol use experienced as an activity that ameliorates the social skills, is alcohol perceived as a means to lower stress levels) • drinking style (e.g. quantity, situations, associated compulsive behaviour) • negative consequences of drinking (e.g. physical-, psychological-, social consequences) • concerns about drinking (e.g. sense of guilt, concerns, seeking help) • acknowledgement that drinking causes problems
ASI Addiction Severity Index	McLellan et al., 1980	Alcohol and drugs	No	200	45-60	• medical, • drug/ alcohol use, • legal/ criminal justice involvement, • family/ social, • employment/ financial support, • psychological/ psychiatric

Data source: Health Canada, 2004; Boland et al., 1998; Connors & Volk, 2003; Eeckhout, 2005, Dom et al., 2004; Chang et al., 2002

Annex 6: Methodology of literature review on biological markers within DUI/DUID assessment

The review of "biological markers in the assessment procedure of DUI/DUID" is based on three literature sources. First, the procedure involved an examination of key reference texts and literature from the internal IBSR review on the assessment procedures of DUI/DUID carried out by Gert Eeckhout in 2005.

A second step was a systematic literature research in PubMed, using the following combination of MeSH (Medical Subject Headings) terms:

Table 5: Literature search for biological markers within DUI/DUID assessment (Date of last search: June 21st 2007)

MESH TERM COMBINATION	LIMITS	IDENTIFIED TEXTS	IDENTIFIED REVIEWS
"Biological Markers"[MeSH] AND "Alcoholism"[MeSH]		993	173
"Biological Markers"[MeSH] AND "Alcoholism"[MeSH]	only items with abstract in English, French, German or Dutch	759	118
"Biological Markers"[MeSH] AND "Alcoholism"[MeSH]	**published in the last 3 years, only items with abstract in English, French, German or Dutch**	**107**	**10**
"Biological Markers"[MeSH] AND "Alcoholism"[MeSH] AND "Automobile Driving"[MeSH]	only items with abstract in English, French, German or Dutch	10	2
"Biological Markers"[MeSH] AND "Alcoholism"[MeSH] AND "Automobile Driving"[MeSH]	published in the last 3 years, only items with abstract in English, French, German or Dutch	1	1
"Substance Abuse Detection"[MeSH] AND ("Street Drugs"[MeSH] OR "Dependency (Psychology)"[MeSH])		440	65

"Substance Abuse Detection"[MeSH] AND ("Street Drugs"[MeSH] OR "Dependency (Psychology)"[MeSH])	only items with abstract in English, French, German or Dutch	368	55
"Substance Abuse Detection"[MeSH] AND ("Street Drugs"[MeSH] OR "Dependency (Psychology)"[MeSH])	**published in the last 3 years, only items with abstract in English, French, German or Dutch**	**70**	**11**
"Substance Abuse Detection"[MeSH] AND ("Street Drugs"[MeSH] OR "Dependency (Psychology)"[MeSH]) AND "Automobile Driving"[MeSH]	only items with abstract in English, French, German or Dutch	14	1
"Substance Abuse Detection"[MeSH] AND ("Street Drugs"[MeSH] OR "Dependency (Psychology)"[MeSH]) AND "Automobile Driving"[MeSH]	published in the last 3 years, only items with abstract in English, French, German or Dutch	5	0

The PubMed research was carried out on the 21st of June 2007 and was limited to literature published in the last 3 years, and items with an abstract in English, French, German or Dutch. The implementation of the MeSH term "Automobile Driving" [MeSH] did not lead to additional findings. Nine of the identified texts on alcohol and seven of the texts on illicit drugs were included in this review.
Third source of this literature review included key reference texts based on the expertise of members of the DRUID Workgroup on Rehabilitation.
The review mainly concentrated on the results of identified reviews and meta-analysis.

Annex 7: Selected biological markers of alcohol

Alcohol (ethanol). The physical presence of alcohol (respective ethanol) can be easily determined in multiple body fluids including blood, saliva, urine, sweat and expired air (breath alcohol) (Tu & Kapur, 1992 in Allen et al., 2003). It was one of the first parameters considered as a marker of alcohol consumption. A positive test result for blood alcohol per se as well as a demonstration of high alcohol tolerance has been considered as an index of heavy drinking (Hamlyn et. al., 1975; Lewis & Parton, 1981 in Allen et al., 2003). Unfortunately, due to its rapid elimination from the body, the detection time of alcohol is very limited (Wolff & Marshall, 2006).

The BAC reflects the alcohol concentration in blood. The values are expressed in percent (%) or promille (*‰)*. The breath alcohol concentration is expressed in milligram alcohol per litre (mg/l) exhaled alveolar air. There is a linear relation between the values of breath alcohol and the values of BAC. Multiplying the breath alcohol results (mg/l) by 2.22727 leads to the respective values in promille (*‰)* of BAC (Eeckhout, 2005).

Tests, measuring the blood or breath alcohol concentration, are mainly used as a marker of acute alcohol ingestion (last 6-8 hours) (Allen et al., 2003). They are of limited value in the assessment of chronic heavy drinking (Allen et al., 2003; Eeckhout, 2005). Demonstration of high alcohol tolerances, as for example showing no evidence of drunkenness with a BAC from over 1.5 ‰ might be used as a rough indicator for alcohol abuse or dependence. However, the sensitivity and specificity of such a test is so low, that it cannot be used as a valid screening instrument in the assessment procedure of DUI (Eeckhout, 2006; Staak & Iffland, 1992).

Gamma-glutamyltransferase (GGT). Gamma–glutamyltransferase (GGT) is one of the most commonly used markers for alcohol abuse (CSAT, 2006). GGT is a protein, which is produced by the liver. Continuous heavy alcohol consumption (>4 glasses per day over 4-8 weeks) causes an elevation of GGT levels in the serum. After 4 to 5 weeks of abstinence the GGT level returns to normal. The

half-life[1] of GGT is 14-26 days (Eeckhout, 2005). Unfortunately, GGT is a very non-specific indicator of liver damage. GGT levels are also elevated in people with liver disease of non-alcoholic origin and in a variety of other conditions, such as Type 2 diabetes, obesity, hypertension and hyperlipidaemia (Conigrave, 2003 in Wolff & Marshall, 2006; Meregalli et al., 1995; Sillanaukee, 1996). In the detection of alcohol dependence and heavy drinking, sensitivity of GGT was reported to be between 50 and 90% and specificity found to be 70% (Musshoff & Daldrup, 1998).

GGT is not a valid stand alone instrument in the assessment of DUI, but it is often recommended in combination with CDT for the differential diagnosis between alcohol use, abuse and dependence (Sillanaukee & Olsson, 2001; Chen et al., 2003; Schwan et al., 2004 in Bortolotti et al., 2006; Conigrave et al., 2002 in Wurst, 2005b; Miller & Anton, 2004).

Alanine Aminotransferase (ALT) / Aspartate aminotransferase (AST). Elevations of serum aspartate aminotransferase (AST) and alanine aminotransferase (ALT) levels are also non-specific indicators of liver damage. They reflect generalized damage to hepatic cells or an increase in cell membrane permeability (Sharpe, 2001 in Wolff & Marshall, 2006). The exact type of drinking which might cause an elevation of AST or ALT levels is unknown, but scientific literature assume it to be at least "heavy drinking lasting for several weeks" (CSAT, 2006). The AST level declines after an abstinence period of around 7 days. The respective "window of assessment" of ALT is unknown (CSAT, 2006).

Both tests have many sources of false positives. Ratios of AST to ALT which are over the value of 2 may suggest liver alcohol related liver damage (Matloff et al., 1980 according to Eeckhout, 2005). AST seems to perform best in adults aged 30 to 70 (CSAT, 2006).

Mean Corpuscular Volume (MCV). Mean corpuscular volume (MCV) refers to the volume of red blood cells, which is elevated after excessive alcohol consumption over a period of 4 to 8 weeks. The cell enlargement results from the toxic effect of alcohol on the erythroblast[2] development in the bone marrow and persists as long as drinking continues (Buffet et al., 1975; Morgan et al., 1981; Whitehead et al., 1985; Wolff & Marshall, 2006). MCV correlates with the amount and frequency of alcohol ingestion and may take several months to return to normal (Wolff & Marshall, 2006). The half-life period of MCV is about 40 days (Eeckhout, 2005; CSAT, 2006).

Other medical conditions, such as hypothyroidism and vitamin deficiencies (B12, folate) can cause en elevation of MCV. These circumstances should be ruled out before attributing the increased MCV to alcohol consumption (Wolff & Marshall, 2006).

MCV has a high risk of false-positive and false-negative test results and has therefore been criticized for having insufficient sensitivity and poor specificity (Schwann et al., 2004 in Wolff & Marshall, 2006). However, as MCV is the only traditional marker which does not show gender effects in its performance, it is often recommended as a marker of heavy drinking among women. Most other traditional markers show better performance characteristics for men than for women (Allen et al., 2000 in Wolff & Marshall, 2006; CSAT, 2006; Mundle et al., 2000).

[1] Half-life: The time required for half the quantity of a drug or other substance deposited in a living organism to be metabolized or eliminated by normal biological processes. Also called biological half-life. The American Heritage® Dictionary of the English Language, Fourth Edition copyright ©2000 by Houghton Mifflin Company. Updated in 2003. Published by Houghton Mifflin Company. All rights reserved.

2 Erythroblast: Any of the nucleated cells normally found only in bone marrow that develop into erythrocytes. The American Heritage® Dictionary of the English Language, Fourth Edition copyright ©2000 by Houghton Mifflin Company. Updated in 2003. Published by Houghton Mifflin Company. All rights reserved.

Carbohydrate Deficient Transferrin (CDT). Carbohydrate deficient transferrin (CDT) is a very commonly used and widely investigated biological marker of alcohol consumption. Transferrin itself is a large glycoprotein, which is responsible for carrying iron within the bloodstream (Peterson, 2004/2005; Allen et al., 2003). It contains two carbohydrate residues and two N-linked glycans (MacGillivray et al., 1983 in Allen et al., 2003). Normally, four to six sialic acid molecules are attached. Research indicates that drinking disrupts sialic acid's ability to attach to transferrin as well as other molecules (Peterson, 2004/2005). Regarding the sialic acid content of this molecule, there are 7 isoforms of transferrin. CDT is a collective term of three of these isoforms including: asialo-, monosialo- and disialoisoforms (Wolff & Marshall, 2006).

It is difficult to measure CDT accurately, as distinguishing CDT from other forms of transferrin is complicated and moreover, CDT levels depend on total levels of transferrin that vary with iron status. In the last years several improvements in measuring CDT have been made. Agents that specifically detect CDT (i.e. immunological reagents) have been developed (Bean et al., 2001 in Peterson, 2004/2005) and CDT levels are meanwhile often expressed as a percentage of total transferrin (%CDT), rather than an absolute value (Anttila et al., 2004 in Peterson, 2004/2005).

Serum CDT levels elevate after drinking 60-80 g/d for 1-2 weeks (Eeckhout, 2005; Wolff & Marshall, 2006). They have a half-life of about 14-17 days (Wolff & Marshall, 2006). Enhanced CDT levels need around 2-4 weeks of abstinence to normalize. Chronic alcohol consumption lengthens this period (Eeckhout, 2005). The biological marker CDT is better at detecting chronically heavy drinkers and alcohol dependence than hazardous drinkers (Neumann & Spies, 2003 in Wolff & Marshall, 2006). Schwan et al. (2005) measured for CDT a sensitivity of 80% in the detection of people who abuse alcohol and respectively 91% in the detection of alcohol dependence. The specificity of CDT was asserted as 83% (Schwan et al., 2005 according to Eeckhout, 2005).

Nevertheless, false positives can occur in patients with inborn error of glycoprotein metabolism, genetic D-variant of transferrin, primary biliary cirrhosis, hepatocellular carcinoma, viral liver cirrhosis and combined pancreas and kidney transplantation or due to the drugs used to treat these disorders (Sillanaukee et al., 2001 in Wolff & Marshall, 2006; Allen et al., 2003). Furthermore, Body mass index (BMI), age and gender can influence the results and should therefore be taken into account (Wolff & Marshall, 2006; Mundle et al., 2000; Mundle et al., 1999). Women tend to have generally higher CDT levels than men (Arndt, 2000). Pregnancy (Stauber et al., 1996a), use of contraceptives (Sillanaukee et al., 2000b) and hormone replacement therapy (Stauber et al., 1996b) are associated with alterations of the normal values of CDT. These sex-based hormonal variations might contribute to the lower sensitivity of CDT as a marker of alcohol abuse among women.

Even with the disadvantages of the CDT marker, it remains a very useful biological indicator for chronic alcohol consumption (Golka & Wiese, 2004; Schellenberg et al., 2005; Golka et al., 2004 according to Eeckhout, 2005; Peterson, 2004/2005). Golka & Wiese (2004) specifically recommend CDT as a tool in the assessment procedure of DUI. This recommendation has according to Eeckhout (2005) recently been underlined by a study of Appenzeller et al. (2005). The authors compared BAC and CDT levels of 408 coincidently chosen drivers. They authors observed, that drivers with a low BAC level also showed lower %CDT levels. In reverse drivers with a strongly elevated % CDT level also had higher BAC values (Eeckhout, 2005).

Plasma Sialic Acid Index of Apolipoprotein J (SIJ). Apolipoprotein J is a glycoprotein that is responsible for the transportation of lipids (i.e. fats) in the blood. Like the glycoprotein transferrin (see

CDT), it contains sialic acid molecules that can decrease in number following alcohol consumption. The advantage of apolipoprotein J is that it has more than four times more sialic acid chains than transferrin, which makes it easier to measure changes in sialic acid content caused by heavy alcohol consumption (Peterson, 2004/2005).

So far little information on the diagnostic performance of this biomarker is available. Based on a study of Ghosh et al. (1999) SIJ seems to be a better marker of long-term alcohol consumption than CDT in both male and female alcohol consuming individuals (Wurst, 2005a). SIJ responded to changes in alcohol consumption in alcohol dependants, with higher sensitivity than CDT. The plasma SIJ restored to normal levels after an abstinence period of 8 weeks. The authors suggested a half-life for the recovery of plasma SIJ after abstinence from alcohol consumption to be around 4-5 weeks (Wurst, 2005a). More research is needed, but preliminary results show promise for SIJ as a highly specific, easy-to-measure and cost-effective marker (Javors & Johnsons, 2003 in Peterson, 2004/2005; Wurst et al., 2005a).

Total Serum Sialic Acid (TSA). Sialic acid has a clear potential as a highly specific marker for alcohol use. Therefore, researchers have begun to examine the potential of directly measuring total sialic acid (TSA) levels in patients' blood, rather than looking at the difference in sialic acid chains only on glycoproteins such as transferrin (see CDT) and apolipoprotein J (see SIJ). Preliminary findings of measuring alcohol consumption show a sensitivity and specificity similar to the biological marker CDT. The TSA elevated levels need a longer period of abstinence than CDT or GGT to normalize (Javors and Johnson, 2003). Hence, the TSA test might not be as useful in rehabilitation programmes to assess relapse. Further research is required to confirm the positive results of the first findings **(**Javors & Johnson, 2003).

Hexosaminidase (hex). Hexosaminidase (hex), also named N-acetyl-β-D-glucosaminidase, is found in most body tissues and has an especially high concentration in kidneys (Dance et al., 1996 in Allen et al., 2003).

Increased urine hex is used as a biological marker to indicate diseases associated with renal malfunction (Vigano et al., 1983 in Allen, 2003), hypertension (Mansell et al., 1978 in Allen, 2003), diabetes (Cohen et al., 1981) and preeclampsia (Goren et al., 1987a in Allen, 2003). It serves as an indicator of rejection after kidney transplantation (Wellwood et al., 1973 in Allen, 2003), and is seen with the use of nephritic drugs (Goren et al., 1987b in Allen, 2003). Elevated urine hex levels are often found in children less than 2 years and adults over age 56 (Kunin et al., 1978 in Allen, 2003).

Alcohol consumption of 60 g/d for at least 10 days (i.e. heavy drinking or more) leads to an increase of serum and urine hex. The time it takes to return to normal hex levels, after a period of abstinence, differs in the two body fluids. Serum hex has a normalization time of 7-10 days and urine hex of 4 weeks (Martines et al., 1989 in Allen, 2003).

An increased serum hex level can occur as well with liver diseases (Hultberg et al., 1981; Hultberg & Isaksson, 1983), hypertension (Simon & Altman, 1984), diabetes mellitus (Poon et al., 1983), silicosis (Koskinen et al., 1983), myocardial infarction (Woollen & Turner, 1965), thyrotoxicosis (Oberkotter et al., 1979), and pregnancy (Isaksson et al., 1984 in Allen, 2003).

Kärkkäinen et al. (1990) reported serum hex to have a sensitivity of 69% and specificity of 96% in detecting heavy drinking among alcoholic subjects. The urine hex obtained respectively values of 81% and 96%. The hex values of this study exceeded the sensitivity of GGT, ALT and AST. A later study

carried out by Stowell et al. (1997) confirmed these findings. The authors measured a sensitivity of serum hex of 94% and a specificity of 91% in identifying drinking in a group of alcohol dependents. In this study, serum hex also proved slightly more accurate than CDT (Allen et al., 2003).

Fatty Acid Ethyl Esters (FAEE). Fatty acid ethyl esters (FAEE) are, as the name implies, fatty acids that the body produces when it metabolises alcohol. The FAEE test refers to four specified fatty acid ethyl esters: ethyl myristate, ethyl palmitate, ethyl oleate and ethyl stearate (Auwärter et al., 2001). They are found in the liver, pancreas, and fat (i.e. adipose) tissues up to 24 hours after alcohol consumption (Peterson, 2004/2005; Eeckhout, 2005). Borucki et al. (2004) even measured in his study on heavy drinkers, increased serum FAEE levels for at least 44 hours. FAEE is also found in hair and as the body cannot flush these molecules out of hair, the compound builds up over a long period of chronic drinking (Peterson, 2004/2005). Researchers suggest using FAEE (in hair) as a marker for chronic heavy alcohol consumption (Wurst et al., 2004 in Peterson, 2004/2005).

Recent studies show that FAEE (in hair) makes it possible to distinguish between total abstainers, social drinkers and heavy drinkers (Yegles et al., 2004; Wurst et al., 2004; Auwärter et al., 2001). Yegles et al. (2004) suggest the following cut-off values for FAEE (in hair): 0.05-0.37 ng/mg for abstainers, 0.26-0.50 ng/mg for social drinkers and 0.65-20.50 ng for heavy drinkers. Wurst et al. (2004) propose a cut-off value for FAEE (in hair) of 0.4 ng/mg to differentiate between abstainers and social drinkers on the one hand, and heavy drinkers and dependant alcohol consumers, on the other hand. In the study of Wurst et al. (2004) the biological marker FAEE (in hair) correctly identified these two groups in 94.4% of the cases, which exceeded the results of CDT (47.1%), MCV (38.8%) and GGT (72.2%). Based on the mentioned results, Eeckhout (2005) recommends a FAEE (in hair) concentration of > 1 ng/mg as cut-off value for heavy drinking in the assessment procedure of DUI. More study is needed to evaluate psychometric characteristics of the test.

Whole blood-associated acetaldehyde assay (WBAA). Acetaldehyde is the first compound the body produces when it metabolises alcohol. It can exist on its own or bind to certain proteins, including haemoglobin. The whole blood-associated acetaldehyde assay (WBAA) uses high-performance liquid chromatography and fluorescence detection to measure the concentration of both, free and bound acetaldehyde (Halvorson et al., 1993 in Peterson, 2004/2005). Peterson & Polizzi (1987) derived from their study, that the WBAA is highly specific and extremely sensitive. Levels of protein-bound acetaldehyde stay high for about a month after alcohol consumption (Halvorson et al., 1993).

The test can be used to detect heavy alcohol consumption. Moreover, it can provide a picture of alcohol consumption over time, as haemoglobin-bound acetaldehyde accumulates in red blood cells, as a person continues to drink (Peterson, 2004/2005).

Ethyl Glucuronide (EtG). Ethyl glucuronide is a minor nonoxidative, water-soluble metabolite of ethanol. It is formed in the liver, when alcohol reacts with activated uridine diphosphoglucuronic acid, a substance which works to detoxify drugs by turning them into water-soluble compounds which can be easily removed from the body (Petersen, 2004/2005; Wurst, 2005a).

The glucuronidation of alcohol was first described by Neubauer (1901) and it was subsequently detected in human urine by Jaakonmaki et al. (1967) and Kozu (1973) (Allen et al., 2003). In the last years, especially in the U.S.A., the testing of these biomarkers rapidly spread as a monitoring tool among physicians (Wurst, 2005a; Eeckhout, 2005).

Main advantage of this marker is, that EtG is only detectable if alcohol has been consumed and that its detection time is longer than those of ethanol per se. EtG can be found in blood up to 36 hours and in urine 3 to 5 days after consumption of alcohol (Wurst et al., 2003; Wurst, 2005a). The half-life of EtG is 2-3 hours (Schmitt et al., 1997 in Allen et al., 2003). It is present in various body fluids, tissue extracts and hair (Schloegl et al., 2006; Wurst et al., 1999; Wurst, 2005a).

So far there is only little information on the minimum dose of alcohol needed to increase the levels of EtG (Allen et al., 2003). A Study of Stephanson et al. (2002) showed that the intake of a very low dose (~ 7g) of ethanol is detectable as urine EtG after six hours. In order to eliminate potential false-positive test results, due to incidental minor exposure to alcohol (e.g. from alcohol in food, some medication, communion wine or mouthwash), cut-off levels for measuring EtG in urine are proposed to be between 100 and 250µg/liter (Wurst, 2005a).

Eeckhout (2005) says that the necessity of highly sophisticated tools to detect EtG in urine is a serious disadvantage in the practical use of EtG as a marker, but this critic can probably also be said for some other markers.

Phosphatidyl Ethanol (PEth). Phosphatidyl Ethanol (PEth) is a direct ethanol metabolite, which is detectable in blood for more than 2 weeks after sustained ethanol intake (Hartmann et al., 2007). So far little is known on the performance characterises of this biomarker (CSAT, 2006). In a recent study, Hartmann et al. (2007) conclude that PEth has the potential to be a sensitive and specific biomarker indicating longer lasting intake of higher amounts of alcohol. In their study they measured a sensitivity of 94.5% and specificity of 100% in the identification of long sustained alcohol intake (Hartmann et al., 2007). The CSAT (2006) states, that the risk of false positive is unlikely, but that it is in fact still unknown, due to paucity of research. PEth probably shows little gender, age or ethnicity effect and a linear dose-response relationship with recent drinking levels. The CSAT sees PEth as a new and promising biological marker (CSAT, 2006).

Combination of tests on alcohol. In search of a biological marker which can detect levels of alcohol consumption in a more accurate, and easy-to-use way than the ones known, a lot of study has been done on the combined use of different biomarkers. Combined models use two or more separated biological markers. The results are judged according to “multiple cut-off” or “compensatory” approaches. Most common is the “multiple cut-off” method, which implies, that if any of the biological markers is above its reference range, the case is termed positive. In the “compensatory” approaches the test is regarded as positive if the sum of the scores of the separate tests exceeds some pre-derived cut-off value (Allen et al., 2003). The second method enables a combination of rather specific tests with more sensitive tests without loss of assay specificity (Niemelä, 2007).

The most frequently suggested combination of biomarkers of alcohol is GGT and CDT (Bortolotti et al., 2006; Eeckhout, 2005; Allen et al., 2003; Miller & Anton, 2004; Niemelä, 2007). Based on a review of the literature on CDT (2001-2005), Bortolotti et al. (2006) derived that the combined use of GGT and CDT is better for the discrimination between alcohol abusers and social drinkers than any of the single markers alone. Litten et al. (1995) reported that the sensitivity increases by more than 20%, whereas the specificity results in a minimal loss if GGT and CDT are used in combination to identify alcohol dependents. Based on a study of more than 7,000 Fins, Sillanaukee & Olsson (2001) discovered, that heavy drinkers *(>40 g/d)* can be better identified with the formula $y = 0.8 \times \ln^3 GGT + 1.3 \times \ln CDT$ than with either test separately. Used for females, both test approaches performed similar (Wurst, 2005b; Allen et al., 2003). The Chen et al. (2003) survey based on 1,863 participants in the WHO-

[3] ln = natural logarithm

ISBRA Study supports these findings. They propose a "compensatory" approach, slimily to Sillanaukee & Olsson (2001), with the formula y = 0.8 x ln GGT + 1.7 x ln CDT (Whitfield, 2005 in Wurst, 2005b). Hietala et al. (2006) compared in their study different combination methods of GGT and CDT and the use of traditional markers. The authors derived, as well that the combined use of GGT and CDT improves the sensitivity of detecting excessive ethanol consumption, compared with traditional markers of alcohol use. They measured for GGT and CDT, combined in a "compensatory" approach with the formula y = 0.8 x ln GGT + 1.3 x ln CDT, a sensitivity and specificity of 90% and 98%. In their follow-up study of 44 alcoholic patients, the combined GGT and CDT levels returned to normal after an average of 18 days with a standard deviation of 9 days (i.e. 18 ± 9 days) (Hietala et al., 2006). In the detection of alcohol abuse and alcohol dependence (DSM-IV), Schwan et al. (2005) measured a sensitivity of respectively 90% and 99%. In his study, the specificity decreased to a value of 63% (Schwan et al., 2005 according to Eeckhout, 2005).

As CDT is, among the tradition markers, a very costly and laborious test and as it lacks sensitivity in some populations, e.g. in female or young drinkers (Helander et al., 2001; Anton et al., 2002; Chen et al., 2003 in Taracha, 2006) some studies chose for the serum marker GGT and examined further combinations with other tests. GGT is the most commonly used, inexpensive and convenient serum marker of alcohol consumption. It has a sensitivity similar to CDT, but its specificity and global predictive value are lower (Reynaud et al., 2000; Schwan et al., 2004; Salaspuro, 1999; Yersin et al., 1995 in Taracha, 2006).

In their study on male alcohol dependents Taracha et al. (2006) combined traditional serum markers of liver origin with urinary markers of kidney origin. GGT and urine hex appeared to be the best for discriminating a group of alcohol dependents (ICD-10) in detoxification from a group of alcohol dependents who had maintained abstinent for more than 6 weeks. The sensitivity and specificity of this combination is lower than those of GGT combined with CDT but reaching the values of 0.75 (0.64-0.85)[4] sensitivity and 0.94 (0.81-0.99)[5] specificity (equation: GGT & hex = 0.62 x ln(GGT) + 0.72 x ln(hex); cut-off value = 1.89), a combination of GGT and hex might be a promising tool for monitoring and maybe detecting alcohol dependent individuals (Taracha et al., 2006).

The scientific literature focused particularly on studies combining CDT and GGT. Preliminary findings on other combinations of biological markers such as GGT and hex or combinations with FAEE or EtG, show good results, but further study is needed to evaluate the validity of these approaches.

Annex 8: Overview table of characteristics of selected biological markers of alcohol

BIOLOGICAL MARKER	REFREENCE	TIME TO RETURN TO NORMAL LIMITS	TYPE OF DRINKING CHARACTERIZED	SENSITIVITY/ SPECIFICITY[6]	SPECIFICITY	EXAMPLES OF POSSIBLE SOURCES OF FALSE POSITIVES	GENERAL COMMENTS
Gamma-glutamyl-transferase	Allen et al., 2003	2-6 weeks of abstinence	~ 70 drinks/wk for several weeks				Many sources of false positives

[4] 95% confidence interval
[5] 95% confidence interval
[6] CSAT 2006 provides a rough index of *sensitivity* (among the individuals *with* the condition of interest, the ability of the test to correctly identify those individuals) and *specificity* (among the individuals *without* the condition of interest, the ability of the test to correctly identify those individuals) with ***low*** representing values approximately **40** percent or less and ***high*** representing values usually **above 70** percent. Sensitivity and specificity also depend on what defines the condition of interest and the cutoff value being used for the test.

(**GGT)**	Eeckhout, 2005	4-5 weeks of abstinence	4-8 weeks 4 or more glasses/d				Many sources of false positives
	CSAT, 2006		Probably at least 5 drinks/d for several weeks	Moderate (as screen for alcohol dependence)	Moderate (as screen for alcohol dependence)	Liver and biliary disease, smoking, obesity and medications inducing microsomal enzymes.	Most commonly used traditional biomarker. Primarily reflects liver damage that is often related to alcohol consumption. Performs best in adults' ages 30 to 60.
	Peterson, 2004/2005		Chronic alcohol abuse	61(1)	n/a	Digestive diseases, such as pancreatitis and prostate disease, also can raise GGT levels.	
Aspartate aminotransferase (**AST**)	Allen et al., 2003	7 days, but considerable variability in declines with abstinence	Unknown, but heavy				Many sources of false positives
	CSAT, 2006		Unknown, but heavy and lasting for several weeks	Moderate (somewhat lower than GGT as screen for alcohol dependence)	Moderate (somewhat lower than GGT as screen for alcohol dependence)	Liver and biliary disease, smoking, obesity, medications inducing microsomal enzymes and excessive coffee consumption can lower values.	Primarily reflects liver damage that is often related to alcohol. ALT seems less sensitive than AST. Ratios of AST to ALT >2 may suggest liver damage that is alcohol related. Performs best in adults ages 30 to 70.
	Peterson, 2004/2005		Chronic alcohol abuse	Method-dependent	n/a		Not as accurate in patients under age 30 or over age 70
Alanine aminotransferase (**ALT)**	Allen et al., 2003	Unknown	Unknown, but heavy				Many sources of false positives; Less sensitive than aspartate aminotransferase (ASAT)

	CSAT 2006		Unknown, but heavy and lasting for several weeks	Moderate (somewhat lower than GGT as screen for alcohol dependence)	Moderate (somewhat lower than GGT as screen for alcohol dependence)	Liver and biliary disease, smoking, obesity, medications inducing microsomal enzymes and excessive coffee consumption can lower values.	Primarily reflects liver damage that is often related to alcohol. ALT seems less sensitive than AST. Ratios of AST to ALT >2 may suggest liver damage that is alcohol related. Performs best in adults' ages 30 to 70.
	Peterson 2004/2005		Chronic alcohol abuse	56(1)	n/a		
Mean corpuscular volume (MCV)	Allen et al. 2003	Unknown but half/life ~ 40 days	Unknown, but heavy				Slow return to normal limits even with abstinence
	Eeckhout 2005;	Unknown but half/life ~ 40 days	4-8 weeks excessive alcohol consumption				Slow return to normal limits even with abstinence
	CSAT 2006		Unknown, but heavy and lasting at least a few months	Low (sensitivity somewhat below GGT as screen for dependence)	Moderate-High (as screen for alcohol dependence)	Liver disease, haemolysis, bleeding disorders, anaemia, folate deficiency, and medications reducing folate.	Poor biomarker for relapse because of sluggish response to drinking. Accuracy does not seem to show a gender effect, whereas other traditional biomarkers often perform better for men than women.
	Peterson 2004/2005		Heavy alcohol use	47(1)	n/a		
Carbohydrate- deficient transferrin (CDT)	Allen et al. 2003	2-4 weeks of abstinence	60+ g/d for at least 2 weeks				Rare false positives; Good indicator of relapse
	Eeckhout 2005;	2-3 weeks of abstinence	60-80 g/d for 1-2 weeks				
	CSAT 2006		Probably at least 5 drinks/d for 2 weeks or so	Moderate (as screen for alcohol dependence)	High (as screen for alcohol dependence)	Iron deficiency, hormonal status in women, carbohydrate-deficient glycoprotein syndrome, fulminant hepatitis C, and severe alcohol disease.	Equal to, or possibly slightly better than, GGT but much more specific. Very good biomarker of relapse to drinking following a period of abstinence. Likely less sensitive for women and younger people.

	Peterson 2004/2005		Heavy alcohol use (more than 60 g/d or 4-5 standard drinks/d)	26-83 (2) Method- and gender-dependent)	92 (2)		
Urine hexosaminidase	Allen et al. 2003	4 weeks of abstinence	At least 10 days of drinking >60 g/d To detect heavy drinking among alcohol dependents (6)	81 (5)	96 (5)		Many sources of false positives: renal malfunction, hypertension, diabetes, preeclampsia, rejection after kidney transplantation, use of nephritic drugs Elevated hex levels in children <2 years and adults >56
Serum hexosaminidase	Allen et al. 2003	7-10 days of abstinence	At least 10 days of drinking >60 g/d To detect heavy drinking among alcohol dependents (6) Identifying drinking in alcohol dependents (7)	68 (5) 94 (6)	96 (5) 91 (6)		Many sources of false positives: Liver diseases, hypertension, diabetes mellitus, silicosis, myocardial infarction, thyrotoxicosis, and pregnancy
	Peterson 2004/2005		Heavy alcohol use	94 (2)	91(2)		
Ethyl glucuronide (EtG)	Allen et al. 2003	3-4 days	Identifies even low-level consumption				Can be measured in urine or hair
	CSAT 2006		Perhaps as little as a single drink	High	Unknown (as indicator of relapse)	Unknown, but alcohol is often in medications, hygiene products, cosmetics, foods, etc. Research is needed to determine whether incidental alcohol exposure can substantially influence the biomarkers.	As direct analytes of nonoxidative breakdown of alcohol, highly sensitive. Probably little gender, age, or ethnicity effect. A new, but promising biomarker; more research is warranted.
	Peterson 2004/2005		Monitoring sobriety; forensics	n/a	Method-dependent		
Phosphatidyl Ethanol (PEth)	CSAT 2006		Possibly 3 or 4 drinks/d for a few days	High (as indicator of relapse)	Unknown (as indicator of relapse)	None likely but still unknown due to paucity of research.	Probably little gender, age, or ethnicity effect. Linear dose–response relationship with recent drinking levels. A new,

							but promising biomarker; more research is warranted.
Whole blood/ associated acetaldehyde (WBAA)	Peterson 2004/2005		Recent alcohol consumption at all levels< monitoring abstinence	100 (3)	95 (3)		
Fatty acid ethyl esters (FAEE)	Peterson 2004/2005		Recent heavy alcohol use	100 (4)	90 (4)		

Index: n/a data not available; (1) Anttila et al., 2004; (2) Stowell et al., 1997; (3) Bean et al., 2001;(4) Wurst et al., 2004; (5) Kärkkäinen et al., 1990; (6) Stowell et al., 1997

Data source: Allen et al., 2003, Eeckhout, 2005, CSAT, 2006, Peterson, 2004/2005

Annex 9: Main advantages and disadvantages of hair analysis

The main advantages of hair analysis compared to urine and blood samples are (Samyn et al., 2002; Wolff 2006):

- Hair analysis can provide a picture of the drug consumption over weeks and even months.
- It can reflect the amount being consumed.
- It enables a detection of the substances themselves as well as their metabolites.
- The technique is non-invasive.
- The sample can be easily collected under close supervision to prevent adulteration or substitution of the samples.
- The sample can be easily preserved and transported.
- It is possible to sample a second time.
- Decontamination methods have been developed to clean the samples of external substances.

The main disadvantages of hair analysis are (Samyn et al., 2002; Wolff, 2006):

- Hair analysis cannot detect recent illicit drug use.
- The drug deposit in the hair strand can differ according to sex, race, colour of the hair (blond versus dark) and treatment of the hair (e.g. bleached or washed with certain shampoos).
- It is not possible to distinguish between active use and passive exposure.

Annex 10: Approximate detection times of selected drugs and some of their metabolites

The following part of this chapter summarizes approximate detection times of selected drugs. They are important in the assessment after the DUID offence, in case the individual is obliged to prove periods of abstinence. In the context of judging the *fitness to drive* at the moment of the DUID offence, the toxicological ability to detect a drug is only a part of the assessment, as detected substance consumption can date back and thus may not have an influence on the actual driving ability. Furthermore, the effect on the driving skills of an individual is not only depending on the kind and amount of substance, he consumed, but also on the tolerance he has developed to the substance. Von Meyer (2006) says that numerous studies have shown that even high-dose opioid use does not necessarily affect a person's fitness to drive. The negative effects of opioid on the driving skills, such as nausea, dizziness and light-headedness, decrease if the person develops tolerance to the substance (Von Meyer, 2006). Maatz (1995) says that there is still a lack of proven results about the relation between dose, blood concentration and effect on the driving skills, which enables a determination of limits. Meanwhile quite some studies and reviews examined this relation as for example the IMMORTAL (Review of impairment and accident risk for alcohol, drugs and medicines) project of the European Commission (IMMORTAL, 2002). The limits or *cut-off* values of illicit drugs

within the assessment procedure of the *fitness to drive* depend on the legal situation and vary by country (see for example: Brenner-Hartmann, 1995; Brenner-Hartmann et al., 2005; del Rio, 2001).

This summary of approximate detection times of selected illicit drugs and metabolites is based on information presented by Verstraete (2004). Additional data from Wolff (2006), Samyn et al. (1999) and Brenner-Hartmann et al., 2005) is added. The detection times are based on common laboratory "cut-off" values and so called "normal doses" of the psychoactive substance. The amount of a psychoactive substance which is considered "normal" can vary widely from one user to another. It depends on the severity of consumption behaviour and the developed tolerance of the subject. A normal dose of amphetamine for example is considered to be 10-30 mg, but tolerant subjects can take up to 2000 mg per day (Verstraete, 2004). The so called "normal doses" are average values which can be used as standard for research purposes.

More detailed information on the detection time of illicit drugs can be found in the original papers of Verstraete (2004), Wolff (2006) Samyn et al. (1999) and Brenner-Hartmann et al. (2005). Detailed information on the effect of selected drugs on the driving skills is summarized in IMMORTAL (2002).

Amphetamine. A normal dose of amphetamine is 10 to 30 mg, but tolerant subjects can take up to 2000 mg/d (Verstraete, 2004). A normal dose is detectable in blood for 46 hours, the half-life varies between 7-34 hours (cut-off value 4ng/ml) (Iten, 1994a). It can be found in urine for 2-3 days (Verstraete, 2004) Wan et al. measured a detection time of 20-50 hours in saliva (cut-off value 10ng/ml) (Wan et al., 1978).

Benzodiazepines. The assessment window of benzodiazepines is very variable as they have very different pharmacokinetic characteristics (Verstraete, 2004). Wolff et al. 1999 distinguishes three different types of benzodiazepines: short-acting (e.g. triazolam), intermediated (e.g. temazepam) and long-acting (e.g. diazepam/nitrazepam) benzodiazepines. They can be detected in urine respectively 1 day, 2-4 days and 7 or more days (Wolff et al., 1999 in Wolf, 2006).

Cannabinoids. The normal dose of cannabis absorbed after smoking a joint varies between 5 and 30 mg. THC is detectable for approximately 5 hours in plasma (Iten, 1994b). Metabolites of cannabis can be detected in blood up to 49 hours. The half-life of THC is approximately 30 minutes, the half-life of its metabolites are between 20 and 57 hours in occasional users and 3-13 days in regular users at a cut-off value of 10ng/ml (Verstraete, 2004). After smoking cannabis it can be detected in urine 33 ± 10 hours using GC-MS. The inactive metabolite THCCOOH can be detected up to 58 ± 6 hours (Niedbala et al., 2001). After oral intake the detection time is even longer and in chronic users THCCOOH can be detected for weeks or even months at a screening cut-off value of 50µg/l (Smith-Kielland et al., 1999). The detection time for cannabis in saliva is 34 hours. The cut-off value is 0.5ng/ml (Niedbala et al., 2001). Brenner-Hartmann et al. (2005) differentiate, based on the detection time of THC or its metabolite THCCOOH in urine samples, three cannabinoid consumption patterns. They link a detection period of 2-4 days with experimental and occasional use on a low frequency (Probierkonsum, vereinzeltem gelegentlichem Konsum), 5-14 days with a chronic use pattern of more than one consume per week (Konsum mehrmals wöchentlich) and 2-6 weeks with permanent chronic use (Dauerkonsumenten) (Brenner-Hartmann et al. 2005).

Cocaine. The usual intranasal dose varies between 20 and 100 mg. After consuming 20 mg the detection time in blood is 4-6 hours and 12 hours after 100 mg (Iten, 1994c). In chronic users metabolites can be detectable up to 5 days on average at a cut-off value of 10ng/ml (Reiter et al., 2001). The half-life of cocaine and its metabolites varies between 1 and 6 hours. Brenner-Hartmann

et al. (2005) state, that *Crack* can be identified in blood up to 1 hour. Metabolites of cocaine can be detected in urine 1-3 days, depending on mode of administration and dose (Cone et al., 1989; Hamilton et al., 1977). In chronic users, metabolites can be found 22 days after administration at a cut-off value of 300µg/l (Weiss & Gawin, 1988). Cocaine can be detected in saliva after 5-12 hours at a cut-off value of 1ng/ml (Samyn et al., 1999; Cone et al., 1997).

LSD. A normal dose of LSD is usually very small. It lies between 50 and 100µg. The half-life is approximately 2.5-5 hours. Detection time in plasma varies between 24 and 48 hours (Foltz, 1995) at a cut-off value of 100pg/ml. LSD and can be found in urine up to 36 hours (Foltz, 1998) and its metabolite 2-Oxo-3OH-LSD for 96 hours. The cut-off value of LSD is 0.2ng/ml (Poch, 1999).

Methamphetamine. A common dose of methamphetamine is considered to be 5-10 mg. It can be much higher in tolerant subjects. The half-life of methamphetamine varies between 10 and 30 hours (Verstraete, 2004). An amount of 22 mg methamphetamine could be identified in blood for 48 hours and in urine around 60 hours (Cook et al., 1993). After a controlled administration of 10 mg, Oyler et al. (2002) measured methamphetamine in urine, for 87.2 ± 51 hours and Schepers et al. (2003) in oral fluid for 24 hours.

Methylenedioxymethamphetamine (MDMA, Ecstasy) and Derivatives. The usual dose of MDMA or Ecstasy varies between 50 and 100mg. A dose of 100mg can be found in blood for 24 hours (cut-off value: 20ng/ml). The half-life is 7 to 8 hours (Pacifici et al., 2001). The detection time in urine is 1-3 days at a cut-off value of 20ng/ml (Iten, 1994d). MDMA can be detected up to 24 hours in saliva (Navarro et al., 2001, cut-off: 126ng/ml).

Opiates: Heroin and Morphine. A normal dose of heroin varies between 10mg and 1-2g for tolerant subjects. The detection times of heroin vary widely according to the way of administration. Typical half–lives of heroin, 6-acetylmorphine and morphine are 2-7 minutes, 6-25 minutes and 2-3 hours, respectively (Verstraete, 2004). After intravenous consumption of 12-20mg, morphine was found in blood up to 20 hours. After smoking 10.5mg, the detection time varied between 22 minutes and 2 hours (Jenkins et al., 1994). After intranasal administration of 9 mg heroin, it was detectable in blood for 12 hours at a cut-off value of 1ng/m (Goldberger et al., 1993). 6-acetylmorphine and morphine can be detected 2-4 hours in urine (Wolff et al., 1999 in Wolff, 2006) and between 0.5 and 8 hours in oral fluid at a cut-off value of 1ng/ml (Samyn et al., 1999). Brenner-Hartmann et al. (2005) state, that heroin can be detected as conjugated morphine in urine 2-4 days.

Other opioids: methadone, buprenorphine and codeine. Methadone is detectable in blood up to 36 hours (Wolff et al., 1997) and buprenorphine 8 hours (Hanks, 1987 in Wolff et al., 1999). In urine these substances can be identified 7-9 days (methadone) and 2-3 days (bubrenorphine). Buprenorphine metabolites can be detected in urine up to 7 days (Wolff, 2006). Brenner-Hartmann et al. (2005) state, that codeine can be identified in blood up to 24 hours, and dihydro-codeine 8-10 hours. *Conjugated codeine* can be detected in urine up to 3 days (Brenner-Hartmann et al. 2005).

γ-Hydroxybutyric Acid (GHB). The estimated half live of γ-hydroxybutyric acid (GHB) is only 20 minutes (Verstraete, 2004). It can be detected in blood and oral fluid around 5 hours and less than 12 hours in urine (Hose et al., 1980). Kintz et al. (2001) discovered that with a sweat patch, one can still detect supraphysiological concentrations between 12 and 24 hours after the administration of 20 mg/kg of GHB.

3 Review of existing DUI/DUID rehabilitation measures

Annex 11: Method of literature review on different scopes of DUI/DUID rehabilitation measures: selected current approaches outside Europe

Method of literature review on U.S.A. and Canada

For the data collection an internet search was done and in addition to that the following institutions and experts (in alphabetical order) in the U.S.A. and Canada were contacted by email:

Elizabeth Earleywine, Senior Attorney, National Traffic Law Center, Virginia, U.S.A.
Jeanne Mejeur and Heather Morton, National Conference of State Legislatures, Colorado, U.S.A.
Anne Leonard, Ministry of Transportation, Ontario, Canada
Rania Shuggi, Manager, Remedial Measures Program, Centre for Addiction and Mental Health, Toronto, Canada
Catherine L. Tress, W. PA Law Enforcement Dir. PA DUI Association, Western Alliance TEAM DUI Task Force, Western Regional Office, Pennsylvania, U.S.A.
Diane Williams, Secretary of the Corporation Director of Executive Services and Corporate Communications, Pacific Institute for Research and Evaluation, Maryland, U.S.A.
U.S. Department of Transportation, National Highway Traffic Safety Administration, Washington, U.S.A.

All experts / institutions received an email with “Research on DR Programs” as subject matter, an introduction about the research project and the following lead questions:

What kind of programmes is offered in the U.S.A. / Canada?
Who are the suppliers of the programmes?
What are the circumstances that lead to participation or on which legal system are they based? Is the participation voluntary or mandatory?
What are the consequences of (not) participating?
How long is the duration of such a programme and what does it cost to participate?
Are there quality criteria, like a standardized quality control system? Are the programmes evaluated?

Methodology of literature review on Australia

Methodology of literature search on rehabilitation approaches in Australia:

- Date of search: 24th October 2007
- Databases: DOKDAT (KfV, based on ITRD)
- Time period included: not defined
- Search term: Rehabilitation und Australien
- Language restriction: no
- Records found: 6
- Number of reviewed titles: 6
- Number of excluded titles: 4
- Number of full text reviewed titles: 2

Further some references were added which an expert from Australia had recently recommended.

Methodology of literature search on rehabilitation approaches in Australia:

- Date: October 2007
- Databases: literature references given by Australian RH expert
- Time period included: not defined
- Records recommended: 7
- Number of reviewed titles: 7
- Number of excluded titles:2
- Number of full text reviewed titles:5

Annex 12: Overview table on impaired driving state substance abuse assessment and treatment laws for convicted impaired drivers in the U.S.A. in 2005

STATE	LAW
Alabama	Education/treatment 1st/subsequent offense
Alaska	At court's discretion
American Samoa	None
Arizona	Education 1st offense; treatment 1st, 2nd & 3rd offenses
Arkansas	Mandatory for all DUI offenses
California	3-30 months treatment
Colorado	Mandatory education/treatment
Connecticut	discretionary 1st offense, mandatory subsequent offenses
Delaware	Mandatory for all DUI offenses
D.C.	None
Florida	Mandatory for any DUI offense
Georgia	Treatment for return of suspended license
Guam	Education required 1st offense, for probation or license restoration
Hawaii	Mandatory education 1st offense, discretionary treatment
Idaho	Treatment at court's discretion
Illinois	Evaluation and treatment at court's discretion.
Indiana	Discretionary
Iowa	Mandatory education/discretionary treatment
Kansas	Mandatory for probation or parole, discretionary for restricted license
Kentucky	Mandatory 90 day treatment/education 1st offense, mandatory 1 year treatment subsequent offenses
Louisiana	Mandatory treatment/education 3rd/4th offenses
Maine	Mandatory treatment/education
Maryland	Mandatory for probation, discretionary for license reinstatement
Massachusetts	Discretionary 1st and subsequent offenses
Michigan	Treatment/education
Minnesota	Mandatory treatment
Mississippi	Mandatory education 1st offense, mandatory treatment 2nd/ subsequent offenses
Missouri	Required 1st offense or if under 21
Montana	Mandatory education/treatment
Nebraska	Discretionary as term of probation
Nevada	Mandatory treatment/education, 1st * subsequent offenses
New Hampshire	Mandatory education any DUI offense or for license restoration
New Jersey	Mandatory any DUI offense, for license restoration or for offenders under 21
New Mexico	Treatment/education at court's discretion
New York	Mandatory all DUI offenses
North Carolina	Required treatment/education as condition of probation
North Dakota	Mandatory evaluation, discretionary treatment 1st, 2nd and 3rd offenses, mandatory treatment 4th/subsequent offenses
Ohio	Discretionary 1st offense, mandatory 2nd/subsequent offense
Oklahoma	Mandatory education 1st offense, discretionary 2nd/subsequent offenses
Oregon	Education mandatory for non-problem drinkers, rehab mandatory for problem drinkers or for hardship driving privileges
Pennsylvania	Discretionary 1st offenses; mandatory 2nd/subsequent offenses
Puerto Rico	License suspension/revocation until successful education/evaluation
Rhode Island	Mandatory education/treatment all offenses
South Carolina	Necessary for reinstatement of suspended or revoked license
South Dakota	Counseling 1st offense; treatment discretionary 2nd offense
Tennessee	Mandatory education for probation, mandatory rehab for 2nd/subsequent offense
Texas	Discretionary education 1st/2nd offense; discretionary treatment 3rd/subsequent offenses
Utah	Mandatory education 1st offense, discretionary treatment 2nd offense, mandatory treatment 3rd/subsequent offenses

Vermont	Mandatory education 1st offense, mandatory treatment on subsequent offenses
Virginia	Mandatory education/treatment 1st/2nd offenses,
Virgin Islands	Mandatory education/treatment for all DUI offenses
Washington	Mandatory education/treatment for all DUI offenses
West Virginia	Mandatory for reinstatement of suspended license and for participation in ignition interlock program
Wisconsin	Mandatory evaluation, discretionary education/treatment
Wyoming	Possible in lieu of some jail time or for hardship license

Sources: Digest of State Alcohol Highway Safety Related Legislation, National Highway Traffic Safety Administration and joint NHTSA/NCSA traffic safety legislative tracking database. kindly supported by Jeanne Mejeur, National Conference of State Legislatures.

Annex 13: Overview table of different Canadian provinces'/territories' programmes

Table 6: Survey of Rehabilitative Measures for DUI/DUID offender in Canada (Status 2004)

PROVINCE	BRITISH COLUMBIA	ALBERTA
Responsible body/provider	Quesnel Alcohol and Drug Abuse Association	Alberta Motor Association
Title of the program	Quesnel Addictions Services - DWI Program	Alberta Impaired Driving Program Planning Ahead / IMPACT
Target group	Sentenced first or re-offender	Driver with an administrative driving suspension of 90 days as well as sentenced first or re-offender
Program access	Referral by Probation Officer	Condition of re-licensing
Assessment	MAST, DAST, SASSI	Drivers with a 90-day administrative licence suspension, convicted first & multiple offenders
Costs	Is funded by the government	$115 or $205
Duration in Hours & Pers./group	21 hours at one weekend approximately 15 persons	*Planning Ahead:* one session with max. 30 persons *IMPACT*: 9 small group sessions with max. 6 persons + 6 big group sessions with max. 30 persons, all at one weekend
Evaluation	Client satisfaction	Process & outcome evaluation

Table 7: Continued Survey of Rehabilitative Measures for DUI/DUID offender in Canada (Status 2004)

PROVINCE	SASKATCHEWAN	
Responsible body/provider	St. Louis Alcoholism Rehabilitation Centre	SGI Driver Licensing
Title of the program	Impaired Driver Treatment Program	Safe Driving Program
Target group	convicted multiple offenders	Offenders given one or more 12-24-hr. suspension, convicted first & multiple offenders and DWI offenders other than alcohol, any driving-related Criminal Code convictions
Program access	Mandated	Condition of re-licensing; mandated
Assessment	SASSI 3	SASSI, MAST, AUDIT, ICD-10, DAST, Bio-Psycho-Social Assessment
Costs	Is funded by the government	$150
Duration in Hours & Pers./group	Daily 1-1.5 hours for two weeks in groups up to max. 8 persons	Four hours over two to four individual sessions for assessment, afterwards they are referred to a DWI or a Recovery Program, schedule varies, groups have max. 12 persons
Evaluation	---	---

Table 8: Continued Survey of Rehabilitative Measures for DUI/DUID offender in Canada (Status 2004)

PROVINCE	MANITOBA	QUEBEC
Responsible body/provider	Addictions Foundation of Manitoba (AFM)	Fédération Québécoise des centres de réadaptation pour personnes alcooliques et

		autres toxicomanes (FQCRPAT)
Title of the program	Manitoba's Impaired Drivers' Program	Programme sur l'évaluation de la compatibilité du comportement des personnes relativement à la consommation d'alcool ou de drogue, avec la conduite sécuritaire d'un véhicule *(Evaluation programme on the compatibility of alcohol or drugs consumption with the safe driving task)*
Target group	Drivers given one or more 24 hours suspensions in a three year period or one 24 hours suspension following an impaired charge in the previous three years, those issued a 90-day administrative suspension as well as convicted first or multiple offenders, DWI offenders other than alcohol	convicted first or multiple offender, DWI offenders other than alcohol
Program access	Condition of re-licensing; mandated	Condition of re-licensing
Assessment	SALCE (Substance Abuse/Life Circumstance Evaluation) + individual interview	Standardised Questionnaire
Costs	$300 (+ governments funding)	varying
Duration in Hours & Pers./group	*Education Program:* one session à 8 hours; *High Risk Program:* 6 sessions with 12.5 hours in 6 months; *Rehabilitation Program Options:* once a week for 3.5 hours in 10 weeks of 5 times per week in 3 weeks or inpatient for 21 - 28 days (max. 16 persons per course)	one - three individual sessions with 1-1.5 hours
Evaluation	Outcome evaluation	Client satisfaction

Table 9: Continued Survey of Rehabilitative Measures for DUI/DUID offender in Canada (Status 2004)

PROVINCE	NEW BRUNSWICK	ONTARIO
Responsible body/provider	Centre for Education and Research in Safety	Centre for Addiction and Mental Health
Title of the program	Auto Control u. Auto Control Plus	Back on Track
Target group	convicted first or multiple offenders	convicted first or multiple offenders
Program access	Condition of re-licensing	Mandated
Assessment	SASSI, Inventory for Drinking Situations (ARF), Alcohol Control Knowledge Inventory	Research Institute on Addictions Self-Inventory (RIASI), Alcohol Dependence Scale (ADS), Drug Abuse Screening Test (DAST)
Costs	$195 for first offenders or $435 for repeat offenders	$475 + tax = $508.25
Duration in Hours & Pers./group	At least 3.5 hours up to one weekend in groups up to 18 persons	Educational part: 2 sessions of 8 hours with max. 25 persons + therapeutic part: max. 16 persons
Evaluation	Process evaluation; quality assurance; client satisfaction	Client's satisfaction, content evaluation: assessment consistency

Table 10: Continued Survey of Rehabilitative Measures for DUI/DUID offender in Canada (Status 2004)

PROVINCE	NEWFOUNDLAND & LABRADOR	PRINCE EDWARD ISLAND	NOVA SCOTIA
Responsible body/provider	Newfoundland and Labrador Safety Council	Highway Safety Operations	Cape Breton District Health Authority & Guysborough Antigonish Strait Health Authority, Nova Scotia Department of Health
Title of the program	Think First - A Program About Drinking & Driving	DR Course	Addiction Services/Drug Dependency DWI Program
Target group	Drivers given one or more 12-24 hours suspension, convicted first offenders	Convicted first or second offender; after three or more convictions clients are automatically referred to addiction services	Driver with an administrative driving suspension of 90 days as well as convicted first or multiple offender
Program access	Condition of re-licensing	Mandatory after assignment	Not specified
Assessment	Alcohol Assessment completed by Addiction Services for clients with two or	Driver Risk Assessment (computerised screening tool) for drivers convicted of two lifetime	SASSI, clinical interview, collateral information

	more convictions	offences (possibly leading to addiction treatment)	
Costs	$125.35	Is funded by the government	$350 for assessment, measure is funded to 95% by the state
Duration in Hours & Pers./group	One group meeting of 4 hours, educational in focus	Two meetings of 3 hours in groups up to 30 persons, educational in focus	Not specified, max. groups of 20 persons
Evaluation	Process evaluation; quality assurance; client satisfaction	client satisfaction	client satisfaction

Annex 14: Methodology of literature research on effectiveness studies of existing DUI rehabilitation measures

This review is based on a broad literature review in several computer-accessible data bases, which included the ITRD database and four libraries of participating road safety institutions in DRUID WP5 (BASt, IBSR, INRETS and KfV).

Three independent reviews in the ITRD database were carried out by three different researchers. These reviews varied within there primary research focus:

1. one had a general focus on recidivism in the keywords,
2. one on rehabilitation measures and
3. one specifically on effectiveness studies of DUI/DUID RH measures.

In a second step all three researchers identified effectiveness studies of DUI/DUID RH measures. Furthermore, the libraries of the participating partner institutions of DRUID WP5 were reviewed on effectiveness studies of DUI/DUID RH measures: this included the libraries of BASt, IBSR, INRETS and KfV.

All identified studies were gathered, compared and doubles were excluded. A final review of all identified full texts was carried out by three authors of the DRUID WP5 team. The following part describes the literature search of the contributing partners in chronological order of the date of search.

Input BASt

This chapter contains information from available literature dealing with the effectiveness of rehabilitation measures. 34 articles were identified by the following literature searches[7]:

I. Search:

- Date of search: May 10th 2007
- Databases: ITRD (International Transport Research Documentation); TRIS (Transport Research Information Services)
- Time period included: 01/1988 - 03/2007
- Search term: recidi*
- Records found: 436
- Number of reviewed titles: 436
- Number of excluded titles: 193
- Number of left titles: 243
- Number of reviewed abstracts: 243

II. Search

- Date of search: May 31st 2007

[7] *The search methodology is identical to the one done for the chapter 1.2 General characteristics of recidivists.*

- Database: MEDLINE
- Time period: not defined
- Search term: recidi*
- Records found: 176.212
- Number of reviewed titles: 2350
- Number of excluded titles: 2331
- The number of left titles: 19

Due to the large amount of records found, but just the small number of titles left after reviewing over 2000 titles, the search term was specified within another search in the same database.

III. Search

- Date of search: June 5th 2007
- Database: MEDLINE
- Time period: not defined
- Search term: recidivis*
- Records found: 1400
- Number of reviewed titles: 1400
- Number of excluded titles: 1295
- Number of left titles: 105

After the third search the left records of the databases *ITRD, TRIS* and *MEDLINE* were compared to each other in order to exclude the doubles.

- Date: June 8th 2007
- Number of excluded titles: 48 (because they were doubled)
- Number of left titles: 57
- Number of reviewed abstracts: 57

IV. Search

- Date of search: June 19th 2007
- Database: Doktat KfV (Internal library of the Austrian Road Safety Institute)
- Time period: not defined
- Search terms and operators: Thesaurus numbers “1783 (drunkenness)” OR “2242 (drugs)” OR “2230 (Addiction)” AND “1519 (recidivist)”
- Records found: 205
- Number of reviewed titles: 205

After this search the left records of the databases *ITRD, TRIS* and *MEDLINE* were compared to the records found in DOKDAT (KfV) in order to exclude the doubles:

- Number of excluded titles: 66 (because of doubling)
- The number of left titles: 139
- Number of reviewed abstracts: 139
- Number of excluded abstracts: 94
- Number of left abstracts: 45

439 abstracts were reviewed and the selected articles were allocated according to their main questions of research (for details see chapter 1.6). For information on the effectiveness of rehabilitation measures the time period was restricted to all publications dealing with this topic since 1995. Thus 34 articles were remaining within these searches.

Input KfV

The EU-project ANDREA was an important study in this area, documenting the State of the Art on efficiency for 2002 and former years. Therefore the main focus concerning DRUID WP5 literature search was on new studies on efficiency from 2002 to 2007.

Search:

- Date of search: August 13th 2007
- Databases: DOKDAT (KfV; based on ITRD);
- Time period included: 1987 - 2007
- Language restriction: German
- Search term: Fahrernacherziehung und Evaluation und Trunkenheit
- Records found: 38

Input IBSR

Members of the IBSR carried out two independent reviews on effectiveness studies of DUI/DUID RH measures: one examined the road safety literature of the IBSR library and the other one searched for effectiveness studies in the ITRD database.

Review on effectiveness studies in the IBSR library (15.10.07)

A review of the IBSR library on effectiveness studies of DUI/DUID RH measures was carried out on the 15th of October 2007. The following table presents an overview of the used keywords, selection criteria and results:

Table 11: Literature search for effectiveness studies in the IBSR library (Date of last search: October 15th 2007)

	"Effectiveness"	"Efficacy"	"Evaluation"	"Rehabilitation"	"DUI"	"DWI"	TOTAL
N titles reviewed	108	17	424	133	26	24	732
N titles included	6	3	22	21	8	6	**66**

Without doubles	50
Within restrictions Time frame: 1988 – 2007 Languages: Dutch, English, French, German	35 paper + 7 PDF*
N abstracts reviewed (IBSR only reviewed the paper abstracts)	35 paper
N abstracts excluded	16 paper
N full texts sent to Inrets	19 paper + 7 PDF*

+ 7 PDF*: The 7 additional PDFs have been selected based on a review of the title only (not the abstract).

Review on effectiveness studies in ITRD database (IBSR; 20.11.07)

A member of the IBSR made an additional systematic review in the ITRD database focusing specifically on effectiveness studies and cost effectiveness studies on DUI/DUID RH measures. This review was carried out on the 20th November 2007 and used following limitations:

- Abstract available

- Language: English, German, French, Dutch
- Published in the last 10 years (1997-2007)

The following search-terms were adapted to the request code of the ITRD database:

I. Search

- (Effectiveness OR efficacy) AND (rehabilitation OR treatment) AND ((DUI OR DWI) OR driving AND (drink OR drug OR alcohol)); 30 hits

II. Search

- (Cost effectiveness) AND (rehabilitation OR treatment) AND ((DUI OR DWI) OR driving AND (drink OR drug OR alcohol)); 20 hits

All 50 identified studies were reviewed by title and abstract and compared with the findings of the IBSR library research and the English results of the BASt review on recidivism. 18 studies were forwarded to the final review round of all authors.

Input INRETS

The review of a member of INRETS included an interrogation of the ITRD data of published literature of the last 20 years and a further review of the INRETS library. The ITRD search used the following key words:

- "alcool ou drogues et rehabilitation; alcohol or drugs and rehabilitation or driver improvement"

This led to 47 references which were forwarded to the final review round of all authors.

Annex 15: Methodology of literature review on alcohol ignition interlock systems

For the preparation of this chapter a literature search was done in the databases ITRD (International Transport Research Documentation) and TRIS (Transport Research Information Services) on June 6th 2007. Due to the fact that a comprehensive literature review on the effectiveness of alcohol ignition interlock programmes was published by Willis et al. in 2004, the electronic search for this report was restricted to publications since 2003.

The search for the term "alcohol ignition interlock" resulted in a number of 29 titles whereof one was excluded and 28 titles were left. The usage of the term "alcolock" resulted in 6 titles whereof none was excluded. A further search was done using the terms "ignition" AND "immobilization" AND "alcohol", which resulted in 17 titles whereof 7 were excluded. After the search the left titles were compared and the doubles were excluded. A number of 34 publications were left and all abstracts were reviewed. The review of these abstracts revealed that only one study dealt with an outcome evaluation of ignition interlock programmes after the literature review in 2004. Thus the results of the review and of the only study identified to deal with the effectiveness of interlock programmes are summed up in this chapter.

Further data presented here are mainly based on information which was gathered within a research project conducted by the Department of Social Psychology of the University of Greifswald, Germany. The information was obtained mainly by means of internet searches and attendance at the 6th Annual Ignition Interlock Symposium in Annecy in 2005.

In addition to that this chapter includes experiences from the last EU-project on this topic "Alcolock Implementation in the European Union - An in-depth qualitative field trial" (SUB-B27020B-E3-ALCOLOCK-2003-S07.26578) contracted by the European Commission, Directorate-General for

Energy and Transport (DG-TREN) and coordinated by the Belgian Road Safety (IBSR/BIVV). Besides a short summary of the results of the field trial, this chapter also includes some results of the literature review done within this project. Further main findings from the EU-project “SUPREME - summary and publication of best practices in road safety in the member states” (SER-TREN/E3-2005-SUPREME-S07.53754) contracted by the European Commission, Directorate-General for Energy and Transport (DG-TREN) are taken into account as well.

4 Review of addiction treatment: options for dependent DUI/DUID offenders

Annex 16: Methodology of literature review on addiction treatment: options for dependent DUI/DUID offenders

Types of interventions

For the summary review, commonly used psychosocial and pharmacological strategies for rehabilitation treatment of alcoholism and drug dependence (as describe before) were considered in the treatment groups. The following conditions were included as controls:

- No treatment, which means that the comparison group undergoes an initial assessment, but is not given any treatment. In some studies, the control group consists of patients on a waiting list.
- Standard treatment or another treatment strategy, which means that the control group undergoes an initial assessment, before it is treated with an alternative treatment strategy.
- Placebo treatment, which means that the control group is treated with an inactive substance, while patients in the intervention group take the potentially active drug.

Primary outcomes

The following variables were defined as primary outcomes in descending order:

1. number of patients who are abstinent;
2. quantity of alcohol or drug consumption.

If none of the primary outcomes was published in the meta-analysis or review, the provided outcomes were considered in the summary review. Measures of consumption are preferred compared to other outcomes like quality of live, health condition and social situation.

Literature Search

The identification of relevant studies was performed by electronic search with PubMed with a last search on August 28th 2007 for the abstracts about treatment of alcohol dependence and on September 14th 2007 for the abstracts about treatment of drug dependence. The search strategies, the MeSH-Terms and the results of the literature search are listed below:

Table 12: Literature search for the rehabilitation treatment of alcohol dependence (Date of last search: August 28th 2007)

STEP	MESH TERM COMBINATION	LIMITS	HITS (IDENTIFIED ABSTRACTS)	INCLUDED ABSTRACTS
1	("Alcoholism/rehabilitation"[MeSH] OR "Alcoholism/therapy"[MeSH])	Limits: a) published in the last five years, b) language restrictions: only English, French, German	2046	
2	("Alcoholism/rehabilitation"[MeSH] OR "Alcoholism/therapy"[MeSH])	Limits: a) published in the last five years, b) language restrictions: only English, French, German; **c) Meta-Analyses, Reviews**	375	35

Table 13: Literature search for the rehabilitation treatment of drug dependence (Date of last search: September 14th 2007)

STEP	MESH TERM COMBINATION	LIMITS	HITS (IDENTIFIED ABSTRACTS)	INCLUDED ABSTRACTS
1	("Opioid-Related	Limits: a) published in the last five years,	24	9

	Disorders/rehabilitation"[Mesh] OR "Opioid-Related Disorders/therapy"[Mesh]) and Cochrane	b) Meta-Analyses, Reviews		
1	("Cannabis/therapy"[Mesh] OR "Marijuana Abuse/therapy"[Mesh]) AND Cochrane	Limits: a) published in the last five years, b) Meta-Analyses, Reviews	1	1
1	("Cocaine-Related Disorders/rehabilitation"[Mesh] OR "Cocaine-Related Disorders/therapy"[Mesh]) and Cochrane	Limits: a) published in the last five years, b) Meta-Analyses, Reviews	5	3

Regarding the high number of abstracts (n=2,046) identified with the search strategy applied first for alcohol dependence, the authors decided to limit the database to meta-analyses and reviews only, with the exception of selected multi-centre studies (e.g. Project MATCH, Project COMBINE, Project UKATT), which have been included because of comprehensiveness and high methodological quality. The authors additionally decided to limit the database for the rehabilitation of drug dependence to Cochrane Reviews. Therefore the corresponding MeSH-terms were combined with the term “Cochrane” (see table), but no time and language restrictions were used.

Inclusion and exclusion criteria

A first view of identified abstracts indicated that meta-analyses and reviews of rehabilitation treatment of alcohol dependence are based on a more standardized and a higher quality database than meta-analyses and reviews of drug dependence. Thus different criteria of inclusion and exclusion were defined for both fields of research. To additionally ensure a high methodological quality for the database of rehabilitation treatment of drug dependence without applying criteria like randomization or provision of summary statistics, only meta-analyses and reviews were included which follow the standards of the Cochrane Collaboration.

Inclusion and exclusion criteria for studies of alcohol dependence

Meta-analyses and systematic reviews were included in the summary review of rehabilitation treatment of alcohol dependence if

- at least one therapeutic strategy as specified in chapter 4.1 was examined
- at least one summary statistic based on at least 4 primary studies was provided and
- only randomised controlled trials (RCTs) or controlled clinical trials (CCTs) were used.

Meta-analyses and systematic reviews were excluded from the summary review of rehabilitation treatment of alcohol dependence if

- analyses were limited to subgroups (e.g. alcoholics with co-morbidity) or
- summary statistics were not provided for different treatments separately.

On a primary level of evidence, three multi-site studies Project MATCH, Project COMBINE and Project UKATT as the largest trials of therapies for alcohol dependence ever undertaken, were included.

Inclusion and exclusion criteria for studies of drug dependence

Meta-analyses and systematic reviews were included in the summary review if

- at least one therapeutic strategy as specified in chapter 4.1 was examined
- reviews were conducted and published in the framework of the Cochrane Collaboration.

On a primary level of evidence, different multi-site studies like the National Treatment Outcome Research Study (NTORS), the Australian National Evaluation of Pharmacotherapies for Opioid

Dependence (NEPOD) and the Drug Abuse Collaborative Cocaine Treatment (CCTS), as the largest trials of therapies for drug dependence ever undertaken, were included.

Data Extraction

Data were extracted by using a pilot data extraction form developed by the authors, which was continuously adapted to the research subject. If available, data from intention-to-treat-analyses were used.

Annex 17: Overview of identified multi-centre studies

Project MATCH. Project MATCH is a multi-centre trial designed to test if matching patients to certain treatments increases the overall effectiveness of alcoholism treatment (Project MATCH Research Group, 1997). Alcohol dependent patients were therefore allocated to three different treatment conditions with reference to a variety of client attributes in order to determine which clients responded best to which treatments. The multi-centre study consists of two parallel but independent randomized sub-trials, one with alcohol dependent clients receiving outpatient therapy (n = 952) and one with clients receiving aftercare therapy following inpatient or day hospital treatment (n = 774). Clients were randomly assigned to one of three 12-week, manual-guided, individually delivered treatments: Cognitive Behavioural Therapy (CBT), Motivational Enhancement Therapy (MET) or a 12-step programme. There was no control group. Outpatients were treated in five facilities, and five facilities treated patients in aftercare following intensive treatment. Clients were then monitored over a one-year and a three-year post-treatment period. The primary outcome measures were percent days of abstinence and drinks per drinking day.

Project COMBINE. Project COMBINE (Anton et al., 2006) was designed to evaluate the efficacy of acamprosate and naltrexone - two drugs that have been shown to be effective in relapse prevention of alcoholism in former trials, in various combinations with behavioural treatment. A total of 1,383 recently abstinent individuals with a primary diagnosis of alcohol dependence were recruited from 11 clinical sites and randomised to one of nine groups for 16 weeks of outpatient treatment. Eight of these groups received medical management, a 9-session intervention focussed on enhancing medication adherence and abstinence, delivered by a licensed health care professional. Four of these groups also received a combined behavioural intervention, which integrated aspects of CBT, delivered by licensed behavioural health specialists in up to twenty 50-minute sessions. Patients in eight groups received acamprosate, naltrexone, a combination of naltrexone and acamprosate, or placebo. A ninth group received CBI alone, without pharmacological relapse prevention and medical management.

Project UKATT. In 1998, the UK Medical Research Council funded the United Kingdom Alcohol Treatment Trial (UKATT), a multi-centre trial with 742 patients, seeking treatment of alcoholism at seven sites around the UK. Participants were randomised to either a Social Behaviour and Network Therapy (SBNT; Copello et al., 2002), which was specially developed for the trial and scheduled for eight weekly 50-minute sessions or to Motivational Enhancement Therapy (MI) with three 50-minute sessions per week for a time period of eight weeks. Open follow-up was carried out at three months after entry to the trial and blind follow-up was conducted after one year (UKATT Research Team, 2001).

Research Study NTORS. The National Treatment Outcome Research Study (NTORS; Gossop et al., 2001; 2000) is a comprehensive multi-centre study carried out by the National Addiction Centre (NAC) in England and Wales. It is one of the largest UK drug treatment studies to date and it compares the

effectiveness of residential drug treatment vs. community drug therapy services with a follow-up to five years. Four modalities were studied: inpatient drug dependence units and residential/rehabilitation programmes as the residential modalities and methadone maintenance treatment (MMT), and methadone reduction treatment (MRT) programmes as the community treatments. Even though a wide range of outcome measures was examined, abstinence was the explicit treatment goal for the residential setting. Besides an outcome evaluation, special value was given to the monitoring of the process from client's recruitment to the long-term effects of treatment. Clients were recruited from 54 residential and community-based drug treatment programmes throughout England. 1,075 clients constituted the study group throughout the first year of the project. The eligible sample for 2 and 4–5 year follow-up was constructed using a sampling frame of 894 clients (83% of the intake sample). 496 patients of the eligible sample were interviewed at the final 4–5 year follow-up (Gossop et al., 2001), which resulted a follow-up rate of 76%. Data on substance use behaviours and physical and psychological health were collected in structured face-to-face interviews at the beginning of the programme and 1- and 2-year follow-up. Urine screening for substance use was conducted at treatment programmes randomly selected (Gossop et al., 2000). The report can be downloaded from the official website of UK Department of Health[8].

The NEPOD Study. The National Evaluation of Pharmacotherapies for Opioid Dependence (NEPOD) was a comprehensive Australian three-year study coordinated by the National Drug and Alcohol Research Centre (NDARC). The basic goal of the study was to contribute to a national effort to develop and implement a range of effective, evidence-based, best practice treatment options for people who are opioid dependent (National Drug and Alcohol Research Centre, 2001). NEPOD monitored the effectiveness as well as the adverse events of pharmaceutical approaches for opioid dependence during treatment and after leaving treatment including MMT, buprenorphine maintenance therapy (BMT), levo-alpha-acetyl-methadol (LAAM) or naltrexone. The NEPOD Project pooled data collected in 13 separate clinical trials of pharmacotherapies for opioid dependence conducted across Australia, resulting in a combined total of data on 1,070 heroin users and 355 methadone patients. The report of NEPOD can be downloaded from the Australian Government's National Drug Strategy-Homepage[9].

The Drug Abuse Collaborative Cocaine Treatment (CCTS). The most comprehensive clinical study about treatment strategies for cocaine dependence was conducted by the National Institute on Drug Abuse Collaborative Cocaine Treatment (CCTS; Crits-Christoph et al., 1999). The multi-centre study which was conducted in the Unites States and supported by the NIDA (National Institute on Drug Abuse) included 487 patients, which were randomly assigned to 1 of 4 manual-guided treatments: individual drug counselling, CBT, supportive-expressive therapy, all combined with group drug counselling and group drug counselling alone. Individual drug counselling followed a manual with specific stages and aims based on the 12-step philosophy (Mercer & Woody, 1992). Group drug counselling was based on a manual designed to educate patients in the stages of recovery from addiction and to strongly encourage their participation in a 12-step programme which was applied in the group (Mercer et al., 1994). Supportive-expressive therapy was conceptualised as a short-term psychodynamic treatment which aims to help patients gain understanding the interpersonal and psychological functioning and its relation to the use of drugs. CBT follows the principles of cognitive behavioural therapy and e.g. includes techniques like the identification and elimination of triggers of cocaine use and the development of skills that provide alternative ways of meeting those needs

[8] http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4084908
[9] http://www.nationaldrugstrategy.gov.au/internet/drugstrategy/publishing.nsf/Content/1800A327CF9ECDD9CA25717A0015E6DC/$File/mono52.pdf

satisfied by cocaine use (Kadden, 2002). Psychosocial treatment in the CCTS-study was intensive, including 36 individual sessions and 24 group sessions for a duration of 6 months. Patients were assessed monthly during active treatment and at 9 and 12 months after baseline. Primary outcome measures were the Addiction Severity Index-Drug Use Composite score and the number of days of cocaine use in the past month.

The Cocaine Rapid Efficacy Screening Trial (CREST). The Cocaine Rapid Efficacy Screening Trial (CREST) paradigm was developed by the Division of Treatment Research and Development at NIDA with the goal of enhancing pilot clinical trial validity when systematically assessing a range of medications and drug classes for potential utility in treatment of cocaine dependence. Therefore CREST utilized a randomized, controlled, parallel group, blinded methodology for comparing one or more marketed medications against a standard, pharmaceutical grade placebo. The trial design comprised a flexible 2–4-week screening/baseline period followed by randomization to an 8-week treatment period. Standard measures of outcomes for the CREST included urinary benzoylecgonine (primary metabolite of cocaine), retention, cocaine craving, depression, clinical global impression and HIV-risk behaviours. In order to facilitate comparisons of data from the CREST studies across sites, drug classes and time, standardized procedures, measures and psychosocial counselling were used. A total of 19 medications were evaluated in out-patient treatment research clinics in Boston, Cincinnati, Los Angeles, New York and Philadelphia.

Annex 18: Overview of identified meta-analyses and systematic reviews

Comprehensive reports. Although meta-analyses show a variety of methodological advantages compared to primary research, their results should always be interpreted in consideration of the methodology and the design of the primary studies. According to the theory of random-effects models (Rustenbach, 2004), different study designs generate differences in outcomes and their meta-analytic integrations. This especially has to be considered if different interventions systematically differ in the methodology that was used for their examination as it is the case for studies that test pharmacological treatment vs. trials that examine the effects of psychosocial approaches. While psychosocial treatments are usually compared with no treatment, standard treatment or another treatment strategy, pharmacological treatments are often compared with an inactive placebo substance (see 4(?).1.2.). Because of the identical appearance of the placebo and the tested substance, double-blinding can be achieved in pharmacological studies, which means that neither the physician nor the patient is informed about the treatment allocation. Thus, expectation effects can be excluded in pharmacological, but not in psychosocial studies. Another difference concerns additional treatments in the treatment group. Effect sizes obtained with pharmacological treatments are based entirely on clinical trials that use these substances only as an adjunct to psychosocial and psychotherapeutic interventions, while treatment groups in trials with psychosocial therapy usually do not receive an additional treatment.

The SBU-Report. A project group of 13 investigators (Berglund et al., 2003) from the Swedish Council for Technology Assessment in Health Care (SBU) has published a comprehensive review that summarizes 641 individual studies with the aim to evaluate the effectiveness of different strategies in the short- and long-term treatment of alcohol and drug abuse. Because of the differences in the study design and the methodological quality between clinical studies of rehabilitation treatment of alcohol and drug dependence, different inclusion and exclusion are made.

The reviewed treatments for alcohol-related problems include interventions against hazardous drinking, psychosocial treatments for alcohol dependence as well as pharmacotherapy for the alcohol withdrawal and alcohol dependence. The quality of primary studies was assessed in this review, but primarily used as a qualitative measure. Statistical integrations of effect sizes were conducted if possible and calculations were predominantly based on intention-to-treat (ITT) analysis. The standard mean difference effect size (d) was used as the general outcome measure, for categorical data odds ratio was calculated and then transformed to the standard mean difference according to Shadish and Haddock (1994). The main variables for relapse prevention treatment of alcohol dependence were abstinence rates and the number of abstinence days. If not available, the rate of return to heavy drinking and the number of heavy drinking days were used as outcomes criteria. For the studies of drug dependence different outcomes were used, depending on which outcomes were used in the primary studies. Analyses were generally performed without attempts to standardize the duration of the treatment. Psychosocial treatment studies usually used outcomes after a follow-up period, pharmacological treatments used the outcomes at the end of the treatment period (Berglund et al., 2003). The meta-analytic calculations were tested for heterogeneity. If studies were homogenous, a fixed-effects-model was used. If heterogeneity was present, a search for moderator variables was performed.

Besides treatment strategies to treat alcohol dependence, the SBU report also includes psychosocial and pharmaceutical strategies for the treatment of drug dependence including heroin addiction, cocaine addiction and cannabis addiction. In contrast to the alcohol part of the report, the drug addiction part does not provide summary statistics. With their distinction between supportive therapies, re-educative therapies and psychotherapeutic approaches, Berglund et al. (2003) used a somewhat unconventional classification of therapeutic approaches for drug dependence. Supportive therapies were thereby defined as approaches that “return the patients to their emotional balance after a crisis and breakdown” (Berglund et al., 2003; p. 326) including e.g. counselling, relaxation, acupuncture, suggestion and case management. Re-educative therapies summarized approaches based on behaviour therapy and psychotherapeutic approaches included family therapy, cognitive therapy and dynamic-oriented treatments.

Mesa Grande. Another comprehensive review of alcohol treatment literature was provided by the Mesa Grande Project. Updated on a regular basis, it included a review of 361 controlled studies (Miller et al., 2001). The project summarizes the current evidence for various treatment approaches, weighting findings different according to the methodological strength of each study. Studies entering the Mesa Grande review were limited to controlled trials, comparing at least two treatment or control conditions, and reporting post treatment outcome on at least one measure of alcohol consumption or alcohol-related problem. Unpublished studies were also included if full reports describing the results were available. Studies were rated by two reviewers on 12 methodological criteria and each study was assigned to a methodological quality score (MQL) computed as a total of final ratings on the 12 dimensions. Study ratings also resulted in the assignment of an outcome logic score (OLS) for each treatment modality for which specific efficacy could be inferred from using the following categories: strong positive evidence (+2), positive evidence (+1), negative evidence (-1) and strong negative evidence (-2). The cumulative evidence score (CMS), which was finally used for a ranking of treatment approaches, was defined as the product of the quality and the logic score (CMS=MQL*OLS).

The Scottish HTA-Report. The Scottish Health Technology Assessment (HTA) report (Slattery et al., 2003) was compiled following the development of a national plan for action on alcohol problems (Scottish Advisory Committee on Alcohol Misuse, 2002) in Scotland. The review is focusing on

secondary care services for persons who were alcohol dependent, defined as those who have underwent some form of alcohol detoxification and for whom the relapse prevention following detoxification was the primary aim of treatment. The report did not include attention to community-based interventions for persons not needing detoxification, but was complemented by a separate document giving guidelines on the management of alcohol problems by primary care professionals (Scottish Intercollegiate Guidelines Network, 2003). The objective of this health technology assessment was to answer the question, which treatment or combination of treatments (pharmacological and/or psychosocial) will yield the maximum maintenance of recovery among the population of those with alcohol dependence who underwent detoxification. A major purpose of the clinical effectiveness analysis was to provide input to the cost-effectiveness analysis, taking economical aspects as well as risk groups, locations and durations of treatment into account.

Practice Guideline of the APA. The most comprehensive review of rehabilitation treatment of drug dependence is the Practice Guideline for the Treatment of Patients With Substance Use Disorders in its second edition (Kleber et al., 2006) developed by the Work Group on Substance Use Disorders of the American Psychiatric Association (APA). It gives an overview of different treatment strategies and their effectiveness for alcohol-, nicotine-, cocaine-, cannabis- and opioid-addiction, deduces key recommendations for the treatment of substance related disorders and codes each recommendation according to the degree of clinical confidence with which the recommendation is made. As no summary statistics are delivered, the guideline is not included in the alcohol part of the summary review (see criteria of inclusion 1.3.4). The Practice Guideline is available from the American Psychiatric Association website[10].

Meta-analyses of selected treatment strategies. Beside meta-analyses and reviews that simultaneously include different therapeutic strategies, also studies that exclusively evaluate the effectiveness of specific treatments were included in the summary review. Roozen et al. (2004) evaluated the effectiveness of the c*ommunity reinforcement approach* (CRA) in alcohol, cocaine and opioid addiction on a meta-analytic level of evidence. In this review, the community reinforcement approach was compared with usual care and in combination with c*ontingency management* (CM). Studies were selected through a literature search of RCTs focusing on substance abuse. Methodological quality was assessed with a summary rating (Van Tulder et al., 2003). The search yielded five trials that examined the effectiveness of the community reinforcement Approach for alcoholism; only three of these studies additionally fulfilled the methodological standards and quality. The pooled relative risks (RR) were computed with 95% confidence intervals using the random effects model.

In a comprehensive meta-analysis, Vasilaki et al. (2006) examined whether or not MI is more efficacious in reducing alcohol consumption than no treatment or any other intervention. Only RCTs were included. Nine studies compared MI with a no treatment control group and another nine studies compared MI with other treatments like brief treatments and other treatment counselling groups.

About the effectiveness of *brief interventions (BI),* several meta-analyses are available. Moyer et al. (2002) compared BI with either control or extended treatment conditions. Effect sizes were calculated for multiple drinking-related outcomes at multiple follow-up points. Differences between treatment-seeking and non-treatment-seeking samples were taken into account. Therapeutic strategies used in the BI were not differentiated. Bertholet et al. (2007) evaluated the evidence of efficacy of brief alcohol interventions aiming at reducing long-term alcohol use and related harm in individuals attending

[10] http://www.psych.org/psych_pract/treatg/pg/prac_guide.cfm

primary care facilities but not seeking help for alcohol-related problems. Nineteen RCTs with more than 5.000 patients were included in this review. Additionally, two Cochrane reviews were published about BI. One Cochrane review published by Kaner et al. (2007) examined the effectiveness of brief alcohol interventions in primary care health settings for excessive drinkers.

The glutamate-antagonist acamprosate and the opioid-antagonist naltrexone were the objective of a variety of reviews and meta-analysis published within the last three years (Mann et al., 2004; Bouza et al., 2004; Srisurapanont & Jarusuraisin, 2005; Roozen et al., 2006; Roesner et al., 2007). A comprehensive meta-analysis of acamprosate was conducted by Mann et al. (2004). The analysis was based on 20 RCTS, including one unpublished study. Effect sizes were calculated after three months, six months and 12 months of treatment. In another comprehensive review from Spain (Bouza et al., 2004), the efficacy and safety of both substances, naltrexone and acamprosate, was evaluated. Altogether, thirty-three studies met the inclusion criteria; effect sizes for different outcomes were evaluated in this review. A first review about naltrexone (Srisurapanont & Jarusuraisin, 2002) was updated in 2005 (Srisurapanont & Jarusuraisin, 2005) by the same authors. Short-term (up to and including 12 weeks), medium-term (between 12 weeks and one year) and long-term comparisons (more than 12 months) between naltrexone and placebo were made for return to drinking and return to heavy drinking. Relapse and abstinence rates, cumulative abstinence duration and treatment compliance were considered as primary outcomes. Roozen et al. (2006) published a systematic review of the effectiveness of naltrexone in the maintenance treatment of opioid and alcohol dependence. Seven opioid trials and seventeen alcohol studies were identified. In a current meta-analysis about acamprosate and naltrexone conducted by the author of the review (SR), 41 RCT were included. Emphasis was placed on the conceptual distinction between having a first drink (breaking abstinence) and returning to heavy drinking (excessive drinking). Unreported results, requested from the study investigators and the drug manufacturers, were integrated in the computation of effect sizes (Roesner et al., 2008).

Annex 19: Overview table on multi-centre studies included in summary review

AUTHORS / AUTHOR GROUP	ABBREVIATION	SUBSTANCE ABUSE DISORDER	COUNTY	CENTERS	TREATMENT	PATIENTS	DURATION (WEEKS)	FOLLOW-UP (MONTH)
Project MATCH Research Group (1998)	MATCH	Alcohol dependence	USA	n. sp.[11]	CBT		12	12
					TSF			
					MET			
						1767		
UKATT Research Team (2005)	UKATT	Alcohol dependence	UK	7	MET		12	12
					SBNT			
						742		
Anton et al.(2006)	COMBINE	Alcohol dependence	USA	11	NTX	1383	12	
					ACAM			
					CBI			
Gossop et al. (2000)	NTORS	Opioid dependence	UK	54	MMT	1075	up to 5 years	60
					BMT			
					LAAM			
					NTX			
NDARC (2001)	NEPOD	Opioid dependence	Australia	13	MMT	1425	24	6
					BMT			
					LAAM			
Crits-Christoph et al. (1999)	CCTS	Cocaine dependence	USA	5	IC + GDC	487	24	6 month
					CBT + GDC			
					SET + GDC			
					GDC			

[11] Not specified

Annex 20: Overview table on meta-analyses and reviews included in summary review

AUTHORS	LAST DATA	TREATMENTS	SUBSTANCE ABUSE DISORDERS	CONTROL CONDITION	STUDIES	PATIENTS
Berglund et al.(2003)	2002	CBT	AD[12]	NT[13], ST[14], PBO[15]	6	350
		CRA	CD[16]		7	216
		ME	OD[17]		3	174
		Bibliotherapy			5	193
		ACAM			15	3948
		NTX			21	2253
Slattery et al.(2003)	1997	CS	AD[1]	NT[18], ST[19], PBO[4]	7	353
		Behavioural Self Control			17	135
		MET			7	96
		Family Therapy			16	380
		ACAM			11	2347
		NTX			8	1171
Miller & Wilbourne (1998; 2002)	2001	CRA			4	Total: 72052
		TSF			3	
		MET			17	
		ACAM			5	
		NTX			6	
		Social Skills			25	
Roozen et al. (2004)	2002	CRA	AD, CD, OD	ST	11	> 700
Vasilaki et al. (2006)	2003	MI	ED[20]	NT, ST	15	2767
Moyer et al. (2002)	1998	BI	PD[21]	NT, ST	20	not specified

[12] AD: Alcohol dependence
[13] No Treatment
[14] Standard Treatment
[15] PBO. Placebo
[16] CD: Cocaine Dependence
[17] Opioid Dependence
[18] No Treatment
[19] Standard Treatment
[20] Excessive drinking
[21] Problem drinkers

		BI	PD	NT, ST	10	not specified
Ballestore et al. (2004)	2003	BI			13	
Kaner et al. (2007); Cochrane-Collaboration	2007	BI	ED	NT, ST	21	7286
Bertholet et al. (2005)	2003	BI	TSP[22]	NT, ST	12	> 2000
Mann et al. (2004)	2003	ACAM	AD	PBO	17	4087
Bouza et al. (2004)	2002	ACAM, NTX	AD	PBO	Nov 14	3324/2072
Srisurapanont & Jarusuraisin (2005)	2003	NTX	AD	PBO	24	2861
Roozen et al. (2006)	2004	NTX	AD, CD, OD	PBO	17	not specified
Roesner et al. (2007)	2004	ACAM, NTX	AD	PBO	21/20	5280/2182

[22] Treatment seeking patients

Annex 21: Treatment effects on rehabilitation treatment of alcoholism

TREATMENT	NAME	OUTCOME	EFFECT MEASURE	EFFEKT	95% CI		SIGN.
Cognitive Behaviour Therapy							
Cognitive Behaviour Therapy	SBU	MPRO[23]	d	0,73			
Coping Skills Training	Scottish HTA-Report	MPRO[1]	OR[24]	2,11	1,53	2,92	n.s.
Behavioral Self-Control Training	Scottish HTA-Report	MPRO[1]	OR	1,75	1,02	3,02	n.s.
Behaviour Contracting	Mesa Grande	MPRO[1]	Rank	6,00			
Cognitive Behaviour Therapy	Project MATCH	CAR[25]	Percent	41,00			
Community Reinforcement Approach	SBU		D	0,59			
	Roozen et al. (2004)	DD[26]	WMD[27]	-0,94	-1,60	-0,27	sign.*
	Mesa Grande		Rank	5,00			
SBNT	UKATT	Percent days abstinent	percent	43,00			
	UKATT	Units per day	percent	20,00			
Brief Interventions	Mesa Grande	MPRO[1]	Rank	1,00			
	Moyer et al.	Units per day	WMD (d)	0,26	0,20	0,32	sign.**
			WMD (d)	0,03	-0,10	0,15	n.s.
	Ballestores et al.(2004)	MPRO[1]	OR	1,55	1,27	1,90	
			NNT	10,00	7,00	-17,00	
	Kaner et al.	Grams per week	WMD (d)	-41,40	-57,30	-25,50	sign.**
	Bertholet et al.	Units per day / week	WMD (d)	-37,90	-51,13	-24,60	sign.*
Bibliotherapy	Berglund et al.	Units per day/ week	SMD	0,19			
Motivational Interviewing	Project MATCH	CAR	Percent	41,00			
	UKATT	Percent days abstinent	Percent	45,00			
	UKATT	Alcohol units per day	means	19,00			
	Berglund et al.		SMD	0,29			
	Mesa Grande		Rank	2,00			
	Scottish HTA-Report		OR	1,88	1,28	2,77	
	Vasilaki et al. (2006)	drinks per week/day/occasion	WMD (d)	0,18	0,07	0,29	sign.**

[23] multiple drinking related outcomes
[24] OR: Odds Ratio
[25] Continous abstinence rate
[26] Drinking Days
[27] Weighted mean difference

				0,43	0,17	0,70	sign.*
12-step Programmes	Project MATCH		AR	28,00			
Acamprosate	Project COMBINE	percent days abstinent	HR	0,02	-0,11	0,15	n.s.
	Mann et al. (2004)	continuous abstinence rates	RB	1,95	1,58	2,42	sign.**
	Bouza et al. (2004)	continuous abstinence rates	OR	1,88	1,57	2,25	sign.**
	Roesner et al. (2007)	continuous abstinence rates	RR	0,84	0,78	0,91	sign.**
Naltrexone	Project COMBINE	relapse rate	HR	0,72	0,53	0,98	sign.*
	Bouza et al. (2004)	relapse rate	OR	0,62	0,52	0,75	sign.**
	Srisurapanont & Jarusuraisin (2005)	relapse rate	RR	0,64	0,51	0,82	sign.**
	Roozen et al. (2006)	relapse rate	RD	0,13	0,07	0,18	sign.**
	Roesner et al. (2007)	relapse rate	RD	0,82	0,73	0,92	sign.**
Combined Approaches							
Combined Behavioural Intervention	Project COMBINE		HR	0,81	0,60	1,10	n.s.

sign.* $\alpha < 0,05$; sign.** $\alpha < 0,01$; n.s.: not significant

II. Provider Survey

Annex 22: Provider and their DR programmes (DUI and DUID)

COUNTRY	NAME OF PROVIDER	NAME OF PROGRAMME
AT	AAAV	Driver Improvement Training
AT	AAP GmbH	Nachschulung für alkoholauffällige Lenker
AT	AAP GmbH	Nachschulungen bei sonstiger Problematik
AT	AAP GmbH	Nachschulung im Rahmen des Vormerksystems
AT	Gute Fahrt - Institut für Verkehrskultur	'A'-Kurs
AT	Gute Fahrt - Institut für Verkehrskultur	'S'-Kurs
AT	INFAR	Drofa/Programm für Drogen-Fahrauffällige
AT	INFAR	INKA-light/ Integrative Nachschulung für KraftfahrerInnen mit Alkoholauffälligkeit-Kurzversion
AT	INFAR	INKA/ Integrative Nachschulung für KraftfahrerInnen mit Alkoholauffälligkeit
AT	KfV Sicherheit Service GmbH	VIT-S Verkehrspsychologisch Integratives Trainingsprogramm für Lenker mit sonstiger Problematik (insbesondere drogenbeeinträchtigte Lenker)
AT	KfV Sicherheit Service GmbH	VIT-A Verkehrspsychologisch Integratives Trainingsprogramm für alkoholauffällige Lenker
AT	KfV Sicherheit Service GmbH	VIT-AV Verkehrspsychologisch Integratives Trainingsprogramm für alkoholauffällige Lenker im Rahmen des Vormerksystems
AT	KfV Sicherheit Service GmbH	VIT-S Verkehrspsychologisch Integratives Trainingsprogramm für Lenker mit sonstiger Problematik (insbesondere drogenbeeinträchtigte Lenker)
AT	KfV Sicherheit Service GmbH	VIT-AP Verkehrspsychologisch Integratives Trainingsprogramm für alkoholauffällige Lenker in Haft
AT	Kuratorium für Verkehrssicherheit/KfV	VIT-A Verkehrspsychologisch Integratives Trainingsprogramm für alkoholauffällige Lenker
AT	Kuratorium für Verkehrssicherheit/KfV	VIT-AV Verkehrspsychologisch Integratives Trainingsprogramm für alkoholauffällige Lenker im Rahmen des Vormerksystems
AT	sicher unterwegs - Verkehrspsychologische Nachschulungen GmbH	Nachschulung für alkoholauffällige LenkerInnen
AT	sicher unterwegs - Verkehrspsychologische Nachschulungen GmbH	Nachschulung für drogenauffällige LenkerInnen
AT	1A Sicherheit	Nachschulung
BE	BIVT	Rehabilitatie en verkeerstherapie voor alcohol, drugs en geneesmiddelenmisbruikers - lange type verkeerstherapie
BE	BIVT	Rehabilitatie en verkeerstherapie voor alcohol, drugs en geneesmiddelenmisbruikers - korte verkeerstherapie - intensief seminarie 3 daagse
BE	IBSR	Sensibilisatiecursus voor verkeersovertreders
BE	IBSR	Sensibilisatiecursus voor verkeersovertreders
BE	IBSR	Sensibilisatiecursus voor verkeersovertreders
CH	Vereinigung für Verkehrspsychologie	bfu-FiaZ-Kurs
DE	AFN	ALFA - Besonderes Aufbauseminar für alkohol- und drogenauffällige Fahranfänger/Kraftfahrer
DE	AFN	DRUGS - Drogen und Gefahren im Straßenverkehr
DE	AFN	IRaK - Individualpsychologische Rehabilitation alkoholauff?liger Kraftfahrer
DE	Impuls GmbH	REAL
DE	Impuls GmbH	CONTROL
DE	Impuls GmbH	CLEAN
DE	Impuls GmbH	DRUG STOP plus
DE	Impuls GmbH	DRUG STOP
DE	Impuls GmbH	K 70
DE	Impuls GmbH	NAFA plus
DE	IVT-Hö(r)	IVT-Hö(r)
DE	IVT-Hö(r)	CAR KURS (Contre l´alkool sur la route)
DE	IVT-Hö(r)	CAR SEMINAR (Contre l´alkool sur la route)

DE	IVT-Hö(r)	IRIS KURS (Illegale Rauschmittel im Straßenverkehr)
DE	IVT-Hö(r)	KBS (Kurse zur Besserung und Sicherung)
DE	Nord-Kurs GmbH & Co. KG	NAFA Plus
DE	Nord-Kurs GmbH & Co. KG	avanti
DE	Nord-Kurs GmbH & Co. KG	Speed-02
DE	PLUSPUNKT GmbH	PLUS 70
DE	SSK TUEV Thueringen Anlagentechnik Gmbh & Co. KG	LEER
DE	SSK TUEV Thueringen Anlagentechnik GmbH & Co. KG	SPEED-02
DE	Nord-Kurs GmbH & Co. KG	Programm LEER
FR	ANPER	C.E.A (Sensibilisation aux causes et cons?uences de la Conduite en Etat Alcoolique)
FR	APAVE PARISIENNE	SENSIBILISATION AUX CAUSES ET CONSEQUENCES DES ACCIDENTS DE LA ROUTE
FR	APAVE PARISIENNE	SENSIBILISATION AUX CAUSES ET CONSEQUENCES DES ACCIDENTS DE LA ROUTE
FR	AUTOMOBILE CLUB ACTION +	SENSIBILISATION A LA SECURITE ROUTIERE
FR	Anper	Alternative
FR	Anper	Peine complementaire
FR	COMARIS	Alternative à la poursuite
FR	Prévention routière de Dordogne	stage alcool: composition pénale et complément de peine
HU	National Transport Authority	Enyhén ittas vezetok programjai
HU	National Transport Authority	Közepesen ittas vezetok foglalkozásai
HU	National Transport Authority	A 'súlyosan ittas', vagy 'visszatéro ittas vezetok' foglalkozása
IT	Azienda Sanitaria dell'Alto Adige - Settore di Psicologia Viaria/Medicina Legale	Riabilitazione psicologica alla guida/Verkehrspsychologische Nachschulung
NL	CBR	EMA (Educatieve Maatregel Alcohol)
PL	Centrum Uslug Psychologicznych	Psycho-corrective program for the drivers detained for driving under the influence of alcohol
PO	Prevenção Rodoviária Portuguesa	Reabilitação de Condutores Infractores- Crime
PO	Prevenção Rodoviária Portuguesa	Reabiltação de Condutores Infractores - Contra-Ordenações
SE	Swedish Prison and Probation Service	Prime for life
UK	dde	DfT Drink Driver Rehabilitaion scheme
UK	Devon County Council	Rehabilitation Scheme for Drink Drive Offenders
UK	DRIVER' S.E.A.T	Drink Drive Rehabilitation Course
UK	Drivewise(London) Ltd	D/D rehabilitation courses
UK	Gloucestershire County Council	Drink Drive Rehabilitation Scheme
UK	Kent Probation Area	Drink DR Course
UK	LRSP	DDR
UK	NECA	Drink Drive Rehabilitation
UK	Ogwr DASH	Drivers Rehabilitation Course
UK	Prism Clearway	Drink Drive Rehabilitation Scheme
UK	Reform Road Safety & Education	Drink Drive Rehabilitation Scheme
UK	The Albert Centre	Drink Drive rehabilitation course
UK	TTC 2000	Drink Drive Rehabilitation Scheme (alcohol, education, the law & driving)
UK	VMCL	Drink Drive Rehabilitation Scheme

Annex 23: Returned questionnaires - Feedback form for tutors according return run of PQ

Country:	Provider questionnaire		
	Form A	Form B	Form C
Name of provider:			
Name of provider:			
Name of provider:			
Total number			

Annex 24: Original provider questionnaires – Form A

Provider Questionnaire on Driver Rehabilitation (DR)

Form A
Organisational Issues

EU Project DRUID

Driving under the influence of alcohol, drugs and medicines

Workpackage 5: Rehabilitation

August 2007

Contract No. TREN - 05-FP6TR-SO7.61320-518404-DRUID

Step-by-step instruction

for filling out the questionnaire Driver Rehabilitation (DR) Form A

1. Please save this **Form A** questionnaire file under your organisation's name in a folder on your PC.
2. Due to electronic data evaluation, please answer this questionnaire directly on your PC (not in a printed version).
3. Fill the answers in the grey underlined fields and/or click on the grey squares corresponding to your answer. (For your reading comfort switch off the Windows mode ¶ - paragraph sign.)
4. Please tick every square where applicable for your organization. **Multiple answers are possible.**
5. After finishing, please save the file again.
6. Then proceed with the DR **Form B** questionnaire.
7. Afterwards please proceed with the **Form C** questionnaire if applicable.
8. After filling out all questionnaires, please send them back as attachments via e-mail to the DRUID-person responsible for your country.

Name of organisation: Legal entity:	Country: Is your organisation : a non governmental organisation: ☐ No ☐ Yes a private company: ☐ with commercial aims ☐ non profit a public service (governmental or community based): ☐ No ☐ Yes (part of) a hospital / health care centre: ☐ No ☐ Yes, Other, please specify:

1. Since when does your organisation provide driver rehabilitation (DR) for alcohol and/or (illicit) drugs offenders (DUI): Starting year

2. Indicate the organisation's local frame regarding DR services for DUI:
☐ Nationwide ☐ Restricted to certain federal states/areas, please list:

3. At which sites does your organisation carry our DR services for DUI:
☐ Rooms in own organisation ☐ Driving school ☐ Public health centre / Hospital
☐ Seminar or training centre ☐ Prison ☐ Other, please specify:

4. Indicate the quality management (QM) level regarding DR for DUI in your organisation:
☐ QM system according to national/ international norms: ☐ ISO ☐ DIN ☐ EN ☐ Other
☐ QM system defined/controlled by your organisation only ☐ Single QM elements only ☐ No QM

5. How many trainers are working on DR for DUI in your organisation: Number

6. Does your organisation offer specific DR services based on the following criteria:
☐ Gender ☐ Age ☐ Language ☐ Cultural background

7. How many different DR programme types for DUI does your organisation offer:
Total number → **Specify the DUI-programme(s) in Form B** (for each programme one Form B).

8. Does your organisation offer treatment programmes for addicts: ☐ No ☐ Yes
If yes, for: ☐ Alcohol dependency ☐ Drug dependency,
If yes, does the treatment contain driving related elements: ☐ No ☐ Yes

9. Does your organisation apply any driver assessment procedures or diagnostic screening prior to driver rehabilitation:
☐ No ☐ Yes → **If yes, please specify the driver assessment procedure(s) in Form C.**

Are there any driver assessment procedures outside your organisation prior to your DR:
☐ No ☐ Yes

10. Evaluate the following frame conditions regarding DR for DUI:

	Exists in your country		Desirable condition	
	Yes	No	Yes	No
Authorization procedure for new rehabilitation providers	☐	☐	☐	☐
Quality control of rehabilitation providers	☐	☐	☐	☐
Assignment criteria for offenders	☐	☐	☐	☐
Co-operation between licensing authorities and rehabilitation provider	☐	☐	☐	☐
Co-operation between court and rehabilitation providers	☐	☐	☐	☐

	Exists in your country		If yes, the effect is	
	Yes	No	Positive	Negative
Influence of competition on maintenance of quality standards	☐	☐	☐	☐
Influence of competition on evaluation/further program development	☐	☐	☐	☐
Image of driver rehabilitation in media /at public	☐	☐	☐	☐

11. Do you have recommendations for improving DR for DUI in your country:

Please save this file and continue with provider questionnaire Form B - THANK YOU !

Annex 25: Original provider questionnaires – Form B

Provider Questionnaire on Driver Rehabilitation (DR)

Form B
Programme Information

EU Project DRUID

Driving under the influence of alcohol, drugs and medicines

Workpackage 5: Rehabilitation

August 2007

Contract No. TREN - 05-FP6TR-SO7.61320-518404-DRUID

Step-by-step instruction

for filling out the questionnaire Driver Rehabilitation (DR) Form B

1. Please save this file in a folder on your PC under the name of the first DR programme for alcohol and/or drug offenders you will describe.
2. Due to electronic data evaluation, please answer this questionnaire directly on your PC (not in a printed version).
3. Fill the answers in the grey underlined fields and/or click on the grey squares corresponding to your answer. (For your reading comfort switch off the Windows mode ¶ - paragraph sign.)
4. Please tick every square where applicable for your organization. **Multiple answers are possible**.
5. After finishing, please save the file again.
6. If existing, please proceed with the next DR programme that you want to describe by opening the original Form B template again attached to the e-mail.
7. Save this file under the next specified DR programme's name in the folder on your PC.
8. Proceed as described under 2. – 7.
9. Repeat all working steps 2. – 7. for each of your DR programme(s).
10. If applicable, please proceed with the Form C questionnaire.
11. After filling out all questionnaires, please send them back as attachments via e-mail to the DRUID-person responsible for your country (maybe with additional information / references on the programme, as described).

Name of organisation: **Country:**	
Name/title of programme:	English translation (if possible):
Origin	**Was this programme developed within your organisation:** ☐ No ☐ Yes
Programme access and consequence	**Is the participation legally regulated:** ☐ No ☐ Yes; If yes, please name the law/paragraph(s): **The participation is:** ☐ Mandatory ☐ Voluntary **If mandatory, who imposes the participation in this programme:** ☐ Licensing authority ☐ Court ☐ Rehabilitation provider ☐ Assessment centre ☐ Other, please specify: **What determines the participation in this programme:** ☐ Prior driver assessment ☐ Recidivism ☐ Substance during the offence ☐ Alcohol; if there is a specific concentration limit, please specify: ☐ Drug(s), please specify the substance(s): ☐ Other, please specify: **What are the consequences of participation:** ☐ ... it leads to a reduction of the suspension period ☐ ....it leads to a reduction/extinction of penalty points ☐ ... it leads to a reduction of other punishments (e.g. reduced fine) ☐ ... it leads to a reduction of community service hours ☐ ... it leads to an avoidance of further criminal prosecution ☐ ... it leads to an ongoing validity of the license ☐ ... it is a necessary condition for re-licensing/license reinstatement/regranting ☐ ... it leads to improved chances of passing an upcoming driver assessment ☐ ... it leads to other consequences: please specify:
Target group(s) of programme	☐ **Alcohol offenders** **Does the programme focus on subgroups of alcohol offenders:** ☐ No ☐ Yes; if yes, please specify: ☐ Novice drivers ☐ First time offenders ☐ Repeated offenders ☐ Other, please specify: ☐ **Drug offenders** **Does the programme focus on specific subgroups of (illicit) drug offenders:** ☐ No ☐ Yes; if yes, please specify: ☐ Novice drivers ☐ First time offenders ☐ Repeated offenders ☐ Other, please specify:
	Does your organisation exclude certain groups from this programme: ☐ Addicts ☐ Drivers with communication problems ☐ Other, please specify:
	Are alcohol and drug offenders mixed: ☐ No ☐ Yes; if yes: ☐ only in special cases ☐ regularly **Are alcohol and drug offenders mixed with other traffic offenders:** ☐ No ☐ Yes; if yes: ☐ only in special cases ☐ regularly

Programme setting	**Is there a legal base for the programme setting and procedure:** ☐ No ☐ Yes **Are there exceptions from the normal procedure:** ☐ No ☐ Yes; if yes, for which indication(s): ☐ Persons with communication problems (e.g. language, deaf) ☐ Persons in special conditions (e.g. VIPs, working abroad, acute stress) ☐ Other, please specify:
Programme design	**Is the programme principally designed as** ☐ Group intervention ☐ Single/individual intervention ☐ Combined group and single intervention (if yes, specify both parts separately below)
Programme structure	☐ **Group intervention:** **Number of participants:** Min. Max. ☐ Not specified **Total time of intervention:** number of hours or number of units: (minutes per unit:) **Total number of sessions/meetings:** **Time span (days) between:** two sessions: ☐ Not specified first and last session: Min. Max. ☐ Not defined ☐ **Single intervention:** **Total time of intervention:** number of hours or number of units: (minutes per unit:) **Total number of sessions/meetings:** **Time span (days) between:** two sessions: ☐ Not specified first and last session: Min. Max. ☐ Not defined
	In case of combined intervention: **How are the group and single interventions ordered in time:**
Programme condition	**Is repeated participation possible:** ☐ No ☐ Yes; if yes and additional conditions are required, please describe:
Trainer(s)	**Are there legal regulations for the trainer/course leader's qualification:** ☐ No ☐ Yes **Specify the profession of trainer(s):** ; **is additional education required:** ☐ No ☐ Yes **Is there a standard combination of disciplines in the programme:** ☐ **No** ☐ **Yes;** **If yes, name the combination(s):**
Costs	**Do the participants pay for attending the programme:** ☐ No ☐ Yes If yes, what are the costs for the participant (€): If yes, the participants' costs are ☐ legally regulated ☐ determined by the organisation
Programme completion	**Are there regulations for successful course completion:** **Legal ones:** ☐ No ☐ Yes; **Intra organisational criteria:** ☐ No ☐ Yes **Are there criteria for participant exclusion during the programme:** ☐ No ☐ Yes; If yes, please indicate: ☐ alcohol intoxication; please specify alcohol level: ☐ intoxication by drugs; please specify how assessed: ☐ missing cooperation ☐ Other, please specify: **Is there a certificate of attendance:** ☐ No ☐ Yes

Scientific back-ground	**What is the scientific background of the programme? Please name briefly:** **What is the primarily approach of the programme:** ☐ Predominantly treatment (psychological, therapeutic) ☐ Predominantly educational (information) ☐ Predominantly individual tailored programme ☐ Predominantly uniform programme
Aim(s) of programme	**Are there legal regulations on this programme's aim(s):** ☐ No ☐ Yes **Name the major aim(s), maximum 5:** . **You can also give a literature reference:** .
Contents of programme	**Please name the most important themes dealt with, maximum 5:**
Material	**Do the participants receive any material:** ☐ No ☐ Yes
Factors for programme success	**How important are the aspects below for the programme's success:**

	not relevant	less relevant	relevant	most relevant
Information	☐	☐	☐	☐
Self observation and reflection	☐	☐	☐	☐
Discussion and confrontation	☐	☐	☐	☐
Emotional experiencing and involvement	☐	☐	☐	☐
Emotional verbal/non-verbal expressing	☐	☐	☐	☐
Open-trustworthy group climate	☐	☐	☐	☐
Goals setting and commitment to stick to them	☐	☐	☐	☐
Development of alternative, new behaviour	☐	☐	☐	☐
Achievement of behavioural goals/self control	☐	☐	☐	☐
Medical treatment	☐	☐	☐	☐
Alcohol-Ignition-Interlock	☐	☐	☐	☐
Alcohol or drug screening	☐	☐	☐	☐
Other, please specify:	☐	☐	☐	☐

Evaluation	**Has this programme already been evaluated:** ☐ No ☐ Yes If yes, what kind of evaluation: ☐ Content evaluation ☐ Participant feedback ☐ Process evaluation ☐ Outcome evaluation, recidivism study ☐ Other, please specify: **Has/have the evaluation/s been published:** ☐ No ☐ Yes; if yes, name reference(s):
Application frequency	**How many participants underwent this programme in 2006:** in total
Comments	**Would you like to add any further information here:**

Please save this file, name and close it.
To describe the next DR programme, if existing, open the original template again.
THANK YOU !

Annex 26: Original provider questionnaires – Form C

Provider Questionnaire on Driver Rehabilitation (DR)

Form C
Prior Driver Assessment or Diagnostic Screening

EU Project DRUID

Driving under the influence of alcohol, drugs and medicines

Workpackage 5: Rehabilitation

August 2007

Contract No. TREN - 05-FP6TR-SO7.61320-518404-DRUID

Step-by-step instruction

for filling out the questionnaire Driver Rehabilitation (DR) Form C

1. Please save this **Form C** questionnaire file under your organisation's name in a folder on your PC.
2. Due to electronic data evaluation, please answer this questionnaire directly on your PC (not in a printed version).
3. Fill the answers in the grey underlined fields and/or click on the grey squares corresponding to your answer. (For your reading comfort switch off the Windows mode ¶ - paragraph sign.)
4. Please tick every square where applicable for your organization. **Multiple answers are possible**.
5. After finishing Form C, please save the file again.
6. After filling out all questionnaires, please send them back as attachments via e-mail to the DRUID-person responsible for your country.

Name of organisation: Country:

1. **Which assessment approach(es) is(are) used in order to assign a DUI (driver under influence) offender to a specific rehabilitation measure/programme:**

Medical approach	☐ Yes for DUI Alcohol	☐ Yes for DUI Drugs
Psychological approach	☐ Yes for DUI Alcohol	☐ Yes for DUI Drugs
In case of both, which is the predominant approach: ☐ Medical or ☐ Psychological		

2. **Which tools are used in order to assign a DUI offender to a specific rehabilitation programme:**

Interview:	☐ Yes for DUI Alcohol	☐ Yes for DUI Drugs
If carried out, please specify: ☐ Developed within the organisation, please specify the topics: ☐ Officially available instrument(s), please specify the tool(s):		
Physical examination:	☐ Yes for DUI Alcohol	☐ Yes for DUI Drugs
If carried out, please specify: Physical heath status..... Mental health status..... Other, please specify:	☐ ☐ ☐	☐ ☐ ☐
Biological marker(s):	☐ Yes for DUI Alcohol	☐ Yes for DUI Drugs
If carried out, please specify the substance examined: Blood..... Urine..... Sweat..... Saliva..... Hair..... Please specify the alcohol marker:	☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐
Screening tool(s) on substance use disorders:	☐ Yes for DUI Alcohol	☐ Yes for DUI Drugs
If carried out, please specify: AUDIT (Alcohol Use Disorders Identification Test)..... CAGE (Cut, Annoyed, Guilty, Eye opener)..... DAST (Drug Abuse Screening Test)..... MAC-R (MacAndrew Alcoholism Scale – Revised) ..... MALT (Munich Alcoholism Test)..... MAST (Michigan Alcoholism Screening Test).....	☐ ☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐ ☐
Other tools for alcohol screening, please specify: Other tools for drug screening, please specify:		
External medical/therapeutic information:	☐ Yes for DUI Alcohol	☐ Yes for DUI Drugs

If carried out, please specify: Comprehensive information on medical/therapeutic status from treating medic(s)/therapist..... Information on / confirmation of actual treatment status..... Opinion from an external medical/therapeutic expert ..... Laboratory results.....	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐
Other medical/therapeutic information for DUI of alcohol, please specify: Other medical/therapeutic information for DUI of drugs, please specify:		
Performance / functional testing:	☐ Yes for DUI Alcohol	☐ Yes for DUI Drugs
If carried out, please specify: Perceptual functioning..... Reactive, loco-motor functioning..... Cognitive functioning..... If cognitive functioning testing, which areas: Memory..... Concentration.. Intelligence..... **Which test(s) are applied for performance/functional testing, please name:**	☐ ☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐ ☐
Personality testing:	☐ Yes for DUI Alcohol	☐ Yes for DUI Drugs
If carried out, please specify: Which tests / questionnaires are applied, please name:		
Practical driving tests:	☐ Yes for DUI Alcohol	☐ Yes for DUI Drugs
If carried out, please specify: Off-road or simulator... On-road.....	☐ ☐	☐ ☐
Qualification of the person conducting psychological assessment:	**For DUI Alcohol:**	**For DUI Drugs:**
Please specify: Psychologist without further qualification Clinical psychologist ..... Traffic psychologist ..... Neuropsychologist..... Other, please specify:	☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐
Qualification of the person conducting medical assessment:	**For DUI Alcohol:**	**For DUI Drugs:**
Please specify: General Practitioner..... Psychiatrist..... Neurologist..... Internist..... Specialist in traffic medicine..... Other, please specify:	☐ ☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐ ☐
Total number of assessments in order to assign a DUI to a specific rehabilitation programme in 2006:		
Estimate the percentage of dependency diagnoses (ICD-10/DSM-IV): Estimate the percentage of harmful use (ICD-10) / abuse (DSM-IV):	% %	% %

THANK YOU!
Please save this file now and continue according to the step-by-step instruction